

Appendix I

Country/Economy Profiles

Country/Economy Profiles

The following tables provide detailed profiles for each of the 127 economies in the Global Innovation Index 2017. They are constructed around three sections.

1 Five key indicators at the beginning of each profile are intended to put the economy into context. They present the population in millions,¹ GDP in US\$ billions, and GDP per capita in PPP current international dollars.² The fourth indicator categorizes the economy into income group and the fifth indicates its geographical region.³

2 The next section provides the economy's scores and rankings on the Global Innovation Index (GII), the Innovation Output Sub-Index, the Innovation Input Sub-Index, and the Innovation Efficiency Ratio.

The GII ranking for the 2016 edition comes next. Because there is one less economy in 2017 than in 2016 (four dropped out and three were added), and because of adjustments made to the GII framework every year and other technical factors not directly related to actual performance (missing data, updates of data, etc.), the GII rankings are not directly comparable from one year to the next. Please refer to Annex 2 of Chapter 1 for details.

Scores are normalized in the 0–100 range except for the Innovation Efficiency Ratio, for which scores revolve around the number 1 (this index is calculated as the ratio between the Output and Input Sub-Indices).

by three-digit numbers. For example, *indicator 1.3.1, ease of starting a business*, appears under *sub-pillar 1.3, Business environment*, which in turn appears under *pillar 1, Institutions*.

The 2017 GII includes 81 indicators and three types of data. Composite indicators are identified with an asterisk (*), survey questions from the World Economic Forum's Executive Opinion Survey are identified with a dagger (†), and the remaining indicators are all hard data series.

For hard data, the original value is provided (except for indicators in sub-pillar 7.3, for which the raw data were provided under the condition that only the normalized scores be published). Normalized scores in the 0–100 range are provided for everything else (index and survey data, sub-pillars, pillars, and indices).

When data are either not available or out of date (the cutoff year is 2007, with the exceptions of indicators 2.2.2, 5.1.2, 6.2.5, and 7.2.4; see Appendix III for more details), 'n/a' is used. The year of each data point is indicated in the Data Tables shown in Appendix II. To the right of the indicator title, a clock symbol indicates that the country's data for that indicator are older than the base year. More details, including the year of the data in question, are available in Appendix II.

Albania

Key indicators

Population (millions)	2.8	4.21
GDP (US\$ billion)	12.1	4.22
GDP per capita (PPP)	4,188	4.23
Income group	Lower middle income	4.24
Region	Europe	4.25

Global Innovation Index (out of 127)

Innovation Input Sub-Index	15.7	5
Innovation Output Sub-Index	43.0	5.1
Innovation Efficiency Ratio	2.74	5.2
Global Innovation Index 2016 (out of 126)	28.4	5.3

1 Institutions

1.1 Political stability & safety	75.5	46
1.2 Government effectiveness	62.9	49
1.3 Regulatory quality	65.3	50
1.4 Rule of law	47.2	62
1.5 Ease of doing business	26.8	87
1.6 Economic complexity	29.9	91
1.7 Ease of starting a business	29.7	92
1.8 Ease of doing business	26.8	87
1.9 Ease of doing business	26.8	87
1.10 Ease of doing business	26.8	87

2 Human capital & research

2.1 Scientific publications in peer-reviewed journals	13.1	91
2.2 Scientific publications in refereed journals	13.1	91
2.3 Spillover in the economy	15.1	89
2.4 R&D as a % of GDP	0.45	92
2.5 Patent as a % of GDP	0.13	93
2.6 Patent as a % of GDP	0.13	93
2.7 Patent as a % of GDP	0.13	93
2.8 Patent as a % of GDP	0.13	93
2.9 Patent as a % of GDP	0.13	93
2.10 Patent as a % of GDP	0.13	93
2.11 Patent as a % of GDP	0.13	93
2.12 Patent as a % of GDP	0.13	93
2.13 Patent as a % of GDP	0.13	93
2.14 Patent as a % of GDP	0.13	93
2.15 Patent as a % of GDP	0.13	93
2.16 Patent as a % of GDP	0.13	93
2.17 Patent as a % of GDP	0.13	93
2.18 Patent as a % of GDP	0.13	93
2.19 Patent as a % of GDP	0.13	93
2.20 Patent as a % of GDP	0.13	93

3 Infrastructure

3.1 Infrastructure & communication technologies (ICT)	15.7	5
3.2 ICT	15.7	5
3.3 Infrastructure & communication technologies (ICT)	15.7	5
3.4 Infrastructure & communication technologies (ICT)	15.7	5
3.5 Infrastructure & communication technologies (ICT)	15.7	5
3.6 Infrastructure & communication technologies (ICT)	15.7	5
3.7 Infrastructure & communication technologies (ICT)	15.7	5
3.8 Infrastructure & communication technologies (ICT)	15.7	5
3.9 Infrastructure & communication technologies (ICT)	15.7	5
3.10 Infrastructure & communication technologies (ICT)	15.7	5
3.11 Infrastructure & communication technologies (ICT)	15.7	5
3.12 Infrastructure & communication technologies (ICT)	15.7	5
3.13 Infrastructure & communication technologies (ICT)	15.7	5
3.14 Infrastructure & communication technologies (ICT)	15.7	5
3.15 Infrastructure & communication technologies (ICT)	15.7	5
3.16 Infrastructure & communication technologies (ICT)	15.7	5
3.17 Infrastructure & communication technologies (ICT)	15.7	5
3.18 Infrastructure & communication technologies (ICT)	15.7	5
3.19 Infrastructure & communication technologies (ICT)	15.7	5
3.20 Infrastructure & communication technologies (ICT)	15.7	5

4 Market sophistication

4.1 Ease of getting started	26.8	87
4.2 Domestic credit to private sector, % GDP	19.1	80
4.3 Foreign direct investment, % GDP	19.1	80

4.4 Ease of getting started	26.8	87
4.5 Market sophistication, % GDP	19.1	80
4.6 Market sophistication, % GDP	19.1	80
4.7 Market sophistication, % GDP	19.1	80
4.8 Market sophistication, % GDP	19.1	80
4.9 Market sophistication, % GDP	19.1	80
4.10 Market sophistication, % GDP	19.1	80
4.11 Market sophistication, % GDP	19.1	80
4.12 Market sophistication, % GDP	19.1	80
4.13 Market sophistication, % GDP	19.1	80
4.14 Market sophistication, % GDP	19.1	80
4.15 Market sophistication, % GDP	19.1	80
4.16 Market sophistication, % GDP	19.1	80
4.17 Market sophistication, % GDP	19.1	80
4.18 Market sophistication, % GDP	19.1	80
4.19 Market sophistication, % GDP	19.1	80
4.20 Market sophistication, % GDP	19.1	80

5 Business sophistication

5.1 Business sophistication	25.1	102
5.2 Business sophistication	25.1	102
5.3 Business sophistication	25.1	102
5.4 Business sophistication	25.1	102
5.5 Business sophistication	25.1	102
5.6 Business sophistication	25.1	102
5.7 Business sophistication	25.1	102
5.8 Business sophistication	25.1	102
5.9 Business sophistication	25.1	102
5.10 Business sophistication	25.1	102
5.11 Business sophistication	25.1	102
5.12 Business sophistication	25.1	102
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5.15 Business sophistication	25.1	102
5.16 Business sophistication	25.1	102
5.17 Business sophistication	25.1	102
5.18 Business sophistication	25.1	102
5.19 Business sophistication	25.1	102
5.20 Business sophistication	25.1	102

6 Knowledge & technology outputs

6.1 Knowledge & technology outputs	114	118
6.2 Knowledge & technology outputs	114	118
6.3 Knowledge & technology outputs	114	118
6.4 Knowledge & technology outputs	114	118
6.5 Knowledge & technology outputs	114	118
6.6 Knowledge & technology outputs	114	118
6.7 Knowledge & technology outputs	114	118
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6.15 Knowledge & technology outputs	114	118
6.16 Knowledge & technology outputs	114	118
6.17 Knowledge & technology outputs	114	118
6.18 Knowledge & technology outputs	114	118
6.19 Knowledge & technology outputs	114	118
6.20 Knowledge & technology outputs	114	118

7 Creative outputs

7.1 Creative outputs	20	100
7.2 Creative outputs	20	100
7.3 Creative outputs	20	100
7.4 Creative outputs	20	100
7.5 Creative outputs	20	100
7.6 Creative outputs	20	100
7.7 Creative outputs	20	100
7.8 Creative outputs	20	100
7.9 Creative outputs	20	100
7.10 Creative outputs	20	100
7.11 Creative outputs	20	100
7.12 Creative outputs	20	100
7.13 Creative outputs	20	100
7.14 Creative outputs	20	100
7.15 Creative outputs	20	100
7.16 Creative outputs	20	100
7.17 Creative outputs	20	100
7.18 Creative outputs	20	100
7.19 Creative outputs	20	100
7.20 Creative outputs	20	100

NOTES • Values are averages. C. countries = not a country questionnaire.

• Countries that are not in the sample are marked with a dash. Countries that are not in the sample are marked with a dash.

Source: Various sources. Data are from the year 2016. Data are from the

For further details, see Appendix III, Sources and Definitions, and Appendix IV, Technical Notes.

4 To the far right of each column, a solid circle indicates that an indicator is one of the strengths of the country/economy in question, and a hollow circle indicates that it is a weakness.

All ranks of 1, 2, and 3 are highlighted as strengths, except in particular instances at the sub-pillar level where strengths and weaknesses are not signaled when the desired minimum indicator coverage (DMC) is not met for that sub-pillar.⁴ For the remaining indicators, strengths and weaknesses of a particular economy are based on the percentage of economies with scores that fall below its score (i.e., percent ranks).

- For a given economy, strengths (●) are those scores with percent ranks greater than the 10th largest percent rank among the 81 indicators in that economy.
- Similarly, for that economy, weaknesses (○) are those scores with percent ranks lower than the 10th smallest percent rank among the 81 indicators in that economy.

In addition, this year countries with a sub-pillar that does not meet the DMC, independently of whether it is signaled as a strength/weakness, will show the rank for that sub-pillar within brackets. Those that have more than one sub-pillar that fails to meet the DMC in the same pillar will also show the ranks of the pillar where these are located within brackets.

Percent ranks embed more information than ranks and allow for comparisons of ranks of series with missing data and ties in ranks. Examples

from the Russian Federation (Russia) illustrate this point:

1. Strengths for Russia are all indicators with percent ranks equal to or above 0.83 (10th largest percent rank for Russia); weaknesses are all indicators with percent ranks equal to or below 0.26 (Russia's 10th smallest percent rank).
2. Russia ranks 22nd out of 127 economies in 6.1.5, *citable documents H index*, with a percent rank of 0.83; this indicator is a strength for Russia.
3. Russia ranks 25th in 2.3.4, *QS university rankings*, but with a percent rank of 0.81, this indicator is not a strength for Russia.
4. The rank of 48 (percent rank of 0.24) in 7.2.3, *global entertainment and media market*, is a weakness for Russia. By contrast, the rank of 47 for Senegal in 5.2.1 *university/industry research collaboration* is a strength for Senegal (with a percent rank of 0.62, this is above the cutoff for strengths for Senegal, which is 0.57).

Percent ranks are not reported in the Country/Economy Profiles but they are presented in the Data Tables (Appendix II).

Notes

- 1 Data are from the United Nations, Department of Economic and Social Affairs, Population Division, *World Population Prospects: The 2015 Revision*.
- 2 Data for GDP and GDP per capita are from the International Monetary Fund *World Economic Outlook 2016* database.

- 3 Countries/economies are classified according to the World Bank Income Group (July 2016; see <https://blogs.worldbank.org/opendata/new-country-classifications-2016>) and special classification based on the online version of the United Nations publication *Standard Country or Area Codes for Statistical Use*, originally published as Series M, No. 49, and now commonly referred to as the M49 standard (April 2017; see <https://unstats.un.org/unsd/methodology/m49/>). These are: EUR = Europe; NAC = Northern America; LCN = Latin America and the Caribbean; CSA = Central and Southern Asia; SEAO = South East Asia, East Asia, and Oceania; NAWA = Northern Africa and Western Asia; SSF = Sub-Saharan Africa.
- 4 Data stringency requirements are used in the attribution of strengths and weaknesses at the sub-pillar level. When countries do not meet a data minimum coverage (DMC) requirement at the sub-pillar level (for sub-pillars with two indicators, the DMC is 1; for three it is 2; for four it is 2; and for five it is 3), they are not attributed a strength or weakness at the sub-pillar either. Furthermore, if the country in question does not meet the DMC requirements at the sub-pillar level, but still obtains a ranking higher than or equal to 10 or a ranking equal to or lower than 100 at the sub-pillar level, for caution this rank is put in brackets. This procedure is to ensure that incomplete data coverage does not lead to erroneous conclusions about strengths or weaknesses, or particularly about strong or weak sub-pillar rankings.

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Key indicators

Population (millions)	2.9
GDP (US\$ billions)	12.1
GDP per capita, PPP\$	11,300.8
Income group	Upper-middle income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	28.9	93
Innovation Output Sub-Index	15.7	115 ○
Innovation Input Sub-Index	42.0	70
Innovation Efficiency Ratio	0.4	122 ○
Global Innovation Index 2016 (out of 128)	28.4	92

1 Institutions	63.3	62
1.1 Political environment	57.7	50
1.1.1 Political stability & safety*	72.5	45
1.1.2 Government effectiveness*	42.9	69
1.2 Regulatory environment	56.3	80
1.2.1 Regulatory quality*	47.2	65
1.2.2 Rule of law*	28.9	82
1.2.3 Cost of redundancy dismissal, salary weeks	20.8	87
1.3 Business environment	75.9	43
1.3.1 Ease of starting a business*	91.7	39 ●
1.3.2 Ease of resolving insolvency*	65.0	40 ●
1.3.3 Ease of paying taxes*	71.0	73

2 Human capital & research	23.5	91
2.1 Education	39.0	92
2.1.1 Expenditure on education, % GDP	3.5	91
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	5.9	104 ○
2.1.3 School life expectancy, years	15.5	35 ●
2.1.4 PISA scales in reading, maths, & science	415.2	57
2.1.5 Pupil-teacher ratio, secondary	13.5	53
2.2 Tertiary education	30.2	81
2.2.1 Tertiary enrolment, % gross	58.1	44
2.2.2 Graduates in science & engineering, %	16.8	73
2.2.3 Tertiary inbound mobility, %	1.7	74
2.3 Research & development (R&D)	1.3	101
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	157.3	80
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.2	95
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	46.4	66
3.1 Information & communication technologies (ICTs)	52.5	74
3.1.1 ICT access*	47.3	87
3.1.2 ICT use*	38.8	71
3.1.3 Government's online service*	59.4	67
3.1.4 E-participation*	64.4	54
3.2 General infrastructure	34.2	77
3.2.1 Electricity output, kWh/cap	1,634.6	83
3.2.2 Logistics performance*	16.2	110
3.2.3 Gross capital formation, % GDP	28.8	24 ●
3.3 Ecological sustainability	52.5	38 ●
3.3.1 GDP/unit of energy use	12.5	22 ●
3.3.2 Environmental performance*	74.4	57
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	3.2	31 ●

4 Market sophistication	51.7	41
4.1 Credit	28.8	82
4.1.1 Ease of getting credit*	65.0	40
4.1.2 Domestic credit to private sector, % GDP	35.5	90
4.1.3 Microfinance gross loans, % GDP	0.5	35

4.2 Investment	71.7	[4]
4.2.1 Ease of protecting minority investors*	71.7	19 ●
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, & market scale	54.6	95
4.3.1 Applied tariff rate, weighted mean, %	1.1	15 ●
4.3.2 Intensity of local competition [†]	58.3	107 ○
4.3.3 Domestic market scale, bn PPP\$	34.2	105

5 Business sophistication	25.3	102
5.1 Knowledge workers	23.3	103
5.1.1 Knowledge-intensive employment, % [Ⓐ]	16.0	85
5.1.2 Firms offering formal training, % firms	23.8	66
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, % [Ⓐ]	3.3	81
5.1.5 Females employed w/advanced degrees, % total	9.2	65
5.2 Innovation linkages	20.8	101
5.2.1 University/industry research collaboration [†]	33.9	96
5.2.2 State of cluster development [†]	32.9	110 ○
5.2.3 GERD financed by abroad, % [Ⓐ]	7.4	54
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	n/a	n/a
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	90
5.3 Knowledge absorption	31.8	69
5.3.1 Intellectual property payments, % total trade	0.6	54
5.3.2 High-tech imports less re-imports, % total trade	4.3	114 ○
5.3.3 ICT services imports, % total trade	1.5	42
5.3.4 FDI net inflows, % GDP	9.1	13 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	11.4	118 ○
6.1 Knowledge creation	2.0	120 ○
6.1.1 Patents by origin/bn PPP\$ GDP	0.4	78
6.1.2 PCT patent applications/bn PPP\$ GDP [Ⓐ]	0.1	72
6.1.3 Utility models by origin/bn PPP\$ GDP [Ⓐ]	0.0	60 ○
6.1.4 Scientific & technical articles/bn PPP\$ GDP	5.2	98
6.1.5 Citable documents H index	1.8	120 ○
6.2 Knowledge impact	12.5	114 ○
6.2.1 Growth rate of PPP\$ GDP/worker, %	(2.7)	106 ○
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	1.1	65
6.2.3 Computer software spending, % GDP	0.1	86
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	8.5	40 ●
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	88
6.3 Knowledge diffusion	19.6	83
6.3.1 Intellectual property receipts, % total trade	0.0	69
6.3.2 High-tech exports less re-exports, % total trade	0.4	91
6.3.3 ICT services exports, % total trade	2.8	37 ●
6.3.4 FDI net outflows, % GDP	0.5	66

7 Creative outputs	20.0	100
7.1 Intangible assets	27.6	114 ○
7.1.1 Trademarks by origin/bn PPP\$ GDP	26.5	77
7.1.2 Industrial designs by origin/bn PPP\$ GDP [Ⓐ]	0.4	82
7.1.3 ICTs & business model creation [†]	49.6	102
7.1.4 ICTs & organizational model creation [†]	32.6	118 ○
7.2 Creative goods & services	5.7	104
7.2.1 Cultural & creative services exports, % of total trade	0.0	65
7.2.2 National feature films/mn pop. 15–69	3.3	54
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.1	88
7.3 Online creativity	19.2	65
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	7.3	45
7.3.2 Country-code TLDs/th pop. 15–69	1.3	74
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	5.1	60
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Algeria

Key indicators

Population (millions)	40.4
GDP (US\$ billions)	168.3
GDP per capita, PPP\$	14,503.9
Income group	Upper-middle income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	24.3	108
Innovation Output Sub-Index	15.6	117
Innovation Input Sub-Index	33.1	105
Innovation Efficiency Ratio	0.5	111
Global Innovation Index 2016 (out of 128)	24.5	113

1 Institutions	47.0	103
1.1 Political environment	33.8	108
1.1.1 Political stability & safety*	38.5	111
1.1.2 Government effectiveness*	29.1	95
1.2 Regulatory environment	47.6	106
1.2.1 Regulatory quality*	12.2	125 ○
1.2.2 Rule of law*	15.1	112
1.2.3 Cost of redundancy dismissal, salary weeks	17.3	71
1.3 Business environment	59.7	99
1.3.1 Ease of starting a business*	77.5	106
1.3.2 Ease of resolving insolvency*	47.7	68
1.3.3 Ease of paying taxes*	54.0	108
2 Human capital & research	25.8	86
2.1 Education	41.4	83
2.1.1 Expenditure on education, % GDP [Ⓐ]	4.3	70
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years [Ⓐ]	14.4	60 ●
2.1.4 PISA scales in reading, maths, & science	361.7	69
2.1.5 Pupil-teacher ratio, secondary	n/a	n/a
2.2 Tertiary education	35.9	63 ●
2.2.1 Tertiary enrolment, % gross	36.9	70
2.2.2 Graduates in science & engineering, %	27.6	17 ●
2.2.3 Tertiary inbound mobility, %	0.6	88
2.3 Research & development (R&D)	0.0	115 ○
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	n/a	n/a
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○
3 Infrastructure	42.3	79
3.1 Information & communication technologies (ICTs)	24.5	113
3.1.1 ICT access*	50.3	82
3.1.2 ICT use*	29.2	89
3.1.3 Government's online service*	6.5	125 ○
3.1.4 E-participation*	11.9	122
3.2 General infrastructure	59.6	8 ●
3.2.1 Electricity output, kWh/cap	1,650.2	82
3.2.2 Logistics performance*	32.7	75
3.2.3 Gross capital formation, % GDP	47.8	1 ●
3.3 Ecological sustainability	42.8	74
3.3.1 GDP/unit of energy use	10.0	48 ●
3.3.2 Environmental performance*	70.3	76
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.2	110
4 Market sophistication	29.5	122
4.1 Credit	8.8	125 ○
4.1.1 Ease of getting credit*	10.0	124 ○
4.1.2 Domestic credit to private sector, % GDP	21.6	110
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	22.8	124
4.2.1 Ease of protecting minority investors*	33.3	124 ○
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	81
4.3 Trade, competition, & market scale	56.7	85
4.3.1 Applied tariff rate, weighted mean, %	8.3	108
4.3.2 Intensity of local competition [†]	46.3	123 ○
4.3.3 Domestic market scale, bn PPP\$	609.4	33 ●

5 Business sophistication 21.0 119

5.1 Knowledge workers	16.6	115
5.1.1 Knowledge-intensive employment, % [Ⓐ]	10.0	95
5.1.2 Firms offering formal training, % firms [Ⓐ]	17.3	83
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	4.6	78
5.2 Innovation linkages	19.6	111
5.2.1 University/industry research collaboration [†]	28.5	108
5.2.2 State of cluster development [†]	34.2	105
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	107
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	101
5.3 Knowledge absorption	26.9	91
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.2	81
5.3.2 High-tech imports less re-imports, % total trade	11.7	25 ●
5.3.3 ICT services imports, % total trade [Ⓐ]	0.3	110
5.3.4 FDI net inflows, % GDP	0.4	118
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs 14.4 107

6.1 Knowledge creation	3.8	101
6.1.1 Patents by origin/bn PPP\$ GDP	0.2	101
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	97
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	5.4	97
6.1.5 Citable documents H index	7.2	81
6.2 Knowledge impact	27.4	81
6.2.1 Growth rate of PPP\$ GDP/worker, %	2.0	37 ●
6.2.2 New businesses/th pop. 15–64	0.6	83
6.2.3 Computer software spending, % GDP	0.0	124 ○
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	1.0	109
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.3	39 ●
6.3 Knowledge diffusion	12.2	124
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	104
6.3.2 High-tech exports less re-exports, % total trade	0.0	125 ○
6.3.3 ICT services exports, % total trade [Ⓐ]	0.3	112
6.3.4 FDI net outflows, % GDP	(0.0)	112

7 Creative outputs 16.7 116

7.1 Intangible assets	26.0	120
7.1.1 Trademarks by origin/bn PPP\$ GDP	24.9	79
7.1.2 Industrial designs by origin/bn PPP\$ GDP [Ⓐ]	1.5	52 ●
7.1.3 ICTs & business model creation [†]	45.2	115
7.1.4 ICTs & organizational model creation [†]	29.6	120
7.2 Creative goods & services	5.7	105
7.2.1 Cultural & creative services exports, % of total trade	0.0	84
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	1.1	55
7.2.4 Printing & publishing manufactures, % [Ⓐ]	1.2	49 ●
7.2.5 Creative goods exports, % total trade	0.0	125 ○
7.3 Online creativity	9.0	101
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.5	107
7.3.2 Country-code TLDs/th pop. 15–69	0.1	110
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	3.0	99
7.3.4 Video uploads on YouTube/pop. 15–69	6.5	66

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	43.8
GDP (US\$ billions)	541.7
GDP per capita, PPP\$	22,553.6
Income group	Upper-middle income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	32.0	76
Innovation Output Sub-Index	22.6	81
Innovation Input Sub-Index	41.4	72
Innovation Efficiency Ratio	0.5	94
Global Innovation Index 2016 (out of 128)	30.2	81

1 Institutions 46.4 109

1.1 Political environment	51.1	68
1.1.1 Political stability & safety*	62.2	66
1.1.2 Government effectiveness*	39.9	77
1.2 Regulatory environment	36.3	118 ○
1.2.1 Regulatory quality*	17.7	119 ○
1.2.2 Rule of law*	15.9	111
1.2.3 Cost of redundancy dismissal, salary weeks	30.3	117 ○
1.3 Business environment	51.7	118 ○
1.3.1 Ease of starting a business*	73.6	115 ○
1.3.2 Ease of resolving insolvency*	41.9	87
1.3.3 Ease of paying taxes*	39.8	122 ○

2 Human capital & research 42.6 34 ●

2.1 Education	57.4	34 ●
2.1.1 Expenditure on education, % GDP	5.5	30 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	22.2	43
2.1.3 School life expectancy, years	17.3	16 ●
2.1.4 PISA scales in reading, maths, & science	468.9	39
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	12.2	43
2.2 Tertiary education	40.9	44
2.2.1 Tertiary enrolment, % gross [Ⓐ]	82.9	11 ●
2.2.2 Graduates in science & engineering, %	14.1	89
2.2.3 Tertiary inbound mobility, %	n/a	n/a
2.3 Research & development (R&D)	29.5	37
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	1,202.1	44
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.6	55
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	43.6	35 ●
2.3.4 QS university ranking, average score top 3*	46.0	28 ●

3 Infrastructure 46.6 65

3.1 Information & communication technologies (ICTs)	64.0	49
3.1.1 ICT access*	67.7	58
3.1.2 ICT use*	54.5	52
3.1.3 Government's online service*	71.0	43
3.1.4 E-participation*	62.7	59
3.2 General infrastructure	28.2	96
3.2.1 Electricity output, kWh/cap	3,286.6	59
3.2.2 Logistics performance*	41.6	65
3.2.3 Gross capital formation, % GDP	16.5	106
3.3 Ecological sustainability	47.6	51
3.3.1 GDP/unit of energy use	9.3	56
3.3.2 Environmental performance*	79.8	43
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.6	55

4 Market sophistication 37.7 104

4.1 Credit	18.3	116 ○
4.1.1 Ease of getting credit*	50.0	72
4.1.2 Domestic credit to private sector, % GDP	14.7	117 ○
4.1.3 Microfinance gross loans, % GDP	0.0	78 ○

4.2 Investment	32.4	100
4.2.1 Ease of protecting minority investors*	61.7	50
4.2.2 Market capitalization, % GDP	9.6	77 ○
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	78
4.3 Trade, competition, & market scale	62.6	59
4.3.1 Applied tariff rate, weighted mean, %	7.4	106
4.3.2 Intensity of local competition [†]	57.1	112 ○
4.3.3 Domestic market scale, bn PPP\$	879.4	25 ●

5 Business sophistication 33.6 59

5.1 Knowledge workers	46.8	42
5.1.1 Knowledge-intensive employment, % [Ⓐ]	23.9	61
5.1.2 Firms offering formal training, % firms [Ⓐ]	63.6	5 ●
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.1	59
5.1.4 GERD financed by business, % [Ⓐ]	26.5	55
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	16.4	34
5.2 Innovation linkages	17.0	119 ○
5.2.1 University/industry research collaboration [†]	40.4	68
5.2.2 State of cluster development [†]	37.2	94
5.2.3 GERD financed by abroad, % [Ⓐ]	0.6	91 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	98
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	67
5.3 Knowledge absorption	37.1	44
5.3.1 Intellectual property payments, % total trade	2.6	7 ●
5.3.2 High-tech imports less re-imports, % total trade	13.4	17 ●
5.3.3 ICT services imports, % total trade	1.4	47
5.3.4 FDI net inflows, % GDP	1.6	93
5.3.5 Research talent, % in business enterprise [Ⓐ]	6.2	72

6 Knowledge & technology outputs 17.6 89

6.1 Knowledge creation	9.5	67
6.1.1 Patents by origin/bn PPP\$ GDP	0.6	71
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	0.1	45
6.1.4 Scientific & technical articles/bn PPP\$ GDP	9.6	68
6.1.5 Citable documents H index	25.3	35 ●
6.2 Knowledge impact	23.0	98
6.2.1 Growth rate of PPP\$ GDP/worker, %	(0.2)	90
6.2.2 New businesses/th pop. 15–64	0.4	89
6.2.3 Computer software spending, % GDP	0.2	68
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	8.0	42
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	20.4	73
6.3.1 Intellectual property receipts, % total trade	0.2	35
6.3.2 High-tech exports less re-exports, % total trade	2.0	56
6.3.3 ICT services exports, % total trade	2.3	48
6.3.4 FDI net outflows, % GDP	0.2	83

7 Creative outputs 27.6 80

7.1 Intangible assets	36.6	90
7.1.1 Trademarks by origin/bn PPP\$ GDP	59.0	37
7.1.2 Industrial designs by origin/bn PPP\$ GDP	1.1	58
7.1.3 ICTs & business model creation [†]	46.6	114 ○
7.1.4 ICTs & organizational model creation [†]	48.5	80
7.2 Creative goods & services	12.9	78
7.2.1 Cultural & creative services exports, % of total trade	0.4	31
7.2.2 National feature films/mn pop. 15–69	6.2	31
7.2.3 Global ent. & media market/th pop. 15–69	13.4	29
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.1	86
7.3 Online creativity	24.4	52
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	3.1	65
7.3.2 Country-code TLDs/th pop. 15–69	5.8	45
7.3.3 Wikipedia edits/mn pop. 15–69	5.3	53
7.3.4 Video uploads on YouTube/pop. 15–69	37.4	35

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Armenia

Key indicators

Population (millions)	3.0
GDP (US\$ billions)	10.8
GDP per capita, PPP\$	8,467.9
Income group	Lower-middle income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	35.7	59
Innovation Output Sub-Index	31.6	47
Innovation Input Sub-Index	39.7	82
Innovation Efficiency Ratio	0.8	17 ●
Global Innovation Index 2016 (out of 128)	35.1	60
1 Institutions	61.9	63
1.1 Political environment	47.7	74
1.1.1 Political stability & safety*	56.8	78
1.1.2 Government effectiveness*	38.7	79
1.2 Regulatory environment	66.5	55
1.2.1 Regulatory quality*	48.5	61
1.2.2 Rule of law*	29.4	80
1.2.3 Cost of redundancy dismissal, salary weeks	11.0	38
1.3 Business environment	71.5	61
1.3.1 Ease of starting a business*	96.1	9 ●
1.3.2 Ease of resolving insolvency*	46.1	71
1.3.3 Ease of paying taxes*	72.5	67
2 Human capital & research	19.4	103
2.1 Education	28.9	110
2.1.1 Expenditure on education, % GDP	2.8	103 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	15.0	82
2.1.3 School life expectancy, years	13.2	67
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	n/a	n/a
2.2 Tertiary education	27.5	88
2.2.1 Tertiary enrolment, % gross	44.3	60
2.2.2 Graduates in science & engineering, %	14.1	90 ○
2.2.3 Tertiary inbound mobility, %	4.1	47
2.3 Research & development (R&D)	1.8	95
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	0.2	83
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○
3 Infrastructure	39.0	91
3.1 Information & communication technologies (ICTs)	49.9	79
3.1.1 ICT access*	65.7	62
3.1.2 ICT use*	38.5	72
3.1.3 Government's online service*	42.8	96
3.1.4 E-participation*	52.5	82
3.2 General infrastructure	23.4	112 ○
3.2.1 Electricity output, kWh/cap	2,574.8	68
3.2.2 Logistics performance*	6.6	121 ○
3.2.3 Gross capital formation, % GDP	20.6	76
3.3 Ecological sustainability	43.7	68
3.3.1 GDP/unit of energy use	7.7	74
3.3.2 Environmental performance*	81.6	37
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.1	115 ○
4 Market sophistication	50.5	46
4.1 Credit	59.1	16 ●
4.1.1 Ease of getting credit*	75.0	19 ●
4.1.2 Domestic credit to private sector, % GDP	45.7	75
4.1.3 Microfinance gross loans, % GDP	4.8	7 ●

4.2 Investment	40.2	62
4.2.1 Ease of protecting minority investors*	60.0	52
4.2.2 Market capitalization, % GDP ^②	1.2	85 ○
4.2.3 Venture capital deals/bn PPP\$ GDP	n/a	n/a
4.3 Trade, competition, & market scale	52.2	101
4.3.1 Applied tariff rate, weighted mean, %	2.5	59
4.3.2 Intensity of local competition [†]	63.5	86
4.3.3 Domestic market scale, bn PPP\$	26.6	112 ○
5 Business sophistication	27.7	85
5.1 Knowledge workers	37.0	65
5.1.1 Knowledge-intensive employment, %	31.1	46
5.1.2 Firms offering formal training, % firms	16.2	84 ○
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	14.5	42
5.2 Innovation linkages	19.1	114 ○
5.2.1 University/industry research collaboration [†]	36.9	86
5.2.2 State of cluster development [†]	38.9	89
5.2.3 GERD financed by abroad, %	2.3	74
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	70
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.5	37
5.3 Knowledge absorption	27.1	90
5.3.1 Intellectual property payments, % total trade	n/a	n/a
5.3.2 High-tech imports less re-imports, % total trade	5.1	109
5.3.3 ICT services imports, % total trade	0.9	73
5.3.4 FDI net inflows, % GDP	2.8	66
5.3.5 Research talent, % in business enterprise	n/a	n/a
6 Knowledge & technology outputs	25.7	50
6.1 Knowledge creation	28.9	32
6.1.1 Patents by origin/bn PPP\$ GDP	4.5	25 ●
6.1.2 PCT patent applications/bn PPP\$ GDP	0.3	45
6.1.3 Utility models by origin/bn PPP\$ GDP	2.1	13 ●
6.1.4 Scientific & technical articles/bn PPP\$ GDP	29.0	26 ●
6.1.5 Citable documents H index	9.9	62
6.2 Knowledge impact	24.2	91
6.2.1 Growth rate of PPP\$ GDP/worker, %	2.4	31
6.2.2 New businesses/th pop. 15–64	1.5	55
6.2.3 Computer software spending, % GDP	0.1	88
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	1.1	107
6.2.5 High- & medium-high-tech manufactures, % ^②	0.0	97 ○
6.3 Knowledge diffusion	24.0	57
6.3.1 Intellectual property receipts, % total trade	n/a	n/a
6.3.2 High-tech exports less re-exports, % total trade	0.3	93
6.3.3 ICT services exports, % total trade	3.5	22 ●
6.3.4 FDI net outflows, % GDP	0.2	88
7 Creative outputs	37.5	44
7.1 Intangible assets	49.1	41
7.1.1 Trademarks by origin/bn PPP\$ GDP	107.4	11 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	1.2	56
7.1.3 ICTs & business model creation [†]	59.0	68
7.1.4 ICTs & organizational model creation [†]	54.6	58
7.2 Creative goods & services	26.1	43
7.2.1 Cultural & creative services exports, % of total trade	0.3	35
7.2.2 National feature films/mn pop. 15–69	16.6	8 ●
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % ^②	1.8	25
7.2.5 Creative goods exports, % total trade	0.4	60
7.3 Online creativity	25.7	48
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	2.8	68
7.3.2 Country-code TLDs/th pop. 15–69	4.9	51
7.3.3 Wikipedia edits/mn pop. 15–69	7.2	7 ●
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

② 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 181 of this appendix for details.

Key indicators

Population (millions)	24.3
GDP (US\$ billions)	1,256.6
GDP per capita, PPP\$	47,389.1
Income group	High income
Region	South East Asia, East Asia, and Oceania

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	51.8	23
Innovation Output Sub-Index	39.1	30
Innovation Input Sub-Index	64.6	12
Innovation Efficiency Ratio	0.6	76 ○
Global Innovation Index 2016 (out of 128)	53.1	19

1 Institutions	87.4	14
1.1 Political environment	83.9	17
1.1.1 Political stability & safety*	85.7	24
1.1.2 Government effectiveness*	82.2	15
1.2 Regulatory environment	91.2	11
1.2.1 Regulatory quality*	88.1	8
1.2.2 Rule of law*	92.7	13
1.2.3 Cost of redundancy dismissal, salary weeks	12.0	43
1.3 Business environment	86.9	16
1.3.1 Ease of starting a business*	96.5	7 ●
1.3.2 Ease of resolving insolvency*	78.7	20
1.3.3 Ease of paying taxes*	85.6	23

2 Human capital & research	60.2	9
2.1 Education	58.6	26
2.1.1 Expenditure on education, % GDP	5.3	41
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	16.9	66 ○
2.1.3 School life expectancy, years	20.5	1 ●
2.1.4 PISA scales in reading, maths, & science	502.3	19
2.1.5 Pupil-teacher ratio, secondary	n/a	n/a
2.2 Tertiary education	58.1	10
2.2.1 Tertiary enrolment, % gross [Ⓐ]	90.3	3 ●
2.2.2 Graduates in science & engineering, % [Ⓐ]	15.9	79 ○
2.2.3 Tertiary inbound mobility, % [Ⓐ]	18.3	6 ●
2.3 Research & development (R&D)	64.0	13
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	4,530.7	15
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	2.2	16
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	68.6	19
2.3.4 QS university ranking, average score top 3*	81.6	7 ●

3 Infrastructure	64.8	7 ●
3.1 Information & communication technologies (ICTs)	88.9	4 ●
3.1.1 ICT access*	82.3	20
3.1.2 ICT use*	77.0	15
3.1.3 Government's online service*	97.8	2 ●
3.1.4 E-participation*	98.3	2 ●
3.2 General infrastructure	53.7	12
3.2.1 Electricity output, kWh/cap	10,388.2	13
3.2.2 Logistics performance*	80.0	19
3.2.3 Gross capital formation, % GDP	24.9	45
3.3 Ecological sustainability	51.8	41
3.3.1 GDP/unit of energy use	8.2	67 ○
3.3.2 Environmental performance*	87.2	13
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	3.9	26

4 Market sophistication	65.3	9
4.1 Credit	72.5	5 ●
4.1.1 Ease of getting credit*	90.0	5 ●
4.1.2 Domestic credit to private sector, % GDP	137.6	13
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	45.2	40
4.2.1 Ease of protecting minority investors*	58.3	62
4.2.2 Market capitalization, % GDP	88.6	13
4.2.3 Venture capital deals/bn PPP\$ GDP	0.1	22
4.3 Trade, competition, & market scale	78.2	13
4.3.1 Applied tariff rate, weighted mean, %	1.9	53
4.3.2 Intensity of local competition [†]	81.9	6 ●
4.3.3 Domestic market scale, bn PPP\$	1,188.8	19

5 Business sophistication	45.4	27
5.1 Knowledge workers	67.5	10
5.1.1 Knowledge-intensive employment, % [Ⓐ]	44.9	13
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP [Ⓐ]	1.2	17
5.1.4 GERD financed by business, % [Ⓐ]	61.9	9
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	22.6	16
5.2 Innovation linkages	32.0	52
5.2.1 University/industry research collaboration [†]	54.5	32
5.2.2 State of cluster development [†]	49.6	42
5.2.3 GERD financed by abroad, % [Ⓐ]	1.6	80 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.2	7
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	1.0	28
5.3 Knowledge absorption	36.6	48
5.3.1 Intellectual property payments, % total trade	1.4	20
5.3.2 High-tech imports less re-imports, % total trade	11.5	28
5.3.3 ICT services imports, % total trade	1.0	69 ○
5.3.4 FDI net inflows, % GDP	3.2	53
5.3.5 Research talent, % in business enterprise [Ⓐ]	27.9	46 ○

6 Knowledge & technology outputs	32.1	34
6.1 Knowledge creation	34.3	25
6.1.1 Patents by origin/bn PPP\$ GDP	2.0	45
6.1.2 PCT patent applications/bn PPP\$ GDP	1.5	22
6.1.3 Utility models by origin/bn PPP\$ GDP	1.0	27
6.1.4 Scientific & technical articles/bn PPP\$ GDP	48.7	9
6.1.5 Citable documents H index	63.6	10
6.2 Knowledge impact	44.0	19
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.8	62 ○
6.2.2 New businesses/th pop. 15–64	14.9	5 ●
6.2.3 Computer software spending, % GDP	0.3	51
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	12.0	32
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.3	49
6.3 Knowledge diffusion	17.9	96 ○
6.3.1 Intellectual property receipts, % total trade	0.3	31
6.3.2 High-tech exports less re-exports, % total trade	2.0	55
6.3.3 ICT services exports, % total trade	0.8	89 ○
6.3.4 FDI net outflows, % GDP	0.1	91 ○

7 Creative outputs	46.1	24
7.1 Intangible assets	50.3	36
7.1.1 Trademarks by origin/bn PPP\$ GDP	70.8	25
7.1.2 Industrial designs by origin/bn PPP\$ GDP	2.5	41
7.1.3 ICTs & business model creation [†]	68.5	35
7.1.4 ICTs & organizational model creation [†]	64.8	28
7.2 Creative goods & services	27.4	38
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.3	38
7.2.2 National feature films/mn pop. 15–69	1.9	61 ○
7.2.3 Global ent. & media market/th pop. 15–69	63.9	8
7.2.4 Printing & publishing manufactures, % [Ⓐ]	2.1	19
7.2.5 Creative goods exports, % total trade	0.8	48
7.3 Online creativity	56.2	12
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	63.6	9
7.3.2 Country-code TLDs/th pop. 15–69	52.8	14
7.3.3 Wikipedia edits/mn pop. 15–69	6.6	24
7.3.4 Video uploads on YouTube/pop. 15–69	44.8	23

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Austria

Key indicators

Population (millions)	8.6
GDP (US\$ billions)	387.3
GDP per capita, PPP\$	47,249.9
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	53.1	20
Innovation Output Sub-Index	43.3	21
Innovation Input Sub-Index	62.9	18
Innovation Efficiency Ratio	0.7	41
Global Innovation Index 2016 (out of 128)	52.6	20

1 Institutions **87.1** **15**

1.1 Political environment	86.3	14
1.1.1 Political stability & safety*	92.6	8 ●
1.1.2 Government effectiveness*	80.0	19
1.2 Regulatory environment	93.0	9 ●
1.2.1 Regulatory quality*	78.7	17
1.2.2 Rule of law*	93.5	10 ●
1.2.3 Cost of redundancy dismissal, salary weeks	8.0	1 ●
1.3 Business environment	82.0	27
1.3.1 Ease of starting a business*	83.7	85 ○
1.3.2 Ease of resolving insolvency*	78.9	19
1.3.3 Ease of paying taxes*	83.4	37

2 Human capital & research **61.0** **8 ●**

2.1 Education	59.7	24
2.1.1 Expenditure on education, % GDP	5.6	29
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	27.5	17
2.1.3 School life expectancy, years	16.0	31
2.1.4 PISA scales in reading, maths, & science	492.2	25
2.1.5 Pupil-teacher ratio, secondary	9.6	22
2.2 Tertiary education	66.0	2 ●
2.2.1 Tertiary enrolment, % gross	81.5	13
2.2.2 Graduates in science & engineering, %	27.9	15
2.2.3 Tertiary inbound mobility, %	15.9	10 ●
2.3 Research & development (R&D)	57.5	18
2.3.1 Researchers, FTE/mn pop.	4,955.0	11
2.3.2 Gross expenditure on R&D, % GDP	3.1	5 ●
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	51.7	27
2.3.4 QS university ranking, average score top 3*	46.3	26

3 Infrastructure **63.0** **16**

3.1 Information & communication technologies (ICTs)	82.4	16
3.1.1 ICT access*	83.5	15
3.1.2 ICT use*	66.7	27
3.1.3 Government's online service*	91.3	11 ●
3.1.4 E-participation*	88.1	14
3.2 General infrastructure	51.5	19
3.2.1 Electricity output, kWh/cap	7,206.5	27
3.2.2 Logistics performance*	94.1	7 ●
3.2.3 Gross capital formation, % GDP	22.5	61 ○
3.3 Ecological sustainability	55.1	29
3.3.1 GDP/unit of energy use	11.2	32
3.3.2 Environmental performance*	86.6	18
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	3.0	33

4 Market sophistication **53.1** **30**

4.1 Credit	47.2	36
4.1.1 Ease of getting credit*	60.0	55 ○
4.1.2 Domestic credit to private sector, % GDP	87.0	35
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	40.2	63 ○
4.2.1 Ease of protecting minority investors*	65.0	31
4.2.2 Market capitalization, % GDP	25.5	56 ○
4.2.3 Venture capital deals/bn PPP\$ GDP	0.1	25
4.3 Trade, competition, & market scale	72.0	29
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition†	76.5	22
4.3.3 Domestic market scale, bn PPP\$	415.9	43

5 Business sophistication **50.3** **19**

5.1 Knowledge workers	63.3	17
5.1.1 Knowledge-intensive employment, %	40.6	23
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	2.2	5 ●
5.1.4 GERD financed by business, %	52.5	18
5.1.5 Females employed w/advanced degrees, % total	16.0	36
5.2 Innovation linkages	43.7	23
5.2.1 University/industry research collaboration†	63.6	15
5.2.2 State of cluster development†	63.8	18
5.2.3 GERD financed by abroad, %	16.0	28
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	52 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	4.9	14
5.3 Knowledge absorption	43.9	24
5.3.1 Intellectual property payments, % total trade	0.8	44
5.3.2 High-tech imports less re-imports, % total trade	9.3	50
5.3.3 ICT services imports, % total trade	1.9	24
5.3.4 FDI net inflows, % GDP	0.5	114 ○
5.3.5 Research talent, % in business enterprise	63.7	7 ●

6 Knowledge & technology outputs **38.2** **21**

6.1 Knowledge creation	42.7	18
6.1.1 Patents by origin/bn PPP\$ GDP	10.4	11 ●
6.1.2 PCT patent applications/bn PPP\$ GDP	3.4	13
6.1.3 Utility models by origin/bn PPP\$ GDP	1.4	19
6.1.4 Scientific & technical articles/bn PPP\$ GDP	36.1	18
6.1.5 Citable documents H index	42.8	17
6.2 Knowledge impact	37.8	40
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.2	79 ○
6.2.2 New businesses/th pop. 15–64	0.7	80 ○
6.2.3 Computer software spending, % GDP	0.6	14
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	11.0	34
6.2.5 High- & medium-high-tech manufactures, %	0.4	15
6.3 Knowledge diffusion	34.1	29
6.3.1 Intellectual property receipts, % total trade	0.4	25
6.3.2 High-tech exports less re-exports, % total trade	9.2	22
6.3.3 ICT services exports, % total trade	2.9	32
6.3.4 FDI net outflows, % GDP	1.8	38

7 Creative outputs **48.3** **17**

7.1 Intangible assets	54.9	24
7.1.1 Trademarks by origin/bn PPP\$ GDP	61.1	34
7.1.2 Industrial designs by origin/bn PPP\$ GDP	7.9	15
7.1.3 ICTs & business model creation†	72.9	26
7.1.4 ICTs & organizational model creation†	67.1	25
7.2 Creative goods & services	33.9	23
7.2.1 Cultural & creative services exports, % of total trade ^②	1.1	12
7.2.2 National feature films/mn pop. 15–69	6.5	28
7.2.3 Global ent. & media market/th pop. 15–69	65.3	7
7.2.4 Printing & publishing manufactures, %	1.3	42 ○
7.2.5 Creative goods exports, % total trade	1.2	40
7.3 Online creativity	49.6	18
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	36.9	19
7.3.2 Country-code TLDs/th pop. 15–69	61.4	11 ●
7.3.3 Wikipedia edits/mn pop. 15–69	6.7	19
7.3.4 Video uploads on YouTube/pop. 15–69	34.9	41 ○

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

② 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 181 of this appendix for details.

Key indicators

Population (millions)	9.9
GDP (US\$ billions)	35.7
GDP per capita, PPP\$	17,993.4
Income group	Upper-middle income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	30.6	82
Innovation Output Sub-Index	20.5	89
Innovation Input Sub-Index	40.7	78
Innovation Efficiency Ratio	0.5	103
Global Innovation Index 2016 (out of 128)	29.6	85

1	Institutions	55.9	74
1.1	Political environment	41.6	90
1.1.1	Political stability & safety*	47.1	97
1.1.2	Government effectiveness*	36.2	84
1.2	Regulatory environment	50.8	96
1.2.1	Regulatory quality*	35.6	85
1.2.2	Rule of law*	21.8	97
1.2.3	Cost of redundancy dismissal, salary weeks	21.7	90
1.3	Business environment	75.3	47
1.3.1	Ease of starting a business*	97.7	5 ●
1.3.2	Ease of resolving insolvency*	44.8	78
1.3.3	Ease of paying taxes*	83.5	35 ●
2	Human capital & research	17.9	108
2.1	Education	18.0	[125]
2.1.1	Expenditure on education, % GDP	2.6	108 ○
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3	School life expectancy, years	n/a	n/a
2.1.4	PISA scales in reading, maths, & science	n/a	n/a
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a
2.2	Tertiary education	29.1	84
2.2.1	Tertiary enrolment, % gross	25.5	89
2.2.2	Graduates in science & engineering, %	22.0	46
2.2.3	Tertiary inbound mobility, %	2.1	67
2.3	Research & development (R&D)	6.5	70
2.3.1	Researchers, FTE/mn pop.	n/a	n/a
2.3.2	Gross expenditure on R&D, % GDP	0.2	87
2.3.3	Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4	QS university ranking, average score top 3*	14.7	56
3	Infrastructure	50.5	50
3.1	Information & communication technologies (ICTs)	65.2	47
3.1.1	ICT access*	67.8	57
3.1.2	ICT use*	57.0	45
3.1.3	Government's online service*	68.1	47
3.1.4	E-participation*	67.8	47
3.2	General infrastructure	36.5	68
3.2.1	Electricity output, kWh/cap	2,592.0	65
3.2.2	Logistics performance* [Ⓐ]	17.8	107
3.2.3	Gross capital formation, % GDP	29.8	19 ●
3.3	Ecological sustainability	49.9	47
3.3.1	GDP/unit of energy use	10.9	39
3.3.2	Environmental performance*	83.8	31 ●
3.3.3	ISO 14001 environmental certificates/bn PPP\$ GDP	0.4	89
4	Market sophistication	55.3	23 ●
4.1	Credit	43.4	43
4.1.1	Ease of getting credit*	40.0	98
4.1.2	Domestic credit to private sector, % GDP	38.5	84
4.1.3	Microfinance gross loans, % GDP	4.3	10 ●

4.2	Investment	65.0	[13]
4.2.1	Ease of protecting minority investors*	65.0	31 ●
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, & market scale	57.6	80
4.3.1	Applied tariff rate, weighted mean, %	5.2	92
4.3.2	Intensity of local competition [†]	58.6	106 ○
4.3.3	Domestic market scale, bn PPP\$	167.9	64

5	Business sophistication	23.8	110 ○
5.1	Knowledge workers	29.0	88
5.1.1	Knowledge-intensive employment, %	23.4	62
5.1.2	Firms offering formal training, % firms	20.2	75
5.1.3	GERD performed by business, % of GDP [Ⓐ]	0.0	77
5.1.4	GERD financed by business, % [Ⓐ]	30.5	50
5.1.5	Females employed w/advanced degrees, % total [Ⓐ]	12.9	50
5.2	Innovation linkages	20.1	107
5.2.1	University/industry research collaboration [†]	42.7	52
5.2.2	State of cluster development [†]	45.2	65
5.2.3	GERD financed by abroad, % [Ⓐ]	0.2	97 ○
5.2.4	JV-strategic alliance deals/bn PPP\$ GDP	0.0	67
5.2.5	Patent families 2+ offices/bn PPP\$ GDP	0.1	74
5.3	Knowledge absorption	22.3	112 ○
5.3.1	Intellectual property payments, % total trade [Ⓐ]	0.1	97
5.3.2	High-tech imports less re-imports, % total trade	3.1	121 ○
5.3.3	ICT services imports, % total trade	0.7	83
5.3.4	FDI net inflows, % GDP	5.7	24 ●
5.3.5	Research talent, % in business enterprise	n/a	n/a

6	Knowledge & technology outputs	15.4	104
6.1	Knowledge creation	3.3	108
6.1.1	Patents by origin/bn PPP\$ GDP	1.3	59
6.1.2	PCT patent applications/bn PPP\$ GDP	0.0	99 ○
6.1.3	Utility models by origin/bn PPP\$ GDP [Ⓐ]	0.1	46
6.1.4	Scientific & technical articles/bn PPP\$ GDP	3.2	108
6.1.5	Citable documents H index	3.3	109
6.2	Knowledge impact	16.7	109
6.2.1	Growth rate of PPP\$ GDP/worker, %	(0.7)	95
6.2.2	New businesses/th pop. 15–64	1.0	71
6.2.3	Computer software spending, % GDP	0.1	97
6.2.4	ISO 9001 quality certificates/bn PPP\$ GDP	1.4	101
6.2.5	High- & medium-high-tech manufactures, % [Ⓐ]	0.1	74
6.3	Knowledge diffusion	26.1	48
6.3.1	Intellectual property receipts, % total trade [Ⓐ]	0.0	107 ○
6.3.2	High-tech exports less re-exports, % total trade	0.1	115 ○
6.3.3	ICT services exports, % total trade	0.5	102
6.3.4	FDI net outflows, % GDP	3.6	16 ●

7	Creative outputs	25.5	87
7.1	Intangible assets	37.9	82
7.1.1	Trademarks by origin/bn PPP\$ GDP	16.5	91
7.1.2	Industrial designs by origin/bn PPP\$ GDP	0.1	107 ○
7.1.3	ICTs & business model creation [†]	63.8	50
7.1.4	ICTs & organizational model creation [†]	60.8	37 ●
7.2	Creative goods & services	7.5	98
7.2.1	Cultural & creative services exports, % of total trade	0.0	66
7.2.2	National feature films/mn pop. 15–69	7.4	21 ●
7.2.3	Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4	Printing & publishing manufactures, % [Ⓐ]	0.7	82
7.2.5	Creative goods exports, % total trade	0.0	119 ○
7.3	Online creativity	18.8	66
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.0	96
7.3.2	Country-code TLDs/th pop. 15–69	1.1	79
7.3.3	Wikipedia edits/mn pop. 15–69	5.6	48
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Bahrain

Key indicators

Population (millions)	1.4
GDP (US\$ billions)	31.8
GDP per capita, PPP\$	50,094.9
Income group	High income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	34.7	66
Innovation Output Sub-Index	24.9	67
Innovation Input Sub-Index	44.4	55
Innovation Efficiency Ratio	0.6	88
Global Innovation Index 2016 (out of 128)	35.5	57

1 Institutions 67.3 51

1.1 Political environment	47.3	75
1.1.1 Political stability & safety*	37.7	114
1.1.2 Government effectiveness*	56.9	41
1.2 Regulatory environment	79.0	26 ●
1.2.1 Regulatory quality*	63.3	37
1.2.2 Rule of law*	52.9	45
1.2.3 Cost of redundancy dismissal, salary weeks	8.0	1 ●
1.3 Business environment	75.6	45
1.3.1 Ease of starting a business*	87.8	60
1.3.2 Ease of resolving insolvency*	44.7	80
1.3.3 Ease of paying taxes*	94.4	4 ●

2 Human capital & research 30.6 73

2.1 Education	42.4	[82]
2.1.1 Expenditure on education, % GDP [Ⓐ]	2.6	107 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years	n/a	n/a
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	9.9	23 ●
2.2 Tertiary education	44.5	35
2.2.1 Tertiary enrolment, % gross	37.4	69
2.2.2 Graduates in science & engineering, %	19.5	60
2.2.3 Tertiary inbound mobility, %	13.9	12 ●
2.3 Research & development (R&D)	5.0	76
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	362.0	67
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.1	103 ○
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	13.7	57

3 Infrastructure 54.6 38

3.1 Information & communication technologies (ICTs)	77.8	25 ●
3.1.1 ICT access*	79.1	29
3.1.2 ICT use*	74.8	20 ●
3.1.3 Government's online service*	82.6	22 ●
3.1.4 E-participation*	74.6	32
3.2 General infrastructure	50.9	22 ●
3.2.1 Electricity output, kWh/cap	20,039.0	3 ●
3.2.2 Logistics performance*	57.8	43
3.2.3 Gross capital formation, % GDP	19.7	83
3.3 Ecological sustainability	35.3	101
3.3.1 GDP/unit of energy use	4.1	111 ○
3.3.2 Environmental performance*	70.1	77
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.4	58

4 Market sophistication 42.7 84

4.1 Credit	37.0	57
4.1.1 Ease of getting credit*	45.0	84
4.1.2 Domestic credit to private sector, % GDP	73.7	40
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	32.8	98
4.2.1 Ease of protecting minority investors*	50.0	89
4.2.2 Market capitalization, % GDP	61.8	28
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	57
4.3 Trade, competition, & market scale	58.3	77
4.3.1 Applied tariff rate, weighted mean, %	3.3	71
4.3.2 Intensity of local competition [†]	70.1	60
4.3.3 Domestic market scale, bn PPP\$	66.4	86

5 Business sophistication 26.8 93

5.1 Knowledge workers	25.1	98
5.1.1 Knowledge-intensive employment, % [Ⓐ]	20.9	71
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.0	78
5.1.4 GERD financed by business, % [Ⓐ]	21.8	60
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	39.6	32
5.2.1 University/industry research collaboration [†]	45.4	42
5.2.2 State of cluster development [†]	60.3	23 ●
5.2.3 GERD financed by abroad, % [Ⓐ]	12.4	41
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.2	2 ●
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	89
5.3 Knowledge absorption	15.7	125 ○
5.3.1 Intellectual property payments, % total trade	n/a	n/a
5.3.2 High-tech imports less re-imports, % total trade	5.3	104
5.3.3 ICT services imports, % total trade [Ⓐ]	0.3	112
5.3.4 FDI net inflows, % GDP	0.4	119 ○
5.3.5 Research talent, % in business enterprise [Ⓐ]	0.4	82 ○

6 Knowledge & technology outputs 20.8 73

6.1 Knowledge creation	1.9	121 ○
6.1.1 Patents by origin/bn PPP\$ GDP	0.2	100
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	67
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	2.7	114 ○
6.1.5 Citable documents H index	2.4	113
6.2 Knowledge impact	30.7	67
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.8	64
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.4	27
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	5.8	58
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	81
6.3 Knowledge diffusion	29.9	40
6.3.1 Intellectual property receipts, % total trade	n/a	n/a
6.3.2 High-tech exports less re-exports, % total trade	0.1	110
6.3.3 ICT services exports, % total trade [Ⓐ]	3.3	25 ●
6.3.4 FDI net outflows, % GDP	1.5	39

7 Creative outputs 29.0 71

7.1 Intangible assets	36.5	91
7.1.1 Trademarks by origin/bn PPP\$ GDP	5.9	110 ○
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.0	111 ○
7.1.3 ICTs & business model creation [†]	66.8	42
7.1.4 ICTs & organizational model creation [†]	58.2	45
7.2 Creative goods & services	18.6	63
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	0.0	104 ○
7.2.3 Global ent. & media market/th pop. 15–69	8.0	39
7.2.4 Printing & publishing manufactures, % [Ⓐ]	1.5	34
7.2.5 Creative goods exports, % total trade	1.3	34
7.3 Online creativity	24.7	51
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	5.4	53
7.3.2 Country-code TLDs/th pop. 15–69	1.2	76
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	5.1	61
7.3.4 Video uploads on YouTube/pop. 15–69	42.9	27

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	162.9
GDP (US\$ billions)	226.8
GDP per capita, PPP\$	3,606.6
Income group	Lower-middle income
Region	Central and Southern Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	23.7	114
Innovation Output Sub-Index	16.8	108
Innovation Input Sub-Index	30.6	113
Innovation Efficiency Ratio	0.5	93
Global Innovation Index 2016 (out of 128)	22.9	117

1 Institutions 40.3 122 ○

1.1 Political environment	29.6	117
1.1.1 Political stability & safety*	35.8	116
1.1.2 Government effectiveness*	23.5	111
1.2 Regulatory environment	36.6	117
1.2.1 Regulatory quality*	18.4	118
1.2.2 Rule of law*	19.0	102
1.2.3 Cost of redundancy dismissal, salary weeks	31.0	119
1.3 Business environment	54.8	116
1.3.1 Ease of starting a business*	81.7	93
1.3.2 Ease of resolving insolvency*	27.0	121
1.3.3 Ease of paying taxes*	55.6	104

2 Human capital & research 12.0 124 ○

2.1 Education	16.1	126 ○
2.1.1 Expenditure on education, % GDP	2.2	111
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	8.4	100
2.1.3 School life expectancy, years [Ⓐ]	9.9	103
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	35.2	106 ○
2.2 Tertiary education	17.0	106
2.2.1 Tertiary enrolment, % gross [Ⓐ]	13.4	99
2.2.2 Graduates in science & engineering, % [Ⓐ]	15.6	82
2.2.3 Tertiary inbound mobility, % [Ⓐ]	0.1	106 ○
2.3 Research & development (R&D)	2.8	88
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	n/a	n/a
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	5.6	69

3 Infrastructure 37.0 95

3.1 Information & communication technologies (ICTs)	39.0	95
3.1.1 ICT access*	30.6	109
3.1.2 ICT use*	10.6	113
3.1.3 Government's online service*	62.3	60 ●
3.1.4 E-participation*	52.5	82
3.2 General infrastructure	35.5	71
3.2.1 Electricity output, kWh/cap	351.0	107
3.2.2 Logistics performance*	27.8	86
3.2.3 Gross capital formation, % GDP	28.5	25 ●
3.3 Ecological sustainability	36.4	96
3.3.1 GDP/unit of energy use	13.2	18 ●
3.3.2 Environmental performance*	41.8	120 ○
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.2	112

4 Market sophistication 38.3 103

4.1 Credit	25.4	96
4.1.1 Ease of getting credit*	25.0	119
4.1.2 Domestic credit to private sector, % GDP	43.9	77
4.1.3 Microfinance gross loans, % GDP	1.9	16 ●

4.2 Investment	32.4	99
4.2.1 Ease of protecting minority investors*	56.7	67
4.2.2 Market capitalization, % GDP [Ⓐ]	37.1	40 ●
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	91 ○
4.3 Trade, competition, & market scale	57.1	82
4.3.1 Applied tariff rate, weighted mean, %	11.9	121 ○
4.3.2 Intensity of local competition [†]	68.5	69
4.3.3 Domestic market scale, bn PPP\$	628.4	32 ●

5 Business sophistication 25.6 99

5.1 Knowledge workers	29.4	[84]
5.1.1 Knowledge-intensive employment, % [Ⓐ]	20.0	74
5.1.2 Firms offering formal training, % firms	21.9	72
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	23.5	81
5.2.1 University/industry research collaboration [†]	25.7	116
5.2.2 State of cluster development [†]	44.0	72
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	84
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	116 ○
5.3 Knowledge absorption	24.0	105
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.1	104
5.3.2 High-tech imports less re-imports, % total trade [Ⓐ]	9.4	48 ●
5.3.3 ICT services imports, % total trade [Ⓐ]	0.1	119
5.3.4 FDI net inflows, % GDP	1.6	91
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs 16.0 96

6.1 Knowledge creation	4.5	95
6.1.1 Patents by origin/bn PPP\$ GDP	0.1	110
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	2.9	110
6.1.5 Citable documents H index	9.8	63 ●
6.2 Knowledge impact	29.2	72
6.2.1 Growth rate of PPP\$ GDP/worker, %	3.8	16 ●
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	0.1	101 ○
6.2.3 Computer software spending, % GDP	0.2	77
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.8	114
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	84
6.3 Knowledge diffusion	14.4	112
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	98
6.3.2 High-tech exports less re-exports, % total trade [Ⓐ]	0.1	107
6.3.3 ICT services exports, % total trade [Ⓐ]	1.1	78
6.3.4 FDI net outflows, % GDP	0.1	90

7 Creative outputs 17.6 110

7.1 Intangible assets	30.1	104
7.1.1 Trademarks by origin/bn PPP\$ GDP	16.1	92
7.1.2 Industrial designs by origin/bn PPP\$ GDP	2.2	42 ●
7.1.3 ICTs & business model creation [†]	49.5	103
7.1.4 ICTs & organizational model creation [†]	42.0	104
7.2 Creative goods & services	1.1	125 ○
7.2.1 Cultural & creative services exports, % of total trade	0.0	83
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	0.7	87
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.2	99 ○
7.2.5 Creative goods exports, % total trade [Ⓐ]	0.1	100
7.3 Online creativity	8.9	102
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.4	111
7.3.2 Country-code TLDs/th pop. 15–69	0.0	123 ○
7.3.3 Wikipedia edits/mn pop. 15–69	2.7	103
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Belarus

Key indicators

Population (millions)	9.5
GDP (US\$ billions)	48.1
GDP per capita, PPP\$	17,654.2
Income group	Upper-middle income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	30.0	88
Innovation Output Sub-Index	16.7	109 ○
Innovation Input Sub-Index	43.2	63
Innovation Efficiency Ratio	0.4	120 ○
Global Innovation Index 2016 (out of 128)	30.4	79

1 Institutions	54.1	81
1.1 Political environment	46.9	77
1.1.1 Political stability & safety*	63.8	61
1.1.2 Government effectiveness*	29.9	93
1.2 Regulatory environment	44.7	109 ○
1.2.1 Regulatory quality*	16.5	120 ○
1.2.2 Rule of law*	16.4	107 ○
1.2.3 Cost of redundancy dismissal, salary weeks	21.7	90
1.3 Business environment	70.8	64
1.3.1 Ease of starting a business*	92.9	28 ●
1.3.2 Ease of resolving insolvency*	49.1	64
1.3.3 Ease of paying taxes*	70.4	74

2 Human capital & research	41.9	36
2.1 Education	64.5	12 ●
2.1.1 Expenditure on education, % GDP	4.9	52
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years	15.7	34
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	8.4	12 ●
2.2 Tertiary education	51.8	17 ●
2.2.1 Tertiary enrolment, % gross	87.9	6 ●
2.2.2 Graduates in science & engineering, %	28.6	12 ●
2.2.3 Tertiary inbound mobility, %	3.3	54
2.3 Research & development (R&D)	9.4	60
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	0.5	63
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	16.4	55

3 Infrastructure	46.1	67
3.1 Information & communication technologies (ICTs)	60.3	59
3.1.1 ICT access*	78.0	32
3.1.2 ICT use*	58.8	39
3.1.3 Government's online service*	48.6	87
3.1.4 E-participation*	55.9	74
3.2 General infrastructure	33.7	79
3.2.1 Electricity output, kWh/cap	3,667.9	56
3.2.2 Logistics performance*	15.6	112 ○
3.2.3 Gross capital formation, % GDP	26.9	32
3.3 Ecological sustainability	44.3	65
3.3.1 GDP/unit of energy use	5.8	94
3.3.2 Environmental performance*	82.3	35
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	2.6	44

4 Market sophistication	41.9	90
4.1 Credit	19.2	114 ○
4.1.1 Ease of getting credit*	45.0	84
4.1.2 Domestic credit to private sector, % GDP	2.9	126 ○
4.1.3 Microfinance gross loans, % GDP	0.7	30

4.2 Investment	42.8	51
4.2.1 Ease of protecting minority investors*	63.3	41
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	82 ○
4.3 Trade, competition, & market scale	63.7	54
4.3.1 Applied tariff rate, weighted mean, %	1.8	52
4.3.2 Intensity of local competition†	n/a	n/a
4.3.3 Domestic market scale, bn PPP\$	165.4	65

5 Business sophistication	32.2	65
5.1 Knowledge workers	59.1	25 ●
5.1.1 Knowledge-intensive employment, % [Ⓐ]	35.9	34
5.1.2 Firms offering formal training, % firms	51.1	21 ●
5.1.3 GERD performed by business, % of GDP	0.3	41
5.1.4 GERD financed by business, %	41.3	32
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	33.9	1 ●
5.2 Innovation linkages	13.9	124 ○
5.2.1 University/industry research collaboration†	n/a	n/a
5.2.2 State of cluster development†	n/a	n/a
5.2.3 GERD financed by abroad, %	12.7	39
5.2.4 JV–strategic alliance deals/bn PPP\$ GDP	0.0	53
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.4	39
5.3 Knowledge absorption	23.6	107 ○
5.3.1 Intellectual property payments, % total trade	0.4	69
5.3.2 High-tech imports less re-imports, % total trade	5.2	105 ○
5.3.3 ICT services imports, % total trade	0.6	89
5.3.4 FDI net inflows, % GDP	2.8	63
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	21.7	61
6.1 Knowledge creation	23.8	39
6.1.1 Patents by origin/bn PPP\$ GDP	4.2	27 ●
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	63
6.1.3 Utility models by origin/bn PPP\$ GDP	2.3	11 ●
6.1.4 Scientific & technical articles/bn PPP\$ GDP	6.5	85
6.1.5 Citable documents H index	9.7	64
6.2 Knowledge impact	21.1	105
6.2.1 Growth rate of PPP\$ GDP/worker, %	(2.4)	104 ○
6.2.2 New businesses/th pop. 15–64	1.1	68
6.2.3 Computer software spending, % GDP	0.0	108 ○
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	21.7	17 ●
6.2.5 High- & medium-high-tech manufactures, %	0.3	41
6.3 Knowledge diffusion	20.2	76
6.3.1 Intellectual property receipts, % total trade	0.1	61
6.3.2 High-tech exports less re-exports, % total trade	1.8	57
6.3.3 ICT services exports, % total trade	3.1	29 ●
6.3.4 FDI net outflows, % GDP	0.2	84

7 Creative outputs	11.7	123 ○
7.1 Intangible assets	11.0	124 ○
7.1.1 Trademarks by origin/bn PPP\$ GDP	26.7	76
7.1.2 Industrial designs by origin/bn PPP\$ GDP	1.2	57
7.1.3 ICTs & business model creation†	n/a	n/a
7.1.4 ICTs & organizational model creation†	n/a	n/a
7.2 Creative goods & services	4.2	113 ○
7.2.1 Cultural & creative services exports, % of total trade	0.0	67
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	0.1	100 ○
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.2	74
7.3 Online creativity	20.8	61
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.8	82
7.3.2 Country-code TLDs/th pop. 15–69	5.2	48
7.3.3 Wikipedia edits/mn pop. 15–69	5.7	46
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	11.4
GDP (US\$ billions)	470.2
GDP per capita, PPP\$	43,585.0
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	49.9	27
Innovation Output Sub-Index	40.2	27
Innovation Input Sub-Index	59.5	22
Innovation Efficiency Ratio	0.7	47
Global Innovation Index 2016 (out of 128)	52.0	23

1 Institutions	80.5	26
1.1 Political environment	78.8	23
1.1.1 Political stability & safety*	78.5	37
1.1.2 Government effectiveness*	79.2	22
1.2 Regulatory environment	77.4	32
1.2.1 Regulatory quality*	74.8	21
1.2.2 Rule of law*	80.9	20
1.2.3 Cost of redundancy dismissal, salary weeks	19.7	81 ○
1.3 Business environment	85.4	22
1.3.1 Ease of starting a business*	94.5	16
1.3.2 Ease of resolving insolvency*	84.3	9 ●
1.3.3 Ease of paying taxes*	77.3	56
2 Human capital & research	59.7	11 ●
2.1 Education	72.8	6 ●
2.1.1 Expenditure on education, % GDP [Ⓐ]	6.4	17
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	37.6	8 ●
2.1.3 School life expectancy, years	19.9	2 ●
2.1.4 PISA scales in reading, maths, & science	502.5	18
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	9.4	19
2.2 Tertiary education	45.6	31
2.2.1 Tertiary enrolment, % gross [Ⓐ]	73.3	22
2.2.2 Graduates in science & engineering, % [Ⓐ]	16.4	76 ○
2.2.3 Tertiary inbound mobility, % [Ⓐ]	11.2	14
2.3 Research & development (R&D)	60.6	16
2.3.1 Researchers, FTE/mn pop.	4,875.3	12
2.3.2 Gross expenditure on R&D, % GDP	2.5	11 ●
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	66.7	20
2.3.4 QS university ranking, average score top 3*	59.6	16
3 Infrastructure	57.2	32
3.1 Information & communication technologies (ICTs)	72.5	32
3.1.1 ICT access*	83.4	16
3.1.2 ICT use*	71.0	22
3.1.3 Government's online service*	71.0	43
3.1.4 E-participation*	64.4	54 ○
3.2 General infrastructure	51.9	17
3.2.1 Electricity output, kWh/cap.	5,969.5	34
3.2.2 Logistics performance*	94.6	6 ●
3.2.3 Gross capital formation, % GDP	23.7	51
3.3 Ecological sustainability	47.3	54
3.3.1 GDP/unit of energy use	8.5	63 ○
3.3.2 Environmental performance*	80.2	41
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	2.3	46
4 Market sophistication	51.8	40
4.1 Credit	34.5	66 ○
4.1.1 Ease of getting credit*	45.0	84 ○
4.1.2 Domestic credit to private sector, % GDP	61.5	51
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	46.7	37
4.2.1 Ease of protecting minority investors*	58.3	62 ○
4.2.2 Market capitalization, % GDP	91.1	11
4.2.3 Venture capital deals/bn PPP\$ GDP	0.1	19
4.3 Trade, competition, & market scale	74.1	24
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	80.8	12 ●
4.3.3 Domestic market scale, bn PPP\$	508.6	35

5 Business sophistication	48.5	22 ●
5.1 Knowledge workers	71.1	6 ●
5.1.1 Knowledge-intensive employment, %	45.6	11
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	1.8	11
5.1.4 GERD financed by business, % [Ⓐ]	61.3	10
5.1.5 Females employed w/advanced degrees, % total	23.3	14

5.2 Innovation linkages	41.8	24
5.2.1 University/industry research collaboration [†]	71.0	9 ●
5.2.2 State of cluster development [†]	60.1	24
5.2.3 GERD financed by abroad, % [Ⓐ]	13.2	35
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	29
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	3.8	17
5.3 Knowledge absorption	32.4	67 ○
5.3.1 Intellectual property payments, % total trade	0.9	38
5.3.2 High-tech imports less re-imports, % total trade	10.3	42
5.3.3 ICT services imports, % total trade	2.3	16
5.3.4 FDI net inflows, % GDP	(4.6)	127 ○
5.3.5 Research talent, % in business enterprise	48.3	27

6 Knowledge & technology outputs	33.2	31
6.1 Knowledge creation	43.3	17
6.1.1 Patents by origin/bn PPP\$ GDP	6.0	20
6.1.2 PCT patent applications/bn PPP\$ GDP	2.4	16
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	40.1	16
6.1.5 Citable documents H index	52.7	13

6.2 Knowledge impact	37.4	41
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.5	71 ○
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	2.1	47
6.2.3 Computer software spending, % GDP	0.6	8 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	7.2	51
6.2.5 High- & medium-high-tech manufactures, %	0.3	31

6.3 Knowledge diffusion	19.1	87 ○
6.3.1 Intellectual property receipts, % total trade	0.8	19
6.3.2 High-tech exports less re-exports, % total trade	11.1	19
6.3.3 ICT services exports, % total trade	3.0	30
6.3.4 FDI net outflows, % GDP	(3.1)	124 ○

7 Creative outputs	47.1	19
7.1 Intangible assets	51.3	34
7.1.1 Trademarks by origin/bn PPP\$ GDP	49.3	53 ○
7.1.2 Industrial designs by origin/bn PPP\$ GDP	2.9	38
7.1.3 ICTs & business model creation [†]	76.4	19
7.1.4 ICTs & organizational model creation [†]	70.4	22

7.2 Creative goods & services	39.8	12 ●
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	1.6	4 ●
7.2.2 National feature films/mn pop. 15–69	8.7	18
7.2.3 Global ent. & media market/th pop. 15–69	52.8	16
7.2.4 Printing & publishing manufactures, %	1.2	45
7.2.5 Creative goods exports, % total trade	1.8	28

7.3 Online creativity	46.1	20
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	22.1	27
7.3.2 Country-code TLDs/th pop. 15–69	58.0	12 ●
7.3.3 Wikipedia edits/mn pop. 15–69	6.2	33
7.3.4 Video uploads on YouTube/pop. 15–69	44.1	25

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Benin

Key indicators

Population (millions)	11.2
GDP (US\$ billions)	8.9
GDP per capita, PPP\$	2,113.2
Income group	Low income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	23.0	116
Innovation Output Sub-Index	14.8	120
Innovation Input Sub-Index	31.3	110
Innovation Efficiency Ratio	0.5	110
Global Innovation Index 2016 (out of 128)	22.2	121

1 Institutions	54.0	82
1.1 Political environment	45.1	83
1.1.1 Political stability & safety*	63.9	60
1.1.2 Government effectiveness*	26.3	102
1.2 Regulatory environment	59.0	74
1.2.1 Regulatory quality*	27.9	103
1.2.2 Rule of law*	22.4	95
1.2.3 Cost of redundancy dismissal, salary weeks	11.6	41 ●
1.3 Business environment	58.0	106
1.3.1 Ease of starting a business*	90.6	48 ●
1.3.2 Ease of resolving insolvency*	38.7	101
1.3.3 Ease of paying taxes*	44.6	119

2 Human capital & research	21.1	97
2.1 Education	39.0	90
2.1.1 Expenditure on education, % GDP	4.3	72
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	11.4	92
2.1.3 School life expectancy, years ^a	12.1	85
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	10.3	28 ●
2.2 Tertiary education	24.4	94
2.2.1 Tertiary enrolment, % gross ^a	15.4	97
2.2.2 Graduates in science & engineering, % ^a	12.7	92
2.2.3 Tertiary inbound mobility, % ^a	7.9	22 ●
2.3 Research & development (R&D)	0.0	115 ○
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	n/a	n/a
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	23.3	123 ○
3.1 Information & communication technologies (ICTs)	16.0	123 ○
3.1.1 ICT access*	28.6	113
3.1.2 ICT use*	4.0	124 ○
3.1.3 Government's online service*	14.5	119 ○
3.1.4 E-participation*	16.9	117
3.2 General infrastructure	30.0	93
3.2.1 Electricity output, kWh/cap	17.4	119 ○
3.2.2 Logistics performance*	16.9	109
3.2.3 Gross capital formation, % GDP	26.2	34 ●
3.3 Ecological sustainability	23.7	121 ○
3.3.1 GDP/unit of energy use	4.7	107
3.3.2 Environmental performance*	43.7	117
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.0	124 ○

4 Market sophistication	30.6	120
4.1 Credit	21.4	109
4.1.1 Ease of getting credit*	30.0	108
4.1.2 Domestic credit to private sector, % GDP	21.5	111
4.1.3 Microfinance gross loans, % GDP	1.5	21 ●

4.2 Investment	40.0	[64]
4.2.1 Ease of protecting minority investors*	40.0	111
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, & market scale	30.3	125 ○
4.3.1 Applied tariff rate, weighted mean, %	17.2	126 ○
4.3.2 Intensity of local competition [†]	63.7	84
4.3.3 Domestic market scale, bn PPP\$	24.3	116

5 Business sophistication

5 Business sophistication	27.5	[88]
5.1 Knowledge workers	21.9	[107]
5.1.1 Knowledge-intensive employment, %	n/a	n/a
5.1.2 Firms offering formal training, % firms	20.0	76
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	37.6	[38]
5.2.1 University/industry research collaboration [†]	35.6	91
5.2.2 State of cluster development [†]	38.6	90
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	n/a	n/a
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	n/a	n/a
5.3 Knowledge absorption	23.1	108
5.3.1 Intellectual property payments, % total trade ^a	0.1	106
5.3.2 High-tech imports less re-imports, % total trade	2.6	124 ○
5.3.3 ICT services imports, % total trade ^a	1.3	55 ●
5.3.4 FDI net inflows, % GDP	3.6	45 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs

6 Knowledge & technology outputs	8.5	122 ○
6.1 Knowledge creation	5.1	87
6.1.1 Patents by origin/bn PPP\$ GDP	0.2	96
6.1.2 PCT patent applications/bn PPP\$ GDP ^a	0.0	83
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	11.3	62
6.1.5 Citable documents H index	3.4	108
6.2 Knowledge impact	3.8	[122]
6.2.1 Growth rate of PPP\$ GDP/worker, %	n/a	n/a
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.1	101
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	2.2	89
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	16.6	103
6.3.1 Intellectual property receipts, % total trade ^a	0.0	105 ○
6.3.2 High-tech exports less re-exports, % total trade	0.1	118
6.3.3 ICT services exports, % total trade ^a	1.8	55 ●
6.3.4 FDI net outflows, % GDP	0.4	74

7 Creative outputs

7 Creative outputs	21.0	99
7.1 Intangible assets	28.6	109
7.1.1 Trademarks by origin/bn PPP\$ GDP	7.5	108
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.3	88
7.1.3 ICTs & business model creation [†]	50.1	97
7.1.4 ICTs & organizational model creation [†]	45.7	87
7.2 Creative goods & services	19.6	[60]
7.2.1 Cultural & creative services exports, % of total trade	1.2	11 ●
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.0	117
7.3 Online creativity	7.4	105
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.6	104
7.3.2 Country-code TLDs/th pop. 15–69	0.0	121 ○
7.3.3 Wikipedia edits/mn pop. 15–69 ^a	2.2	106
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

^a 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 181 of this appendix for details.

Key indicators

Population (millions)	10.9
GDP (US\$ billions)	35.7
GDP per capita, PPP\$	6,465.3
Income group	Lower-middle income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	25.6	106
Innovation Output Sub-Index	18.7	99
Innovation Input Sub-Index	32.6	107
Innovation Efficiency Ratio	0.6	85
Global Innovation Index 2016 (out of 128)	25.2	109

1	Institutions	29.8	127	○
1.1	Political environment	41.1	92	
1.1.1	Political stability & safety*	57.0	77	
1.1.2	Government effectiveness*	25.3	106	
1.2	Regulatory environment	6.2	127	○
1.2.1	Regulatory quality*	18.9	117	
1.2.2	Rule of law*	5.8	124	○
1.2.3	Cost of redundancy dismissal, salary weeks [Ⓐ]	82.3	126	○
1.3	Business environment	42.2	127	○
1.3.1	Ease of starting a business*	62.9	124	○
1.3.2	Ease of resolving insolvency*	42.3	85	
1.3.3	Ease of paying taxes*	21.4	127	○
2	Human capital & research	25.8	85	
2.1	Education	50.3	52	●
2.1.1	Expenditure on education, % GDP	7.3	11	●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	18.4	57	
2.1.3	School life expectancy, years	n/a	n/a	
2.1.4	PISA scales in reading, maths, & science	n/a	n/a	
2.1.5	Pupil-teacher ratio, secondary [Ⓐ]	18.2	76	
2.2	Tertiary education	n/a	n/a	
2.2.1	Tertiary enrolment, % gross	n/a	n/a	
2.2.2	Graduates in science & engineering, %	n/a	n/a	
2.2.3	Tertiary inbound mobility, %	n/a	n/a	
2.3	Research & development (R&D)	1.3	99	
2.3.1	Researchers, FTE/mn pop. [Ⓐ]	166.0	79	
2.3.2	Gross expenditure on R&D, % GDP [Ⓐ]	0.2	93	
2.3.3	Global R&D companies, avg. expend. top 3, mn \$US	0.0	43	○
2.3.4	QS university ranking, average score top 3*	0.0	75	○
3	Infrastructure	35.3	102	
3.1	Information & communication technologies (ICTs)	44.5	88	
3.1.1	ICT access*	43.7	95	
3.1.2	ICT use*	27.2	92	
3.1.3	Government's online service*	49.3	86	
3.1.4	E-participation*	57.6	70	
3.2	General infrastructure	20.8	117	
3.2.1	Electricity output, kWh/cap	829.1	98	
3.2.2	Logistics performance*	8.7	120	○
3.2.3	Gross capital formation, % GDP	19.2	92	
3.3	Ecological sustainability	40.6	80	
3.3.1	GDP/unit of energy use	7.9	72	
3.3.2	Environmental performance*	71.1	69	
3.3.3	ISO 14001 environmental certificates/bn PPP\$ GDP	0.7	74	
4	Market sophistication	46.2	63	
4.1	Credit	52.5	24	●
4.1.1	Ease of getting credit*	35.0	104	
4.1.2	Domestic credit to private sector, % GDP	58.1	52	●
4.1.3	Microfinance gross loans, % GDP	19.6	1	●

4.2	Investment	30.1	112	
4.2.1	Ease of protecting minority investors*	41.7	105	
4.2.2	Market capitalization, % GDP [Ⓐ]	16.4	65	
4.2.3	Venture capital deals/bn PPP\$ GDP	n/a	n/a	
4.3	Trade, competition, & market scale	55.9	89	
4.3.1	Applied tariff rate, weighted mean, %	4.8	87	
4.3.2	Intensity of local competition [†]	65.6	79	
4.3.3	Domestic market scale, bn PPP\$	78.4	81	

5	Business sophistication	26.0	98	
5.1	Knowledge workers	40.0	56	●
5.1.1	Knowledge-intensive employment, % [Ⓐ]	15.2	86	
5.1.2	Firms offering formal training, % firms [Ⓐ]	57.1	11	●
5.1.3	GERD performed by business, % of GDP	n/a	n/a	
5.1.4	GERD financed by business, % [Ⓐ]	5.2	77	
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a	

5.2	Innovation linkages	13.6	125	○
5.2.1	University/industry research collaboration [†]	23.8	120	○
5.2.2	State of cluster development [†]	30.8	119	○
5.2.3	GERD financed by abroad, % [Ⓐ]	1.9	76	
5.2.4	JV-strategic alliance deals/bn PPP\$ GDP	0.0	85	
5.2.5	Patent families 2+ offices/bn PPP\$ GDP [Ⓐ]	0.0	108	
5.3	Knowledge absorption	24.3	102	
5.3.1	Intellectual property payments, % total trade	0.6	57	●
5.3.2	High-tech imports less re-imports, % total trade	10.0	45	●
5.3.3	ICT services imports, % total trade	0.8	80	
5.3.4	FDI net inflows, % GDP	3.0	55	●
5.3.5	Research talent, % in business enterprise [Ⓐ]	0.4	83	○

6	Knowledge & technology outputs	15.6	99	
6.1	Knowledge creation	3.2	111	
6.1.1	Patents by origin/bn PPP\$ GDP [Ⓐ]	0.1	104	
6.1.2	PCT patent applications/bn PPP\$ GDP	n/a	n/a	
6.1.3	Utility models by origin/bn PPP\$ GDP [Ⓐ]	0.2	44	
6.1.4	Scientific & technical articles/bn PPP\$ GDP	3.2	109	
6.1.5	Citable documents H index	5.5	91	
6.2	Knowledge impact	27.9	79	
6.2.1	Growth rate of PPP\$ GDP/worker, %	2.8	23	●
6.2.2	New businesses/th pop. 15–64	0.6	84	
6.2.3	Computer software spending, % GDP	0.2	71	
6.2.4	ISO 9001 quality certificates/bn PPP\$ GDP	3.1	77	
6.2.5	High- & medium-high-tech manufactures, % [Ⓐ]	0.1	85	
6.3	Knowledge diffusion	15.8	110	
6.3.1	Intellectual property receipts, % total trade	0.2	36	●
6.3.2	High-tech exports less re-exports, % total trade	0.2	97	
6.3.3	ICT services exports, % total trade	1.0	85	
6.3.4	FDI net outflows, % GDP	0.0	109	

7	Creative outputs	21.7	96	
7.1	Intangible assets	29.2	107	
7.1.1	Trademarks by origin/bn PPP\$ GDP [Ⓐ]	35.1	65	
7.1.2	Industrial designs by origin/bn PPP\$ GDP [Ⓐ]	0.4	85	
7.1.3	ICTs & business model creation [†]	47.4	110	
7.1.4	ICTs & organizational model creation [†]	36.1	115	
7.2	Creative goods & services	16.2	72	
7.2.1	Cultural & creative services exports, % of total trade	0.1	61	
7.2.2	National feature films/mn pop. 15–69	0.9	81	
7.2.3	Global ent. & media market/th pop. 15–69	n/a	n/a	
7.2.4	Printing & publishing manufactures, % [Ⓐ]	1.1	56	
7.2.5	Creative goods exports, % total trade	1.3	35	●
7.3	Online creativity	12.3	93	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	1.8	80	
7.3.2	Country-code TLDs/th pop. 15–69	0.5	89	
7.3.3	Wikipedia edits/mn pop. 15–69 [Ⓐ]	3.6	93	
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Bosnia and Herzegovina

Key indicators

Population (millions)	3.8
GDP (US\$ billions)	16.5
GDP per capita, PPP\$	10,491.8
Income group	Upper-middle income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	30.2	86
Innovation Output Sub-Index	19.3	96
Innovation Input Sub-Index	41.1	75
Innovation Efficiency Ratio	0.5	112 ○
Global Innovation Index 2016 (out of 128)	29.6	87

1 Institutions	56.8	71
1.1 Political environment	40.5	94
1.1.1 Political stability & safety*	52.9	86
1.1.2 Government effectiveness*	28.2	97
1.2 Regulatory environment	65.9	59
1.2.1 Regulatory quality*	37.5	80
1.2.2 Rule of law*	30.9	75
1.2.3 Cost of redundancy dismissal, salary weeks	9.2	26 ●
1.3 Business environment	64.0	80
1.3.1 Ease of starting a business*	65.1	122 ○
1.3.2 Ease of resolving insolvency*	66.9	38 ●
1.3.3 Ease of paying taxes*	60.1	95

2 Human capital & research	41.3	39
2.1 Education	90.2	[1]
2.1.1 Expenditure on education, % GDP	n/a	n/a
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years	n/a	n/a
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	10.1	26 ●
2.2 Tertiary education	31.4	76
2.2.1 Tertiary enrolment, % gross	n/a	n/a
2.2.2 Graduates in science & engineering, %	15.4	84
2.2.3 Tertiary inbound mobility, %	7.5	25 ●
2.3 Research & development (R&D)	2.2	92
2.3.1 Researchers, FTE/mn pop.	328.7	69
2.3.2 Gross expenditure on R&D, % GDP	0.2	88
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	36.9	96
3.1 Information & communication technologies (ICTs)	48.9	81
3.1.1 ICT access*	57.8	74
3.1.2 ICT use*	42.1	66
3.1.3 Government's online service*	44.9	94
3.1.4 E-participation*	50.8	87
3.2 General infrastructure	25.5	106
3.2.1 Electricity output, kWh/cap	4,230.4	50
3.2.2 Logistics performance*	24.7	95
3.2.3 Gross capital formation, % GDP	17.1	103
3.3 Ecological sustainability	36.2	99
3.3.1 GDP/unit of energy use	4.5	108 ○
3.3.2 Environmental performance*	63.3	98
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	3.7	28 ●

4 Market sophistication	43.4	79
4.1 Credit	36.0	60
4.1.1 Ease of getting credit*	65.0	40
4.1.2 Domestic credit to private sector, % GDP	53.7	64
4.1.3 Microfinance gross loans, % GDP	1.2	23 ●

4.2 Investment	38.4	73
4.2.1 Ease of protecting minority investors*	55.0	75
4.2.2 Market capitalization, % GDP ^②	12.2	74
4.2.3 Venture capital deals/bn PPP\$ GDP	n/a	n/a
4.3 Trade, competition, & market scale	55.8	91
4.3.1 Applied tariff rate, weighted mean, %	1.1	14 ●
4.3.2 Intensity of local competition [†]	57.6	110 ○
4.3.3 Domestic market scale, bn PPP\$	42.5	96

5 Business sophistication	27.4	90
5.1 Knowledge workers	37.7	61
5.1.1 Knowledge-intensive employment, %	24.0	60
5.1.2 Firms offering formal training, % firms	52.4	18 ●
5.1.3 GERD performed by business, % of GDP	0.1	66
5.1.4 GERD financed by business, %	31.4	48
5.1.5 Females employed w/advanced degrees, % total	3.2	81 ○
5.2 Innovation linkages	23.9	80
5.2.1 University/industry research collaboration [†]	29.6	105
5.2.2 State of cluster development [†]	35.8	99
5.2.3 GERD financed by abroad, %	16.9	25 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	56
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.2	56
5.3 Knowledge absorption	20.6	120 ○
5.3.1 Intellectual property payments, % total trade	0.1	90
5.3.2 High-tech imports less re-imports, % total trade	6.5	84
5.3.3 ICT services imports, % total trade	0.8	79
5.3.4 FDI net inflows, % GDP	2.1	80
5.3.5 Research talent, % in business enterprise	6.5	71

6 Knowledge & technology outputs	17.2	92
6.1 Knowledge creation	5.9	84
6.1.1 Patents by origin/bn PPP\$ GDP ^②	1.0	62
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	66
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	10.2	66
6.1.5 Citable documents H index	3.0	110 ○
6.2 Knowledge impact	27.2	82
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.3	46
6.2.2 New businesses/th pop. 15–64	0.8	77
6.2.3 Computer software spending, % GDP	0.1	89
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	19.4	20 ●
6.2.5 High- & medium-high-tech manufactures, % ^②	0.1	79
6.3 Knowledge diffusion	18.5	94
6.3.1 Intellectual property receipts, % total trade	0.2	42
6.3.2 High-tech exports less re-exports, % total trade	1.4	63
6.3.3 ICT services exports, % total trade	1.7	60
6.3.4 FDI net outflows, % GDP	0.3	79

7 Creative outputs	21.4	98
7.1 Intangible assets	26.5	118 ○
7.1.1 Trademarks by origin/bn PPP\$ GDP	16.9	88
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.6	75
7.1.3 ICTs & business model creation [†]	44.7	116 ○
7.1.4 ICTs & organizational model creation [†]	38.4	110 ○
7.2 Creative goods & services	11.2	85
7.2.1 Cultural & creative services exports, % of total trade	0.0	81 ○
7.2.2 National feature films/mn pop. 15–69	4.8	40
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % ^②	1.1	63
7.2.5 Creative goods exports, % total trade	0.3	65
7.3 Online creativity	21.5	58
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	2.4	73
7.3.2 Country-code TLDs/th pop. 15–69	2.0	67
7.3.3 Wikipedia edits/mn pop. 15–69	6.0	43
7.3.4 Video uploads on YouTube/pop. 15–69	23.2	55

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

② 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 181 of this appendix for details.

Key indicators

Population (millions)	2.3
GDP (US\$ billions)	10.9
GDP per capita, PPP\$	16,368.2
Income group	Upper-middle income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	30.0	89
Innovation Output Sub-Index	16.4	111
Innovation Input Sub-Index	43.6	59
Innovation Efficiency Ratio	0.4	121 ○
Global Innovation Index 2016 (out of 128)	29.0	90

1 Institutions	68.6	46
1.1 Political environment	72.1	36
1.1.1 Political stability & safety*	88.8	12 ●
1.1.2 Government effectiveness*	55.3	43
1.2 Regulatory environment	64.6	65
1.2.1 Regulatory quality*	54.5	50
1.2.2 Rule of law*	57.9	39
1.2.3 Cost of redundancy dismissal, salary weeks	21.7	93
1.3 Business environment	69.1	71
1.3.1 Ease of starting a business*	76.2	113 ○
1.3.2 Ease of resolving insolvency*	50.5	59
1.3.3 Ease of paying taxes*	80.6	46

2 Human capital & research	32.0	65
2.1 Education	68.3	9 ●
2.1.1 Expenditure on education, % GDP [Ⓐ]	9.6	1 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	42.0	3 ●
2.1.3 School life expectancy, years [Ⓐ]	12.1	87
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	13.8	56
2.2 Tertiary education	24.1	96
2.2.1 Tertiary enrolment, % gross [Ⓐ]	27.5	84
2.2.2 Graduates in science & engineering, %	17.5	70
2.2.3 Tertiary inbound mobility, % [Ⓐ]	1.6	76
2.3 Research & development (R&D)	3.6	82
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	175.5	78
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.5	60
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	41.0	83
3.1 Information & communication technologies (ICTs)	33.2	103
3.1.1 ICT access*	43.3	96
3.1.2 ICT use*	32.6	81
3.1.3 Government's online service*	28.3	109
3.1.4 E-participation*	28.8	107
3.2 General infrastructure	42.8	45
3.2.1 Electricity output, kWh/cap.	1,064.4	91
3.2.2 Logistics performance*	45.4	56
3.2.3 Gross capital formation, % GDP	30.4	17 ●
3.3 Ecological sustainability	46.8	57
3.3.1 GDP/unit of energy use	12.3	25 ●
3.3.2 Environmental performance*	70.7	72
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.3	103

4 Market sophistication	49.3	52
4.1 Credit	33.8	68
4.1.1 Ease of getting credit*	55.0	67
4.1.2 Domestic credit to private sector, % GDP	33.9	95
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	55.0	[23]
4.2.1 Ease of protecting minority investors*	55.0	75
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, & market scale	59.0	75
4.3.1 Applied tariff rate, weighted mean, %	0.5	6 ●
4.3.2 Intensity of local competition [†]	71.2	49
4.3.3 Domestic market scale, bn PPP\$	36.5	103

5 Business sophistication **27.1** **91**

5.1 Knowledge workers	34.4	76
5.1.1 Knowledge-intensive employment, % [Ⓐ]	17.8	80
5.1.2 Firms offering formal training, % firms [Ⓐ]	51.9	19 ●
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.1	62
5.1.4 GERD financed by business, % [Ⓐ]	17.7	65
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	9.1	67
5.2 Innovation linkages	31.2	54
5.2.1 University/industry research collaboration [†]	40.2	69
5.2.2 State of cluster development [†]	40.6	84
5.2.3 GERD financed by abroad, % [Ⓐ]	21.7	18 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	20 ●
5.2.5 Patent families 2+ offices/bn PPP\$ GDP [Ⓐ]	0.1	72
5.3 Knowledge absorption	15.7	126 ○
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.1	99
5.3.2 High-tech imports less re-imports, % total trade	3.7	117 ○
5.3.3 ICT services imports, % total trade [Ⓐ]	0.5	98
5.3.4 FDI net inflows, % GDP	2.9	60
5.3.5 Research talent, % in business enterprise [Ⓐ]	1.0	77 ○

6 Knowledge & technology outputs **15.6** **102**

6.1 Knowledge creation	2.8	115 ○
6.1.1 Patents by origin/bn PPP\$ GDP [Ⓐ]	0.1	105
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	91
6.1.3 Utility models by origin/bn PPP\$ GDP [Ⓐ]	0.0	61 ○
6.1.4 Scientific & technical articles/bn PPP\$ GDP	8.2	73
6.1.5 Citable documents H index	4.7	97
6.2 Knowledge impact	29.0	73
6.2.1 Growth rate of PPP\$ GDP/worker, %	n/a	n/a
6.2.2 New businesses/th pop. 15–64	13.1	8 ●
6.2.3 Computer software spending, % GDP	0.1	85
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.4	119 ○
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	15.0	111
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	99 ○
6.3.2 High-tech exports less re-exports, % total trade	0.5	82
6.3.3 ICT services exports, % total trade [Ⓐ]	0.3	111 ○
6.3.4 FDI net outflows, % GDP	0.6	65

7 Creative outputs **17.1** **114** ○

7.1 Intangible assets	28.4	110
7.1.1 Trademarks by origin/bn PPP\$ GDP [Ⓐ]	10.4	102 ○
7.1.2 Industrial designs by origin/bn PPP\$ GDP [Ⓐ]	0.3	89
7.1.3 ICTs & business model creation [†]	52.5	92
7.1.4 ICTs & organizational model creation [†]	41.3	106
7.2 Creative goods & services	6.1	[102]
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.2	76
7.3 Online creativity	5.5	109
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.0	94
7.3.2 Country-code TLDs/th pop. 15–69	1.4	73
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	1.5	111
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Brazil

Key indicators

Population (millions)	209.6
GDP (US\$ billions)	1,769.6
GDP per capita, PPP\$	15,614.5
Income group	Upper-middle income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	33.1	69
Innovation Output Sub-Index	22.7	80
Innovation Input Sub-Index	43.5	60
Innovation Efficiency Ratio	0.5	99
Global Innovation Index 2016 (out of 128)	33.2	69

1 Institutions	51.8	91
1.1 Political environment	46.0	80
1.1.1 Political stability & safety*	54.6	80
1.1.2 Government effectiveness*	37.3	81
1.2 Regulatory environment	60.2	72
1.2.1 Regulatory quality*	36.7	83
1.2.2 Rule of law*	33.8	71
1.2.3 Cost of redundancy dismissal, salary weeks	15.4	62
1.3 Business environment	49.1	123 ○
1.3.1 Ease of starting a business*	65.0	123 ○
1.3.2 Ease of resolving insolvency*	49.2	62
1.3.3 Ease of paying taxes*	33.0	124 ○

2 Human capital & research	35.9	50
2.1 Education	49.3	56
2.1.1 Expenditure on education, % GDP	6.0	21 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	21.6	48
2.1.3 School life expectancy, years	15.3	41
2.1.4 PISA scales in reading, maths, & science	395.0	64 ○
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	16.7	73
2.2 Tertiary education	21.1	101 ○
2.2.1 Tertiary enrolment, % gross [Ⓐ]	49.3	53
2.2.2 Graduates in science & engineering, % [Ⓐ]	12.0	96 ○
2.2.3 Tertiary inbound mobility, % [Ⓐ]	0.2	100 ○
2.3 Research & development (R&D)	37.2	29 ●
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	698.1	55
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	1.2	32 ●
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	66.1	21 ●
2.3.4 QS university ranking, average score top 3*	47.4	24 ●

3 Infrastructure	48.3	57
3.1 Information & communication technologies (ICTs)	66.6	41
3.1.1 ICT access*	64.2	66
3.1.2 ICT use*	56.0	47
3.1.3 Government's online service*	73.2	37 ●
3.1.4 E-participation*	72.9	37 ●
3.2 General infrastructure	30.9	91
3.2.1 Electricity output, kWh/cap	2,866.0	63
3.2.2 Logistics performance*	47.4	54
3.2.3 Gross capital formation, % GDP	18.0	98 ○
3.3 Ecological sustainability	47.5	52
3.3.1 GDP/unit of energy use	10.1	47
3.3.2 Environmental performance*	78.9	45
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.0	65

4 Market sophistication	44.2	74
4.1 Credit	24.1	102 ○
4.1.1 Ease of getting credit*	45.0	84
4.1.2 Domestic credit to private sector, % GDP	67.9	44
4.1.3 Microfinance gross loans, % GDP	0.0	62

4.2 Investment	37.3	78
4.2.1 Ease of protecting minority investors*	65.0	31
4.2.2 Market capitalization, % GDP	27.6	51
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	48
4.3 Trade, competition, & market scale	71.1	32 ●
4.3.1 Applied tariff rate, weighted mean, %	8.3	108 ○
4.3.2 Intensity of local competition [†]	71.0	51
4.3.3 Domestic market scale, bn PPP\$	3,134.9	7 ●

5 Business sophistication	37.2	43
5.1 Knowledge workers	41.7	52
5.1.1 Knowledge-intensive employment, % [Ⓐ]	21.6	67
5.1.2 Firms offering formal training, % firms [Ⓐ]	42.2	29
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, % [Ⓐ]	36.4	42
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	9.1	66
5.2 Innovation linkages	28.0	63
5.2.1 University/industry research collaboration [†]	37.4	84
5.2.2 State of cluster development [†]	49.3	43
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	90 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	61
5.3 Knowledge absorption	41.9	29 ●
5.3.1 Intellectual property payments, % total trade	2.3	8 ●
5.3.2 High-tech imports less re-imports, % total trade	12.4	22 ●
5.3.3 ICT services imports, % total trade	1.4	45
5.3.4 FDI net inflows, % GDP	3.7	41
5.3.5 Research talent, % in business enterprise [Ⓐ]	25.9	49

6 Knowledge & technology outputs	18.9	85
6.1 Knowledge creation	16.7	50
6.1.1 Patents by origin/bn PPP\$ GDP	1.5	56
6.1.2 PCT patent applications/bn PPP\$ GDP	0.2	52
6.1.3 Utility models by origin/bn PPP\$ GDP	0.8	29
6.1.4 Scientific & technical articles/bn PPP\$ GDP	13.5	55
6.1.5 Citable documents H index	35.8	23 ●
6.2 Knowledge impact	18.8	106 ○
6.2.1 Growth rate of PPP\$ GDP/worker, %	(4.1)	109 ○
6.2.2 New businesses/th pop. 15–64	2.9	39
6.2.3 Computer software spending, % GDP	0.2	72
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	5.5	60
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.4	21 ●
6.3 Knowledge diffusion	21.1	67
6.3.1 Intellectual property receipts, % total trade	0.3	34
6.3.2 High-tech exports less re-exports, % total trade	4.1	38
6.3.3 ICT services exports, % total trade	0.7	92
6.3.4 FDI net outflows, % GDP	0.8	57

7 Creative outputs	26.6	83
7.1 Intangible assets	38.0	81
7.1.1 Trademarks by origin/bn PPP\$ GDP	40.9	57
7.1.2 Industrial designs by origin/bn PPP\$ GDP	1.0	61
7.1.3 ICTs & business model creation [†]	58.2	71
7.1.4 ICTs & organizational model creation [†]	51.3	69
7.2 Creative goods & services	7.0	99
7.2.1 Cultural & creative services exports, % of total trade	0.1	56
7.2.2 National feature films/mn pop. 15–69	0.9	82 ○
7.2.3 Global ent. & media market/th pop. 15–69	7.9	40
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.8	77
7.2.5 Creative goods exports, % total trade	0.2	72
7.3 Online creativity	23.4	55
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.6	86
7.3.2 Country-code TLDs/th pop. 15–69	7.7	43
7.3.3 Wikipedia edits/mn pop. 15–69	4.6	67
7.3.4 Video uploads on YouTube/pop. 15–69	39.7	29

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	0.4
GDP (US\$ billions)	10.5
GDP per capita, PPP\$	79,587.0
Income group	High income
Region	South East Asia, East Asia, and Oceania

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	32.9	71
Innovation Output Sub-Index	16.5	110 ○
Innovation Input Sub-Index	49.3	40
Innovation Efficiency Ratio	0.3	124 ○
Global Innovation Index 2016 (out of 128)	n/a	n/a

1 Institutions	77.2	31
1.1 Political environment	81.2	20 ●
1.1.1 Political stability & safety*	93.1	7 ●
1.1.2 Government effectiveness*	69.2	30 ●
1.2 Regulatory environment	79.0	27 ●
1.2.1 Regulatory quality*	63.7	36
1.2.2 Rule of law*	52.4	46
1.2.3 Cost of redundancy dismissal, salary weeks	8.0	1 ●
1.3 Business environment	71.4	62
1.3.1 Ease of starting a business*	86.7	68
1.3.2 Ease of resolving insolvency*	55.1	54
1.3.3 Ease of paying taxes*	72.4	68

2 Human capital & research	31.1	69
2.1 Education	46.3	68
2.1.1 Expenditure on education, % GDP	3.7	88
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	20.1	52
2.1.3 School life expectancy, years	14.7	56
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	8.8	15 ●
2.2 Tertiary education	47.0	27 ●
2.2.1 Tertiary enrolment, % gross	30.8	78
2.2.2 Graduates in science & engineering, %	34.0	6 ●
2.2.3 Tertiary inbound mobility, %	4.9	37
2.3 Research & development (R&D)	0.0	115 ○
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	n/a	n/a
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	49.4	55
3.1 Information & communication technologies (ICTs)	47.5	85
3.1.1 ICT access*	72.1	47
3.1.2 ICT use*	29.7	85
3.1.3 Government's online service*	50.7	83
3.1.4 E-participation*	37.3	101
3.2 General infrastructure	61.3	6 ●
3.2.1 Electricity output, kWh/cap	10,728.6	12 ●
3.2.2 Logistics performance*	37.3	69
3.2.3 Gross capital formation, % GDP	40.9	5 ●
3.3 Ecological sustainability	39.4	84
3.3.1 GDP/unit of energy use	7.8	73
3.3.2 Environmental performance*	67.9	86
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.9	66

4 Market sophistication	48.5	54
4.1 Credit	37.9	55
4.1.1 Ease of getting credit*	60.0	55
4.1.2 Domestic credit to private sector, % GDP	41.4	81
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	51.7	[28]
4.2.1 Ease of protecting minority investors*	51.7	86
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, & market scale	55.9	90
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	0.5	5 ●
4.3.2 Intensity of local competition [†]	60.0	102
4.3.3 Domestic market scale, bn PPP\$	33.7	106

5 Business sophistication	40.2	34
5.1 Knowledge workers	71.0	[7]
5.1.1 Knowledge-intensive employment, % [Ⓐ]	40.5	25 ●
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	28.0	64
5.2.1 University/industry research collaboration [†]	38.4	79
5.2.2 State of cluster development [†]	48.9	47
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	93 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	63
5.3 Knowledge absorption	21.7	115 ○
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.1	91
5.3.2 High-tech imports less re-imports, % total trade	6.0	96
5.3.3 ICT services imports, % total trade [Ⓐ]	0.3	113 ○
5.3.4 FDI net inflows, % GDP	3.0	56
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	13.6	114 ○
6.1 Knowledge creation	4.1	98
6.1.1 Patents by origin/bn PPP\$ GDP [Ⓐ]	0.8	68
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	56
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	6.1	88
6.1.5 Citable documents H index	2.1	116 ○
6.2 Knowledge impact	2.9	[125]
6.2.1 Growth rate of PPP\$ GDP/worker, %	n/a	n/a
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	n/a	n/a
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	3.1	79
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.0	99 ○
6.3 Knowledge diffusion	33.9	31
6.3.1 Intellectual property receipts, % total trade	n/a	n/a
6.3.2 High-tech exports less re-exports, % total trade	1.4	62
6.3.3 ICT services exports, % total trade [Ⓐ]	0.4	107 ○
6.3.4 FDI net outflows, % GDP	3.6	15 ●

7 Creative outputs	19.4	105
7.1 Intangible assets	28.7	108 ○
7.1.1 Trademarks by origin/bn PPP\$ GDP [Ⓐ]	2.5	115 ○
7.1.2 Industrial designs by origin/bn PPP\$ GDP [Ⓐ]	0.1	104 ○
7.1.3 ICTs & business model creation [†]	51.9	93
7.1.4 ICTs & organizational model creation [†]	47.7	81
7.2 Creative goods & services	4.5	[110]
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.5	91 ○
7.2.5 Creative goods exports, % total trade	0.1	85
7.3 Online creativity	15.6	78
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	7.0	47
7.3.2 Country-code TLDs/th pop. 15–69	0.9	82
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	4.0	81
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Bulgaria

Key indicators

Population (millions)	7.1
GDP (US\$ billions)	50.4
GDP per capita, PPP\$	19,097.3
Income group	Upper-middle income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	42.8	36
Innovation Output Sub-Index	38.1	32
Innovation Input Sub-Index	47.6	45
Innovation Efficiency Ratio	0.8	15 ●
Global Innovation Index 2016 (out of 128)	41.4	38

1 Institutions	67.1	52
1.1 Political environment	56.0	55
1.1.1 Political stability & safety*	64.2	58
1.1.2 Government effectiveness*	47.7	58
1.2 Regulatory environment	72.4	40
1.2.1 Regulatory quality*	56.3	47
1.2.2 Rule of law*	35.8	67
1.2.3 Cost of redundancy dismissal, salary weeks	8.6	20 ●
1.3 Business environment	73.0	59
1.3.1 Ease of starting a business*	86.8	67
1.3.2 Ease of resolving insolvency*	59.4	45
1.3.3 Ease of paying taxes*	72.8	65

2 Human capital & research	33.7	56
2.1 Education	47.1	63
2.1.1 Expenditure on education, % GDP	4.1	80 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	22.2	44
2.1.3 School life expectancy, years	14.9	51
2.1.4 PISA scales in reading, maths, & science	439.6	45 ○
2.1.5 Pupil-teacher ratio, secondary ^②	13.2	52
2.2 Tertiary education	40.7	45
2.2.1 Tertiary enrolment, % gross	73.9	21 ●
2.2.2 Graduates in science & engineering, %	20.1	56
2.2.3 Tertiary inbound mobility, %	4.2	44
2.3 Research & development (R&D)	13.2	52
2.3.1 Researchers, FTE/mn pop.	1,989.4	39
2.3.2 Gross expenditure on R&D, % GDP	1.0	38
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	6.2	66

3 Infrastructure	51.9	48
3.1 Information & communication technologies (ICTs)	63.3	50
3.1.1 ICT access*	68.6	53
3.1.2 ICT use*	58.4	42
3.1.3 Government's online service*	56.5	74
3.1.4 E-participation*	69.5	43
3.2 General infrastructure	35.4	72
3.2.1 Electricity output, kWh/cap	6,499.6	30
3.2.2 Logistics performance*	34.4	72
3.2.3 Gross capital formation, % GDP	22.0	65
3.3 Ecological sustainability	57.1	24
3.3.1 GDP/unit of energy use	6.5	87 ○
3.3.2 Environmental performance*	83.4	33
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	10.8	6 ●

4 Market sophistication	43.9	76 ○
4.1 Credit	30.5	76 ○
4.1.1 Ease of getting credit*	70.0	29
4.1.2 Domestic credit to private sector, % GDP	55.4	58
4.1.3 Microfinance gross loans, % GDP	0.0	75 ○

4.2 Investment	38.7	70
4.2.1 Ease of protecting minority investors*	73.3	13 ●
4.2.2 Market capitalization, % GDP ^②	14.4	69 ○
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	76 ○
4.3 Trade, competition, & market scale	62.5	60
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	60.3	98 ○
4.3.3 Domestic market scale, bn PPP\$	143.1	69

5 Business sophistication	41.4	32
5.1 Knowledge workers	46.1	43
5.1.1 Knowledge-intensive employment, %	32.3	43
5.1.2 Firms offering formal training, % firms	42.7	28
5.1.3 GERD performed by business, % of GDP	0.7	26
5.1.4 GERD financed by business, % ^②	22.3	59 ○
5.1.5 Females employed w/advanced degrees, % total	19.7	24

5.2 Innovation linkages	44.6	21 ●
5.2.1 University/industry research collaboration [†]	39.7	71
5.2.2 State of cluster development [†]	43.8	73 ○
5.2.3 GERD financed by abroad, % ^②	50.9	3 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	42
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.3	46
5.3 Knowledge absorption	33.6	61
5.3.1 Intellectual property payments, % total trade	0.6	55
5.3.2 High-tech imports less re-imports, % total trade	7.4	72
5.3.3 ICT services imports, % total trade	1.1	65
5.3.4 FDI net inflows, % GDP	3.6	44
5.3.5 Research talent, % in business enterprise	38.6	35

6 Knowledge & technology outputs	32.0	35
6.1 Knowledge creation	23.1	40
6.1.1 Patents by origin/bn PPP\$ GDP	2.3	43
6.1.2 PCT patent applications/bn PPP\$ GDP	0.4	40
6.1.3 Utility models by origin/bn PPP\$ GDP	1.9	15
6.1.4 Scientific & technical articles/bn PPP\$ GDP	15.3	50
6.1.5 Citable documents H index	14.5	50

6.2 Knowledge impact	49.5	12 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	2.6	27
6.2.2 New businesses/th pop. 15–64	8.9	13 ●
6.2.3 Computer software spending, % GDP	0.3	48
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	39.7	3 ●
6.2.5 High- & medium-high-tech manufactures, %	0.2	57

6.3 Knowledge diffusion	23.5	60
6.3.1 Intellectual property receipts, % total trade	0.1	45
6.3.2 High-tech exports less re-exports, % total trade	3.7	42
6.3.3 ICT services exports, % total trade	2.7	39
6.3.4 FDI net outflows, % GDP	0.8	61

7 Creative outputs	44.1	29
7.1 Intangible assets	59.4	16 ●
7.1.1 Trademarks by origin/bn PPP\$ GDP	113.6	8 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	10.8	12 ●
7.1.3 ICTs & business model creation [†]	62.0	56
7.1.4 ICTs & organizational model creation [†]	58.6	44

7.2 Creative goods & services	26.5	41
7.2.1 Cultural & creative services exports, % of total trade ^②	1.1	13 ●
7.2.2 National feature films/mn pop. 15–69	4.8	39
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	1.3	38
7.2.5 Creative goods exports, % total trade	1.0	43

7.3 Online creativity	31.2	38
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	22.7	26
7.3.2 Country-code TLDs/th pop. 15–69	2.0	65
7.3.3 Wikipedia edits/mn pop. 15–69	6.5	26
7.3.4 Video uploads on YouTube/pop. 15–69	36.8	36

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

② 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 181 of this appendix for details.

Key indicators

Population (millions)	18.6
GDP (US\$ billions)	12.0
GDP per capita, PPP\$	1,723.6
Income group	Low income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	21.9	120 ○
Innovation Output Sub-Index	8.4	126 ○
Innovation Input Sub-Index	35.3	101
Innovation Efficiency Ratio	0.2	127 ○
Global Innovation Index 2016 (out of 128)	21.0	122

1 Institutions	53.4	86
1.1 Political environment	37.6	101
1.1.1 Political stability & safety*	48.1	96
1.1.2 Government effectiveness*	27.1	99
1.2 Regulatory environment	61.7	70
1.2.1 Regulatory quality*	32.9	91
1.2.2 Rule of law*	23.9	94
1.2.3 Cost of redundancy dismissal, salary weeks	10.5	35 ●
1.3 Business environment	61.0	93
1.3.1 Ease of starting a business*	88.1	59 ●
1.3.2 Ease of resolving insolvency*	39.3	99
1.3.3 Ease of paying taxes*	55.8	103

2 Human capital & research	15.8	110
2.1 Education	25.3	118
2.1.1 Expenditure on education, % GDP	3.9	82
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	16.2	73
2.1.3 School life expectancy, years [Ⓐ]	7.7	114 ○
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	25.2	94
2.2 Tertiary education	20.8	102
2.2.1 Tertiary enrolment, % gross [Ⓐ]	4.8	114 ○
2.2.2 Graduates in science & engineering, %	17.6	69
2.2.3 Tertiary inbound mobility, % [Ⓐ]	2.9	57
2.3 Research & development (R&D)	1.2	102
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	47.5	90
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.2	90
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	25.4	118
3.1 Information & communication technologies (ICTs)	20.1	115
3.1.1 ICT access*	28.7	112
3.1.2 ICT use*	9.0	115
3.1.3 Government's online service*	18.8	116
3.1.4 E-participation*	23.7	111
3.2 General infrastructure	26.8	103
3.2.1 Electricity output, kWh/cap	n/a	n/a
3.2.2 Logistics performance*	30.9	80
3.2.3 Gross capital formation, % GDP	14.3	114
3.3 Ecological sustainability	29.3	117
3.3.1 GDP/unit of energy use	n/a	n/a
3.3.2 Environmental performance*	43.7	116 ○
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.1	119 ○

4 Market sophistication	29.7	121 ○
4.1 Credit	22.4	108
4.1.1 Ease of getting credit*	30.0	108
4.1.2 Domestic credit to private sector, % GDP	27.2	101
4.1.3 Microfinance gross loans, % GDP	1.5	19 ●

4.2 Investment	30.0	114
4.2.1 Ease of protecting minority investors*	40.0	111
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP [Ⓐ]	0.0	39 ●
4.3 Trade, competition, & market scale	36.6	122 ○
4.3.1 Applied tariff rate, weighted mean, %	9.6	112
4.3.2 Intensity of local competition [†]	n/a	n/a
4.3.3 Domestic market scale, bn PPP\$	33.0	107

5 Business sophistication	52.2	[14]
5.1 Knowledge workers	23.9	[100]
5.1.1 Knowledge-intensive employment, %	n/a	n/a
5.1.2 Firms offering formal training, % firms [Ⓐ]	24.8	65
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, % [Ⓐ]	11.9	70
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	100.0	[1]
5.2.1 University/industry research collaboration [†]	n/a	n/a
5.2.2 State of cluster development [†]	n/a	n/a
5.2.3 GERD financed by abroad, % [Ⓐ]	59.6	1 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	n/a	n/a
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	n/a	n/a
5.3 Knowledge absorption	32.6	66
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.0	114 ○
5.3.2 High-tech imports less re-imports, % total trade	6.4	91
5.3.3 ICT services imports, % total trade [Ⓐ]	2.4	14 ●
5.3.4 FDI net inflows, % GDP	2.9	62 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	15.1	106
6.1 Knowledge creation	5.1	86
6.1.1 Patents by origin/bn PPP\$ GDP	0.2	94
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP [Ⓐ]	0.1	47
6.1.4 Scientific & technical articles/bn PPP\$ GDP	10.6	63 ●
6.1.5 Citable documents H index	5.0	94
6.2 Knowledge impact	24.1	93
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.9	38 ●
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	0.2	96
6.2.3 Computer software spending, % GDP	0.0	110
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	1.6	100
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	16.2	109
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	80
6.3.2 High-tech exports less re-exports, % total trade	0.2	101
6.3.3 ICT services exports, % total trade [Ⓐ]	1.3	72
6.3.4 FDI net outflows, % GDP	0.4	71

7 Creative outputs	1.8	127 ○
7.1 Intangible assets	1.0	126 ○
7.1.1 Trademarks by origin/bn PPP\$ GDP	3.2	114 ○
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.2	100
7.1.3 ICTs & business model creation [†]	n/a	n/a
7.1.4 ICTs & organizational model creation [†]	n/a	n/a
7.2 Creative goods & services	4.7	109
7.2.1 Cultural & creative services exports, % of total trade	0.3	40 ●
7.2.2 National feature films/mn pop. 15–69	0.5	92
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.0	109
7.3 Online creativity	0.4	125 ○
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.1	122 ○
7.3.2 Country-code TLDs/th pop. 15–69	0.0	119
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	0.1	125 ○
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Burundi

Key indicators

Population (millions)	11.6
GDP (US\$ billions)	2.7
GDP per capita, PPP\$	818.5
Income group	Low income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	21.3	122
Innovation Output Sub-Index	12.4	122
Innovation Input Sub-Index	30.2	115
Innovation Efficiency Ratio	0.4	117
Global Innovation Index 2016 (out of 128)	20.9	123

1 Institutions	43.2	118
1.1 Political environment	17.3	124
1.1.1 Political stability & safety*	21.9	123
1.1.2 Government effectiveness*	12.7	123
1.2 Regulatory environment	49.8	98
1.2.1 Regulatory quality*	24.0	107
1.2.2 Rule of law*	6.7	123
1.2.3 Cost of redundancy dismissal, salary weeks	15.9	67
1.3 Business environment	62.4	85
1.3.1 Ease of starting a business*	94.5	17 ●
1.3.2 Ease of resolving insolvency*	30.5	114
1.3.3 Ease of paying taxes*	62.2	88
2 Human capital & research	14.9	114
2.1 Education	37.7	95
2.1.1 Expenditure on education, % GDP	5.4	35 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	31.0	13 ●
2.1.3 School life expectancy, years ^a	10.6	98
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	35.8	107
2.2 Tertiary education	6.1	119
2.2.1 Tertiary enrolment, % gross ^a	4.4	117
2.2.2 Graduates in science & engineering, %	6.4	100
2.2.3 Tertiary inbound mobility, % ^a	1.0	81
2.3 Research & development (R&D)	0.8	105
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP ^a	0.1	99
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○
3 Infrastructure	21.9	124
3.1 Information & communication technologies (ICTs)	14.0	125 ○
3.1.1 ICT access*	21.4	123
3.1.2 ICT use*	4.2	123
3.1.3 Government's online service*	15.2	118
3.1.4 E-participation*	15.3	119
3.2 General infrastructure	8.3	126 ○
3.2.1 Electricity output, kWh/cap	n/a	n/a
3.2.2 Logistics performance*	20.7	101
3.2.3 Gross capital formation, % GDP	4.2	123 ○
3.3 Ecological sustainability	43.4	[70]
3.3.1 GDP/unit of energy use	n/a	n/a
3.3.2 Environmental performance*	43.4	118
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	n/a	n/a
4 Market sophistication	32.7	114
4.1 Credit	25.1	97
4.1.1 Ease of getting credit*	10.0	124 ○
4.1.2 Domestic credit to private sector, % GDP	14.3	120
4.1.3 Microfinance gross loans, % GDP	3.4	13 ●

4.2 Investment	41.7	[55]
4.2.1 Ease of protecting minority investors*	41.7	105
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, & market scale	31.2	124
4.3.1 Applied tariff rate, weighted mean, %	5.4	94
4.3.2 Intensity of local competition [†]	56.1	113
4.3.3 Domestic market scale, bn PPP\$	7.9	127 ○

5 Business sophistication	38.4	36 ●
5.1 Knowledge workers	37.7	[60]
5.1.1 Knowledge-intensive employment, %	n/a	n/a
5.1.2 Firms offering formal training, % firms	32.0	46
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	38.1	36 ●
5.2.1 University/industry research collaboration [†]	30.2	104
5.2.2 State of cluster development [†]	31.3	117
5.2.3 GERD financed by abroad, % ^a	39.9	10 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	n/a	n/a
5.2.5 Patent families 2+ offices/bn PPP\$ GDP ^a	0.2	54 ●
5.3 Knowledge absorption	39.5	33 ●
5.3.1 Intellectual property payments, % total trade ^a	0.0	115 ○
5.3.2 High-tech imports less re-imports, % total trade ^a	10.8	35 ●
5.3.3 ICT services imports, % total trade ^a	2.6	11 ●
5.3.4 FDI net inflows, % GDP	2.8	64
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	7.9	124
6.1 Knowledge creation	2.5	[118]
6.1.1 Patents by origin/bn PPP\$ GDP	n/a	n/a
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	3.9	104
6.1.5 Citable documents H index	0.3	125 ○
6.2 Knowledge impact	3.2	124
6.2.1 Growth rate of PPP\$ GDP/worker, %	n/a	n/a
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.1	94
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.0	127 ○
6.2.5 High- & medium-high-tech manufactures, % ^a	0.0	98
6.3 Knowledge diffusion	17.9	95
6.3.1 Intellectual property receipts, % total trade ^a	0.0	87
6.3.2 High-tech exports less re-exports, % total trade ^a	0.1	114
6.3.3 ICT services exports, % total trade ^a	3.2	27 ●
6.3.4 FDI net outflows, % GDP	0.0	108

7 Creative outputs	16.9	115
7.1 Intangible assets	29.2	106
7.1.1 Trademarks by origin/bn PPP\$ GDP	n/a	n/a
7.1.2 Industrial designs by origin/bn PPP\$ GDP	n/a	n/a
7.1.3 ICTs & business model creation [†]	31.9	122 ○
7.1.4 ICTs & organizational model creation [†]	26.5	122 ○
7.2 Creative goods & services	8.4	94
7.2.1 Cultural & creative services exports, % of total trade ^a	0.3	33 ●
7.2.2 National feature films/mn pop. 15–69	0.2	99
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % ^a	1.2	52
7.2.5 Creative goods exports, % total trade ^a	0.0	113
7.3 Online creativity	1.0	122
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.0	125 ○
7.3.2 Country-code TLDs/th pop. 15–69	0.1	107
7.3.3 Wikipedia edits/mn pop. 15–69 ^a	0.3	122
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

^a 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 181 of this appendix for details.

Key indicators

Population (millions)	15.8
GDP (US\$ billions)	19.4
GDP per capita, PPP\$	3,487.5
Income group	Lower-middle income
Region	South East Asia, East Asia, and Oceania

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	27.0	101
Innovation Output Sub-Index	20.9	87
Innovation Input Sub-Index	33.2	104
Innovation Efficiency Ratio	0.6	61
Global Innovation Index 2016 (out of 128)	27.9	95

1 Institutions	49.1	98
1.1 Political environment	42.9	88
1.1.1 Political stability & safety*	61.5	68
1.1.2 Government effectiveness*	24.4	109
1.2 Regulatory environment	49.3	101
1.2.1 Regulatory quality*	29.8	98
1.2.2 Rule of law*	12.5	114
1.2.3 Cost of redundancy dismissal, salary weeks	19.4	80
1.3 Business environment	55.0	115
1.3.1 Ease of starting a business*	54.9	126 ○
1.3.2 Ease of resolving insolvency*	48.1	66
1.3.3 Ease of paying taxes*	62.0	89

2 Human capital & research	14.2	118
2.1 Education	24.6	119
2.1.1 Expenditure on education, % GDP	1.9	115 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years [Ⓐ]	10.5	99
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	28.9	103
2.2 Tertiary education	17.9	105
2.2.1 Tertiary enrolment, % gross	13.1	100
2.2.2 Graduates in science & engineering, % [Ⓐ]	12.5	93
2.2.3 Tertiary inbound mobility, %	n/a	n/a
2.3 Research & development (R&D)	0.0	115 ○
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	n/a	n/a
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	26.9	113
3.1 Information & communication technologies (ICTs)	18.7	118
3.1.1 ICT access*	42.1	99
3.1.2 ICT use*	20.9	97
3.1.3 Government's online service*	5.1	126 ○
3.1.4 E-participation*	6.8	125 ○
3.2 General infrastructure	30.7	92
3.2.1 Electricity output, kWh/cap	199.5	112 ○
3.2.2 Logistics performance*	34.1	73
3.2.3 Gross capital formation, % GDP	22.9	57 ●
3.3 Ecological sustainability	31.3	113
3.3.1 GDP/unit of energy use	7.4	81
3.3.2 Environmental performance*	51.2	110
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.3	92

4 Market sophistication	52.4	37 ●
4.1 Credit	69.9	7 ●
4.1.1 Ease of getting credit*	85.0	7 ●
4.1.2 Domestic credit to private sector, % GDP	63.1	50 ●
4.1.3 Microfinance gross loans, % GDP	29.6	1 ●

4.2 Investment	34.1	88
4.2.1 Ease of protecting minority investors*	48.3	92
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP [Ⓐ]	0.0	54
4.3 Trade, competition, & market scale	53.3	98
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	4.9	90
4.3.2 Intensity of local competition [†]	62.1	93
4.3.3 Domestic market scale, bn PPP\$	58.9	90

5 Business sophistication 23.3 111

5.1 Knowledge workers	15.4	[117]
5.1.1 Knowledge-intensive employment, % [Ⓐ]	4.1	102 ○
5.1.2 Firms offering formal training, % firms	22.2	69
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	30.7	55 ●
5.2.1 University/industry research collaboration [†]	34.7	95
5.2.2 State of cluster development [†]	49.1	44 ●
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	25 ●
5.2.5 Patent families 2+ offices/bn PPP\$ GDP [Ⓐ]	0.0	93
5.3 Knowledge absorption	23.9	106
5.3.1 Intellectual property payments, % total trade	0.1	102
5.3.2 High-tech imports less re-imports, % total trade	2.9	122 ○
5.3.3 ICT services imports, % total trade	0.7	87
5.3.4 FDI net inflows, % GDP	9.5	11 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs 17.4 90

6.1 Knowledge creation	3.5	105
6.1.1 Patents by origin/bn PPP\$ GDP [Ⓐ]	0.0	118 ○
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	5.0	99
6.1.5 Citable documents H index	4.0	103
6.2 Knowledge impact	34.4	49 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	5.0	7 ●
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	0.2	95
6.2.3 Computer software spending, % GDP	0.0	112
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.7	115
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	14.2	116
6.3.1 Intellectual property receipts, % total trade	0.0	92
6.3.2 High-tech exports less re-exports, % total trade	0.9	69
6.3.3 ICT services exports, % total trade	0.4	103
6.3.4 FDI net outflows, % GDP	0.3	80

7 Creative outputs 24.4 92

7.1 Intangible assets	36.7	89
7.1.1 Trademarks by origin/bn PPP\$ GDP [Ⓐ]	23.5	80
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.2	99
7.1.3 ICTs & business model creation [†]	60.7	61
7.1.4 ICTs & organizational model creation [†]	55.6	52 ●
7.2 Creative goods & services	14.7	[74]
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	3.1	55
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.6	56 ●
7.3 Online creativity	9.8	99
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.1	92
7.3.2 Country-code TLDs/th pop. 15–69	0.1	113
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	2.9	102
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Cameroon

Key indicators

Population (millions)	23.9
GDP (US\$ billions)	30.9
GDP per capita, PPP\$	3,143.7
Income group	Lower-middle income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	22.6	117
Innovation Output Sub-Index	16.1	113
Innovation Input Sub-Index	29.0	117
Innovation Efficiency Ratio	0.6	92
Global Innovation Index 2016 (out of 128)	22.8	118

1 Institutions	42.3	119	○
1.1 Political environment	31.2	115	
1.1.1 Political stability & safety*	39.8	110	
1.1.2 Government effectiveness*	22.5	114	
1.2 Regulatory environment	45.8	108	
1.2.1 Regulatory quality*	19.0	116	
1.2.2 Rule of law*	11.3	117	
1.2.3 Cost of redundancy dismissal, salary weeks	19.9	82	
1.3 Business environment	49.8	122	○
1.3.1 Ease of starting a business*	77.0	110	
1.3.2 Ease of resolving insolvency*	36.6	104	
1.3.3 Ease of paying taxes*	35.9	123	○

2 Human capital & research	19.8	101	
2.1 Education	34.4	100	
2.1.1 Expenditure on education, % GDP	3.0	98	
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	19.7	54	●
2.1.3 School life expectancy, years	12.2	84	
2.1.4 PISA scales in reading, maths, & science	n/a	n/a	
2.1.5 Pupil-teacher ratio, secondary	19.9	80	
2.2 Tertiary education	25.1	93	
2.2.1 Tertiary enrolment, % gross	17.5	95	
2.2.2 Graduates in science & engineering, % [Ⓐ]	21.0	49	●
2.2.3 Tertiary inbound mobility, % [Ⓐ]	1.1	80	
2.3 Research & development (R&D)	0.0	115	○
2.3.1 Researchers, FTE/mn pop.	n/a	n/a	
2.3.2 Gross expenditure on R&D, % GDP	n/a	n/a	
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43	○
2.3.4 QS university ranking, average score top 3*	0.0	75	○

3 Infrastructure	25.3	119	○
3.1 Information & communication technologies (ICTs)	18.7	119	○
3.1.1 ICT access*	27.7	115	
3.1.2 ICT use*	8.4	117	
3.1.3 Government's online service*	21.7	113	
3.1.4 E-participation*	16.9	117	
3.2 General infrastructure	22.2	114	
3.2.1 Electricity output, kWh/cap.	304.0	108	
3.2.2 Logistics performance*	4.1	125	○
3.2.3 Gross capital formation, % GDP	21.9	66	●
3.3 Ecological sustainability	35.1	102	
3.3.1 GDP/unit of energy use	8.3	66	●
3.3.2 Environmental performance*	57.1	106	
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.3	102	

4 Market sophistication	33.7	113	
4.1 Credit	20.0	112	
4.1.1 Ease of getting credit*	35.0	104	
4.1.2 Domestic credit to private sector, % GDP	16.4	114	
4.1.3 Microfinance gross loans, % GDP	1.1	25	●

4.2 Investment	41.7	[55]	
4.2.1 Ease of protecting minority investors*	41.7	105	
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, & market scale	39.4	121	○
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	15.8	125	○
4.3.2 Intensity of local competition [†]	63.8	83	
4.3.3 Domestic market scale, bn PPP\$	77.2	82	

5 Business sophistication	24.0	109	
5.1 Knowledge workers	29.2	[86]	
5.1.1 Knowledge-intensive employment, %	n/a	n/a	
5.1.2 Firms offering formal training, % firms [Ⓐ]	25.5	62	
5.1.3 GERD performed by business, % of GDP	n/a	n/a	
5.1.4 GERD financed by business, %	n/a	n/a	
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a	
5.2 Innovation linkages	22.5	83	
5.2.1 University/industry research collaboration [†]	37.2	85	
5.2.2 State of cluster development [†]	36.8	96	
5.2.3 GERD financed by abroad, %	n/a	n/a	
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	96	
5.2.5 Patent families 2+ offices/bn PPP\$ GDP [Ⓐ]	0.0	107	
5.3 Knowledge absorption	20.4	121	○
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.1	100	
5.3.2 High-tech imports less re-imports, % total trade	5.1	108	
5.3.3 ICT services imports, % total trade [Ⓐ]	0.5	102	
5.3.4 FDI net inflows, % GDP	1.9	84	
5.3.5 Research talent, % in business enterprise	n/a	n/a	

6 Knowledge & technology outputs	15.6	101	
6.1 Knowledge creation	5.6	85	
6.1.1 Patents by origin/bn PPP\$ GDP	0.4	82	
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	94	
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a	
6.1.4 Scientific & technical articles/bn PPP\$ GDP	10.6	64	●
6.1.5 Citable documents H index	6.1	86	
6.2 Knowledge impact	28.5	75	●
6.2.1 Growth rate of PPP\$ GDP/worker, %	2.4	33	●
6.2.2 New businesses/th pop. 15–64	n/a	n/a	
6.2.3 Computer software spending, % GDP	0.2	76	
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.9	110	
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.0	96	○
6.3 Knowledge diffusion	12.7	122	○
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	96	
6.3.2 High-tech exports less re-exports, % total trade	0.2	102	
6.3.3 ICT services exports, % total trade [Ⓐ]	1.3	74	●
6.3.4 FDI net outflows, % GDP	(0.4)	119	○

7 Creative outputs	16.7	117	
7.1 Intangible assets	28.3	111	
7.1.1 Trademarks by origin/bn PPP\$ GDP	7.3	109	○
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.4	87	
7.1.3 ICTs & business model creation [†]	51.3	95	
7.1.4 ICTs & organizational model creation [†]	43.7	98	
7.2 Creative goods & services	7.6	97	
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.1	64	
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	1.8	63	●
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a	
7.2.4 Printing & publishing manufactures, % [Ⓐ]	1.3	41	●
7.2.5 Creative goods exports, % total trade	0.0	118	○
7.3 Online creativity	2.4	120	○
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.2	116	
7.3.2 Country-code TLDs/th pop. 15–69	0.3	100	
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	0.7	119	○
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	36.3
GDP (US\$ billions)	1,532.3
GDP per capita, PPP\$	45,552.6
Income group	High income
Region	Northern America

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	53.7	18
Innovation Output Sub-Index	41.7	23
Innovation Input Sub-Index	65.6	10
Innovation Efficiency Ratio	0.6	59
Global Innovation Index 2016 (out of 128)	54.7	15

1	Institutions	91.0	7
1.1	Political environment	90.7	6 ●
1.1.1	Political stability & safety*	94.0	5 ●
1.1.2	Government effectiveness*	87.5	11
1.2	Regulatory environment	92.7	10
1.2.1	Regulatory quality*	85.8	12
1.2.2	Rule of law*	93.1	11
1.2.3	Cost of redundancy dismissal, salary weeks	10.0	31
1.3	Business environment	89.5	7
1.3.1	Ease of starting a business*	98.2	2 ●
1.3.2	Ease of resolving insolvency*	81.4	14
1.3.3	Ease of paying taxes*	88.9	16
2	Human capital & research	53.3	20
2.1	Education	44.9	74 ○
2.1.1	Expenditure on education, % GDP [Ⓐ]	5.3	40
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	18.3	60 ○
2.1.3	School life expectancy, years	n/a	n/a
2.1.4	PISA scales in reading, maths, & science	523.3	5
2.1.5	Pupil-teacher ratio, secondary	n/a	n/a
2.2	Tertiary education	n/a	n/a
2.2.1	Tertiary enrolment, % gross	n/a	n/a
2.2.2	Graduates in science & engineering, %	n/a	n/a
2.2.3	Tertiary inbound mobility, %	n/a	n/a
2.3	Research & development (R&D)	61.8	15
2.3.1	Researchers, FTE/mn pop. [Ⓐ]	4,518.5	16
2.3.2	Gross expenditure on R&D, % GDP [Ⓐ]	1.6	22
2.3.3	Global R&D companies, avg. expend. top 3, mn \$US	73.2	16
2.3.4	QS university ranking, average score top 3*	82.0	5 ●
3	Infrastructure	62.1	18
3.1	Information & communication technologies (ICTs)	83.9	12
3.1.1	ICT access*	79.9	25
3.1.2	ICT use*	68.5	24
3.1.3	Government's online service*	95.7	4 ●
3.1.4	E-participation*	91.5	8
3.2	General infrastructure	59.7	7
3.2.1	Electricity output, kWh/cap.	17,594.1	5 ●
3.2.2	Logistics performance*	86.4	14
3.2.3	Gross capital formation, % GDP	23.1	56
3.3	Ecological sustainability	42.6	75 ○
3.3.1	GDP/unit of energy use	5.6	97 ○
3.3.2	Environmental performance*	85.1	25
3.3.3	ISO 14001 environmental certificates/bn PPP\$ GDP	0.8	73 ○
4	Market sophistication	73.7	3 ●
4.1	Credit	67.3	8
4.1.1	Ease of getting credit*	85.0	7
4.1.2	Domestic credit to private sector, % GDP [Ⓐ]	124.4	18
4.1.3	Microfinance gross loans, % GDP	n/a	n/a

4.2	Investment	74.3	2 ●
4.2.1	Ease of protecting minority investors*	76.7	7
4.2.2	Market capitalization, % GDP	102.8	8
4.2.3	Venture capital deals/bn PPP\$ GDP	0.5	1 ●
4.3	Trade, competition, & market scale	79.4	9
4.3.1	Applied tariff rate, weighted mean, %	1.0	11
4.3.2	Intensity of local competition [†]	74.1	31
4.3.3	Domestic market scale, bn PPP\$	1,674.3	16

5	Business sophistication	47.8	24
5.1	Knowledge workers	56.7	27
5.1.1	Knowledge-intensive employment, % [Ⓐ]	43.7	18
5.1.2	Firms offering formal training, % firms	n/a	n/a
5.1.3	GERD performed by business, % of GDP [Ⓐ]	0.8	24
5.1.4	GERD financed by business, % [Ⓐ]	45.4	27
5.1.5	Females employed w/advanced degrees, % total	17.0	30
5.2	Innovation linkages	41.5	27
5.2.1	University/industry research collaboration [†]	59.6	22
5.2.2	State of cluster development [†]	61.9	19
5.2.3	GERD financed by abroad, % [Ⓐ]	6.0	61 ○
5.2.4	JV-strategic alliance deals/bn PPP\$ GDP	0.2	5 ●
5.2.5	Patent families 2+ offices/bn PPP\$ GDP	2.9	18
5.3	Knowledge absorption	45.3	21
5.3.1	Intellectual property payments, % total trade	1.8	12
5.3.2	High-tech imports less re-imports, % total trade	11.1	32
5.3.3	ICT services imports, % total trade	0.9	70 ○
5.3.4	FDI net inflows, % GDP	3.7	42
5.3.5	Research talent, % in business enterprise [Ⓐ]	56.0	18

6	Knowledge & technology outputs	38.7	19
6.1	Knowledge creation	40.6	21
6.1.1	Patents by origin/bn PPP\$ GDP	2.6	39
6.1.2	PCT patent applications/bn PPP\$ GDP	1.4	24
6.1.3	Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4	Scientific & technical articles/bn PPP\$ GDP	37.2	17
6.1.5	Citable documents H index	77.9	5 ●
6.2	Knowledge impact	36.2	44
6.2.1	Growth rate of PPP\$ GDP/worker, %	0.3	75 ○
6.2.2	New businesses/th pop. 15–64	1.3	61 ○
6.2.3	Computer software spending, % GDP	0.8	3 ●
6.2.4	ISO 9001 quality certificates/bn PPP\$ GDP	3.9	70 ○
6.2.5	High- & medium-high-tech manufactures, %	0.3	38
6.3	Knowledge diffusion	39.1	23
6.3.1	Intellectual property receipts, % total trade	0.8	18
6.3.2	High-tech exports less re-exports, % total trade	5.6	32
6.3.3	ICT services exports, % total trade	1.5	69
6.3.4	FDI net outflows, % GDP	3.8	13

7	Creative outputs	44.8	27
7.1	Intangible assets	50.8	35
7.1.1	Trademarks by origin/bn PPP\$ GDP	51.1	45
7.1.2	Industrial designs by origin/bn PPP\$ GDP	0.5	79 ○
7.1.3	ICTs & business model creation [†]	75.8	23
7.1.4	ICTs & organizational model creation [†]	74.8	12
7.2	Creative goods & services	20.7	57
7.2.1	Cultural & creative services exports, % of total trade [Ⓐ]	0.7	23
7.2.2	National feature films/mn pop. 15–69	3.9	50
7.2.3	Global ent. & media market/th pop. 15–69	55.6	14
7.2.4	Printing & publishing manufactures, %	0.4	94 ○
7.2.5	Creative goods exports, % total trade	0.6	54
7.3	Online creativity	56.9	11
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	76.4	6 ●
7.3.2	Country-code TLDs/th pop. 15–69	28.7	21
7.3.3	Wikipedia edits/mn pop. 15–69	6.6	23
7.3.4	Video uploads on YouTube/pop. 15–69	58.6	9

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	18.1
GDP (US\$ billions)	234.9
GDP per capita, PPP\$	23,459.6
Income group	High income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	38.7	46
Innovation Output Sub-Index	29.1	53
Innovation Input Sub-Index	48.3	42
Innovation Efficiency Ratio	0.6	77
Global Innovation Index 2016 (out of 128)	38.4	44

1 Institutions	70.3	41
1.1 Political environment	71.8	38
1.1.1 Political stability & safety*	73.6	44
1.1.2 Government effectiveness*	69.9	29
1.2 Regulatory environment	69.6	45
1.2.1 Regulatory quality*	76.7	18 ●
1.2.2 Rule of law*	78.4	22 ●
1.2.3 Cost of redundancy dismissal, salary weeks	27.4	107 ○
1.3 Business environment	69.7	68
1.3.1 Ease of starting a business*	89.8	50
1.3.2 Ease of resolving insolvency*	55.5	52
1.3.3 Ease of paying taxes*	63.9	87

2 Human capital & research	32.8	61
2.1 Education	46.5	65
2.1.1 Expenditure on education, % GDP	4.8	60
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	15.2	80 ○
2.1.3 School life expectancy, years	16.5	22
2.1.4 PISA scales in reading, maths, & science	442.7	44
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	21.0	83 ○
2.2 Tertiary education	37.7	55
2.2.1 Tertiary enrolment, % gross	88.6	5 ●
2.2.2 Graduates in science & engineering, % [Ⓐ]	19.2	62
2.2.3 Tertiary inbound mobility, %	0.3	96 ○
2.3 Research & development (R&D)	14.1	50
2.3.1 Researchers, FTE/mn pop.	455.5	64
2.3.2 Gross expenditure on R&D, % GDP	0.4	71
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	42.5	31

3 Infrastructure	52.1	47
3.1 Information & communication technologies (ICTs)	67.3	40
3.1.1 ICT access*	68.1	56
3.1.2 ICT use*	49.1	59
3.1.3 Government's online service*	77.5	28
3.1.4 E-participation*	74.6	32
3.2 General infrastructure	38.8	54
3.2.1 Electricity output, kWh/cap	4,118.8	52
3.2.2 Logistics performance*	54.8	45
3.2.3 Gross capital formation, % GDP	22.3	63
3.3 Ecological sustainability	50.1	46
3.3.1 GDP/unit of energy use	10.4	43
3.3.2 Environmental performance*	77.7	51
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	2.9	39

4 Market sophistication	49.8	50
4.1 Credit	35.8	61
4.1.1 Ease of getting credit*	50.0	72
4.1.2 Domestic credit to private sector, % GDP	111.0	24 ●
4.1.3 Microfinance gross loans, % GDP	0.7	28

4.2 Investment	41.6	58
4.2.1 Ease of protecting minority investors*	65.0	31
4.2.2 Market capitalization, % GDP	79.1	20
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	71 ○
4.3 Trade, competition, & market scale	72.0	30
4.3.1 Applied tariff rate, weighted mean, %	0.6	8 ●
4.3.2 Intensity of local competition [†]	70.0	61
4.3.3 Domestic market scale, bn PPP\$	436.1	41

5 Business sophistication	36.5	46
5.1 Knowledge workers	46.0	44
5.1.1 Knowledge-intensive employment, %	25.0	54
5.1.2 Firms offering formal training, % firms [Ⓐ]	57.5	10 ●
5.1.3 GERD performed by business, % of GDP	0.1	58
5.1.4 GERD financed by business, %	32.8	46
5.1.5 Females employed w/advanced degrees, % total	15.9	38
5.2 Innovation linkages	24.9	74
5.2.1 University/industry research collaboration [†]	41.1	61
5.2.2 State of cluster development [†]	39.8	85 ○
5.2.3 GERD financed by abroad, %	12.9	37
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	54
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.2	49
5.3 Knowledge absorption	38.7	37
5.3.1 Intellectual property payments, % total trade [Ⓐ]	1.8	11 ●
5.3.2 High-tech imports less re-imports, % total trade	10.3	40
5.3.3 ICT services imports, % total trade [Ⓐ]	0.8	75
5.3.4 FDI net inflows, % GDP	8.0	16 ●
5.3.5 Research talent, % in business enterprise	27.4	48

6 Knowledge & technology outputs	26.0	49
6.1 Knowledge creation	11.1	61
6.1.1 Patents by origin/bn PPP\$ GDP	1.0	63
6.1.2 PCT patent applications/bn PPP\$ GDP	0.5	39
6.1.3 Utility models by origin/bn PPP\$ GDP	0.2	42
6.1.4 Scientific & technical articles/bn PPP\$ GDP	18.5	41
6.1.5 Citable documents H index	21.3	37
6.2 Knowledge impact	33.8	52
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.3	77 ○
6.2.2 New businesses/th pop. 15–64	8.0	14 ●
6.2.3 Computer software spending, % GDP	0.3	49
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	12.5	28
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.2	63
6.3 Knowledge diffusion	33.3	34
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.1	52
6.3.2 High-tech exports less re-exports, % total trade	0.8	70
6.3.3 ICT services exports, % total trade [Ⓐ]	0.5	99 ○
6.3.4 FDI net outflows, % GDP	5.0	10 ●

7 Creative outputs	32.1	59
7.1 Intangible assets	46.3	51
7.1.1 Trademarks by origin/bn PPP\$ GDP	68.3	27
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.1	106 ○
7.1.3 ICTs & business model creation [†]	71.5	28
7.1.4 ICTs & organizational model creation [†]	55.4	54
7.2 Creative goods & services	10.1	89 ○
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	2.9	56
7.2.3 Global ent. & media market/th pop. 15–69	11.2	33
7.2.4 Printing & publishing manufactures, % [Ⓐ]	1.1	61
7.2.5 Creative goods exports, % total trade	0.2	82
7.3 Online creativity	26.0	45
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	2.2	75
7.3.2 Country-code TLDs/th pop. 15–69	11.8	37
7.3.3 Wikipedia edits/mn pop. 15–69	5.6	49
7.3.4 Video uploads on YouTube/pop. 15–69	36.0	38

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	1,382.3
GDP (US\$ billions)	11,391.6
GDP per capita, PPP\$	14,107.4
Income group	Upper-middle income
Region	South East Asia, East Asia, and Oceania

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	52.5	22
Innovation Output Sub-Index	50.9	11
Innovation Input Sub-Index	54.2	31
Innovation Efficiency Ratio	0.9	3 ●
Global Innovation Index 2016 (out of 128)	50.6	25
1 Institutions	54.8	78
1.1 Political environment	51.6	64
1.1.1 Political stability & safety*	50.2	90
1.1.2 Government effectiveness*	53.0	47
1.2 Regulatory environment	47.0	107 ○
1.2.1 Regulatory quality*	35.3	87
1.2.2 Rule of law*	29.6	78
1.2.3 Cost of redundancy dismissal, salary weeks	27.4	107 ○
1.3 Business environment	65.8	75
1.3.1 Ease of starting a business*	81.0	96
1.3.2 Ease of resolving insolvency*	55.8	50
1.3.3 Ease of paying taxes*	60.5	94
2 Human capital & research	49.2	25
2.1 Education	69.6	8
2.1.1 Expenditure on education, % GDP	n/a	n/a
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years	14.1	62
2.1.4 PISA scales in reading, maths, & science	514.3	8
2.1.5 Pupil-teacher ratio, secondary	13.8	55
2.2 Tertiary education	19.5	104 ○
2.2.1 Tertiary enrolment, % gross	43.4	62
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, %	0.3	98 ○
2.3 Research & development (R&D)	58.5	17
2.3.1 Researchers, FTE/mn pop.	1,176.6	45
2.3.2 Gross expenditure on R&D, % GDP	2.1	17
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	89.1	6
2.3.4 QS university ranking, average score top 3*	82.2	4 ●
3 Infrastructure	57.9	27
3.1 Information & communication technologies (ICTs)	64.6	48
3.1.1 ICT access*	54.5	77
3.1.2 ICT use*	45.8	61
3.1.3 Government's online service*	76.8	31
3.1.4 E-participation*	81.4	22
3.2 General infrastructure	67.5	3 ●
3.2.1 Electricity output, kWh/cap	4,152.9	51
3.2.2 Logistics performance*	73.9	26
3.2.3 Gross capital formation, % GDP	43.7	3 ●
3.3 Ecological sustainability	41.4	78
3.3.1 GDP/unit of energy use	5.5	98 ○
3.3.2 Environmental performance*	65.1	93
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	5.8	18
4 Market sophistication	54.7	28
4.1 Credit	40.5	48
4.1.1 Ease of getting credit*	60.0	55
4.1.2 Domestic credit to private sector, % GDP	153.3	7
4.1.3 Microfinance gross loans, % GDP	0.0	73 ○

4.2 Investment	35.0	85
4.2.1 Ease of protecting minority investors*	45.0	98 ○
4.2.2 Market capitalization, % GDP	74.4	21
4.2.3 Venture capital deals/bn PPP\$ GDP	0.1	26
4.3 Trade, competition, & market scale	88.4	2 ●
4.3.1 Applied tariff rate, weighted mean, %	3.4	76
4.3.2 Intensity of local competition†	73.5	35
4.3.3 Domestic market scale, bn PPP\$	21,269.0	1 ●

5 Business sophistication **54.5** **9**

5.1 Knowledge workers	84.9	1 ●
5.1.1 Knowledge-intensive employment, %	n/a	n/a
5.1.2 Firms offering formal training, % firms [Ⓐ]	79.2	1 ●
5.1.3 GERD performed by business, % of GDP	1.6	13
5.1.4 GERD financed by business, %	74.7	2 ●
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	28.6	62
5.2.1 University/industry research collaboration†	55.3	29
5.2.2 State of cluster development†	60.9	20
5.2.3 GERD financed by abroad, %	0.7	90 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	45
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.9	29
5.3 Knowledge absorption	50.1	13
5.3.1 Intellectual property payments, % total trade	1.0	32
5.3.2 High-tech imports less re-imports, % total trade	19.3	6
5.3.3 ICT services imports, % total trade	0.5	99 ○
5.3.4 FDI net inflows, % GDP	2.6	68
5.3.5 Research talent, % in business enterprise	62.7	9

6 Knowledge & technology outputs **56.4** **4 ●**

6.1 Knowledge creation	66.0	5
6.1.1 Patents by origin/bn PPP\$ GDP	49.2	1 ●
6.1.2 PCT patent applications/bn PPP\$ GDP	2.0	17
6.1.3 Utility models by origin/bn PPP\$ GDP	56.9	1 ●
6.1.4 Scientific & technical articles/bn PPP\$ GDP	14.1	54
6.1.5 Citable documents H index	49.9	14
6.2 Knowledge impact	64.3	1 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	6.6	2 ●
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.4	26
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	14.9	25
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.4	14
6.3 Knowledge diffusion	38.8	24
6.3.1 Intellectual property receipts, % total trade	0.0	67
6.3.2 High-tech exports less re-exports, % total trade	29.4	1 ●
6.3.3 ICT services exports, % total trade	1.1	77
6.3.4 FDI net outflows, % GDP	1.2	45

7 Creative outputs **45.3** **26**

7.1 Intangible assets	71.1	2 ●
7.1.1 Trademarks by origin/bn PPP\$ GDP	135.0	4 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	28.0	1 ●
7.1.3 ICTs & business model creation†	65.4	46
7.1.4 ICTs & organizational model creation†	64.4	29
7.2 Creative goods & services	31.3	29
7.2.1 Cultural & creative services exports, % of total trade	0.0	70
7.2.2 National feature films/mn pop. 15–69	0.6	88 ○
7.2.3 Global ent. & media market/th pop. 15–69	5.0	44
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.5	89 ○
7.2.5 Creative goods exports, % total trade	12.8	1 ●
7.3 Online creativity	7.8	104 ○
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	2.4	74
7.3.2 Country-code TLDs/th pop. 15–69	5.8	46
7.3.3 Wikipedia edits/mn pop. 15–69	1.6	110 ○
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Colombia

Key indicators

Population (millions)	48.7
GDP (US\$ billions)	274.1
GDP per capita, PPP\$	13,846.5
Income group	Upper-middle income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	34.8	65
Innovation Output Sub-Index	23.8	75
Innovation Input Sub-Index	45.8	52
Innovation Efficiency Ratio	0.5	100 ○
Global Innovation Index 2016 (out of 128)	34.2	63

1 Institutions	58.5	69
1.1 Political environment	39.7	98 ○
1.1.1 Political stability & safety*	38.1	113 ○
1.1.2 Government effectiveness*	41.3	72
1.2 Regulatory environment	62.4	68
1.2.1 Regulatory quality*	53.7	52
1.2.2 Rule of law*	30.4	76
1.2.3 Cost of redundancy dismissal, salary weeks	16.7	68
1.3 Business environment	73.4	57
1.3.1 Ease of starting a business*	89.6	52
1.3.2 Ease of resolving insolvency*	71.7	31
1.3.3 Ease of paying taxes*	58.9	97

2 Human capital & research	31.7	66
2.1 Education	39.0	91
2.1.1 Expenditure on education, % GDP	4.5	68
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	16.0	75
2.1.3 School life expectancy, years	14.4	59
2.1.4 PISA scales in reading, maths, & science	410.1	59 ○
2.1.5 Pupil-teacher ratio, secondary	25.6	95 ○
2.2 Tertiary education	34.1	69
2.2.1 Tertiary enrolment, % gross	55.6	47
2.2.2 Graduates in science & engineering, %	22.7	38
2.2.3 Tertiary inbound mobility, %	0.2	101 ○
2.3 Research & development (R&D)	22.1	43
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	114.9	84 ○
2.3.2 Gross expenditure on R&D, % GDP	0.2	86 ○
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	46.0	33
2.3.4 QS university ranking, average score top 3*	35.9	34

3 Infrastructure	52.5	44
3.1 Information & communication technologies (ICTs)	63.0	52
3.1.1 ICT access*	58.3	73
3.1.2 ICT use*	38.5	72
3.1.3 Government's online service*	79.0	27
3.1.4 E-participation*	76.3	27
3.2 General infrastructure	32.1	86
3.2.1 Electricity output, kWh/cap	1,463.1	89
3.2.2 Logistics performance*	25.4	92
3.2.3 Gross capital formation, % GDP	25.0	44
3.3 Ecological sustainability	62.4	13 ●
3.3.1 GDP/unit of energy use	17.5	4 ●
3.3.2 Environmental performance*	75.9	55
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	4.2	23 ●

4 Market sophistication	53.1	31
4.1 Credit	48.0	33
4.1.1 Ease of getting credit*	95.0	2 ●
4.1.2 Domestic credit to private sector, % GDP	47.1	74
4.1.3 Microfinance gross loans, % GDP	1.7	17 ●

4.2 Investment	40.6	61
4.2.1 Ease of protecting minority investors*	73.3	13 ●
4.2.2 Market capitalization, % GDP	29.4	49
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	69
4.3 Trade, competition, & market scale	70.7	33
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	4.2	81
4.3.2 Intensity of local competition [†]	76.3	23 ●
4.3.3 Domestic market scale, bn PPP\$	690.4	30

5 Business sophistication	32.9	64
5.1 Knowledge workers	43.0	48
5.1.1 Knowledge-intensive employment, % [Ⓐ]	16.8	83 ○
5.1.2 Firms offering formal training, % firms [Ⓐ]	65.1	4 ●
5.1.3 GERD performed by business, % of GDP	0.1	63
5.1.4 GERD financed by business, %	33.6	44
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	12.1	58
5.2 Innovation linkages	20.5	103 ○
5.2.1 University/industry research collaboration [†]	44.3	46
5.2.2 State of cluster development [†]	43.5	75
5.2.3 GERD financed by abroad, %	2.4	72
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	88 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	66
5.3 Knowledge absorption	35.3	52
5.3.1 Intellectual property payments, % total trade	0.8	42
5.3.2 High-tech imports less re-imports, % total trade	18.7	8 ●
5.3.3 ICT services imports, % total trade	0.9	71
5.3.4 FDI net inflows, % GDP	4.2	35
5.3.5 Research talent, % in business enterprise [Ⓐ]	0.6	80 ○

6 Knowledge & technology outputs	19.1	81
6.1 Knowledge creation	6.5	78
6.1.1 Patents by origin/bn PPP\$ GDP	0.5	77
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	58
6.1.3 Utility models by origin/bn PPP\$ GDP	0.3	39
6.1.4 Scientific & technical articles/bn PPP\$ GDP	6.0	91
6.1.5 Citable documents H index	14.7	48
6.2 Knowledge impact	30.4	69
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.7	68
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	2.0	48
6.2.3 Computer software spending, % GDP	0.2	69
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	18.5	21 ●
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.2	58
6.3 Knowledge diffusion	20.3	75
6.3.1 Intellectual property receipts, % total trade	0.1	56
6.3.2 High-tech exports less re-exports, % total trade	1.5	60
6.3.3 ICT services exports, % total trade	0.5	100 ○
6.3.4 FDI net outflows, % GDP	1.5	40

7 Creative outputs	28.6	73
7.1 Intangible assets	39.5	76
7.1.1 Trademarks by origin/bn PPP\$ GDP	36.2	62
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.5	76
7.1.3 ICTs & business model creation [†]	61.5	58
7.1.4 ICTs & organizational model creation [†]	57.2	47
7.2 Creative goods & services	14.1	75
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.1	51
7.2.2 National feature films/mn pop. 15–69	1.6	66
7.2.3 Global ent. & media market/th pop. 15–69	4.7	47
7.2.4 Printing & publishing manufactures, % [Ⓐ]	2.2	18 ●
7.2.5 Creative goods exports, % total trade	0.2	71
7.3 Online creativity	21.1	59
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	2.9	67
7.3.2 Country-code TLDs/th pop. 15–69	17.2	31
7.3.3 Wikipedia edits/mn pop. 15–69	4.2	76
7.3.4 Video uploads on YouTube/pop. 15–69	23.4	54

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	4.9
GDP (US\$ billions)	57.7
GDP per capita, PPP\$	15,482.3
Income group	Upper-middle income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	37.1	53
Innovation Output Sub-Index	30.2	50
Innovation Input Sub-Index	44.0	57
Innovation Efficiency Ratio	0.7	43
Global Innovation Index 2016 (out of 128)	38.4	45

1 Institutions **66.0** **56**

1.1 Political environment	64.9	44
1.1.1 Political stability & safety*	77.9	38
1.1.2 Government effectiveness*	51.9	49
1.2 Regulatory environment	66.4	56
1.2.1 Regulatory quality*	54.7	49
1.2.2 Rule of law*	53.4	42
1.2.3 Cost of redundancy dismissal, salary weeks	18.7	76
1.3 Business environment	66.7	72
1.3.1 Ease of starting a business*	81.6	95
1.3.2 Ease of resolving insolvency*	39.6	95
1.3.3 Ease of paying taxes*	79.0	53

2 Human capital & research **32.7** **62**

2.1 Education	57.9	33
2.1.1 Expenditure on education, % GDP	7.6	8 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	26.7	21
2.1.3 School life expectancy, years	15.2	43
2.1.4 PISA scales in reading, maths, & science	415.8	54
2.1.5 Pupil-teacher ratio, secondary	14.0	57
2.2 Tertiary education	30.7	78
2.2.1 Tertiary enrolment, % gross	53.6	49
2.2.2 Graduates in science & engineering, %	13.1	91 ○
2.2.3 Tertiary inbound mobility, %	n/a	n/a
2.3 Research & development (R&D)	9.5	59
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	573.0	62
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.6	57
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	18.1	52

3 Infrastructure **47.6** **61**

3.1 Information & communication technologies (ICTs)	62.6	54
3.1.1 ICT access*	64.4	65
3.1.2 ICT use*	58.0	43
3.1.3 Government's online service*	63.8	55
3.1.4 E-participation*	64.4	54
3.2 General infrastructure	26.2	104 ○
3.2.1 Electricity output, kWh/cap	2,146.4	76
3.2.2 Logistics performance*	27.1	87
3.2.3 Gross capital formation, % GDP	18.8	93
3.3 Ecological sustainability	54.0	33
3.3.1 GDP/unit of energy use	13.5	15 ●
3.3.2 Environmental performance*	80.0	42
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.5	57

4 Market sophistication **38.4** **101**

4.1 Credit	35.8	62
4.1.1 Ease of getting credit*	85.0	7 ●
4.1.2 Domestic credit to private sector, % GDP	56.8	55
4.1.3 Microfinance gross loans, % GDP	0.0	67 ○

4.2 Investment	18.8	127 ○
4.2.1 Ease of protecting minority investors*	35.0	121 ○
4.2.2 Market capitalization, % GDP [Ⓐ]	3.5	83 ○
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	62
4.3 Trade, competition, & market scale	60.5	65
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	2.7	61
4.3.2 Intensity of local competition [†]	71.6	48
4.3.3 Domestic market scale, bn PPP\$	79.3	80

5 Business sophistication **35.2** **52**

5.1 Knowledge workers	36.5	68
5.1.1 Knowledge-intensive employment, %	21.6	66
5.1.2 Firms offering formal training, % firms [Ⓐ]	54.7	16 ●
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.2	51
5.1.4 GERD financed by business, % [Ⓐ]	1.5	85 ○
5.1.5 Females employed w/advanced degrees, % total	13.0	48
5.2 Innovation linkages	21.3	92
5.2.1 University/industry research collaboration [†]	40.9	62
5.2.2 State of cluster development [†]	48.7	48
5.2.3 GERD financed by abroad, % [Ⓐ]	1.4	83 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	69
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	97 ○
5.3 Knowledge absorption	47.6	17 ●
5.3.1 Intellectual property payments, % total trade	1.1	27
5.3.2 High-tech imports less re-imports, % total trade	11.8	24
5.3.3 ICT services imports, % total trade	0.7	84
5.3.4 FDI net inflows, % GDP	6.0	22 ●
5.3.5 Research talent, % in business enterprise [Ⓐ]	69.2	5 ●

6 Knowledge & technology outputs **22.1** **59**

6.1 Knowledge creation	4.3	96
6.1.1 Patents by origin/bn PPP\$ GDP	0.2	93
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	77
6.1.3 Utility models by origin/bn PPP\$ GDP	0.1	52 ○
6.1.4 Scientific & technical articles/bn PPP\$ GDP	7.5	75
6.1.5 Citable documents H index	10.1	61
6.2 Knowledge impact	22.4	99
6.2.1 Growth rate of PPP\$ GDP/worker, %	(0.0)	88
6.2.2 New businesses/th pop. 15–64	1.1	66
6.2.3 Computer software spending, % GDP	0.3	52
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	3.7	71
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	77
6.3 Knowledge diffusion	39.6	22 ●
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	79
6.3.2 High-tech exports less re-exports, % total trade	5.1	33
6.3.3 ICT services exports, % total trade	14.6	1 ●
6.3.4 FDI net outflows, % GDP	1.1	50

7 Creative outputs **38.3** **40**

7.1 Intangible assets	48.6	44
7.1.1 Trademarks by origin/bn PPP\$ GDP	79.8	22 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.1	103 ○
7.1.3 ICTs & business model creation [†]	67.0	41
7.1.4 ICTs & organizational model creation [†]	62.3	33
7.2 Creative goods & services	36.4	15 ●
7.2.1 Cultural & creative services exports, % of total trade	10.1	1 ●
7.2.2 National feature films/mn pop. 15–69	4.0	48
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	2.4	16 ●
7.2.5 Creative goods exports, % total trade	0.5	57
7.3 Online creativity	19.5	62
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	11.5	37
7.3.2 Country-code TLDs/th pop. 15–69	1.6	68
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	4.7	65
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Côte d'Ivoire

Key indicators

Population (millions)	23.3
GDP (US\$ billions)	34.6
GDP per capita, PPP\$	3,315.8
Income group	Lower-middle income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	24.0	112
Innovation Output Sub-Index	19.5	94
Innovation Input Sub-Index	28.4	121 ○
Innovation Efficiency Ratio	0.7	40 ●
Global Innovation Index 2016 (out of 128)	25.8	108

1 Institutions	51.0	94
1.1 Political environment	34.2	107
1.1.1 Political stability & safety*	43.0	99
1.1.2 Government effectiveness*	25.4	105
1.2 Regulatory environment	57.5	77
1.2.1 Regulatory quality*	28.9	101
1.2.2 Rule of law*	21.3	99
1.2.3 Cost of redundancy dismissal, salary weeks	13.1	50 ●
1.3 Business environment	61.3	91
1.3.1 Ease of starting a business*	91.4	43 ●
1.3.2 Ease of resolving insolvency*	49.1	63 ●
1.3.3 Ease of paying taxes*	43.4	121 ○

2 Human capital & research	14.4	117
2.1 Education	35.0	99
2.1.1 Expenditure on education, % GDP	4.7	61 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	27.4	18 ●
2.1.3 School life expectancy, years	9.2	105
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	26.6	98
2.2 Tertiary education	8.3	113
2.2.1 Tertiary enrolment, % gross	9.2	108
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, %	1.8	72
2.3 Research & development (R&D)	0.0	115 ○
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	n/a	n/a
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	26.5	114
3.1 Information & communication technologies (ICTs)	23.2	114
3.1.1 ICT access*	37.9	101
3.1.2 ICT use*	20.8	98
3.1.3 Government's online service*	18.8	116 ○
3.1.4 E-participation*	15.3	119 ○
3.2 General infrastructure	25.6	105
3.2.1 Electricity output, kWh/cap	373.9	106
3.2.2 Logistics performance*	25.0	93
3.2.3 Gross capital formation, % GDP	20.2	79
3.3 Ecological sustainability	30.8	114
3.3.1 GDP/unit of energy use	4.9	104
3.3.2 Environmental performance*	59.9	101
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.3	100

4 Market sophistication	29.1	123 ○
4.1 Credit	14.9	119 ○
4.1.1 Ease of getting credit*	30.0	108 ○
4.1.2 Domestic credit to private sector, % GDP	23.1	106
4.1.3 Microfinance gross loans, % GDP	0.4	37 ●

4.2 Investment	25.2	123 ○
4.2.1 Ease of protecting minority investors*	40.0	111 ○
4.2.2 Market capitalization, % GDP	39.3	39 ●
4.2.3 Venture capital deals/bn PPP\$ GDP [Ⓐ]	0.0	61
4.3 Trade, competition, & market scale	47.3	110
4.3.1 Applied tariff rate, weighted mean, %	10.6	115
4.3.2 Intensity of local competition [†]	62.9	90
4.3.3 Domestic market scale, bn PPP\$	87.1	75

5 Business sophistication	20.9	121 ○
5.1 Knowledge workers	20.7	[110]
5.1.1 Knowledge-intensive employment, %	n/a	n/a
5.1.2 Firms offering formal training, % firms [Ⓐ]	19.1	77
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	20.2	104
5.2.1 University/industry research collaboration [†]	38.2	81
5.2.2 State of cluster development [†]	30.8	120 ○
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	100
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	94
5.3 Knowledge absorption	21.7	116
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.0	110 ○
5.3.2 High-tech imports less re-imports, % total trade	5.6	101
5.3.3 ICT services imports, % total trade [Ⓐ]	0.7	81
5.3.4 FDI net inflows, % GDP	1.3	100
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	20.4	75
6.1 Knowledge creation	2.7	117
6.1.1 Patents by origin/bn PPP\$ GDP	0.3	86
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	96
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	2.9	111
6.1.5 Citable documents H index	5.6	90
6.2 Knowledge impact	44.8	16 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	5.4	4 ●
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.0	120 ○
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	2.0	91
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	13.6	117
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	91
6.3.2 High-tech exports less re-exports, % total trade	0.6	76
6.3.3 ICT services exports, % total trade [Ⓐ]	0.7	90
6.3.4 FDI net outflows, % GDP	0.0	103

7 Creative outputs	18.7	108
7.1 Intangible assets	33.1	96
7.1.1 Trademarks by origin/bn PPP\$ GDP	9.5	104
7.1.2 Industrial designs by origin/bn PPP\$ GDP	1.6	50 ●
7.1.3 ICTs & business model creation [†]	56.3	81
7.1.4 ICTs & organizational model creation [†]	50.8	72 ●
7.2 Creative goods & services	2.8	[117]
7.2.1 Cultural & creative services exports, % of total trade	0.0	72
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.1	90
7.3 Online creativity	5.7	108
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.5	106
7.3.2 Country-code TLDs/th pop. 15–69	0.1	104
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	1.7	108
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	4.2
GDP (US\$ billions)	49.9
GDP per capita, PPP\$	21,581.4
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	39.8	41
Innovation Output Sub-Index	31.6	46
Innovation Input Sub-Index	48.0	44
Innovation Efficiency Ratio	0.7	52
Global Innovation Index 2016 (out of 128)	38.3	47

1 Institutions **69.3** **42**

1.1 Political environment	66.5	43
1.1.1 Political stability & safety*	77.8	39
1.1.2 Government effectiveness*	55.2	44
1.2 Regulatory environment	67.1	51
1.2.1 Regulatory quality*	51.4	57
1.2.2 Rule of law*	45.3	52
1.2.3 Cost of redundancy dismissal, salary weeks	15.1	60
1.3 Business environment	74.3	55
1.3.1 Ease of starting a business*	85.6	76
1.3.2 Ease of resolving insolvency*	55.6	51
1.3.3 Ease of paying taxes*	81.7	42

2 Human capital & research **37.4** **47**

2.1 Education	62.3	15 ●
2.1.1 Expenditure on education, % GDP	4.6	65
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years	15.3	42
2.1.4 PISA scales in reading, maths, & science	475.4	34
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	8.0	7 ●
2.2 Tertiary education	38.7	52
2.2.1 Tertiary enrolment, % gross [Ⓐ]	69.5	27
2.2.2 Graduates in science & engineering, % [Ⓐ]	23.8	33
2.2.3 Tertiary inbound mobility, % [Ⓐ]	0.4	93 ○
2.3 Research & development (R&D)	11.0	56
2.3.1 Researchers, FTE/mn pop.	1,501.5	43
2.3.2 Gross expenditure on R&D, % GDP	0.9	42
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	6.4	65

3 Infrastructure **55.9** **33**

3.1 Information & communication technologies (ICTs)	72.4	33
3.1.1 ICT access*	75.8	36
3.1.2 ICT use*	61.3	37
3.1.3 Government's online service*	74.6	33
3.1.4 E-participation*	78.0	25 ●
3.2 General infrastructure	32.9	83
3.2.1 Electricity output, kWh/cap	3,168.9	61
3.2.2 Logistics performance*	50.8	50
3.2.3 Gross capital formation, % GDP	18.7	95 ○
3.3 Ecological sustainability	62.4	12 ●
3.3.1 GDP/unit of energy use	10.0	50
3.3.2 Environmental performance*	87.0	15 ●
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	9.7	8 ●

4 Market sophistication **42.1** **88**

4.1 Credit	26.9	92 ○
4.1.1 Ease of getting credit*	55.0	67
4.1.2 Domestic credit to private sector, % GDP	65.5	47
4.1.3 Microfinance gross loans, % GDP [Ⓐ]	0.0	70 ○

4.2 Investment	38.0	76
4.2.1 Ease of protecting minority investors*	66.7	26
4.2.2 Market capitalization, % GDP [Ⓐ]	36.2	41
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	68 ○
4.3 Trade, competition, & market scale	61.4	62
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	1.3	18 ●
4.3.2 Intensity of local competition [†]	63.3	87 ○
4.3.3 Domestic market scale, bn PPP\$	94.2	73

5 Business sophistication **35.1** **53**

5.1 Knowledge workers	52.0	32
5.1.1 Knowledge-intensive employment, %	35.6	36
5.1.2 Firms offering formal training, % firms	49.3	23
5.1.3 GERD performed by business, % of GDP	0.4	37
5.1.4 GERD financed by business, %	46.6	23
5.1.5 Females employed w/advanced degrees, % total	16.0	37
5.2 Innovation linkages	21.6	89
5.2.1 University/industry research collaboration [†]	31.1	103 ○
5.2.2 State of cluster development [†]	32.7	113 ○
5.2.3 GERD financed by abroad, %	14.5	33
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	74
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	62
5.3 Knowledge absorption	31.7	70
5.3.1 Intellectual property payments, % total trade	1.2	24 ●
5.3.2 High-tech imports less re-imports, % total trade	7.5	70
5.3.3 ICT services imports, % total trade	1.6	36
5.3.4 FDI net inflows, % GDP	3.0	57
5.3.5 Research talent, % in business enterprise	16.7	58

6 Knowledge & technology outputs **25.4** **51**

6.1 Knowledge creation	19.3	48
6.1.1 Patents by origin/bn PPP\$ GDP	2.0	46
6.1.2 PCT patent applications/bn PPP\$ GDP	0.4	41
6.1.3 Utility models by origin/bn PPP\$ GDP	0.8	31
6.1.4 Scientific & technical articles/bn PPP\$ GDP	35.2	19 ●
6.1.5 Citable documents H index	15.4	44
6.2 Knowledge impact	31.5	60
6.2.1 Growth rate of PPP\$ GDP/worker, %	(0.0)	89 ○
6.2.2 New businesses/th pop. 15–64	4.6	25
6.2.3 Computer software spending, % GDP	0.1	98 ○
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	27.7	10 ●
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	25.4	52
6.3.1 Intellectual property receipts, % total trade	0.2	38
6.3.2 High-tech exports less re-exports, % total trade	3.9	40
6.3.3 ICT services exports, % total trade	2.5	45
6.3.4 FDI net outflows, % GDP	1.2	47

7 Creative outputs **37.9** **43**

7.1 Intangible assets	43.6	60
7.1.1 Trademarks by origin/bn PPP\$ GDP	50.6	47
7.1.2 Industrial designs by origin/bn PPP\$ GDP	5.5	21 ●
7.1.3 ICTs & business model creation [†]	57.8	74
7.1.4 ICTs & organizational model creation [†]	54.3	60
7.2 Creative goods & services	36.0	17 ●
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	1.5	6 ●
7.2.2 National feature films/mn pop. 15–69	4.6	44
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.9	44
7.3 Online creativity	28.3	42
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	14.1	32
7.3.2 Country-code TLDs/th pop. 15–69	9.5	40
7.3.3 Wikipedia edits/mn pop. 15–69	6.2	37
7.3.4 Video uploads on YouTube/pop. 15–69	30.3	43

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Cyprus

Key indicators

Population (millions)	1.2
GDP (US\$ billions)	19.9
GDP per capita, PPP\$	32,785.5
Income group	High income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	46.8	30
Innovation Output Sub-Index	39.7	28
Innovation Input Sub-Index	53.9	32
Innovation Efficiency Ratio	0.7	28
Global Innovation Index 2016 (out of 128)	46.3	31

1 Institutions **81.0** **21**

1.1 Political environment	72.9	34
1.1.1 Political stability & safety*	77.0	41
1.1.2 Government effectiveness*	68.8	32
1.2 Regulatory environment	84.6	20
1.2.1 Regulatory quality*	69.2	32
1.2.2 Rule of law*	69.0	28
1.2.3 Cost of redundancy dismissal, salary weeks	8.0	1
1.3 Business environment	85.7	20
1.3.1 Ease of starting a business*	91.2	45
1.3.2 Ease of resolving insolvency*	81.4	15
1.3.3 Ease of paying taxes*	84.5	30

2 Human capital & research **39.9** **40**

2.1 Education	60.2	21
2.1.1 Expenditure on education, % GDP	6.4	16
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	37.9	7
2.1.3 School life expectancy, years	14.6	57
2.1.4 PISA scales in reading, maths, & science	437.5	46
2.1.5 Pupil-teacher ratio, secondary	10.4	29
2.2 Tertiary education	53.7	16
2.2.1 Tertiary enrolment, % gross	60.1	42
2.2.2 Graduates in science & engineering, %	19.0	65
2.2.3 Tertiary inbound mobility, %	17.6	8
2.3 Research & development (R&D)	5.6	74
2.3.1 Researchers, FTE/mn pop.	1,013.8	48
2.3.2 Gross expenditure on R&D, % GDP	0.5	67
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43
2.3.4 QS university ranking, average score top 3*	0.0	75

3 Infrastructure **48.1** **59**

3.1 Information & communication technologies (ICTs)	57.7	65
3.1.1 ICT access*	70.2	51
3.1.2 ICT use*	54.6	50
3.1.3 Government's online service*	53.6	78
3.1.4 E-participation*	52.5	82
3.2 General infrastructure	23.4	113
3.2.1 Electricity output, kWh/cap	5,058.1	41
3.2.2 Logistics performance*	43.3	58
3.2.3 Gross capital formation, % GDP	10.4	121
3.3 Ecological sustainability	63.2	10
3.3.1 GDP/unit of energy use	13.0	20
3.3.2 Environmental performance*	80.2	40
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	8.8	9

4 Market sophistication **57.9** **19**

4.1 Credit	80.0	2
4.1.1 Ease of getting credit*	60.0	55
4.1.2 Domestic credit to private sector, % GDP	247.6	1
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	37.5	77
4.2.1 Ease of protecting minority investors*	66.7	26
4.2.2 Market capitalization, % GDP	13.8	71
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	38
4.3 Trade, competition, & market scale	56.3	86
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	71.9	42
4.3.3 Domestic market scale, bn PPP\$	29.3	109

5 Business sophistication **42.7** **31**

5.1 Knowledge workers	42.7	49
5.1.1 Knowledge-intensive employment, %	35.2	38
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	0.1	65
5.1.4 GERD financed by business, % [Ⓐ]	13.7	67
5.1.5 Females employed w/advanced degrees, % total	24.0	11
5.2 Innovation linkages	41.7	26
5.2.1 University/industry research collaboration [†]	39.2	73
5.2.2 State of cluster development [†]	46.7	55
5.2.3 GERD financed by abroad, % [Ⓐ]	23.7	17
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.2	6
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	2.4	22
5.3 Knowledge absorption	43.7	26
5.3.1 Intellectual property payments, % total trade	0.6	53
5.3.2 High-tech imports less re-imports, % total trade	3.5	118
5.3.3 ICT services imports, % total trade	7.7	1
5.3.4 FDI net inflows, % GDP	4.2	34
5.3.5 Research talent, % in business enterprise	21.5	53

6 Knowledge & technology outputs **41.3** **17**

6.1 Knowledge creation	22.8	42
6.1.1 Patents by origin/bn PPP\$ GDP	1.5	55
6.1.2 PCT patent applications/bn PPP\$ GDP	1.2	26
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	41.0	15
6.1.5 Citable documents H index	9.2	70
6.2 Knowledge impact	42.7	23
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.7	66
6.2.2 New businesses/th pop. 15–64	13.7	7
6.2.3 Computer software spending, % GDP	0.2	78
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	29.2	9
6.2.5 High- & medium-high-tech manufactures, %	0.1	66
6.3 Knowledge diffusion	58.5	7
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	86
6.3.2 High-tech exports less re-exports, % total trade	0.5	86
6.3.3 ICT services exports, % total trade [Ⓐ]	9.6	6
6.3.4 FDI net outflows, % GDP	17.2	1

7 Creative outputs **38.2** **41**

7.1 Intangible assets	44.0	59
7.1.1 Trademarks by origin/bn PPP\$ GDP	75.4	23
7.1.2 Industrial designs by origin/bn PPP\$ GDP	5.4	22
7.1.3 ICTs & business model creation [†]	54.3	86
7.1.4 ICTs & organizational model creation [†]	46.6	86
7.2 Creative goods & services	20.4	58
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.5	28
7.2.2 National feature films/mn pop. 15–69	4.6	43
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	2.6	13
7.2.5 Creative goods exports, % total trade	0.0	107
7.3 Online creativity	44.4	23
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	68.2	8
7.3.2 Country-code TLDs/th pop. 15–69	4.7	52
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	6.2	32
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	10.5
GDP (US\$ billions)	193.5
GDP per capita, PPP\$	31,549.5
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	51.0	24
Innovation Output Sub-Index	46.2	16 ●
Innovation Input Sub-Index	55.7	27
Innovation Efficiency Ratio	0.8	13 ●
Global Innovation Index 2016 (out of 128)	49.4	27
1 Institutions	77.6	30
1.1 Political environment	78.1	24
1.1.1 Political stability & safety*	87.1	18
1.1.2 Government effectiveness*	69.2	31
1.2 Regulatory environment	73.4	37
1.2.1 Regulatory quality*	69.9	31
1.2.2 Rule of law*	72.2	27
1.2.3 Cost of redundancy dismissal, salary weeks	20.2	83 ○
1.3 Business environment	81.3	28
1.3.1 Ease of starting a business*	86.9	66
1.3.2 Ease of resolving insolvency*	76.4	24
1.3.3 Ease of paying taxes*	80.7	45
2 Human capital & research	47.6	30
2.1 Education	54.5	43
2.1.1 Expenditure on education, % GDP	4.1	78 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	23.7	36
2.1.3 School life expectancy, years	16.8	17
2.1.4 PISA scales in reading, maths, & science	490.8	28
2.1.5 Pupil-teacher ratio, secondary [Ⓢ]	11.5	37
2.2 Tertiary education	49.6	21
2.2.1 Tertiary enrolment, % gross [Ⓢ]	66.0	34
2.2.2 Graduates in science & engineering, %	23.2	36
2.2.3 Tertiary inbound mobility, % [Ⓢ]	9.8	21
2.3 Research & development (R&D)	38.7	28
2.3.1 Researchers, FTE/mn pop.	3,611.9	25
2.3.2 Gross expenditure on R&D, % GDP	2.0	19
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	37.5	40
2.3.4 QS university ranking, average score top 3*	27.6	42
3 Infrastructure	57.3	30
3.1 Information & communication technologies (ICTs)	61.0	56
3.1.1 ICT access*	74.6	38
3.1.2 ICT use*	65.5	28
3.1.3 Government's online service*	47.8	89 ○
3.1.4 E-participation*	55.9	74 ○
3.2 General infrastructure	51.2	20
3.2.1 Electricity output, kWh/cap	7,823.0	24
3.2.2 Logistics performance*	74.5	25
3.2.3 Gross capital formation, % GDP	26.1	36
3.3 Ecological sustainability	59.8	17 ●
3.3.1 GDP/unit of energy use	7.5	78 ○
3.3.2 Environmental performance*	84.7	27
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	11.3	5 ●
4 Market sophistication	50.2	47
4.1 Credit	44.7	41
4.1.1 Ease of getting credit*	70.0	29
4.1.2 Domestic credit to private sector, % GDP	50.3	70 ○
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	34.1	89 ○
4.2.1 Ease of protecting minority investors*	60.0	52
4.2.2 Market capitalization, % GDP [Ⓢ]	17.4	63 ○
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	42
4.3 Trade, competition, & market scale	71.9	31
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	79.4	14 ●
4.3.3 Domestic market scale, bn PPP\$	350.9	46

5 Business sophistication **45.9** **26**

5.1 Knowledge workers	53.6	30
5.1.1 Knowledge-intensive employment, %	37.6	31
5.1.2 Firms offering formal training, % firms	55.1	14
5.1.3 GERD performed by business, % of GDP	1.1	21
5.1.4 GERD financed by business, %	34.5	43
5.1.5 Females employed w/advanced degrees, % total	11.6	59 ○
5.2 Innovation linkages	36.8	40
5.2.1 University/industry research collaboration [†]	44.4	45
5.2.2 State of cluster development [†]	46.7	56
5.2.3 GERD financed by abroad, %	32.5	14 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	92 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.7	31
5.3 Knowledge absorption	47.2	19
5.3.1 Intellectual property payments, % total trade	0.7	47
5.3.2 High-tech imports less re-imports, % total trade	17.7	10 ●
5.3.3 ICT services imports, % total trade	1.1	62
5.3.4 FDI net inflows, % GDP	2.9	59
5.3.5 Research talent, % in business enterprise	50.3	24

6 Knowledge & technology outputs **45.8** **14 ●**

6.1 Knowledge creation	46.8	14 ●
6.1.1 Patents by origin/bn PPP\$ GDP	3.2	32
6.1.2 PCT patent applications/bn PPP\$ GDP	0.6	35
6.1.3 Utility models by origin/bn PPP\$ GDP	4.0	6 ●
6.1.4 Scientific & technical articles/bn PPP\$ GDP	34.7	21
6.1.5 Citable documents H index	27.4	32
6.2 Knowledge impact	52.0	8 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	3.0	20
6.2.2 New businesses/th pop. 15–64	3.4	35
6.2.3 Computer software spending, % GDP	0.3	41
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	31.5	7 ●
6.2.5 High- & medium-high-tech manufactures, %	0.5	7 ●
6.3 Knowledge diffusion	38.7	25
6.3.1 Intellectual property receipts, % total trade	0.3	32
6.3.2 High-tech exports less re-exports, % total trade	16.7	7 ●
6.3.3 ICT services exports, % total trade	1.8	57
6.3.4 FDI net outflows, % GDP	2.5	25

7 Creative outputs **46.7** **22**

7.1 Intangible assets	51.4	33
7.1.1 Trademarks by origin/bn PPP\$ GDP	66.2	29
7.1.2 Industrial designs by origin/bn PPP\$ GDP	5.1	25
7.1.3 ICTs & business model creation [†]	68.7	34
7.1.4 ICTs & organizational model creation [†]	63.6	30
7.2 Creative goods & services	39.9	9 ●
7.2.1 Cultural & creative services exports, % of total trade [Ⓢ]	0.5	27
7.2.2 National feature films/mn pop. 15–69	7.2	22
7.2.3 Global ent. & media market/th pop. 15–69	20.3	26
7.2.4 Printing & publishing manufactures, %	1.0	65 ○
7.2.5 Creative goods exports, % total trade	9.8	4 ●
7.3 Online creativity	44.0	24
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	17.1	30
7.3.2 Country-code TLDs/th pop. 15–69	49.6	15 ●
7.3.3 Wikipedia edits/mn pop. 15–69	6.7	22
7.3.4 Video uploads on YouTube/pop. 15–69	44.8	23

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Denmark

Key indicators

Population (millions)	5.7
GDP (US\$ billions)	302.6
GDP per capita, PPP\$	45,709.4
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	58.7	6 ●
Innovation Output Sub-Index	48.7	12
Innovation Input Sub-Index	68.7	6 ●
Innovation Efficiency Ratio	0.7	34
Global Innovation Index 2016 (out of 128)	58.5	8

1 Institutions	91.4	6 ●
1.1 Political environment	87.6	13
1.1.1 Political stability & safety*	85.5	25
1.1.2 Government effectiveness*	89.7	6 ●
1.2 Regulatory environment	96.4	4 ●
1.2.1 Regulatory quality*	86.5	11
1.2.2 Rule of law*	99.0	3 ●
1.2.3 Cost of redundancy dismissal, salary weeks	8.0	1 ●
1.3 Business environment	90.3	4 ●
1.3.1 Ease of starting a business*	94.1	22
1.3.2 Ease of resolving insolvency*	84.9	8
1.3.3 Ease of paying taxes*	92.1	7

2 Human capital & research	66.1	3 ●
2.1 Education	74.1	4 ●
2.1.1 Expenditure on education, % GDP	8.6	2 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	28.2	15
2.1.3 School life expectancy, years	19.2	6 ●
2.1.4 PISA scales in reading, maths, & science	504.3	16
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	11.3	34
2.2 Tertiary education	50.0	19
2.2.1 Tertiary enrolment, % gross [Ⓐ]	81.5	14
2.2.2 Graduates in science & engineering, %	20.4	53 ○
2.2.3 Tertiary inbound mobility, % [Ⓐ]	9.9	18
2.3 Research & development (R&D)	74.2	7
2.3.1 Researchers, FTE/mn pop.	7,483.6	2 ●
2.3.2 Gross expenditure on R&D, % GDP	3.0	6
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	72.3	17
2.3.4 QS university ranking, average score top 3*	63.8	15

3 Infrastructure	63.2	15
3.1 Information & communication technologies (ICTs)	83.3	14
3.1.1 ICT access*	85.2	14
3.1.2 ICT use*	89.1	1 ●
3.1.3 Government's online service*	77.5	28
3.1.4 E-participation*	81.4	22
3.2 General infrastructure	43.1	44
3.2.1 Electricity output, kWh/cap	5,076.0	40
3.2.2 Logistics performance*	81.0	17
3.2.3 Gross capital formation, % GDP	19.6	86 ○
3.3 Ecological sustainability	63.2	11
3.3.1 GDP/unit of energy use	14.9	11
3.3.2 Environmental performance*	89.2	4 ●
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	3.9	24

4 Market sophistication	70.2	6 ●
4.1 Credit	70.0	6 ●
4.1.1 Ease of getting credit*	70.0	29
4.1.2 Domestic credit to private sector, % GDP	174.1	5 ●
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	71.4	5 ●
4.2.1 Ease of protecting minority investors*	71.7	19
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP	0.2	6
4.3 Trade, competition, & market scale	69.1	37
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	74.2	30
4.3.3 Domestic market scale, bn PPP\$	264.8	56 ○

5 Business sophistication	52.5	12
5.1 Knowledge workers	70.3	8
5.1.1 Knowledge-intensive employment, %	45.1	12
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	1.9	10
5.1.4 GERD financed by business, %	59.4	13
5.1.5 Females employed w/advanced degrees, % total	21.8	18
5.2 Innovation linkages	46.1	17
5.2.1 University/industry research collaboration [†]	64.0	14
5.2.2 State of cluster development [†]	60.7	21
5.2.3 GERD financed by abroad, %	6.5	59 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	15
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	8.0	9
5.3 Knowledge absorption	41.1	30
5.3.1 Intellectual property payments, % total trade	0.8	41
5.3.2 High-tech imports less re-imports, % total trade	6.5	86 ○
5.3.3 ICT services imports, % total trade	2.4	13
5.3.4 FDI net inflows, % GDP	0.0	123 ○
5.3.5 Research talent, % in business enterprise	58.0	15

6 Knowledge & technology outputs	43.9	16
6.1 Knowledge creation	50.3	12
6.1.1 Patents by origin/bn PPP\$ GDP	13.1	8
6.1.2 PCT patent applications/bn PPP\$ GDP	5.1	10
6.1.3 Utility models by origin/bn PPP\$ GDP	0.5	37 ○
6.1.4 Scientific & technical articles/bn PPP\$ GDP	66.8	2 ●
6.1.5 Citable documents H index	49.4	15
6.2 Knowledge impact	39.8	34
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.1	87 ○
6.2.2 New businesses/th pop. 15–64	4.4	28
6.2.3 Computer software spending, % GDP	0.6	12
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	7.2	50
6.2.5 High- & medium-high-tech manufactures, %	0.4	17
6.3 Knowledge diffusion	41.7	17
6.3.1 Intellectual property receipts, % total trade	1.4	12
6.3.2 High-tech exports less re-exports, % total trade	6.8	27
6.3.3 ICT services exports, % total trade	2.5	46
6.3.4 FDI net outflows, % GDP	3.0	20

7 Creative outputs	53.5	9
7.1 Intangible assets	53.8	25
7.1.1 Trademarks by origin/bn PPP\$ GDP	36.6	61 ○
7.1.2 Industrial designs by origin/bn PPP\$ GDP	7.6	16
7.1.3 ICTs & business model creation [†]	75.3	24
7.1.4 ICTs & organizational model creation [†]	74.1	15
7.2 Creative goods & services	39.8	11
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.7	21
7.2.2 National feature films/mn pop. 15–69	17.7	6
7.2.3 Global ent. & media market/th pop. 15–69	76.0	4
7.2.4 Printing & publishing manufactures, %	1.0	64 ○
7.2.5 Creative goods exports, % total trade	1.8	29
7.3 Online creativity	66.5	6 ●
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	48.4	15
7.3.2 Country-code TLDs/th pop. 15–69	98.4	4 ●
7.3.3 Wikipedia edits/mn pop. 15–69	6.6	25
7.3.4 Video uploads on YouTube/pop. 15–69	56.1	11

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	10.6
GDP (US\$ billions)	71.5
GDP per capita, PPP\$	14,983.7
Income group	Upper-middle income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	31.2	79
Innovation Output Sub-Index	24.5	72
Innovation Input Sub-Index	37.8	88
Innovation Efficiency Ratio	0.6	54 ●
Global Innovation Index 2016 (out of 128)	30.6	76

1 Institutions	51.8	90
1.1 Political environment	50.6	69
1.1.1 Political stability & safety*	68.0	53 ●
1.1.2 Government effectiveness*	33.3	88
1.2 Regulatory environment	48.8	104
1.2.1 Regulatory quality*	41.2	73
1.2.2 Rule of law*	26.1	89
1.2.3 Cost of redundancy dismissal, salary weeks	26.2	103
1.3 Business environment	55.9	112
1.3.1 Ease of starting a business*	83.3	89
1.3.2 Ease of resolving insolvency*	23.6	125 ○
1.3.3 Ease of paying taxes*	60.7	93

2 Human capital & research	17.6	109
2.1 Education	26.6	115
2.1.1 Expenditure on education, % GDP [Ⓐ]	2.1	113 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	15.0	83
2.1.3 School life expectancy, years	13.2	70
2.1.4 PISA scales in reading, maths, & science	339.0	70 ○
2.1.5 Pupil-teacher ratio, secondary	22.1	87
2.2 Tertiary education	26.1	91
2.2.1 Tertiary enrolment, % gross [Ⓐ]	47.5	55
2.2.2 Graduates in science & engineering, %	14.4	87
2.2.3 Tertiary inbound mobility, % [Ⓐ]	2.3	65
2.3 Research & development (R&D)	0.0	115 ○
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	n/a	n/a
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	42.4	78
3.1 Information & communication technologies (ICTs)	44.4	89
3.1.1 ICT access*	43.8	94
3.1.2 ICT use*	34.1	78
3.1.3 Government's online service*	50.7	83
3.1.4 E-participation*	49.2	89
3.2 General infrastructure	27.0	102
3.2.1 Electricity output, kWh/cap	1,784.1	80
3.2.2 Logistics performance*	26.1	89
3.2.3 Gross capital formation, % GDP	20.1	80
3.3 Ecological sustainability	55.7	28 ●
3.3.1 GDP/unit of energy use	16.9	7 ●
3.3.2 Environmental performance*	75.3	56
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.2	108

4 Market sophistication	45.4	70
4.1 Credit	22.6	107
4.1.1 Ease of getting credit*	45.0	84
4.1.2 Domestic credit to private sector, % GDP	27.1	102
4.1.3 Microfinance gross loans, % GDP	0.7	29 ●

4.2 Investment	53.3	[24]
4.2.1 Ease of protecting minority investors*	53.3	80
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, & market scale	60.3	67
4.3.1 Applied tariff rate, weighted mean, %	6.3	100
4.3.2 Intensity of local competition [†]	76.6	20 ●
4.3.3 Domestic market scale, bn PPP\$	160.9	66

5 Business sophistication	31.9	67
5.1 Knowledge workers	48.1	36 ●
5.1.1 Knowledge-intensive employment, %	17.9	79
5.1.2 Firms offering formal training, % firms [Ⓐ]	57.0	12 ●
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	12.7	52
5.2 Innovation linkages	24.8	75
5.2.1 University/industry research collaboration [†]	31.8	101
5.2.2 State of cluster development [†]	45.9	60
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	109 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	100
5.3 Knowledge absorption	22.8	109
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.4	65
5.3.2 High-tech imports less re-imports, % total trade	5.7	99
5.3.3 ICT services imports, % total trade [Ⓐ]	0.3	115
5.3.4 FDI net inflows, % GDP	3.2	52 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	17.2	91
6.1 Knowledge creation	0.9	126 ○
6.1.1 Patents by origin/bn PPP\$ GDP	0.1	102
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	71
6.1.3 Utility models by origin/bn PPP\$ GDP	0.1	57
6.1.4 Scientific & technical articles/bn PPP\$ GDP	0.5	126 ○
6.1.5 Citable documents H index	2.1	117 ○
6.2 Knowledge impact	33.2	56
6.2.1 Growth rate of PPP\$ GDP/worker, %	4.3	13 ●
6.2.2 New businesses/th pop. 15–64	1.2	62
6.2.3 Computer software spending, % GDP	0.0	117 ○
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	1.3	103
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	17.6	98
6.3.1 Intellectual property receipts, % total trade	n/a	n/a
6.3.2 High-tech exports less re-exports, % total trade	1.1	68
6.3.3 ICT services exports, % total trade [Ⓐ]	1.1	81
6.3.4 FDI net outflows, % GDP	(0.1)	117 ○

7 Creative outputs	31.9	60
7.1 Intangible assets	41.4	68
7.1.1 Trademarks by origin/bn PPP\$ GDP	45.6	54
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.3	91
7.1.3 ICTs & business model creation [†]	65.6	44 ●
7.1.4 ICTs & organizational model creation [†]	55.6	53 ●
7.2 Creative goods & services	30.2	[30]
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	1.0	79
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	2.2	21 ●
7.3 Online creativity	14.4	81
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	2.9	66
7.3.2 Country-code TLDs/th pop. 15–69	1.1	80
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	4.1	80
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Ecuador

Key indicators

Population (millions)	16.4
GDP (US\$ billions)	99.1
GDP per capita, PPP\$	11,263.6
Income group	Upper-middle income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	29.1	92
Innovation Output Sub-Index	22.2	83
Innovation Input Sub-Index	36.1	95
Innovation Efficiency Ratio	0.6	66
Global Innovation Index 2016 (out of 128)	27.1	100

1 Institutions 43.3 116

1.1 Political environment	46.2	78
1.1.1 Political stability & safety*	61.4	70
1.1.2 Government effectiveness*	31.0	91
1.2 Regulatory environment	32.0	122 ○
1.2.1 Regulatory quality*	12.9	124 ○
1.2.2 Rule of law*	9.4	121 ○
1.2.3 Cost of redundancy dismissal, salary weeks	31.8	120
1.3 Business environment	51.7	119
1.3.1 Ease of starting a business*	70.6	118
1.3.2 Ease of resolving insolvency*	25.2	124 ○
1.3.3 Ease of paying taxes*	59.3	96

2 Human capital & research 22.8 93

2.1 Education	39.1	89
2.1.1 Expenditure on education, % GDP	4.9	56
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	5.0	106 ○
2.1.3 School life expectancy, years [Ⓐ]	15.1	45 ●
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	22.3	88
2.2 Tertiary education	22.8	99
2.2.1 Tertiary enrolment, % gross [Ⓐ]	40.5	65
2.2.2 Graduates in science & engineering, %	14.9	86
2.2.3 Tertiary inbound mobility, % [Ⓐ]	0.6	89
2.3 Research & development (R&D)	6.5	71
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	400.7	66
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.4	68
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	11.1	62

3 Infrastructure 43.4 76

3.1 Information & communication technologies (ICTs)	50.7	77
3.1.1 ICT access*	49.0	84
3.1.2 ICT use*	33.1	80
3.1.3 Government's online service*	63.0	57
3.1.4 E-participation*	57.6	70
3.2 General infrastructure	33.8	78
3.2.1 Electricity output, kWh/cap	1,528.7	85
3.2.2 Logistics performance*	33.1	74
3.2.3 Gross capital formation, % GDP	24.7	46 ●
3.3 Ecological sustainability	45.7	60
3.3.1 GDP/unit of energy use	11.9	28 ●
3.3.2 Environmental performance*	66.6	88
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.2	60

4 Market sophistication 45.8 68

4.1 Credit	46.2	38 ●
4.1.1 Ease of getting credit*	45.0	84
4.1.2 Domestic credit to private sector, % GDP	26.9	103
4.1.3 Microfinance gross loans, % GDP	4.7	8 ●

4.2 Investment	31.6	103
4.2.1 Ease of protecting minority investors*	46.7	95
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP [Ⓐ]	0.0	85
4.3 Trade, competition, & market scale	59.5	72
4.3.1 Applied tariff rate, weighted mean, %	5.6	96
4.3.2 Intensity of local competition [†]	66.9	73
4.3.3 Domestic market scale, bn PPP\$	182.4	59

5 Business sophistication 25.1 103

5.1 Knowledge workers	35.9	73
5.1.1 Knowledge-intensive employment, %	14.7	88
5.1.2 Firms offering formal training, % firms [Ⓐ]	65.9	3 ●
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.2	53
5.1.4 GERD financed by business, % [Ⓐ]	0.1	93 ○
5.1.5 Females employed w/advanced degrees, % total	10.6	62
5.2 Innovation linkages	17.0	120
5.2.1 University/industry research collaboration [†]	35.1	94
5.2.2 State of cluster development [†]	37.7	92
5.2.3 GERD financed by abroad, % [Ⓐ]	2.5	71
5.2.4 JV–strategic alliance deals/bn PPP\$ GDP	0.0	111 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	114 ○
5.3 Knowledge absorption	22.6	110
5.3.1 Intellectual property payments, % total trade	0.3	73
5.3.2 High-tech imports less re-imports, % total trade	9.7	47 ●
5.3.3 ICT services imports, % total trade	0.0	124 ○
5.3.4 FDI net inflows, % GDP	0.9	106
5.3.5 Research talent, % in business enterprise [Ⓐ]	15.0	61

6 Knowledge & technology outputs 14.3 109

6.1 Knowledge creation	3.5	104
6.1.1 Patents by origin/bn PPP\$ GDP [Ⓐ]	0.0	121 ○
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	78
6.1.3 Utility models by origin/bn PPP\$ GDP [Ⓐ]	0.1	50
6.1.4 Scientific & technical articles/bn PPP\$ GDP	6.0	89
6.1.5 Citable documents H index	7.7	79
6.2 Knowledge impact	23.1	96
6.2.1 Growth rate of PPP\$ GDP/worker, %	(1.1)	99
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.2	63
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	6.9	54 ●
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	70
6.3 Knowledge diffusion	16.3	107
6.3.1 Intellectual property receipts, % total trade	n/a	n/a
6.3.2 High-tech exports less re-exports, % total trade	0.5	87
6.3.3 ICT services exports, % total trade	0.4	106
6.3.4 FDI net outflows, % GDP	0.1	97

7 Creative outputs 30.1 66

7.1 Intangible assets	47.4	48 ●
7.1.1 Trademarks by origin/bn PPP\$ GDP [Ⓐ]	63.9	31 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	n/a	n/a
7.1.3 ICTs & business model creation [†]	57.4	76
7.1.4 ICTs & organizational model creation [†]	52.2	67
7.2 Creative goods & services	12.0	82
7.2.1 Cultural & creative services exports, % of total trade	0.3	37 ●
7.2.2 National feature films/mn pop. 15–69	2.1	60
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	1.6	33 ●
7.2.5 Creative goods exports, % total trade	0.1	104
7.3 Online creativity	13.7	83
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	2.1	76
7.3.2 Country-code TLDs/th pop. 15–69	1.1	78
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	3.9	86
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	93.4
GDP (US\$ billions)	330.2
GDP per capita, PPP\$	11,849.6
Income group	Lower-middle income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	26.0	105
Innovation Output Sub-Index	19.3	97
Innovation Input Sub-Index	32.7	106
Innovation Efficiency Ratio	0.6	81
Global Innovation Index 2016 (out of 128)	26.0	107

1 Institutions	40.4	121	○
1.1 Political environment	26.9	119	
1.1.1 Political stability & safety*	31.3	119	
1.1.2 Government effectiveness*	22.6	113	
1.2 Regulatory environment	33.1	120	○
1.2.1 Regulatory quality*	21.8	111	
1.2.2 Rule of law*	24.7	92	
1.2.3 Cost of redundancy dismissal, salary weeks	36.8	122	○
1.3 Business environment	61.3	90	
1.3.1 Ease of starting a business*	92.4	33	●
1.3.2 Ease of resolving insolvency*	39.5	97	
1.3.3 Ease of paying taxes*	52.0	111	
2 Human capital & research	26.9	82	
2.1 Education	48.6	58	
2.1.1 Expenditure on education, % GDP [Ⓐ]	3.8	86	
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3 School life expectancy, years	13.1	71	
2.1.4 PISA scales in reading, maths, & science	n/a	n/a	
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	14.4	60	
2.2 Tertiary education	20.2	103	
2.2.1 Tertiary enrolment, % gross	36.2	72	
2.2.2 Graduates in science & engineering, %	11.8	97	○
2.2.3 Tertiary inbound mobility, % [Ⓐ]	1.9	70	
2.3 Research & development (R&D)	11.9	54	
2.3.1 Researchers, FTE/mn pop.	679.8	57	
2.3.2 Gross expenditure on R&D, % GDP	0.7	49	
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43	○
2.3.4 QS university ranking, average score top 3*	22.9	48	●
3 Infrastructure	38.4	93	
3.1 Information & communication technologies (ICTs)	43.0	91	
3.1.1 ICT access*	53.0	78	
3.1.2 ICT use*	31.4	84	
3.1.3 Government's online service*	47.1	90	
3.1.4 E-participation*	40.7	97	
3.2 General infrastructure	27.4	100	
3.2.1 Electricity output, kWh/cap	1,917.2	78	
3.2.2 Logistics performance*	51.9	48	●
3.2.3 Gross capital formation, % GDP	14.5	113	
3.3 Ecological sustainability	44.9	63	
3.3.1 GDP/unit of energy use	11.8	29	●
3.3.2 Environmental performance*	66.5	89	
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.8	70	
4 Market sophistication	36.7	107	
4.1 Credit	20.2	111	
4.1.1 Ease of getting credit*	50.0	72	
4.1.2 Domestic credit to private sector, % GDP	26.5	104	
4.1.3 Microfinance gross loans, % GDP	0.0	61	

4.2 Investment	26.6	121	○
4.2.1 Ease of protecting minority investors*	48.3	92	
4.2.2 Market capitalization, % GDP	16.7	64	
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	72	
4.3 Trade, competition, & market scale	63.4	56	
4.3.1 Applied tariff rate, weighted mean, %	7.0	103	
4.3.2 Intensity of local competition [†]	53.9	117	○
4.3.3 Domestic market scale, bn PPP\$	1,105.0	21	●

5 Business sophistication **21.0** **120** ○

5.1 Knowledge workers	21.2	108	
5.1.1 Knowledge-intensive employment, %	33.9	40	●
5.1.2 Firms offering formal training, % firms	5.2	91	○
5.1.3 GERD performed by business, % of GDP	0.0	72	
5.1.4 GERD financed by business, %	6.2	76	
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	5.5	76	
5.2 Innovation linkages	19.2	113	
5.2.1 University/industry research collaboration ^{†Ⓐ}	23.8	121	○
5.2.2 State of cluster development [†]	54.5	31	●
5.2.3 GERD financed by abroad, % [Ⓐ]	0.1	98	○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	103	
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	83	
5.3 Knowledge absorption	22.5	111	
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.4	66	
5.3.2 High-tech imports less re-imports, % total trade	8.6	56	
5.3.3 ICT services imports, % total trade [Ⓐ]	0.7	86	
5.3.4 FDI net inflows, % GDP	1.7	88	
5.3.5 Research talent, % in business enterprise	5.4	73	

6 Knowledge & technology outputs **17.0** **93**

6.1 Knowledge creation	8.0	71	
6.1.1 Patents by origin/bn PPP\$ GDP [Ⓐ]	0.8	69	
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	88	
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a	
6.1.4 Scientific & technical articles/bn PPP\$ GDP	9.7	67	
6.1.5 Citable documents H index	14.5	50	
6.2 Knowledge impact	25.3	90	
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.7	69	
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	0.1	99	○
6.2.3 Computer software spending, % GDP	0.3	46	●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	2.4	87	
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.2	60	
6.3 Knowledge diffusion	17.6	97	
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.3	33	●
6.3.2 High-tech exports less re-exports, % total trade	0.2	104	
6.3.3 ICT services exports, % total trade [Ⓐ]	1.7	59	
6.3.4 FDI net outflows, % GDP	0.1	94	

7 Creative outputs **21.6** **97**

7.1 Intangible assets	30.2	103	
7.1.1 Trademarks by origin/bn PPP\$ GDP	11.7	99	
7.1.2 Industrial designs by origin/bn PPP\$ GDP	1.5	51	
7.1.3 ICTs & business model creation [†]	50.3	97	
7.1.4 ICTs & organizational model creation [†]	45.7	88	
7.2 Creative goods & services	15.2	73	
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a	
7.2.2 National feature films/mn pop. 15–69	0.6	90	
7.2.3 Global ent. & media market/th pop. 15–69	1.0	56	
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.4	93	○
7.2.5 Creative goods exports, % total trade	1.9	26	●
7.3 Online creativity	11.0	97	
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.2	90	
7.3.2 Country-code TLDs/th pop. 15–69	0.0	120	○
7.3.3 Wikipedia edits/mn pop. 15–69	3.6	91	
7.3.4 Video uploads on YouTube/pop. 15–69	7.9	65	

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

El Salvador

Key indicators

Population (millions)	6.1
GDP (US\$ billions)	26.6
GDP per capita, PPP\$	8,302.5
Income group	Lower-middle income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	26.7	103
Innovation Output Sub-Index	17.3	105
Innovation Input Sub-Index	36.1	96
Innovation Efficiency Ratio	0.5	107
Global Innovation Index 2016 (out of 128)	26.6	104

1 Institutions 53.5 85

1.1 Political environment	49.3	70
1.1.1 Political stability & safety*	62.6	64
1.1.2 Government effectiveness*	35.9	85
1.2 Regulatory environment	52.6	93
1.2.1 Regulatory quality*	47.2	64
1.2.2 Rule of law*	22.1	96
1.2.3 Cost of redundancy dismissal, salary weeks	22.9	96
1.3 Business environment	58.7	102
1.3.1 Ease of starting a business*	80.7	97
1.3.2 Ease of resolving insolvency*	45.8	73
1.3.3 Ease of paying taxes*	49.5	114

2 Human capital & research 20.1 100

2.1 Education	32.0	106
2.1.1 Expenditure on education, % GDP	3.4	93
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	10.4	96
2.1.3 School life expectancy, years	13.2	69
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	24.3	91
2.2 Tertiary education	28.0	85
2.2.1 Tertiary enrolment, % gross [Ⓐ]	28.9	81
2.2.2 Graduates in science & engineering, %	22.2	41 ●
2.2.3 Tertiary inbound mobility, % [Ⓐ]	0.4	92
2.3 Research & development (R&D)	0.5	108
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.1	106 ○
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure 36.2 98

3.1 Information & communication technologies (ICTs)	43.2	90
3.1.1 ICT access*	49.5	83
3.1.2 ICT use*	18.7	101
3.1.3 Government's online service*	48.6	87
3.1.4 E-participation*	55.9	74
3.2 General infrastructure	20.7	118
3.2.1 Electricity output, kWh/cap	1,018.5	92
3.2.2 Logistics performance*	29.7	82
3.2.3 Gross capital formation, % GDP	14.2	116
3.3 Ecological sustainability	44.8	64
3.3.1 GDP/unit of energy use	11.8	29 ●
3.3.2 Environmental performance*	68.1	85
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.3	101

4 Market sophistication 42.2 87

4.1 Credit	35.0	65
4.1.1 Ease of getting credit*	65.0	40
4.1.2 Domestic credit to private sector, % GDP	44.9	76
4.1.3 Microfinance gross loans, % GDP	1.3	22 ●

4.2 Investment	32.0	101
4.2.1 Ease of protecting minority investors*	38.3	120 ○
4.2.2 Market capitalization, % GDP [Ⓐ]	45.1	36
4.2.3 Venture capital deals/bn PPP\$ GDP	n/a	n/a
4.3 Trade, competition, & market scale	59.6	71
4.3.1 Applied tariff rate, weighted mean, %	1.8	51
4.3.2 Intensity of local competition [†]	71.0	52
4.3.3 Domestic market scale, bn PPP\$	54.8	92

5 Business sophistication 28.2 82

5.1 Knowledge workers	29.1	87
5.1.1 Knowledge-intensive employment, % [Ⓐ]	12.1	92
5.1.2 Firms offering formal training, % firms	53.8	17 ●
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, % [Ⓐ]	0.7	88 ○
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	0.1	88 ○
5.2 Innovation linkages	26.5	70
5.2.1 University/industry research collaboration [†]	29.6	106
5.2.2 State of cluster development [†]	36.2	98
5.2.3 GERD financed by abroad, % [Ⓐ]	16.9	26 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	n/a	n/a
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	104
5.3 Knowledge absorption	29.1	81
5.3.1 Intellectual property payments, % total trade	0.8	43 ●
5.3.2 High-tech imports less re-imports, % total trade	9.9	46 ●
5.3.3 ICT services imports, % total trade	0.4	104
5.3.4 FDI net inflows, % GDP	1.7	89
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs 9.3 121 ○

6.1 Knowledge creation	1.4	122 ○
6.1.1 Patents by origin/bn PPP\$ GDP	0.1	103
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	98 ○
6.1.3 Utility models by origin/bn PPP\$ GDP [Ⓐ]	0.1	49
6.1.4 Scientific & technical articles/bn PPP\$ GDP	1.1	123 ○
6.1.5 Citable documents H index	1.4	123 ○
6.2 Knowledge impact	4.5	119 ○
6.2.1 Growth rate of PPP\$ GDP/worker, %	n/a	n/a
6.2.2 New businesses/th pop. 15–64	0.5	86
6.2.3 Computer software spending, % GDP	0.0	105
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	4.2	68
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	22.0	64
6.3.1 Intellectual property receipts, % total trade	0.3	30 ●
6.3.2 High-tech exports less re-exports, % total trade	2.4	49 ●
6.3.3 ICT services exports, % total trade	2.1	51
6.3.4 FDI net outflows, % GDP	0.5	69

7 Creative outputs 25.3 89

7.1 Intangible assets	39.1	77
7.1.1 Trademarks by origin/bn PPP\$ GDP	83.7	18 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.2	95
7.1.3 ICTs & business model creation [†]	49.1	106
7.1.4 ICTs & organizational model creation [†]	44.5	95
7.2 Creative goods & services	9.6	91
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.0	89 ○
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	0.3	97
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.7	52
7.3 Online creativity	13.6	86
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	2.6	72
7.3.2 Country-code TLDs/th pop. 15–69	0.6	88
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	3.9	87
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	1.3
GDP (US\$ billions)	23.5
GDP per capita, PPP\$	28,591.8
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	50.9	25
Innovation Output Sub-Index	44.9	19
Innovation Input Sub-Index	57.0	26
Innovation Efficiency Ratio	0.8	19
Global Innovation Index 2016 (out of 128)	51.7	24

1 Institutions **81.1** **20**

1.1 Political environment	74.5	32
1.1.1 Political stability & safety*	78.9	36
1.1.2 Government effectiveness*	70.2	28
1.2 Regulatory environment	85.8	18
1.2.1 Regulatory quality*	84.5	15
1.2.2 Rule of law*	78.2	23
1.2.3 Cost of redundancy dismissal, salary weeks	12.9	44
1.3 Business environment	82.9	24
1.3.1 Ease of starting a business*	95.1	13
1.3.2 Ease of resolving insolvency*	65.5	39
1.3.3 Ease of paying taxes*	88.0	19

2 Human capital & research **41.5** **38**

2.1 Education	58.8	25
2.1.1 Expenditure on education, % GDP	4.8	58 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	23.1	40
2.1.3 School life expectancy, years	16.4	26
2.1.4 PISA scales in reading, maths, & science	524.3	4 ●
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	8.1	9
2.2 Tertiary education	43.1	40
2.2.1 Tertiary enrolment, % gross	69.6	26
2.2.2 Graduates in science & engineering, % [Ⓐ]	22.1	44
2.2.3 Tertiary inbound mobility, %	5.2	35
2.3 Research & development (R&D)	22.7	42
2.3.1 Researchers, FTE/mn pop.	3,189.2	28
2.3.2 Gross expenditure on R&D, % GDP	1.5	24
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	17.9	53

3 Infrastructure **63.9** **11**

3.1 Information & communication technologies (ICTs)	82.3	17
3.1.1 ICT access*	80.2	24
3.1.2 ICT use*	78.7	13
3.1.3 Government's online service*	89.1	13
3.1.4 E-participation*	81.4	22
3.2 General infrastructure	45.5	38
3.2.1 Electricity output, kWh/cap	7,891.7	22
3.2.2 Logistics performance*	60.1	37
3.2.3 Gross capital formation, % GDP	24.0	49
3.3 Ecological sustainability	63.9	9 ●
3.3.1 GDP/unit of energy use	6.1	92 ○
3.3.2 Environmental performance*	88.6	8 ●
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	14.8	1 ●

4 Market sophistication **55.0** **26**

4.1 Credit	48.8	30
4.1.1 Ease of getting credit*	70.0	29
4.1.2 Domestic credit to private sector, % GDP	70.3	41
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	56.4	20
4.2.1 Ease of protecting minority investors*	60.0	52
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP	0.2	12
4.3 Trade, competition, & market scale	59.9	70 ○
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	79.2	15
4.3.3 Domestic market scale, bn PPP\$	38.7	98 ○

5 Business sophistication **43.4** **29**

5.1 Knowledge workers	55.1	28
5.1.1 Knowledge-intensive employment, %	44.0	17
5.1.2 Firms offering formal training, % firms	35.2	38
5.1.3 GERD performed by business, % of GDP	0.7	27
5.1.4 GERD financed by business, %	41.0	33
5.1.5 Females employed w/advanced degrees, % total	25.8	7
5.2 Innovation linkages	36.9	39
5.2.1 University/industry research collaboration [†]	51.4	34
5.2.2 State of cluster development [†]	46.0	59
5.2.3 GERD financed by abroad, %	12.2	42
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.2	3 ●
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	1.1	27
5.3 Knowledge absorption	38.3	40
5.3.1 Intellectual property payments, % total trade	0.2	79 ○
5.3.2 High-tech imports less re-imports, % total trade	12.2	23
5.3.3 ICT services imports, % total trade	2.2	18
5.3.4 FDI net inflows, % GDP	2.6	69 ○
5.3.5 Research talent, % in business enterprise	27.5	47 ○

6 Knowledge & technology outputs **36.1** **27**

6.1 Knowledge creation	31.3	30
6.1.1 Patents by origin/bn PPP\$ GDP	1.6	52
6.1.2 PCT patent applications/bn PPP\$ GDP	0.6	33
6.1.3 Utility models by origin/bn PPP\$ GDP	2.0	14
6.1.4 Scientific & technical articles/bn PPP\$ GDP	47.6	10
6.1.5 Citable documents H index	14.6	49
6.2 Knowledge impact	43.4	20
6.2.1 Growth rate of PPP\$ GDP/worker, %	(1.8)	101 ○
6.2.2 New businesses/th pop. 15–64	16.1	4 ●
6.2.3 Computer software spending, % GDP	0.2	79 ○
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	30.1	8 ●
6.2.5 High- & medium-high-tech manufactures, %	0.4	30
6.3 Knowledge diffusion	33.6	32
6.3.1 Intellectual property receipts, % total trade	0.1	65 ○
6.3.2 High-tech exports less re-exports, % total trade	11.7	17
6.3.3 ICT services exports, % total trade	3.2	28
6.3.4 FDI net outflows, % GDP	1.9	32

7 Creative outputs **53.6** **8 ●**

7.1 Intangible assets	59.9	15
7.1.1 Trademarks by origin/bn PPP\$ GDP	82.9	19
7.1.2 Industrial designs by origin/bn PPP\$ GDP	4.3	29
7.1.3 ICTs & business model creation [†]	75.9	22
7.1.4 ICTs & organizational model creation [†]	79.9	5 ●
7.2 Creative goods & services	48.8	4 ●
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	1.5	7 ●
7.2.2 National feature films/mn pop. 15–69	27.2	1 ●
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	2.0	22
7.2.5 Creative goods exports, % total trade	1.2	38
7.3 Online creativity	45.9	21
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	9.2	41
7.3.2 Country-code TLDs/th pop. 15–69	40.7	17
7.3.3 Wikipedia edits/mn pop. 15–69	7.3	5 ●
7.3.4 Video uploads on YouTube/pop. 15–69	63.0	7

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Ethiopia

Key indicators

Population (millions)	101.9
GDP (US\$ billions)	69.2
GDP per capita, PPP\$	1,800.7
Income group	Low income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	24.2	110
Innovation Output Sub-Index	20.2	91
Innovation Input Sub-Index	28.2	122
Innovation Efficiency Ratio	0.7	32 ●
Global Innovation Index 2016 (out of 128)	24.8	110

1 Institutions	43.9	114
1.1 Political environment	26.8	120
1.1.1 Political stability & safety*	27.9	120
1.1.2 Government effectiveness*	25.7	104
1.2 Regulatory environment	49.7	99
1.2.1 Regulatory quality*	16.4	121
1.2.2 Rule of law*	26.7	88
1.2.3 Cost of redundancy dismissal, salary weeks	19.1	79
1.3 Business environment	55.2	114
1.3.1 Ease of starting a business*	56.0	125 ○
1.3.2 Ease of resolving insolvency*	37.6	103
1.3.3 Ease of paying taxes*	72.1	69

2 Human capital & research	14.8	115
2.1 Education	26.4	116
2.1.1 Expenditure on education, % GDP	4.5	67
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	25.7	27 ●
2.1.3 School life expectancy, years [Ⓐ]	8.4	110
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	40.4	109
2.2 Tertiary education	14.6	110
2.2.1 Tertiary enrolment, % gross [Ⓐ]	8.1	110
2.2.2 Graduates in science & engineering, % [Ⓐ]	11.2	98
2.2.3 Tertiary inbound mobility, %	n/a	n/a
2.3 Research & development (R&D)	3.5	83
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	45.1	91
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.6	56
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	33.0	107
3.1 Information & communication technologies (ICTs)	32.8	104
3.1.1 ICT access*	21.1	124 ○
3.1.2 ICT use*	8.2	118
3.1.3 Government's online service*	52.9	79
3.1.4 E-participation*	49.2	89
3.2 General infrastructure	44.6	39 ●
3.2.1 Electricity output, kWh/cap.	99.2	116
3.2.2 Logistics performance*	14.5	116
3.2.3 Gross capital formation, % GDP	39.7	6 ●
3.3 Ecological sustainability	21.6	124
3.3.1 GDP/unit of energy use	2.8	114
3.3.2 Environmental performance*	45.8	115
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.0	126 ○

4 Market sophistication	24.8	127 ○
4.1 Credit	7.2	126 ○
4.1.1 Ease of getting credit*	15.0	121
4.1.2 Domestic credit to private sector, % GDP [Ⓐ]	17.7	113
4.1.3 Microfinance gross loans, % GDP	0.0	66

4.2 Investment	22.3	125 ○
4.2.1 Ease of protecting minority investors*	31.7	126 ○
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	66
4.3 Trade, competition, & market scale	45.1	114
4.3.1 Applied tariff rate, weighted mean, %	12.1	123
4.3.2 Intensity of local competition [†]	48.1	122 ○
4.3.3 Domestic market scale, bn PPP\$	174.7	61 ●

5 Business sophistication **24.2** **108**

5.1 Knowledge workers	10.8	121
5.1.1 Knowledge-intensive employment, % [Ⓐ]	3.8	104
5.1.2 Firms offering formal training, % firms	20.8	74
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.0	82
5.1.4 GERD financed by business, % [Ⓐ]	0.7	87
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	6.0	74
5.2 Innovation linkages	23.3	82
5.2.1 University/industry research collaboration [†]	47.2	38 ●
5.2.2 State of cluster development [†]	42.3	77
5.2.3 GERD financed by abroad, % [Ⓐ]	2.1	75
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	101
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	n/a	n/a
5.3 Knowledge absorption	38.5	38 ●
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.0	111
5.3.2 High-tech imports less re-imports, % total trade	22.2	4 ●
5.3.3 ICT services imports, % total trade [Ⓐ]	1.6	34 ●
5.3.4 FDI net inflows, % GDP	3.1	54 ●
5.3.5 Research talent, % in business enterprise [Ⓐ]	0.5	81

6 Knowledge & technology outputs **15.3** **105**

6.1 Knowledge creation	8.0	[72]
6.1.1 Patents by origin/bn PPP\$ GDP	n/a	n/a
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	7.1	77
6.1.5 Citable documents H index	6.7	83
6.2 Knowledge impact	32.7	59 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	5.6	3 ●
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	0.0	104 ○
6.2.3 Computer software spending, % GDP	0.0	125 ○
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.6	116
6.2.5 High- & medium-high-tech manufactures, %	0.1	71
6.3 Knowledge diffusion	5.3	127 ○
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	93
6.3.2 High-tech exports less re-exports, % total trade	0.1	108
6.3.3 ICT services exports, % total trade [Ⓐ]	1.7	63 ●
6.3.4 FDI net outflows, % GDP	n/a	n/a

7 Creative outputs **25.0** **90**

7.1 Intangible assets	44.3	57 ●
7.1.1 Trademarks by origin/bn PPP\$ GDP	n/a	n/a
7.1.2 Industrial designs by origin/bn PPP\$ GDP	n/a	n/a
7.1.3 ICTs & business model creation [†]	44.4	117
7.1.4 ICTs & organizational model creation [†]	44.2	96
7.2 Creative goods & services	10.6	87
7.2.1 Cultural & creative services exports, % of total trade	0.0	86
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	1.8	26 ●
7.2.5 Creative goods exports, % total trade	0.0	111
7.3 Online creativity	0.9	123
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.0	127 ○
7.3.2 Country-code TLDs/th pop. 15–69	0.0	124
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	0.3	123
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	5.5
GDP (US\$ billions)	239.2
GDP per capita, PPP\$	41,120.0
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	58.5	8
Innovation Output Sub-Index	48.1	13
Innovation Input Sub-Index	68.9	4 ●
Innovation Efficiency Ratio	0.7	37
Global Innovation Index 2016 (out of 128)	59.9	5

1 Institutions	92.2	4 ●
1.1 Political environment	89.0	8
1.1.1 Political stability & safety*	89.0	11
1.1.2 Government effectiveness*	89.0	8
1.2 Regulatory environment	95.1	5 ●
1.2.1 Regulatory quality*	88.9	5 ●
1.2.2 Rule of law*	100.0	1 ●
1.2.3 Cost of redundancy dismissal, salary weeks	10.1	33
1.3 Business environment	92.4	1 ●
1.3.1 Ease of starting a business*	93.1	25
1.3.2 Ease of resolving insolvency*	93.9	1 ●
1.3.3 Ease of paying taxes*	90.2	13

2 Human capital & research	66.4	1 ●
2.1 Education	73.0	5 ●
2.1.1 Expenditure on education, % GDP	7.2	13
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓔ]	34.7	11
2.1.3 School life expectancy, years	19.3	4 ●
2.1.4 PISA scales in reading, maths, & science	522.7	6
2.1.5 Pupil-teacher ratio, secondary [Ⓔ]	12.8	48 ○
2.2 Tertiary education	56.5	11
2.2.1 Tertiary enrolment, % gross	87.3	7
2.2.2 Graduates in science & engineering, %	27.9	16
2.2.3 Tertiary inbound mobility, %	7.7	24
2.3 Research & development (R&D)	69.7	9
2.3.1 Researchers, FTE/mn pop.	6,816.8	5
2.3.2 Gross expenditure on R&D, % GDP	2.9	8
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	73.5	15
2.3.4 QS university ranking, average score top 3*	54.8	17

3 Infrastructure	64.4	8
3.1 Information & communication technologies (ICTs)	86.1	9
3.1.1 ICT access*	76.9	33
3.1.2 ICT use*	81.8	7
3.1.3 Government's online service*	94.2	5
3.1.4 E-participation*	91.5	8
3.2 General infrastructure	53.1	15
3.2.1 Electricity output, kWh/cap.	12,494.7	9
3.2.2 Logistics performance*	85.9	15
3.2.3 Gross capital formation, % GDP	21.4	72 ○
3.3 Ecological sustainability	53.9	34
3.3.1 GDP/unit of energy use	6.3	89 ○
3.3.2 Environmental performance*	90.7	1 ●
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	6.5	17

4 Market sophistication	61.6	13
4.1 Credit	51.4	26
4.1.1 Ease of getting credit*	65.0	40
4.1.2 Domestic credit to private sector, % GDP	95.5	30
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	67.8	9
4.2.1 Ease of protecting minority investors*	56.7	67 ○
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP	0.3	5
4.3 Trade, competition, & market scale	65.6	51
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	63.0	89 ○
4.3.3 Domestic market scale, bn PPP\$	230.0	58 ○

5 Business sophistication	60.1	6
5.1 Knowledge workers	72.6	5 ●
5.1.1 Knowledge-intensive employment, %	46.0	10
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	2.0	8
5.1.4 GERD financed by business, %	54.8	15
5.1.5 Females employed w/advanced degrees, % total	26.6	6
5.2 Innovation linkages	56.8	5 ●
5.2.1 University/industry research collaboration [†]	78.6	2 ●
5.2.2 State of cluster development [†]	64.9	17
5.2.3 GERD financed by abroad, %	14.5	32
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	11
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	9.4	1 ●
5.3 Knowledge absorption	50.9	11
5.3.1 Intellectual property payments, % total trade	1.0	33
5.3.2 High-tech imports less re-imports, % total trade	8.2	62 ○
5.3.3 ICT services imports, % total trade	3.6	5 ●
5.3.4 FDI net inflows, % GDP	3.9	38
5.3.5 Research talent, % in business enterprise	56.8	16

6 Knowledge & technology outputs	48.8	10
6.1 Knowledge creation	61.2	8
6.1.1 Patents by origin/bn PPP\$ GDP	14.6	7
6.1.2 PCT patent applications/bn PPP\$ GDP	6.6	6
6.1.3 Utility models by origin/bn PPP\$ GDP	1.8	17
6.1.4 Scientific & technical articles/bn PPP\$ GDP	55.0	5 ●
6.1.5 Citable documents H index	42.1	18
6.2 Knowledge impact	40.3	32
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.9	60 ○
6.2.2 New businesses/th pop. 15–64	3.4	34
6.2.3 Computer software spending, % GDP	0.5	19
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	11.5	33
6.2.5 High- & medium-high-tech manufactures, %	0.4	22
6.3 Knowledge diffusion	44.9	14
6.3.1 Intellectual property receipts, % total trade	2.9	6
6.3.2 High-tech exports less re-exports, % total trade	5.0	34
6.3.3 ICT services exports, % total trade	9.9	5 ●
6.3.4 FDI net outflows, % GDP	(1.0)	120 ○

7 Creative outputs	47.3	18
7.1 Intangible assets	57.7	20
7.1.1 Trademarks by origin/bn PPP\$ GDP	51.5	44
7.1.2 Industrial designs by origin/bn PPP\$ GDP	5.3	23
7.1.3 ICTs & business model creation [†]	83.1	4 ●
7.1.4 ICTs & organizational model creation [†]	78.5	7
7.2 Creative goods & services	27.1	40
7.2.1 Cultural & creative services exports, % of total trade [Ⓔ]	0.3	39
7.2.2 National feature films/mn pop. 15–69	11.6	12
7.2.3 Global ent. & media market/th pop. 15–69	62.6	9
7.2.4 Printing & publishing manufactures, %	1.2	50 ○
7.2.5 Creative goods exports, % total trade	0.6	53
7.3 Online creativity	46.7	19
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	29.3	21
7.3.2 Country-code TLDs/th pop. 15–69	31.6	19
7.3.3 Wikipedia edits/mn pop. 15–69	7.3	6
7.3.4 Video uploads on YouTube/pop. 15–69	56.1	11

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

France

Key indicators

Population (millions)	64.7
GDP (US\$ billions)	2,488.3
GDP per capita, PPP\$	41,180.7
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	54.2	15
Innovation Output Sub-Index	44.9	18
Innovation Input Sub-Index	63.4	15
Innovation Efficiency Ratio	0.7	35
Global Innovation Index 2016 (out of 128)	54.0	18

1 Institutions 80.7 24

1.1 Political environment	74.8	31
1.1.1 Political stability & safety*	70.5	48
1.1.2 Government effectiveness*	79.2	21
1.2 Regulatory environment	84.2	21
1.2.1 Regulatory quality*	71.7	27
1.2.2 Rule of law*	80.5	21
1.2.3 Cost of redundancy dismissal, salary weeks	11.8	42
1.3 Business environment	82.9	25
1.3.1 Ease of starting a business*	93.3	24
1.3.2 Ease of resolving insolvency*	76.6	22
1.3.3 Ease of paying taxes*	78.7	54

2 Human capital & research 58.1 12

2.1 Education	58.6	27
2.1.1 Expenditure on education, % GDP	5.5	32
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	26.8	20
2.1.3 School life expectancy, years	16.3	27
2.1.4 PISA scales in reading, maths, & science	495.7	24
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	12.9	50 ○
2.2 Tertiary education	50.6	18
2.2.1 Tertiary enrolment, % gross [Ⓐ]	64.4	36
2.2.2 Graduates in science & engineering, %	24.5	32
2.2.3 Tertiary inbound mobility, % [Ⓐ]	9.8	20
2.3 Research & development (R&D)	65.1	12
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	4,168.8	21
2.3.2 Gross expenditure on R&D, % GDP	2.2	12
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	87.1	8 ●
2.3.4 QS university ranking, average score top 3*	71.4	10 ●

3 Infrastructure 63.4 12

3.1 Information & communication technologies (ICTs)	86.8	8 ●
3.1.1 ICT access*	87.0	11
3.1.2 ICT use*	76.1	16
3.1.3 Government's online service*	94.2	5 ●
3.1.4 E-participation*	89.8	12
3.2 General infrastructure	50.3	25
3.2.1 Electricity output, kWh/cap	8,470.6	17
3.2.2 Logistics performance*	85.0	16
3.2.3 Gross capital formation, % GDP	22.4	62 ○
3.3 Ecological sustainability	53.1	35
3.3.1 GDP/unit of energy use	9.9	51 ○
3.3.2 Environmental performance*	88.2	10 ●
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	2.6	43

4 Market sophistication 64.3 11 ●

4.1 Credit	44.0	42
4.1.1 Ease of getting credit*	50.0	72 ○
4.1.2 Domestic credit to private sector, % GDP	95.8	29
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	66.7	10 ●
4.2.1 Ease of protecting minority investors*	65.0	31
4.2.2 Market capitalization, % GDP	86.3	16
4.2.3 Venture capital deals/bn PPP\$ GDP	0.3	1 ●
4.3 Trade, competition, & market scale	82.3	6 ●
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	79.4	13
4.3.3 Domestic market scale, bn PPP\$	2,736.7	10 ●

5 Business sophistication 50.6 18

5.1 Knowledge workers	65.9	13
5.1.1 Knowledge-intensive employment, %	44.6	14
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	1.5	14
5.1.4 GERD financed by business, % [Ⓐ]	55.7	14
5.1.5 Females employed w/advanced degrees, % total	21.1	20
5.2 Innovation linkages	36.2	41
5.2.1 University/industry research collaboration [†]	54.8	31
5.2.2 State of cluster development [†]	59.3	25
5.2.3 GERD financed by abroad, % [Ⓐ]	7.8	51 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	39
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	3.9	16
5.3 Knowledge absorption	49.7	14
5.3.1 Intellectual property payments, % total trade	1.8	13
5.3.2 High-tech imports less re-imports, % total trade	11.4	31
5.3.3 ICT services imports, % total trade	2.2	17
5.3.4 FDI net inflows, % GDP	0.8	108 ○
5.3.5 Research talent, % in business enterprise [Ⓐ]	60.5	11

6 Knowledge & technology outputs 38.5 20

6.1 Knowledge creation	34.6	24
6.1.1 Patents by origin/bn PPP\$ GDP	9.4	14
6.1.2 PCT patent applications/bn PPP\$ GDP	3.0	15
6.1.3 Utility models by origin/bn PPP\$ GDP	0.1	55 ○
6.1.4 Scientific & technical articles/bn PPP\$ GDP	25.3	30
6.1.5 Citable documents H index	79.3	4 ●
6.2 Knowledge impact	39.3	36
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.8	63 ○
6.2.2 New businesses/th pop. 15–64	2.3	46 ○
6.2.3 Computer software spending, % GDP	0.6	13
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	10.4	36
6.2.5 High- & medium-high-tech manufactures, %	0.4	23
6.3 Knowledge diffusion	41.6	18
6.3.1 Intellectual property receipts, % total trade	1.9	11
6.3.2 High-tech exports less re-exports, % total trade	14.4	11 ●
6.3.3 ICT services exports, % total trade	2.2	49
6.3.4 FDI net outflows, % GDP	1.2	43

7 Creative outputs 51.4 12

7.1 Intangible assets	64.0	7 ●
7.1.1 Trademarks by origin/bn PPP\$ GDP	109.0	10 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	7.5	17
7.1.3 ICTs & business model creation [†]	76.7	17
7.1.4 ICTs & organizational model creation [†]	71.4	20
7.2 Creative goods & services	34.5	19
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	1.2	10
7.2.2 National feature films/mn pop. 15–69	6.8	25
7.2.3 Global ent. & media market/th pop. 15–69	53.1	15
7.2.4 Printing & publishing manufactures, %	1.2	55 ○
7.2.5 Creative goods exports, % total trade	1.7	30
7.3 Online creativity	43.0	26
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	41.3	18
7.3.2 Country-code TLDs/th pop. 15–69	20.2	27
7.3.3 Wikipedia edits/mn pop. 15–69	7.0	10 ●
7.3.4 Video uploads on YouTube/pop. 15–69	43.3	26

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	4.0
GDP (US\$ billions)	14.5
GDP per capita, PPP\$	9,630.0
Income group	Upper-middle income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	34.4	68
Innovation Output Sub-Index	26.6	62
Innovation Input Sub-Index	42.2	69
Innovation Efficiency Ratio	0.6	60
Global Innovation Index 2016 (out of 128)	33.9	64

1 Institutions	68.6	47
1.1 Political environment	53.3	61
1.1.1 Political stability & safety*	54.2	82
1.1.2 Government effectiveness*	52.5	48
1.2 Regulatory environment	77.8	30
1.2.1 Regulatory quality*	65.8	35
1.2.2 Rule of law*	48.1	48
1.2.3 Cost of redundancy dismissal, salary weeks	8.6	20 ●
1.3 Business environment	74.5	53
1.3.1 Ease of starting a business*	96.1	8 ●
1.3.2 Ease of resolving insolvency*	40.0	94
1.3.3 Ease of paying taxes*	87.4	20 ●
2 Human capital & research	23.6	89
2.1 Education	39.1	88
2.1.1 Expenditure on education, % GDP [Ⓐ]	2.0	114 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	14.2	85
2.1.3 School life expectancy, years	15.4	37
2.1.4 PISA scales in reading, maths, & science	405.4	61
2.1.5 Pupil-teacher ratio, secondary	7.2	4 ●
2.2 Tertiary education	29.5	83
2.2.1 Tertiary enrolment, % gross	43.4	61
2.2.2 Graduates in science & engineering, %	16.7	75
2.2.3 Tertiary inbound mobility, %	3.7	51
2.3 Research & development (R&D)	2.2	91
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	585.4	61
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.1	104 ○
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○
3 Infrastructure	43.8	74
3.1 Information & communication technologies (ICTs)	55.7	69
3.1.1 ICT access*	62.9	67
3.1.2 ICT use*	40.0	68
3.1.3 Government's online service*	63.8	55
3.1.4 E-participation*	55.9	74
3.2 General infrastructure	39.3	53
3.2.1 Electricity output, kWh/cap	2,304.7	74
3.2.2 Logistics performance*	13.4	118 ○
3.2.3 Gross capital formation, % GDP	33.4	10 ●
3.3 Ecological sustainability	36.6	93
3.3.1 GDP/unit of energy use	7.2	83
3.3.2 Environmental performance*	65.0	94
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.3	95
4 Market sophistication	49.2	53
4.1 Credit	48.3	31
4.1.1 Ease of getting credit*	85.0	7 ●
4.1.2 Domestic credit to private sector, % GDP	49.8	72
4.1.3 Microfinance gross loans, % GDP	2.3	15

4.2 Investment	41.0	60
4.2.1 Ease of protecting minority investors*	76.7	7 ●
4.2.2 Market capitalization, % GDP [Ⓐ]	6.0	80 ○
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	44
4.3 Trade, competition, & market scale	58.2	78
4.3.1 Applied tariff rate, weighted mean, %	0.3	4 ●
4.3.2 Intensity of local competition [†]	66.1	75
4.3.3 Domestic market scale, bn PPP\$	37.4	101

5 Business sophistication **25.6** **101**

5.1 Knowledge workers	28.2	90
5.1.1 Knowledge-intensive employment, % [Ⓐ]	22.3	65
5.1.2 Firms offering formal training, % firms	10.5	89 ○
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	15.4	39
5.2 Innovation linkages	20.9	98
5.2.1 University/industry research collaboration [†]	28.7	107 ○
5.2.2 State of cluster development [†]	32.9	111 ○
5.2.3 GERD financed by abroad, % [Ⓐ]	14.3	34
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	81
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	92
5.3 Knowledge absorption	27.6	88
5.3.1 Intellectual property payments, % total trade	0.1	101 ○
5.3.2 High-tech imports less re-imports, % total trade	6.5	88
5.3.3 ICT services imports, % total trade	0.5	97
5.3.4 FDI net inflows, % GDP	9.3	12 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs **23.9** **54**

6.1 Knowledge creation	20.9	44
6.1.1 Patents by origin/bn PPP\$ GDP	2.8	36
6.1.2 PCT patent applications/bn PPP\$ GDP	0.3	44
6.1.3 Utility models by origin/bn PPP\$ GDP	1.7	18
6.1.4 Scientific & technical articles/bn PPP\$ GDP	16.0	47
6.1.5 Citable documents H index	7.9	75
6.2 Knowledge impact	30.7	66
6.2.1 Growth rate of PPP\$ GDP/worker, %	2.4	32
6.2.2 New businesses/th pop. 15–64	5.7	22
6.2.3 Computer software spending, % GDP	0.1	91
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	2.4	86
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	76
6.3 Knowledge diffusion	20.2	77
6.3.1 Intellectual property receipts, % total trade	0.0	88
6.3.2 High-tech exports less re-exports, % total trade	0.5	83
6.3.3 ICT services exports, % total trade	0.6	96
6.3.4 FDI net outflows, % GDP	1.8	36

7 Creative outputs **29.3** **69**

7.1 Intangible assets	37.6	85
7.1.1 Trademarks by origin/bn PPP\$ GDP	53.7	41
7.1.2 Industrial designs by origin/bn PPP\$ GDP	4.9	27
7.1.3 ICTs & business model creation [†]	50.0	99
7.1.4 ICTs & organizational model creation [†]	41.3	107 ○
7.2 Creative goods & services	21.0	54
7.2.1 Cultural & creative services exports, % of total trade	0.1	59
7.2.2 National feature films/mn pop. 15–69	5.5	35
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	3.1	7 ●
7.2.5 Creative goods exports, % total trade	0.1	91
7.3 Online creativity	20.9	60
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.8	83
7.3.2 Country-code TLDs/th pop. 15–69	2.1	63
7.3.3 Wikipedia edits/mn pop. 15–69	6.1	40
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Germany

Key indicators

Population (millions)	80.7
GDP (US\$ billions)	3,494.9
GDP per capita, PPP\$	46,893.2
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	58.4	9
Innovation Output Sub-Index	53.5	7
Innovation Input Sub-Index	63.3	17
Innovation Efficiency Ratio	0.8	7
Global Innovation Index 2016 (out of 128)	57.9	10

1 Institutions	83.5	18
1.1 Political environment	84.0	15
1.1.1 Political stability & safety*	81.2	30
1.1.2 Government effectiveness*	86.8	12
1.2 Regulatory environment	80.6	25
1.2.1 Regulatory quality*	84.7	14
1.2.2 Rule of law*	91.5	16
1.2.3 Cost of redundancy dismissal, salary weeks	21.6	88 ○
1.3 Business environment	85.9	19
1.3.1 Ease of starting a business*	83.4	88 ○
1.3.2 Ease of resolving insolvency*	92.3	3 ●
1.3.3 Ease of paying taxes*	82.1	41

2 Human capital & research	60.1	10
2.1 Education	58.5	29
2.1.1 Expenditure on education, % GDP	4.9	53
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	23.7	35
2.1.3 School life expectancy, years	17.3	15
2.1.4 PISA scales in reading, maths, & science	508.1	11
2.1.5 Pupil-teacher ratio, secondary	12.1	42
2.2 Tertiary education	49.8	20
2.2.1 Tertiary enrolment, % gross	68.3	31
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, %	7.7	23
2.3 Research & development (R&D)	72.1	8
2.3.1 Researchers, FTE/mn pop.	4,431.1	19
2.3.2 Gross expenditure on R&D, % GDP	2.9	9
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	97.1	2 ●
2.3.4 QS university ranking, average score top 3*	70.8	11

3 Infrastructure	61.5	20
3.1 Information & communication technologies (ICTs)	81.5	18
3.1.1 ICT access*	90.9	5 ●
3.1.2 ICT use*	74.9	19
3.1.3 Government's online service*	84.1	21
3.1.4 E-participation*	76.3	27
3.2 General infrastructure	50.1	26
3.2.1 Electricity output, kWh/cap	7,915.4	21
3.2.2 Logistics performance*	100.0	1 ●
3.2.3 Gross capital formation, % GDP	19.3	91 ○
3.3 Ecological sustainability	53.0	36
3.3.1 GDP/unit of energy use	11.2	32
3.3.2 Environmental performance*	84.3	30
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	2.1	48

4 Market sophistication	60.0	16
4.1 Credit	50.3	28
4.1.1 Ease of getting credit*	70.0	29
4.1.2 Domestic credit to private sector, % GDP	78.0	38
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	44.9	41
4.2.1 Ease of protecting minority investors*	60.0	52
4.2.2 Market capitalization, % GDP	51.0	31
4.2.3 Venture capital deals/bn PPP\$ GDP	0.1	16
4.3 Trade, competition, & market scale	84.7	4 ●
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition†	81.7	9
4.3.3 Domestic market scale, bn PPP\$	3,979.1	5 ●

5 Business sophistication	51.4	15
5.1 Knowledge workers	66.0	12
5.1.1 Knowledge-intensive employment, %	44.2	16
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	2.0	9
5.1.4 GERD financed by business, % ^②	65.8	7
5.1.5 Females employed w/advanced degrees, % total	12.7	51 ○
5.2 Innovation linkages	45.2	20
5.2.1 University/industry research collaboration†	72.5	8
5.2.2 State of cluster development†	72.7	3 ●
5.2.3 GERD financed by abroad, % ^②	5.0	65 ○
5.2.4 JV–strategic alliance deals/bn PPP\$ GDP	0.0	46
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	6.7	10
5.3 Knowledge absorption	43.1	27
5.3.1 Intellectual property payments, % total trade	0.5	60 ○
5.3.2 High-tech imports less re-imports, % total trade	11.6	26
5.3.3 ICT services imports, % total trade	1.7	30
5.3.4 FDI net inflows, % GDP	1.1	102 ○
5.3.5 Research talent, % in business enterprise	56.5	17

6 Knowledge & technology outputs	51.1	8
6.1 Knowledge creation	67.3	4 ●
6.1.1 Patents by origin/bn PPP\$ GDP	18.7	1 ●
6.1.2 PCT patent applications/bn PPP\$ GDP	4.6	11
6.1.3 Utility models by origin/bn PPP\$ GDP	2.7	9
6.1.4 Scientific & technical articles/bn PPP\$ GDP	25.7	29
6.1.5 Citable documents H index	87.1	3 ●
6.2 Knowledge impact	43.1	21
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.9	61 ○
6.2.2 New businesses/th pop. 15–64 ^②	1.3	60 ○
6.2.3 Computer software spending, % GDP	0.5	20
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	13.7	27
6.2.5 High- & medium-high-tech manufactures, %	0.5	6
6.3 Knowledge diffusion	42.7	15
6.3.1 Intellectual property receipts, % total trade	0.9	16
6.3.2 High-tech exports less re-exports, % total trade	13.9	13
6.3.3 ICT services exports, % total trade	2.0	52
6.3.4 FDI net outflows, % GDP	2.9	22

7 Creative outputs	55.9	7
7.1 Intangible assets	65.7	4 ●
7.1.1 Trademarks by origin/bn PPP\$ GDP	66.9	28
7.1.2 Industrial designs by origin/bn PPP\$ GDP	16.5	6 ●
7.1.3 ICTs & business model creation†	77.3	15
7.1.4 ICTs & organizational model creation†	74.0	17
7.2 Creative goods & services	31.7	28
7.2.1 Cultural & creative services exports, % of total trade ^②	0.7	22
7.2.2 National feature films/mn pop. 15–69	3.9	49
7.2.3 Global ent. & media market/th pop. 15–69	57.8	11
7.2.4 Printing & publishing manufactures, %	1.1	59 ○
7.2.5 Creative goods exports, % total trade	2.2	22
7.3 Online creativity	60.4	8
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	55.3	13
7.3.2 Country-code TLDs/th pop. 15–69	83.8	5 ●
7.3.3 Wikipedia edits/mn pop. 15–69	6.8	15
7.3.4 Video uploads on YouTube/pop. 15–69	36.8	36

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

② 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 181 of this appendix for details.

Key indicators

Population (millions)	10.9
GDP (US\$ billions)	195.9
GDP per capita, PPP\$	26,448.7
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	38.8	44
Innovation Output Sub-Index	28.0	59
Innovation Input Sub-Index	49.7	38
Innovation Efficiency Ratio	0.6	87
Global Innovation Index 2016 (out of 128)	39.8	40

1 Institutions **65.2** **59**

1.1 Political environment	53.4	60
1.1.1 Political stability & safety*	58.3	76
1.1.2 Government effectiveness*	48.6	54
1.2 Regulatory environment	66.9	53
1.2.1 Regulatory quality*	52.3	55
1.2.2 Rule of law*	46.5	51
1.2.3 Cost of redundancy dismissal, salary weeks	15.9	66
1.3 Business environment	75.2	49
1.3.1 Ease of starting a business*	90.7	47
1.3.2 Ease of resolving insolvency*	56.7	49
1.3.3 Ease of paying taxes*	78.2	55

2 Human capital & research **56.4** **16 ●**

2.1 Education	79.2	2 ●
2.1.1 Expenditure on education, % GDP	n/a	n/a
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years	17.8	12 ●
2.1.4 PISA scales in reading, maths, & science	458.5	42
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	8.3	11 ●
2.2 Tertiary education	58.7	9 ●
2.2.1 Tertiary enrolment, % gross [Ⓐ]	113.9	1 ●
2.2.2 Graduates in science & engineering, % [Ⓐ]	28.7	11 ●
2.2.3 Tertiary inbound mobility, % [Ⓐ]	4.2	45
2.3 Research & development (R&D)	31.2	36
2.3.1 Researchers, FTE/mn pop.	3,201.3	27
2.3.2 Gross expenditure on R&D, % GDP	1.0	39
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	39.5	38
2.3.4 QS university ranking, average score top 3*	24.8	46

3 Infrastructure **48.2** **58**

3.1 Information & communication technologies (ICTs)	63.0	51
3.1.1 ICT access*	78.5	31
3.1.2 ICT use*	54.6	50
3.1.3 Government's online service*	58.0	71
3.1.4 E-participation*	61.0	63
3.2 General infrastructure	25.5	109 ○
3.2.1 Electricity output, kWh/cap	4,374.4	48
3.2.2 Logistics performance*	54.4	46
3.2.3 Gross capital formation, % GDP	10.3	122 ○
3.3 Ecological sustainability	56.0	26
3.3.1 GDP/unit of energy use	11.2	32
3.3.2 Environmental performance*	85.8	21 ●
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	3.9	25 ●

4 Market sophistication **50.2** **48**

4.1 Credit	47.5	34
4.1.1 Ease of getting credit*	50.0	72
4.1.2 Domestic credit to private sector, % GDP	113.2	21 ●
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	35.0	84
4.2.1 Ease of protecting minority investors*	63.3	41
4.2.2 Market capitalization, % GDP	21.6	60
4.2.3 Venture capital deals/bn PPP\$ GDP [Ⓐ]	0.0	58
4.3 Trade, competition, & market scale	68.0	43
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	67.6	70
4.3.3 Domestic market scale, bn PPP\$	290.5	53

5 Business sophistication **28.8** **80**

5.1 Knowledge workers	40.6	55
5.1.1 Knowledge-intensive employment, %	29.9	47
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	0.3	45
5.1.4 GERD financed by business, %	31.8	47
5.1.5 Females employed w/advanced degrees, % total	16.9	31
5.2 Innovation linkages	21.5	91
5.2.1 University/industry research collaboration [†]	27.6	112 ○
5.2.2 State of cluster development [†]	33.6	107 ○
5.2.3 GERD financed by abroad, %	12.8	38
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	51
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.4	41
5.3 Knowledge absorption	24.2	104 ○
5.3.1 Intellectual property payments, % total trade	0.5	62
5.3.2 High-tech imports less re-imports, % total trade	6.7	83
5.3.3 ICT services imports, % total trade	1.1	64
5.3.4 FDI net inflows, % GDP	1.0	104 ○
5.3.5 Research talent, % in business enterprise	14.3	62 ○

6 Knowledge & technology outputs **20.4** **74**

6.1 Knowledge creation	15.8	51
6.1.1 Patents by origin/bn PPP\$ GDP	2.2	44
6.1.2 PCT patent applications/bn PPP\$ GDP	0.4	43
6.1.3 Utility models by origin/bn PPP\$ GDP	0.0	59 ○
6.1.4 Scientific & technical articles/bn PPP\$ GDP	33.4	22 ●
6.1.5 Citable documents H index	30.4	29
6.2 Knowledge impact	25.8	87
6.2.1 Growth rate of PPP\$ GDP/worker, %	(2.1)	102 ○
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	0.8	78 ○
6.2.3 Computer software spending, % GDP	0.6	17 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	21.6	18 ●
6.2.5 High- & medium-high-tech manufactures, %	0.1	75 ○
6.3 Knowledge diffusion	19.6	82
6.3.1 Intellectual property receipts, % total trade	0.1	57
6.3.2 High-tech exports less re-exports, % total trade	2.3	51
6.3.3 ICT services exports, % total trade	1.5	66
6.3.4 FDI net outflows, % GDP	0.7	63

7 Creative outputs **35.5** **51**

7.1 Intangible assets	44.1	58
7.1.1 Trademarks by origin/bn PPP\$ GDP	n/a	n/a
7.1.2 Industrial designs by origin/bn PPP\$ GDP	4.2	30
7.1.3 ICTs & business model creation [†]	54.2	87
7.1.4 ICTs & organizational model creation [†]	44.7	94 ○
7.2 Creative goods & services	22.0	53
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.6	24
7.2.2 National feature films/mn pop. 15–69	5.5	36
7.2.3 Global ent. & media market/th pop. 15–69	18.6	27
7.2.4 Printing & publishing manufactures, %	0.9	69
7.2.5 Creative goods exports, % total trade	1.2	36
7.3 Online creativity	32.0	36
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	12.4	35
7.3.2 Country-code TLDs/th pop. 15–69	16.3	33
7.3.3 Wikipedia edits/mn pop. 15–69	6.2	35
7.3.4 Video uploads on YouTube/pop. 15–69	39.7	29

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Guatemala

Key indicators

Population (millions)	16.7
GDP (US\$ billions)	68.4
GDP per capita, PPP\$	7,737.6
Income group	Lower-middle income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	27.9	98
Innovation Output Sub-Index	19.9	92
Innovation Input Sub-Index	35.9	97
Innovation Efficiency Ratio	0.6	91
Global Innovation Index 2016 (out of 128)	27.3	97

1 Institutions	46.5	107
1.1 Political environment	36.0	105
1.1.1 Political stability & safety*	48.1	95
1.1.2 Government effectiveness*	23.8	110
1.2 Regulatory environment	43.1	111
1.2.1 Regulatory quality*	36.9	81
1.2.2 Rule of law*	10.6	118
1.2.3 Cost of redundancy dismissal, salary weeks	27.0	104
1.3 Business environment	60.5	97
1.3.1 Ease of starting a business*	82.3	91
1.3.2 Ease of resolving insolvency*	27.5	119
1.3.3 Ease of paying taxes*	71.6	71

2 Human capital & research	18.1	107
2.1 Education	28.5	112
2.1.1 Expenditure on education, % GDP	3.0	99
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	5.6	105 ○
2.1.3 School life expectancy, years [Ⓐ]	10.7	97
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	12.7	47
2.2 Tertiary education	25.6	92
2.2.1 Tertiary enrolment, % gross [Ⓐ]	18.3	94
2.2.2 Graduates in science & engineering, % [Ⓐ]	16.8	74
2.2.3 Tertiary inbound mobility, %	n/a	n/a
2.3 Research & development (R&D)	0.2	112
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	26.7	99 ○
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.0	109 ○
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	34.6	103
3.1 Information & communication technologies (ICTs)	47.0	86
3.1.1 ICT access*	44.7	93
3.1.2 ICT use*	14.0	105
3.1.3 Government's online service*	66.7	51
3.1.4 E-participation*	62.7	59
3.2 General infrastructure	16.7	123 ○
3.2.1 Electricity output, kWh/cap	669.5	100
3.2.2 Logistics performance*	19.1	105
3.2.3 Gross capital formation, % GDP	13.4	119 ○
3.3 Ecological sustainability	40.2	81
3.3.1 GDP/unit of energy use	8.5	63
3.3.2 Environmental performance*	69.6	79
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.2	111

4 Market sophistication	43.8	77
4.1 Credit	32.1	73
4.1.1 Ease of getting credit*	80.0	15 ●
4.1.2 Domestic credit to private sector, % GDP	34.4	94
4.1.3 Microfinance gross loans, % GDP	0.2	52

4.2 Investment	33.3	[94]
4.2.1 Ease of protecting minority investors*	33.3	124 ○
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, & market scale	66.1	50
4.3.1 Applied tariff rate, weighted mean, %	1.4	21 ●
4.3.2 Intensity of local competition [†]	75.3	25 ●
4.3.3 Domestic market scale, bn PPP\$	132.3	70

5 Business sophistication	36.2	47 ●
5.1 Knowledge workers	28.3	89
5.1.1 Knowledge-intensive employment, %	9.6	97
5.1.2 Firms offering formal training, % firms [Ⓐ]	51.9	19 ●
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.0	90 ○
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	3.5	80
5.2 Innovation linkages	50.2	8 ●
5.2.1 University/industry research collaboration [†]	41.8	57
5.2.2 State of cluster development [†]	47.4	51
5.2.3 GERD financed by abroad, % [Ⓐ]	49.0	5 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	n/a	n/a
5.2.5 Patent families 2+ offices/bn PPP\$ GDP [Ⓐ]	0.0	112
5.3 Knowledge absorption	30.2	80
5.3.1 Intellectual property payments, % total trade	1.2	23 ●
5.3.2 High-tech imports less re-imports, % total trade	9.4	49 ●
5.3.3 ICT services imports, % total trade	0.4	107
5.3.4 FDI net inflows, % GDP	2.1	81
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	13.9	111
6.1 Knowledge creation	1.4	123 ○
6.1.1 Patents by origin/bn PPP\$ GDP	0.1	115
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	101 ○
6.1.3 Utility models by origin/bn PPP\$ GDP	0.1	54
6.1.4 Scientific & technical articles/bn PPP\$ GDP	1.3	121 ○
6.1.5 Citable documents H index	3.7	106
6.2 Knowledge impact	21.1	103
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.0	56
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	0.5	86
6.2.3 Computer software spending, % GDP	0.0	121 ○
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	1.8	96
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	19.2	84
6.3.1 Intellectual property receipts, % total trade	0.1	55
6.3.2 High-tech exports less re-exports, % total trade	1.5	61
6.3.3 ICT services exports, % total trade	2.9	33 ●
6.3.4 FDI net outflows, % GDP	0.0	106

7 Creative outputs	26.0	84
7.1 Intangible assets	41.3	69
7.1.1 Trademarks by origin/bn PPP\$ GDP [Ⓐ]	39.3	60
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.2	101
7.1.3 ICTs & business model creation [†]	65.2	47 ●
7.1.4 ICTs & organizational model creation [†]	59.2	40 ●
7.2 Creative goods & services	7.8	96
7.2.1 Cultural & creative services exports, % of total trade	0.0	76
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	1.2	75
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.4	61
7.3 Online creativity	13.5	87
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	4.3	60
7.3.2 Country-code TLDs/th pop. 15–69	0.5	90
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	3.7	90
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	12.9
GDP (US\$ billions)	6.8
GDP per capita, PPP\$	1,213.6
Income group	Low income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	17.4	126 ○
Innovation Output Sub-Index	10.0	124
Innovation Input Sub-Index	24.9	126 ○
Innovation Efficiency Ratio	0.4	118
Global Innovation Index 2016 (out of 128)	17.2	127

1 Institutions 45.0 112

1.1 Political environment	33.0	111
1.1.1 Political stability & safety*	53.0	84 ●
1.1.2 Government effectiveness*	13.0	122
1.2 Regulatory environment	54.3	87 ●
1.2.1 Regulatory quality*	20.0	115
1.2.2 Rule of law*	5.2	125 ○
1.2.3 Cost of redundancy dismissal, salary weeks	10.1	32 ●
1.3 Business environment	47.8	124
1.3.1 Ease of starting a business*	80.2	100
1.3.2 Ease of resolving insolvency*	38.8	100
1.3.3 Ease of paying taxes*	24.3	126 ○

2 Human capital & research 8.9 126 ○

2.1 Education	20.0	124
2.1.1 Expenditure on education, % GDP	3.2	96
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	12.0	91
2.1.3 School life expectancy, years	8.8	108
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	33.1	105
2.2 Tertiary education	6.8	118
2.2.1 Tertiary enrolment, % gross [Ⓐ]	10.8	101
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, % [Ⓐ]	0.9	83
2.3 Research & development (R&D)	0.0	115 ○
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	n/a	n/a
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure 24.8 121

3.1 Information & communication technologies (ICTs)	12.3	126 ○
3.1.1 ICT access*	25.7	120
3.1.2 ICT use*	6.2	119
3.1.3 Government's online service*	8.7	123
3.1.4 E-participation*	8.5	123 ○
3.2 General infrastructure	25.0	110
3.2.1 Electricity output, kWh/cap	n/a	n/a
3.2.2 Logistics performance*	13.7	117
3.2.3 Gross capital formation, % GDP	16.9	104
3.3 Ecological sustainability	37.1	91 ●
3.3.1 GDP/unit of energy use	n/a	n/a
3.3.2 Environmental performance*	55.4	107
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.1	118

4 Market sophistication 26.3 126 ○

4.1 Credit	13.0	123
4.1.1 Ease of getting credit*	30.0	108
4.1.2 Domestic credit to private sector, % GDP	14.4	119
4.1.3 Microfinance gross loans, % GDP [Ⓐ]	0.2	46 ●

4.2 Investment	33.6	91 ●
4.2.1 Ease of protecting minority investors*	40.0	111
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP [Ⓐ]	0.1	24 ●
4.3 Trade, competition, & market scale	32.2	123
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	11.9	122
4.3.2 Intensity of local competition ^{†Ⓐ}	53.3	119
4.3.3 Domestic market scale, bn PPP\$	16.1	124

5 Business sophistication 19.3 124

5.1 Knowledge workers	11.7	[120]
5.1.1 Knowledge-intensive employment, % [Ⓐ]	0.7	108 ○
5.1.2 Firms offering formal training, % firms [Ⓐ]	21.1	73
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	22.0	86 ●
5.2.1 University/industry research collaboration [†]	19.7	122 ○
5.2.2 State of cluster development ^{†Ⓐ}	33.7	106
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	n/a	n/a
5.2.5 Patent families 2+ offices/bn PPP\$ GDP [Ⓐ]	0.1	70 ●
5.3 Knowledge absorption	24.3	101
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.1	107
5.3.2 High-tech imports less re-imports, % total trade [Ⓐ]	4.5	111
5.3.3 ICT services imports, % total trade [Ⓐ]	1.5	44 ●
5.3.4 FDI net inflows, % GDP	1.5	97 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs 6.5 127 ○

6.1 Knowledge creation	0.7	127 ○
6.1.1 Patents by origin/bn PPP\$ GDP	0.1	113
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	0.7	125 ○
6.1.5 Citable documents H index	1.6	121
6.2 Knowledge impact	1.7	126 ○
6.2.1 Growth rate of PPP\$ GDP/worker, %	n/a	n/a
6.2.2 New businesses/th pop. 15–64	0.1	98
6.2.3 Computer software spending, % GDP	0.0	107
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.6	117
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	17.0	101
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	90
6.3.2 High-tech exports less re-exports, % total trade [Ⓐ]	0.1	106
6.3.3 ICT services exports, % total trade [Ⓐ]	2.7	40 ●
6.3.4 FDI net outflows, % GDP	0.0	105

7 Creative outputs 13.5 122

7.1 Intangible assets	23.9	122
7.1.1 Trademarks by origin/bn PPP\$ GDP	13.8	94
7.1.2 Industrial designs by origin/bn PPP\$ GDP	4.6	28 ●
7.1.3 ICTs & business model creation ^{†Ⓐ}	35.9	121 ○
7.1.4 ICTs & organizational model creation ^{†Ⓐ}	28.6	121 ○
7.2 Creative goods & services	6.1	103
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.4	30 ●
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	0.8	84
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade [Ⓐ]	0.0	114
7.3 Online creativity	0.0	127 ○
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.0	124
7.3.2 Country-code TLDs/th pop. 15–69	0.1	115
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	0.0	126 ○
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Honduras

Key indicators

Population (millions)	8.2
GDP (US\$ billions)	20.9
GDP per capita, PPP\$	4,868.6
Income group	Lower-middle income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	26.4	104
Innovation Output Sub-Index	18.0	103
Innovation Input Sub-Index	34.8	103
Innovation Efficiency Ratio	0.5	101
Global Innovation Index 2016 (out of 128)	26.9	101

1 Institutions 43.2 117 ○

1.1 Political environment	36.3	104
1.1.1 Political stability & safety*	51.5	88
1.1.2 Government effectiveness*	21.1	115 ○
1.2 Regulatory environment	38.8	116 ○
1.2.1 Regulatory quality*	32.0	95
1.2.2 Rule of law*	11.6	115 ○
1.2.3 Cost of redundancy dismissal, salary weeks	30.3	117 ○
1.3 Business environment	54.6	117 ○
1.3.1 Ease of starting a business*	77.0	109
1.3.2 Ease of resolving insolvency*	31.7	112
1.3.3 Ease of paying taxes*	55.0	105

2 Human capital & research 19.7 102

2.1 Education	43.1	79
2.1.1 Expenditure on education, % GDP	5.9	23 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	18.1	62
2.1.3 School life expectancy, years	11.2	92
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	16.1	70
2.2 Tertiary education	15.9	107
2.2.1 Tertiary enrolment, % gross ^a	21.2	90
2.2.2 Graduates in science & engineering, %	12.4	94 ○
2.2.3 Tertiary inbound mobility, % ^a	0.7	85
2.3 Research & development (R&D)	0.0	115 ○
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	n/a	n/a
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure 33.8 104

3.1 Information & communication technologies (ICTs)	31.4	107
3.1.1 ICT access*	41.7	100
3.1.2 ICT use*	13.8	106
3.1.3 Government's online service*	31.2	108
3.1.4 E-participation*	39.0	98
3.2 General infrastructure	31.0	88
3.2.1 Electricity output, kWh/cap	1,009.8	93
3.2.2 Logistics performance*	18.5	106
3.2.3 Gross capital formation, % GDP	26.0	38 ●
3.3 Ecological sustainability	38.9	86
3.3.1 GDP/unit of energy use	6.8	86
3.3.2 Environmental performance*	69.6	79
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.2	59

4 Market sophistication 45.9 66

4.1 Credit	38.9	52 ●
4.1.1 Ease of getting credit*	85.0	7 ●
4.1.2 Domestic credit to private sector, % GDP	55.4	59
4.1.3 Microfinance gross loans, % GDP	0.6	32 ●

4.2 Investment	43.3	[47]
4.2.1 Ease of protecting minority investors*	43.3	101
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, & market scale	55.4	93
4.3.1 Applied tariff rate, weighted mean, %	2.8	64
4.3.2 Intensity of local competition [†]	65.9	76
4.3.3 Domestic market scale, bn PPP\$	43.2	95

5 Business sophistication 31.3 70

5.1 Knowledge workers	31.4	[82]
5.1.1 Knowledge-intensive employment, %	12.0	93
5.1.2 Firms offering formal training, % firms ^a	35.8	37 ●
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	31.7	53 ●
5.2.1 University/industry research collaboration [†]	35.4	92
5.2.2 State of cluster development [†]	45.5	63
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	n/a	n/a
5.2.5 Patent families 2+ offices/bn PPP\$ GDP ^a	0.0	95
5.3 Knowledge absorption	30.7	77
5.3.1 Intellectual property payments, % total trade	0.5	58
5.3.2 High-tech imports less re-imports, % total trade ^a	7.5	71
5.3.3 ICT services imports, % total trade	0.8	76
5.3.4 FDI net inflows, % GDP	6.3	21 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs 12.4 117 ○

6.1 Knowledge creation	1.0	125 ○
6.1.1 Patents by origin/bn PPP\$ GDP	0.1	107
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	95 ○
6.1.3 Utility models by origin/bn PPP\$ GDP	0.1	56
6.1.4 Scientific & technical articles/bn PPP\$ GDP	1.2	122 ○
6.1.5 Citable documents H index	2.1	117 ○
6.2 Knowledge impact	15.6	[112]
6.2.1 Growth rate of PPP\$ GDP/worker, %	n/a	n/a
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.3	55 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	4.2	67
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	20.5	72
6.3.1 Intellectual property receipts, % total trade	0.0	85
6.3.2 High-tech exports less re-exports, % total trade ^a	0.5	80
6.3.3 ICT services exports, % total trade	2.9	34 ●
6.3.4 FDI net outflows, % GDP	0.8	60

7 Creative outputs 23.5 93

7.1 Intangible assets	40.0	74
7.1.1 Trademarks by origin/bn PPP\$ GDP	49.7	51 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.2	98
7.1.3 ICTs & business model creation [†]	59.4	67
7.1.4 ICTs & organizational model creation [†]	54.9	56 ●
7.2 Creative goods & services	2.5	118 ○
7.2.1 Cultural & creative services exports, % of total trade ^a	(0.0)	92 ○
7.2.2 National feature films/mn pop. 15–69	1.0	80
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade ^a	0.1	94
7.3 Online creativity	11.6	94
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.6	100
7.3.2 Country-code TLDs/th pop. 15–69	0.4	91
7.3.3 Wikipedia edits/mn pop. 15–69 ^a	3.5	95
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

^a 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 181 of this appendix for details.

Key indicators

Population (millions)	7.3
GDP (US\$ billions)	316.1
GDP per capita, PPP\$	56,700.8
Income group	High income
Region	South East Asia, East Asia, and Oceania

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	53.9	16
Innovation Output Sub-Index	40.8	25
Innovation Input Sub-Index	67.0	8
Innovation Efficiency Ratio	0.6	73 ○
Global Innovation Index 2016 (out of 128)	55.7	14

1 Institutions	92.7	3 ●
1.1 Political environment	89.8	7
1.1.1 Political stability & safety*	87.9	13
1.1.2 Government effectiveness*	91.7	3 ●
1.2 Regulatory environment	97.7	2 ●
1.2.1 Regulatory quality*	97.8	2 ●
1.2.2 Rule of law*	92.9	12
1.2.3 Cost of redundancy dismissal, salary weeks	8.0	1 ●
1.3 Business environment	90.7	2 ●
1.3.1 Ease of starting a business*	98.2	3 ●
1.3.2 Ease of resolving insolvency*	75.1	26
1.3.3 Ease of paying taxes*	98.7	3 ●

2 Human capital & research	47.7	28
2.1 Education	44.9	73 ○
2.1.1 Expenditure on education, % GDP	3.3	95 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	20.4	51
2.1.3 School life expectancy, years	n/a	n/a
2.1.4 PISA scales in reading, maths, & science	532.6	2 ●
2.1.5 Pupil-teacher ratio, secondary	13.0	51
2.2 Tertiary education	63.7	4
2.2.1 Tertiary enrolment, % gross	68.5	30
2.2.2 Graduates in science & engineering, %	34.7	5
2.2.3 Tertiary inbound mobility, %	10.7	16
2.3 Research & development (R&D)	34.6	33
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	3,297.6	26
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.7	47
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	81.8	6

3 Infrastructure	68.4	4
3.1 Information & communication technologies (ICTs)	85.5	10
3.1.1 ICT access*	91.6	4
3.1.2 ICT use*	79.4	12
3.1.3 Government's online service*	n/a	n/a
3.1.4 E-participation*	n/a	n/a
3.2 General infrastructure	49.2	29
3.2.1 Electricity output, kWh/cap	5,511.3	36
3.2.2 Logistics performance*	92.7	9
3.2.3 Gross capital formation, % GDP	22.1	64
3.3 Ecological sustainability	70.5	1 ●
3.3.1 GDP/unit of energy use	26.3	1 ●
3.3.2 Environmental performance*	n/a	n/a
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.7	53

4 Market sophistication	74.8	2 ●
4.1 Credit	79.4	3 ●
4.1.1 Ease of getting credit*	75.0	19
4.1.2 Domestic credit to private sector, % GDP	208.0	2 ●
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	68.1	8
4.2.1 Ease of protecting minority investors*	80.0	3 ●
4.2.2 Market capitalization, % GDP	1,029.9	1 ●
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	34
4.3 Trade, competition, & market scale	76.8	17
4.3.1 Applied tariff rate, weighted mean, %	0.0	1 ●
4.3.2 Intensity of local competition [†]	86.0	2 ●
4.3.3 Domestic market scale, bn PPP\$	427.4	42

5 Business sophistication	51.1	16
5.1 Knowledge workers	48.6	35
5.1.1 Knowledge-intensive employment, %	38.6	27
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.3	44
5.1.4 GERD financed by business, % [Ⓐ]	46.4	25
5.1.5 Females employed w/advanced degrees, % total	13.4	46
5.2 Innovation linkages	47.3	13
5.2.1 University/industry research collaboration ^{†Ⓐ}	59.8	21
5.2.2 State of cluster development [†]	67.3	14
5.2.3 GERD financed by abroad, % [Ⓐ]	7.0	56 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.3	1 ●
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	1.3	26
5.3 Knowledge absorption	57.4	3 ●
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.3	74 ○
5.3.2 High-tech imports less re-imports, % total trade	46.1	1 ●
5.3.3 ICT services imports, % total trade [Ⓐ]	0.3	111 ○
5.3.4 FDI net inflows, % GDP	43.6	1 ●
5.3.5 Research talent, % in business enterprise [Ⓐ]	40.9	32

6 Knowledge & technology outputs	36.2	25
6.1 Knowledge creation	20.9	43
6.1.1 Patents by origin/bn PPP\$ GDP	0.6	73 ○
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	1.1	24
6.1.4 Scientific & technical articles/bn PPP\$ GDP	n/a	n/a
6.1.5 Citable documents H index	33.9	25
6.2 Knowledge impact	46.0	15
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.0	55
6.2.2 New businesses/th pop. 15–64	31.3	1 ●
6.2.3 Computer software spending, % GDP	0.4	28
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	6.1	56
6.2.5 High- & medium-high-tech manufactures, %	0.2	53
6.3 Knowledge diffusion	41.8	16
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.1	54
6.3.2 High-tech exports less re-exports, % total trade	0.1	113 ○
6.3.3 ICT services exports, % total trade [Ⓐ]	0.5	101 ○
6.3.4 FDI net outflows, % GDP	32.8	1 ●

7 Creative outputs	45.4	25
7.1 Intangible assets	53.1	28
7.1.1 Trademarks by origin/bn PPP\$ GDP	69.5	26
7.1.2 Industrial designs by origin/bn PPP\$ GDP	3.2	35
7.1.3 ICTs & business model creation [†]	70.7	31
7.1.4 ICTs & organizational model creation [†]	71.2	21
7.2 Creative goods & services	22.7	50
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.2	49 ○
7.2.2 National feature films/mn pop. 15–69	10.4	14
7.2.3 Global ent. & media market/th pop. 15–69	56.2	13
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.2	79 ○
7.3 Online creativity	52.7	15
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	70.8	7
7.3.2 Country-code TLDs/th pop. 15–69	17.5	30
7.3.3 Wikipedia edits/mn pop. 15–69	7.0	9
7.3.4 Video uploads on YouTube/pop. 15–69	54.6	14

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Hungary

Key indicators

Population (millions)	9.8
GDP (US\$ billions)	117.1
GDP per capita, PPP\$	26,222.0
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	41.7	39
Innovation Output Sub-Index	35.1	37
Innovation Input Sub-Index	48.4	41
Innovation Efficiency Ratio	0.7	30
Global Innovation Index 2016 (out of 128)	44.7	33

1 Institutions 70.7 40

1.1 Political environment	68.2	40
1.1.1 Political stability & safety*	81.6	29
1.1.2 Government effectiveness*	54.8	45
1.2 Regulatory environment	72.9	38
1.2.1 Regulatory quality*	61.8	41
1.2.2 Rule of law*	51.2	47
1.2.3 Cost of redundancy dismissal, salary weeks	13.4	52
1.3 Business environment	71.0	63
1.3.1 Ease of starting a business*	87.3	62
1.3.2 Ease of resolving insolvency*	51.3	58
1.3.3 Ease of paying taxes*	74.5	62

2 Human capital & research 39.5 42

2.1 Education	49.2	57
2.1.1 Expenditure on education, % GDP	4.2	73
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	16.2	72
2.1.3 School life expectancy, years	15.4	38
2.1.4 PISA scales in reading, maths, & science	474.4	36
2.1.5 Pupil-teacher ratio, secondary	10.3	27
2.2 Tertiary education	35.7	64
2.2.1 Tertiary enrolment, % gross	50.9	52
2.2.2 Graduates in science & engineering, % [Ⓐ]	16.8	72
2.2.3 Tertiary inbound mobility, %	7.1	28
2.3 Research & development (R&D)	33.7	34
2.3.1 Researchers, FTE/mn pop.	2,568.8	33
2.3.2 Gross expenditure on R&D, % GDP	1.4	25
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	51.0	30
2.3.4 QS university ranking, average score top 3*	20.8	49

3 Infrastructure 52.3 46

3.1 Information & communication technologies (ICTs)	60.3	60
3.1.1 ICT access*	76.2	35
3.1.2 ICT use*	52.8	55
3.1.3 Government's online service*	63.0	57
3.1.4 E-participation*	49.2	89 ○
3.2 General infrastructure	38.4	57
3.2.1 Electricity output, kWh/cap	3,062.0	62
3.2.2 Logistics performance*	63.2	30
3.2.3 Gross capital formation, % GDP	21.0	75
3.3 Ecological sustainability	58.2	22
3.3.1 GDP/unit of energy use	9.8	53
3.3.2 Environmental performance*	84.6	28
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	7.5	14 ●

4 Market sophistication 41.5 91

4.1 Credit	29.5	80
4.1.1 Ease of getting credit*	75.0	19
4.1.2 Domestic credit to private sector, % GDP	36.1	89
4.1.3 Microfinance gross loans, % GDP [Ⓐ]	0.0	79 ○

4.2 Investment	31.1	105 ○
4.2.1 Ease of protecting minority investors*	55.0	75
4.2.2 Market capitalization, % GDP	14.5	68 ○
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	45
4.3 Trade, competition, & market scale	63.8	53
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	52.7	120 ○
4.3.3 Domestic market scale, bn PPP\$	267.6	55

5 Business sophistication 37.8 40

5.1 Knowledge workers	41.5	53
5.1.1 Knowledge-intensive employment, %	34.9	39
5.1.2 Firms offering formal training, % firms	15.8	85 ○
5.1.3 GERD performed by business, % of GDP	1.0	23
5.1.4 GERD financed by business, %	49.7	20
5.1.5 Females employed w/advanced degrees, % total	15.2	41
5.2 Innovation linkages	24.7	76
5.2.1 University/industry research collaboration [†]	32.0	99 ○
5.2.2 State of cluster development [†]	39.3	87
5.2.3 GERD financed by abroad, %	15.0	31
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	63
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.5	38
5.3 Knowledge absorption	47.2	18 ●
5.3.1 Intellectual property payments, % total trade	1.3	22
5.3.2 High-tech imports less re-imports, % total trade	13.8	16 ●
5.3.3 ICT services imports, % total trade	1.3	51
5.3.4 FDI net inflows, % GDP	1.4	99 ○
5.3.5 Research talent, % in business enterprise	59.4	12 ●

6 Knowledge & technology outputs 32.3 33

6.1 Knowledge creation	20.4	46
6.1.1 Patents by origin/bn PPP\$ GDP	2.6	40
6.1.2 PCT patent applications/bn PPP\$ GDP	0.7	30
6.1.3 Utility models by origin/bn PPP\$ GDP	0.8	28
6.1.4 Scientific & technical articles/bn PPP\$ GDP	25.3	31
6.1.5 Citable documents H index	28.0	31
6.2 Knowledge impact	43.0	22
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.1	84 ○
6.2.2 New businesses/th pop. 15–64	3.7	33
6.2.3 Computer software spending, % GDP	0.3	42
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	22.4	16 ●
6.2.5 High- & medium-high-tech manufactures, %	0.6	3 ●
6.3 Knowledge diffusion	33.6	33
6.3.1 Intellectual property receipts, % total trade	1.4	13 ●
6.3.2 High-tech exports less re-exports, % total trade	13.9	14 ●
6.3.3 ICT services exports, % total trade	1.7	58
6.3.4 FDI net outflows, % GDP	(0.0)	114 ○

7 Creative outputs 37.9 42

7.1 Intangible assets	41.4	67
7.1.1 Trademarks by origin/bn PPP\$ GDP	35.8	63
7.1.2 Industrial designs by origin/bn PPP\$ GDP	3.3	34
7.1.3 ICTs & business model creation [†]	63.8	49
7.1.4 ICTs & organizational model creation [†]	54.5	59
7.2 Creative goods & services	32.9	25
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.6	25
7.2.2 National feature films/mn pop. 15–69	5.7	34
7.2.3 Global ent. & media market/th pop. 15–69	12.6	30
7.2.4 Printing & publishing manufactures, %	0.8	73 ○
7.2.5 Creative goods exports, % total trade	5.9	8 ●
7.3 Online creativity	35.9	31
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	10.3	39
7.3.2 Country-code TLDs/th pop. 15–69	29.1	20 ●
7.3.3 Wikipedia edits/mn pop. 15–69	6.8	16 ●
7.3.4 Video uploads on YouTube/pop. 15–69	38.9	33

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	0.3
GDP (US\$ billions)	19.4
GDP per capita, PPP\$	46,097.0
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	55.8	13
Innovation Output Sub-Index	51.4	10
Innovation Input Sub-Index	60.1	21
Innovation Efficiency Ratio	0.9	5 ●
Global Innovation Index 2016 (out of 128)	56.0	13
1 Institutions	86.6	16
1.1 Political environment	87.6	12
1.1.1 Political stability & safety*	94.6	4 ●
1.1.2 Government effectiveness*	80.7	18
1.2 Regulatory environment	85.8	19
1.2.1 Regulatory quality*	74.6	23
1.2.2 Rule of law*	88.4	17
1.2.3 Cost of redundancy dismissal, salary weeks	13.0	46
1.3 Business environment	86.4	18
1.3.1 Ease of starting a business*	92.6	31
1.3.2 Ease of resolving insolvency*	81.7	13
1.3.3 Ease of paying taxes*	84.9	27
2 Human capital & research	49.0	26
2.1 Education	64.7	11
2.1.1 Expenditure on education, % GDP	7.8	6
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	18.3	59
2.1.3 School life expectancy, years ^a	19.6	3 ●
2.1.4 PISA scales in reading, maths, & science	480.9	33
2.1.5 Pupil-teacher ratio, secondary	n/a	n/a
2.2 Tertiary education	40.4	46
2.2.1 Tertiary enrolment, % gross ^a	81.3	15
2.2.2 Graduates in science & engineering, % ^a	15.6	81 ○
2.2.3 Tertiary inbound mobility, % ^a	6.5	30
2.3 Research & development (R&D)	41.8	24
2.3.1 Researchers, FTE/mn pop.	5,902.5	8
2.3.2 Gross expenditure on R&D, % GDP	2.2	13
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	44.2	34
2.3.4 QS university ranking, average score top 3*	0.0	75 ○
3 Infrastructure	59.9	25
3.1 Information & communication technologies (ICTs)	76.8	26
3.1.1 ICT access*	94.2	2 ●
3.1.2 ICT use*	84.4	5 ●
3.1.3 Government's online service*	62.3	60
3.1.4 E-participation*	66.1	49
3.2 General infrastructure	59.2	9
3.2.1 Electricity output, kWh/cap	56,966.7	1 ●
3.2.2 Logistics performance*	59.3	38
3.2.3 Gross capital formation, % GDP	20.5	77 ○
3.3 Ecological sustainability	43.8	66
3.3.1 GDP/unit of energy use	2.4	116 ○
3.3.2 Environmental performance*	90.5	2 ●
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	3.7	27
4 Market sophistication	55.2	24
4.1 Credit	48.2	32
4.1.1 Ease of getting credit*	60.0	55
4.1.2 Domestic credit to private sector, % GDP	92.1	32
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	66.3	12
4.2.1 Ease of protecting minority investors*	70.0	22
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP	0.2	9
4.3 Trade, competition, & market scale	51.0	102 ○
4.3.1 Applied tariff rate, weighted mean, %	0.8	9
4.3.2 Intensity of local competition [†]	64.0	82 ○
4.3.3 Domestic market scale, bn PPP\$	16.1	123 ○

5 Business sophistication **49.8** **20**

5.1 Knowledge workers	63.3	16
5.1.1 Knowledge-intensive employment, %	47.8	7
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	1.4	15
5.1.4 GERD financed by business, %	33.3	45
5.1.5 Females employed w/advanced degrees, % total	22.7	15
5.2 Innovation linkages	45.6	18
5.2.1 University/industry research collaboration [†]	63.1	16
5.2.2 State of cluster development [†]	51.5	41
5.2.3 GERD financed by abroad, %	26.4	16
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	48
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	5.1	12
5.3 Knowledge absorption	40.4	32
5.3.1 Intellectual property payments, % total trade	1.2	26
5.3.2 High-tech imports less re-imports, % total trade	6.8	80 ○
5.3.3 ICT services imports, % total trade	2.1	21
5.3.4 FDI net inflows, % GDP	4.6	31
5.3.5 Research talent, % in business enterprise	41.8	31

6 Knowledge & technology outputs **39.9** **18**

6.1 Knowledge creation	48.5	13
6.1.1 Patents by origin/bn PPP\$ GDP	5.6	22
6.1.2 PCT patent applications/bn PPP\$ GDP	3.5	12
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	71.1	1 ●
6.1.5 Citable documents H index	17.7	39
6.2 Knowledge impact	31.1	64
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.2	81 ○
6.2.2 New businesses/th pop. 15–64	9.5	12
6.2.3 Computer software spending, % GDP	0.3	32
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	4.9	62
6.2.5 High- & medium-high-tech manufactures, %	0.1	90 ○
6.3 Knowledge diffusion	40.1	21
6.3.1 Intellectual property receipts, % total trade	2.8	7
6.3.2 High-tech exports less re-exports, % total trade	1.3	65
6.3.3 ICT services exports, % total trade	2.8	38
6.3.4 FDI net outflows, % GDP	2.0	31

7 Creative outputs **62.9** **2 ●**

7.1 Intangible assets	58.3	19
7.1.1 Trademarks by origin/bn PPP\$ GDP	87.7	17
7.1.2 Industrial designs by origin/bn PPP\$ GDP	1.1	59
7.1.3 ICTs & business model creation [†]	78.6	14
7.1.4 ICTs & organizational model creation [†]	77.8	8
7.2 Creative goods & services	53.7	1 ●
7.2.1 Cultural & creative services exports, % of total trade	0.3	36
7.2.2 National feature films/mn pop. 15–69	55.9	1 ●
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	6.4	1 ●
7.2.5 Creative goods exports, % total trade	0.1	95 ○
7.3 Online creativity	81.4	1
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	100.0	1 ●
7.3.2 Country-code TLDs/th pop. 15–69	77.0	6
7.3.3 Wikipedia edits/mn pop. 15–69 ^a	7.0	11
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

^a 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 181 of this appendix for details.

India

Key indicators

Population (millions)	1,326.8
GDP (US\$ billions)	2,251.0
GDP per capita, PPP\$	6,161.6
Income group	Lower-middle income
Region	Central and Southern Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	35.5	60
Innovation Output Sub-Index	28.1	58
Innovation Input Sub-Index	42.8	66
Innovation Efficiency Ratio	0.7	53
Global Innovation Index 2016 (out of 128)	33.6	66

1 Institutions	51.4	92
1.1 Political environment	43.1	87
1.1.1 Political stability & safety*	41.5	106
1.1.2 Government effectiveness*	44.7	66
1.2 Regulatory environment	59.8	73
1.2.1 Regulatory quality*	32.1	93
1.2.2 Rule of law*	37.8	61
1.2.3 Cost of redundancy dismissal, salary weeks	15.8	64
1.3 Business environment	51.2	121 ○
1.3.1 Ease of starting a business*	74.3	114 ○
1.3.2 Ease of resolving insolvency*	32.8	111 ○
1.3.3 Ease of paying taxes*	46.6	118 ○

2 Human capital & research	32.3	64
2.1 Education	26.7	114 ○
2.1.1 Expenditure on education, % GDP	3.8	84
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	16.8	67
2.1.3 School life expectancy, years	11.9	89
2.1.4 PISA scales in reading, maths, & science [Ⓐ]	336.0	71 ○
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	31.8	104 ○
2.2 Tertiary education	34.3	68
2.2.1 Tertiary enrolment, % gross [Ⓐ]	25.5	88
2.2.2 Graduates in science & engineering, %	29.1	10
2.2.3 Tertiary inbound mobility, % [Ⓐ]	0.1	102 ○
2.3 Research & development (R&D)	35.9	32
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	156.6	81
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.8	43
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	74.0	14 ●
2.3.4 QS university ranking, average score top 3*	49.0	21 ●

3 Infrastructure	44.1	73
3.1 Information & communication technologies (ICTs)	49.2	80
3.1.1 ICT access*	33.2	106
3.1.2 ICT use*	12.5	109
3.1.3 Government's online service*	74.6	33
3.1.4 E-participation*	76.3	27
3.2 General infrastructure	48.5	32
3.2.1 Electricity output, kWh/cap	993.9	94
3.2.2 Logistics performance*	62.7	34
3.2.3 Gross capital formation, % GDP	31.7	12 ●
3.3 Ecological sustainability	34.6	103
3.3.1 GDP/unit of energy use	8.4	65
3.3.2 Environmental performance*	53.6	108 ○
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.8	69

4 Market sophistication	51.9	39
4.1 Credit	31.7	74
4.1.1 Ease of getting credit*	65.0	40
4.1.2 Domestic credit to private sector, % GDP	52.6	67
4.1.3 Microfinance gross loans, % GDP	0.6	34

4.2 Investment	46.9	36
4.2.1 Ease of protecting minority investors*	73.3	13 ●
4.2.2 Market capitalization, % GDP	72.4	22
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	40
4.3 Trade, competition, & market scale	77.0	16 ●
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	6.3	100
4.3.2 Intensity of local competition [†]	62.5	91
4.3.3 Domestic market scale, bn PPP\$	8,720.5	3 ●

5 Business sophistication	34.6	55
5.1 Knowledge workers	31.3	[83]
5.1.1 Knowledge-intensive employment, %	n/a	n/a
5.1.2 Firms offering formal training, % firms	35.9	36
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.3	46
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a

5.2 Innovation linkages	37.8	37
5.2.1 University/industry research collaboration [†]	58.9	23
5.2.2 State of cluster development [†]	58.7	26
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	49
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.3	43
5.3 Knowledge absorption	34.7	55
5.3.1 Intellectual property payments, % total trade	1.1	29
5.3.2 High-tech imports less re-imports, % total trade	9.2	52
5.3.3 ICT services imports, % total trade	0.8	78
5.3.4 FDI net inflows, % GDP	1.8	87
5.3.5 Research talent, % in business enterprise [Ⓐ]	38.7	33

6 Knowledge & technology outputs	30.3	38
6.1 Knowledge creation	14.2	55
6.1.1 Patents by origin/bn PPP\$ GDP	1.6	53
6.1.2 PCT patent applications/bn PPP\$ GDP	0.2	54
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	6.9	79
6.1.5 Citable documents H index	37.1	21 ●

6.2 Knowledge impact	40.5	30
6.2.1 Growth rate of PPP\$ GDP/worker, %	5.2	5 ●
6.2.2 New businesses/th pop. 15–64	0.1	100 ○
6.2.3 Computer software spending, % GDP	0.2	66
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	4.5	65
6.2.5 High- & medium-high-tech manufactures, %	0.3	40
6.3 Knowledge diffusion	36.2	26
6.3.1 Intellectual property receipts, % total trade	0.1	53
6.3.2 High-tech exports less re-exports, % total trade	3.2	45
6.3.3 ICT services exports, % total trade	12.6	1 ●
6.3.4 FDI net outflows, % GDP	0.3	76

7 Creative outputs	25.9	85
7.1 Intangible assets	39.0	78
7.1.1 Trademarks by origin/bn PPP\$ GDP	31.3	71
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.9	66
7.1.3 ICTs & business model creation [†]	56.6	80
7.1.4 ICTs & organizational model creation [†]	61.9	35

7.2 Creative goods & services	17.5	67
7.2.1 Cultural & creative services exports, % of total trade	0.1	52
7.2.2 National feature films/mn pop. 15–69	2.1	59
7.2.3 Global ent. & media market/th pop. 15–69	0.3	61 ○
7.2.4 Printing & publishing manufactures, %	0.6	85
7.2.5 Creative goods exports, % total trade	2.6	18 ●

7.3 Online creativity	8.1	103
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.0	98
7.3.2 Country-code TLDs/th pop. 15–69	0.7	85
7.3.3 Wikipedia edits/mn pop. 15–69	2.9	100
7.3.4 Video uploads on YouTube/pop. 15–69	2.5	68 ○

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	260.6
GDP (US\$ billions)	941.0
GDP per capita, PPP\$	11,125.9
Income group	Lower-middle income
Region	South East Asia, East Asia, and Oceania

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	30.1	87
Innovation Output Sub-Index	24.5	73
Innovation Input Sub-Index	35.7	99
Innovation Efficiency Ratio	0.7	42
Global Innovation Index 2016 (out of 128)	29.1	88

1 Institutions	41.2	120	○
1.1 Political environment	42.9	89	
1.1.1 Political stability & safety*	49.4	94	
1.1.2 Government effectiveness*	36.4	83	
1.2 Regulatory environment	16.7	126	○
1.2.1 Regulatory quality*	36.7	82	
1.2.2 Rule of law*	27.4	86	
1.2.3 Cost of redundancy dismissal, salary weeks	57.8	125	○
1.3 Business environment	64.0	79	
1.3.1 Ease of starting a business*	76.4	112	
1.3.2 Ease of resolving insolvency*	46.5	70	
1.3.3 Ease of paying taxes*	69.3	77	

2 Human capital & research	23.0	92	
2.1 Education	33.5	103	
2.1.1 Expenditure on education, % GDP	3.3	94	
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	9.9	97	○
2.1.3 School life expectancy, years	12.9	75	
2.1.4 PISA scales in reading, maths, & science	395.5	63	
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	15.5	66	
2.2 Tertiary education	27.5	87	
2.2.1 Tertiary enrolment, % gross [Ⓐ]	31.1	77	
2.2.2 Graduates in science & engineering, % [Ⓐ]	21.7	47	
2.2.3 Tertiary inbound mobility, % [Ⓐ]	0.1	104	○
2.3 Research & development (R&D)	8.1	63	
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	89.5	87	
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.1	105	○
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43	○
2.3.4 QS university ranking, average score top 3*	29.8	38	●

3 Infrastructure	42.0	81	
3.1 Information & communication technologies (ICTs)	35.6	99	
3.1.1 ICT access*	47.1	88	
3.1.2 ICT use*	21.9	96	
3.1.3 Government's online service*	36.2	102	
3.1.4 E-participation*	37.3	101	
3.2 General infrastructure	46.7	35	●
3.2.1 Electricity output, kWh/cap	898.2	96	
3.2.2 Logistics performance*	42.6	62	
3.2.3 Gross capital formation, % GDP	34.7	8	●
3.3 Ecological sustainability	43.6	69	
3.3.1 GDP/unit of energy use	11.1	36	●
3.3.2 Environmental performance*	65.9	91	
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.8	72	

4 Market sophistication	46.0	64	
4.1 Credit	25.0	99	
4.1.1 Ease of getting credit*	60.0	55	
4.1.2 Domestic credit to private sector, % GDP	39.1	83	
4.1.3 Microfinance gross loans, % GDP	0.0	68	

4.2 Investment	33.2	96	
4.2.1 Ease of protecting minority investors*	56.7	67	
4.2.2 Market capitalization, % GDP	41.0	38	
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	80	
4.3 Trade, competition, & market scale	79.7	8	●
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	2.3	58	
4.3.2 Intensity of local competition [†]	71.2	50	
4.3.3 Domestic market scale, bn PPP\$	3,027.8	8	●

5 Business sophistication	26.2	96	
5.1 Knowledge workers	9.7	123	○
5.1.1 Knowledge-intensive employment, %	9.8	96	○
5.1.2 Firms offering formal training, % firms	7.7	90	○
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.0	76	
5.1.4 GERD financed by business, %	n/a	n/a	
5.1.5 Females employed w/advanced degrees, % total	4.8	77	
5.2 Innovation linkages	34.7	44	
5.2.1 University/industry research collaboration [†]	57.0	27	●
5.2.2 State of cluster development [†]	57.6	28	●
5.2.3 GERD financed by abroad, %	n/a	n/a	
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	97	
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	117	○
5.3 Knowledge absorption	34.1	58	
5.3.1 Intellectual property payments, % total trade	0.9	36	
5.3.2 High-tech imports less re-imports, % total trade	8.5	58	
5.3.3 ICT services imports, % total trade	1.0	66	
5.3.4 FDI net inflows, % GDP	2.6	70	
5.3.5 Research talent, % in business enterprise [Ⓐ]	35.5	39	

6 Knowledge & technology outputs	20.9	70	
6.1 Knowledge creation	2.9	113	○
6.1.1 Patents by origin/bn PPP\$ GDP	0.4	81	
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	103	○
6.1.3 Utility models by origin/bn PPP\$ GDP	0.1	53	
6.1.4 Scientific & technical articles/bn PPP\$ GDP	0.7	124	○
6.1.5 Citable documents H index	11.8	55	
6.2 Knowledge impact	39.8	33	●
6.2.1 Growth rate of PPP\$ GDP/worker, %	4.6	9	●
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	0.3	91	
6.2.3 Computer software spending, % GDP	0.3	36	●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	3.0	80	
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.3	43	
6.3 Knowledge diffusion	19.9	81	
6.3.1 Intellectual property receipts, % total trade	0.0	76	
6.3.2 High-tech exports less re-exports, % total trade	3.5	43	
6.3.3 ICT services exports, % total trade	0.6	95	
6.3.4 FDI net outflows, % GDP	1.2	48	

7 Creative outputs	28.1	77	
7.1 Intangible assets	37.5	88	
7.1.1 Trademarks by origin/bn PPP\$ GDP	13.2	95	
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.9	64	
7.1.3 ICTs & business model creation [†]	62.9	52	
7.1.4 ICTs & organizational model creation [†]	59.8	38	●
7.2 Creative goods & services	22.3	52	
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a	
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	0.5	93	
7.2.3 Global ent. & media market/th pop. 15–69	1.8	52	
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.5	88	○
7.2.5 Creative goods exports, % total trade	3.9	13	●
7.3 Online creativity	15.2	79	
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.6	87	
7.3.2 Country-code TLDs/th pop. 15–69	2.0	66	
7.3.3 Wikipedia edits/mn pop. 15–69	3.6	94	
7.3.4 Video uploads on YouTube/pop. 15–69	22.8	56	

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Iran, Islamic Republic of

Key indicators

Population (millions)	80.0
GDP (US\$ billions)	412.3
GDP per capita, PPP\$	17,251.3
Income group	Upper-middle income
Region	Central and Southern Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	32.1	75
Innovation Output Sub-Index	28.5	57
Innovation Input Sub-Index	35.7	98
Innovation Efficiency Ratio	0.8	16 ●
Global Innovation Index 2016 (out of 128)	30.5	78

1 Institutions	46.6	106
1.1 Political environment	39.4	99
1.1.1 Political stability & safety*	41.9	105
1.1.2 Government effectiveness*	37.0	82
1.2 Regulatory environment	40.3	115
1.2.1 Regulatory quality*	9.4	126 ○
1.2.2 Rule of law*	11.5	116
1.2.3 Cost of redundancy dismissal, salary weeks	23.1	97
1.3 Business environment	60.0	98
1.3.1 Ease of starting a business*	85.1	77
1.3.2 Ease of resolving insolvency*	25.3	123 ○
1.3.3 Ease of paying taxes*	69.8	75

2 Human capital & research	37.5	45
2.1 Education	38.6	93
2.1.1 Expenditure on education, % GDP	2.9	101
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	15.1	81
2.1.3 School life expectancy, years	14.9	53
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	17.0	74
2.2 Tertiary education	63.7	3 ●
2.2.1 Tertiary enrolment, % gross	71.9	23 ●
2.2.2 Graduates in science & engineering, %	46.6	2 ●
2.2.3 Tertiary inbound mobility, %	0.3	97
2.3 Research & development (R&D)	10.4	58
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	691.4	56
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.3	78
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	25.9	45

3 Infrastructure	36.2	99
3.1 Information & communication technologies (ICTs)	35.9	98
3.1.1 ICT access*	62.6	68
3.1.2 ICT use*	27.4	91
3.1.3 Government's online service*	33.3	104
3.1.4 E-participation*	20.3	113 ○
3.2 General infrastructure	38.1	59
3.2.1 Electricity output, kWh/cap	3,514.3	57
3.2.2 Logistics performance*	24.9	94
3.2.3 Gross capital formation, % GDP	28.9	23 ●
3.3 Ecological sustainability	34.4	105
3.3.1 GDP/unit of energy use	5.3	100
3.3.2 Environmental performance*	66.3	90
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.5	80

4 Market sophistication	35.5	112
4.1 Credit	33.0	69
4.1.1 Ease of getting credit*	45.0	84
4.1.2 Domestic credit to private sector, % GDP [Ⓐ]	54.4	61
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	20.4	126 ○
4.2.1 Ease of protecting minority investors*	35.0	121 ○
4.2.2 Market capitalization, % GDP [Ⓐ]	27.4	52
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	92 ○
4.3 Trade, competition, & market scale	52.9	99
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	15.2	124 ○
4.3.2 Intensity of local competition [†]	54.0	116 ○
4.3.3 Domestic market scale, bn PPP\$	1,459.2	18 ●

5 Business sophistication	22.8	115
5.1 Knowledge workers	25.5	96
5.1.1 Knowledge-intensive employment, %	17.7	81
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.1	67
5.1.4 GERD financed by business, % [Ⓐ]	30.9	49
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	24.5	77
5.2.1 University/industry research collaboration [†]	33.6	97
5.2.2 State of cluster development [†]	43.3	76
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	94
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	111 ○
5.3 Knowledge absorption	18.4	124 ○
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.2	85
5.3.2 High-tech imports less re-imports, % total trade [Ⓐ]	4.0	115 ○
5.3.3 ICT services imports, % total trade [Ⓐ]	0.6	93
5.3.4 FDI net inflows, % GDP	0.5	115
5.3.5 Research talent, % in business enterprise [Ⓐ]	15.0	60

6 Knowledge & technology outputs	26.7	47
6.1 Knowledge creation	25.0	36 ●
6.1.1 Patents by origin/bn PPP\$ GDP [Ⓐ]	10.1	12 ●
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	85
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	21.5	35 ●
6.1.5 Citable documents H index	15.9	41 ●
6.2 Knowledge impact	42.5	24 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	3.6	18 ●
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.2	67
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	1.9	93
6.2.5 High- & medium-high-tech manufactures, %	0.3	36 ●
6.3 Knowledge diffusion	12.7	121 ○
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	82
6.3.2 High-tech exports less re-exports, % total trade [Ⓐ]	0.5	81
6.3.3 ICT services exports, % total trade [Ⓐ]	0.2	116 ○
6.3.4 FDI net outflows, % GDP	0.0	101

7 Creative outputs	30.2	65
7.1 Intangible assets	47.8	47
7.1.1 Trademarks by origin/bn PPP\$ GDP	n/a	n/a
7.1.2 Industrial designs by origin/bn PPP\$ GDP [Ⓐ]	6.5	19 ●
7.1.3 ICTs & business model creation [†]	58.8	70
7.1.4 ICTs & organizational model creation [†]	43.4	100
7.2 Creative goods & services	6.4	101
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	1.5	68
7.2.3 Global ent. & media market/th pop. 15–69	1.3	54
7.2.4 Printing & publishing manufactures, %	0.2	98 ○
7.2.5 Creative goods exports, % total trade [Ⓐ]	0.5	58
7.3 Online creativity	18.7	68
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.8	79
7.3.2 Country-code TLDs/th pop. 15–69	4.3	55
7.3.3 Wikipedia edits/mn pop. 15–69	5.2	55
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	4.7
GDP (US\$ billions)	307.9
GDP per capita, PPP\$	55,532.9
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	58.1	10
Innovation Output Sub-Index	53.4	8
Innovation Input Sub-Index	62.9	19
Innovation Efficiency Ratio	0.8	6 ●
Global Innovation Index 2016 (out of 128)	59.0	7

1 Institutions	87.6	12
1.1 Political environment	84.0	16
1.1.1 Political stability & safety*	86.3	22
1.1.2 Government effectiveness*	81.6	17
1.2 Regulatory environment	88.8	15
1.2.1 Regulatory quality*	88.5	6 ●
1.2.2 Rule of law*	91.6	15
1.2.3 Cost of redundancy dismissal, salary weeks	14.3	56 ○
1.3 Business environment	90.1	5 ●
1.3.1 Ease of starting a business*	95.9	10
1.3.2 Ease of resolving insolvency*	80.0	16
1.3.3 Ease of paying taxes*	94.4	5 ●

2 Human capital & research	55.1	18
2.1 Education	60.3	20
2.1.1 Expenditure on education, % GDP	5.3	36
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	26.0	24
2.1.3 School life expectancy, years	19.0	7
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	49.0	22
2.2.1 Tertiary enrolment, % gross [Ⓐ]	77.6	19
2.2.2 Graduates in science & engineering, % [Ⓐ]	23.8	34
2.2.3 Tertiary inbound mobility, % [Ⓐ]	7.0	29
2.3 Research & development (R&D)	55.8	19
2.3.1 Researchers, FTE/mn pop.	4,575.2	13
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	1.5	23
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	81.1	12
2.3.4 QS university ranking, average score top 3*	51.2	19

3 Infrastructure	62.1	17
3.1 Information & communication technologies (ICTs)	74.8	28
3.1.1 ICT access*	81.9	22
3.1.2 ICT use*	73.8	21
3.1.3 Government's online service*	72.5	39
3.1.4 E-participation*	71.2	39
3.2 General infrastructure	47.1	34
3.2.1 Electricity output, kWh/cap.	6,102.2	32
3.2.2 Logistics performance*	80.1	18
3.2.3 Gross capital formation, % GDP	22.5	60 ○
3.3 Ecological sustainability	64.3	8
3.3.1 GDP/unit of energy use	17.5	4 ●
3.3.2 Environmental performance*	86.6	19
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	2.5	45

4 Market sophistication	55.0	25
4.1 Credit	45.5	40
4.1.1 Ease of getting credit*	70.0	29
4.1.2 Domestic credit to private sector, % GDP	54.3	62 ○
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	50.5	29
4.2.1 Ease of protecting minority investors*	73.3	13
4.2.2 Market capitalization, % GDP	45.1	35 ○
4.2.3 Venture capital deals/bn PPP\$ GDP	0.1	17
4.3 Trade, competition, & market scale	69.1	38
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	69.9	63 ○
4.3.3 Domestic market scale, bn PPP\$	324.3	49

5 Business sophistication	54.5	10
5.1 Knowledge workers	62.7	20
5.1.1 Knowledge-intensive employment, %	40.6	24
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP [Ⓐ]	1.1	20
5.1.4 GERD financed by business, % [Ⓐ]	52.8	17
5.1.5 Females employed w/advanced degrees, % total	24.9	8
5.2 Innovation linkages	44.2	22
5.2.1 University/industry research collaboration [†]	68.5	13
5.2.2 State of cluster development [†]	65.8	16
5.2.3 GERD financed by abroad, % [Ⓐ]	18.6	22
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	26
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	2.5	20
5.3 Knowledge absorption	56.6	4 ●
5.3.1 Intellectual property payments, % total trade	26.3	1 ●
5.3.2 High-tech imports less re-imports, % total trade	9.0	54 ○
5.3.3 ICT services imports, % total trade	0.7	85 ○
5.3.4 FDI net inflows, % GDP	42.2	2 ●
5.3.5 Research talent, % in business enterprise	53.8	19

6 Knowledge & technology outputs	55.9	5 ●
6.1 Knowledge creation	24.1	38
6.1.1 Patents by origin/bn PPP\$ GDP	2.7	37
6.1.2 PCT patent applications/bn PPP\$ GDP	1.4	25
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	23.3	34
6.1.5 Citable documents H index	31.3	28
6.2 Knowledge impact	62.5	2 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	5.1	6 ●
6.2.2 New businesses/th pop. 15–64	5.8	21
6.2.3 Computer software spending, % GDP	0.8	2 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	7.6	46
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.6	5 ●
6.3 Knowledge diffusion	81.1	1 ●
6.3.1 Intellectual property receipts, % total trade	2.4	8
6.3.2 High-tech exports less re-exports, % total trade	11.7	18
6.3.3 ICT services exports, % total trade	24.0	1 ●
6.3.4 FDI net outflows, % GDP	39.6	1 ●

7 Creative outputs	50.9	13
7.1 Intangible assets	62.5	11
7.1.1 Trademarks by origin/bn PPP\$ GDP	n/a	n/a
7.1.2 Industrial designs by origin/bn PPP\$ GDP	1.3	53 ○
7.1.3 ICTs & business model creation [†]	80.4	9
7.1.4 ICTs & organizational model creation [†]	72.2	19
7.2 Creative goods & services	28.3	33
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.2	46 ○
7.2.2 National feature films/mn pop. 15–69	10.1	15
7.2.3 Global ent. & media market/th pop. 15–69	49.3	18
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.8	71 ○
7.2.5 Creative goods exports, % total trade	1.9	25
7.3 Online creativity	50.5	16
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	61.4	11
7.3.2 Country-code TLDs/th pop. 15–69	20.2	28
7.3.3 Wikipedia edits/mn pop. 15–69	6.5	27
7.3.4 Video uploads on YouTube/pop. 15–69	57.3	10

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Israel

Key indicators

Population (millions)	8.2
GDP (US\$ billions)	311.7
GDP per capita, PPP\$	33,656.1
Income group	High income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	53.9	17
Innovation Output Sub-Index	46.8	14
Innovation Input Sub-Index	61.0	20
Innovation Efficiency Ratio	0.8	23
Global Innovation Index 2016 (out of 128)	52.3	21

1 Institutions	67.9	49
1.1 Political environment	57.1	53
1.1.1 Political stability & safety*	36.7	115 ○
1.1.2 Government effectiveness*	77.5	23
1.2 Regulatory environment	67.8	49
1.2.1 Regulatory quality*	74.6	22
1.2.2 Rule of law*	73.6	24
1.2.3 Cost of redundancy dismissal, salary weeks	27.4	111 ○
1.3 Business environment	78.7	35
1.3.1 Ease of starting a business*	92.3	35
1.3.2 Ease of resolving insolvency*	72.8	29
1.3.3 Ease of paying taxes*	71.0	72 ○

2 Human capital & research	56.5	15
2.1 Education	54.0	44
2.1.1 Expenditure on education, % GDP	5.9	24
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	16.1	74 ○
2.1.3 School life expectancy, years	16.0	33
2.1.4 PISA scales in reading, maths, & science	471.7	38 ○
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	12.4	46
2.2 Tertiary education	36.1	62
2.2.1 Tertiary enrolment, % gross [Ⓐ]	66.2	33
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, % [Ⓐ]	2.8	61 ○
2.3 Research & development (R&D)	79.4	2 ●
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	8,255.4	1 ●
2.3.2 Gross expenditure on R&D, % GDP	4.3	1 ●
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	69.2	18
2.3.4 QS university ranking, average score top 3*	48.4	22

3 Infrastructure	57.8	28
3.1 Information & communication technologies (ICTs)	78.1	24
3.1.1 ICT access*	82.8	18
3.1.2 ICT use*	60.2	38
3.1.3 Government's online service*	86.2	18
3.1.4 E-participation*	83.1	17
3.2 General infrastructure	43.7	42
3.2.1 Electricity output, kWh/cap	7,849.7	23
3.2.2 Logistics performance*	73.9	27
3.2.3 Gross capital formation, % GDP	19.5	89 ○
3.3 Ecological sustainability	51.5	42
3.3.1 GDP/unit of energy use	11.1	37
3.3.2 Environmental performance*	78.1	48
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	3.0	34

4 Market sophistication	61.5	15
4.1 Credit	45.5	39
4.1.1 Ease of getting credit*	65.0	40
4.1.2 Domestic credit to private sector, % GDP	66.6	45
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	71.2	6
4.2.1 Ease of protecting minority investors*	75.0	9
4.2.2 Market capitalization, % GDP	81.5	19
4.2.3 Venture capital deals/bn PPP\$ GDP	0.4	1 ●
4.3 Trade, competition, & market scale	67.7	44
4.3.1 Applied tariff rate, weighted mean, %	2.2	57
4.3.2 Intensity of local competition [†]	69.8	64
4.3.3 Domestic market scale, bn PPP\$	297.0	52

5 Business sophistication	61.5	5 ●
5.1 Knowledge workers	63.0	18
5.1.1 Knowledge-intensive employment, %	48.3	6
5.1.2 Firms offering formal training, % firms	18.6	78 ○
5.1.3 GERD performed by business, % of GDP	3.7	1 ●
5.1.4 GERD financed by business, % [Ⓐ]	37.0	40
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	28.4	4 ●
5.2 Innovation linkages	67.8	2 ●
5.2.1 University/industry research collaboration [†]	76.7	3 ●
5.2.2 State of cluster development [†]	53.8	33
5.2.3 GERD financed by abroad, % [Ⓐ]	49.2	4 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	12
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	8.0	8
5.3 Knowledge absorption	53.5	9
5.3.1 Intellectual property payments, % total trade	0.6	56
5.3.2 High-tech imports less re-imports, % total trade	11.4	29
5.3.3 ICT services imports, % total trade	2.1	22
5.3.4 FDI net inflows, % GDP	3.4	48
5.3.5 Research talent, % in business enterprise [Ⓐ]	83.7	1 ●

6 Knowledge & technology outputs	49.6	9
6.1 Knowledge creation	54.6	11
6.1.1 Patents by origin/bn PPP\$ GDP	4.5	26
6.1.2 PCT patent applications/bn PPP\$ GDP	6.2	7
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	45.8	11
6.1.5 Citable documents H index	47.4	16
6.2 Knowledge impact	37.2	42
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.2	82 ○
6.2.2 New businesses/th pop. 15–64	3.1	36
6.2.3 Computer software spending, % GDP	0.3	53
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	31.8	6
6.2.5 High- & medium-high-tech manufactures, %	0.3	37
6.3 Knowledge diffusion	57.1	8
6.3.1 Intellectual property receipts, % total trade	0.9	17
6.3.2 High-tech exports less re-exports, % total trade	15.8	8
6.3.3 ICT services exports, % total trade	10.6	1 ●
6.3.4 FDI net outflows, % GDP	2.1	28

7 Creative outputs	43.9	30
7.1 Intangible assets	49.3	40
7.1.1 Trademarks by origin/bn PPP\$ GDP	13.0	97 ○
7.1.2 Industrial designs by origin/bn PPP\$ GDP	3.7	32
7.1.3 ICTs & business model creation [†]	80.9	8
7.1.4 ICTs & organizational model creation [†]	75.5	11
7.2 Creative goods & services	33.2	24
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	1.3	8
7.2.2 National feature films/mn pop. 15–69	6.1	33
7.2.3 Global ent. & media market/th pop. 15–69	35.9	21
7.2.4 Printing & publishing manufactures, %	1.2	46
7.2.5 Creative goods exports, % total trade	1.8	27
7.3 Online creativity	43.7	25
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	23.2	24
7.3.2 Country-code TLDs/th pop. 15–69	13.5	35
7.3.3 Wikipedia edits/mn pop. 15–69	7.6	3 ●
7.3.4 Video uploads on YouTube/pop. 15–69	64.9	4

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	59.8
GDP (US\$ billions)	1,852.5
GDP per capita, PPP\$	35,708.3
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	47.0	29
Innovation Output Sub-Index	39.5	29
Innovation Input Sub-Index	54.4	29
Innovation Efficiency Ratio	0.7	31
Global Innovation Index 2016 (out of 128)	47.2	29

1 Institutions	71.9	38
1.1 Political environment	63.0	46
1.1.1 Political stability & safety*	72.2	46
1.1.2 Government effectiveness*	53.8	46
1.2 Regulatory environment	76.9	33
1.2.1 Regulatory quality*	60.8	42
1.2.2 Rule of law*	46.8	50
1.2.3 Cost of redundancy dismissal, salary weeks	8.0	1 ●
1.3 Business environment	75.9	44
1.3.1 Ease of starting a business*	89.4	54
1.3.2 Ease of resolving insolvency*	76.6	23
1.3.3 Ease of paying taxes*	61.7	91 ○

2 Human capital & research	46.3	32
2.1 Education	53.6	48
2.1.1 Expenditure on education, % GDP	4.2	75 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	23.3	38
2.1.3 School life expectancy, years	16.4	23
2.1.4 PISA scales in reading, maths, & science	485.0	31
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	11.4	36
2.2 Tertiary education	38.9	51
2.2.1 Tertiary enrolment, % gross [Ⓐ]	63.1	39
2.2.2 Graduates in science & engineering, % [Ⓐ]	20.2	55
2.2.3 Tertiary inbound mobility, % [Ⓐ]	4.7	39
2.3 Research & development (R&D)	46.5	21
2.3.1 Researchers, FTE/mn pop.	2,018.1	36
2.3.2 Gross expenditure on R&D, % GDP	1.3	26
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	84.5	9 ●
2.3.4 QS university ranking, average score top 3*	46.3	27

3 Infrastructure	61.8	19
3.1 Information & communication technologies (ICTs)	79.5	20
3.1.1 ICT access*	76.9	33
3.1.2 ICT use*	62.5	34
3.1.3 Government's online service*	87.0	17 ●
3.1.4 E-participation*	91.5	8 ●
3.2 General infrastructure	38.7	56
3.2.1 Electricity output, kWh/cap	4,597.4	47
3.2.2 Logistics performance*	78.2	21
3.2.3 Gross capital formation, % GDP	16.6	105 ○
3.3 Ecological sustainability	67.2	4 ●
3.3.1 GDP/unit of energy use	13.2	18
3.3.2 Environmental performance*	84.5	29
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	10.3	7 ●

4 Market sophistication	52.6	36
4.1 Credit	39.9	50
4.1.1 Ease of getting credit*	45.0	84 ○
4.1.2 Domestic credit to private sector, % GDP	88.0	34
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	38.5	71 ○
4.2.1 Ease of protecting minority investors*	63.3	41
4.2.2 Market capitalization, % GDP [Ⓐ]	27.3	53 ○
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	30
4.3 Trade, competition, & market scale	79.3	10 ●
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	71.8	45
4.3.3 Domestic market scale, bn PPP\$	2,220.6	12 ●

5 Business sophistication	39.6	35
5.1 Knowledge workers	47.6	40
5.1.1 Knowledge-intensive employment, %	35.7	35
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	0.7	25
5.1.4 GERD financed by business, % [Ⓐ]	46.2	26
5.1.5 Females employed w/advanced degrees, % total	11.5	60 ○
5.2 Innovation linkages	35.3	43
5.2.1 University/industry research collaboration [†]	44.7	43
5.2.2 State of cluster development [†]	72.6	4 ●
5.2.3 GERD financed by abroad, % [Ⓐ]	9.3	49
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	61 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	1.8	25
5.3 Knowledge absorption	35.8	51
5.3.1 Intellectual property payments, % total trade	0.9	39
5.3.2 High-tech imports less re-imports, % total trade	8.1	64
5.3.3 ICT services imports, % total trade	1.7	29
5.3.4 FDI net inflows, % GDP	0.8	109 ○
5.3.5 Research talent, % in business enterprise	38.6	34

6 Knowledge & technology outputs	36.1	26
6.1 Knowledge creation	30.9	31
6.1.1 Patents by origin/bn PPP\$ GDP	1.8	49
6.1.2 PCT patent applications/bn PPP\$ GDP	1.5	23
6.1.3 Utility models by origin/bn PPP\$ GDP [Ⓐ]	1.1	21
6.1.4 Scientific & technical articles/bn PPP\$ GDP	27.6	27
6.1.5 Citable documents H index	68.9	7 ●
6.2 Knowledge impact	51.0	9 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.2	80 ○
6.2.2 New businesses/th pop. 15–64	2.3	44
6.2.3 Computer software spending, % GDP	0.6	15 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	61.1	1 ●
6.2.5 High- & medium-high-tech manufactures, %	0.4	26
6.3 Knowledge diffusion	26.4	47
6.3.1 Intellectual property receipts, % total trade	0.6	22
6.3.2 High-tech exports less re-exports, % total trade	5.7	31
6.3.3 ICT services exports, % total trade	1.5	67
6.3.4 FDI net outflows, % GDP	0.9	54

7 Creative outputs	42.9	33
7.1 Intangible assets	53.5	27
7.1.1 Trademarks by origin/bn PPP\$ GDP [Ⓐ]	49.9	50
7.1.2 Industrial designs by origin/bn PPP\$ GDP [Ⓐ]	18.5	1 ●
7.1.3 ICTs & business model creation [†]	61.7	57
7.1.4 ICTs & organizational model creation [†]	50.5	75 ○
7.2 Creative goods & services	25.8	44
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.3	41
7.2.2 National feature films/mn pop. 15–69	4.4	45
7.2.3 Global ent. & media market/th pop. 15–69	28.1	23
7.2.4 Printing & publishing manufactures, %	1.2	48
7.2.5 Creative goods exports, % total trade	2.3	19
7.3 Online creativity	38.6	29
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	23.1	25
7.3.2 Country-code TLDs/th pop. 15–69	21.4	26
7.3.3 Wikipedia edits/mn pop. 15–69	6.5	29
7.3.4 Video uploads on YouTube/pop. 15–69	47.3	19

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Jamaica

Key indicators

Population (millions)	2.8
GDP (US\$ billions)	13.8
GDP per capita, PPP\$	8,758.5
Income group	Upper-middle income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	30.4	84
Innovation Output Sub-Index	22.0	84
Innovation Input Sub-Index	38.7	84
Innovation Efficiency Ratio	0.6	86
Global Innovation Index 2016 (out of 128)	29.0	89

1 Institutions 65.8 **57**

1.1 Political environment	57.3	51
1.1.1 Political stability & safety*	66.1	56
1.1.2 Government effectiveness*	48.5	55
1.2 Regulatory environment	63.4	67
1.2.1 Regulatory quality*	44.9	68
1.2.2 Rule of law*	32.6	72
1.2.3 Cost of redundancy dismissal, salary weeks	14.0	54
1.3 Business environment	76.6	40
1.3.1 Ease of starting a business*	95.6	12 ●
1.3.2 Ease of resolving insolvency*	69.2	35 ●
1.3.3 Ease of paying taxes*	65.2	85

2 Human capital & research 23.8 **88**

2.1 Education	47.9	62
2.1.1 Expenditure on education, % GDP	5.4	34 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	27.1	19 ●
2.1.3 School life expectancy, years	n/a	n/a
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	16.4	72
2.2 Tertiary education	23.4	[98]
2.2.1 Tertiary enrolment, % gross	27.2	85
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, %	n/a	n/a
2.3 Research & development (R&D)	0.0	115 ○
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	n/a	n/a
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure 32.8 **108**

3.1 Information & communication technologies (ICTs)	36.6	96
3.1.1 ICT access*	48.3	85
3.1.2 ICT use*	35.5	76
3.1.3 Government's online service*	35.5	103
3.1.4 E-participation*	27.1	110 ○
3.2 General infrastructure	18.9	120 ○
3.2.1 Electricity output, kWh/cap	1,516.2	86
3.2.2 Logistics performance*	15.6	111 ○
3.2.3 Gross capital formation, % GDP	15.4	109 ○
3.3 Ecological sustainability	42.9	73
3.3.1 GDP/unit of energy use	8.1	69
3.3.2 Environmental performance*	77.0	53
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.5	82

4 Market sophistication 39.8 **95**

4.1 Credit	31.2	75
4.1.1 Ease of getting credit*	80.0	15 ●
4.1.2 Domestic credit to private sector, % GDP	29.9	99
4.1.3 Microfinance gross loans, % GDP	0.1	53

4.2 Investment	43.8	44
4.2.1 Ease of protecting minority investors*	58.3	62
4.2.2 Market capitalization, % GDP ^②	34.7	43
4.2.3 Venture capital deals/bn PPP\$ GDP	n/a	n/a
4.3 Trade, competition, & market scale	44.4	117 ○
4.3.1 Applied tariff rate, weighted mean, % ^②	9.6	112 ○
4.3.2 Intensity of local competition [†]	74.8	27 ●
4.3.3 Domestic market scale, bn PPP\$	25.4	115 ○

5 Business sophistication 31.3 **69**

5.1 Knowledge workers	32.1	[81]
5.1.1 Knowledge-intensive employment, % ^②	20.1	73
5.1.2 Firms offering formal training, % firms ^②	25.9	60
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	28.9	58
5.2.1 University/industry research collaboration [†]	40.8	64
5.2.2 State of cluster development [†]	44.3	70
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	34
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.2	55
5.3 Knowledge absorption	32.9	64
5.3.1 Intellectual property payments, % total trade	1.0	35 ●
5.3.2 High-tech imports less re-imports, % total trade	6.0	93
5.3.3 ICT services imports, % total trade	1.5	41
5.3.4 FDI net inflows, % GDP	4.9	28 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs 14.4 **108**

6.1 Knowledge creation	4.8	88
6.1.1 Patents by origin/bn PPP\$ GDP	0.3	89
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	6.6	82
6.1.5 Citable documents H index	4.3	99
6.2 Knowledge impact	22.0	100
6.2.1 Growth rate of PPP\$ GDP/worker, %	(0.5)	93
6.2.2 New businesses/th pop. 15–64	1.0	70
6.2.3 Computer software spending, % GDP	0.3	38 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	1.1	108
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	16.3	106
6.3.1 Intellectual property receipts, % total trade	0.1	51
6.3.2 High-tech exports less re-exports, % total trade	0.0	124 ○
6.3.3 ICT services exports, % total trade	2.3	47
6.3.4 FDI net outflows, % GDP	(0.2)	118 ○

7 Creative outputs 29.7 **67**

7.1 Intangible assets	52.7	29 ●
7.1.1 Trademarks by origin/bn PPP\$ GDP	126.4	6 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	2.6	39
7.1.3 ICTs & business model creation [†]	62.0	55
7.1.4 ICTs & organizational model creation [†]	50.7	74
7.2 Creative goods & services	2.0	[120]
7.2.1 Cultural & creative services exports, % of total trade	0.1	60
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.0	108 ○
7.3 Online creativity	11.3	95
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.9	78
7.3.2 Country-code TLDs/th pop. 15–69	1.0	81
7.3.3 Wikipedia edits/mn pop. 15–69 ^②	3.2	98
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

② 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 181 of this appendix for details.

Key indicators

Population (millions)	126.3
GDP (US\$ billions)	4,730.3
GDP per capita, PPP\$	38,054.2
Income group	High income
Region	South East Asia, East Asia, and Oceania

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	54.7	14
Innovation Output Sub-Index	44.0	20
Innovation Input Sub-Index	65.5	11
Innovation Efficiency Ratio	0.7	49
Global Innovation Index 2016 (out of 128)	54.5	16

1 Institutions 87.4 **13**

1.1 Political environment	87.9	11
1.1.1 Political stability & safety*	87.6	15
1.1.2 Government effectiveness*	88.2	10
1.2 Regulatory environment	89.0	14
1.2.1 Regulatory quality*	72.2	24
1.2.2 Rule of law*	83.6	19
1.2.3 Cost of redundancy dismissal, salary weeks	8.0	1 ●
1.3 Business environment	85.5	21
1.3.1 Ease of starting a business*	86.1	72
1.3.2 Ease of resolving insolvency*	93.3	2 ●
1.3.3 Ease of paying taxes*	77.0	59

2 Human capital & research 56.7 **14**

2.1 Education	53.8	46
2.1.1 Expenditure on education, % GDP	3.8	85 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	25.1	29
2.1.3 School life expectancy, years	15.4	39
2.1.4 PISA scales in reading, maths, & science	528.9	3 ●
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	11.7	38
2.2 Tertiary education	37.1	60
2.2.1 Tertiary enrolment, % gross [Ⓐ]	63.4	37
2.2.2 Graduates in science & engineering, %	19.9	59 ○
2.2.3 Tertiary inbound mobility, % [Ⓐ]	3.4	53
2.3 Research & development (R&D)	79.4	3 ●
2.3.1 Researchers, FTE/mn pop.	5,230.7	9
2.3.2 Gross expenditure on R&D, % GDP	3.5	3 ●
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	93.2	4 ●
2.3.4 QS university ranking, average score top 3*	79.7	8

3 Infrastructure 64.3 **9**

3.1 Information & communication technologies (ICTs)	88.8	5
3.1.1 ICT access*	88.0	10
3.1.2 ICT use*	81.4	8
3.1.3 Government's online service*	87.7	15
3.1.4 E-participation*	98.3	2 ●
3.2 General infrastructure	49.7	28
3.2.1 Electricity output, kWh/cap	7,948.1	20
3.2.2 Logistics performance*	88.2	12
3.2.3 Gross capital formation, % GDP	21.5	71
3.3 Ecological sustainability	54.3	32
3.3.1 GDP/unit of energy use	10.2	46
3.3.2 Environmental performance*	80.6	39
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	5.4	20

4 Market sophistication 64.3 **12**

4.1 Credit	61.8	12
4.1.1 Ease of getting credit*	50.0	72 ○
4.1.2 Domestic credit to private sector, % GDP	182.9	4 ●
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	43.7	45
4.2.1 Ease of protecting minority investors*	60.0	52
4.2.2 Market capitalization, % GDP	111.7	7
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	49
4.3 Trade, competition, & market scale	87.5	3 ●
4.3.1 Applied tariff rate, weighted mean, %	1.4	20
4.3.2 Intensity of local competition [†]	87.1	1 ●
4.3.3 Domestic market scale, bn PPP\$	4,931.9	4 ●

5 Business sophistication 54.5 **11**

5.1 Knowledge workers	64.1	15
5.1.1 Knowledge-intensive employment, %	24.8	55
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	2.7	3 ●
5.1.4 GERD financed by business, %	78.0	1 ●
5.1.5 Females employed w/advanced degrees, % total	20.3	22
5.2 Innovation linkages	45.3	19
5.2.1 University/industry research collaboration [†]	62.5	17
5.2.2 State of cluster development [†]	70.3	7
5.2.3 GERD financed by abroad, %	0.5	92 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	38
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	15.5	1 ●
5.3 Knowledge absorption	54.1	8
5.3.1 Intellectual property payments, % total trade	2.2	9
5.3.2 High-tech imports less re-imports, % total trade	14.9	15
5.3.3 ICT services imports, % total trade	1.5	43
5.3.4 FDI net inflows, % GDP	0.2	122 ○
5.3.5 Research talent, % in business enterprise	73.4	3 ●

6 Knowledge & technology outputs 47.1 **12**

6.1 Knowledge creation	56.7	9
6.1.1 Patents by origin/bn PPP\$ GDP	53.4	1 ●
6.1.2 PCT patent applications/bn PPP\$ GDP	9.2	1 ●
6.1.3 Utility models by origin/bn PPP\$ GDP	1.1	22
6.1.4 Scientific & technical articles/bn PPP\$ GDP	15.1	51
6.1.5 Citable documents H index	71.8	6
6.2 Knowledge impact	33.2	55
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.1	85 ○
6.2.2 New businesses/th pop. 15–64	0.2	96 ○
6.2.3 Computer software spending, % GDP	0.3	60
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	9.7	37
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.5	9
6.3 Knowledge diffusion	51.6	10
6.3.1 Intellectual property receipts, % total trade	4.7	2 ●
6.3.2 High-tech exports less re-exports, % total trade	12.8	16
6.3.3 ICT services exports, % total trade	0.4	105 ○
6.3.4 FDI net outflows, % GDP	2.9	21

7 Creative outputs 40.8 **36**

7.1 Intangible assets	52.0	30
7.1.1 Trademarks by origin/bn PPP\$ GDP	59.9	35
7.1.2 Industrial designs by origin/bn PPP\$ GDP	5.1	24
7.1.3 ICTs & business model creation [†]	71.3	29
7.1.4 ICTs & organizational model creation [†]	66.3	27
7.2 Creative goods & services	34.3	21
7.2.1 Cultural & creative services exports, % of total trade	0.1	55 ○
7.2.2 National feature films/mn pop. 15–69	6.7	26
7.2.3 Global ent. & media market/th pop. 15–69	61.8	10
7.2.4 Printing & publishing manufactures, % [Ⓐ]	2.1	20
7.2.5 Creative goods exports, % total trade	2.2	20
7.3 Online creativity	25.1	50
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	15.1	31
7.3.2 Country-code TLDs/th pop. 15–69	5.1	49
7.3.3 Wikipedia edits/mn pop. 15–69	5.7	47
7.3.4 Video uploads on YouTube/pop. 15–69	25.3	49 ○

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Jordan

Key indicators

Population (millions)	7.7
GDP (US\$ billions)	39.5
GDP per capita, PPP\$	12,122.9
Income group	Upper-middle income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	30.5	83
Innovation Output Sub-Index	24.0	74
Innovation Input Sub-Index	37.1	92
Innovation Efficiency Ratio	0.6	57
Global Innovation Index 2016 (out of 128)	30.0	82

1 Institutions	61.6	64
1.1 Political environment	47.8	73
1.1.1 Political stability & safety*	49.9	91
1.1.2 Government effectiveness*	45.6	62
1.2 Regulatory environment	74.1	36 ●
1.2.1 Regulatory quality*	43.3	69
1.2.2 Rule of law*	52.9	44
1.2.3 Cost of redundancy dismissal, salary weeks	8.0	1 ●
1.3 Business environment	63.0	82
1.3.1 Ease of starting a business*	84.6	81
1.3.2 Ease of resolving insolvency*	30.4	115 ○
1.3.3 Ease of paying taxes*	73.9	64

2 Human capital & research	26.7	83
2.1 Education	32.3	105 ○
2.1.1 Expenditure on education, % GDP	n/a	n/a
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	16.5	71
2.1.3 School life expectancy, years [Ⓐ]	12.8	80
2.1.4 PISA scales in reading, maths, & science	399.0	62 ○
2.1.5 Pupil-teacher ratio, secondary	n/a	n/a
2.2 Tertiary education	41.2	43
2.2.1 Tertiary enrolment, % gross	44.9	59
2.2.2 Graduates in science & engineering, % [Ⓐ]	16.1	78 ○
2.2.3 Tertiary inbound mobility, %	12.9	13 ●
2.3 Research & development (R&D)	6.7	68
2.3.1 Researchers, FTE/mn pop.	308.0	70
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.4	70
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	13.3	58

3 Infrastructure	40.1	87
3.1 Information & communication technologies (ICTs)	46.1	87
3.1.1 ICT access*	61.0	70
3.1.2 ICT use*	32.0	83
3.1.3 Government's online service*	45.7	91
3.1.4 E-participation*	45.8	95
3.2 General infrastructure	31.0	89
3.2.1 Electricity output, kWh/cap.	2,756.4	64
3.2.2 Logistics performance*	41.3	66
3.2.3 Gross capital formation, % GDP	19.5	88
3.3 Ecological sustainability	43.0	72
3.3.1 GDP/unit of energy use	9.1	60
3.3.2 Environmental performance*	72.2	68
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.8	71

4 Market sophistication	32.3	116 ○
4.1 Credit	11.8	124 ○
4.1.1 Ease of getting credit*	0.0	126 ○
4.1.2 Domestic credit to private sector, % GDP	70.3	42 ●
4.1.3 Microfinance gross loans, % GDP	0.4	36

4.2 Investment	25.6	122 ○
4.2.1 Ease of protecting minority investors*	35.0	121 ○
4.2.2 Market capitalization, % GDP	67.8	23 ●
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	65
4.3 Trade, competition, & market scale	59.5	74
4.3.1 Applied tariff rate, weighted mean, %	4.0	79
4.3.2 Intensity of local competition [†]	73.3	37 ●
4.3.3 Domestic market scale, bn PPP\$	86.2	76

5 Business sophistication	24.7	[104]
5.1 Knowledge workers	0.0	[127]
5.1.1 Knowledge-intensive employment, %	n/a	n/a
5.1.2 Firms offering formal training, % firms	3.4	92 ○
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	34.7	45
5.2.1 University/industry research collaboration [†]	47.3	37 ●
5.2.2 State of cluster development [†]	54.7	30 ●
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	32 ●
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	65
5.3 Knowledge absorption	39.3	[34]
5.3.1 Intellectual property payments, % total trade	n/a	n/a
5.3.2 High-tech imports less re-imports, % total trade	6.8	79
5.3.3 ICT services imports, % total trade	n/a	n/a
5.3.4 FDI net inflows, % GDP	4.8	29 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	19.3	79
6.1 Knowledge creation	10.8	62
6.1.1 Patents by origin/bn PPP\$ GDP	0.5	76
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	16.0	46
6.1.5 Citable documents H index	7.8	77
6.2 Knowledge impact	26.2	85
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.4	72
6.2.2 New businesses/th pop. 15–64	1.0	71
6.2.3 Computer software spending, % GDP	0.3	54
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	4.1	69
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.2	55
6.3 Knowledge diffusion	21.0	68
6.3.1 Intellectual property receipts, % total trade	n/a	n/a
6.3.2 High-tech exports less re-exports, % total trade	0.7	73
6.3.3 ICT services exports, % total trade	n/a	n/a
6.3.4 FDI net outflows, % GDP	0.1	92

7 Creative outputs	28.6	72
7.1 Intangible assets	38.9	79
7.1.1 Trademarks by origin/bn PPP\$ GDP	32.9	68
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.7	73
7.1.3 ICTs & business model creation [†]	64.6	48
7.1.4 ICTs & organizational model creation [†]	53.3	64
7.2 Creative goods & services	17.2	68
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	1.7	53 ○
7.2.4 Printing & publishing manufactures, % [Ⓐ]	1.2	51
7.2.5 Creative goods exports, % total trade	1.0	42 ●
7.3 Online creativity	19.4	63
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	6.6	49
7.3.2 Country-code TLDs/th pop. 15–69	0.3	98 ○
7.3.3 Wikipedia edits/mn pop. 15–69	5.4	52
7.3.4 Video uploads on YouTube/pop. 15–69	18.8	59 ○

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	17.9
GDP (US\$ billions)	128.1
GDP per capita, PPP\$	24,267.9
Income group	Upper-middle income
Region	Central and Southern Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	31.5	78
Innovation Output Sub-Index	19.8	93
Innovation Input Sub-Index	43.2	64
Innovation Efficiency Ratio	0.5	116 ○
Global Innovation Index 2016 (out of 128)	31.5	75

1 Institutions **66.1** **55**

1.1 Political environment	51.1	67
1.1.1 Political stability & safety*	61.5	69
1.1.2 Government effectiveness*	40.8	75
1.2 Regulatory environment	66.9	54
1.2.1 Regulatory quality*	41.5	71
1.2.2 Rule of law*	28.7	83
1.2.3 Cost of redundancy dismissal, salary weeks	8.7	22 ●
1.3 Business environment	80.2	31 ●
1.3.1 Ease of starting a business*	91.9	38
1.3.2 Ease of resolving insolvency*	69.2	34 ●
1.3.3 Ease of paying taxes*	79.5	51

2 Human capital & research **31.0** **71**

2.1 Education	43.4	78
2.1.1 Expenditure on education, % GDP	2.8	104 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	19.2	56
2.1.3 School life expectancy, years	15.0	48
2.1.4 PISA scales in reading, maths, & science [Ⓐ]	416.4	53
2.1.5 Pupil-teacher ratio, secondary	6.8	1 ●
2.2 Tertiary education	37.7	57
2.2.1 Tertiary enrolment, % gross	46.3	57
2.2.2 Graduates in science & engineering, %	25.7	26 ●
2.2.3 Tertiary inbound mobility, %	2.0	68
2.3 Research & development (R&D)	11.9	55
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	734.1	54
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.2	92
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	35.1	35 ●

3 Infrastructure **47.9** **60**

3.1 Information & communication technologies (ICTs)	65.8	46
3.1.1 ICT access*	75.6	37
3.1.2 ICT use*	51.5	57
3.1.3 Government's online service*	76.8	31 ●
3.1.4 E-participation*	59.3	65
3.2 General infrastructure	41.3	49
3.2.1 Electricity output, kWh/cap	6,076.8	33 ●
3.2.2 Logistics performance*	31.9	77
3.2.3 Gross capital formation, % GDP	28.1	28 ●
3.3 Ecological sustainability	36.5	94
3.3.1 GDP/unit of energy use	5.1	102
3.3.2 Environmental performance*	73.3	64
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.3	99

4 Market sophistication **43.2** **80**

4.1 Credit	23.5	105
4.1.1 Ease of getting credit*	55.0	67
4.1.2 Domestic credit to private sector, % GDP	37.7	85
4.1.3 Microfinance gross loans, % GDP	0.1	59

4.2 Investment	42.2	53
4.2.1 Ease of protecting minority investors*	80.0	3 ●
4.2.2 Market capitalization, % GDP	18.9	62
4.2.3 Venture capital deals/bn PPP\$ GDP [Ⓐ]	0.0	88 ○
4.3 Trade, competition, & market scale	64.0	52
4.3.1 Applied tariff rate, weighted mean, %	4.7	86
4.3.2 Intensity of local competition [†]	60.5	97
4.3.3 Domestic market scale, bn PPP\$	460.7	39

5 Business sophistication **27.6** **87**

5.1 Knowledge workers	38.9	58
5.1.1 Knowledge-intensive employment, %	33.3	41
5.1.2 Firms offering formal training, % firms	28.3	55
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.0	70
5.1.4 GERD financed by business, % [Ⓐ]	28.9	52
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	17.5	29
5.2 Innovation linkages	16.5	121 ○
5.2.1 University/industry research collaboration [†]	40.9	63
5.2.2 State of cluster development [†]	33.3	109 ○
5.2.3 GERD financed by abroad, % [Ⓐ]	0.8	88 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	78
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.2	57
5.3 Knowledge absorption	27.5	89
5.3.1 Intellectual property payments, % total trade	0.3	75
5.3.2 High-tech imports less re-imports, % total trade	7.6	69
5.3.3 ICT services imports, % total trade	0.7	82
5.3.4 FDI net inflows, % GDP	3.7	43
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs **17.8** **88**

6.1 Knowledge creation	10.7	64
6.1.1 Patents by origin/bn PPP\$ GDP	2.9	35
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	76
6.1.3 Utility models by origin/bn PPP\$ GDP	1.0	26
6.1.4 Scientific & technical articles/bn PPP\$ GDP	1.8	118 ○
6.1.5 Citable documents H index	3.6	107
6.2 Knowledge impact	21.9	101
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.0	57
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	1.7	50
6.2.3 Computer software spending, % GDP	0.0	119 ○
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	1.1	106
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	67
6.3 Knowledge diffusion	20.9	69
6.3.1 Intellectual property receipts, % total trade	0.0	101 ○
6.3.2 High-tech exports less re-exports, % total trade	5.9	30 ●
6.3.3 ICT services exports, % total trade	0.3	109 ○
6.3.4 FDI net outflows, % GDP	1.2	46

7 Creative outputs **21.9** **95**

7.1 Intangible assets	32.1	99
7.1.1 Trademarks by origin/bn PPP\$ GDP [Ⓐ]	16.7	90
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.2	96
7.1.3 ICTs & business model creation [†]	54.4	85
7.1.4 ICTs & organizational model creation [†]	49.2	77
7.2 Creative goods & services	5.6	107
7.2.1 Cultural & creative services exports, % of total trade	0.0	77
7.2.2 National feature films/mn pop. 15–69	1.3	73
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.7	79
7.2.5 Creative goods exports, % total trade	0.2	80
7.3 Online creativity	17.7	72
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.3	112 ○
7.3.2 Country-code TLDs/th pop. 15–69	3.1	57
7.3.3 Wikipedia edits/mn pop. 15–69	5.2	56
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Kenya

Key indicators

Population (millions)	47.3
GDP (US\$ billions)	69.2
GDP per capita, PPP\$	3,207.7
Income group	Lower-middle income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	31.0	80
Innovation Output Sub-Index	24.7	70
Innovation Input Sub-Index	37.2	91
Innovation Efficiency Ratio	0.7	50
Global Innovation Index 2016 (out of 128)	30.4	80
1 Institutions	53.8	84
1.1 Political environment	33.7	109
1.1.1 Political stability & safety*	32.5	118 ○
1.1.2 Government effectiveness*	34.8	87
1.2 Regulatory environment	64.9	63
1.2.1 Regulatory quality*	34.6	89
1.2.2 Rule of law*	25.1	91
1.2.3 Cost of redundancy dismissal, salary weeks	8.0	1 ●
1.3 Business environment	62.7	83
1.3.1 Ease of starting a business*	83.1	90
1.3.2 Ease of resolving insolvency*	43.4	83
1.3.3 Ease of paying taxes*	61.7	90
2 Human capital & research	14.1	119 ○
2.1 Education	33.3	104
2.1.1 Expenditure on education, % GDP	5.3	39
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	24.9	31
2.1.3 School life expectancy, years [Ⓐ]	11.1	94
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	41.1	111 ○
2.2 Tertiary education	2.9	[122]
2.2.1 Tertiary enrolment, % gross [Ⓐ]	4.0	118 ○
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, %	n/a	n/a
2.3 Research & development (R&D)	6.2	73
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	230.7	73
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.8	45
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	4.3	73
3 Infrastructure	36.7	97
3.1 Information & communication technologies (ICTs)	41.1	93
3.1.1 ICT access*	35.4	103
3.1.2 ICT use*	20.5	99
3.1.3 Government's online service*	55.8	75
3.1.4 E-participation*	52.5	82
3.2 General infrastructure	36.5	69
3.2.1 Electricity output, kWh/cap.	206.4	111 ○
3.2.2 Logistics performance*	58.6	41
3.2.3 Gross capital formation, % GDP	22.5	59
3.3 Ecological sustainability	32.5	112
3.3.1 GDP/unit of energy use	5.2	101
3.3.2 Environmental performance*	62.5	99
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.4	90
4 Market sophistication	48.2	56
4.1 Credit	53.0	22 ●
4.1.1 Ease of getting credit*	70.0	29
4.1.2 Domestic credit to private sector, % GDP	34.9	92
4.1.3 Microfinance gross loans, % GDP	4.3	9 ●

4.2 Investment	33.4	93
4.2.1 Ease of protecting minority investors*	53.3	80
4.2.2 Market capitalization, % GDP [Ⓐ]	24.3	58
4.2.3 Venture capital deals/bn PPP\$ GDP	0.1	29
4.3 Trade, competition, & market scale	58.3	76
4.3.1 Applied tariff rate, weighted mean, %	7.6	107
4.3.2 Intensity of local competition [†]	77.2	18 ●
4.3.3 Domestic market scale, bn PPP\$	152.7	67
5 Business sophistication	33.2	62
5.1 Knowledge workers	26.4	95
5.1.1 Knowledge-intensive employment, %	n/a	n/a
5.1.2 Firms offering formal training, % firms	40.6	33
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.1	68
5.1.4 GERD financed by business, % [Ⓐ]	4.3	79
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	47.5	11 ●
5.2.1 University/industry research collaboration [†]	57.6	25 ●
5.2.2 State of cluster development [†]	52.6	38
5.2.3 GERD financed by abroad, % [Ⓐ]	47.1	6 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	44
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	91
5.3 Knowledge absorption	25.7	94
5.3.1 Intellectual property payments, % total trade [Ⓐ]	1.0	34
5.3.2 High-tech imports less re-imports, % total trade [Ⓐ]	10.8	36 ●
5.3.3 ICT services imports, % total trade [Ⓐ]	0.1	120 ○
5.3.4 FDI net inflows, % GDP	1.5	96
5.3.5 Research talent, % in business enterprise [Ⓐ]	11.4	64
6 Knowledge & technology outputs	21.6	63
6.1 Knowledge creation	11.7	59
6.1.1 Patents by origin/bn PPP\$ GDP	1.0	65
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	93 ○
6.1.3 Utility models by origin/bn PPP\$ GDP	0.8	30
6.1.4 Scientific & technical articles/bn PPP\$ GDP	11.6	61
6.1.5 Citable documents H index	14.0	52
6.2 Knowledge impact	29.6	71
6.2.1 Growth rate of PPP\$ GDP/worker, %	2.8	22 ●
6.2.2 New businesses/th pop. 15–64	1.8	49
6.2.3 Computer software spending, % GDP	0.2	74
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	4.6	64
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	78
6.3 Knowledge diffusion	23.5	61
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.4	28 ●
6.3.2 High-tech exports less re-exports, % total trade [Ⓐ]	0.6	79
6.3.3 ICT services exports, % total trade [Ⓐ]	4.3	17 ●
6.3.4 FDI net outflows, % GDP	(0.0)	111 ○
7 Creative outputs	27.8	79
7.1 Intangible assets	40.9	71
7.1.1 Trademarks by origin/bn PPP\$ GDP	32.9	67
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.5	78
7.1.3 ICTs & business model creation [†]	67.8	37
7.1.4 ICTs & organizational model creation [†]	57.5	46
7.2 Creative goods & services	22.9	49
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.0	88 ○
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	2.3	50
7.2.4 Printing & publishing manufactures, % [Ⓐ]	3.8	4 ●
7.2.5 Creative goods exports, % total trade [Ⓐ]	0.3	68
7.3 Online creativity	6.6	106
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.1	93
7.3.2 Country-code TLDs/th pop. 15–69	0.7	86
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	2.4	105
7.3.4 Video uploads on YouTube/pop. 15–69	1.0	70 ○

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	50.5
GDP (US\$ billions)	1,404.4
GDP per capita, PPP\$	36,511.0
Income group	High income
Region	South East Asia, East Asia, and Oceania

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	57.7	11
Innovation Output Sub-Index	52.1	9
Innovation Input Sub-Index	63.3	16
Innovation Efficiency Ratio	0.8	14
Global Innovation Index 2016 (out of 128)	57.1	11

1 Institutions	74.5	35
1.1 Political environment	67.4	42
1.1.1 Political stability & safety*	66.2	55
1.1.2 Government effectiveness*	68.5	34
1.2 Regulatory environment	65.5	61
1.2.1 Regulatory quality*	71.7	26
1.2.2 Rule of law*	67.3	30
1.2.3 Cost of redundancy dismissal, salary weeks	27.4	107 ○
1.3 Business environment	90.5	3 ●
1.3.1 Ease of starting a business*	95.8	11
1.3.2 Ease of resolving insolvency*	89.2	4 ●
1.3.3 Ease of paying taxes*	86.6	21
2 Human capital & research	66.2	2 ●
2.1 Education	55.6	40
2.1.1 Expenditure on education, % GDP [Ⓐ]	4.6	62
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	23.4	37
2.1.3 School life expectancy, years [Ⓐ]	16.6	18
2.1.4 PISA scales in reading, maths, & science	519.1	7
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	15.6	68
2.2 Tertiary education	54.8	15
2.2.1 Tertiary enrolment, % gross [Ⓐ]	95.3	2 ●
2.2.2 Graduates in science & engineering, % [Ⓐ]	31.9	8
2.2.3 Tertiary inbound mobility, % [Ⓐ]	1.7	75 ○
2.3 Research & development (R&D)	88.2	1 ●
2.3.1 Researchers, FTE/mn pop.	7,087.4	3 ●
2.3.2 Gross expenditure on R&D, % GDP	4.2	2 ●
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	92.8	5
2.3.4 QS university ranking, average score top 3*	75.7	9
3 Infrastructure	63.4	13
3.1 Information & communication technologies (ICTs)	91.6	2 ●
3.1.1 ICT access*	89.9	8
3.1.2 ICT use*	85.7	3 ●
3.1.3 Government's online service*	94.2	5
3.1.4 E-participation*	96.6	4 ●
3.2 General infrastructure	57.6	11
3.2.1 Electricity output, kWh/cap	10,756.7	11
3.2.2 Logistics performance*	76.5	24
3.2.3 Gross capital formation, % GDP	28.9	22
3.3 Ecological sustainability	40.9	79
3.3.1 GDP/unit of energy use	6.3	91 ○
3.3.2 Environmental performance*	70.6	73
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	2.9	37
4 Market sophistication	61.6	14
4.1 Credit	60.6	13
4.1.1 Ease of getting credit*	65.0	40
4.1.2 Domestic credit to private sector, % GDP	140.6	11
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	47.6	32
4.2.1 Ease of protecting minority investors*	73.3	13
4.2.2 Market capitalization, % GDP	89.4	12
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	53
4.3 Trade, competition, & market scale	76.5	18
4.3.1 Applied tariff rate, weighted mean, %	4.8	88 ○
4.3.2 Intensity of local competition [†]	81.9	7
4.3.3 Domestic market scale, bn PPP\$	1,928.6	13

5 Business sophistication	51.1	17
5.1 Knowledge workers	61.3	22
5.1.1 Knowledge-intensive employment, %	21.4	68 ○
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	3.3	2 ●
5.1.4 GERD financed by business, %	74.5	3 ●
5.1.5 Females employed w/advanced degrees, % total	16.2	35
5.2 Innovation linkages	41.0	28
5.2.1 University/industry research collaboration [†]	56.0	28
5.2.2 State of cluster development [†]	58.6	27
5.2.3 GERD financed by abroad, %	0.8	89 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	43
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	16.3	1 ●
5.3 Knowledge absorption	50.9	12
5.3.1 Intellectual property payments, % total trade	1.7	17
5.3.2 High-tech imports less re-imports, % total trade	15.2	14
5.3.3 ICT services imports, % total trade	0.5	100 ○
5.3.4 FDI net inflows, % GDP	0.7	111 ○
5.3.5 Research talent, % in business enterprise	79.7	2 ●

6 Knowledge & technology outputs	54.7	6
6.1 Knowledge creation	80.4	2 ●
6.1.1 Patents by origin/bn PPP\$ GDP	90.3	1 ●
6.1.2 PCT patent applications/bn PPP\$ GDP	8.1	1 ●
6.1.3 Utility models by origin/bn PPP\$ GDP	4.5	1 ●
6.1.4 Scientific & technical articles/bn PPP\$ GDP	29.2	25
6.1.5 Citable documents H index	41.8	19
6.2 Knowledge impact	38.8	38
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.3	48
6.2.2 New businesses/th pop. 15–64	2.3	45
6.2.3 Computer software spending, % GDP	0.3	50
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	6.5	55
6.2.5 High- & medium-high-tech manufactures, %	0.5	8
6.3 Knowledge diffusion	45.0	13
6.3.1 Intellectual property receipts, % total trade	1.0	14
6.3.2 High-tech exports less re-exports, % total trade	24.8	5
6.3.3 ICT services exports, % total trade	0.6	94 ○
6.3.4 FDI net outflows, % GDP	2.1	30

7 Creative outputs	49.4	15
7.1 Intangible assets	70.4	3 ●
7.1.1 Trademarks by origin/bn PPP\$ GDP	103.3	14
7.1.2 Industrial designs by origin/bn PPP\$ GDP	35.6	1 ●
7.1.3 ICTs & business model creation [†]	76.7	18
7.1.4 ICTs & organizational model creation [†]	66.8	26
7.2 Creative goods & services	28.0	35
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.3	42
7.2.2 National feature films/mn pop. 15–69	6.9	24
7.2.3 Global ent. & media market/th pop. 15–69	47.1	19
7.2.4 Printing & publishing manufactures, %	0.3	97 ○
7.2.5 Creative goods exports, % total trade	3.1	16
7.3 Online creativity	28.8	40
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	8.2	43
7.3.2 Country-code TLDs/th pop. 15–69	8.0	42
7.3.3 Wikipedia edits/mn pop. 15–69	5.6	50
7.3.4 Video uploads on YouTube/pop. 15–69	45.4	21

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Kuwait

Key indicators

Population (millions)	4.0
GDP (US\$ billions)	110.5
GDP per capita, PPP\$	70,166.0
Income group	High income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	36.1	56
Innovation Output Sub-Index	31.9	45
Innovation Input Sub-Index	40.3	80
Innovation Efficiency Ratio	0.8	18 ●
Global Innovation Index 2016 (out of 128)	33.6	67

1 Institutions	55.8	76
1.1 Political environment	51.4	66
1.1.1 Political stability & safety*	61.2	71
1.1.2 Government effectiveness*	41.5	71
1.2 Regulatory environment	49.7	100
1.2.1 Regulatory quality*	38.1	77
1.2.2 Rule of law*	40.4	58
1.2.3 Cost of redundancy dismissal, salary weeks	28.1	113 ○
1.3 Business environment	66.3	74
1.3.1 Ease of starting a business*	66.8	121 ○
1.3.2 Ease of resolving insolvency*	39.6	96
1.3.3 Ease of paying taxes*	92.5	6 ●

2 Human capital & research	31.3	68
2.1 Education	48.0	61
2.1.1 Expenditure on education, % GDP	n/a	n/a
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	17.6	65
2.1.3 School life expectancy, years [Ⓐ]	13.2	68
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	7.2	3 ●
2.2 Tertiary education	42.6	41
2.2.1 Tertiary enrolment, % gross [Ⓐ]	27.0	86
2.2.2 Graduates in science & engineering, %	26.7	21 ●
2.2.3 Tertiary inbound mobility, %	n/a	n/a
2.3 Research & development (R&D)	3.4	86
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	128.4	83
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.3	80
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	5.3	70

3 Infrastructure	51.4	49
3.1 Information & communication technologies (ICTs)	66.3	45
3.1.1 ICT access*	74.0	39
3.1.2 ICT use*	61.5	36 ●
3.1.3 Government's online service*	65.2	53
3.1.4 E-participation*	64.4	54
3.2 General infrastructure	50.9	23 ●
3.2.1 Electricity output, kWh/cap	17,370.7	6 ●
3.2.2 Logistics performance*	50.3	52
3.2.3 Gross capital formation, % GDP	23.5	52
3.3 Ecological sustainability	36.9	92
3.3.1 GDP/unit of energy use	7.6	76
3.3.2 Environmental performance*	64.4	95
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.3	93

4 Market sophistication	47.8	58
4.1 Credit	39.6	51
4.1.1 Ease of getting credit*	40.0	98
4.1.2 Domestic credit to private sector, % GDP	98.6	27 ●
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	37.0	79
4.2.1 Ease of protecting minority investors*	55.0	75
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP [Ⓐ]	0.0	87 ○
4.3 Trade, competition, & market scale	66.8	47
4.3.1 Applied tariff rate, weighted mean, %	3.0	68
4.3.2 Intensity of local competition [†]	70.2	58
4.3.3 Domestic market scale, bn PPP\$	301.1	50

5 Business sophistication	15.2	127 ○
5.1 Knowledge workers	1.7	[126]
5.1.1 Knowledge-intensive employment, %	n/a	n/a
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, % [Ⓐ]	1.4	86 ○
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	19.6	110
5.2.1 University/industry research collaboration [†]	27.3	113 ○
5.2.2 State of cluster development [†]	49.1	46
5.2.3 GERD financed by abroad, % [Ⓐ]	1.2	84
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	55
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	102
5.3 Knowledge absorption	24.4	100
5.3.1 Intellectual property payments, % total trade	n/a	n/a
5.3.2 High-tech imports less re-imports, % total trade	6.4	92
5.3.3 ICT services imports, % total trade	0.6	90
5.3.4 FDI net inflows, % GDP	0.5	117 ○
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	29.7	41
6.1 Knowledge creation	3.5	106
6.1.1 Patents by origin/bn PPP\$ GDP	0.0	123 ○
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	2.6	115 ○
6.1.5 Citable documents H index	7.4	80
6.2 Knowledge impact	24.2	92
6.2.1 Growth rate of PPP\$ GDP/worker, %	(1.3)	100 ○
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.4	21 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	1.2	104
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	69
6.3 Knowledge diffusion	61.6	6 ●
6.3.1 Intellectual property receipts, % total trade	n/a	n/a
6.3.2 High-tech exports less re-exports, % total trade	0.3	96
6.3.3 ICT services exports, % total trade	4.9	12 ●
6.3.4 FDI net outflows, % GDP	7.5	1 ●

7 Creative outputs	34.1	55
7.1 Intangible assets	50.2	37
7.1.1 Trademarks by origin/bn PPP\$ GDP	n/a	n/a
7.1.2 Industrial designs by origin/bn PPP\$ GDP	n/a	n/a
7.1.3 ICTs & business model creation [†]	53.4	89
7.1.4 ICTs & organizational model creation [†]	47.0	85
7.2 Creative goods & services	10.0	90
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	10.7	35
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.6	84
7.2.5 Creative goods exports, % total trade	0.4	62
7.3 Online creativity	25.9	46
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	8.1	44
7.3.2 Country-code TLDs/th pop. 15–69	0.4	93
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	5.1	58
7.3.4 Video uploads on YouTube/pop. 15–69	45.8	20 ●

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	6.0
GDP (US\$ billions)	5.8
GDP per capita, PPP\$	3,362.6
Income group	Lower-middle income
Region	Central and Southern Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	28.0	95
Innovation Output Sub-Index	17.9	104
Innovation Input Sub-Index	38.2	86
Innovation Efficiency Ratio	0.5	114
Global Innovation Index 2016 (out of 128)	26.6	103

1 Institutions	47.6	102
1.1 Political environment	30.8	116
1.1.1 Political stability & safety*	42.7	103
1.1.2 Government effectiveness*	19.0	117
1.2 Regulatory environment	50.9	95
1.2.1 Regulatory quality*	30.2	97
1.2.2 Rule of law*	10.3	119 ○
1.2.3 Cost of redundancy dismissal, salary weeks	17.3	71
1.3 Business environment	61.2	92
1.3.1 Ease of starting a business*	93.0	27 ●
1.3.2 Ease of resolving insolvency*	34.1	108
1.3.3 Ease of paying taxes*	56.4	102

2 Human capital & research	30.6	74
2.1 Education	58.0	32 ●
2.1.1 Expenditure on education, % GDP	5.5	31 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years	13.1	72
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	12.4	45
2.2 Tertiary education	32.8	73
2.2.1 Tertiary enrolment, % gross [Ⓐ]	45.9	58
2.2.2 Graduates in science & engineering, %	18.3	67
2.2.3 Tertiary inbound mobility, % [Ⓐ]	4.5	41
2.3 Research & development (R&D)	0.8	106
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	0.1	100
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	38.2	94
3.1 Information & communication technologies (ICTs)	41.8	92
3.1.1 ICT access*	42.5	97
3.1.2 ICT use*	22.5	95
3.1.3 Government's online service*	42.8	96
3.1.4 E-participation*	59.3	65
3.2 General infrastructure	37.2	64
3.2.1 Electricity output, kWh/cap	2,499.5	71
3.2.2 Logistics performance*	4.3	123 ○
3.2.3 Gross capital formation, % GDP	33.4	11 ●
3.3 Ecological sustainability	35.7	100
3.3.1 GDP/unit of energy use	4.8	106
3.3.2 Environmental performance*	73.1	65
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP [Ⓐ]	0.1	122 ○

4 Market sophistication	46.9	61
4.1 Credit	50.7	27 ●
4.1.1 Ease of getting credit*	70.0	29 ●
4.1.2 Domestic credit to private sector, % GDP	23.0	107
4.1.3 Microfinance gross loans, % GDP	4.2	11 ●

4.2 Investment	42.6	52
4.2.1 Ease of protecting minority investors*	63.3	41
4.2.2 Market capitalization, % GDP [Ⓐ]	2.5	84 ○
4.2.3 Venture capital deals/bn PPP\$ GDP	n/a	n/a
4.3 Trade, competition, & market scale	47.4	109
4.3.1 Applied tariff rate, weighted mean, %	2.7	62
4.3.2 Intensity of local competition [†]	52.5	121 ○
4.3.3 Domestic market scale, bn PPP\$	21.0	119 ○

5 Business sophistication	27.5	89
5.1 Knowledge workers	36.3	70
5.1.1 Knowledge-intensive employment, %	18.3	78
5.1.2 Firms offering formal training, % firms	62.7	6 ●
5.1.3 GERD performed by business, % of GDP	0.0	79
5.1.4 GERD financed by business, %	2.2	83
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	10.8	61
5.2 Innovation linkages	17.5	118
5.2.1 University/industry research collaboration [†]	28.5	109
5.2.2 State of cluster development [†]	32.7	112
5.2.3 GERD financed by abroad, %	1.0	87
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	19 ●
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	80
5.3 Knowledge absorption	28.7	84
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.1	95
5.3.2 High-tech imports less re-imports, % total trade	6.5	85
5.3.3 ICT services imports, % total trade	0.6	91
5.3.4 FDI net inflows, % GDP	10.3	8 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	18.3	87
6.1 Knowledge creation	12.2	58
6.1.1 Patents by origin/bn PPP\$ GDP	6.4	19 ●
6.1.2 PCT patent applications/bn PPP\$ GDP [Ⓐ]	0.0	79
6.1.3 Utility models by origin/bn PPP\$ GDP	0.7	32
6.1.4 Scientific & technical articles/bn PPP\$ GDP	5.6	95
6.1.5 Citable documents H index	1.5	122 ○
6.2 Knowledge impact	23.9	94
6.2.1 Growth rate of PPP\$ GDP/worker, %	2.6	29 ●
6.2.2 New businesses/th pop. 15–64	1.1	67
6.2.3 Computer software spending, % GDP	0.1	90
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.0	126 ○
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.0	95
6.3 Knowledge diffusion	18.7	92
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	77
6.3.2 High-tech exports less re-exports, % total trade	1.2	67
6.3.3 ICT services exports, % total trade	0.7	93
6.3.4 FDI net outflows, % GDP	1.2	44

7 Creative outputs	17.4	111
7.1 Intangible assets	25.7	121 ○
7.1.1 Trademarks by origin/bn PPP\$ GDP	16.8	89
7.1.2 Industrial designs by origin/bn PPP\$ GDP	1.0	60
7.1.3 ICTs & business model creation [†]	41.1	118 ○
7.1.4 ICTs & organizational model creation [†]	38.0	111
7.2 Creative goods & services	4.3	112
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	0.5	91
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.7	83
7.2.5 Creative goods exports, % total trade	0.1	98
7.3 Online creativity	14.0	82
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.2	114
7.3.2 Country-code TLDs/th pop. 15–69	0.4	92
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	4.3	73
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Latvia

Key indicators

Population (millions)	2.0
GDP (US\$ billions)	27.9
GDP per capita, PPP\$	24,712.2
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	44.6	33
Innovation Output Sub-Index	38.0	33
Innovation Input Sub-Index	51.3	35
Innovation Efficiency Ratio	0.7	26
Global Innovation Index 2016 (out of 128)	44.3	34

1 Institutions	77.8	28
1.1 Political environment	72.6	35
1.1.1 Political stability & safety*	74.8	42
1.1.2 Government effectiveness*	70.4	27
1.2 Regulatory environment	78.1	29
1.2.1 Regulatory quality*	69.9	30
1.2.2 Rule of law*	62.4	36
1.2.3 Cost of redundancy dismissal, salary weeks	13.0	47
1.3 Business environment	82.6	26
1.3.1 Ease of starting a business*	94.2	20
1.3.2 Ease of resolving insolvency*	64.0	41
1.3.3 Ease of paying taxes*	89.8	14 ●

2 Human capital & research	35.2	52
2.1 Education	57.2	35
2.1.1 Expenditure on education, % GDP	4.9	57
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	25.5	28
2.1.3 School life expectancy, years	16.1	29
2.1.4 PISA scales in reading, maths, & science	486.8	30
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	8.2	10 ●
2.2 Tertiary education	37.7	56
2.2.1 Tertiary enrolment, % gross [Ⓐ]	67.0	32
2.2.2 Graduates in science & engineering, %	17.9	68 ○
2.2.3 Tertiary inbound mobility, % [Ⓐ]	5.0	36
2.3 Research & development (R&D)	10.6	57
2.3.1 Researchers, FTE/mn pop.	1,833.5	41
2.3.2 Gross expenditure on R&D, % GDP	0.6	53
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	6.1	67

3 Infrastructure	53.1	42
3.1 Information & communication technologies (ICTs)	62.5	55
3.1.1 ICT access*	73.8	40
3.1.2 ICT use*	62.7	33
3.1.3 Government's online service*	60.9	62
3.1.4 E-participation*	52.5	82 ○
3.2 General infrastructure	37.5	63
3.2.1 Electricity output, kWh/cap	2,583.4	67
3.2.2 Logistics performance*	58.4	42
3.2.3 Gross capital formation, % GDP	21.6	70
3.3 Ecological sustainability	59.2	19
3.3.1 GDP/unit of energy use	9.8	53
3.3.2 Environmental performance*	85.7	22
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	7.9	12 ●

4 Market sophistication	52.1	38
4.1 Credit	51.9	25
4.1.1 Ease of getting credit*	85.0	7 ●
4.1.2 Domestic credit to private sector, % GDP	48.8	73
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	44.2	42
4.2.1 Ease of protecting minority investors*	63.3	41
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	52
4.3 Trade, competition, & market scale	60.1	69
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	73.7	34
4.3.3 Domestic market scale, bn PPP\$	50.9	93 ○

5 Business sophistication	38.2	39
5.1 Knowledge workers	43.0	46
5.1.1 Knowledge-intensive employment, %	41.2	22
5.1.2 Firms offering formal training, % firms	25.2	64 ○
5.1.3 GERD performed by business, % of GDP	0.2	56
5.1.4 GERD financed by business, %	20.1	63 ○
5.1.5 Females employed w/advanced degrees, % total	23.6	12
5.2 Innovation linkages	40.6	29
5.2.1 University/industry research collaboration [†]	39.2	74
5.2.2 State of cluster development [†]	41.2	82 ○
5.2.3 GERD financed by abroad, %	45.0	7 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	68
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.5	36
5.3 Knowledge absorption	30.9	76
5.3.1 Intellectual property payments, % total trade	0.2	83 ○
5.3.2 High-tech imports less re-imports, % total trade	10.9	34
5.3.3 ICT services imports, % total trade	1.3	53
5.3.4 FDI net inflows, % GDP	3.2	51
5.3.5 Research talent, % in business enterprise	16.7	59 ○

6 Knowledge & technology outputs	26.5	48
6.1 Knowledge creation	13.0	56
6.1.1 Patents by origin/bn PPP\$ GDP	3.4	31
6.1.2 PCT patent applications/bn PPP\$ GDP	0.5	38
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	14.9	52
6.1.5 Citable documents H index	7.8	77
6.2 Knowledge impact	39.2	37
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.4	44
6.2.2 New businesses/th pop. 15–64	10.6	10 ●
6.2.3 Computer software spending, % GDP	0.1	87 ○
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	22.8	15
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.2	65
6.3 Knowledge diffusion	27.3	46
6.3.1 Intellectual property receipts, % total trade	0.0	70
6.3.2 High-tech exports less re-exports, % total trade	8.0	24
6.3.3 ICT services exports, % total trade	2.5	44
6.3.4 FDI net outflows, % GDP	1.3	41

7 Creative outputs	49.4	14 ●
7.1 Intangible assets	47.0	49
7.1.1 Trademarks by origin/bn PPP\$ GDP	72.8	24
7.1.2 Industrial designs by origin/bn PPP\$ GDP	3.9	31
7.1.3 ICTs & business model creation [†]	60.5	63
7.1.4 ICTs & organizational model creation [†]	56.6	50
7.2 Creative goods & services	53.4	2 ●
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	1.2	9 ●
7.2.2 National feature films/mn pop. 15–69	12.2	11 ●
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	3.0	8 ●
7.2.5 Creative goods exports, % total trade	4.2	12 ●
7.3 Online creativity	50.2	17
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	9.4	40
7.3.2 Country-code TLDs/th pop. 15–69	43.0	16
7.3.3 Wikipedia edits/mn pop. 15–69	6.9	14 ●
7.3.4 Video uploads on YouTube/pop. 15–69	81.8	2 ●

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	6.0
GDP (US\$ billions)	51.8
GDP per capita, PPP\$	18,239.8
Income group	Upper-middle income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	30.6	81
Innovation Output Sub-Index	23.3	78
Innovation Input Sub-Index	38.0	87
Innovation Efficiency Ratio	0.6	69
Global Innovation Index 2016 (out of 128)	32.7	70

1 Institutions **47.9** **100**

1.1 Political environment	26.1	121 ○
1.1.1 Political stability & safety*	22.1	122 ○
1.1.2 Government effectiveness*	30.1	92
1.2 Regulatory environment	55.8	83
1.2.1 Regulatory quality*	35.0	88
1.2.2 Rule of law*	16.4	106
1.2.3 Cost of redundancy dismissal, salary weeks	15.1	60
1.3 Business environment	61.9	88
1.3.1 Ease of starting a business*	78.5	104
1.3.2 Ease of resolving insolvency*	30.0	116 ○
1.3.3 Ease of paying taxes*	77.2	57

2 Human capital & research **29.0** **78**

2.1 Education	28.8	111 ○
2.1.1 Expenditure on education, % GDP	2.6	109 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	6.0	103 ○
2.1.3 School life expectancy, years	11.1	93
2.1.4 PISA scales in reading, maths, & science	376.4	66 ○
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	7.7	5 ●
2.2 Tertiary education	43.7	37
2.2.1 Tertiary enrolment, % gross	38.5	68
2.2.2 Graduates in science & engineering, % [Ⓐ]	23.3	35
2.2.3 Tertiary inbound mobility, %	9.9	19 ●
2.3 Research & development (R&D)	14.6	49
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	n/a	n/a
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	29.3	39

3 Infrastructure **40.0** **88**

3.1 Information & communication technologies (ICTs)	55.4	70
3.1.1 ICT access*	65.7	62
3.1.2 ICT use*	55.1	48
3.1.3 Government's online service*	51.4	81
3.1.4 E-participation*	49.2	89
3.2 General infrastructure	22.2	115 ○
3.2.1 Electricity output, kWh/cap	3,945.5	54
3.2.2 Logistics performance*	30.3	81
3.2.3 Gross capital formation, % GDP	n/a	n/a
3.3 Ecological sustainability	42.6	76
3.3.1 GDP/unit of energy use	9.9	52
3.3.2 Environmental performance*	69.1	83
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.4	86

4 Market sophistication **39.4** **96**

4.1 Credit	28.0	86
4.1.1 Ease of getting credit*	40.0	98
4.1.2 Domestic credit to private sector, % GDP	106.6	25 ●
4.1.3 Microfinance gross loans, % GDP	0.1	57

4.2 Investment	28.9	118 ○
4.2.1 Ease of protecting minority investors*	40.0	111 ○
4.2.2 Market capitalization, % GDP [Ⓐ]	22.6	59
4.2.3 Venture capital deals/bn PPP\$ GDP	0.1	23 ●
4.3 Trade, competition, & market scale	61.3	63
4.3.1 Applied tariff rate, weighted mean, %	2.8	63
4.3.2 Intensity of local competition [†]	73.9	32 ●
4.3.3 Domestic market scale, bn PPP\$	85.2	78

5 Business sophistication **33.5** **61**

5.1 Knowledge workers	43.0	[47]
5.1.1 Knowledge-intensive employment, % [Ⓐ]	31.8	45
5.1.2 Firms offering formal training, % firms	26.6	58
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	28.7	60
5.2.1 University/industry research collaboration [†]	43.9	48
5.2.2 State of cluster development [†]	47.2	53
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	75
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	81
5.3 Knowledge absorption	28.8	83
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.1	89
5.3.2 High-tech imports less re-imports, % total trade [Ⓐ]	3.8	116 ○
5.3.3 ICT services imports, % total trade [Ⓐ]	1.8	28 ●
5.3.4 FDI net inflows, % GDP	5.8	23 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs **19.1** **82**

6.1 Knowledge creation	12.9	57
6.1.1 Patents by origin/bn PPP\$ GDP	1.3	58
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	15.7	48
6.1.5 Citable documents H index	10.2	60
6.2 Knowledge impact	15.9	110 ○
6.2.1 Growth rate of PPP\$ GDP/worker, %	n/a	n/a
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.0	104
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	7.6	47
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.2	54
6.3 Knowledge diffusion	28.4	44
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.1	59
6.3.2 High-tech exports less re-exports, % total trade [Ⓐ]	0.2	100
6.3.3 ICT services exports, % total trade [Ⓐ]	2.8	36 ●
6.3.4 FDI net outflows, % GDP	2.8	23 ●

7 Creative outputs **27.5** **81**

7.1 Intangible assets	32.4	98
7.1.1 Trademarks by origin/bn PPP\$ GDP	15.1	93
7.1.2 Industrial designs by origin/bn PPP\$ GDP	n/a	n/a
7.1.3 ICTs & business model creation [†]	48.5	109 ○
7.1.4 ICTs & organizational model creation [†]	41.4	105 ○
7.2 Creative goods & services	28.8	32 ●
7.2.1 Cultural & creative services exports, % of total trade	0.2	44
7.2.2 National feature films/mn pop. 15–69	3.6	52
7.2.3 Global ent. & media market/th pop. 15–69	3.0	49
7.2.4 Printing & publishing manufactures, % [Ⓐ]	4.2	3 ●
7.2.5 Creative goods exports, % total trade [Ⓐ]	0.8	47
7.3 Online creativity	16.4	76
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	6.9	48
7.3.2 Country-code TLDs/th pop. 15–69	0.3	99
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	4.3	72
7.3.4 Video uploads on YouTube/pop. 15–69	16.9	60

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Lithuania

Key indicators

Population (millions)	2.9
GDP (US\$ billions)	42.8
GDP per capita, PPP\$	28,359.1
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	41.2	40
Innovation Output Sub-Index	30.4	49
Innovation Input Sub-Index	51.9	34
Innovation Efficiency Ratio	0.6	84
Global Innovation Index 2016 (out of 128)	41.8	36

1 Institutions	74.1	36
1.1 Political environment	76.9	27
1.1.1 Political stability & safety*	80.8	32
1.1.2 Government effectiveness*	73.0	25
1.2 Regulatory environment	69.4	46
1.2.1 Regulatory quality*	74.9	20 ●
1.2.2 Rule of law*	68.2	29
1.2.3 Cost of redundancy dismissal, salary weeks	24.6	100 ○
1.3 Business environment	75.9	42
1.3.1 Ease of starting a business*	93.0	26
1.3.2 Ease of resolving insolvency*	49.2	61
1.3.3 Ease of paying taxes*	85.4	25

2 Human capital & research	37.5	46
2.1 Education	53.7	47
2.1.1 Expenditure on education, % GDP	4.6	63
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	17.8	64
2.1.3 School life expectancy, years	16.5	21 ●
2.1.4 PISA scales in reading, maths, & science	475.4	35
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	8.1	8 ●
2.2 Tertiary education	39.4	50
2.2.1 Tertiary enrolment, % gross [Ⓐ]	68.5	29
2.2.2 Graduates in science & engineering, %	22.2	43
2.2.3 Tertiary inbound mobility, % [Ⓐ]	2.5	64
2.3 Research & development (R&D)	19.5	45
2.3.1 Researchers, FTE/mn pop.	2,822.4	30
2.3.2 Gross expenditure on R&D, % GDP	1.0	35
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	20.1	50

3 Infrastructure	57.2	31
3.1 Information & communication technologies (ICTs)	75.1	27
3.1.1 ICT access*	70.8	49
3.1.2 ICT use*	64.0	29
3.1.3 Government's online service*	82.6	22 ●
3.1.4 E-participation*	83.1	17 ●
3.2 General infrastructure	35.4	73
3.2.1 Electricity output, kWh/cap	1,265.5	90 ○
3.2.2 Logistics performance*	72.5	28
3.2.3 Gross capital formation, % GDP	17.7	100 ○
3.3 Ecological sustainability	61.2	16 ●
3.3.1 GDP/unit of energy use	10.4	43
3.3.2 Environmental performance*	85.5	23
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	8.7	10 ●

4 Market sophistication	53.0	32
4.1 Credit	43.0	44
4.1.1 Ease of getting credit*	70.0	29
4.1.2 Domestic credit to private sector, % GDP	41.8	80
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	52.7	27
4.2.1 Ease of protecting minority investors*	61.7	50
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP [Ⓐ]	0.1	18
4.3 Trade, competition, & market scale	63.5	55
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	75.2	26
4.3.3 Domestic market scale, bn PPP\$	85.8	77

5 Business sophistication	37.8	41
5.1 Knowledge workers	53.1	31
5.1.1 Knowledge-intensive employment, %	41.8	20
5.1.2 Firms offering formal training, % firms	42.0	30
5.1.3 GERD performed by business, % of GDP	0.3	47
5.1.4 GERD financed by business, %	28.0	54
5.1.5 Females employed w/advanced degrees, % total	27.2	5 ●
5.2 Innovation linkages	35.9	42
5.2.1 University/industry research collaboration [†]	51.9	33
5.2.2 State of cluster development [†]	39.0	88 ○
5.2.3 GERD financed by abroad, %	34.6	13 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	99 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.4	42
5.3 Knowledge absorption	24.2	103 ○
5.3.1 Intellectual property payments, % total trade	0.2	88 ○
5.3.2 High-tech imports less re-imports, % total trade	6.7	82
5.3.3 ICT services imports, % total trade	0.6	88 ○
5.3.4 FDI net inflows, % GDP	1.6	92 ○
5.3.5 Research talent, % in business enterprise	22.7	52

6 Knowledge & technology outputs	21.3	66
6.1 Knowledge creation	14.6	54
6.1.1 Patents by origin/bn PPP\$ GDP	1.7	51
6.1.2 PCT patent applications/bn PPP\$ GDP	0.3	46
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	24.8	33
6.1.5 Citable documents H index	10.7	57
6.2 Knowledge impact	28.1	78
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.3	76
6.2.2 New businesses/th pop. 15–64	4.2	30
6.2.3 Computer software spending, % GDP	0.1	96 ○
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	15.0	23 ●
6.2.5 High- & medium-high-tech manufactures, %	0.2	61
6.3 Knowledge diffusion	21.1	66
6.3.1 Intellectual property receipts, % total trade	0.1	62
6.3.2 High-tech exports less re-exports, % total trade	6.1	28
6.3.3 ICT services exports, % total trade	0.8	88 ○
6.3.4 FDI net outflows, % GDP	0.8	58

7 Creative outputs	39.6	38
7.1 Intangible assets	48.8	43
7.1.1 Trademarks by origin/bn PPP\$ GDP	50.6	48
7.1.2 Industrial designs by origin/bn PPP\$ GDP	2.0	45
7.1.3 ICTs & business model creation [†]	70.9	30
7.1.4 ICTs & organizational model creation [†]	68.9	24
7.2 Creative goods & services	25.4	45
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.4	29
7.2.2 National feature films/mn pop. 15–69	4.4	46
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	1.1	60
7.2.5 Creative goods exports, % total trade	2.1	23
7.3 Online creativity	35.4	32
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	13.8	33
7.3.2 Country-code TLDs/th pop. 15–69	26.6	23 ●
7.3.3 Wikipedia edits/mn pop. 15–69	6.4	30
7.3.4 Video uploads on YouTube/pop. 15–69	39.5	31

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	0.6
GDP (US\$ billions)	61.0
GDP per capita, PPP\$	98,987.2
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	56.4	12
Innovation Output Sub-Index	55.4	4 ●
Innovation Input Sub-Index	57.4	24
Innovation Efficiency Ratio	1.0	1 ●
Global Innovation Index 2016 (out of 128)	57.1	12

1 Institutions	82.6	19
1.1 Political environment	92.2	4 ●
1.1.1 Political stability & safety*	98.0	2 ●
1.1.2 Government effectiveness*	86.5	14
1.2 Regulatory environment	81.2	23
1.2.1 Regulatory quality*	84.9	13
1.2.2 Rule of law*	93.9	9
1.2.3 Cost of redundancy dismissal, salary weeks	21.7	92 ○
1.3 Business environment	74.3	54
1.3.1 Ease of starting a business*	88.7	55
1.3.2 Ease of resolving insolvency*	45.4	74
1.3.3 Ease of paying taxes*	88.9	15

2 Human capital & research	42.9	33
2.1 Education	48.5	59
2.1.1 Expenditure on education, % GDP [Ⓐ]	4.1	76
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	19.4	55
2.1.3 School life expectancy, years [Ⓐ]	13.9	64
2.1.4 PISA scales in reading, maths, & science	483.3	32
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	9.1	16
2.2 Tertiary education	43.9	36
2.2.1 Tertiary enrolment, % gross [Ⓐ]	19.4	92 ○
2.2.2 Graduates in science & engineering, %	16.3	77 ○
2.2.3 Tertiary inbound mobility, % [Ⓐ]	40.6	1 ●
2.3 Research & development (R&D)	36.2	31
2.3.1 Researchers, FTE/mn pop.	5,058.3	10
2.3.2 Gross expenditure on R&D, % GDP	1.3	27
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	53.9	26
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	60.1	24
3.1 Information & communication technologies (ICTs)	79.3	21
3.1.1 ICT access*	95.4	1 ●
3.1.2 ICT use*	80.5	10
3.1.3 Government's online service*	71.7	40
3.1.4 E-participation*	69.5	43
3.2 General infrastructure	44.2	41
3.2.1 Electricity output, kWh/cap	2,289.5	75
3.2.2 Logistics performance*	99.7	2 ●
3.2.3 Gross capital formation, % GDP	18.6	96 ○
3.3 Ecological sustainability	56.9	25
3.3.1 GDP/unit of energy use	13.3	17
3.3.2 Environmental performance*	86.6	20
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.9	49

4 Market sophistication	43.4	78
4.1 Credit	26.4	94 ○
4.1.1 Ease of getting credit*	15.0	121 ○
4.1.2 Domestic credit to private sector, % GDP	95.4	31
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	43.4	46
4.2.1 Ease of protecting minority investors*	45.0	98 ○
4.2.2 Market capitalization, % GDP	81.6	18
4.2.3 Venture capital deals/bn PPP\$ GDP	0.2	13
4.3 Trade, competition, & market scale	60.5	66
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	71.9	41
4.3.3 Domestic market scale, bn PPP\$	58.7	91 ○

5 Business sophistication	57.8	7
5.1 Knowledge workers	59.9	23
5.1.1 Knowledge-intensive employment, %	56.8	1 ●
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	0.7	29
5.1.4 GERD financed by business, % [Ⓐ]	16.5	66
5.1.5 Females employed w/advanced degrees, % total	20.6	21
5.2 Innovation linkages	64.4	3 ●
5.2.1 University/industry research collaboration [†]	60.8	20
5.2.2 State of cluster development [†]	69.7	10
5.2.3 GERD financed by abroad, % [Ⓐ]	32.3	15
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	8
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	8.4	7
5.3 Knowledge absorption	49.0	16
5.3.1 Intellectual property payments, % total trade	2.6	6
5.3.2 High-tech imports less re-imports, % total trade	2.5	125 ○
5.3.3 ICT services imports, % total trade	2.8	9
5.3.4 FDI net inflows, % GDP	28.7	4 ●
5.3.5 Research talent, % in business enterprise	36.0	38

6 Knowledge & technology outputs	45.0	15
6.1 Knowledge creation	45.9	15
6.1.1 Patents by origin/bn PPP\$ GDP	9.7	13
6.1.2 PCT patent applications/bn PPP\$ GDP	7.3	5
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	18.7	40
6.1.5 Citable documents H index	7.9	75
6.2 Knowledge impact	34.2	50
6.2.1 Growth rate of PPP\$ GDP/worker, %	2.3	34
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	6.1	20
6.2.3 Computer software spending, % GDP	0.2	73
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	4.5	66
6.2.5 High- & medium-high-tech manufactures, %	0.2	62
6.3 Knowledge diffusion	54.9	9
6.3.1 Intellectual property receipts, % total trade	1.0	15
6.3.2 High-tech exports less re-exports, % total trade	0.7	72
6.3.3 ICT services exports, % total trade	3.9	20
6.3.4 FDI net outflows, % GDP	48.4	1 ●

7 Creative outputs	65.8	1 ●
7.1 Intangible assets	74.8	1 ●
7.1.1 Trademarks by origin/bn PPP\$ GDP	131.6	5 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	13.8	7
7.1.3 ICTs & business model creation [†]	82.7	6
7.1.4 ICTs & organizational model creation [†]	74.2	14
7.2 Creative goods & services	39.9	10
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	5.0	1 ●
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	42.4	1 ●
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	1.2	54
7.2.5 Creative goods exports, % total trade	0.1	89 ○
7.3 Online creativity	74.0	3 ●
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	92.5	4 ●
7.3.2 Country-code TLDs/th pop. 15–69	63.9	8
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	6.8	17
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Madagascar

Key indicators

Population (millions)	24.9
GDP (US\$ billions)	9.7
GDP per capita, PPP\$	1,462.2
Income group	Low income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	24.2	111
Innovation Output Sub-Index	19.5	95
Innovation Input Sub-Index	28.8	120
Innovation Efficiency Ratio	0.7	45 ●
Global Innovation Index 2016 (out of 128)	24.8	111
1 Institutions	48.7	99
1.1 Political environment	31.5	113
1.1.1 Political stability & safety*	54.1	83
1.1.2 Government effectiveness*	9.0	126 ○
1.2 Regulatory environment	53.9	91
1.2.1 Regulatory quality*	22.8	109
1.2.2 Rule of law*	19.1	100
1.2.3 Cost of redundancy dismissal, salary weeks	14.7	58 ●
1.3 Business environment	60.8	96
1.3.1 Ease of starting a business*	83.5	87
1.3.2 Ease of resolving insolvency*	34.2	107
1.3.3 Ease of paying taxes*	64.8	86
2 Human capital & research	14.8	116
2.1 Education	22.0	122
2.1.1 Expenditure on education, % GDP	2.1	112
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	8.4	101
2.1.3 School life expectancy, years	10.5	100
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	23.1	90
2.2 Tertiary education	22.3	100
2.2.1 Tertiary enrolment, % gross [Ⓐ]	4.8	115
2.2.2 Graduates in science & engineering, %	20.3	54
2.2.3 Tertiary inbound mobility, % [Ⓐ]	1.8	73
2.3 Research & development (R&D)	0.1	114
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	51.0	88
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.0	110 ○
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○
3 Infrastructure	20.8	125 ○
3.1 Information & communication technologies (ICTs)	17.8	120
3.1.1 ICT access*	23.9	121
3.1.2 ICT use*	4.4	122
3.1.3 Government's online service*	22.5	112
3.1.4 E-participation*	20.3	113
3.2 General infrastructure	19.5	119
3.2.1 Electricity output, kWh/cap.	n/a	n/a
3.2.2 Logistics performance*	4.2	124 ○
3.2.3 Gross capital formation, % GDP	15.3	110
3.3 Ecological sustainability	25.2	120
3.3.1 GDP/unit of energy use	n/a	n/a
3.3.2 Environmental performance*	37.1	123 ○
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.2	107
4 Market sophistication	36.9	106
4.1 Credit	13.8	122
4.1.1 Ease of getting credit*	15.0	121 ○
4.1.2 Domestic credit to private sector, % GDP	13.3	123 ○
4.1.3 Microfinance gross loans, % GDP	1.2	24 ●

4.2 Investment	48.3	[31]
4.2.1 Ease of protecting minority investors*	48.3	92
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, & market scale	48.5	106
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	6.0	98
4.3.2 Intensity of local competition [†]	60.0	101
4.3.3 Domestic market scale, bn PPP\$	37.5	100

5 Business sophistication

5.1 Knowledge workers	8.3	125 ○
5.1.1 Knowledge-intensive employment, %	3.7	106 ○
5.1.2 Firms offering formal training, % firms	12.7	87
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	2.3	83
5.2 Innovation linkages	21.6	90
5.2.1 University/industry research collaboration [†]	40.0	70
5.2.2 State of cluster development [†]	35.6	101
5.2.3 GERD financed by abroad, % [Ⓐ]	10.6	45 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	82
5.2.5 Patent families 2+ offices/bn PPP\$ GDP [Ⓐ]	0.0	88
5.3 Knowledge absorption	38.2	41 ●
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.5	59
5.3.2 High-tech imports less re-imports, % total trade	5.9	98
5.3.3 ICT services imports, % total trade [Ⓐ]	2.9	8 ●
5.3.4 FDI net inflows, % GDP	4.6	30 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs

6.1 Knowledge creation	3.2	110
6.1.1 Patents by origin/bn PPP\$ GDP	0.1	108
6.1.2 PCT patent applications/bn PPP\$ GDP [Ⓐ]	0.1	73
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	5.8	92
6.1.5 Citable documents H index	4.2	101
6.2 Knowledge impact	18.7	107
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.1	51 ●
6.2.2 New businesses/th pop. 15–64	0.7	81
6.2.3 Computer software spending, % GDP	0.0	115
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	2.7	82
6.2.5 High- & medium-high-tech manufactures, %	0.0	101 ○
6.3 Knowledge diffusion	19.0	88
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.5	24 ●
6.3.2 High-tech exports less re-exports, % total trade	0.0	119
6.3.3 ICT services exports, % total trade [Ⓐ]	1.7	62
6.3.4 FDI net outflows, % GDP	0.1	96

7 Creative outputs

7.1 Intangible assets	41.6	66
7.1.1 Trademarks by origin/bn PPP\$ GDP	57.0	38 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	5.8	20 ●
7.1.3 ICTs & business model creation [†]	53.4	88
7.1.4 ICTs & organizational model creation [†]	47.6	82
7.2 Creative goods & services	13.4	77
7.2.1 Cultural & creative services exports, % of total trade	0.0	73
7.2.2 National feature films/mn pop. 15–69	2.6	57
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	2.1	21 ●
7.2.5 Creative goods exports, % total trade	0.1	87
7.3 Online creativity	5.2	111
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.1	120
7.3.2 Country-code TLDs/th pop. 15–69	0.0	118
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	1.6	109
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	17.7
GDP (US\$ billions)	5.5
GDP per capita, PPP\$	1,124.2
Income group	Low income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	23.5	115
Innovation Output Sub-Index	16.2	112
Innovation Input Sub-Index	30.8	112
Innovation Efficiency Ratio	0.5	98
Global Innovation Index 2016 (out of 128)	27.3	98

1	Institutions	51.3	93
1.1	Political environment	43.5	85
1.1.1	Political stability & safety*	62.3	65 ●
1.1.2	Government effectiveness*	24.8	108
1.2	Regulatory environment	54.1	89
1.2.1	Regulatory quality*	21.2	112
1.2.2	Rule of law*	29.7	77
1.2.3	Cost of redundancy dismissal, salary weeks	16.7	69
1.3	Business environment	56.2	111
1.3.1	Ease of starting a business*	76.7	111
1.3.2	Ease of resolving insolvency*	22.3	126 ○
1.3.3	Ease of paying taxes*	69.6	76
2	Human capital & research	12.3	122
2.1	Education	33.9	101
2.1.1	Expenditure on education, % GDP	5.6	27 ●
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	25.1	30 ●
2.1.3	School life expectancy, years [Ⓐ]	10.7	96
2.1.4	PISA scales in reading, maths, & science	n/a	n/a
2.1.5	Pupil-teacher ratio, secondary	40.9	110 ○
2.2	Tertiary education	2.9	121 ○
2.2.1	Tertiary enrolment, % gross [Ⓐ]	0.8	121 ○
2.2.2	Graduates in science & engineering, %	n/a	n/a
2.2.3	Tertiary inbound mobility, % [Ⓐ]	1.1	79
2.3	Research & development (R&D)	0.2	113
2.3.1	Researchers, FTE/mn pop. [Ⓐ]	49.6	89
2.3.2	Gross expenditure on R&D, % GDP	n/a	n/a
2.3.3	Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4	QS university ranking, average score top 3*	0.0	75 ○
3	Infrastructure	26.2	117
3.1	Information & communication technologies (ICTs)	19.9	116
3.1.1	ICT access*	20.3	126 ○
3.1.2	ICT use*	8.6	116
3.1.3	Government's online service*	21.7	113
3.1.4	E-participation*	28.8	107
3.2	General infrastructure	25.5	107
3.2.1	Electricity output, kWh/cap	n/a	n/a
3.2.2	Logistics performance* [Ⓐ]	34.7	71
3.2.3	Gross capital formation, % GDP	12.6	120
3.3	Ecological sustainability	33.3	110
3.3.1	GDP/unit of energy use	n/a	n/a
3.3.2	Environmental performance*	49.7	113
3.3.3	ISO 14001 environmental certificates/bn PPP\$ GDP	0.1	116
4	Market sophistication	32.0	118
4.1	Credit	18.0	117
4.1.1	Ease of getting credit*	45.0	84
4.1.2	Domestic credit to private sector, % GDP	12.2	124 ○
4.1.3	Microfinance gross loans, % GDP	0.3	42

4.2	Investment	30.7	106
4.2.1	Ease of protecting minority investors*	43.3	101
4.2.2	Market capitalization, % GDP [Ⓐ]	12.6	73
4.2.3	Venture capital deals/bn PPP\$ GDP	n/a	n/a
4.3	Trade, competition, & market scale	47.1	112
4.3.1	Applied tariff rate, weighted mean, %	4.2	83
4.3.2	Intensity of local competition [†]	59.7	104
4.3.3	Domestic market scale, bn PPP\$	21.2	118

5 Business sophistication **32.0** **[66]**

5.1	Knowledge workers	38.9	[57]
5.1.1	Knowledge-intensive employment, %	n/a	n/a
5.1.2	Firms offering formal training, % firms	32.9	42 ●
5.1.3	GERD performed by business, % of GDP	n/a	n/a
5.1.4	GERD financed by business, %	n/a	n/a
5.1.5	Females employed w/advanced degrees, % total	n/a	n/a
5.2	Innovation linkages	30.3	[56]
5.2.1	University/industry research collaboration [†]	28.5	110
5.2.2	State of cluster development [†]	31.2	118
5.2.3	GERD financed by abroad, %	n/a	n/a
5.2.4	JV-strategic alliance deals/bn PPP\$ GDP	n/a	n/a
5.2.5	Patent families 2+ offices/bn PPP\$ GDP	n/a	n/a
5.3	Knowledge absorption	26.7	92
5.3.1	Intellectual property payments, % total trade [Ⓐ]	0.1	92
5.3.2	High-tech imports less re-imports, % total trade	8.6	57 ●
5.3.3	ICT services imports, % total trade [Ⓐ]	1.2	59 ●
5.3.4	FDI net inflows, % GDP	8.7	15 ●
5.3.5	Research talent, % in business enterprise [Ⓐ]	1.7	76

6 Knowledge & technology outputs **15.8** **98**

6.1	Knowledge creation	9.4	68
6.1.1	Patents by origin/bn PPP\$ GDP	0.3	87
6.1.2	PCT patent applications/bn PPP\$ GDP	0.0	82
6.1.3	Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4	Scientific & technical articles/bn PPP\$ GDP	20.7	37 ●
6.1.5	Citable documents H index	7.0	82
6.2	Knowledge impact	21.3	102
6.2.1	Growth rate of PPP\$ GDP/worker, %	1.8	40 ●
6.2.2	New businesses/th pop. 15–64 [Ⓐ]	0.1	102 ○
6.2.3	Computer software spending, % GDP	0.1	102
6.2.4	ISO 9001 quality certificates/bn PPP\$ GDP	0.8	111
6.2.5	High- & medium-high-tech manufactures, % [Ⓐ]	0.1	86
6.3	Knowledge diffusion	16.6	104
6.3.1	Intellectual property receipts, % total trade	n/a	n/a
6.3.2	High-tech exports less re-exports, % total trade	0.2	99
6.3.3	ICT services exports, % total trade [Ⓐ]	0.9	87
6.3.4	FDI net outflows, % GDP	(0.1)	116

7 Creative outputs **16.5** **118**

7.1	Intangible assets	26.7	116
7.1.1	Trademarks by origin/bn PPP\$ GDP	21.0	82
7.1.2	Industrial designs by origin/bn PPP\$ GDP	n/a	n/a
7.1.3	ICTs & business model creation [†]	39.4	120 ○
7.1.4	ICTs & organizational model creation [†]	30.5	119
7.2	Creative goods & services	11.7	83
7.2.1	Cultural & creative services exports, % of total trade	0.0	68
7.2.2	National feature films/mn pop. 15–69	n/a	n/a
7.2.3	Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4	Printing & publishing manufactures, % [Ⓐ]	1.7	30 ●
7.2.5	Creative goods exports, % total trade	0.1	92
7.3	Online creativity	0.9	124 ○
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.2	115
7.3.2	Country-code TLDs/th pop. 15–69	0.3	96
7.3.3	Wikipedia edits/mn pop. 15–69 [Ⓐ]	0.2	124 ○
7.3.4	Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Malaysia

Key indicators

Population (millions)	30.8
GDP (US\$ billions)	302.7
GDP per capita, PPP\$	26,314.8
Income group	Upper-middle income
Region	South East Asia, East Asia, and Oceania

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	42.7	37
Innovation Output Sub-Index	34.5	39
Innovation Input Sub-Index	50.9	36
Innovation Efficiency Ratio	0.7	46
Global Innovation Index 2016 (out of 128)	43.4	35

1 Institutions	67.0	53
1.1 Political environment	67.7	41
1.1.1 Political stability & safety*	68.5	52
1.1.2 Government effectiveness*	66.9	37
1.2 Regulatory environment	58.3	75
1.2.1 Regulatory quality*	61.9	40
1.2.2 Rule of law*	56.2	40
1.2.3 Cost of redundancy dismissal, salary weeks	29.4	115 ○
1.3 Business environment	75.1	50
1.3.1 Ease of starting a business*	83.7	86
1.3.2 Ease of resolving insolvency*	62.5	43
1.3.3 Ease of paying taxes*	79.2	52

2 Human capital & research	41.9	35
2.1 Education	43.9	77
2.1.1 Expenditure on education, % GDP	5.0	49
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	18.4	58
2.1.3 School life expectancy, years	12.9	74
2.1.4 PISA scales in reading, maths, & science [Ⓐ]	412.7	58 ○
2.1.5 Pupil-teacher ratio, secondary	12.0	40
2.2 Tertiary education	48.4	24
2.2.1 Tertiary enrolment, % gross	26.1	87 ○
2.2.2 Graduates in science & engineering, %	33.3	7 ●
2.2.3 Tertiary inbound mobility, %	7.4	26
2.3 Research & development (R&D)	33.3	35
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	2,017.4	37
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	1.3	29
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	35.5	42
2.3.4 QS university ranking, average score top 3*	44.4	29

3 Infrastructure	52.4	45
3.1 Information & communication technologies (ICTs)	66.4	44
3.1.1 ICT access*	67.5	59
3.1.2 ICT use*	58.6	41
3.1.3 Government's online service*	71.7	40
3.1.4 E-participation*	67.8	47
3.2 General infrastructure	45.9	37
3.2.1 Electricity output, kWh/cap	4,932.1	42
3.2.2 Logistics performance*	63.0	31
3.2.3 Gross capital formation, % GDP	26.1	35
3.3 Ecological sustainability	45.0	62
3.3.1 GDP/unit of energy use	8.0	71
3.3.2 Environmental performance*	74.2	59
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	2.9	35

4 Market sophistication	57.6	20
4.1 Credit	42.4	46
4.1.1 Ease of getting credit*	75.0	19
4.1.2 Domestic credit to private sector, % GDP	125.2	17 ●
4.1.3 Microfinance gross loans, % GDP [Ⓐ]	0.1	54

4.2 Investment	55.1	22
4.2.1 Ease of protecting minority investors*	80.0	3 ●
4.2.2 Market capitalization, % GDP	129.3	6 ●
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	55
4.3 Trade, competition, & market scale	75.3	21
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	1.3	17 ●
4.3.2 Intensity of local competition [†]	73.1	39
4.3.3 Domestic market scale, bn PPP\$	863.8	27

5 Business sophistication	35.7	48
5.1 Knowledge workers	26.9	93 ○
5.1.1 Knowledge-intensive employment, %	25.5	53
5.1.2 Firms offering formal training, % firms	18.5	79 ○
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.6	32
5.1.4 GERD financed by business, % [Ⓐ]	6.9	75 ○
5.1.5 Females employed w/advanced degrees, % total	12.2	57

5.2 Innovation linkages	34.5	47
5.2.1 University/industry research collaboration [†]	70.0	11 ●
5.2.2 State of cluster development [†]	69.5	12 ●
5.2.3 GERD financed by abroad, % [Ⓐ]	0.2	96 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	18
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.3	45
5.3 Knowledge absorption	45.6	20
5.3.1 Intellectual property payments, % total trade	0.6	52
5.3.2 High-tech imports less re-imports, % total trade	24.7	1 ●
5.3.3 ICT services imports, % total trade	1.6	38
5.3.4 FDI net inflows, % GDP	3.4	47
5.3.5 Research talent, % in business enterprise [Ⓐ]	10.3	66 ○

6 Knowledge & technology outputs	31.7	36
6.1 Knowledge creation	8.0	74
6.1.1 Patents by origin/bn PPP\$ GDP	1.6	54
6.1.2 PCT patent applications/bn PPP\$ GDP	0.2	50
6.1.3 Utility models by origin/bn PPP\$ GDP	0.1	51 ○
6.1.4 Scientific & technical articles/bn PPP\$ GDP	12.3	58
6.1.5 Citable documents H index	15.0	45

6.2 Knowledge impact	37.1	43
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.9	58
6.2.2 New businesses/th pop. 15–64	2.4	43
6.2.3 Computer software spending, % GDP	0.4	29
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	14.6	26
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.4	28

6.3 Knowledge diffusion	50.1	11 ●
6.3.1 Intellectual property receipts, % total trade	0.0	73
6.3.2 High-tech exports less re-exports, % total trade	32.3	1 ●
6.3.3 ICT services exports, % total trade	1.3	71
6.3.4 FDI net outflows, % GDP	4.1	12 ●

7 Creative outputs	37.3	45
7.1 Intangible assets	46.1	53
7.1.1 Trademarks by origin/bn PPP\$ GDP	19.5	84 ○
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.8	70
7.1.3 ICTs & business model creation [†]	76.2	20
7.1.4 ICTs & organizational model creation [†]	73.7	18

7.2 Creative goods & services	38.4	13 ●
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	3.7	51
7.2.3 Global ent. & media market/th pop. 15–69	11.2	32
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.9	70
7.2.5 Creative goods exports, % total trade	10.3	2 ●

7.3 Online creativity	18.5	69
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	6.3	52
7.3.2 Country-code TLDs/th pop. 15–69	4.3	54
7.3.3 Wikipedia edits/mn pop. 15–69	4.6	69
7.3.4 Video uploads on YouTube/pop. 15–69	19.0	58 ○

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	18.1
GDP (US\$ billions)	14.1
GDP per capita, PPP\$	2,199.0
Income group	Low income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	22.5	118
Innovation Output Sub-Index	16.8	107
Innovation Input Sub-Index	28.1	123 ○
Innovation Efficiency Ratio	0.6	78
Global Innovation Index 2016 (out of 128)	24.8	112

1 Institutions 45.9 110

1.1 Political environment	21.2	123 ○
1.1.1 Political stability & safety*	23.6	121
1.1.2 Government effectiveness*	18.7	118
1.2 Regulatory environment	55.6	85
1.2.1 Regulatory quality*	27.6	104
1.2.2 Rule of law*	17.3	105
1.2.3 Cost of redundancy dismissal, salary weeks	13.7	53 ●
1.3 Business environment	61.0	93
1.3.1 Ease of starting a business*	84.1	83
1.3.2 Ease of resolving insolvency*	41.5	88
1.3.3 Ease of paying taxes*	57.5	100

2 Human capital & research 12.2 123 ○

2.1 Education	29.4	109
2.1.1 Expenditure on education, % GDP	3.6	89
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	22.1	46 ●
2.1.3 School life expectancy, years [Ⓐ]	7.7	113 ○
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	19.2	78
2.2 Tertiary education	4.0	120 ○
2.2.1 Tertiary enrolment, % gross [Ⓐ]	6.9	112
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, % [Ⓐ]	0.5	90
2.3 Research & development (R&D)	3.4	85
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	29.2	98 ○
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.6	58
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure 24.5 122

3.1 Information & communication technologies (ICTs)	14.7	124 ○
3.1.1 ICT access*	33.0	107
3.1.2 ICT use*	9.7	114
3.1.3 Government's online service*	9.4	122 ○
3.1.4 E-participation*	6.8	125 ○
3.2 General infrastructure	31.0	90
3.2.1 Electricity output, kWh/cap	n/a	n/a
3.2.2 Logistics performance*	20.4	103
3.2.3 Gross capital formation, % GDP	19.4	90
3.3 Ecological sustainability	27.8	118
3.3.1 GDP/unit of energy use	n/a	n/a
3.3.2 Environmental performance*	41.5	121 ○
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.1	120

4 Market sophistication 28.6 124 ○

4.1 Credit	14.5	120
4.1.1 Ease of getting credit*	30.0	108
4.1.2 Domestic credit to private sector, % GDP	24.4	105
4.1.3 Microfinance gross loans, % GDP	0.3	44

4.2 Investment	30.2	110
4.2.1 Ease of protecting minority investors*	40.0	111
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP [Ⓐ]	0.0	37 ●
4.3 Trade, competition, & market scale	41.1	120
4.3.1 Applied tariff rate, weighted mean, %	10.6	116
4.3.2 Intensity of local competition [†]	57.2	111
4.3.3 Domestic market scale, bn PPP\$	38.1	99

5 Business sophistication 29.4 74

5.1 Knowledge workers	22.2	105
5.1.1 Knowledge-intensive employment, %	n/a	n/a
5.1.2 Firms offering formal training, % firms [Ⓐ]	32.1	44 ●
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.0	83
5.1.4 GERD financed by business, % [Ⓐ]	10.1	73
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	26.7	69
5.2.1 University/industry research collaboration [†]	35.8	90
5.2.2 State of cluster development [†]	40.8	83
5.2.3 GERD financed by abroad, % [Ⓐ]	8.8	50
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	35 ●
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	n/a	n/a
5.3 Knowledge absorption	39.3	35 ●
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.1	105
5.3.2 High-tech imports less re-imports, % total trade [Ⓐ]	5.1	107
5.3.3 ICT services imports, % total trade [Ⓐ]	3.1	7 ●
5.3.4 FDI net inflows, % GDP	1.5	95
5.3.5 Research talent, % in business enterprise [Ⓐ]	49.0	26 ●

6 Knowledge & technology outputs 19.1 80

6.1 Knowledge creation	3.8	100
6.1.1 Patents by origin/bn PPP\$ GDP [Ⓐ]	0.3	90
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	4.6	101
6.1.5 Citable documents H index	4.3	99
6.2 Knowledge impact	32.9	58 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	2.7	24 ●
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.0	111
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.2	123 ○
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	20.7	70
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	94
6.3.2 High-tech exports less re-exports, % total trade [Ⓐ]	0.1	111
6.3.3 ICT services exports, % total trade [Ⓐ]	4.7	14 ●
6.3.4 FDI net outflows, % GDP	0.0	104

7 Creative outputs 14.5 121

7.1 Intangible assets	26.1	119
7.1.1 Trademarks by origin/bn PPP\$ GDP	5.4	111
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.5	77
7.1.3 ICTs & business model creation [†]	48.8	107
7.1.4 ICTs & organizational model creation [†]	38.9	109
7.2 Creative goods & services	0.5	127
7.2.1 Cultural & creative services exports, % of total trade	0.0	74
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	0.1	101 ○
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade [Ⓐ]	0.0	122 ○
7.3 Online creativity	5.2	110
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.2	119
7.3.2 Country-code TLDs/th pop. 15–69	11.1	38 ●
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	0.5	121
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	0.4
GDP (US\$ billions)	10.5
GDP per capita, PPP\$	35,825.6
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	50.6	26
Innovation Output Sub-Index	46.3	15
Innovation Input Sub-Index	54.9	28
Innovation Efficiency Ratio	0.8	8
Global Innovation Index 2016 (out of 128)	50.4	26

1 Institutions **77.6** **29**

1.1 Political environment	76.5	29
1.1.1 Political stability & safety*	89.1	10
1.1.2 Government effectiveness*	64.0	38
1.2 Regulatory environment	86.3	17
1.2.1 Regulatory quality*	72.2	25
1.2.2 Rule of law*	73.1	25
1.2.3 Cost of redundancy dismissal, salary weeks	8.0	1 ●
1.3 Business environment	70.1	66
1.3.1 Ease of starting a business*	80.2	99 ○
1.3.2 Ease of resolving insolvency*	45.4	76
1.3.3 Ease of paying taxes*	84.6	29

2 Human capital & research **41.9** **37**

2.1 Education	69.8	7
2.1.1 Expenditure on education, % GDP	8.3	5 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	40.6	4 ●
2.1.3 School life expectancy, years	15.0	46
2.1.4 PISA scales in reading, maths, & science	463.4	40
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	7.8	6
2.2 Tertiary education	36.2	61
2.2.1 Tertiary enrolment, % gross	47.0	56
2.2.2 Graduates in science & engineering, % [Ⓐ]	19.1	63 ○
2.2.3 Tertiary inbound mobility, %	6.2	31
2.3 Research & development (R&D)	19.6	44
2.3.1 Researchers, FTE/mn pop.	1,951.4	40
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.8	46
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	37.4	41
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure **60.6** **23**

3.1 Information & communication technologies (ICTs)	78.9	22
3.1.1 ICT access*	90.4	6 ●
3.1.2 ICT use*	67.5	26
3.1.3 Government's online service*	79.7	26
3.1.4 E-participation*	78.0	25
3.2 General infrastructure	41.4	48
3.2.1 Electricity output, kWh/cap	5,220.9	37
3.2.2 Logistics performance*	46.5	55
3.2.3 Gross capital formation, % GDP	25.6	42
3.3 Ecological sustainability	61.5	15
3.3.1 GDP/unit of energy use	15.2	9
3.3.2 Environmental performance*	88.5	9
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	2.6	42

4 Market sophistication **45.4** **69**

4.1 Credit	34.4	67
4.1.1 Ease of getting credit*	30.0	108 ○
4.1.2 Domestic credit to private sector, % GDP	98.0	28
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	47.0	35
4.2.1 Ease of protecting minority investors*	65.0	31
4.2.2 Market capitalization, % GDP	45.2	34
4.2.3 Venture capital deals/bn PPP\$ GDP	0.1	15
4.3 Trade, competition, & market scale	54.8	94 ○
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	83.2	4 ●
4.3.3 Domestic market scale, bn PPP\$	16.3	122 ○

5 Business sophistication **49.0** **21**

5.1 Knowledge workers	48.7	34
5.1.1 Knowledge-intensive employment, %	39.8	26
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.4	38
5.1.4 GERD financed by business, %	44.1	28
5.1.5 Females employed w/advanced degrees, % total	12.3	55 ○
5.2 Innovation linkages	49.0	9
5.2.1 University/industry research collaboration [†]	50.0	36
5.2.2 State of cluster development [†]	53.6	35
5.2.3 GERD financed by abroad, %	21.3	19
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	24
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	8.8	6
5.3 Knowledge absorption	49.4	15
5.3.1 Intellectual property payments, % total trade	3.2	5 ●
5.3.2 High-tech imports less re-imports, % total trade	7.4	73
5.3.3 ICT services imports, % total trade	1.0	67
5.3.4 FDI net inflows, % GDP	9.5	10
5.3.5 Research talent, % in business enterprise	58.0	14

6 Knowledge & technology outputs **36.6** **23**

6.1 Knowledge creation	33.3	28
6.1.1 Patents by origin/bn PPP\$ GDP	6.0	21
6.1.2 PCT patent applications/bn PPP\$ GDP	5.3	9
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	17.9	42
6.1.5 Citable documents H index	5.0	93 ○
6.2 Knowledge impact	59.0	3 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	2.7	25
6.2.2 New businesses/th pop. 15–64	17.3	1 ●
6.2.3 Computer software spending, % GDP	0.4	25
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	32.8	5 ●
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.2	50
6.3 Knowledge diffusion	17.4	99 ○
6.3.1 Intellectual property receipts, % total trade	2.1	9
6.3.2 High-tech exports less re-exports, % total trade	4.7	36
6.3.3 ICT services exports, % total trade	1.0	82 ○
6.3.4 FDI net outflows, % GDP	(81.5)	124 ○

7 Creative outputs **56.0** **6 ●**

7.1 Intangible assets	62.8	10
7.1.1 Trademarks by origin/bn PPP\$ GDP	104.6	13
7.1.2 Industrial designs by origin/bn PPP\$ GDP [Ⓐ]	13.0	9
7.1.3 ICTs & business model creation [†]	69.9	32
7.1.4 ICTs & organizational model creation [†]	61.2	36
7.2 Creative goods & services	45.1	7
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.0	90 ○
7.2.2 National feature films/mn pop. 15–69	22.8	4 ●
7.2.3 Global ent. & media market/th pop. 15–69	8.8	36
7.2.4 Printing & publishing manufactures, % [Ⓐ]	36.2	1 ●
7.2.5 Creative goods exports, % total trade	0.4	64
7.3 Online creativity	53.5	14
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	94.5	3 ●
7.3.2 Country-code TLDs/th pop. 15–69	7.3	44
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	6.1	42
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	1.3
GDP (US\$ billions)	11.7
GDP per capita, PPP\$	19,509.2
Income group	Upper-middle income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	34.8	64
Innovation Output Sub-Index	22.5	82
Innovation Input Sub-Index	47.1	47
Innovation Efficiency Ratio	0.5	109 ○
Global Innovation Index 2016 (out of 128)	35.9	53

1 Institutions	80.0	27 ●
1.1 Political environment	77.8	25 ●
1.1.1 Political stability & safety*	86.9	20 ●
1.1.2 Government effectiveness*	68.8	33 ●
1.2 Regulatory environment	81.0	24 ●
1.2.1 Regulatory quality*	70.0	29 ●
1.2.2 Rule of law*	64.4	34
1.2.3 Cost of redundancy dismissal, salary weeks	10.6	36
1.3 Business environment	81.2	29 ●
1.3.1 Ease of starting a business*	91.7	41
1.3.2 Ease of resolving insolvency*	69.1	36
1.3.3 Ease of paying taxes*	83.0	38

2 Human capital & research	30.2	76
2.1 Education	53.8	45
2.1.1 Expenditure on education, % GDP	5.0	50
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	31.2	12 ●
2.1.3 School life expectancy, years	14.9	54
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	12.9	49
2.2 Tertiary education	35.2	65
2.2.1 Tertiary enrolment, % gross	36.7	71
2.2.2 Graduates in science & engineering, %	22.9	37
2.2.3 Tertiary inbound mobility, %	4.0	50
2.3 Research & development (R&D)	1.5	98
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	181.1	77
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.2	91 ○
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	47.2	64
3.1 Information & communication technologies (ICTs)	60.7	58
3.1.1 ICT access*	68.6	53
3.1.2 ICT use*	37.8	74
3.1.3 Government's online service*	70.3	45
3.1.4 E-participation*	66.1	49
3.2 General infrastructure	28.0	97
3.2.1 Electricity output, kWh/cap	2,328.6	73
3.2.2 Logistics performance* [Ⓐ]	20.9	99
3.2.3 Gross capital formation, % GDP	21.7	68
3.3 Ecological sustainability	52.8	37
3.3.1 GDP/unit of energy use	15.6	8 ●
3.3.2 Environmental performance*	70.9	70
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.9	67

4 Market sophistication	50.6	44
4.1 Credit	52.9	23 ●
4.1.1 Ease of getting credit*	65.0	40
4.1.2 Domestic credit to private sector, % GDP	102.8	26 ●
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	42.2	54
4.2.1 Ease of protecting minority investors*	65.0	31
4.2.2 Market capitalization, % GDP	62.0	27
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	35
4.3 Trade, competition, & market scale	56.8	84
4.3.1 Applied tariff rate, weighted mean, %	0.6	7 ●
4.3.2 Intensity of local competition [†]	71.7	47
4.3.3 Domestic market scale, bn PPP\$	25.8	113 ○

5 Business sophistication	27.7	86
5.1 Knowledge workers	27.7	92
5.1.1 Knowledge-intensive employment, %	24.7	56
5.1.2 Firms offering formal training, % firms [Ⓐ]	25.6	61
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, % [Ⓐ]	0.3	91 ○
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	7.4	73 ○
5.2 Innovation linkages	24.4	78
5.2.1 University/industry research collaboration [†]	36.5	87
5.2.2 State of cluster development [†]	52.3	39
5.2.3 GERD financed by abroad, % [Ⓐ]	6.4	60
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP [Ⓐ]	0.0	64
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.2	53
5.3 Knowledge absorption	31.0	75
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.3	77
5.3.2 High-tech imports less re-imports, % total trade	8.9	55
5.3.3 ICT services imports, % total trade [Ⓐ]	1.3	54
5.3.4 FDI net inflows, % GDP	2.5	72
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	13.6	115 ○
6.1 Knowledge creation	2.8	116 ○
6.1.1 Patents by origin/bn PPP\$ GDP	0.0	117 ○
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	4.6	100
6.1.5 Citable documents H index	2.3	114 ○
6.2 Knowledge impact	17.7	108 ○
6.2.1 Growth rate of PPP\$ GDP/worker, %	n/a	n/a
6.2.2 New businesses/th pop. 15–64	5.1	24 ●
6.2.3 Computer software spending, % GDP	0.2	75
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	9.7	38
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	87 ○
6.3 Knowledge diffusion	20.3	74
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	72
6.3.2 High-tech exports less re-exports, % total trade	0.0	122 ○
6.3.3 ICT services exports, % total trade [Ⓐ]	2.6	41
6.3.4 FDI net outflows, % GDP	0.9	55

7 Creative outputs	31.4	61
7.1 Intangible assets	37.8	83
7.1.1 Trademarks by origin/bn PPP\$ GDP	40.2	59
7.1.2 Industrial designs by origin/bn PPP\$ GDP [Ⓐ]	0.4	81
7.1.3 ICTs & business model creation [†]	60.0	64
7.1.4 ICTs & organizational model creation [†]	50.9	71
7.2 Creative goods & services	32.0	27 ●
7.2.1 Cultural & creative services exports, % of total trade	0.0	69
7.2.2 National feature films/mn pop. 15–69	9.4	16 ●
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	3.2	5 ●
7.2.5 Creative goods exports, % total trade	1.1	41
7.3 Online creativity	18.1	70
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	12.7	34
7.3.2 Country-code TLDs/th pop. 15–69	2.3	62
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	4.1	79
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Mexico

Key indicators

Population (millions)	128.6
GDP (US\$ billions)	1,063.6
GDP per capita, PPP\$	17,534.4
Income group	Upper-middle income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	35.8	58
Innovation Output Sub-Index	27.1	60
Innovation Input Sub-Index	44.5	54
Innovation Efficiency Ratio	0.6	74
Global Innovation Index 2016 (out of 128)	34.6	61

1 Institutions	58.5	68
1.1 Political environment	45.1	82
1.1.1 Political stability & safety*	42.7	104 ○
1.1.2 Government effectiveness*	47.6	59
1.2 Regulatory environment	55.6	84
1.2.1 Regulatory quality*	52.4	54
1.2.2 Rule of law*	25.7	90
1.2.3 Cost of redundancy dismissal, salary weeks	22.0	94
1.3 Business environment	74.9	51
1.3.1 Ease of starting a business*	85.7	75
1.3.2 Ease of resolving insolvency*	73.1	28
1.3.3 Ease of paying taxes*	65.8	83

2 Human capital & research	33.7	55
2.1 Education	43.1	80
2.1.1 Expenditure on education, % GDP [Ⓐ]	5.2	44
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	16.6	69
2.1.3 School life expectancy, years	13.3	66
2.1.4 PISA scales in reading, maths, & science	415.7	55 ○
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	16.1	71
2.2 Tertiary education	33.0	72
2.2.1 Tertiary enrolment, % gross [Ⓐ]	29.9	79
2.2.2 Graduates in science & engineering, % [Ⓐ]	26.9	19 ●
2.2.3 Tertiary inbound mobility, % [Ⓐ]	0.2	99 ○
2.3 Research & development (R&D)	24.8	41
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	241.8	72
2.3.2 Gross expenditure on R&D, % GDP	0.6	59
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	42.5	37
2.3.4 QS university ranking, average score top 3*	41.6	32

3 Infrastructure	49.7	53
3.1 Information & communication technologies (ICTs)	66.5	42
3.1.1 ICT access*	50.8	81
3.1.2 ICT use*	42.4	65
3.1.3 Government's online service*	84.8	19 ●
3.1.4 E-participation*	88.1	14 ●
3.2 General infrastructure	36.7	67
3.2.1 Electricity output, kWh/cap	2,538.6	70
3.2.2 Logistics performance*	48.6	53
3.2.3 Gross capital formation, % GDP	23.1	54
3.3 Ecological sustainability	45.8	58
3.3.1 GDP/unit of energy use	10.6	41
3.3.2 Environmental performance*	73.6	63
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.6	78

4 Market sophistication	50.0	49
4.1 Credit	35.5	63
4.1.1 Ease of getting credit*	90.0	5 ●
4.1.2 Domestic credit to private sector, % GDP	32.7	97
4.1.3 Microfinance gross loans, % GDP	0.2	47

4.2 Investment	34.5	86
4.2.1 Ease of protecting minority investors*	60.0	52
4.2.2 Market capitalization, % GDP	35.2	42
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	70
4.3 Trade, competition, & market scale	79.9	7 ●
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	1.0	12 ●
4.3.2 Intensity of local competition [†]	70.3	56
4.3.3 Domestic market scale, bn PPP\$	2,306.7	11 ●

5 Business sophistication	30.8	71
5.1 Knowledge workers	34.9	75
5.1.1 Knowledge-intensive employment, %	18.8	77
5.1.2 Firms offering formal training, % firms [Ⓐ]	50.8	22
5.1.3 GERD performed by business, % of GDP	0.2	54
5.1.4 GERD financed by business, %	20.6	62
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	8.2	69 ○
5.2 Innovation linkages	22.3	84
5.2.1 University/industry research collaboration [†]	43.8	50
5.2.2 State of cluster development [†]	53.8	34
5.2.3 GERD financed by abroad, %	0.4	93 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	87 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	73
5.3 Knowledge absorption	35.0	54
5.3.1 Intellectual property payments, % total trade	0.2	82
5.3.2 High-tech imports less re-imports, % total trade	18.4	9 ●
5.3.3 ICT services imports, % total trade	0.0	125 ○
5.3.4 FDI net inflows, % GDP	2.9	61
5.3.5 Research talent, % in business enterprise [Ⓐ]	24.5	50

6 Knowledge & technology outputs	21.5	64
6.1 Knowledge creation	8.3	70
6.1.1 Patents by origin/bn PPP\$ GDP	0.6	72
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	61
6.1.3 Utility models by origin/bn PPP\$ GDP	0.3	40
6.1.4 Scientific & technical articles/bn PPP\$ GDP	5.8	93
6.1.5 Citable documents H index	26.8	34
6.2 Knowledge impact	30.3	70
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.1	83
6.2.2 New businesses/th pop. 15–64	0.9	73
6.2.3 Computer software spending, % GDP	0.3	57
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	3.3	74
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.4	16 ●
6.3 Knowledge diffusion	25.9	49
6.3.1 Intellectual property receipts, % total trade	0.1	58
6.3.2 High-tech exports less re-exports, % total trade	14.8	10 ●
6.3.3 ICT services exports, % total trade	0.0	126 ○
6.3.4 FDI net outflows, % GDP	0.9	53

7 Creative outputs	32.6	58
7.1 Intangible assets	41.7	64
7.1.1 Trademarks by origin/bn PPP\$ GDP	40.7	58
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.8	69
7.1.3 ICTs & business model creation [†]	66.6	43
7.1.4 ICTs & organizational model creation [†]	57.0	49
7.2 Creative goods & services	29.9	31
7.2.1 Cultural & creative services exports, % of total trade	0.0	75 ○
7.2.2 National feature films/mn pop. 15–69	1.6	67
7.2.3 Global ent. & media market/th pop. 15–69	8.3	38
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.6	87 ○
7.2.5 Creative goods exports, % total trade	10.0	3 ●
7.3 Online creativity	17.1	73
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	2.6	71
7.3.2 Country-code TLDs/th pop. 15–69	2.8	59
7.3.3 Wikipedia edits/mn pop. 15–69	4.0	85
7.3.4 Video uploads on YouTube/pop. 15–69	24.9	51

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	4.1
GDP (US\$ billions)	6.7
GDP per capita, PPP\$	5,006.2
Income group	Lower-middle income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	36.8	54
Innovation Output Sub-Index	32.3	42
Innovation Input Sub-Index	41.4	73
Innovation Efficiency Ratio	0.8	22 ●
Global Innovation Index 2016 (out of 128)	38.4	46

1 Institutions	56.4	72
1.1 Political environment	40.1	96
1.1.1 Political stability & safety*	54.3	81
1.1.2 Government effectiveness*	25.9	103
1.2 Regulatory environment	52.7	92
1.2.1 Regulatory quality*	40.8	75
1.2.2 Rule of law*	27.7	85
1.2.3 Cost of redundancy dismissal, salary weeks	22.6	95
1.3 Business environment	76.4	41
1.3.1 Ease of starting a business*	92.0	37
1.3.2 Ease of resolving insolvency*	52.6	56
1.3.3 Ease of paying taxes*	84.8	28 ●
2 Human capital & research	33.2	59
2.1 Education	58.3	31
2.1.1 Expenditure on education, % GDP	7.5	9 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	39.3	5 ●
2.1.3 School life expectancy, years	11.6	90
2.1.4 PISA scales in reading, maths, & science	421.3	51
2.1.5 Pupil-teacher ratio, secondary	9.3	18 ●
2.2 Tertiary education	37.2	58
2.2.1 Tertiary enrolment, % gross	41.2	63
2.2.2 Graduates in science & engineering, %	25.7	24 ●
2.2.3 Tertiary inbound mobility, %	2.5	63
2.3 Research & development (R&D)	4.0	81
2.3.1 Researchers, FTE/mn pop.	662.1	59
2.3.2 Gross expenditure on R&D, % GDP	0.4	74
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○
3 Infrastructure	41.7	82
3.1 Information & communication technologies (ICTs)	58.6	62
3.1.1 ICT access*	66.4	61
3.1.2 ICT use*	42.6	64
3.1.3 Government's online service*	59.4	67
3.1.4 E-participation*	66.1	49
3.2 General infrastructure	27.7	98
3.2.1 Electricity output, kWh/cap	1,503.1	87
3.2.2 Logistics performance*	25.5	91
3.2.3 Gross capital formation, % GDP	21.1	73
3.3 Ecological sustainability	38.7	87
3.3.1 GDP/unit of energy use	5.0	103 ○
3.3.2 Environmental performance*	76.7	54
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.0	62
4 Market sophistication	46.8	62
4.1 Credit	29.8	79
4.1.1 Ease of getting credit*	70.0	29
4.1.2 Domestic credit to private sector, % GDP	34.8	93
4.1.3 Microfinance gross loans, % GDP	0.4	38

4.2 Investment	63.3	[15]
4.2.1 Ease of protecting minority investors*	63.3	41
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, & market scale	47.2	111 ○
4.3.1 Applied tariff rate, weighted mean, %	3.4	72
4.3.2 Intensity of local competition†	59.1	105 ○
4.3.3 Domestic market scale, bn PPP\$	18.5	121 ○

5 Business sophistication	28.7	81
5.1 Knowledge workers	36.2	71
5.1.1 Knowledge-intensive employment, %	28.1	50
5.1.2 Firms offering formal training, % firms	32.4	43
5.1.3 GERD performed by business, % of GDP	0.1	64
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	14.0	43
5.2 Innovation linkages	18.5	117 ○
5.2.1 University/industry research collaboration†	25.3	117 ○
5.2.2 State of cluster development†	22.2	123 ○
5.2.3 GERD financed by abroad, %	11.6	44
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	27
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.2	47
5.3 Knowledge absorption	31.3	73
5.3.1 Intellectual property payments, % total trade	0.5	61
5.3.2 High-tech imports less re-imports, % total trade	7.8	67
5.3.3 ICT services imports, % total trade	2.5	12 ●
5.3.4 FDI net inflows, % GDP	3.9	39
5.3.5 Research talent, % in business enterprise	7.6	68

6 Knowledge & technology outputs	25.4	52
6.1 Knowledge creation	41.5	19 ●
6.1.1 Patents by origin/bn PPP\$ GDP	3.6	30
6.1.2 PCT patent applications/bn PPP\$ GDP	0.5	36
6.1.3 Utility models by origin/bn PPP\$ GDP	9.3	1 ●
6.1.4 Scientific & technical articles/bn PPP\$ GDP	13.2	57
6.1.5 Citable documents H index	4.8	96
6.2 Knowledge impact	11.0	115 ○
6.2.1 Growth rate of PPP\$ GDP/worker, %	(3.5)	108 ○
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	1.6	52
6.2.3 Computer software spending, % GDP	0.1	83
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	7.2	49
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	80
6.3 Knowledge diffusion	23.7	59
6.3.1 Intellectual property receipts, % total trade	0.1	46
6.3.2 High-tech exports less re-exports, % total trade	0.6	74
6.3.3 ICT services exports, % total trade	4.7	13 ●
6.3.4 FDI net outflows, % GDP	0.4	75

7 Creative outputs	39.3	39
7.1 Intangible assets	63.3	9 ●
7.1.1 Trademarks by origin/bn PPP\$ GDP	149.8	3 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	67.3	1 ●
7.1.3 ICTs & business model creation†	49.5	104 ○
7.1.4 ICTs & organizational model creation†	45.1	92
7.2 Creative goods & services	12.5	80
7.2.1 Cultural & creative services exports, % of total trade	0.4	32
7.2.2 National feature films/mn pop. 15–69	0.3	96 ○
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	1.7	29
7.2.5 Creative goods exports, % total trade	0.1	102
7.3 Online creativity	18.0	71
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	2.1	77
7.3.2 Country-code TLDs/th pop. 15–69	2.3	61
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	5.1	57
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Mongolia

Key indicators

Population (millions)	3.0
GDP (US\$ billions)	11.2
GDP per capita, PPP\$	12,146.6
Income group	Lower-middle income
Region	South East Asia, East Asia, and Oceania

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	37.1	52
Innovation Output Sub-Index	31.6	48
Innovation Input Sub-Index	42.7	67
Innovation Efficiency Ratio	0.7	27
Global Innovation Index 2016 (out of 128)	35.7	55

1 Institutions	64.6	60
1.1 Political environment	55.7	56
1.1.1 Political stability & safety*	79.6	34
1.1.2 Government effectiveness*	31.8	89
1.2 Regulatory environment	64.7	64
1.2.1 Regulatory quality*	33.6	90
1.2.2 Rule of law*	28.0	84
1.2.3 Cost of redundancy dismissal, salary weeks	8.7	22 ●
1.3 Business environment	73.4	56
1.3.1 Ease of starting a business*	92.6	32
1.3.2 Ease of resolving insolvency*	43.6	82
1.3.3 Ease of paying taxes*	84.2	31

2 Human capital & research	26.9	81
2.1 Education	45.5	71
2.1.1 Expenditure on education, % GDP [Ⓐ]	4.6	64
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	15.4	78
2.1.3 School life expectancy, years	15.0	47
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	14.5	61
2.2 Tertiary education	34.1	70
2.2.1 Tertiary enrolment, % gross	68.6	28
2.2.2 Graduates in science & engineering, %	19.5	61
2.2.3 Tertiary inbound mobility, %	0.7	86
2.3 Research & development (R&D)	1.1	104
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	0.2	94
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	40.1	86
3.1 Information & communication technologies (ICTs)	52.6	73
3.1.1 ICT access*	51.2	80
3.1.2 ICT use*	36.4	75
3.1.3 Government's online service*	51.4	81
3.1.4 E-participation*	71.2	39
3.2 General infrastructure	33.5	80
3.2.1 Electricity output, kWh/cap.	1,847.4	79
3.2.2 Logistics performance*	20.5	102
3.2.3 Gross capital formation, % GDP	27.0	31
3.3 Ecological sustainability	34.3	106
3.3.1 GDP/unit of energy use	6.1	93
3.3.2 Environmental performance*	64.4	96
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.2	113

4 Market sophistication	52.6	35
4.1 Credit	60.4	14 ●
4.1.1 Ease of getting credit*	60.0	55
4.1.2 Domestic credit to private sector, % GDP	54.8	60
4.1.3 Microfinance gross loans, % GDP	18.4	1 ●

4.2 Investment	47.1	34
4.2.1 Ease of protecting minority investors*	68.3	25 ●
4.2.2 Market capitalization, % GDP [Ⓐ]	10.5	75
4.2.3 Venture capital deals/bn PPP\$ GDP	n/a	n/a
4.3 Trade, competition, & market scale	50.4	103
4.3.1 Applied tariff rate, weighted mean, %	4.6	85
4.3.2 Intensity of local competition [†]	60.1	100
4.3.3 Domestic market scale, bn PPP\$	36.7	102

5 Business sophistication	29.3	76
5.1 Knowledge workers	42.3	50
5.1.1 Knowledge-intensive employment, %	24.7	57
5.1.2 Firms offering formal training, % firms	60.9	7 ●
5.1.3 GERD performed by business, % of GDP	0.0	81 ○
5.1.4 GERD financed by business, %	7.3	74
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	16.7	32
5.2 Innovation linkages	14.5	123 ○
5.2.1 University/industry research collaboration [†]	26.6	114 ○
5.2.2 State of cluster development [†]	28.8	121 ○
5.2.3 GERD financed by abroad, % [Ⓐ]	2.8	68
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	59
5.2.5 Patent families 2+ offices/bn PPP\$ GDP [Ⓐ]	0.0	87
5.3 Knowledge absorption	31.1	74
5.3.1 Intellectual property payments, % total trade	0.3	76
5.3.2 High-tech imports less re-imports, % total trade	5.5	103
5.3.3 ICT services imports, % total trade	1.6	40
5.3.4 FDI net inflows, % GDP	6.6	19 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	21.1	67
6.1 Knowledge creation	35.5	23 ●
6.1.1 Patents by origin/bn PPP\$ GDP	3.0	34
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	92
6.1.3 Utility models by origin/bn PPP\$ GDP	4.1	5 ●
6.1.4 Scientific & technical articles/bn PPP\$ GDP	6.5	83
6.1.5 Citable documents H index	4.0	103
6.2 Knowledge impact	13.5	113
6.2.1 Growth rate of PPP\$ GDP/worker, %	n/a	n/a
6.2.2 New businesses/th pop. 15–64	6.3	19 ●
6.2.3 Computer software spending, % GDP	0.1	82
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.5	118 ○
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	93 ○
6.3 Knowledge diffusion	14.3	113
6.3.1 Intellectual property receipts, % total trade	0.0	68
6.3.2 High-tech exports less re-exports, % total trade	0.1	116 ○
6.3.3 ICT services exports, % total trade	0.2	113
6.3.4 FDI net outflows, % GDP	0.4	70

7 Creative outputs	42.0	34
7.1 Intangible assets	62.0	13 ●
7.1.1 Trademarks by origin/bn PPP\$ GDP	194.5	1 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP [Ⓐ]	7.4	18 ●
7.1.3 ICTs & business model creation [†]	55.8	82
7.1.4 ICTs & organizational model creation [†]	41.2	108
7.2 Creative goods & services	27.2	39
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.0	91 ○
7.2.2 National feature films/mn pop. 15–69	20.0	5 ●
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	2.9	9 ●
7.2.5 Creative goods exports, % total trade	0.0	120 ○
7.3 Online creativity	17.0	75
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.6	102
7.3.2 Country-code TLDs/th pop. 15–69	1.4	70
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	5.1	62
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	0.6
GDP (US\$ billions)	4.2
GDP per capita, PPP\$	16,123.1
Income group	Upper-middle income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	38.1	48
Innovation Output Sub-Index	29.3	52
Innovation Input Sub-Index	46.8	50
Innovation Efficiency Ratio	0.6	62
Global Innovation Index 2016 (out of 128)	37.4	51

1 Institutions	68.4	48
1.1 Political environment	56.6	54
1.1.1 Political stability & safety*	67.0	54
1.1.2 Government effectiveness*	46.3	61
1.2 Regulatory environment	68.9	47
1.2.1 Regulatory quality*	47.9	63
1.2.2 Rule of law*	40.4	59
1.2.3 Cost of redundancy dismissal, salary weeks	11.2	39
1.3 Business environment	79.6	34
1.3.1 Ease of starting a business*	90.1	49
1.3.2 Ease of resolving insolvency*	68.4	37
1.3.3 Ease of paying taxes*	80.4	48
2 Human capital & research	36.3	[49]
2.1 Education	56.0	[39]
2.1.1 Expenditure on education, % GDP	n/a	n/a
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years [Ⓐ]	15.1	44
2.1.4 PISA scales in reading, maths, & science	418.7	52 ○
2.1.5 Pupil-teacher ratio, secondary	n/a	n/a
2.2 Tertiary education	48.2	[25]
2.2.1 Tertiary enrolment, % gross [Ⓐ]	55.3	48
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, %	n/a	n/a
2.3 Research & development (R&D)	4.6	77
2.3.1 Researchers, FTE/mn pop.	835.8	53
2.3.2 Gross expenditure on R&D, % GDP	0.4	72
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○
3 Infrastructure	49.5	54
3.1 Information & communication technologies (ICTs)	66.4	43
3.1.1 ICT access*	68.5	55
3.1.2 ICT use*	46.1	60
3.1.3 Government's online service*	68.1	47
3.1.4 E-participation*	83.1	17 ●
3.2 General infrastructure	35.0	74
3.2.1 Electricity output, kWh/cap	5,119.4	39
3.2.2 Logistics performance*	14.7	114 ○
3.2.3 Gross capital formation, % GDP	27.1	30
3.3 Ecological sustainability	47.1	55
3.3.1 GDP/unit of energy use	9.2	58
3.3.2 Environmental performance*	78.9	46
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.7	52
4 Market sophistication	45.9	65
4.1 Credit	40.8	47
4.1.1 Ease of getting credit*	85.0	7 ●
4.1.2 Domestic credit to private sector, % GDP	50.6	69
4.1.3 Microfinance gross loans, % GDP	1.0	26

4.2 Investment	55.4	21 ●
4.2.1 Ease of protecting minority investors*	63.3	41
4.2.2 Market capitalization, % GDP [Ⓐ]	92.6	10 ●
4.2.3 Venture capital deals/bn PPP\$ GDP	n/a	n/a
4.3 Trade, competition, & market scale	41.4	119 ○
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	2.6	60
4.3.2 Intensity of local competition [†]	54.6	114 ○
4.3.3 Domestic market scale, bn PPP\$	10.6	126 ○

5 Business sophistication	34.1	58
5.1 Knowledge workers	37.4	62
5.1.1 Knowledge-intensive employment, %	37.4	32
5.1.2 Firms offering formal training, % firms	23.7	67
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.1	57
5.1.4 GERD financed by business, % [Ⓐ]	28.5	53
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a

5.2 Innovation linkages	29.6	57
5.2.1 University/industry research collaboration [†]	36.4	88
5.2.2 State of cluster development [†]	34.8	103 ○
5.2.3 GERD financed by abroad, % [Ⓐ]	20.7	20 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	n/a	n/a
5.2.5 Patent families 2+ offices/bn PPP\$ GDP [Ⓐ]	0.2	48
5.3 Knowledge absorption	35.3	53
5.3.1 Intellectual property payments, % total trade	0.2	86 ○
5.3.2 High-tech imports less re-imports, % total trade	6.4	90
5.3.3 ICT services imports, % total trade	2.3	15 ●
5.3.4 FDI net inflows, % GDP	12.8	7 ●
5.3.5 Research talent, % in business enterprise [Ⓐ]	19.0	57

6 Knowledge & technology outputs	22.5	57
6.1 Knowledge creation	11.2	60
6.1.1 Patents by origin/bn PPP\$ GDP	2.3	42
6.1.2 PCT patent applications/bn PPP\$ GDP	0.2	51
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	21.5	36
6.1.5 Citable documents H index	0.3	125 ○

6.2 Knowledge impact	36.1	45
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.4	73
6.2.2 New businesses/th pop. 15–64	6.9	17 ●
6.2.3 Computer software spending, % GDP	0.4	22 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	8.4	41
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	20.1	78
6.3.1 Intellectual property receipts, % total trade	0.0	74
6.3.2 High-tech exports less re-exports, % total trade	0.6	77
6.3.3 ICT services exports, % total trade	3.2	26
6.3.4 FDI net outflows, % GDP	0.4	72

7 Creative outputs	36.1	48
7.1 Intangible assets	41.7	65
7.1.1 Trademarks by origin/bn PPP\$ GDP	n/a	n/a
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.8	68
7.1.3 ICTs & business model creation [†]	56.7	79
7.1.4 ICTs & organizational model creation [†]	45.5	90 ○

7.2 Creative goods & services	16.5	70
7.2.1 Cultural & creative services exports, % of total trade	0.1	57
7.2.2 National feature films/mn pop. 15–69	13.3	10 ●
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.2	75

7.3 Online creativity	44.6	22 ●
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.4	89
7.3.2 Country-code TLDs/th pop. 15–69	100.0	1 ●
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	5.5	51
7.3.4 Video uploads on YouTube/pop. 15–69	23.8	53

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Morocco

Key indicators

Population (millions)	34.8
GDP (US\$ billions)	104.9
GDP per capita, PPP\$	8,164.4
Income group	Lower-middle income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	32.7	72
Innovation Output Sub-Index	24.8	68
Innovation Input Sub-Index	40.6	79
Innovation Efficiency Ratio	0.6	71
Global Innovation Index 2016 (out of 128)	32.3	72

1 Institutions	58.1	70
1.1 Political environment	48.1	72
1.1.1 Political stability & safety*	55.7	79
1.1.2 Government effectiveness*	40.6	76
1.2 Regulatory environment	56.2	81
1.2.1 Regulatory quality*	37.7	78
1.2.2 Rule of law*	37.2	63
1.2.3 Cost of redundancy dismissal, salary weeks	20.7	85
1.3 Business environment	69.9	67
1.3.1 Ease of starting a business*	92.3	34 ●
1.3.2 Ease of resolving insolvency*	33.9	109 ○
1.3.3 Ease of paying taxes*	83.5	36 ●

2 Human capital & research	32.3	63
2.1 Education	46.4	66
2.1.1 Expenditure on education, % GDP [Ⓐ]	5.3	42
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	36.1	9 ●
2.1.3 School life expectancy, years [Ⓐ]	12.1	86
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	n/a	n/a
2.2 Tertiary education	43.4	39
2.2.1 Tertiary enrolment, % gross	28.1	83
2.2.2 Graduates in science & engineering, % [Ⓐ]	34.9	4 ●
2.2.3 Tertiary inbound mobility, % [Ⓐ]	1.8	71
2.3 Research & development (R&D)	7.2	65
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	1,032.5	47
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.7	50
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	50.0	51
3.1 Information & communication technologies (ICTs)	62.9	53
3.1.1 ICT access*	60.7	71
3.1.2 ICT use*	34.0	79
3.1.3 Government's online service*	73.9	36
3.1.4 E-participation*	83.1	17 ●
3.2 General infrastructure	38.0	61
3.2.1 Electricity output, kWh/cap.	847.5	97 ○
3.2.2 Logistics performance*	27.9	85
3.2.3 Gross capital formation, % GDP	30.2	18 ●
3.3 Ecological sustainability	49.2	49
3.3.1 GDP/unit of energy use	12.7	21 ●
3.3.2 Environmental performance*	74.2	60
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.6	79

4 Market sophistication	42.1	89
4.1 Credit	26.7	93
4.1.1 Ease of getting credit*	45.0	84
4.1.2 Domestic credit to private sector, % GDP	64.3	49
4.1.3 Microfinance gross loans, % GDP	0.6	33

4.2 Investment	33.2	97
4.2.1 Ease of protecting minority investors*	53.3	80
4.2.2 Market capitalization, % GDP	45.7	33
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	50
4.3 Trade, competition, & market scale	66.3	49
4.3.1 Applied tariff rate, weighted mean, %	2.8	64
4.3.2 Intensity of local competition [†]	68.7	68
4.3.3 Domestic market scale, bn PPP\$	282.8	54

5 Business sophistication	20.5	122	○
5.1 Knowledge workers	21.0	109	○
5.1.1 Knowledge-intensive employment, % [Ⓐ]	6.8	99	○
5.1.2 Firms offering formal training, % firms	26.3	59	
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.2	50	
5.1.4 GERD financed by business, % [Ⓐ]	29.9	51	
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a	
5.2 Innovation linkages	18.8	115	○
5.2.1 University/industry research collaboration [†]	35.4	93	
5.2.2 State of cluster development [†]	43.6	74	
5.2.3 GERD financed by abroad, % [Ⓐ]	1.7	78	
5.2.4 JV–strategic alliance deals/bn PPP\$ GDP	0.0	89	
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	99	○
5.3 Knowledge absorption	21.6	118	○
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.2	84	
5.3.2 High-tech imports less re-imports, % total trade	7.3	75	
5.3.3 ICT services imports, % total trade [Ⓐ]	0.5	96	
5.3.4 FDI net inflows, % GDP	3.2	50	
5.3.5 Research talent, % in business enterprise [Ⓐ]	7.5	69	○

6 Knowledge & technology outputs	20.3	77	
6.1 Knowledge creation	6.2	81	
6.1.1 Patents by origin/bn PPP\$ GDP	0.8	67	
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	59	
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a	
6.1.4 Scientific & technical articles/bn PPP\$ GDP	7.0	78	
6.1.5 Citable documents H index	9.3	68	
6.2 Knowledge impact	34.5	48	
6.2.1 Growth rate of PPP\$ GDP/worker, %	2.7	26 ●	
6.2.2 New businesses/th pop. 15–64	1.5	54	
6.2.3 Computer software spending, % GDP	0.3	62	
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	3.5	73	
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.3	42	
6.3 Knowledge diffusion	20.1	79	
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	95	○
6.3.2 High-tech exports less re-exports, % total trade	1.5	59	
6.3.3 ICT services exports, % total trade [Ⓐ]	2.9	31 ●	
6.3.4 FDI net outflows, % GDP	0.5	68	

7 Creative outputs	29.4	68	
7.1 Intangible assets	49.4	39	
7.1.1 Trademarks by origin/bn PPP\$ GDP	49.4	52	
7.1.2 Industrial designs by origin/bn PPP\$ GDP	13.6	8 ●	
7.1.3 ICTs & business model creation [†]	62.3	53	
7.1.4 ICTs & organizational model creation [†]	48.8	78	
7.2 Creative goods & services	5.6	106	○
7.2.1 Cultural & creative services exports, % of total trade	0.1	58	
7.2.2 National feature films/mn pop. 15–69	0.8	85	
7.2.3 Global ent. & media market/th pop. 15–69	0.6	60	○
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.8	74	
7.2.5 Creative goods exports, % total trade	0.2	77	
7.3 Online creativity	13.3	89	
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.6	85	
7.3.2 Country-code TLDs/th pop. 15–69	0.8	84	
7.3.3 Wikipedia edits/mn pop. 15–69	4.0	84	
7.3.4 Video uploads on YouTube/pop. 15–69	12.6	62	○

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	28.8
GDP (US\$ billions)	12.0
GDP per capita, PPP\$	1,186.2
Income group	Low income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	24.5	107
Innovation Output Sub-Index	18.6	100
Innovation Input Sub-Index	30.5	114
Innovation Efficiency Ratio	0.6	70 ●
Global Innovation Index 2016 (out of 128)	29.8	84

1 Institutions	44.6	113
1.1 Political environment	36.5	102
1.1.1 Political stability & safety*	49.9	92
1.1.2 Government effectiveness*	23.1	112
1.2 Regulatory environment	31.7	123 ○
1.2.1 Regulatory quality*	29.5	99
1.2.2 Rule of law*	14.1	113
1.2.3 Cost of redundancy dismissal, salary weeks	37.5	123 ○
1.3 Business environment	65.5	76
1.3.1 Ease of starting a business*	79.9	101
1.3.2 Ease of resolving insolvency*	49.6	60 ●
1.3.3 Ease of paying taxes*	67.1	81

2 Human capital & research	18.7	104
2.1 Education	46.5	64 ●
2.1.1 Expenditure on education, % GDP	6.5	15 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	52.0	2 ●
2.1.3 School life expectancy, years	9.6	104
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	39.7	108 ○
2.2 Tertiary education	7.6	117
2.2.1 Tertiary enrolment, % gross [Ⓐ]	6.0	113
2.2.2 Graduates in science & engineering, %	8.1	99 ○
2.2.3 Tertiary inbound mobility, % [Ⓐ]	0.4	94
2.3 Research & development (R&D)	2.0	94
2.3.1 Researchers, FTE/mn pop.	41.5	92
2.3.2 Gross expenditure on R&D, % GDP	0.3	75
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	28.8	110
3.1 Information & communication technologies (ICTs)	19.0	117
3.1.1 ICT access*	29.0	111
3.1.2 ICT use*	6.2	119
3.1.3 Government's online service*	20.3	115
3.1.4 E-participation*	20.3	113
3.2 General infrastructure	47.4	33 ●
3.2.1 Electricity output, kWh/cap	651.9	102
3.2.2 Logistics performance*	28.7	84
3.2.3 Gross capital formation, % GDP	38.5	7 ●
3.3 Ecological sustainability	20.0	125 ○
3.3.1 GDP/unit of energy use	2.5	115
3.3.2 Environmental performance*	41.8	119 ○
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.4	87

4 Market sophistication	35.8	111
4.1 Credit	13.9	121
4.1.1 Ease of getting credit*	25.0	119
4.1.2 Domestic credit to private sector, % GDP	35.1	91
4.1.3 Microfinance gross loans, % GDP	0.2	51

4.2 Investment	43.3	[47]
4.2.1 Ease of protecting minority investors*	43.3	101
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, & market scale	50.2	104
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	4.2	80
4.3.2 Intensity of local competition [†]	58.0	108
4.3.3 Domestic market scale, bn PPP\$	35.3	104

5 Business sophistication **24.4** **106**

5.1 Knowledge workers	10.2	122
5.1.1 Knowledge-intensive employment, %	n/a	n/a
5.1.2 Firms offering formal training, % firms [Ⓐ]	22.1	71
5.1.3 GERD performed by business, % of GDP	0.0	86
5.1.4 GERD financed by business, %	0.5	89
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	0.5	87 ○
5.2 Innovation linkages	34.5	46 ●
5.2.1 University/industry research collaboration [†]	37.8	82
5.2.2 State of cluster development [†]	34.5	104
5.2.3 GERD financed by abroad, %	39.9	11 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	102
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	118 ○
5.3 Knowledge absorption	28.5	85
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.2	78
5.3.2 High-tech imports less re-imports, % total trade	5.7	100
5.3.3 ICT services imports, % total trade	0.9	72
5.3.4 FDI net inflows, % GDP	32.5	3 ●
5.3.5 Research talent, % in business enterprise	0.3	84 ○

6 Knowledge & technology outputs **20.8** **72 ●**

6.1 Knowledge creation	4.5	93
6.1.1 Patents by origin/bn PPP\$ GDP	0.7	70 ●
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	90
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	7.4	76
6.1.5 Citable documents H index	4.1	102
6.2 Knowledge impact	40.6	29 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	4.4	10 ●
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.0	113
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	1.7	98
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	17.3	100
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	102
6.3.2 High-tech exports less re-exports, % total trade	0.4	90
6.3.3 ICT services exports, % total trade	0.2	114
6.3.4 FDI net outflows, % GDP	1.3	42 ●

7 Creative outputs **16.5** **119**

7.1 Intangible assets	30.3	102
7.1.1 Trademarks by origin/bn PPP\$ GDP	34.7	66 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.9	65
7.1.3 ICTs & business model creation [†]	49.3	105
7.1.4 ICTs & organizational model creation [†]	37.0	113
7.2 Creative goods & services	2.0	119
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.0	71
7.2.2 National feature films/mn pop. 15–69	1.7	65
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.0	121 ○
7.3 Online creativity	3.3	117
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.0	126 ○
7.3.2 Country-code TLDs/th pop. 15–69	0.1	111
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	1.0	116
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Namibia

Key indicators

Population (millions)	2.5
GDP (US\$ billions)	10.2
GDP per capita, PPP\$	11,408.2
Income group	Upper-middle income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	27.9	97
Innovation Output Sub-Index	18.1	102
Innovation Input Sub-Index	37.8	89
Innovation Efficiency Ratio	0.5	108
Global Innovation Index 2016 (out of 128)	28.2	93

1 Institutions	65.2	58
1.1 Political environment	64.2	45
1.1.1 Political stability & safety*	79.6	35 ●
1.1.2 Government effectiveness*	48.8	53
1.2 Regulatory environment	69.6	44
1.2.1 Regulatory quality*	40.0	76
1.2.2 Rule of law*	44.9	53
1.2.3 Cost of redundancy dismissal, salary weeks	9.7	30 ●
1.3 Business environment	61.9	87
1.3.1 Ease of starting a business*	68.9	119 ○
1.3.2 Ease of resolving insolvency*	42.0	86
1.3.3 Ease of paying taxes*	75.0	60

2 Human capital & research	22.5	94
2.1 Education	50.1	53
2.1.1 Expenditure on education, % GDP [Ⓐ]	8.3	4 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	16.0	76
2.1.3 School life expectancy, years	n/a	n/a
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	24.6	92
2.2 Tertiary education	15.1	108
2.2.1 Tertiary enrolment, % gross [Ⓐ]	9.3	107
2.2.2 Graduates in science & engineering, % [Ⓐ]	2.6	102 ○
2.2.3 Tertiary inbound mobility, % [Ⓐ]	10.2	17 ●
2.3 Research & development (R&D)	2.3	89
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	141.4	82
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.3	76
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	38.6	92
3.1 Information & communication technologies (ICTs)	30.9	108
3.1.1 ICT access*	42.5	97
3.1.2 ICT use*	29.1	90
3.1.3 Government's online service*	28.3	109
3.1.4 E-participation*	23.7	111
3.2 General infrastructure	37.6	62
3.2.1 Electricity output, kWh/cap.	624.2	103
3.2.2 Logistics performance*	31.5	78
3.2.3 Gross capital formation, % GDP	29.2	21 ●
3.3 Ecological sustainability	47.4	53
3.3.1 GDP/unit of energy use	12.3	27 ●
3.3.2 Environmental performance*	70.8	71
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.7	76

4 Market sophistication	39.3	97
4.1 Credit	27.1	91
4.1.1 Ease of getting credit*	60.0	55
4.1.2 Domestic credit to private sector, % GDP	53.8	63
4.1.3 Microfinance gross loans, % GDP [Ⓐ]	0.0	65

4.2 Investment	36.7	80
4.2.1 Ease of protecting minority investors*	55.0	75
4.2.2 Market capitalization, % GDP [Ⓐ]	0.0	86 ○
4.2.3 Venture capital deals/bn PPP\$ GDP	n/a	n/a
4.3 Trade, competition, & market scale	54.1	97
4.3.1 Applied tariff rate, weighted mean, %	0.9	10 ●
4.3.2 Intensity of local competition [†]	61.1	95
4.3.3 Domestic market scale, bn PPP\$	27.0	111

5 Business sophistication

5.1 Knowledge workers	20.5	111
5.1.1 Knowledge-intensive employment, % [Ⓐ]	14.6	89
5.1.2 Firms offering formal training, % firms	25.4	63
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.0	74
5.1.4 GERD financed by business, % [Ⓐ]	11.1	71
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	27.7	65
5.2.1 University/industry research collaboration [†]	37.7	83
5.2.2 State of cluster development [†]	44.5	68
5.2.3 GERD financed by abroad, % [Ⓐ]	15.8	29 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	40
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	59
5.3 Knowledge absorption	21.3	119 ○
5.3.1 Intellectual property payments, % total trade	0.1	93
5.3.2 High-tech imports less re-imports, % total trade [Ⓐ]	6.0	95
5.3.3 ICT services imports, % total trade	0.5	103
5.3.4 FDI net inflows, % GDP	6.4	20 ●
5.3.5 Research talent, % in business enterprise [Ⓐ]	6.9	70

6 Knowledge & technology outputs

6.1 Knowledge creation	4.5	92
6.1.1 Patents by origin/bn PPP\$ GDP	n/a	n/a
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	68
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	6.7	81
6.1.5 Citable documents H index	4.0	103
6.2 Knowledge impact	5.5	118 ○
6.2.1 Growth rate of PPP\$ GDP/worker, %	n/a	n/a
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	0.9	76
6.2.3 Computer software spending, % GDP	0.1	84
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	1.8	97
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.0	94 ○
6.3 Knowledge diffusion	13.5	118 ○
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	100 ○
6.3.2 High-tech exports less re-exports, % total trade [Ⓐ]	1.6	58
6.3.3 ICT services exports, % total trade [Ⓐ]	0.0	124 ○
6.3.4 FDI net outflows, % GDP	0.2	89

7 Creative outputs

7.1 Intangible assets	40.1	73
7.1.1 Trademarks by origin/bn PPP\$ GDP	62.9	32 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.0	112 ○
7.1.3 ICTs & business model creation [†]	58.0	72
7.1.4 ICTs & organizational model creation [†]	50.1	76
7.2 Creative goods & services	18.9	[62]
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade [Ⓐ]	0.7	51
7.3 Online creativity	14.4	80
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	8.7	42
7.3.2 Country-code TLDs/th pop. 15–69	0.0	117 ○
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	3.6	92
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	28.9
GDP (US\$ billions)	21.2
GDP per capita, PPP\$	2,465.2
Income group	Low income
Region	Central and Southern Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	24.2	109
Innovation Output Sub-Index	15.9	114
Innovation Input Sub-Index	32.5	108
Innovation Efficiency Ratio	0.5	105
Global Innovation Index 2016 (out of 128)	23.1	115

1 Institutions	43.9	115
1.1 Political environment	28.4	118
1.1.1 Political stability & safety*	41.4	107
1.1.2 Government effectiveness*	15.3	121 ○
1.2 Regulatory environment	41.2	114
1.2.1 Regulatory quality*	22.0	110
1.2.2 Rule of law*	18.9	103
1.2.3 Cost of redundancy dismissal, salary weeks	27.2	105
1.3 Business environment	62.2	86
1.3.1 Ease of starting a business*	83.8	84
1.3.2 Ease of resolving insolvency*	44.6	81
1.3.3 Ease of paying taxes*	58.1	99
2 Human capital & research	15.0	113
2.1 Education	29.5	108
2.1.1 Expenditure on education, % GDP	3.7	87
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	11.1	93
2.1.3 School life expectancy, years	12.2	83
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	28.9	102
2.2 Tertiary education	13.4	111
2.2.1 Tertiary enrolment, % gross	14.9	98
2.2.2 Graduates in science & engineering, %	12.1	95
2.2.3 Tertiary inbound mobility, % [Ⓐ]	0.0	107 ○
2.3 Research & development (R&D)	2.2	90
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.3	79
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○
3 Infrastructure	33.3	105
3.1 Information & communication technologies (ICTs)	34.0	101
3.1.1 ICT access*	31.6	108
3.1.2 ICT use*	13.5	107
3.1.3 Government's online service*	39.9	99
3.1.4 E-participation*	50.8	87
3.2 General infrastructure	38.2	58 ●
3.2.1 Electricity output, kWh/cap	134.7	114 ○
3.2.2 Logistics performance*	14.5	115
3.2.3 Gross capital formation, % GDP	34.0	9 ●
3.3 Ecological sustainability	27.7	119 ○
3.3.1 GDP/unit of energy use	5.3	99
3.3.2 Environmental performance*	50.2	112
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.3	97
4 Market sophistication	44.1	75
4.1 Credit	28.7	83
4.1.1 Ease of getting credit*	30.0	108
4.1.2 Domestic credit to private sector, % GDP	65.0	48 ●
4.1.3 Microfinance gross loans, % GDP	1.7	18 ●

4.2 Investment	58.3	[19]
4.2.1 Ease of protecting minority investors*	58.3	62 ●
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, & market scale	45.2	113
4.3.1 Applied tariff rate, weighted mean, %	11.7	119 ○
4.3.2 Intensity of local competition [†]	65.2	80
4.3.3 Domestic market scale, bn PPP\$	71.5	85

5 Business sophistication	26.2	95
5.1 Knowledge workers	21.9	[106]
5.1.1 Knowledge-intensive employment, % [Ⓐ]	4.3	101
5.1.2 Firms offering formal training, % firms	31.9	48 ●
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	25.3	73 ●
5.2.1 University/industry research collaboration [†]	25.9	115
5.2.2 State of cluster development [†]	35.7	100
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	77
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	n/a	n/a
5.3 Knowledge absorption	31.4	72 ●
5.3.1 Intellectual property payments, % total trade	n/a	n/a
5.3.2 High-tech imports less re-imports, % total trade	11.4	30 ●
5.3.3 ICT services imports, % total trade [Ⓐ]	0.6	94
5.3.4 FDI net inflows, % GDP	0.3	120 ○
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	13.7	112
6.1 Knowledge creation	6.1	83
6.1.1 Patents by origin/bn PPP\$ GDP	0.2	99
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	8.5	72 ●
6.1.5 Citable documents H index	6.1	86
6.2 Knowledge impact	3.8	123 ○
6.2.1 Growth rate of PPP\$ GDP/worker, %	n/a	n/a
6.2.2 New businesses/th pop. 15–64	0.7	82
6.2.3 Computer software spending, % GDP	0.0	116
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	1.4	102
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	91
6.3 Knowledge diffusion	31.1	37 ●
6.3.1 Intellectual property receipts, % total trade	n/a	n/a
6.3.2 High-tech exports less re-exports, % total trade	0.1	117 ○
6.3.3 ICT services exports, % total trade [Ⓐ]	6.6	9 ●
6.3.4 FDI net outflows, % GDP	n/a	n/a

7 Creative outputs	18.1	109
7.1 Intangible assets	26.7	117
7.1.1 Trademarks by origin/bn PPP\$ GDP	35.1	64 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.2	93
7.1.3 ICTs & business model creation [†]	41.1	119 ○
7.1.4 ICTs & organizational model creation [†]	34.0	116 ○
7.2 Creative goods & services	5.6	[108]
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.4	92
7.2.5 Creative goods exports, % total trade	0.2	73 ●
7.3 Online creativity	13.7	84
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.5	108
7.3.2 Country-code TLDs/th pop. 15–69	0.8	83
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	4.1	78
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Netherlands

Key indicators

Population (millions)	17.0
GDP (US\$ billions)	769.9
GDP per capita, PPP\$	49,165.8
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	63.4	3 ●
Innovation Output Sub-Index	60.9	2 ●
Innovation Input Sub-Index	65.8	9
Innovation Efficiency Ratio	0.9	4 ●
Global Innovation Index 2016 (out of 128)	58.3	9

1 Institutions	88.2	11
1.1 Political environment	87.9	10
1.1.1 Political stability & safety*	86.4	21
1.1.2 Government effectiveness*	89.5	7
1.2 Regulatory environment	88.1	16
1.2.1 Regulatory quality*	87.4	9
1.2.2 Rule of law*	95.9	7
1.2.3 Cost of redundancy dismissal, salary weeks	15.8	65 ○
1.3 Business environment	88.7	9
1.3.1 Ease of starting a business*	94.2	20
1.3.2 Ease of resolving insolvency*	84.0	10
1.3.3 Ease of paying taxes*	88.1	18

2 Human capital & research	54.7	19
2.1 Education	61.1	18
2.1.1 Expenditure on education, % GDP	5.6	28
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	24.4	33
2.1.3 School life expectancy, years ^a	18.1	9
2.1.4 PISA scales in reading, maths, & science	507.9	12
2.1.5 Pupil-teacher ratio, secondary ^a	14.6	62 ○
2.2 Tertiary education	39.4	49 ○
2.2.1 Tertiary enrolment, % gross ^a	78.5	18
2.2.2 Graduates in science & engineering, % ^a	14.4	88 ○
2.2.3 Tertiary inbound mobility, % ^a	7.2	27
2.3 Research & development (R&D)	63.6	14
2.3.1 Researchers, FTE/mn pop.	4,548.1	14
2.3.2 Gross expenditure on R&D, % GDP	2.0	18
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	83.0	10
2.3.4 QS university ranking, average score top 3*	69.7	13

3 Infrastructure	63.3	14
3.1 Information & communication technologies (ICTs)	88.9	3 ●
3.1.1 ICT access*	90.2	7
3.1.2 ICT use*	77.7	14
3.1.3 Government's online service*	92.8	9
3.1.4 E-participation*	94.9	5 ●
3.2 General infrastructure	48.6	30
3.2.1 Electricity output, kWh/cap.	6,497.5	31
3.2.2 Logistics performance*	98.2	4 ●
3.2.3 Gross capital formation, % GDP	19.5	87 ○
3.3 Ecological sustainability	52.4	39
3.3.1 GDP/unit of energy use	10.8	40 ○
3.3.2 Environmental performance*	82.0	36
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	2.9	38

4 Market sophistication	59.0	17
4.1 Credit	47.2	35
4.1.1 Ease of getting credit*	50.0	72 ○
4.1.2 Domestic credit to private sector, % GDP	111.5	23
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	52.8	26
4.2.1 Ease of protecting minority investors*	56.7	67 ○
4.2.2 Market capitalization, % GDP	97.1	9
4.2.3 Venture capital deals/bn PPP\$ GDP	0.2	11
4.3 Trade, competition, & market scale	77.0	15
4.3.1 Applied tariff rate, weighted mean, %	1.6	23 ○
4.3.2 Intensity of local competition [†]	81.6	10
4.3.3 Domestic market scale, bn PPP\$	865.9	26

5 Business sophistication	63.7	1 ●
5.1 Knowledge workers	62.3	21
5.1.1 Knowledge-intensive employment, %	46.6	9
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	1.1	19
5.1.4 GERD financed by business, %	48.7	21
5.1.5 Females employed w/advanced degrees, % total	18.7	27

5.2 Innovation linkages	50.7	7
5.2.1 University/industry research collaboration [†]	75.0	5 ●
5.2.2 State of cluster development [†]	71.2	6
5.2.3 GERD financed by abroad, %	15.1	30
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	23
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	6.2	11
5.3 Knowledge absorption	78.0	1 ●
5.3.1 Intellectual property payments, % total trade	5.4	1 ●
5.3.2 High-tech imports less re-imports, % total trade	12.9	19
5.3.3 ICT services imports, % total trade	5.5	1 ●
5.3.4 FDI net inflows, % GDP	21.0	6 ●
5.3.5 Research talent, % in business enterprise	59.1	13

6 Knowledge & technology outputs	62.9	2 ●
6.1 Knowledge creation	64.8	6 ●
6.1.1 Patents by origin/bn PPP\$ GDP	11.1	10
6.1.2 PCT patent applications/bn PPP\$ GDP	5.4	8
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	42.9	13
6.1.5 Citable documents H index	67.6	8

6.2 Knowledge impact	44.6	17
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.1	52 ○
6.2.2 New businesses/th pop. 15–64	5.3	23
6.2.3 Computer software spending, % GDP	0.6	10
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	12.4	30
6.2.5 High- & medium-high-tech manufactures, %	0.4	20

6.3 Knowledge diffusion	79.3	2 ●
6.3.1 Intellectual property receipts, % total trade	3.7	5 ●
6.3.2 High-tech exports less re-exports, % total trade	13.0	15
6.3.3 ICT services exports, % total trade	7.2	7
6.3.4 FDI net outflows, % GDP	23.1	1 ●

7 Creative outputs	59.0	5 ●
7.1 Intangible assets	57.7	21
7.1.1 Trademarks by origin/bn PPP\$ GDP	61.1	33
7.1.2 Industrial designs by origin/bn PPP\$ GDP	3.1	36
7.1.3 ICTs & business model creation [†]	83.2	3 ●
7.1.4 ICTs & organizational model creation [†]	79.2	6

7.2 Creative goods & services	42.8	8
7.2.1 Cultural & creative services exports, % of total trade ^a	1.1	14
7.2.2 National feature films/mn pop. 15–69	7.2	23
7.2.3 Global ent. & media market/th pop. 15–69	50.3	17
7.2.4 Printing & publishing manufactures, %	1.4	36 ○
7.2.5 Creative goods exports, % total trade	4.7	11

7.3 Online creativity	77.8	2 ●
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	77.9	5 ●
7.3.2 Country-code TLDs/th pop. 15–69	100.0	1 ●
7.3.3 Wikipedia edits/mn pop. 15–69	7.2	8
7.3.4 Video uploads on YouTube/pop. 15–69	64.0	5

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

^a 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 181 of this appendix for details.

Key indicators

Population (millions)	4.6
GDP (US\$ billions)	179.4
GDP per capita, PPP\$	36,171.6
Income group	High income
Region	South East Asia, East Asia, and Oceania

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	52.9	21
Innovation Output Sub-Index	41.6	24
Innovation Input Sub-Index	64.1	13
Innovation Efficiency Ratio	0.6	56
Global Innovation Index 2016 (out of 128)	54.2	17

1	Institutions	93.4	2 ●
1.1	Political environment	95.4	2 ●
1.1.1	Political stability & safety*	100.0	1 ●
1.1.2	Government effectiveness*	90.7	4 ●
1.2	Regulatory environment	97.6	3 ●
1.2.1	Regulatory quality*	91.9	3 ●
1.2.2	Rule of law*	98.5	5 ●
1.2.3	Cost of redundancy dismissal, salary weeks	8.0	1 ●
1.3	Business environment	87.4	13
1.3.1	Ease of starting a business*	100.0	1 ●
1.3.2	Ease of resolving insolvency*	71.4	32
1.3.3	Ease of paying taxes*	90.7	11
2	Human capital & research	56.0	17
2.1	Education	64.4	13
2.1.1	Expenditure on education, % GDP	6.3	18
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	22.0	47
2.1.3	School life expectancy, years	19.2	5 ●
2.1.4	PISA scales in reading, maths, & science	505.9	14
2.1.5	Pupil-teacher ratio, secondary [Ⓐ]	14.0	58 ○
2.2	Tertiary education	59.7	7
2.2.1	Tertiary enrolment, % gross [Ⓐ]	80.9	16
2.2.2	Graduates in science & engineering, % [Ⓐ]	18.8	66 ○
2.2.3	Tertiary inbound mobility, % [Ⓐ]	18.7	5 ●
2.3	Research & development (R&D)	44.0	23
2.3.1	Researchers, FTE/mn pop. [Ⓐ]	4,008.7	22
2.3.2	Gross expenditure on R&D, % GDP [Ⓐ]	1.2	33
2.3.3	Global R&D companies, avg. expend. top 3, mn \$US	46.3	32
2.3.4	QS university ranking, average score top 3*	54.7	18
3	Infrastructure	61.0	22
3.1	Information & communication technologies (ICTs)	88.2	6
3.1.1	ICT access*	83.2	17
3.1.2	ICT use*	80.3	11
3.1.3	Government's online service*	94.2	5
3.1.4	E-participation*	94.9	5
3.2	General infrastructure	46.6	36
3.2.1	Electricity output, kWh/cap	9,821.3	15
3.2.2	Logistics performance*	61.3	36
3.2.3	Gross capital formation, % GDP	23.3	53
3.3	Ecological sustainability	48.1	50
3.3.1	GDP/unit of energy use	7.6	75 ○
3.3.2	Environmental performance*	88.0	11
3.3.3	ISO 14001 environmental certificates/bn PPP\$ GDP	1.5	56
4	Market sophistication	66.3	8
4.1	Credit	78.5	4 ●
4.1.1	Ease of getting credit*	100.0	1 ●
4.1.2	Domestic credit to private sector, % GDP [Ⓐ]	142.3	10
4.1.3	Microfinance gross loans, % GDP	n/a	n/a

4.2	Investment	53.0	25
4.2.1	Ease of protecting minority investors*	83.3	1 ●
4.2.2	Market capitalization, % GDP	42.8	37
4.2.3	Venture capital deals/bn PPP\$ GDP	0.1	20
4.3	Trade, competition, & market scale	67.4	45
4.3.1	Applied tariff rate, weighted mean, %	1.3	19
4.3.2	Intensity of local competition [†]	74.6	28
4.3.3	Domestic market scale, bn PPP\$	174.8	60

5 Business sophistication **44.0** **28**

5.1	Knowledge workers	54.7	29
5.1.1	Knowledge-intensive employment, % [Ⓐ]	42.9	19
5.1.2	Firms offering formal training, % firms	n/a	n/a
5.1.3	GERD performed by business, % of GDP [Ⓐ]	0.5	33
5.1.4	GERD financed by business, % [Ⓐ]	39.8	37
5.1.5	Females employed w/advanced degrees, % total [Ⓐ]	19.5	25
5.2	Innovation linkages	38.4	35
5.2.1	University/industry research collaboration [†]	62.5	18
5.2.2	State of cluster development [†]	49.1	45
5.2.3	GERD financed by abroad, % [Ⓐ]	7.2	55 ○
5.2.4	JV-strategic alliance deals/bn PPP\$ GDP	0.1	14
5.2.5	Patent families 2+ offices/bn PPP\$ GDP	4.7	15
5.3	Knowledge absorption	38.8	36
5.3.1	Intellectual property payments, % total trade	1.7	15
5.3.2	High-tech imports less re-imports, % total trade	11.6	27
5.3.3	ICT services imports, % total trade	1.4	50
5.3.4	FDI net inflows, % GDP	0.5	116 ○
5.3.5	Research talent, % in business enterprise [Ⓐ]	34.1	41

6 Knowledge & technology outputs **34.2** **29**

6.1	Knowledge creation	41.5	20
6.1.1	Patents by origin/bn PPP\$ GDP	7.1	17
6.1.2	PCT patent applications/bn PPP\$ GDP	1.8	21
6.1.3	Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4	Scientific & technical articles/bn PPP\$ GDP	50.9	7
6.1.5	Citable documents H index	33.5	27
6.2	Knowledge impact	41.1	27
6.2.1	Growth rate of PPP\$ GDP/worker, %	0.9	59 ○
6.2.2	New businesses/th pop. 15–64	16.6	3 ●
6.2.3	Computer software spending, % GDP	0.3	58
6.2.4	ISO 9001 quality certificates/bn PPP\$ GDP	7.2	52
6.2.5	High- & medium-high-tech manufactures, % [Ⓐ]	0.1	73 ○
6.3	Knowledge diffusion	20.1	80 ○
6.3.1	Intellectual property receipts, % total trade	0.6	21
6.3.2	High-tech exports less re-exports, % total trade	1.4	64
6.3.3	ICT services exports, % total trade	1.2	75 ○
6.3.4	FDI net outflows, % GDP	0.0	107 ○

7 Creative outputs **49.0** **16**

7.1	Intangible assets	56.8	22
7.1.1	Trademarks by origin/bn PPP\$ GDP	93.9	16
7.1.2	Industrial designs by origin/bn PPP\$ GDP	2.1	44
7.1.3	ICTs & business model creation [†]	76.1	21
7.1.4	ICTs & organizational model creation [†]	69.1	23
7.2	Creative goods & services	26.3	42
7.2.1	Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2	National feature films/mn pop. 15–69	8.8	17
7.2.3	Global ent. & media market/th pop. 15–69	56.8	12
7.2.4	Printing & publishing manufactures, % [Ⓐ]	1.8	27
7.2.5	Creative goods exports, % total trade	0.3	66 ○
7.3	Online creativity	56.1	13
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	34.3	20
7.3.2	Country-code TLDs/th pop. 15–69	62.4	10
7.3.3	Wikipedia edits/mn pop. 15–69	6.9	13
7.3.4	Video uploads on YouTube/pop. 15–69	60.9	8

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

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Key indicators

Population (millions)	20.7
GDP (US\$ billions)	7.6
GDP per capita, PPP\$	1,079.7
Income group	Low income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127).....	21.2	123
Innovation Output Sub-Index	11.2	123
Innovation Input Sub-Index	31.2	111
Innovation Efficiency Ratio	0.4	123
Global Innovation Index 2016 (out of 128)	20.4	124

1 Institutions.....49.2 97

1.1 Political environment	33.3	110
1.1.1 Political stability & safety*	40.1	109
1.1.2 Government effectiveness*	26.6	101
1.2 Regulatory environment	55.4	86
1.2.1 Regulatory quality*	23.6	108
1.2.2 Rule of law*	21.7	98
1.2.3 Cost of redundancy dismissal, salary weeks	14.0	55
1.3 Business environment	58.9	100
1.3.1 Ease of starting a business*	86.2	71
1.3.2 Ease of resolving insolvency*	40.4	93
1.3.3 Ease of paying taxes*	50.2	113

2 Human capital & research.....20.6 98

2.1 Education	52.9	49
2.1.1 Expenditure on education, % GDP	6.7	14 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	72.6	1 ●
2.1.3 School life expectancy, years ^a	5.3	115 ○
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	28.0	100
2.2 Tertiary education	9.0	112
2.2.1 Tertiary enrolment, % gross ^a	1.7	120 ○
2.2.2 Graduates in science & engineering, % ^a	4.3	101
2.2.3 Tertiary inbound mobility, % ^a	5.4	34 ●
2.3 Research & development (R&D)	0.0	115 ○
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	n/a	n/a
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure.....27.5 112

3.1 Information & communication technologies (ICTs)	9.4	127 ○
3.1.1 ICT access*	20.4	125 ○
3.1.2 ICT use*	1.4	126 ○
3.1.3 Government's online service*	7.2	124
3.1.4 E-participation*	8.5	123
3.2 General infrastructure	49.9	27 ●
3.2.1 Electricity output, kWh/cap	36.1	117
3.2.2 Logistics performance*	23.1	97
3.2.3 Gross capital formation, % GDP	42.5	4 ●
3.3 Ecological sustainability	23.1	122
3.3.1 GDP/unit of energy use	5.8	94
3.3.2 Environmental performance*	37.5	122 ○
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.2	114

4 Market sophistication.....28.0 125

4.1 Credit	16.1	118
4.1.1 Ease of getting credit*	30.0	108
4.1.2 Domestic credit to private sector, % GDP	14.2	122
4.1.3 Microfinance gross loans, % GDP	0.8	27 ●

4.2 Investment	40.0	[64]
4.2.1 Ease of protecting minority investors*	40.0	111
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, & market scale	27.9	126 ○
4.3.1 Applied tariff rate, weighted mean, %	11.8	120
4.3.2 Intensity of local competition [†]	n/a	n/a
4.3.3 Domestic market scale, bn PPP\$	20.3	120

5 Business sophistication.....30.6 [72]

5.1 Knowledge workers	37.9	[59]
5.1.1 Knowledge-intensive employment, %	n/a	n/a
5.1.2 Firms offering formal training, % firms ^a	32.1	44
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	1.9	[127]
5.2.1 University/industry research collaboration [†]	n/a	n/a
5.2.2 State of cluster development [†]	n/a	n/a
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	n/a	n/a
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.2	52
5.3 Knowledge absorption	52.1	10 ●
5.3.1 Intellectual property payments, % total trade ^a	0.1	94
5.3.2 High-tech imports less re-imports, % total trade ^a	7.6	68
5.3.3 ICT services imports, % total trade ^a	5.0	3 ●
5.3.4 FDI net inflows, % GDP	8.9	14 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs.....19.7 78

6.1 Knowledge creation	3.2	109
6.1.1 Patents by origin/bn PPP\$ GDP	0.3	85
6.1.2 PCT patent applications/bn PPP\$ GDP ^a	0.1	75
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	6.0	90
6.1.5 Citable documents H index	2.8	112
6.2 Knowledge impact	26.9	83
6.2.1 Growth rate of PPP\$ GDP/worker, %	2.9	21 ●
6.2.2 New businesses/th pop. 15–64 ^a	0.0	105 ○
6.2.3 Computer software spending, % GDP	0.0	109
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.4	120
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	29.0	42
6.3.1 Intellectual property receipts, % total trade ^a	0.0	106
6.3.2 High-tech exports less re-exports, % total trade ^a	2.9	47
6.3.3 ICT services exports, % total trade ^a	6.0	10 ●
6.3.4 FDI net outflows, % GDP	1.0	51

7 Creative outputs.....2.7 126 ○

7.1 Intangible assets	0.0	127 ○
7.1.1 Trademarks by origin/bn PPP\$ GDP	1.0	116 ○
7.1.2 Industrial designs by origin/bn PPP\$ GDP ^a	0.1	108
7.1.3 ICTs & business model creation [†]	n/a	n/a
7.1.4 ICTs & organizational model creation [†]	n/a	n/a
7.2 Creative goods & services	10.2	88
7.2.1 Cultural & creative services exports, % of total trade ^a	0.7	20 ●
7.2.2 National feature films/mn pop. 15–69 ^a	0.7	86
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade ^a	0.0	112
7.3 Online creativity	0.3	126 ○
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.0	97
7.3.2 Country-code TLDs/th pop. 15–69	0.0	125
7.3.3 Wikipedia edits/mn pop. 15–69 ^a	0.0	127 ○
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

^a 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 181 of this appendix for details.

Key indicators

Population (millions)	187.0
GDP (US\$ billions)	415.1
GDP per capita, PPP\$	6,108.4
Income group	Lower-middle income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	21.9	119
Innovation Output Sub-Index	14.9	119
Innovation Input Sub-Index	28.9	118
Innovation Efficiency Ratio	0.5	102
Global Innovation Index 2016 (out of 128)	23.1	114

1 Institutions	39.6	123	○
1.1 Political environment	15.7	125	○
1.1.1 Political stability & safety*	13.6	125	○
1.1.2 Government effectiveness*	17.7	120	
1.2 Regulatory environment	57.4	78	
1.2.1 Regulatory quality*	20.6	114	
1.2.2 Rule of law*	8.9	122	○
1.2.3 Cost of redundancy dismissal, salary weeks	8.0	1	●
1.3 Business environment	45.8	125	○
1.3.1 Ease of starting a business*	78.6	103	
1.3.2 Ease of resolving insolvency*	30.6	113	
1.3.3 Ease of paying taxes*	28.1	125	○

2 Human capital & research	15.1	[112]	
2.1 Education	35.7	[98]	
2.1.1 Expenditure on education, % GDP	n/a	n/a	
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3 School life expectancy, years [Ⓐ]	8.6	109	
2.1.4 PISA scales in reading, maths, & science	n/a	n/a	
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	19.3	79	
2.2 Tertiary education	8.2	[114]	
2.2.1 Tertiary enrolment, % gross [Ⓐ]	10.1	104	
2.2.2 Graduates in science & engineering, %	n/a	n/a	
2.2.3 Tertiary inbound mobility, %	n/a	n/a	

2.3 Research & development (R&D)	1.3	100	
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	38.6	95	
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.2	89	
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43	○
2.3.4 QS university ranking, average score top 3*	0.0	75	○

3 Infrastructure	28.2	111	
3.1 Information & communication technologies (ICTs)	32.3	105	
3.1.1 ICT access*	29.6	110	
3.1.2 ICT use*	22.8	94	
3.1.3 Government's online service*	41.3	98	
3.1.4 E-participation*	35.6	105	
3.2 General infrastructure	18.5	121	
3.2.1 Electricity output, kWh/cap	171.2	113	
3.2.2 Logistics performance*	26.1	88	
3.2.3 Gross capital formation, % GDP	13.8	117	
3.3 Ecological sustainability	33.6	108	
3.3.1 GDP/unit of energy use	7.3	82	
3.3.2 Environmental performance*	58.3	104	
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.1	121	

4 Market sophistication	40.2	94	
4.1 Credit	23.8	103	
4.1.1 Ease of getting credit*	65.0	40	●
4.1.2 Domestic credit to private sector, % GDP	14.2	121	
4.1.3 Microfinance gross loans, % GDP	0.1	56	

4.2 Investment	33.9	90	
4.2.1 Ease of protecting minority investors*	65.0	31	●
4.2.2 Market capitalization, % GDP	10.4	76	
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	86	
4.3 Trade, competition, & market scale	62.7	58	●
4.3.1 Applied tariff rate, weighted mean, %	9.8	114	
4.3.2 Intensity of local competition [†]	67.2	72	●
4.3.3 Domestic market scale, bn PPP\$	1,088.9	22	●

5 Business sophistication	21.7	118	
5.1 Knowledge workers	24.0	[99]	
5.1.1 Knowledge-intensive employment, %	n/a	n/a	
5.1.2 Firms offering formal training, % firms	30.7	51	●
5.1.3 GERD performed by business, % of GDP	n/a	n/a	
5.1.4 GERD financed by business, % [Ⓐ]	0.2	92	○
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a	
5.2 Innovation linkages	16.4	122	○
5.2.1 University/industry research collaboration [†]	27.8	111	
5.2.2 State of cluster development [†]	41.5	80	
5.2.3 GERD financed by abroad, % [Ⓐ]	1.0	86	
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	106	
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	115	○
5.3 Knowledge absorption	24.6	98	
5.3.1 Intellectual property payments, % total trade	0.4	67	●
5.3.2 High-tech imports less re-imports, % total trade [Ⓐ]	3.4	119	
5.3.3 ICT services imports, % total trade	1.7	32	●
5.3.4 FDI net inflows, % GDP	0.8	107	
5.3.5 Research talent, % in business enterprise	n/a	n/a	

6 Knowledge & technology outputs	9.9	119	
6.1 Knowledge creation	3.1	112	
6.1.1 Patents by origin/bn PPP\$ GDP [Ⓐ]	0.1	116	
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	104	○
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a	
6.1.4 Scientific & technical articles/bn PPP\$ GDP	2.3	117	
6.1.5 Citable documents H index	9.5	66	●
6.2 Knowledge impact	10.3	116	
6.2.1 Growth rate of PPP\$ GDP/worker, %	(2.7)	107	○
6.2.2 New businesses/th pop. 15–64	0.8	79	
6.2.3 Computer software spending, % GDP	0.1	81	
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.2	122	○
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a	
6.3 Knowledge diffusion	16.4	105	
6.3.1 Intellectual property receipts, % total trade	n/a	n/a	
6.3.2 High-tech exports less re-exports, % total trade [Ⓐ]	0.2	103	
6.3.3 ICT services exports, % total trade	0.1	119	
6.3.4 FDI net outflows, % GDP	0.3	78	

7 Creative outputs	19.9	102	
7.1 Intangible assets	32.8	97	
7.1.1 Trademarks by origin/bn PPP\$ GDP [Ⓐ]	19.8	83	
7.1.2 Industrial designs by origin/bn PPP\$ GDP [Ⓐ]	0.9	67	
7.1.3 ICTs & business model creation [†]	57.5	75	
7.1.4 ICTs & organizational model creation [†]	45.2	91	
7.2 Creative goods & services	10.7	86	
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a	
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	11.2	13	●
7.2.3 Global ent. & media market/th pop. 15–69	0.8	59	
7.2.4 Printing & publishing manufactures, %	n/a	n/a	
7.2.5 Creative goods exports, % total trade [Ⓐ]	0.0	115	
7.3 Online creativity	3.4	116	
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.5	105	
7.3.2 Country-code TLDs/th pop. 15–69	0.1	109	
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	1.3	112	
7.3.4 Video uploads on YouTube/pop. 15–69	0.4	72	○

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Norway

Key indicators

Population (millions)	5.3
GDP (US\$ billions)	376.3
GDP per capita, PPP\$	68,430.2
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	53.1	19
Innovation Output Sub-Index	42.3	22
Innovation Input Sub-Index	64.0	14
Innovation Efficiency Ratio	0.7	51
Global Innovation Index 2016 (out of 128)	52.0	22

1 Institutions	91.8	5 ●
1.1 Political environment	90.8	5 ●
1.1.1 Political stability & safety*	91.7	9
1.1.2 Government effectiveness*	90.0	5 ●
1.2 Regulatory environment	94.9	6 ●
1.2.1 Regulatory quality*	83.9	16
1.2.2 Rule of law*	98.5	4 ●
1.2.3 Cost of redundancy dismissal, salary weeks	8.7	22
1.3 Business environment	89.6	6 ●
1.3.1 Ease of starting a business*	94.3	19
1.3.2 Ease of resolving insolvency*	89.1	6 ●
1.3.3 Ease of paying taxes*	85.5	24

2 Human capital & research	53.3	21
2.1 Education	64.3	14
2.1.1 Expenditure on education, % GDP	7.4	10
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap ^②	25.8	26
2.1.3 School life expectancy, years	17.7	13
2.1.4 PISA scales in reading, maths, & science	504.5	15
2.1.5 Pupil-teacher ratio, secondary	n/a	n/a
2.2 Tertiary education	40.2	47
2.2.1 Tertiary enrolment, % gross	76.7	20
2.2.2 Graduates in science & engineering, %	20.0	57 ○
2.2.3 Tertiary inbound mobility, %	3.5	52 ○
2.3 Research & development (R&D)	55.5	20
2.3.1 Researchers, FTE/mn pop.	5,915.6	7
2.3.2 Gross expenditure on R&D, % GDP	1.9	20
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	55.8	24
2.3.4 QS university ranking, average score top 3*	49.8	20

3 Infrastructure	69.3	1 ●
3.1 Information & communication technologies (ICTs)	80.9	19
3.1.1 ICT access*	82.1	21
3.1.2 ICT use*	84.8	4 ●
3.1.3 Government's online service*	80.4	25
3.1.4 E-participation*	76.3	27
3.2 General infrastructure	72.4	1 ●
3.2.1 Electricity output, kWh/cap.	27,803.7	1 ●
3.2.2 Logistics performance*	77.2	22
3.2.3 Gross capital formation, % GDP	28.3	27
3.3 Ecological sustainability	54.7	30
3.3.1 GDP/unit of energy use	10.4	43
3.3.2 Environmental performance*	86.9	17
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	3.5	29

4 Market sophistication	57.2	22
4.1 Credit	55.2	18
4.1.1 Ease of getting credit*	55.0	67 ○
4.1.2 Domestic credit to private sector, % GDP	138.4	12
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	46.3	38
4.2.1 Ease of protecting minority investors*	75.0	9
4.2.2 Market capitalization, % GDP	50.2	32
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	33
4.3 Trade, competition, & market scale	70.2	36
4.3.1 Applied tariff rate, weighted mean, %	1.0	13
4.3.2 Intensity of local competition [†]	68.9	67 ○
4.3.3 Domestic market scale, bn PPP\$	364.7	45

5 Business sophistication	48.3	23
5.1 Knowledge workers	67.7	9
5.1.1 Knowledge-intensive employment, %	51.7	4 ●
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	1.0	22
5.1.4 GERD financed by business, % ^②	43.1	29
5.1.5 Females employed w/advanced degrees, % total	24.7	9
5.2 Innovation linkages	40.0	30
5.2.1 University/industry research collaboration [†]	62.4	19
5.2.2 State of cluster development [†]	70.2	8 ●
5.2.3 GERD financed by abroad, % ^②	9.5	48
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	22
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	2.2	23
5.3 Knowledge absorption	37.1	45
5.3.1 Intellectual property payments, % total trade	0.5	64 ○
5.3.2 High-tech imports less re-imports, % total trade	7.0	77 ○
5.3.3 ICT services imports, % total trade	2.1	20
5.3.4 FDI net inflows, % GDP	0.0	125 ○
5.3.5 Research talent, % in business enterprise	49.4	25

6 Knowledge & technology outputs	37.5	22
6.1 Knowledge creation	34.0	27
6.1.1 Patents by origin/bn PPP\$ GDP	4.7	24
6.1.2 PCT patent applications/bn PPP\$ GDP	1.8	20
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	35.0	20
6.1.5 Citable documents H index	38.3	20
6.2 Knowledge impact	44.1	18
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.0	54 ○
6.2.2 New businesses/th pop. 15–64	7.7	15
6.2.3 Computer software spending, % GDP	0.6	9
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	6.9	53
6.2.5 High- & medium-high-tech manufactures, %	0.3	32
6.3 Knowledge diffusion	34.4	28
6.3.1 Intellectual property receipts, % total trade	0.4	29
6.3.2 High-tech exports less re-exports, % total trade	3.9	41
6.3.3 ICT services exports, % total trade	1.6	65 ○
6.3.4 FDI net outflows, % GDP	3.7	14

7 Creative outputs	47.1	20
7.1 Intangible assets	51.5	32
7.1.1 Trademarks by origin/bn PPP\$ GDP	32.0	69 ○
7.1.2 Industrial designs by origin/bn PPP\$ GDP	1.7	47
7.1.3 ICTs & business model creation [†]	79.1	13
7.1.4 ICTs & organizational model creation [†]	80.6	3 ●
7.2 Creative goods & services	27.4	37
7.2.1 Cultural & creative services exports, % of total trade	0.1	62 ○
7.2.2 National feature films/mn pop. 15–69	6.2	32
7.2.3 Global ent. & media market/th pop. 15–69	100.0	1 ●
7.2.4 Printing & publishing manufactures, %	1.3	39
7.2.5 Creative goods exports, % total trade	0.5	59
7.3 Online creativity	57.8	10
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	51.5	14
7.3.2 Country-code TLDs/th pop. 15–69	56.8	13
7.3.3 Wikipedia edits/mn pop. 15–69	7.8	2 ●
7.3.4 Video uploads on YouTube/pop. 15–69	47.5	17

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

② 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 181 of this appendix for details.

Key indicators

Population (millions)	4.7
GDP (US\$ billions)	59.7
GDP per capita, PPP\$	44,628.3
Income group	High income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	31.8	77
Innovation Output Sub-Index	20.2	90
Innovation Input Sub-Index	43.5	62
Innovation Efficiency Ratio	0.5	115 ○
Global Innovation Index 2016 (out of 128)	32.2	73

1 Institutions **71.8** **39 ●**

1.1 Political environment	62.6	47
1.1.1 Political stability & safety*	80.7	33 ●
1.1.2 Government effectiveness*	44.6	67
1.2 Regulatory environment	77.5	31 ●
1.2.1 Regulatory quality*	57.0	46
1.2.2 Rule of law*	52.9	43
1.2.3 Cost of redundancy dismissal, salary weeks [Ⓐ]	8.0	1 ●
1.3 Business environment	75.4	46
1.3.1 Ease of starting a business*	92.9	29 ●
1.3.2 Ease of resolving insolvency*	42.7	84
1.3.3 Ease of paying taxes*	90.6	12 ●

2 Human capital & research **35.8** **51**

2.1 Education	42.8	81
2.1.1 Expenditure on education, % GDP	5.0	48
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	21.5	49
2.1.3 School life expectancy, years	14.1	61
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	n/a	n/a
2.2 Tertiary education	60.5	6 ●
2.2.1 Tertiary enrolment, % gross	31.9	76
2.2.2 Graduates in science & engineering, %	48.7	1 ●
2.2.3 Tertiary inbound mobility, %	2.8	60
2.3 Research & development (R&D)	4.2	78
2.3.1 Researchers, FTE/mn pop.	202.0	74
2.3.2 Gross expenditure on R&D, % GDP	0.2	85
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	9.1	64

3 Infrastructure **48.4** **56**

3.1 Information & communication technologies (ICTs)	60.7	57
3.1.1 ICT access*	73.7	41 ●
3.1.2 ICT use*	53.9	53
3.1.3 Government's online service*	59.4	67
3.1.4 E-participation*	55.9	74
3.2 General infrastructure	50.8	24 ●
3.2.1 Electricity output, kWh/cap	6,869.8	29 ●
3.2.2 Logistics performance*	54.2	47
3.2.3 Gross capital formation, % GDP	31.0	15 ●
3.3 Ecological sustainability	33.7	107
3.3.1 GDP/unit of energy use	6.3	90
3.3.2 Environmental performance*	60.1	100
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.7	77

4 Market sophistication **44.2** **72**

4.1 Credit	30.3	78
4.1.1 Ease of getting credit*	35.0	104
4.1.2 Domestic credit to private sector, % GDP	65.6	46
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	39.5	68
4.2.1 Ease of protecting minority investors*	46.7	95
4.2.2 Market capitalization, % GDP	58.9	29
4.2.3 Venture capital deals/bn PPP\$ GDP	n/a	n/a
4.3 Trade, competition, & market scale	62.9	57
4.3.1 Applied tariff rate, weighted mean, %	1.9	54
4.3.2 Intensity of local competition [†]	60.0	103
4.3.3 Domestic market scale, bn PPP\$	173.1	62

5 Business sophistication **17.0** **126 ○**

5.1 Knowledge workers	14.2	[118]
5.1.1 Knowledge-intensive employment, %	n/a	n/a
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	0.0	73
5.1.4 GERD financed by business, %	21.4	61
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	21.1	97
5.2.1 University/industry research collaboration [†]	43.4	51
5.2.2 State of cluster development [†]	45.7	61
5.2.3 GERD financed by abroad, % [Ⓐ]	0.0	99 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	37 ●
5.2.5 Patent families 2+ offices/bn PPP\$ GDP [Ⓐ]	0.0	103
5.3 Knowledge absorption	15.6	127 ○
5.3.1 Intellectual property payments, % total trade	n/a	n/a
5.3.2 High-tech imports less re-imports, % total trade [Ⓐ]	3.1	120 ○
5.3.3 ICT services imports, % total trade [Ⓐ]	0.2	116 ○
5.3.4 FDI net inflows, % GDP	0.0	124 ○
5.3.5 Research talent, % in business enterprise	10.6	65

6 Knowledge & technology outputs **15.6** **100**

6.1 Knowledge creation	2.9	114 ○
6.1.1 Patents by origin/bn PPP\$ GDP	0.0	122 ○
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	87
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	4.2	103
6.1.5 Citable documents H index	5.8	89
6.2 Knowledge impact	23.2	95
6.2.1 Growth rate of PPP\$ GDP/worker, %	(0.7)	96
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	1.0	69
6.2.3 Computer software spending, % GDP	0.1	99
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	3.2	76
6.2.5 High- & medium-high-tech manufactures, %	0.4	24 ●
6.3 Knowledge diffusion	20.7	71
6.3.1 Intellectual property receipts, % total trade	n/a	n/a
6.3.2 High-tech exports less re-exports, % total trade [Ⓐ]	0.5	85
6.3.3 ICT services exports, % total trade [Ⓐ]	0.2	115 ○
6.3.4 FDI net outflows, % GDP	1.1	49

7 Creative outputs **24.8** **91**

7.1 Intangible assets	40.9	70
7.1.1 Trademarks by origin/bn PPP\$ GDP	n/a	n/a
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.0	113 ○
7.1.3 ICTs & business model creation [†]	55.3	83
7.1.4 ICTs & organizational model creation [†]	47.0	83
7.2 Creative goods & services	3.9	114 ○
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	0.0	104 ○
7.2.3 Global ent. & media market/th pop. 15–69	4.8	46
7.2.4 Printing & publishing manufactures, %	0.7	78
7.2.5 Creative goods exports, % total trade [Ⓐ]	0.0	110 ○
7.3 Online creativity	13.3	88
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.8	81
7.3.2 Country-code TLDs/th pop. 15–69	0.1	105
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	4.0	83
7.3.4 Video uploads on YouTube/pop. 15–69	13.0	61

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Pakistan

Key indicators

Population (millions)	192.8
GDP (US\$ billions)	271.1
GDP per capita, PPP\$	5,000.0
Income group	Lower-middle income
Region	Central and Southern Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	23.8	113
Innovation Output Sub-Index	18.2	101
Innovation Input Sub-Index	29.4	116 ○
Innovation Efficiency Ratio	0.6	64
Global Innovation Index 2016 (out of 128)	22.6	119

1 Institutions	38.0	124 ○
1.1 Political environment	13.7	126 ○
1.1.1 Political stability & safety*	2.1	126 ○
1.1.2 Government effectiveness*	25.2	107
1.2 Regulatory environment	41.6	113
1.2.1 Regulatory quality*	26.2	106
1.2.2 Rule of law*	16.4	108
1.2.3 Cost of redundancy dismissal, salary weeks	27.2	105
1.3 Business environment	58.8	101
1.3.1 Ease of starting a business*	77.9	105
1.3.2 Ease of resolving insolvency*	45.0	77
1.3.3 Ease of paying taxes*	53.4	109

2 Human capital & research	12.8	121 ○
2.1 Education	23.4	120 ○
2.1.1 Expenditure on education, % GDP	2.7	105
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	15.2	79
2.1.3 School life expectancy, years	8.2	112 ○
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	21.1	84
2.2 Tertiary education	8.1	[115]
2.2.1 Tertiary enrolment, % gross	9.9	106
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, %	n/a	n/a

2.3 Research & development (R&D)	6.9	67
2.3.1 Researchers, FTE/mn pop.	294.4	71
2.3.2 Gross expenditure on R&D, % GDP	0.2	84
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	19.0	51 ●

3 Infrastructure	29.0	109
3.1 Information & communication technologies (ICTs)	28.7	109
3.1.1 ICT access*	33.9	104
3.1.2 ICT use*	10.9	112
3.1.3 Government's online service*	32.6	106
3.1.4 E-participation*	37.3	101
3.2 General infrastructure	23.9	111
3.2.1 Electricity output, kWh/cap	569.1	105
3.2.2 Logistics performance*	39.8	67
3.2.3 Gross capital formation, % GDP	15.2	111
3.3 Ecological sustainability	34.5	104
3.3.1 GDP/unit of energy use	9.3	57 ●
3.3.2 Environmental performance*	51.4	109
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.5	83

4 Market sophistication	38.3	102
4.1 Credit	19.7	113
4.1.1 Ease of getting credit*	50.0	72
4.1.2 Domestic credit to private sector, % GDP	15.4	115 ○
4.1.3 Microfinance gross loans, % GDP	0.2	50

4.2 Investment	35.1	83
4.2.1 Ease of protecting minority investors*	66.7	26 ●
4.2.2 Market capitalization, % GDP ^②	15.2	67
4.2.3 Venture capital deals/bn PPP\$ GDP ^②	0.0	89 ○
4.3 Trade, competition, & market scale	60.2	68
4.3.1 Applied tariff rate, weighted mean, %	9.5	111
4.3.2 Intensity of local competition [†]	57.8	109
4.3.3 Domestic market scale, bn PPP\$	988.2	24 ●

5 Business sophistication	29.0	78
5.1 Knowledge workers	35.6	[74]
5.1.1 Knowledge-intensive employment, % ^②	19.5	75
5.1.2 Firms offering formal training, % firms	32.0	46
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	20.8	99
5.2.1 University/industry research collaboration [†]	40.7	65
5.2.2 State of cluster development [†]	44.2	71
5.2.3 GERD financed by abroad, %	2.7	69
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	57
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	109 ○
5.3 Knowledge absorption	30.6	78
5.3.1 Intellectual property payments, % total trade	0.5	63
5.3.2 High-tech imports less re-imports, % total trade	10.3	41 ●
5.3.3 ICT services imports, % total trade	1.1	61 ●
5.3.4 FDI net inflows, % GDP	0.6	113
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	18.9	84
6.1 Knowledge creation	8.5	69
6.1.1 Patents by origin/bn PPP\$ GDP	0.2	95
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	8.7	71
6.1.5 Citable documents H index	12.8	53 ●
6.2 Knowledge impact	31.2	62
6.2.1 Growth rate of PPP\$ GDP/worker, %	2.5	30 ●
6.2.2 New businesses/th pop. 15–64	0.0	103 ○
6.2.3 Computer software spending, % GDP	0.3	59 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	2.7	83
6.2.5 High- & medium-high-tech manufactures, %	0.2	52
6.3 Knowledge diffusion	16.9	102
6.3.1 Intellectual property receipts, % total trade	0.0	71
6.3.2 High-tech exports less re-exports, % total trade	0.7	71
6.3.3 ICT services exports, % total trade	2.2	50 ●
6.3.4 FDI net outflows, % GDP	0.1	100

7 Creative outputs	17.4	112
7.1 Intangible assets	29.4	105
7.1.1 Trademarks by origin/bn PPP\$ GDP	25.3	78
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.4	84
7.1.3 ICTs & business model creation [†]	51.3	96
7.1.4 ICTs & organizational model creation [†]	38.0	112
7.2 Creative goods & services	1.4	123 ○
7.2.1 Cultural & creative services exports, % of total trade ^②	0.0	78
7.2.2 National feature films/mn pop. 15–69	0.0	103 ○
7.2.3 Global ent. & media market/th pop. 15–69	0.2	62 ○
7.2.4 Printing & publishing manufactures, %	0.3	96 ○
7.2.5 Creative goods exports, % total trade	0.1	99
7.3 Online creativity	9.7	100
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.6	103
7.3.2 Country-code TLDs/th pop. 15–69	0.1	108
7.3.3 Wikipedia edits/mn pop. 15–69	2.9	101
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

② 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 181 of this appendix for details.

Key indicators

Population (millions)	4.0
GDP (US\$ billions)	55.2
GDP per capita, PPP\$	21,764.6
Income group	Upper-middle income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	35.0	63
Innovation Output Sub-Index	28.7	55
Innovation Input Sub-Index	41.3	74
Innovation Efficiency Ratio	0.7	38
Global Innovation Index 2016 (out of 128)	33.5	68

1 Institutions	60.5	66
1.1 Political environment	61.8	48
1.1.1 Political stability & safety*	73.8	43
1.1.2 Government effectiveness*	49.8	51
1.2 Regulatory environment	61.9	69
1.2.1 Regulatory quality*	51.7	56
1.2.2 Rule of law*	35.9	66
1.2.3 Cost of redundancy dismissal, salary weeks	18.1	75
1.3 Business environment	57.8	107
1.3.1 Ease of starting a business*	92.0	36
1.3.2 Ease of resolving insolvency*	33.4	110
1.3.3 Ease of paying taxes*	48.1	117

2 Human capital & research	21.4	96
2.1 Education	33.6	102
2.1.1 Expenditure on education, % GDP [Ⓐ]	3.2	97
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	9.2	98
2.1.3 School life expectancy, years [Ⓐ]	12.8	77
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	15.5	67
2.2 Tertiary education	30.3	80
2.2.1 Tertiary enrolment, % gross [Ⓐ]	38.7	67
2.2.2 Graduates in science & engineering, %	15.9	80
2.2.3 Tertiary inbound mobility, %	n/a	n/a
2.3 Research & development (R&D)	0.4	110
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	39.4	94 ○
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.1	108 ○
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	55.1	36
3.1 Information & communication technologies (ICTs)	40.7	94
3.1.1 ICT access*	59.9	72
3.1.2 ICT use*	32.4	82
3.1.3 Government's online service*	33.3	104
3.1.4 E-participation*	37.3	101
3.2 General infrastructure	66.2	4 ●
3.2.1 Electricity output, kWh/cap.	2,399.7	72
3.2.2 Logistics performance*	58.9	39
3.2.3 Gross capital formation, % GDP	47.2	2 ●
3.3 Ecological sustainability	58.4	21 ●
3.3.1 GDP/unit of energy use	17.9	3 ●
3.3.2 Environmental performance*	78.0	50
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.3	98

4 Market sophistication	43.0	83
4.1 Credit	38.4	53
4.1.1 Ease of getting credit*	75.0	19 ●
4.1.2 Domestic credit to private sector, % GDP	88.5	33
4.1.3 Microfinance gross loans, % GDP	0.3	43

4.2 Investment	33.5	92
4.2.1 Ease of protecting minority investors*	56.7	67
4.2.2 Market capitalization, % GDP [Ⓐ]	31.1	44
4.2.3 Venture capital deals/bn PPP\$ GDP [Ⓐ]	0.0	46
4.3 Trade, competition, & market scale	57.0	83
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	6.1	99
4.3.2 Intensity of local competition [†]	73.7	33
4.3.3 Domestic market scale, bn PPP\$	93.1	74

5 Business sophistication **26.4** **94**

5.1 Knowledge workers	23.7	101
5.1.1 Knowledge-intensive employment, % [Ⓐ]	24.0	59
5.1.2 Firms offering formal training, % firms [Ⓐ]	11.0	88 ○
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.0	88 ○
5.1.4 GERD financed by business, % [Ⓐ]	10.8	72
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	16.6	33
5.2 Innovation linkages	21.3	93
5.2.1 University/industry research collaboration [†]	39.7	72
5.2.2 State of cluster development [†]	53.3	36
5.2.3 GERD financed by abroad, % [Ⓐ]	0.3	94 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	104 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	64
5.3 Knowledge absorption	34.3	57
5.3.1 Intellectual property payments, % total trade	0.4	70
5.3.2 High-tech imports less re-imports, % total trade [Ⓐ]	18.8	7 ●
5.3.3 ICT services imports, % total trade	0.3	114
5.3.4 FDI net inflows, % GDP	10.1	9 ●
5.3.5 Research talent, % in business enterprise [Ⓐ]	0.9	79 ○

6 Knowledge & technology outputs **21.7** **60**

6.1 Knowledge creation	4.6	91
6.1.1 Patents by origin/bn PPP\$ GDP	0.2	98
6.1.2 PCT patent applications/bn PPP\$ GDP	0.6	31
6.1.3 Utility models by origin/bn PPP\$ GDP	0.1	58
6.1.4 Scientific & technical articles/bn PPP\$ GDP	4.5	102
6.1.5 Citable documents H index	10.6	58
6.2 Knowledge impact	28.2	76
6.2.1 Growth rate of PPP\$ GDP/worker, %	n/a	n/a
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	14.1	6 ●
6.2.3 Computer software spending, % GDP	0.2	70
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	2.3	88
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	89
6.3 Knowledge diffusion	32.5	35
6.3.1 Intellectual property receipts, % total trade	0.0	81
6.3.2 High-tech exports less re-exports, % total trade [Ⓐ]	17.1	6 ●
6.3.3 ICT services exports, % total trade	1.1	79
6.3.4 FDI net outflows, % GDP	1.8	37

7 Creative outputs **35.6** **50**

7.1 Intangible assets	46.6	50
7.1.1 Trademarks by origin/bn PPP\$ GDP	56.4	39
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.2	94
7.1.3 ICTs & business model creation [†]	71.8	27 ●
7.1.4 ICTs & organizational model creation [†]	62.1	34
7.2 Creative goods & services	17.9	65
7.2.1 Cultural & creative services exports, % of total trade	0.1	50
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	0.4	94
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	3.2	6 ●
7.2.5 Creative goods exports, % total trade	0.0	116 ○
7.3 Online creativity	31.3	37
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	44.6	16 ●
7.3.2 Country-code TLDs/th pop. 15–69	1.2	77
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	5.0	63
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Paraguay

Key indicators

Population (millions)	6.7
GDP (US\$ billions)	27.3
GDP per capita, PPP\$	8,707.8
Income group	Upper-middle income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	30.3	85
Innovation Output Sub-Index	23.0	79
Innovation Input Sub-Index	37.6	90
Innovation Efficiency Ratio	0.6	72
Global Innovation Index 2016 (out of 128)	28.2	94

1 Institutions	46.9	105
1.1 Political environment	40.6	93
1.1.1 Political stability & safety*	63.3	62
1.1.2 Government effectiveness*	17.9	119 ○
1.2 Regulatory environment	42.4	112
1.2.1 Regulatory quality*	35.3	86
1.2.2 Rule of law*	19.1	101
1.2.3 Cost of redundancy dismissal, salary weeks	29.4	114
1.3 Business environment	57.6	108
1.3.1 Ease of starting a business*	77.5	107
1.3.2 Ease of resolving insolvency*	40.7	91
1.3.3 Ease of paying taxes*	54.6	106

2 Human capital & research	24.0	87
2.1 Education	40.5	86
2.1.1 Expenditure on education, % GDP [Ⓐ]	5.0	51 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	16.6	70
2.1.3 School life expectancy, years [Ⓐ]	12.3	82
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	18.4	77
2.2 Tertiary education	30.3	[79]
2.2.1 Tertiary enrolment, % gross [Ⓐ]	35.1	74
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, %	n/a	n/a

2.3 Research & development (R&D)	1.2	103
2.3.1 Researchers, FTE/mn pop.	184.1	76
2.3.2 Gross expenditure on R&D, % GDP	0.1	98
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	39.9	89
3.1 Information & communication technologies (ICTs)	48.3	84
3.1.1 ICT access*	45.9	91
3.1.2 ICT use*	29.6	86
3.1.3 Government's online service*	60.1	64
3.1.4 E-participation*	57.6	70
3.2 General infrastructure	27.5	99
3.2.1 Electricity output, kWh/cap.	8,440.0	18 ●
3.2.2 Logistics performance*	23.0	98
3.2.3 Gross capital formation, % GDP	15.8	107
3.3 Ecological sustainability	43.8	67
3.3.1 GDP/unit of energy use	10.5	42 ●
3.3.2 Environmental performance*	70.4	75
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.2	104

4 Market sophistication	50.5	45 ●
4.1 Credit	54.1	19 ●
4.1.1 Ease of getting credit*	45.0	84
4.1.2 Domestic credit to private sector, % GDP	57.9	53 ●
4.1.3 Microfinance gross loans, % GDP	5.3	5 ●

4.2 Investment	41.7	[55]
4.2.1 Ease of protecting minority investors*	41.7	105
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, & market scale	55.7	92
4.3.1 Applied tariff rate, weighted mean, %	4.4	84
4.3.2 Intensity of local competition [†]	67.3	71
4.3.3 Domestic market scale, bn PPP\$	64.1	89

5 Business sophistication	26.9	92
5.1 Knowledge workers	34.0	79
5.1.1 Knowledge-intensive employment, %	19.0	76
5.1.2 Firms offering formal training, % firms [Ⓐ]	54.9	15 ●
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.0	89 ○
5.1.4 GERD financed by business, %	0.3	90 ○
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	12.4	54
5.2 Innovation linkages	18.7	116
5.2.1 University/industry research collaboration [†]	24.6	119 ○
5.2.2 State of cluster development [†]	31.9	116 ○
5.2.3 GERD financed by abroad, %	10.3	47
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	58
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	106
5.3 Knowledge absorption	28.0	87
5.3.1 Intellectual property payments, % total trade	0.2	87
5.3.2 High-tech imports less re-imports, % total trade	13.3	18 ●
5.3.3 ICT services imports, % total trade	0.0	126 ○
5.3.4 FDI net inflows, % GDP	1.0	105
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	9.5	120 ○
6.1 Knowledge creation	2.2	119 ○
6.1.1 Patents by origin/bn PPP\$ GDP [Ⓐ]	0.4	80
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	1.6	119 ○
6.1.5 Citable documents H index	2.9	111
6.2 Knowledge impact	10.1	117
6.2.1 Growth rate of PPP\$ GDP/worker, %	n/a	n/a
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.0	106
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	5.5	59 ●
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	72
6.3 Knowledge diffusion	16.3	108
6.3.1 Intellectual property receipts, % total trade	n/a	n/a
6.3.2 High-tech exports less re-exports, % total trade	0.5	88
6.3.3 ICT services exports, % total trade	0.1	118 ○
6.3.4 FDI net outflows, % GDP	0.2	86

7 Creative outputs	36.4	46 ●
7.1 Intangible assets	62.0	12 ●
7.1.1 Trademarks by origin/bn PPP\$ GDP [Ⓐ]	296.3	1 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	n/a	n/a
7.1.3 ICTs & business model creation [†]	49.9	100
7.1.4 ICTs & organizational model creation [†]	36.2	114
7.2 Creative goods & services	8.6	93
7.2.1 Cultural & creative services exports, % of total trade	0.0	82
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	1.3	74
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	1.3	37 ●
7.2.5 Creative goods exports, % total trade	0.1	83
7.3 Online creativity	13.1	90
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.7	84
7.3.2 Country-code TLDs/th pop. 15–69	1.3	75
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	3.8	88
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	31.8
GDP (US\$ billions)	180.3
GDP per capita, PPP\$	12,194.7
Income group	Upper-middle income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	32.9	70
Innovation Output Sub-Index	21.6	85
Innovation Input Sub-Index	44.2	56
Innovation Efficiency Ratio	0.5	106 ○
Global Innovation Index 2016 (out of 128)	32.5	71

1 Institutions	58.7	67
1.1 Political environment	43.3	86
1.1.1 Political stability & safety*	51.6	87
1.1.2 Government effectiveness*	35.0	86
1.2 Regulatory environment	66.3	57
1.2.1 Regulatory quality*	54.7	48
1.2.2 Rule of law*	23.9	93
1.2.3 Cost of redundancy dismissal, salary weeks	11.4	40 ●
1.3 Business environment	66.6	73
1.3.1 Ease of starting a business*	85.0	78
1.3.2 Ease of resolving insolvency*	45.9	72
1.3.3 Ease of paying taxes*	69.0	78

2 Human capital & research	26.6	84
2.1 Education	38.2	94
2.1.1 Expenditure on education, % GDP	3.9	81
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	14.1	86
2.1.3 School life expectancy, years [Ⓐ]	13.4	65
2.1.4 PISA scales in reading, maths, & science	393.6	65 ○
2.1.5 Pupil-teacher ratio, secondary	14.1	59
2.2 Tertiary education	35.1	[66]
2.2.1 Tertiary enrolment, % gross [Ⓐ]	40.5	64
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, %	n/a	n/a
2.3 Research & development (R&D)	6.5	72
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	0.1	97 ○
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	16.6	54

3 Infrastructure	45.2	69
3.1 Information & communication technologies (ICTs)	48.7	82
3.1.1 ICT access*	48.0	86
3.1.2 ICT use*	29.4	87
3.1.3 Government's online service*	63.0	57
3.1.4 E-participation*	54.2	80
3.2 General infrastructure	34.9	75
3.2.1 Electricity output, kWh/cap	1,470.0	88
3.2.2 Logistics performance*	38.4	68
3.2.3 Gross capital formation, % GDP	24.6	47
3.3 Ecological sustainability	52.1	40 ●
3.3.1 GDP/unit of energy use	14.5	12 ●
3.3.2 Environmental performance*	73.0	67
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.0	61

4 Market sophistication	54.8	27 ●
4.1 Credit	60.0	15 ●
4.1.1 Ease of getting credit*	80.0	15 ●
4.1.2 Domestic credit to private sector, % GDP	37.4	86
4.1.3 Microfinance gross loans, % GDP	4.8	6 ●

4.2 Investment	34.1	87
4.2.1 Ease of protecting minority investors*	60.0	52
4.2.2 Market capitalization, % GDP	29.9	47
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	64
4.3 Trade, competition, & market scale	70.4	35 ●
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	1.4	22 ●
4.3.2 Intensity of local competition [†]	69.6	66
4.3.3 Domestic market scale, bn PPP\$	409.9	44 ●

5 Business sophistication	35.7	49
5.1 Knowledge workers	47.8	38 ●
5.1.1 Knowledge-intensive employment, %	14.6	90 ○
5.1.2 Firms offering formal training, % firms [Ⓐ]	60.1	8 ●
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	13.5	45
5.2 Innovation linkages	21.7	88
5.2.1 University/industry research collaboration [†]	31.8	100 ○
5.2.2 State of cluster development [†]	37.4	93
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	95 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	105 ○
5.3 Knowledge absorption	37.5	43 ●
5.3.1 Intellectual property payments, % total trade	0.7	49
5.3.2 High-tech imports less re-imports, % total trade	11.1	33 ●
5.3.3 ICT services imports, % total trade	1.4	46
5.3.4 FDI net inflows, % GDP	4.2	33 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	15.8	97
6.1 Knowledge creation	6.3	80
6.1.1 Patents by origin/bn PPP\$ GDP	0.2	97
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	81
6.1.3 Utility models by origin/bn PPP\$ GDP	0.5	36
6.1.4 Scientific & technical articles/bn PPP\$ GDP	2.7	113 ○
6.1.5 Citable documents H index	11.7	56
6.2 Knowledge impact	27.6	80
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.8	39
6.2.2 New businesses/th pop. 15–64	2.4	42
6.2.3 Computer software spending, % GDP	0.2	64
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	3.3	75
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	83 ○
6.3 Knowledge diffusion	13.4	119 ○
6.3.1 Intellectual property receipts, % total trade	0.1	66
6.3.2 High-tech exports less re-exports, % total trade	0.5	84
6.3.3 ICT services exports, % total trade	0.3	108 ○
6.3.4 FDI net outflows, % GDP	0.1	98

7 Creative outputs	27.4	82
7.1 Intangible assets	38.1	80
7.1.1 Trademarks by origin/bn PPP\$ GDP	51.1	46
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.3	90
7.1.3 ICTs & business model creation [†]	59.8	65
7.1.4 ICTs & organizational model creation [†]	47.0	84
7.2 Creative goods & services	16.3	71
7.2.1 Cultural & creative services exports, % of total trade	0.1	54
7.2.2 National feature films/mn pop. 15–69	1.4	70
7.2.3 Global ent. & media market/th pop. 15–69	5.9	42
7.2.4 Printing & publishing manufactures, % [Ⓐ]	2.7	11 ●
7.2.5 Creative goods exports, % total trade	0.3	67
7.3 Online creativity	17.1	74
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	5.3	55
7.3.2 Country-code TLDs/th pop. 15–69	1.4	72
7.3.3 Wikipedia edits/mn pop. 15–69	4.3	74
7.3.4 Video uploads on YouTube/pop. 15–69	20.3	57

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Philippines

Key indicators

Population (millions)	102.3
GDP (US\$ billions)	311.7
GDP per capita, PPP\$	7,254.2
Income group	Lower-middle income
Region	South East Asia, East Asia, and Oceania

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	32.5	73
Innovation Output Sub-Index	25.6	65
Innovation Input Sub-Index	39.4	83
Innovation Efficiency Ratio	0.6	55
Global Innovation Index 2016 (out of 128)	31.8	74
1 Institutions	52.0	89
1.1 Political environment	44.2	84
1.1.1 Political stability & safety*	43.5	98
1.1.2 Government effectiveness*	44.9	65
1.2 Regulatory environment	48.4	105
1.2.1 Regulatory quality*	41.2	72
1.2.2 Rule of law*	29.3	81
1.2.3 Cost of redundancy dismissal, salary weeks	27.4	111 ○
1.3 Business environment	63.3	81
1.3.1 Ease of starting a business*	68.9	120 ○
1.3.2 Ease of resolving insolvency*	55.2	53
1.3.3 Ease of paying taxes*	65.7	84
2 Human capital & research	22.3	95
2.1 Education	26.9	113 ○
2.1.1 Expenditure on education, % GDP [Ⓐ]	2.7	106 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	9.1	99 ○
2.1.3 School life expectancy, years [Ⓐ]	12.7	81
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	27.0	99 ○
2.2 Tertiary education	32.7	74
2.2.1 Tertiary enrolment, % gross [Ⓐ]	35.8	73
2.2.2 Graduates in science & engineering, %	25.5	27 ●
2.2.3 Tertiary inbound mobility, % [Ⓐ]	0.1	105 ○
2.3 Research & development (R&D)	7.4	64
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	189.4	75
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.1	96
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	24.4	47
3 Infrastructure	44.6	72
3.1 Information & communication technologies (ICTs)	50.6	78
3.1.1 ICT access*	47.0	89
3.1.2 ICT use*	29.3	88
3.1.3 Government's online service*	66.7	51
3.1.4 E-participation*	59.3	65
3.2 General infrastructure	32.9	84
3.2.1 Electricity output, kWh/cap.	779.3	99
3.2.2 Logistics performance*	36.7	70
3.2.3 Gross capital formation, % GDP	23.7	50
3.3 Ecological sustainability	50.4	44
3.3.1 GDP/unit of energy use	13.5	16 ●
3.3.2 Environmental performance*	73.7	62
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.7	75
4 Market sophistication	41.3	92
4.1 Credit	20.7	110
4.1.1 Ease of getting credit*	40.0	98
4.1.2 Domestic credit to private sector, % GDP	41.8	79
4.1.3 Microfinance gross loans, % GDP	0.3	39

4.2 Investment	30.2	111
4.2.1 Ease of protecting minority investors*	41.7	105
4.2.2 Market capitalization, % GDP	81.7	17 ●
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	74
4.3 Trade, competition, & market scale	72.9	27 ●
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	2.2	56
4.3.2 Intensity of local competition [†]	70.2	59
4.3.3 Domestic market scale, bn PPP\$	801.9	28 ●
5 Business sophistication	36.9	45
5.1 Knowledge workers	45.5	45
5.1.1 Knowledge-intensive employment, %	24.0	58
5.1.2 Firms offering formal training, % firms	59.8	9 ●
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.0	69
5.1.4 GERD financed by business, % [Ⓐ]	36.9	41
5.1.5 Females employed w/advanced degrees, % total	13.0	47
5.2 Innovation linkages	21.2	95
5.2.1 University/industry research collaboration [†]	41.4	59
5.2.2 State of cluster development [†]	45.7	62
5.2.3 GERD financed by abroad, % [Ⓐ]	1.8	77
5.2.4 JV–strategic alliance deals/bn PPP\$ GDP	0.0	50
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	79
5.3 Knowledge absorption	43.8	25 ●
5.3.1 Intellectual property payments, % total trade	0.8	45
5.3.2 High-tech imports less re-imports, % total trade	n/a	n/a
5.3.3 ICT services imports, % total trade	1.0	68
5.3.4 FDI net inflows, % GDP	1.8	86
5.3.5 Research talent, % in business enterprise [Ⓐ]	63.2	8 ●
6 Knowledge & technology outputs	28.3	42
6.1 Knowledge creation	10.6	65
6.1.1 Patents by origin/bn PPP\$ GDP	0.5	75
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	89
6.1.3 Utility models by origin/bn PPP\$ GDP	1.1	23
6.1.4 Scientific & technical articles/bn PPP\$ GDP	1.6	120 ○
6.1.5 Citable documents H index	12.5	54
6.2 Knowledge impact	40.3	31 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	4.0	15 ●
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	0.3	92 ○
6.2.3 Computer software spending, % GDP	0.3	61
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	3.0	81
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.4	18 ●
6.3 Knowledge diffusion	34.0	30 ●
6.3.1 Intellectual property receipts, % total trade	0.0	84
6.3.2 High-tech exports less re-exports, % total trade	n/a	n/a
6.3.3 ICT services exports, % total trade	4.3	16 ●
6.3.4 FDI net outflows, % GDP	1.9	33 ●
7 Creative outputs	22.8	94
7.1 Intangible assets	37.6	86
7.1.1 Trademarks by origin/bn PPP\$ GDP	28.2	74
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.7	71
7.1.3 ICTs & business model creation [†]	60.9	60
7.1.4 ICTs & organizational model creation [†]	54.8	57
7.2 Creative goods & services	3.7	115 ○
7.2.1 Cultural & creative services exports, % of total trade	0.1	63
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	0.8	83
7.2.3 Global ent. & media market/th pop. 15–69	2.3	51
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.5	90 ○
7.2.5 Creative goods exports, % total trade	n/a	n/a
7.3 Online creativity	12.4	92
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.2	91
7.3.2 Country-code TLDs/th pop. 15–69	0.3	97
7.3.3 Wikipedia edits/mn pop. 15–69	4.0	82
7.3.4 Video uploads on YouTube/pop. 15–69	9.2	63 ○

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	38.6
GDP (US\$ billions)	467.4
GDP per capita, PPP\$	26,455.3
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	42.0	38
Innovation Output Sub-Index	33.8	41
Innovation Input Sub-Index	50.2	37
Innovation Efficiency Ratio	0.7	48
Global Innovation Index 2016 (out of 128)	40.2	39

1 Institutions	75.6	33
1.1 Political environment	73.9	33
1.1.1 Political stability & safety*	85.0	26
1.1.2 Government effectiveness*	62.7	40
1.2 Regulatory environment	71.9	41
1.2.1 Regulatory quality*	67.6	33
1.2.2 Rule of law*	62.7	35
1.2.3 Cost of redundancy dismissal, salary weeks	18.8	78
1.3 Business environment	81.1	30
1.3.1 Ease of starting a business*	84.2	82 ○
1.3.2 Ease of resolving insolvency*	76.4	25 ●
1.3.3 Ease of paying taxes*	82.7	40
2 Human capital & research	36.5	48
2.1 Education	57.1	36
2.1.1 Expenditure on education, % GDP	4.9	55
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	22.1	45
2.1.3 School life expectancy, years [Ⓐ]	16.4	25
2.1.4 PISA scales in reading, maths, & science	503.9	17
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	9.5	20 ●
2.2 Tertiary education	33.5	71
2.2.1 Tertiary enrolment, % gross [Ⓐ]	71.2	24 ●
2.2.2 Graduates in science & engineering, %	17.4	71 ○
2.2.3 Tertiary inbound mobility, % [Ⓐ]	1.5	77 ○
2.3 Research & development (R&D)	19.0	46
2.3.1 Researchers, FTE/mn pop.	2,139.1	34
2.3.2 Gross expenditure on R&D, % GDP	1.0	36
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	26.9	44
3 Infrastructure	53.3	41
3.1 Information & communication technologies (ICTs)	70.7	35
3.1.1 ICT access*	70.9	48
3.1.2 ICT use*	53.5	54
3.1.3 Government's online service*	70.3	45
3.1.4 E-participation*	88.1	14 ●
3.2 General infrastructure	38.7	55
3.2.1 Electricity output, kWh/cap	4,263.4	49
3.2.2 Logistics performance*	63.0	32
3.2.3 Gross capital formation, % GDP	20.3	78 ○
3.3 Ecological sustainability	50.3	45
3.3.1 GDP/unit of energy use	9.7	55
3.3.2 Environmental performance*	81.3	38
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	2.8	40
4 Market sophistication	48.2	55
4.1 Credit	32.6	70
4.1.1 Ease of getting credit*	75.0	19
4.1.2 Domestic credit to private sector, % GDP	53.6	65
4.1.3 Microfinance gross loans, % GDP	0.1	55 ○

4.2 Investment	36.6	81 ○
4.2.1 Ease of protecting minority investors*	63.3	41
4.2.2 Market capitalization, % GDP	28.9	50
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	47
4.3 Trade, competition, & market scale	75.6	20 ●
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	71.8	46
4.3.3 Domestic market scale, bn PPP\$	1,052.2	23 ●

5 Business sophistication **37.4** **42**

5.1 Knowledge workers	47.8	39
5.1.1 Knowledge-intensive employment, %	37.6	29
5.1.2 Firms offering formal training, % firms	34.6	40
5.1.3 GERD performed by business, % of GDP	0.5	35
5.1.4 GERD financed by business, %	39.0	38
5.1.5 Females employed w/advanced degrees, % total	19.5	26
5.2 Innovation linkages	27.5	66
5.2.1 University/industry research collaboration [†]	38.2	80 ○
5.2.2 State of cluster development [†]	44.9	66
5.2.3 GERD financed by abroad, %	16.7	27
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	83 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.4	40
5.3 Knowledge absorption	36.9	47
5.3.1 Intellectual property payments, % total trade	1.1	30
5.3.2 High-tech imports less re-imports, % total trade	10.7	37
5.3.3 ICT services imports, % total trade	1.2	60
5.3.4 FDI net inflows, % GDP	2.2	76
5.3.5 Research talent, % in business enterprise	34.8	40

6 Knowledge & technology outputs **27.9** **44**

6.1 Knowledge creation	24.2	37
6.1.1 Patents by origin/bn PPP\$ GDP	5.2	23 ●
6.1.2 PCT patent applications/bn PPP\$ GDP	0.3	47
6.1.3 Utility models by origin/bn PPP\$ GDP	1.0	25
6.1.4 Scientific & technical articles/bn PPP\$ GDP	25.1	32
6.1.5 Citable documents H index	34.8	24 ●
6.2 Knowledge impact	35.7	46
6.2.1 Growth rate of PPP\$ GDP/worker, %	2.2	35
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	0.5	85 ○
6.2.3 Computer software spending, % GDP	0.3	44
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	10.6	35
6.2.5 High- & medium-high-tech manufactures, %	0.3	35
6.3 Knowledge diffusion	23.8	58
6.3.1 Intellectual property receipts, % total trade	0.2	41
6.3.2 High-tech exports less re-exports, % total trade	7.3	25
6.3.3 ICT services exports, % total trade	1.9	54
6.3.4 FDI net outflows, % GDP	0.5	67

7 Creative outputs **39.7** **37**

7.1 Intangible assets	45.9	54
7.1.1 Trademarks by origin/bn PPP\$ GDP	45.0	55
7.1.2 Industrial designs by origin/bn PPP\$ GDP	n/a	n/a
7.1.3 ICTs & business model creation [†]	61.0	59
7.1.4 ICTs & organizational model creation [†]	54.0	62
7.2 Creative goods & services	34.1	22 ●
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	1.0	16 ●
7.2.2 National feature films/mn pop. 15–69	1.5	69 ○
7.2.3 Global ent. & media market/th pop. 15–69	11.1	34
7.2.4 Printing & publishing manufactures, %	1.1	57
7.2.5 Creative goods exports, % total trade	5.5	9 ●
7.3 Online creativity	32.7	35
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	7.1	46
7.3.2 Country-code TLDs/th pop. 15–69	27.9	22 ●
7.3.3 Wikipedia edits/mn pop. 15–69	6.2	31
7.3.4 Video uploads on YouTube/pop. 15–69	35.8	39

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Portugal

Key indicators

Population (millions)	10.3
GDP (US\$ billions)	205.9
GDP per capita, PPP\$	27,834.8
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	46.1	31
Innovation Output Sub-Index	38.3	31
Innovation Input Sub-Index	53.8	33
Innovation Efficiency Ratio	0.7	33
Global Innovation Index 2016 (out of 128)	46.4	30

1 Institutions	80.8	23
1.1 Political environment	79.4	22
1.1.1 Political stability & safety*	85.0	27
1.1.2 Government effectiveness*	73.8	24
1.2 Regulatory environment	75.8	34
1.2.1 Regulatory quality*	66.2	34
1.2.2 Rule of law*	72.8	26
1.2.3 Cost of redundancy dismissal, salary weeks	17.0	70 ○
1.3 Business environment	87.3	15 ●
1.3.1 Ease of starting a business*	92.9	29
1.3.2 Ease of resolving insolvency*	85.2	7 ●
1.3.3 Ease of paying taxes*	83.8	34

2 Human capital & research	47.6	29
2.1 Education	60.9	19
2.1.1 Expenditure on education, % GDP	5.3	38
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	30.3	14 ●
2.1.3 School life expectancy, years	16.6	19
2.1.4 PISA scales in reading, maths, & science	497.0	22
2.1.5 Pupil-teacher ratio, secondary ^②	9.9	24
2.2 Tertiary education	45.1	33
2.2.1 Tertiary enrolment, % gross ^②	65.6	35
2.2.2 Graduates in science & engineering, %	26.1	23
2.2.3 Tertiary inbound mobility, % ^②	4.1	49
2.3 Research & development (R&D)	36.9	30
2.3.1 Researchers, FTE/mn pop.	3,824.2	23
2.3.2 Gross expenditure on R&D, % GDP	1.3	28
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	38.0	39
2.3.4 QS university ranking, average score top 3*	34.0	36

3 Infrastructure	54.0	39
3.1 Information & communication technologies (ICTs)	69.2	37
3.1.1 ICT access*	79.3	26
3.1.2 ICT use*	56.7	46
3.1.3 Government's online service*	74.6	33
3.1.4 E-participation*	66.1	49
3.2 General infrastructure	33.1	82 ○
3.2.1 Electricity output, kWh/cap	4,900.3	43
3.2.2 Logistics performance*	62.3	35
3.2.3 Gross capital formation, % GDP	15.0	112 ○
3.3 Ecological sustainability	59.5	18 ●
3.3.1 GDP/unit of energy use	12.3	25
3.3.2 Environmental performance*	88.6	7 ●
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	4.4	21

4 Market sophistication	51.1	43
4.1 Credit	46.4	37
4.1.1 Ease of getting credit*	45.0	84 ○
4.1.2 Domestic credit to private sector, % GDP	120.1	19
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	38.2	74 ○
4.2.1 Ease of protecting minority investors*	56.7	67 ○
4.2.2 Market capitalization, % GDP	30.1	46
4.2.3 Venture capital deals/bn PPP\$ GDP	0.1	21
4.3 Trade, competition, & market scale	68.8	42
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	70.5	55
4.3.3 Domestic market scale, bn PPP\$	297.1	51

5 Business sophistication	35.4	50
5.1 Knowledge workers	47.8	37
5.1.1 Knowledge-intensive employment, %	35.5	37
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	0.6	31
5.1.4 GERD financed by business, % ^②	41.8	30
5.1.5 Females employed w/advanced degrees, % total	15.3	40
5.2 Innovation linkages	26.8	68
5.2.1 University/industry research collaboration [†]	50.5	35
5.2.2 State of cluster development [†]	52.6	37
5.2.3 GERD financed by abroad, % ^②	5.6	62 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	72 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.7	32
5.3 Knowledge absorption	31.6	71 ○
5.3.1 Intellectual property payments, % total trade	0.9	40
5.3.2 High-tech imports less re-imports, % total trade	6.5	87 ○
5.3.3 ICT services imports, % total trade	1.2	58
5.3.4 FDI net inflows, % GDP	3.6	46
5.3.5 Research talent, % in business enterprise	29.0	44

6 Knowledge & technology outputs	29.9	39
6.1 Knowledge creation	22.9	41
6.1.1 Patents by origin/bn PPP\$ GDP	3.7	28
6.1.2 PCT patent applications/bn PPP\$ GDP	0.6	34
6.1.3 Utility models by origin/bn PPP\$ GDP	0.4	38 ○
6.1.4 Scientific & technical articles/bn PPP\$ GDP	45.5	12 ●
6.1.5 Citable documents H index	28.5	30
6.2 Knowledge impact	41.1	26
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.1	86 ○
6.2.2 New businesses/th pop. 15–64	4.6	26
6.2.3 Computer software spending, % GDP	0.6	11 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	25.8	11 ●
6.2.5 High- & medium-high-tech manufactures, %	0.3	47
6.3 Knowledge diffusion	25.9	50
6.3.1 Intellectual property receipts, % total trade	0.1	49
6.3.2 High-tech exports less re-exports, % total trade	2.6	48
6.3.3 ICT services exports, % total trade	1.4	70 ○
6.3.4 FDI net outflows, % GDP	2.3	27

7 Creative outputs	46.7	21
7.1 Intangible assets	61.2	14 ●
7.1.1 Trademarks by origin/bn PPP\$ GDP	95.4	15 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	9.7	14 ●
7.1.3 ICTs & business model creation [†]	76.8	16 ●
7.1.4 ICTs & organizational model creation [†]	62.6	32
7.2 Creative goods & services	24.6	47
7.2.1 Cultural & creative services exports, % of total trade ^②	0.6	26
7.2.2 National feature films/mn pop. 15–69	4.2	47
7.2.3 Global ent. & media market/th pop. 15–69	32.2	22
7.2.4 Printing & publishing manufactures, %	1.3	43
7.2.5 Creative goods exports, % total trade	1.2	37
7.3 Online creativity	39.6	28
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	18.9	29
7.3.2 Country-code TLDs/th pop. 15–69	35.6	18 ●
7.3.3 Wikipedia edits/mn pop. 15–69	5.8	45
7.3.4 Video uploads on YouTube/pop. 15–69	47.5	17

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

② 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 181 of this appendix for details.

Key indicators

Population (millions)	2.3
GDP (US\$ billions)	156.6
GDP per capita, PPP\$	132,098.7
Income group	High income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	37.9	49
Innovation Output Sub-Index	28.8	54
Innovation Input Sub-Index	47.0	48
Innovation Efficiency Ratio	0.6	68
Global Innovation Index 2016 (out of 128)	37.5	50

1 Institutions **72.8** **37**

1.1 Political environment	77.6	26
1.1.1 Political stability & safety*	87.5	16 ●
1.1.2 Government effectiveness*	67.7	35
1.2 Regulatory environment	66.2	58
1.2.1 Regulatory quality*	59.8	43
1.2.2 Rule of law*	65.3	33
1.2.3 Cost of redundancy dismissal, salary weeks	23.2	98
1.3 Business environment	74.6	52
1.3.1 Ease of starting a business*	86.1	74
1.3.2 Ease of resolving insolvency*	38.2	102
1.3.3 Ease of paying taxes*	99.4	1 ●

2 Human capital & research **33.3** **58**

2.1 Education	37.2	97
2.1.1 Expenditure on education, % GDP	3.5	90
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	10.5	95 ○
2.1.3 School life expectancy, years [Ⓐ]	13.1	73
2.1.4 PISA scales in reading, maths, & science	407.3	60 ○
2.1.5 Pupil-teacher ratio, secondary	10.7	30
2.2 Tertiary education	55.7	13 ●
2.2.1 Tertiary enrolment, % gross	17.2	96
2.2.2 Graduates in science & engineering, %	27.6	18
2.2.3 Tertiary inbound mobility, %	37.7	1 ●
2.3 Research & development (R&D)	7.0	66
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	597.1	60
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.5	66
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	10.2	63

3 Infrastructure **58.1** **26**

3.1 Information & communication technologies (ICTs)	68.5	39
3.1.1 ICT access*	79.1	29
3.1.2 ICT use*	63.2	31
3.1.3 Government's online service*	67.4	49
3.1.4 E-participation*	64.4	54
3.2 General infrastructure	67.6	2 ●
3.2.1 Electricity output, kWh/cap.	17,830.4	4 ●
3.2.2 Logistics performance*	71.0	29
3.2.3 Gross capital formation, % GDP	n/a	n/a
3.3 Ecological sustainability	38.3	88
3.3.1 GDP/unit of energy use	6.5	88
3.3.2 Environmental performance*	69.9	78
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.0	64

4 Market sophistication **42.6** **85**

4.1 Credit	28.6	85
4.1.1 Ease of getting credit*	30.0	108 ○
4.1.2 Domestic credit to private sector, % GDP	69.6	43
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	30.1	113 ○
4.2.1 Ease of protecting minority investors*	26.7	127 ○
4.2.2 Market capitalization, % GDP	86.6	15
4.2.3 Venture capital deals/bn PPP\$ GDP	n/a	n/a
4.3 Trade, competition, & market scale	68.9	40
4.3.1 Applied tariff rate, weighted mean, %	3.4	74
4.3.2 Intensity of local competition [†]	79.0	16 ●
4.3.3 Domestic market scale, bn PPP\$	334.5	48

5 Business sophistication **28.0** **84**

5.1 Knowledge workers	20.4	112 ○
5.1.1 Knowledge-intensive employment, %	16.1	84
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.1	60
5.1.4 GERD financed by business, % [Ⓐ]	24.2	58
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	4.5	79 ○
5.2 Innovation linkages	33.0	51
5.2.1 University/industry research collaboration [†]	70.5	10 ●
5.2.2 State of cluster development [†]	70.0	9 ●
5.2.3 GERD financed by abroad, % [Ⓐ]	2.4	73
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	41
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	82
5.3 Knowledge absorption	30.6	79
5.3.1 Intellectual property payments, % total trade	n/a	n/a
5.3.2 High-tech imports less re-imports, % total trade	4.4	113 ○
5.3.3 ICT services imports, % total trade	2.0	23
5.3.4 FDI net inflows, % GDP	0.2	121 ○
5.3.5 Research talent, % in business enterprise [Ⓐ]	28.0	45

6 Knowledge & technology outputs **23.1** **55**

6.1 Knowledge creation	3.5	103
6.1.1 Patents by origin/bn PPP\$ GDP	0.0	120 ○
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	86
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	6.3	86
6.1.5 Citable documents H index	5.3	92
6.2 Knowledge impact	33.9	51
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.6	70
6.2.2 New businesses/th pop. 15–64	1.7	51
6.2.3 Computer software spending, % GDP	0.4	31
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	2.1	90
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.4	12 ●
6.3 Knowledge diffusion	32.0	36
6.3.1 Intellectual property receipts, % total trade	n/a	n/a
6.3.2 High-tech exports less re-exports, % total trade	0.3	94
6.3.3 ICT services exports, % total trade	0.7	91
6.3.4 FDI net outflows, % GDP	3.3	19

7 Creative outputs **34.5** **54**

7.1 Intangible assets	51.8	31
7.1.1 Trademarks by origin/bn PPP\$ GDP [Ⓐ]	4.6	112 ○
7.1.2 Industrial designs by origin/bn PPP\$ GDP	n/a	n/a
7.1.3 ICTs & business model creation [†]	79.4	11 ●
7.1.4 ICTs & organizational model creation [†]	74.1	16 ●
7.2 Creative goods & services	12.2	81
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	25.9	25
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.9	68
7.2.5 Creative goods exports, % total trade	0.2	78
7.3 Online creativity	22.4	57
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	4.4	58
7.3.2 Country-code TLDs/th pop. 15–69	3.4	56
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	4.6	70
7.3.4 Video uploads on YouTube/pop. 15–69	37.7	34

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Romania

Key indicators

Population (millions)	19.4
GDP (US\$ billions)	186.5
GDP per capita, PPP\$	20,786.9
Income group	Upper-middle income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	39.2	42
Innovation Output Sub-Index	32.0	44
Innovation Input Sub-Index	46.4	51
Innovation Efficiency Ratio	0.7	39
Global Innovation Index 2016 (out of 128)	37.9	48

1 Institutions	69.0	43
1.1 Political environment	54.9	57
1.1.1 Political stability & safety*	68.6	51
1.1.2 Government effectiveness*	41.2	73
1.2 Regulatory environment	75.3	35
1.2.1 Regulatory quality*	57.2	45
1.2.2 Rule of law*	43.9	54
1.2.3 Cost of redundancy dismissal, salary weeks	8.0	1 ●
1.3 Business environment	76.8	39
1.3.1 Ease of starting a business*	89.5	53
1.3.2 Ease of resolving insolvency*	59.2	46
1.3.3 Ease of paying taxes*	81.6	43

2 Human capital & research	30.5	75
2.1 Education	40.9	84
2.1.1 Expenditure on education, % GDP [Ⓐ]	2.9	100 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	13.4	87 ○
2.1.3 School life expectancy, years	14.9	52
2.1.4 PISA scales in reading, maths, & science	437.5	47
2.1.5 Pupil-teacher ratio, secondary	12.1	41
2.2 Tertiary education	41.9	42
2.2.1 Tertiary enrolment, % gross	53.2	50
2.2.2 Graduates in science & engineering, %	25.5	29
2.2.3 Tertiary inbound mobility, %	4.3	42
2.3 Research & development (R&D)	8.6	62
2.3.1 Researchers, FTE/mn pop.	894.8	50
2.3.2 Gross expenditure on R&D, % GDP	0.5	64
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	12.8	59

3 Infrastructure	55.1	37
3.1 Information & communication technologies (ICTs)	57.0	66
3.1.1 ICT access*	69.0	52
3.1.2 ICT use*	50.8	58
3.1.3 Government's online service*	45.7	91 ○
3.1.4 E-participation*	62.7	59
3.2 General infrastructure	38.1	60
3.2.1 Electricity output, kWh/cap	3,274.8	60
3.2.2 Logistics performance*	43.0	59
3.2.3 Gross capital formation, % GDP	25.0	43
3.3 Ecological sustainability	70.1	3 ●
3.3.1 GDP/unit of energy use	11.5	31
3.3.2 Environmental performance*	83.2	34
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	25.5	1 ●

4 Market sophistication	44.2	73
4.1 Credit	32.1	72
4.1.1 Ease of getting credit*	85.0	7 ●
4.1.2 Domestic credit to private sector, % GDP	29.9	100 ○
4.1.3 Microfinance gross loans, % GDP	0.0	72 ○

4.2 Investment	31.7	102 ○
4.2.1 Ease of protecting minority investors*	60.0	52
4.2.2 Market capitalization, % GDP [Ⓐ]	7.6	79 ○
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	67
4.3 Trade, competition, & market scale	69.0	39
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	63.1	88
4.3.3 Domestic market scale, bn PPP\$	441.0	40

5 Business sophistication	33.0	63
5.1 Knowledge workers	37.4	63
5.1.1 Knowledge-intensive employment, %	22.7	63
5.1.2 Firms offering formal training, % firms	40.7	32
5.1.3 GERD performed by business, % of GDP	0.2	49
5.1.4 GERD financed by business, %	37.3	39
5.1.5 Females employed w/advanced degrees, % total	10.6	63
5.2 Innovation linkages	25.5	71
5.2.1 University/industry research collaboration [†]	38.8	77
5.2.2 State of cluster development [†]	37.0	95 ○
5.2.3 GERD financed by abroad, %	19.2	21 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	108 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	75
5.3 Knowledge absorption	36.1	50
5.3.1 Intellectual property payments, % total trade	1.1	28
5.3.2 High-tech imports less re-imports, % total trade	10.3	43
5.3.3 ICT services imports, % total trade	1.8	26 ●
5.3.4 FDI net inflows, % GDP	2.1	79
5.3.5 Research talent, % in business enterprise	24.3	51

6 Knowledge & technology outputs	31.0	37
6.1 Knowledge creation	9.5	66
6.1.1 Patents by origin/bn PPP\$ GDP	2.4	41
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	65
6.1.3 Utility models by origin/bn PPP\$ GDP	0.1	48 ○
6.1.4 Scientific & technical articles/bn PPP\$ GDP	16.5	45
6.1.5 Citable documents H index	14.8	47
6.2 Knowledge impact	57.9	4 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	4.7	8 ●
6.2.2 New businesses/th pop. 15–64	4.1	31
6.2.3 Computer software spending, % GDP	0.3	45
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	49.5	2 ●
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.4	27
6.3 Knowledge diffusion	25.6	51
6.3.1 Intellectual property receipts, % total trade	0.1	47
6.3.2 High-tech exports less re-exports, % total trade	6.0	29
6.3.3 ICT services exports, % total trade	4.1	18 ●
6.3.4 FDI net outflows, % GDP	0.2	82

7 Creative outputs	32.9	57
7.1 Intangible assets	39.8	75
7.1.1 Trademarks by origin/bn PPP\$ GDP	52.7	42
7.1.2 Industrial designs by origin/bn PPP\$ GDP	2.5	40
7.1.3 ICTs & business model creation [†]	57.2	77
7.1.4 ICTs & organizational model creation [†]	48.7	79
7.2 Creative goods & services	25.2	46
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	1.6	5 ●
7.2.2 National feature films/mn pop. 15–69	1.8	62
7.2.3 Global ent. & media market/th pop. 15–69	4.9	45
7.2.4 Printing & publishing manufactures, % [Ⓐ]	1.1	62
7.2.5 Creative goods exports, % total trade	1.2	39
7.3 Online creativity	26.9	43
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	4.5	57
7.3.2 Country-code TLDs/th pop. 15–69	18.4	29 ●
7.3.3 Wikipedia edits/mn pop. 15–69	5.1	59
7.3.4 Video uploads on YouTube/pop. 15–69	35.4	40

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	143.4
GDP (US\$ billions)	1,267.8
GDP per capita, PPP\$	25,410.9
Income group	Upper-middle income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	38.8	45
Innovation Output Sub-Index	29.3	51
Innovation Input Sub-Index	48.2	43
Innovation Efficiency Ratio	0.6	75
Global Innovation Index 2016 (out of 128)	38.5	43

1 Institutions	56.1	73
1.1 Political environment	37.9	100 ○
1.1.1 Political stability & safety*	38.4	112 ○
1.1.2 Government effectiveness*	37.5	80
1.2 Regulatory environment	52.5	94 ○
1.2.1 Regulatory quality*	28.8	102 ○
1.2.2 Rule of law*	18.4	104 ○
1.2.3 Cost of redundancy dismissal, salary weeks	17.3	73
1.3 Business environment	77.7	36
1.3.1 Ease of starting a business*	93.6	23
1.3.2 Ease of resolving insolvency*	56.7	48
1.3.3 Ease of paying taxes*	83.0	38

2 Human capital & research	50.0	23
2.1 Education	59.7	23
2.1.1 Expenditure on education, % GDP [Ⓐ]	3.9	83
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years	15.0	50
2.1.4 PISA scales in reading, maths, & science	491.8	26
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	8.8	14 ●
2.2 Tertiary education	48.8	23
2.2.1 Tertiary enrolment, % gross [Ⓐ]	78.7	17 ●
2.2.2 Graduates in science & engineering, % [Ⓐ]	28.1	13 ●
2.2.3 Tertiary inbound mobility, % [Ⓐ]	3.0	56
2.3 Research & development (R&D)	41.5	25
2.3.1 Researchers, FTE/mn pop.	3,131.1	29
2.3.2 Gross expenditure on R&D, % GDP	1.1	34
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	55.6	25
2.3.4 QS university ranking, average score top 3*	46.5	25

3 Infrastructure	47.5	62
3.1 Information & communication technologies (ICTs)	69.7	36
3.1.1 ICT access*	72.3	44
3.1.2 ICT use*	58.7	40
3.1.3 Government's online service*	73.2	37
3.1.4 E-participation*	74.6	32
3.2 General infrastructure	33.1	81
3.2.1 Electricity output, kWh/cap	7,386.5	25
3.2.2 Logistics performance*	23.5	96 ○
3.2.3 Gross capital formation, % GDP	21.6	69
3.3 Ecological sustainability	39.8	83
3.3.1 GDP/unit of energy use	4.5	108 ○
3.3.2 Environmental performance*	83.5	32
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.3	94 ○

4 Market sophistication	47.1	60
4.1 Credit	29.4	81
4.1.1 Ease of getting credit*	65.0	40
4.1.2 Domestic credit to private sector, % GDP	56.4	57
4.1.3 Microfinance gross loans, % GDP	0.1	60

4.2 Investment	33.2	95 ○
4.2.1 Ease of protecting minority investors*	60.0	52
4.2.2 Market capitalization, % GDP	29.5	48
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	90 ○
4.3 Trade, competition, & market scale	78.7	12 ●
4.3.1 Applied tariff rate, weighted mean, %	2.8	66
4.3.2 Intensity of local competition [†]	65.8	78
4.3.3 Domestic market scale, bn PPP\$	3,745.1	6 ●

5 Business sophistication	40.3	33
5.1 Knowledge workers	59.8	24
5.1.1 Knowledge-intensive employment, %	44.3	15 ●
5.1.2 Firms offering formal training, % firms [Ⓐ]	46.2	26
5.1.3 GERD performed by business, % of GDP	0.7	28
5.1.4 GERD financed by business, %	26.5	56
5.1.5 Females employed w/advanced degrees, % total	33.2	2 ●
5.2 Innovation linkages	20.2	105 ○
5.2.1 University/industry research collaboration [†]	44.6	44
5.2.2 State of cluster development [†]	39.4	86
5.2.3 GERD financed by abroad, %	2.6	70
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	62
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.2	50
5.3 Knowledge absorption	41.0	31
5.3.1 Intellectual property payments, % total trade	1.7	16 ●
5.3.2 High-tech imports less re-imports, % total trade	8.5	59
5.3.3 ICT services imports, % total trade	1.6	35
5.3.4 FDI net inflows, % GDP	1.6	94 ○
5.3.5 Research talent, % in business enterprise	46.4	29

6 Knowledge & technology outputs	27.6	45
6.1 Knowledge creation	38.4	22 ●
6.1.1 Patents by origin/bn PPP\$ GDP	7.9	15 ●
6.1.2 PCT patent applications/bn PPP\$ GDP	0.2	49
6.1.3 Utility models by origin/bn PPP\$ GDP	3.1	8 ●
6.1.4 Scientific & technical articles/bn PPP\$ GDP	8.8	70
6.1.5 Citable documents H index	36.6	22 ●
6.2 Knowledge impact	15.6	111 ○
6.2.1 Growth rate of PPP\$ GDP/worker, %	(4.8)	110 ○
6.2.2 New businesses/th pop. 15–64	4.2	29
6.2.3 Computer software spending, % GDP	0.3	35
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	2.4	85
6.2.5 High- & medium-high-tech manufactures, %	0.2	51
6.3 Knowledge diffusion	28.7	43
6.3.1 Intellectual property receipts, % total trade	0.2	37
6.3.2 High-tech exports less re-exports, % total trade	3.4	44
6.3.3 ICT services exports, % total trade	1.2	76
6.3.4 FDI net outflows, % GDP	2.8	24

7 Creative outputs	31.0	62
7.1 Intangible assets	37.6	87
7.1.1 Trademarks by origin/bn PPP\$ GDP	43.4	56
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.7	72
7.1.3 ICTs & business model creation [†]	52.7	91
7.1.4 ICTs & organizational model creation [†]	55.1	55
7.2 Creative goods & services	18.9	61
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.9	17
7.2.2 National feature films/mn pop. 15–69	1.1	76
7.2.3 Global ent. & media market/th pop. 15–69	4.6	48 ○
7.2.4 Printing & publishing manufactures, %	1.2	47
7.2.5 Creative goods exports, % total trade	0.8	49
7.3 Online creativity	30.1	39
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	3.3	61
7.3.2 Country-code TLDs/th pop. 15–69	15.2	34
7.3.3 Wikipedia edits/mn pop. 15–69	6.2	34
7.3.4 Video uploads on YouTube/pop. 15–69	42.1	28

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Rwanda

Key indicators

Population (millions)	11.9
GDP (US\$ billions)	8.3
GDP per capita, PPP\$	1,807.0
Income group	Low income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	27.4	99
Innovation Output Sub-Index	13.7	121 ○
Innovation Input Sub-Index	41.1	76
Innovation Efficiency Ratio	0.3	125 ○
Global Innovation Index 2016 (out of 128)	30.0	83

1 Institutions	63.5	61
1.1 Political environment	51.5	65
1.1.1 Political stability & safety*	61.8	67
1.1.2 Government effectiveness*	41.1	74
1.2 Regulatory environment	67.6	50
1.2.1 Regulatory quality*	48.5	62
1.2.2 Rule of law*	41.5	55
1.2.3 Cost of redundancy dismissal, salary weeks	13.0	45
1.3 Business environment	71.6	60
1.3.1 Ease of starting a business*	87.2	63
1.3.2 Ease of resolving insolvency*	47.9	67
1.3.3 Ease of paying taxes*	79.7	50

2 Human capital & research	23.5	90
2.1 Education	46.4	67
2.1.1 Expenditure on education, % GDP	5.0	47
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	39.0	6 ●
2.1.3 School life expectancy, years ^a	11.0	95
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary ^a	21.7	85
2.2 Tertiary education	24.2	95
2.2.1 Tertiary enrolment, % gross ^a	7.5	111
2.2.2 Graduates in science & engineering, % ^a	22.5	39
2.2.3 Tertiary inbound mobility, % ^a	1.0	82
2.3 Research & development (R&D)	0.0	115 ○
2.3.1 Researchers, FTE/mn pop. ^a	12.3	101 ○
2.3.2 Gross expenditure on R&D, % GDP	n/a	n/a
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	40.4	85
3.1 Information & communication technologies (ICTs)	34.0	100
3.1.1 ICT access*	26.5	117 ○
3.1.2 ICT use*	14.7	104
3.1.3 Government's online service*	45.7	91
3.1.4 E-participation*	49.2	89
3.2 General infrastructure	53.6	14 ●
3.2.1 Electricity output, kWh/cap	n/a	n/a
3.2.2 Logistics performance*	42.7	61
3.2.3 Gross capital formation, % GDP	29.5	20 ●
3.3 Ecological sustainability	33.6	109
3.3.1 GDP/unit of energy use	n/a	n/a
3.3.2 Environmental performance*	50.3	111
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.0	123 ○

4 Market sophistication	40.9	93
4.1 Credit	38.3	54
4.1.1 Ease of getting credit*	95.0	2 ●
4.1.2 Domestic credit to private sector, % GDP	21.6	109
4.1.3 Microfinance gross loans, % GDP	0.7	31

4.2 Investment	39.6	67
4.2.1 Ease of protecting minority investors*	51.7	86
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP ^a	0.0	31 ●
4.3 Trade, competition, & market scale	44.8	116
4.3.1 Applied tariff rate, weighted mean, %	7.2	104
4.3.2 Intensity of local competition [†]	66.4	74
4.3.3 Domestic market scale, bn PPP\$	22.0	117

5 Business sophistication	37.0	44
5.1 Knowledge workers	37.0	[66]
5.1.1 Knowledge-intensive employment, % ^a	3.8	105 ○
5.1.2 Firms offering formal training, % firms ^a	55.4	13 ●
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	41.7	25 ●
5.2.1 University/industry research collaboration [†]	38.9	75
5.2.2 State of cluster development [†]	52.1	40 ●
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	21 ●
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	n/a	n/a
5.3 Knowledge absorption	32.2	68
5.3.1 Intellectual property payments, % total trade ^a	0.1	108 ○
5.3.2 High-tech imports less re-imports, % total trade	12.8	20 ●
5.3.3 ICT services imports, % total trade ^a	0.5	95
5.3.4 FDI net inflows, % GDP	3.7	40 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	7.7	125 ○
6.1 Knowledge creation	4.5	94
6.1.1 Patents by origin/bn PPP\$ GDP	0.2	91
6.1.2 PCT patent applications/bn PPP\$ GDP ^a	0.0	80
6.1.3 Utility models by origin/bn PPP\$ GDP	0.2	41
6.1.4 Scientific & technical articles/bn PPP\$ GDP	9.5	69
6.1.5 Citable documents H index	2.3	114
6.2 Knowledge impact	4.3	120 ○
6.2.1 Growth rate of PPP\$ GDP/worker, %	n/a	n/a
6.2.2 New businesses/th pop. 15–64	1.5	57
6.2.3 Computer software spending, % GDP	0.1	100
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.1	125 ○
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	14.2	115
6.3.1 Intellectual property receipts, % total trade ^a	0.0	83
6.3.2 High-tech exports less re-exports, % total trade	0.5	89
6.3.3 ICT services exports, % total trade ^a	0.9	86
6.3.4 FDI net outflows, % GDP	0.1	93

7 Creative outputs	19.6	103
7.1 Intangible assets	36.0	93
7.1.1 Trademarks by origin/bn PPP\$ GDP	12.0	98
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.2	92
7.1.3 ICTs & business model creation [†]	68.0	36 ●
7.1.4 ICTs & organizational model creation [†]	51.7	68
7.2 Creative goods & services	3.3	[116]
7.2.1 Cultural & creative services exports, % of total trade ^a	0.0	87 ○
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.1	84
7.3 Online creativity	3.2	119 ○
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.2	118 ○
7.3.2 Country-code TLDs/th pop. 15–69	0.1	112
7.3.3 Wikipedia edits/mn pop. 15–69 ^a	1.0	117
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

^a 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 181 of this appendix for details.

Key indicators

Population (millions)	32.2
GDP (US\$ billions)	637.8
GDP per capita, PPP\$	53,624.4
Income group	High income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	36.2	55
Innovation Output Sub-Index	25.0	66
Innovation Input Sub-Index	47.3	46
Innovation Efficiency Ratio	0.5	96
Global Innovation Index 2016 (out of 128)	37.8	49

1 Institutions	52.4	88
1.1 Political environment	49.1	71
1.1.1 Political stability & safety*	50.6	89
1.1.2 Government effectiveness*	47.5	60
1.2 Regulatory environment	56.9	79
1.2.1 Regulatory quality*	42.9	70
1.2.2 Rule of law*	46.8	49
1.2.3 Cost of redundancy dismissal, salary weeks	23.7	99
1.3 Business environment	51.4	120 ○
1.3.1 Ease of starting a business*	77.1	108 ○
1.3.2 Ease of resolving insolvency*	0.0	127 ○
1.3.3 Ease of paying taxes*	77.0	58
2 Human capital & research	46.5	31
2.1 Education	52.0	50
2.1.1 Expenditure on education, % GDP [Ⓐ]	5.1	45
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	18.2	61
2.1.3 School life expectancy, years	16.1	28 ●
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	11.0	31
2.2 Tertiary education	46.3	29 ●
2.2.1 Tertiary enrolment, % gross	63.1	40
2.2.2 Graduates in science & engineering, %	26.9	20 ●
2.2.3 Tertiary inbound mobility, %	4.8	38
2.3 Research & development (R&D)	41.2	26 ●
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.8	44
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	61.9	23 ●
2.3.4 QS university ranking, average score top 3*	43.1	30 ●
3 Infrastructure	53.3	40
3.1 Information & communication technologies (ICTs)	68.7	38
3.1.1 ICT access*	72.9	42
3.1.2 ICT use*	63.2	31
3.1.3 Government's online service*	67.4	49
3.1.4 E-participation*	71.2	39
3.2 General infrastructure	53.6	13 ●
3.2.1 Electricity output, kWh/cap.	10,094.1	14 ●
3.2.2 Logistics performance*	50.6	51
3.2.3 Gross capital formation, % GDP	31.7	13 ●
3.3 Ecological sustainability	37.6	89
3.3.1 GDP/unit of energy use	7.0	85
3.3.2 Environmental performance*	68.6	84
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.2	106 ○
4 Market sophistication	49.4	51
4.1 Credit	36.0	59
4.1.1 Ease of getting credit*	50.0	72
4.1.2 Domestic credit to private sector, % GDP	56.6	56
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	36.5	82
4.2.1 Ease of protecting minority investors*	58.3	62
4.2.2 Market capitalization, % GDP	65.2	25
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	84 ○
4.3 Trade, competition, & market scale	75.8	19 ●
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	3.4	75
4.3.2 Intensity of local competition [†]	73.4	36
4.3.3 Domestic market scale, bn PPP\$	1,731.2	14 ●

5 Business sophistication	35.0	54
5.1 Knowledge workers	37.2	[64]
5.1.1 Knowledge-intensive employment, %	27.3	52
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	5.8	75 ○
5.2 Innovation linkages	33.8	49
5.2.1 University/industry research collaboration [†]	41.9	54
5.2.2 State of cluster development [†]	60.6	22 ●
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	80
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.2	51
5.3 Knowledge absorption	34.0	59
5.3.1 Intellectual property payments, % total trade	n/a	n/a
5.3.2 High-tech imports less re-imports, % total trade	9.1	53
5.3.3 ICT services imports, % total trade	1.4	49
5.3.4 FDI net inflows, % GDP	1.2	101 ○
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	21.6	62
6.1 Knowledge creation	7.8	75
6.1.1 Patents by origin/bn PPP\$ GDP	0.5	74
6.1.2 PCT patent applications/bn PPP\$ GDP	0.2	55
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	8.0	74
6.1.5 Citable documents H index	15.5	42
6.2 Knowledge impact	38.6	39
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.0	53
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.4	23 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	1.8	95
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.4	29
6.3 Knowledge diffusion	18.6	93
6.3.1 Intellectual property receipts, % total trade	n/a	n/a
6.3.2 High-tech exports less re-exports, % total trade	0.1	109 ○
6.3.3 ICT services exports, % total trade	0.1	120 ○
6.3.4 FDI net outflows, % GDP	0.7	62

7 Creative outputs	28.4	74
7.1 Intangible assets	36.4	92
7.1.1 Trademarks by origin/bn PPP\$ GDP	4.4	113 ○
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.2	97 ○
7.1.3 ICTs & business model creation [†]	68.8	33
7.1.4 ICTs & organizational model creation [†]	56.5	51
7.2 Creative goods & services	17.1	69
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	11.3	31
7.2.4 Printing & publishing manufactures, % [Ⓐ]	2.3	17 ●
7.2.5 Creative goods exports, % total trade	0.1	96
7.3 Online creativity	23.5	54
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	3.1	63
7.3.2 Country-code TLDs/th pop. 15–69	0.6	87
7.3.3 Wikipedia edits/mn pop. 15–69	4.6	66
7.3.4 Video uploads on YouTube/pop. 15–69	45.4	21

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Senegal

Key indicators

Population (millions)	15.6
GDP (US\$ billions)	14.9
GDP per capita, PPP\$	2,451.3
Income group	Low income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	27.1	100
Innovation Output Sub-Index	19.0	98
Innovation Input Sub-Index	35.2	102
Innovation Efficiency Ratio	0.5	95
Global Innovation Index 2016 (out of 128)	26.1	106

1 Institutions	54.5	80
1.1 Political environment	45.4	81
1.1.1 Political stability & safety*	59.7	72
1.1.2 Government effectiveness*	31.0	90
1.2 Regulatory environment	61.4	71
1.2.1 Regulatory quality*	37.5	79
1.2.2 Rule of law*	35.0	69
1.2.3 Cost of redundancy dismissal, salary weeks	14.8	59
1.3 Business environment	56.8	109
1.3.1 Ease of starting a business*	86.1	73
1.3.2 Ease of resolving insolvency*	40.7	90
1.3.3 Ease of paying taxes*	43.7	120 ○

2 Human capital & research	31.7	67
2.1 Education	45.6	69
2.1.1 Expenditure on education, % GDP	7.2	12 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	27.6	16 ●
2.1.3 School life expectancy, years	9.0	107 ○
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	20.4	82
2.2 Tertiary education	45.4	32 ●
2.2.1 Tertiary enrolment, % gross	10.4	103
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, %	15.8	11 ●
2.3 Research & development (R&D)	4.1	79
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	361.1	68
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.5	61
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	33.1	106
3.1 Information & communication technologies (ICTs)	32.2	106
3.1.1 ICT access*	35.9	102
3.1.2 ICT use*	16.4	103
3.1.3 Government's online service*	37.7	100
3.1.4 E-participation*	39.0	98
3.2 General infrastructure	29.5	94
3.2.1 Electricity output, kWh/cap	254.2	110
3.2.2 Logistics performance*	12.2	119 ○
3.2.3 Gross capital formation, % GDP	26.6	33 ●
3.3 Ecological sustainability	37.6	90
3.3.1 GDP/unit of energy use	8.1	69
3.3.2 Environmental performance*	63.7	97
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.5	84

4 Market sophistication	32.4	115
4.1 Credit	23.2	106
4.1.1 Ease of getting credit*	30.0	108
4.1.2 Domestic credit to private sector, % GDP	33.3	96
4.1.3 Microfinance gross loans, % GDP	1.5	20 ●

4.2 Investment	30.6	108
4.2.1 Ease of protecting minority investors*	41.7	105
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP [Ⓐ]	0.0	43
4.3 Trade, competition, & market scale	43.3	118
4.3.1 Applied tariff rate, weighted mean, %	11.6	118 ○
4.3.2 Intensity of local competition [†]	70.6	53 ●
4.3.3 Domestic market scale, bn PPP\$	39.7	97

5 Business sophistication	24.5	105
5.1 Knowledge workers	8.8	124 ○
5.1.1 Knowledge-intensive employment, %	n/a	n/a
5.1.2 Firms offering formal training, % firms	17.4	82
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.0	85 ○
5.1.4 GERD financed by business, % [Ⓐ]	4.1	80
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	0.7	86 ○
5.2 Innovation linkages	39.0	33 ●
5.2.1 University/industry research collaboration [†]	44.0	47 ●
5.2.2 State of cluster development [†]	44.4	69
5.2.3 GERD financed by abroad, % [Ⓐ]	40.5	9 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	86
5.2.5 Patent families 2+ offices/bn PPP\$ GDP [Ⓐ]	0.1	76
5.3 Knowledge absorption	25.5	95
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.1	98
5.3.2 High-tech imports less re-imports, % total trade	5.5	102
5.3.3 ICT services imports, % total trade [Ⓐ]	2.6	10 ●
5.3.4 FDI net inflows, % GDP	2.4	74
5.3.5 Research talent, % in business enterprise [Ⓐ]	0.1	85 ○

6 Knowledge & technology outputs	18.4	86
6.1 Knowledge creation	6.1	82
6.1.1 Patents by origin/bn PPP\$ GDP	0.4	79
6.1.2 PCT patent applications/bn PPP\$ GDP	0.2	53
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	10.3	65
6.1.5 Citable documents H index	6.2	85
6.2 Knowledge impact	25.7	89
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.3	49
6.2.2 New businesses/th pop. 15–64	0.3	90
6.2.3 Computer software spending, % GDP	0.3	56
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	1.7	99
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.2	64
6.3 Knowledge diffusion	23.4	62
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.1	63
6.3.2 High-tech exports less re-exports, % total trade	0.6	78
6.3.3 ICT services exports, % total trade [Ⓐ]	5.2	11 ●
6.3.4 FDI net outflows, % GDP	0.2	85

7 Creative outputs	19.6	104
7.1 Intangible assets	34.2	95
7.1.1 Trademarks by origin/bn PPP\$ GDP	11.5	100
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.6	74
7.1.3 ICTs & business model creation [†]	59.7	66
7.1.4 ICTs & organizational model creation [†]	53.0	65
7.2 Creative goods & services	6.5	100
7.2.1 Cultural & creative services exports, % of total trade	0.2	47
7.2.2 National feature films/mn pop. 15–69	0.4	95
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.8	72
7.2.5 Creative goods exports, % total trade	0.1	93
7.3 Online creativity	3.4	115
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.0	95
7.3.2 Country-code TLDs/th pop. 15–69	0.2	103
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	1.1	114
7.3.4 Video uploads on YouTube/pop. 15–69	1.9	69 ○

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	8.8
GDP (US\$ billions)	37.8
GDP per capita, PPP\$	13,671.4
Income group	Upper-middle income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	35.3	62
Innovation Output Sub-Index	26.9	61
Innovation Input Sub-Index	43.8	58
Innovation Efficiency Ratio	0.6	67
Global Innovation Index 2016 (out of 128)	33.8	65

1 Institutions **67.7** **50**

1.1 Political environment	57.2	52
1.1.1 Political stability & safety*	69.3	50
1.1.2 Government effectiveness*	45.1	64
1.2 Regulatory environment	70.6	43
1.2.1 Regulatory quality*	45.6	67
1.2.2 Rule of law*	36.6	64
1.2.3 Cost of redundancy dismissal, salary weeks	8.0	1 ●
1.3 Business environment	75.2	48
1.3.1 Ease of starting a business*	91.7	40
1.3.2 Ease of resolving insolvency*	59.7	44
1.3.3 Ease of paying taxes*	74.4	63

2 Human capital & research **33.9** **54**

2.1 Education	45.6	70
2.1.1 Expenditure on education, % GDP	4.2	74
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	13.1	88 ○
2.1.3 School life expectancy, years	14.6	58
2.1.4 PISA scales in reading, maths, & science [Ⓐ]	446.6	43
2.1.5 Pupil-teacher ratio, secondary	8.5	13 ●
2.2 Tertiary education	43.7	38
2.2.1 Tertiary enrolment, % gross	58.3	43
2.2.2 Graduates in science & engineering, %	26.2	22
2.2.3 Tertiary inbound mobility, %	4.1	48
2.3 Research & development (R&D)	12.6	53
2.3.1 Researchers, FTE/mn pop.	2,071.2	35
2.3.2 Gross expenditure on R&D, % GDP	0.9	40
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	5.1	71

3 Infrastructure **49.7** **52**

3.1 Information & communication technologies (ICTs)	73.0	31
3.1.1 ICT access*	72.2	45
3.1.2 ICT use*	55.0	49
3.1.3 Government's online service*	81.9	24 ●
3.1.4 E-participation*	83.1	17 ●
3.2 General infrastructure	29.1	95
3.2.1 Electricity output, kWh/cap	4,690.9	45
3.2.2 Logistics performance*	32.4	76
3.2.3 Gross capital formation, % GDP	18.3	97
3.3 Ecological sustainability	47.0	56
3.3.1 GDP/unit of energy use	0.7	119 ○
3.3.2 Environmental performance*	78.7	47
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	11.5	4 ●

4 Market sophistication **38.7** **99**

4.1 Credit	28.7	84
4.1.1 Ease of getting credit*	65.0	40
4.1.2 Domestic credit to private sector, % GDP	43.4	78
4.1.3 Microfinance gross loans, % GDP	0.3	45

4.2 Investment	39.0	69
4.2.1 Ease of protecting minority investors*	56.7	67
4.2.2 Market capitalization, % GDP [Ⓐ]	8.7	78 ○
4.2.3 Venture capital deals/bn PPP\$ GDP	n/a	n/a
4.3 Trade, competition, & market scale	48.4	107 ○
4.3.1 Applied tariff rate, weighted mean, %	n/a	n/a
4.3.2 Intensity of local competition [†]	53.9	118 ○
4.3.3 Domestic market scale, bn PPP\$	101.5	72

5 Business sophistication **28.9** **79**

5.1 Knowledge workers	35.9	72
5.1.1 Knowledge-intensive employment, %	28.9	48
5.1.2 Firms offering formal training, % firms	37.8	34
5.1.3 GERD performed by business, % of GDP	0.3	48
5.1.4 GERD financed by business, %	12.8	69
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	12.2	56
5.2 Innovation linkages	21.8	87
5.2.1 University/industry research collaboration [†]	35.9	89
5.2.2 State of cluster development [†]	35.1	102 ○
5.2.3 GERD financed by abroad, %	12.6	40
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP [Ⓐ]	0.0	91 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	58
5.3 Knowledge absorption	29.1	82
5.3.1 Intellectual property payments, % total trade	0.9	37
5.3.2 High-tech imports less re-imports, % total trade	6.8	81
5.3.3 ICT services imports, % total trade	1.6	39
5.3.4 FDI net inflows, % GDP	5.1	27 ●
5.3.5 Research talent, % in business enterprise	9.6	67

6 Knowledge & technology outputs **24.7** **53**

6.1 Knowledge creation	19.2	49
6.1.1 Patents by origin/bn PPP\$ GDP	1.9	47
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	57
6.1.3 Utility models by origin/bn PPP\$ GDP	0.6	33
6.1.4 Scientific & technical articles/bn PPP\$ GDP	49.2	8 ●
6.1.5 Citable documents H index	8.3	74
6.2 Knowledge impact	30.4	68
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.4	74
6.2.2 New businesses/th pop. 15–64	1.6	53
6.2.3 Computer software spending, % GDP	0.0	103 ○
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	25.7	12 ●
6.2.5 High- & medium-high-tech manufactures, %	0.3	45
6.3 Knowledge diffusion	24.5	55
6.3.1 Intellectual property receipts, % total trade	0.2	39
6.3.2 High-tech exports less re-exports, % total trade	2.2	53
6.3.3 ICT services exports, % total trade	3.4	23 ●
6.3.4 FDI net outflows, % GDP	0.8	56

7 Creative outputs **29.1** **70**

7.1 Intangible assets	31.7	100
7.1.1 Trademarks by origin/bn PPP\$ GDP	32.0	70
7.1.2 Industrial designs by origin/bn PPP\$ GDP	1.2	55
7.1.3 ICTs & business model creation [†]	49.7	101 ○
7.1.4 ICTs & organizational model creation [†]	42.1	103 ○
7.2 Creative goods & services	19.8	59
7.2.1 Cultural & creative services exports, % of total trade	0.2	45
7.2.2 National feature films/mn pop. 15–69	5.4	37
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	1.6	32
7.2.5 Creative goods exports, % total trade	0.8	50
7.3 Online creativity	33.2	34
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	1.5	88
7.3.2 Country-code TLDs/th pop. 15–69	4.4	53
7.3.3 Wikipedia edits/mn pop. 15–69	10.4	1 ●
7.3.4 Video uploads on YouTube/pop. 15–69	27.0	47

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Singapore

Key indicators

Population (millions)	5.7
GDP (US\$ billions)	296.6
GDP per capita, PPP\$	85,253.2
Income group	High income
Region	South East Asia, East Asia, and Oceania

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	58.7	7
Innovation Output Sub-Index	45.1	17
Innovation Input Sub-Index	72.3	1 ●
Innovation Efficiency Ratio	0.6	63 ○
Global Innovation Index 2016 (out of 128)	59.2	6

1 Institutions 94.4 1 ●

1.1 Political environment	96.9	1 ●
1.1.1 Political stability & safety*	93.9	6
1.1.2 Government effectiveness*	100.0	1 ●
1.2 Regulatory environment	98.6	1 ●
1.2.1 Regulatory quality*	100.0	1 ●
1.2.2 Rule of law*	94.4	8
1.2.3 Cost of redundancy dismissal, salary weeks	8.0	1 ●
1.3 Business environment	87.6	11
1.3.1 Ease of starting a business*	96.5	6
1.3.2 Ease of resolving insolvency*	74.3	27
1.3.3 Ease of paying taxes*	91.9	8

2 Human capital & research 63.7 5

2.1 Education	44.0	76 ○
2.1.1 Expenditure on education, % GDP	2.9	102 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	16.7	68 ○
2.1.3 School life expectancy, years [Ⓐ]	12.8	78 ○
2.1.4 PISA scales in reading, maths, & science	551.6	1 ●
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	14.9	64 ○
2.2 Tertiary education	80.5	1 ●
2.2.1 Tertiary enrolment, % gross [Ⓐ]	69.8	25
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, % [Ⓐ]	19.2	1 ●
2.3 Research & development (R&D)	66.5	11
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	6,658.5	6
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	2.2	15
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	64.0	22
2.3.4 QS university ranking, average score top 3*	70.3	12

3 Infrastructure 69.1 2 ●

3.1 Information & communication technologies (ICTs)	87.8	7
3.1.1 ICT access*	87.0	11
3.1.2 ICT use*	75.4	18
3.1.3 Government's online service*	97.1	3 ●
3.1.4 E-participation*	91.5	8
3.2 General infrastructure	57.7	10
3.2.1 Electricity output, kWh/cap.	9,027.4	16
3.2.2 Logistics performance*	96.2	5
3.2.3 Gross capital formation, % GDP	26.0	39
3.3 Ecological sustainability	62.0	14
3.3.1 GDP/unit of energy use	15.2	9
3.3.2 Environmental performance*	87.0	14
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	3.4	30

4 Market sophistication 71.2 4

4.1 Credit	63.4	11
4.1.1 Ease of getting credit*	75.0	19
4.1.2 Domestic credit to private sector, % GDP	129.7	15
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	75.0	1 ●
4.2.1 Ease of protecting minority investors*	83.3	1 ●
4.2.2 Market capitalization, % GDP	218.6	4
4.2.3 Venture capital deals/bn PPP\$ GDP	0.1	14
4.3 Trade, competition, & market scale	75.2	22
4.3.1 Applied tariff rate, weighted mean, %	0.0	1 ●
4.3.2 Intensity of local competition [†]	76.9	19
4.3.3 Domestic market scale, bn PPP\$	486.9	38

5 Business sophistication 62.9 2 ●

5.1 Knowledge workers	73.2	4
5.1.1 Knowledge-intensive employment, %	54.3	2 ●
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP [Ⓐ]	1.3	16
5.1.4 GERD financed by business, % [Ⓐ]	54.1	16
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	23.3	13
5.2 Innovation linkages	46.5	16
5.2.1 University/industry research collaboration [†]	74.5	7
5.2.2 State of cluster development [†]	69.5	11
5.2.3 GERD financed by abroad, % [Ⓐ]	6.8	57 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.2	4
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	2.8	19
5.3 Knowledge absorption	68.9	2 ●
5.3.1 Intellectual property payments, % total trade	3.6	1 ●
5.3.2 High-tech imports less re-imports, % total trade	21.4	5
5.3.3 ICT services imports, % total trade	1.7	33
5.3.4 FDI net inflows, % GDP	22.2	5
5.3.5 Research talent, % in business enterprise [Ⓐ]	50.5	23

6 Knowledge & technology outputs 47.3 11

6.1 Knowledge creation	27.7	34
6.1.1 Patents by origin/bn PPP\$ GDP	3.1	33
6.1.2 PCT patent applications/bn PPP\$ GDP	1.8	19
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	26.1	28
6.1.5 Citable documents H index	33.9	25
6.2 Knowledge impact	47.2	14
6.2.1 Growth rate of PPP\$ GDP/worker, %	(0.2)	91 ○
6.2.2 New businesses/th pop. 15–64	9.5	11
6.2.3 Computer software spending, % GDP	0.3	34
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	12.2	31
6.2.5 High- & medium-high-tech manufactures, %	0.6	2 ●
6.3 Knowledge diffusion	67.1	4
6.3.1 Intellectual property receipts, % total trade	0.7	20
6.3.2 High-tech exports less re-exports, % total trade	29.1	3 ●
6.3.3 ICT services exports, % total trade	1.0	84 ○
6.3.4 FDI net outflows, % GDP	12.7	1 ●

7 Creative outputs 42.9 32

7.1 Intangible assets	49.0	42
7.1.1 Trademarks by origin/bn PPP\$ GDP	17.9	85 ○
7.1.2 Industrial designs by origin/bn PPP\$ GDP	1.7	48 ○
7.1.3 ICTs & business model creation [†]	81.5	7
7.1.4 ICTs & organizational model creation [†]	76.7	9
7.2 Creative goods & services	36.0	16
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	4.8	38
7.2.3 Global ent. & media market/th pop. 15–69	42.2	20
7.2.4 Printing & publishing manufactures, %	0.8	75 ○
7.2.5 Creative goods exports, % total trade	5.2	10
7.3 Online creativity	37.8	30
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	25.8	23
7.3.2 Country-code TLDs/th pop. 15–69	11.9	36
7.3.3 Wikipedia edits/mn pop. 15–69	6.0	44
7.3.4 Video uploads on YouTube/pop. 15–69	55.9	13

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	5.4
GDP (US\$ billions)	90.3
GDP per capita, PPP\$	29,720.1
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	43.4	34
Innovation Output Sub-Index	37.2	35
Innovation Input Sub-Index	49.7	39
Innovation Efficiency Ratio	0.7	25
Global Innovation Index 2016 (out of 128)	41.7	37

1 Institutions 74.5 **34**

1.1 Political environment	75.4	30
1.1.1 Political stability & safety*	87.0	19 ●
1.1.2 Government effectiveness*	63.7	39
1.2 Regulatory environment	68.3	48
1.2.1 Regulatory quality*	62.3	38
1.2.2 Rule of law*	53.6	41
1.2.3 Cost of redundancy dismissal, salary weeks	18.8	77
1.3 Business environment	79.9	32
1.3.1 Ease of starting a business*	88.6	56
1.3.2 Ease of resolving insolvency*	70.5	33
1.3.3 Ease of paying taxes*	80.6	47

2 Human capital & research 34.4 **53**

2.1 Education	48.5	60
2.1.1 Expenditure on education, % GDP	4.1	79 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	19.7	53
2.1.3 School life expectancy, years	15.0	49
2.1.4 PISA scales in reading, maths, & science	462.8	41
2.1.5 Pupil-teacher ratio, secondary [Ⓢ]	11.1	32
2.2 Tertiary education	38.2	53
2.2.1 Tertiary enrolment, % gross [Ⓢ]	52.9	51
2.2.2 Graduates in science & engineering, %	20.5	51
2.2.3 Tertiary inbound mobility, % [Ⓢ]	5.6	33
2.3 Research & development (R&D)	16.4	48
2.3.1 Researchers, FTE/mn pop.	2,654.8	31
2.3.2 Gross expenditure on R&D, % GDP	1.2	31
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	6.1	68

3 Infrastructure 55.3 **35**

3.1 Information & communication technologies (ICTs)	58.6	63
3.1.1 ICT access*	72.2	45
3.1.2 ICT use*	63.8	30
3.1.3 Government's online service*	44.2	95 ○
3.1.4 E-participation*	54.2	80
3.2 General infrastructure	40.9	50
3.2.1 Electricity output, kWh/cap	4,787.3	44
3.2.2 Logistics performance*	58.9	40
3.2.3 Gross capital formation, % GDP	22.8	58
3.3 Ecological sustainability	66.4	5 ●
3.3.1 GDP/unit of energy use	9.1	59
3.3.2 Environmental performance*	85.4	24
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	14.1	3 ●

4 Market sophistication 45.8 **67**

4.1 Credit	42.8	45
4.1.1 Ease of getting credit*	65.0	40
4.1.2 Domestic credit to private sector, % GDP	53.5	66
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	27.6	119 ○
4.2.1 Ease of protecting minority investors*	53.3	80 ○
4.2.2 Market capitalization, % GDP [Ⓢ]	4.9	82 ○
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	83 ○
4.3 Trade, competition, & market scale	67.1	46
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	75.4	24
4.3.3 Domestic market scale, bn PPP\$	169.1	63

5 Business sophistication 38.3 **38**

5.1 Knowledge workers	42.1	51
5.1.1 Knowledge-intensive employment, %	31.9	44
5.1.2 Firms offering formal training, % firms	43.5	27
5.1.3 GERD performed by business, % of GDP	0.3	43
5.1.4 GERD financed by business, %	25.1	57
5.1.5 Females employed w/advanced degrees, % total	12.5	53
5.2 Innovation linkages	38.7	34
5.2.1 University/industry research collaboration [†]	38.6	78
5.2.2 State of cluster development [†]	48.5	49
5.2.3 GERD financed by abroad, %	39.4	12 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	110 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.3	44
5.3 Knowledge absorption	34.0	60
5.3.1 Intellectual property payments, % total trade	0.7	50
5.3.2 High-tech imports less re-imports, % total trade	15.6	13 ●
5.3.3 ICT services imports, % total trade	0.9	74
5.3.4 FDI net inflows, % GDP	0.7	112 ○
5.3.5 Research talent, % in business enterprise	19.4	56

6 Knowledge & technology outputs 33.5 **30**

6.1 Knowledge creation	26.5	35
6.1.1 Patents by origin/bn PPP\$ GDP	1.7	50
6.1.2 PCT patent applications/bn PPP\$ GDP	0.3	48
6.1.3 Utility models by origin/bn PPP\$ GDP	2.3	10 ●
6.1.4 Scientific & technical articles/bn PPP\$ GDP	19.6	39
6.1.5 Citable documents H index	15.5	42
6.2 Knowledge impact	50.0	11 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.6	41
6.2.2 New businesses/th pop. 15–64	3.1	37
6.2.3 Computer software spending, % GDP	0.3	43
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	35.2	4 ●
6.2.5 High- & medium-high-tech manufactures, %	0.6	4 ●
6.3 Knowledge diffusion	24.1	56
6.3.1 Intellectual property receipts, % total trade	0.0	75 ○
6.3.2 High-tech exports less re-exports, % total trade	9.3	20 ●
6.3.3 ICT services exports, % total trade	1.1	80
6.3.4 FDI net outflows, % GDP	1.0	52

7 Creative outputs 40.8 **35**

7.1 Intangible assets	48.3	46
7.1.1 Trademarks by origin/bn PPP\$ GDP	66.0	30
7.1.2 Industrial designs by origin/bn PPP\$ GDP	2.1	43
7.1.3 ICTs & business model creation [†]	67.1	40
7.1.4 ICTs & organizational model creation [†]	62.7	31
7.2 Creative goods & services	38.3	14 ●
7.2.1 Cultural & creative services exports, % of total trade [Ⓢ]	0.3	34
7.2.2 National feature films/mn pop. 15–69	6.3	30
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	0.6	86 ○
7.2.5 Creative goods exports, % total trade	9.3	6 ●
7.3 Online creativity	28.5	41
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	3.1	64
7.3.2 Country-code TLDs/th pop. 15–69	25.5	24 ●
7.3.3 Wikipedia edits/mn pop. 15–69	6.1	38
7.3.4 Video uploads on YouTube/pop. 15–69	26.6	48

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Slovenia

Key indicators

Population (millions)	2.1
GDP (US\$ billions)	44.1
GDP per capita, PPP\$	31,007.4
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	45.8	32
Innovation Output Sub-Index	37.2	34
Innovation Input Sub-Index	54.4	30
Innovation Efficiency Ratio	0.7	44
Global Innovation Index 2016 (out of 128)	46.0	32

1	Institutions	80.9	22
1.1	Political environment	76.7	28
1.1.1	Political stability & safety*	86.1	23
1.1.2	Government effectiveness*	67.2	36
1.2	Regulatory environment	78.7	28
1.2.1	Regulatory quality*	58.0	44
1.2.2	Rule of law*	67.3	31
1.2.3	Cost of redundancy dismissal, salary weeks	10.7	37
1.3	Business environment	87.3	14 ●
1.3.1	Ease of starting a business*	91.4	42
1.3.2	Ease of resolving insolvency*	84.0	11 ●
1.3.3	Ease of paying taxes*	86.6	22
2	Human capital & research	49.2	24
2.1	Education	61.8	16
2.1.1	Expenditure on education, % GDP	5.5	33
2.1.2	Gov't expenditure/pupil, secondary, % GDP/cap	25.9	25
2.1.3	School life expectancy, years	17.3	14
2.1.4	PISA scales in reading, maths, & science	509.3	9
2.1.5	Pupil-teacher ratio, secondary ^a	10.1	25
2.2	Tertiary education	45.7	30
2.2.1	Tertiary enrolment, % gross ^a	82.9	10 ●
2.2.2	Graduates in science & engineering, % ^a	24.7	31
2.2.3	Tertiary inbound mobility, % ^a	2.7	62
2.3	Research & development (R&D)	40.1	27
2.3.1	Researchers, FTE/mn pop.	3,821.0	24
2.3.2	Gross expenditure on R&D, % GDP	2.2	14
2.3.3	Global R&D companies, avg. expend. top 3, mn \$US	51.4	28
2.3.4	QS university ranking, average score top 3*	11.6	61
3	Infrastructure	55.4	34
3.1	Information & communication technologies (ICTs)	73.5	29
3.1.1	ICT access*	79.3	26
3.1.2	ICT use*	57.1	44
3.1.3	Government's online service*	84.8	19
3.1.4	E-participation*	72.9	37
3.2	General infrastructure	36.8	65
3.2.1	Electricity output, kWh/cap	7,153.1	28
3.2.2	Logistics performance*	51.9	49
3.2.3	Gross capital formation, % GDP	18.8	94 ○
3.3	Ecological sustainability	55.9	27
3.3.1	GDP/unit of energy use	8.8	61
3.3.2	Environmental performance*	89.0	5 ●
3.3.3	ISO 14001 environmental certificates/bn PPP\$ GDP	5.6	19
4	Market sophistication	43.1	82 ○
4.1	Credit	27.2	90 ○
4.1.1	Ease of getting credit*	35.0	104 ○
4.1.2	Domestic credit to private sector, % GDP	50.2	71
4.1.3	Microfinance gross loans, % GDP	n/a	n/a

4.2	Investment	41.4	59
4.2.1	Ease of protecting minority investors*	75.0	9 ●
4.2.2	Market capitalization, % GDP	14.1	70 ○
4.2.3	Venture capital deals/bn PPP\$ GDP	0.0	41
4.3	Trade, competition, & market scale	60.8	64
4.3.1	Applied tariff rate, weighted mean, %	1.6	23
4.3.2	Intensity of local competition [†]	70.5	54
4.3.3	Domestic market scale, bn PPP\$	66.1	87 ○

5	Business sophistication	43.4	30
5.1	Knowledge workers	62.9	19
5.1.1	Knowledge-intensive employment, %	41.7	21
5.1.2	Firms offering formal training, % firms	41.5	31
5.1.3	GERD performed by business, % of GDP	1.7	12
5.1.4	GERD financed by business, %	69.2	5 ●
5.1.5	Females employed w/advanced degrees, % total	20.1	23

5.2	Innovation linkages	28.7	61
5.2.1	University/industry research collaboration [†]	46.0	41
5.2.2	State of cluster development [†]	41.5	79 ○
5.2.3	GERD financed by abroad, %	10.6	46
5.2.4	JV-strategic alliance deals/bn PPP\$ GDP	0.0	33
5.2.5	Patent families 2+ offices/bn PPP\$ GDP	2.0	24
5.3	Knowledge absorption	38.5	39
5.3.1	Intellectual property payments, % total trade	0.7	48
5.3.2	High-tech imports less re-imports, % total trade	6.0	97 ○
5.3.3	ICT services imports, % total trade	1.9	25
5.3.4	FDI net inflows, % GDP	2.1	82 ○
5.3.5	Research talent, % in business enterprise	53.1	20

6	Knowledge & technology outputs	28.0	43
6.1	Knowledge creation	20.7	45
6.1.1	Patents by origin/bn PPP\$ GDP	1.9	48
6.1.2	PCT patent applications/bn PPP\$ GDP	1.0	27
6.1.3	Utility models by origin/bn PPP\$ GDP ^a	0.2	43 ○
6.1.4	Scientific & technical articles/bn PPP\$ GDP	55.5	4 ●
6.1.5	Citable documents H index	16.4	40
6.2	Knowledge impact	41.6	25
6.2.1	Growth rate of PPP\$ GDP/worker, %	1.4	42
6.2.2	New businesses/th pop. 15–64	4.4	27
6.2.3	Computer software spending, % GDP	0.1	92 ○
6.2.4	ISO 9001 quality certificates/bn PPP\$ GDP	23.2	14 ●
6.2.5	High- & medium-high-tech manufactures, %	0.5	10 ●
6.3	Knowledge diffusion	21.8	65
6.3.1	Intellectual property receipts, % total trade	0.2	40
6.3.2	High-tech exports less re-exports, % total trade	5.0	35
6.3.3	ICT services exports, % total trade	1.8	56
6.3.4	FDI net outflows, % GDP	0.4	73

7	Creative outputs	46.4	23
7.1	Intangible assets	59.3	17
7.1.1	Trademarks by origin/bn PPP\$ GDP ^a	111.2	9 ●
7.1.2	Industrial designs by origin/bn PPP\$ GDP	n/a	n/a
7.1.3	ICTs & business model creation [†]	62.1	54
7.1.4	ICTs & organizational model creation [†]	58.9	42
7.2	Creative goods & services	32.0	26
7.2.1	Cultural & creative services exports, % of total trade ^a	0.9	18
7.2.2	National feature films/mn pop. 15–69	13.4	9 ●
7.2.3	Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4	Printing & publishing manufactures, %	1.8	28
7.2.5	Creative goods exports, % total trade	0.9	45
7.3	Online creativity	34.8	33
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	21.1	28
7.3.2	Country-code TLDs/th pop. 15–69	24.4	25
7.3.3	Wikipedia edits/mn pop. 15–69	6.7	20
7.3.4	Video uploads on YouTube/pop. 15–69	28.9	45 ○

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

^a 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 181 of this appendix for details.

Key indicators

Population (millions)	55.0
GDP (US\$ billions)	280.4
GDP per capita, PPP\$	13,165.2
Income group	Upper-middle income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	35.8	57
Innovation Output Sub-Index	24.7	69
Innovation Input Sub-Index	46.9	49
Innovation Efficiency Ratio	0.5	97
Global Innovation Index 2016 (out of 128)	35.8	54

1 Institutions	66.3	54
1.1 Political environment	54.3	58
1.1.1 Political stability & safety*	59.6	74
1.1.2 Government effectiveness*	49.0	52
1.2 Regulatory environment	71.4	42
1.2.1 Regulatory quality*	49.9	59
1.2.2 Rule of law*	41.0	57
1.2.3 Cost of redundancy dismissal, salary weeks	9.3	27 ●
1.3 Business environment	73.2	58
1.3.1 Ease of starting a business*	80.5	98 ○
1.3.2 Ease of resolving insolvency*	57.9	47
1.3.3 Ease of paying taxes*	81.1	44

2 Human capital & research	32.8	60
2.1 Education	44.1	75
2.1.1 Expenditure on education, % GDP	6.1	20 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	20.9	50
2.1.3 School life expectancy, years [Ⓐ]	12.8	79
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	25.0	93 ○
2.2 Tertiary education	27.3	89
2.2.1 Tertiary enrolment, % gross [Ⓐ]	19.4	93 ○
2.2.2 Graduates in science & engineering, %	19.0	64
2.2.3 Tertiary inbound mobility, % [Ⓐ]	4.2	46
2.3 Research & development (R&D)	27.1	39
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	437.1	65
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.7	48
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	49.6	31
2.3.4 QS university ranking, average score top 3*	37.0	33

3 Infrastructure	43.4	75
3.1 Information & communication technologies (ICTs)	51.6	76
3.1.1 ICT access*	54.6	76
3.1.2 ICT use*	40.0	68
3.1.3 Government's online service*	55.8	75
3.1.4 E-participation*	55.9	74
3.2 General infrastructure	42.3	46
3.2.1 Electricity output, kWh/cap.	4,619.8	46
3.2.2 Logistics performance*	79.2	20 ●
3.2.3 Gross capital formation, % GDP	19.6	85
3.3 Ecological sustainability	36.3	98 ○
3.3.1 GDP/unit of energy use	4.5	110 ○
3.3.2 Environmental performance*	70.5	74
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.6	54

4 Market sophistication	57.4	21 ●
4.1 Credit	40.0	49
4.1.1 Ease of getting credit*	60.0	55
4.1.2 Domestic credit to private sector, % GDP	149.2	9 ●
4.1.3 Microfinance gross loans, % GDP	0.0	74 ○

4.2 Investment	61.6	17 ●
4.2.1 Ease of protecting minority investors*	70.0	22 ●
4.2.2 Market capitalization, % GDP	234.0	1 ●
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	51
4.3 Trade, competition, & market scale	70.5	34
4.3.1 Applied tariff rate, weighted mean, %	4.2	82
4.3.2 Intensity of local competition [†]	74.3	29
4.3.3 Domestic market scale, bn PPP\$	736.3	29 ●

5 Business sophistication	34.4	57
5.1 Knowledge workers	36.8	67
5.1.1 Knowledge-intensive employment, %	22.5	64
5.1.2 Firms offering formal training, % firms [Ⓐ]	36.8	35
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.3	42
5.1.4 GERD financed by business, % [Ⓐ]	41.4	31
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	10.2	64
5.2 Innovation linkages	33.4	50
5.2.1 University/industry research collaboration [†]	57.4	26 ●
5.2.2 State of cluster development [†]	56.4	29
5.2.3 GERD financed by abroad, % [Ⓐ]	12.9	36
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	36
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.7	33
5.3 Knowledge absorption	33.0	62
5.3.1 Intellectual property payments, % total trade	1.7	14 ●
5.3.2 High-tech imports less re-imports, % total trade	10.0	44
5.3.3 ICT services imports, % total trade	1.1	63
5.3.4 FDI net inflows, % GDP	1.5	98 ○
5.3.5 Research talent, % in business enterprise [Ⓐ]	19.4	55

6 Knowledge & technology outputs	21.5	65
6.1 Knowledge creation	15.6	52
6.1.1 Patents by origin/bn PPP\$ GDP	1.2	60
6.1.2 PCT patent applications/bn PPP\$ GDP	0.4	42
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	17.2	44
6.1.5 Citable documents H index	27.2	33
6.2 Knowledge impact	26.5	84
6.2.1 Growth rate of PPP\$ GDP/worker, %	(2.5)	105 ○
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	6.5	18 ●
6.2.3 Computer software spending, % GDP	0.4	30
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	6.0	57
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.3	44
6.3 Knowledge diffusion	22.4	63
6.3.1 Intellectual property receipts, % total trade	0.1	50
6.3.2 High-tech exports less re-exports, % total trade	2.3	52
6.3.3 ICT services exports, % total trade	0.6	97 ○
6.3.4 FDI net outflows, % GDP	1.9	34

7 Creative outputs	28.0	78
7.1 Intangible assets	40.5	72
7.1.1 Trademarks by origin/bn PPP\$ GDP	29.7	73
7.1.2 Industrial designs by origin/bn PPP\$ GDP	1.0	63
7.1.3 ICTs & business model creation [†]	65.5	45
7.1.4 ICTs & organizational model creation [†]	59.0	41
7.2 Creative goods & services	17.9	64
7.2.1 Cultural & creative services exports, % of total trade	0.2	48
7.2.2 National feature films/mn pop. 15–69	0.6	89 ○
7.2.3 Global ent. & media market/th pop. 15–69	8.6	37
7.2.4 Printing & publishing manufactures, % [Ⓐ]	2.4	15 ●
7.2.5 Creative goods exports, % total trade	0.6	55
7.3 Online creativity	12.8	91
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	3.2	62
7.3.2 Country-code TLDs/th pop. 15–69	8.9	41
7.3.3 Wikipedia edits/mn pop. 15–69	3.8	89
7.3.4 Video uploads on YouTube/pop. 15–69	2.9	67 ○

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Spain

Key indicators

Population (millions)	46.1
GDP (US\$ billions)	1,252.2
GDP per capita, PPP\$	34,819.5
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	48.8	28
Innovation Output Sub-Index	40.3	26
Innovation Input Sub-Index	57.3	25
Innovation Efficiency Ratio	0.7	36
Global Innovation Index 2016 (out of 128)	49.2	28

1 Institutions	75.9	32
1.1 Political environment	71.6	39
1.1.1 Political stability & safety*	70.8	47
1.1.2 Government effectiveness*	72.4	26
1.2 Regulatory environment	72.7	39
1.2.1 Regulatory quality*	62.2	39
1.2.2 Rule of law*	65.6	32
1.2.3 Cost of redundancy dismissal, salary weeks	17.4	74 ○
1.3 Business environment	83.3	23
1.3.1 Ease of starting a business*	86.6	69 ○
1.3.2 Ease of resolving insolvency*	79.6	17
1.3.3 Ease of paying taxes*	83.8	33

2 Human capital & research	48.9	27
2.1 Education	56.2	38
2.1.1 Expenditure on education, % GDP	4.3	71 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	22.5	42
2.1.3 School life expectancy, years	17.9	11 ●
2.1.4 PISA scales in reading, maths, & science	491.4	27
2.1.5 Pupil-teacher ratio, secondary	12.0	39
2.2 Tertiary education	44.6	34
2.2.1 Tertiary enrolment, % gross	89.7	4 ●
2.2.2 Graduates in science & engineering, % [Ⓐ]	22.2	42
2.2.3 Tertiary inbound mobility, % [Ⓐ]	2.9	58 ○
2.3 Research & development (R&D)	45.8	22
2.3.1 Researchers, FTE/mn pop.	2,654.7	32
2.3.2 Gross expenditure on R&D, % GDP	1.2	30
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	74.9	13 ●
2.3.4 QS university ranking, average score top 3*	48.2	23

3 Infrastructure	64.3	10 ●
3.1 Information & communication technologies (ICTs)	83.3	15
3.1.1 ICT access*	79.2	28
3.1.2 ICT use*	69.3	23
3.1.3 Government's online service*	91.3	11 ●
3.1.4 E-participation*	93.2	7 ●
3.2 General infrastructure	44.5	40
3.2.1 Electricity output, kWh/cap	5,940.7	35
3.2.2 Logistics performance*	77.0	23
3.2.3 Gross capital formation, % GDP	21.0	74 ○
3.3 Ecological sustainability	65.1	6 ●
3.3.1 GDP/unit of energy use	12.5	23
3.3.2 Environmental performance*	88.9	6 ●
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	8.2	11 ●

4 Market sophistication	59.0	18
4.1 Credit	53.7	20
4.1.1 Ease of getting credit*	60.0	55 ○
4.1.2 Domestic credit to private sector, % GDP	118.9	20
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	43.9	43
4.2.1 Ease of protecting minority investors*	65.0	31
4.2.2 Market capitalization, % GDP	65.7	24
4.2.3 Venture capital deals/bn PPP\$ GDP	0.1	27
4.3 Trade, competition, & market scale	79.3	11 ●
4.3.1 Applied tariff rate, weighted mean, %	1.6	23
4.3.2 Intensity of local competition [†]	77.3	17
4.3.3 Domestic market scale, bn PPP\$	1,689.7	15

5 Business sophistication	38.4	37
5.1 Knowledge workers	51.1	33
5.1.1 Knowledge-intensive employment, %	32.9	42
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	0.6	30
5.1.4 GERD financed by business, % [Ⓐ]	46.4	24
5.1.5 Females employed w/advanced degrees, % total	21.7	19
5.2 Innovation linkages	27.2	67 ○
5.2.1 University/industry research collaboration [†]	41.8	55
5.2.2 State of cluster development [†]	54.2	32
5.2.3 GERD financed by abroad, % [Ⓐ]	7.4	52 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	60 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.8	30
5.3 Knowledge absorption	36.9	46
5.3.1 Intellectual property payments, % total trade	1.2	25
5.3.2 High-tech imports less re-imports, % total trade	7.3	74 ○
5.3.3 ICT services imports, % total trade	1.7	31
5.3.4 FDI net inflows, % GDP	2.8	65
5.3.5 Research talent, % in business enterprise	36.9	37

6 Knowledge & technology outputs	36.3	24
6.1 Knowledge creation	31.6	29
6.1.1 Patents by origin/bn PPP\$ GDP	2.7	38
6.1.2 PCT patent applications/bn PPP\$ GDP	0.9	28
6.1.3 Utility models by origin/bn PPP\$ GDP	1.4	20
6.1.4 Scientific & technical articles/bn PPP\$ GDP	32.1	23
6.1.5 Citable documents H index	57.9	12 ●
6.2 Knowledge impact	41.0	28
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.3	78 ○
6.2.2 New businesses/th pop. 15–64	3.0	38
6.2.3 Computer software spending, % GDP	0.7	7 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	20.2	19
6.2.5 High- & medium-high-tech manufactures, %	0.3	33
6.3 Knowledge diffusion	36.2	27
6.3.1 Intellectual property receipts, % total trade	0.4	26
6.3.2 High-tech exports less re-exports, % total trade	4.0	39
6.3.3 ICT services exports, % total trade	2.9	35
6.3.4 FDI net outflows, % GDP	3.4	17

7 Creative outputs	44.4	28
7.1 Intangible assets	56.5	23
7.1.1 Trademarks by origin/bn PPP\$ GDP	59.2	36
7.1.2 Industrial designs by origin/bn PPP\$ GDP	12.8	10 ●
7.1.3 ICTs & business model creation [†]	73.7	25
7.1.4 ICTs & organizational model creation [†]	59.4	39
7.2 Creative goods & services	23.9	48
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	7.7	19
7.2.3 Global ent. & media market/th pop. 15–69	26.0	24
7.2.4 Printing & publishing manufactures, %	1.5	35
7.2.5 Creative goods exports, % total trade	0.9	46
7.3 Online creativity	40.8	27
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	28.1	22
7.3.2 Country-code TLDs/th pop. 15–69	16.6	32
7.3.3 Wikipedia edits/mn pop. 15–69	6.8	18
7.3.4 Video uploads on YouTube/pop. 15–69	53.3	15

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	20.8
GDP (US\$ billions)	82.2
GDP per capita, PPP\$	10,566.2
Income group	Lower-middle income
Region	Central and Southern Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	29.9	90
Innovation Output Sub-Index	23.4	77
Innovation Input Sub-Index	36.3	94
Innovation Efficiency Ratio	0.6	58
Global Innovation Index 2016 (out of 128)	28.9	91

1 Institutions	45.3	111	○
1.1 Political environment	52.7	62	
1.1.1 Political stability & safety*	63.1	63	
1.1.2 Government effectiveness*	42.4	70	
1.2 Regulatory environment	20.6	125	○
1.2.1 Regulatory quality*	40.8	74	
1.2.2 Rule of law*	41.4	56	
1.2.3 Cost of redundancy dismissal, salary weeks	58.5	126	○
1.3 Business environment	62.5	84	
1.3.1 Ease of starting a business*	87.5	61	
1.3.2 Ease of resolving insolvency*	46.7	69	
1.3.3 Ease of paying taxes*	53.2	110	○

2 Human capital & research	18.6	105	
2.1 Education	30.5	107	
2.1.1 Expenditure on education, % GDP	2.2	110	○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	6.3	102	○
2.1.3 School life expectancy, years [Ⓐ]	14.0	63	
2.1.4 PISA scales in reading, maths, & science	n/a	n/a	
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	17.3	75	
2.2 Tertiary education	23.4	97	
2.2.1 Tertiary enrolment, % gross	19.8	91	
2.2.2 Graduates in science & engineering, %	19.9	58	
2.2.3 Tertiary inbound mobility, %	0.3	95	○
2.3 Research & development (R&D)	2.0	93	
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	110.9	85	
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.1	102	○
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43	○
2.3.4 QS university ranking, average score top 3*	4.9	72	

3 Infrastructure	47.3	63	
3.1 Information & communication technologies (ICTs)	48.4	83	
3.1.1 ICT access*	45.1	92	
3.1.2 ICT use*	17.0	102	
3.1.3 Government's online service*	65.2	53	
3.1.4 E-participation*	66.1	49	
3.2 General infrastructure	36.0	70	
3.2.1 Electricity output, kWh/cap	603.7	104	○
3.2.2 Logistics performance [Ⓐ]	29.2	83	
3.2.3 Gross capital formation, % GDP	28.3	26	●
3.3 Ecological sustainability	57.5	23	●
3.3.1 GDP/unit of energy use	20.0	2	●
3.3.2 Environmental performance*	65.6	92	
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.9	68	

4 Market sophistication	42.2	86	
4.1 Credit	18.7	115	○
4.1.1 Ease of getting credit*	40.0	98	
4.1.2 Domestic credit to private sector, % GDP	40.7	82	
4.1.3 Microfinance gross loans, % GDP	0.0	63	

4.2 Investment	45.8	39	●
4.2.1 Ease of protecting minority investors*	63.3	41	●
4.2.2 Market capitalization, % GDP	25.3	57	
4.2.3 Venture capital deals/bn PPP\$ GDP	n/a	n/a	
4.3 Trade, competition, & market scale	62.1	61	
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	5.3	93	
4.3.2 Intensity of local competition [†]	69.7	65	
4.3.3 Domestic market scale, bn PPP\$	237.8	57	

5 Business sophistication	28.0	83	
5.1 Knowledge workers	25.2	97	
5.1.1 Knowledge-intensive employment, % [Ⓐ]	16.9	82	
5.1.2 Firms offering formal training, % firms [Ⓐ]	18.4	80	○
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.0	71	
5.1.4 GERD financed by business, % [Ⓐ]	40.7	34	●
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	8.8	68	
5.2 Innovation linkages	24.4	79	
5.2.1 University/industry research collaboration [†]	43.8	49	
5.2.2 State of cluster development [†]	46.3	57	
5.2.3 GERD financed by abroad, % [Ⓐ]	5.0	64	
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	31	●
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	84	
5.3 Knowledge absorption	34.6	56	
5.3.1 Intellectual property payments, % total trade	n/a	n/a	
5.3.2 High-tech imports less re-imports, % total trade	6.0	94	
5.3.3 ICT services imports, % total trade	2.1	19	●
5.3.4 FDI net inflows, % GDP	1.1	103	
5.3.5 Research talent, % in business enterprise [Ⓐ]	30.7	43	

6 Knowledge & technology outputs	21.0	68	
6.1 Knowledge creation	4.7	89	
6.1.1 Patents by origin/bn PPP\$ GDP	1.0	64	
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	70	
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a	
6.1.4 Scientific & technical articles/bn PPP\$ GDP	3.5	105	
6.1.5 Citable documents H index	8.5	73	
6.2 Knowledge impact	33.6	53	
6.2.1 Growth rate of PPP\$ GDP/worker, %	4.3	11	●
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	0.5	88	
6.2.3 Computer software spending, % GDP	0.3	33	●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	3.6	72	
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	92	○
6.3 Knowledge diffusion	24.8	53	
6.3.1 Intellectual property receipts, % total trade	n/a	n/a	
6.3.2 High-tech exports less re-exports, % total trade	0.3	92	
6.3.3 ICT services exports, % total trade	4.0	19	●
6.3.4 FDI net outflows, % GDP	0.1	95	

7 Creative outputs	25.8	86	
7.1 Intangible assets	37.8	84	
7.1.1 Trademarks by origin/bn PPP\$ GDP	26.8	75	
7.1.2 Industrial designs by origin/bn PPP\$ GDP	1.7	46	
7.1.3 ICTs & business model creation [†]	60.6	62	
7.1.4 ICTs & organizational model creation [†]	53.6	63	
7.2 Creative goods & services	14.1	76	
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a	
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	1.0	77	
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a	
7.2.4 Printing & publishing manufactures, % [Ⓐ]	1.7	31	●
7.2.5 Creative goods exports, % total trade	0.3	69	
7.3 Online creativity	13.6	85	
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.8	99	
7.3.2 Country-code TLDs/th pop. 15–69	0.2	102	
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	4.1	77	
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a	

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Sweden

Key indicators

Population (millions)	9.9
GDP (US\$ billions)	517.4
GDP per capita, PPP\$	47,922.2
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	63.8	2 ●
Innovation Output Sub-Index	57.9	3 ●
Innovation Input Sub-Index	69.7	2 ●
Innovation Efficiency Ratio	0.8	12
Global Innovation Index 2016 (out of 128)	63.6	2
1 Institutions	88.3	10
1.1 Political environment	88.0	9
1.1.1 Political stability & safety*	87.3	17
1.1.2 Government effectiveness*	88.7	9
1.2 Regulatory environment	90.5	12
1.2.1 Regulatory quality*	88.4	7
1.2.2 Rule of law*	99.2	2 ●
1.2.3 Cost of redundancy dismissal, salary weeks	14.4	57 ○
1.3 Business environment	86.5	17
1.3.1 Ease of starting a business*	94.6	14
1.3.2 Ease of resolving insolvency*	79.4	18
1.3.3 Ease of paying taxes*	85.3	26
2 Human capital & research	63.7	4 ●
2.1 Education	67.7	10
2.1.1 Expenditure on education, % GDP	7.7	7
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	24.6	32
2.1.3 School life expectancy, years	18.2	8
2.1.4 PISA scales in reading, maths, & science	495.8	23
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	12.3	44 ○
2.2 Tertiary education	46.3	28
2.2.1 Tertiary enrolment, % gross [Ⓐ]	62.4	41
2.2.2 Graduates in science & engineering, %	25.7	25
2.2.3 Tertiary inbound mobility, % [Ⓐ]	5.9	32
2.3 Research & development (R&D)	77.1	5
2.3.1 Researchers, FTE/mn pop.	7,021.9	4 ●
2.3.2 Gross expenditure on R&D, % GDP	3.3	4 ●
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	82.0	11
2.3.4 QS university ranking, average score top 3*	65.0	14
3 Infrastructure	69.1	3 ●
3.1 Information & communication technologies (ICTs)	83.6	13
3.1.1 ICT access*	86.9	13
3.1.2 ICT use*	83.6	6
3.1.3 Government's online service*	87.7	15
3.1.4 E-participation*	76.3	27
3.2 General infrastructure	64.7	5
3.2.1 Electricity output, kWh/cap.	16,520.7	7
3.2.2 Logistics performance*	99.0	3 ●
3.2.3 Gross capital formation, % GDP	25.6	41
3.3 Ecological sustainability	59.0	20
3.3.1 GDP/unit of energy use	8.6	62 ○
3.3.2 Environmental performance*	90.4	3 ●
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	7.8	13
4 Market sophistication	64.9	10
4.1 Credit	53.3	21
4.1.1 Ease of getting credit*	55.0	67 ○
4.1.2 Domestic credit to private sector, % GDP	128.9	16
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	68.4	7
4.2.1 Ease of protecting minority investors*	71.7	19
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP	0.2	8
4.3 Trade, competition, & market scale	72.9	28
4.3.1 Applied tariff rate, weighted mean, %	1.6	23 ○
4.3.2 Intensity of local competition [†]	76.5	21
4.3.3 Domestic market scale, bn PPP\$	498.1	36
5 Business sophistication	62.6	4 ●
5.1 Knowledge workers	80.7	2 ●
5.1.1 Knowledge-intensive employment, %	50.4	5
5.1.2 Firms offering formal training, % firms	70.3	2 ●
5.1.3 GERD performed by business, % of GDP	2.3	4
5.1.4 GERD financed by business, % [Ⓐ]	61.0	11
5.1.5 Females employed w/advanced degrees, % total	24.1	10
5.2 Innovation linkages	52.4	6
5.2.1 University/industry research collaboration [†]	69.3	12
5.2.2 State of cluster development [†]	66.4	15
5.2.3 GERD financed by abroad, % [Ⓐ]	6.7	58 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	9
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	8.8	5
5.3 Knowledge absorption	54.6	7
5.3.1 Intellectual property payments, % total trade	2.1	10
5.3.2 High-tech imports less re-imports, % total trade	9.3	51 ○
5.3.3 ICT services imports, % total trade	3.3	6
5.3.4 FDI net inflows, % GDP	0.7	110 ○
5.3.5 Research talent, % in business enterprise	68.6	6
6 Knowledge & technology outputs	62.5	3 ●
6.1 Knowledge creation	74.9	3 ●
6.1.1 Patents by origin/bn PPP\$ GDP	12.4	9
6.1.2 PCT patent applications/bn PPP\$ GDP	7.5	1 ●
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	52.8	6
6.1.5 Citable documents H index	59.5	11
6.2 Knowledge impact	50.5	10
6.2.1 Growth rate of PPP\$ GDP/worker, %	2.6	28
6.2.2 New businesses/th pop. 15–64	6.9	16
6.2.3 Computer software spending, % GDP	0.6	16
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	9.1	39
6.2.5 High- & medium-high-tech manufactures, %	0.5	11
6.3 Knowledge diffusion	62.1	5
6.3.1 Intellectual property receipts, % total trade	4.2	3 ●
6.3.2 High-tech exports less re-exports, % total trade	9.0	23
6.3.3 ICT services exports, % total trade	7.1	8
6.3.4 FDI net outflows, % GDP	3.4	18
7 Creative outputs	53.3	11
7.1 Intangible assets	58.7	18
7.1.1 Trademarks by origin/bn PPP\$ GDP	55.7	40 ○
7.1.2 Industrial designs by origin/bn PPP\$ GDP	5.0	26
7.1.3 ICTs & business model creation [†]	83.0	5
7.1.4 ICTs & organizational model creation [†]	80.5	4 ●
7.2 Creative goods & services	35.8	18
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.9	19
7.2.2 National feature films/mn pop. 15–69	7.4	20
7.2.3 Global ent. & media market/th pop. 15–69	71.5	6
7.2.4 Printing & publishing manufactures, %	1.3	40 ○
7.2.5 Creative goods exports, % total trade	1.6	32
7.3 Online creativity	60.2	9
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	43.0	17
7.3.2 Country-code TLDs/th pop. 15–69	63.6	9
7.3.3 Wikipedia edits/mn pop. 15–69	7.4	4 ●
7.3.4 Video uploads on YouTube/pop. 15–69	63.2	6

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	8.4
GDP (US\$ billions)	662.5
GDP per capita, PPP\$	58,551.5
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	67.7	1 ●
Innovation Output Sub-Index	65.8	1 ●
Innovation Input Sub-Index	69.6	3 ●
Innovation Efficiency Ratio	0.9	2 ●
Global Innovation Index 2016 (out of 128)	66.3	1

1 Institutions	89.5	8
1.1 Political environment	94.7	3 ●
1.1.1 Political stability & safety*	95.6	3 ●
1.1.2 Government effectiveness*	93.8	2 ●
1.2 Regulatory environment	93.9	8
1.2.1 Regulatory quality*	87.0	10
1.2.2 Rule of law*	96.9	6
1.2.3 Cost of redundancy dismissal, salary weeks	10.1	33
1.3 Business environment	79.8	33
1.3.1 Ease of starting a business*	88.4	58 ○
1.3.2 Ease of resolving insolvency*	62.6	42
1.3.3 Ease of paying taxes*	88.5	17

2 Human capital & research	63.3	7
2.1 Education	58.6	28
2.1.1 Expenditure on education, % GDP	5.1	46
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	26.1	23
2.1.3 School life expectancy, years	16.0	30
2.1.4 PISA scales in reading, maths, & science	506.3	13
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	9.3	17
2.2 Tertiary education	55.9	12
2.2.1 Tertiary enrolment, % gross [Ⓐ]	57.2	45
2.2.2 Graduates in science & engineering, %	22.1	45 ○
2.2.3 Tertiary inbound mobility, % [Ⓐ]	17.1	9
2.3 Research & development (R&D)	75.4	6
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	4,481.1	17
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	3.0	7
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	94.3	3 ●
2.3.4 QS university ranking, average score top 3*	84.4	3 ●

3 Infrastructure	65.1	6
3.1 Information & communication technologies (ICTs)	73.5	30
3.1.1 ICT access*	89.5	9
3.1.2 ICT use*	86.7	2 ●
3.1.3 Government's online service*	60.1	64 ○
3.1.4 E-participation*	57.6	70 ○
3.2 General infrastructure	51.7	18
3.2.1 Electricity output, kWh/cap.	7,975.4	19
3.2.2 Logistics performance*	89.0	11
3.2.3 Gross capital formation, % GDP	23.1	55 ○
3.3 Ecological sustainability	70.1	2 ●
3.3.1 GDP/unit of energy use	17.5	4
3.3.2 Environmental performance*	86.9	16
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	6.7	15

4 Market sophistication	67.5	7
4.1 Credit	64.7	9
4.1.1 Ease of getting credit*	60.0	55 ○
4.1.2 Domestic credit to private sector, % GDP	172.6	6
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	63.5	14
4.2.1 Ease of protecting minority investors*	50.0	89 ○
4.2.2 Market capitalization, % GDP	226.5	3 ●
4.2.3 Venture capital deals/bn PPP\$ GDP	0.2	10
4.3 Trade, competition, & market scale	74.4	23
4.3.1 Applied tariff rate, weighted mean, %	0.0	1 ●
4.3.2 Intensity of local competition [†]	73.2	38
4.3.3 Domestic market scale, bn PPP\$	494.3	37

5 Business sophistication	62.6	3 ●
5.1 Knowledge workers	74.6	3 ●
5.1.1 Knowledge-intensive employment, %	53.0	3 ●
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP [Ⓐ]	2.1	6
5.1.4 GERD financed by business, % [Ⓐ]	60.8	12
5.1.5 Females employed w/advanced degrees, % total	17.8	28
5.2 Innovation linkages	57.0	4
5.2.1 University/industry research collaboration [†]	80.0	1 ●
5.2.2 State of cluster development [†]	68.9	13
5.2.3 GERD financed by abroad, % [Ⓐ]	12.1	43
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	10
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	10.6	1 ●
5.3 Knowledge absorption	56.3	5
5.3.1 Intellectual property payments, % total trade	3.3	4
5.3.2 High-tech imports less re-imports, % total trade	8.2	63 ○
5.3.3 ICT services imports, % total trade	3.7	4
5.3.4 FDI net inflows, % GDP	5.6	25
5.3.5 Research talent, % in business enterprise [Ⓐ]	46.2	30

6 Knowledge & technology outputs	69.1	1 ●
6.1 Knowledge creation	85.8	1 ●
6.1.1 Patents by origin/bn PPP\$ GDP	17.7	5
6.1.2 PCT patent applications/bn PPP\$ GDP	8.8	1 ●
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	58.1	3 ●
6.1.5 Citable documents H index	66.8	9
6.2 Knowledge impact	49.1	13
6.2.1 Growth rate of PPP\$ GDP/worker, %	(0.6)	94 ○
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	2.5	40
6.2.3 Computer software spending, % GDP	0.7	5
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	25.3	13
6.2.5 High- & medium-high-tech manufactures, %	0.6	1 ●
6.3 Knowledge diffusion	72.3	3 ●
6.3.1 Intellectual property receipts, % total trade	3.8	4
6.3.2 High-tech exports less re-exports, % total trade	14.4	12
6.3.3 ICT services exports, % total trade	3.7	21
6.3.4 FDI net outflows, % GDP	7.0	8

7 Creative outputs	62.5	3 ●
7.1 Intangible assets	65.0	5
7.1.1 Trademarks by origin/bn PPP\$ GDP	79.8	21
7.1.2 Industrial designs by origin/bn PPP\$ GDP	10.1	13
7.1.3 ICTs & business model creation [†]	83.3	2 ●
7.1.4 ICTs & organizational model creation [†]	76.2	10
7.2 Creative goods & services	51.5	3 ●
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	16.9	7
7.2.3 Global ent. & media market/th pop. 15–69	98.7	2 ●
7.2.4 Printing & publishing manufactures, %	1.1	58 ○
7.2.5 Creative goods exports, % total trade	3.8	14
7.3 Online creativity	68.6	5
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	60.5	12
7.3.2 Country-code TLDs/th pop. 15–69	100.0	1 ●
7.3.3 Wikipedia edits/mn pop. 15–69	6.7	21
7.3.4 Video uploads on YouTube/pop. 15–69	49.2	16

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Tajikistan

Key indicators

Population (millions)	8.7
GDP (US\$ billions)	6.6
GDP per capita, PPP\$	2,749.4
Income group	Lower-middle income
Region	Central and Southern Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	28.2	94
Innovation Output Sub-Index	20.8	88
Innovation Input Sub-Index	35.5	100
Innovation Efficiency Ratio	0.6	83
Global Innovation Index 2016 (out of 128)	29.6	86

1 Institutions	46.4	108
1.1 Political environment	32.0	112
1.1.1 Political stability & safety*	42.8	101
1.1.2 Government effectiveness*	21.1	116
1.2 Regulatory environment	49.1	102
1.2.1 Regulatory quality*	16.4	122
1.2.2 Rule of law*	9.9	120
1.2.3 Cost of redundancy dismissal, salary weeks	15.5	63 ●
1.3 Business environment	58.0	105
1.3.1 Ease of starting a business*	86.6	69
1.3.2 Ease of resolving insolvency*	28.7	117
1.3.3 Ease of paying taxes*	58.8	98

2 Human capital & research	28.5	80
2.1 Education	50.0	54 ●
2.1.1 Expenditure on education, % GDP	5.2	43 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years [Ⓐ]	11.3	91
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	15.4	65
2.2 Tertiary education	34.6	67
2.2.1 Tertiary enrolment, % gross	28.9	80
2.2.2 Graduates in science & engineering, %	28.1	14 ●
2.2.3 Tertiary inbound mobility, %	0.6	87
2.3 Research & development (R&D)	0.8	107
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.1	101
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	24.8	120
3.1 Information & communication technologies (ICTs)	16.3	122
3.1.1 ICT access*	n/a	n/a
3.1.2 ICT use*	n/a	n/a
3.1.3 Government's online service*	12.3	121
3.1.4 E-participation*	20.3	113
3.2 General infrastructure	18.2	122
3.2.1 Electricity output, kWh/cap	1,984.6	77
3.2.2 Logistics performance*	0.0	127 ○
3.2.3 Gross capital formation, % GDP	17.9	99
3.3 Ecological sustainability	39.9	82
3.3.1 GDP/unit of energy use	7.5	79
3.3.2 Environmental performance*	73.1	66
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.1	117

4 Market sophistication	53.6	29 ●
4.1 Credit	49.4	29 ●
4.1.1 Ease of getting credit*	40.0	98
4.1.2 Domestic credit to private sector, % GDP	22.7	108
4.1.3 Microfinance gross loans, % GDP	5.6	1 ●

4.2 Investment	66.7	[11]
4.2.1 Ease of protecting minority investors*	66.7	26 ●
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, & market scale	44.9	115
4.3.1 Applied tariff rate, weighted mean, %	7.2	105
4.3.2 Intensity of local competition [†]	62.2	92
4.3.3 Domestic market scale, bn PPP\$	25.8	114

5 Business sophistication	24.2	107
5.1 Knowledge workers	26.8	[94]
5.1.1 Knowledge-intensive employment, %	n/a	n/a
5.1.2 Firms offering formal training, % firms	33.1	41 ●
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, % [Ⓐ]	1.6	84
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	20.6	102
5.2.1 University/industry research collaboration [†]	55.2	30 ●
5.2.2 State of cluster development [†]	33.6	108
5.2.3 GERD financed by abroad, % [Ⓐ]	0.2	95
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	n/a	n/a
5.2.5 Patent families 2+ offices/bn PPP\$ GDP [Ⓐ]	0.1	78
5.3 Knowledge absorption	25.3	96
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.0	116 ○
5.3.2 High-tech imports less re-imports, % total trade	n/a	n/a
5.3.3 ICT services imports, % total trade	0.5	101
5.3.4 FDI net inflows, % GDP	3.4	49 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	22.4	58 ●
6.1 Knowledge creation	34.1	26 ●
6.1.1 Patents by origin/bn PPP\$ GDP	0.1	109
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	3.7	7 ●
6.1.4 Scientific & technical articles/bn PPP\$ GDP	2.6	116
6.1.5 Citable documents H index	0.0	127 ○
6.2 Knowledge impact	25.8	86
6.2.1 Growth rate of PPP\$ GDP/worker, %	3.8	17 ●
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	0.3	93
6.2.3 Computer software spending, % GDP	0.1	95
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.2	124 ○
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.0	100 ○
6.3 Knowledge diffusion	7.3	126 ○
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	89
6.3.2 High-tech exports less re-exports, % total trade	n/a	n/a
6.3.3 ICT services exports, % total trade	0.6	98
6.3.4 FDI net outflows, % GDP	(1.9)	123 ○

7 Creative outputs	19.2	106
7.1 Intangible assets	26.8	115
7.1.1 Trademarks by origin/bn PPP\$ GDP	9.2	105
7.1.2 Industrial designs by origin/bn PPP\$ GDP [Ⓐ]	0.0	110 ○
7.1.3 ICTs & business model creation [†]	47.3	111
7.1.4 ICTs & organizational model creation [†]	42.1	102
7.2 Creative goods & services	12.7	[79]
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	1.8	64
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	1.2	53
7.2.5 Creative goods exports, % total trade	n/a	n/a
7.3 Online creativity	10.7	98
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.0	123 ○
7.3.2 Country-code TLDs/th pop. 15–69	0.4	95
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	3.3	97
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	55.2
GDP (US\$ billions)	46.7
GDP per capita, PPP\$	2,904.0
Income group	Low income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	28.0	96
Innovation Output Sub-Index	23.6	76
Innovation Input Sub-Index	32.3	109
Innovation Efficiency Ratio	0.7	29 ●
Global Innovation Index 2016 (out of 128)	26.4	105
1 Institutions	53.9	83
1.1 Political environment	39.9	97
1.1.1 Political stability & safety*	53.0	85
1.1.2 Government effectiveness*	26.8	100
1.2 Regulatory environment	63.6	66 ●
1.2.1 Regulatory quality*	32.8	92
1.2.2 Rule of law*	27.0	87
1.2.3 Cost of redundancy dismissal, salary weeks	9.3	27 ●
1.3 Business environment	58.1	104
1.3.1 Ease of starting a business*	79.1	102
1.3.2 Ease of resolving insolvency*	41.0	89
1.3.3 Ease of paying taxes*	54.1	107
2 Human capital & research	9.5	125 ○
2.1 Education	22.9	121
2.1.1 Expenditure on education, % GDP	3.5	92
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	12.3	90
2.1.3 School life expectancy, years [Ⓐ]	8.4	111
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	26.4	97
2.2 Tertiary education	2.5	[123]
2.2.1 Tertiary enrolment, % gross [Ⓐ]	3.6	119 ○
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, %	n/a	n/a
2.3 Research & development (R&D)	3.0	87
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	18.5	100 ○
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.5	62
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○
3 Infrastructure	36.1	100
3.1 Information & communication technologies (ICTs)	36.5	97
3.1.1 ICT access*	26.5	117
3.1.2 ICT use*	3.0	125 ○
3.1.3 Government's online service*	57.2	72
3.1.4 E-participation*	59.3	65
3.2 General infrastructure	41.7	47 ●
3.2.1 Electricity output, kWh/cap	120.0	115
3.2.2 Logistics performance*	42.9	60 ●
3.2.3 Gross capital formation, % GDP	30.7	16 ●
3.3 Ecological sustainability	30.0	116
3.3.1 GDP/unit of energy use	4.8	105
3.3.2 Environmental performance*	58.3	103
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.2	105
4 Market sophistication	36.0	110
4.1 Credit	24.7	100
4.1.1 Ease of getting credit*	65.0	40 ●
4.1.2 Domestic credit to private sector, % GDP	15.2	116
4.1.3 Microfinance gross loans, % GDP	0.2	48

4.2 Investment	27.3	120
4.2.1 Ease of protecting minority investors*	40.0	111
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	79
4.3 Trade, competition, & market scale	55.9	88
4.3.1 Applied tariff rate, weighted mean, %	6.5	102
4.3.2 Intensity of local competition [†]	62.0	94
4.3.3 Domestic market scale, bn PPP\$	150.6	68 ●

5 Business sophistication **26.1** **97**

5.1 Knowledge workers	14.2	119
5.1.1 Knowledge-intensive employment, % [Ⓐ]	3.4	107 ○
5.1.2 Firms offering formal training, % firms	30.7	51
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, % [Ⓐ]	0.1	94 ○
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	1.3	85
5.2 Innovation linkages	39.7	31 ●
5.2.1 University/industry research collaboration [†]	42.3	53 ●
5.2.2 State of cluster development [†]	44.8	67
5.2.3 GERD financed by abroad, % [Ⓐ]	42.0	8 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	73
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	113
5.3 Knowledge absorption	24.4	99
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.0	113
5.3.2 High-tech imports less re-imports, % total trade	7.2	76
5.3.3 ICT services imports, % total trade [Ⓐ]	0.4	109
5.3.4 FDI net inflows, % GDP	4.4	32 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs **16.6** **94**

6.1 Knowledge creation	4.2	97
6.1.1 Patents by origin/bn PPP\$ GDP	0.0	124 ○
6.1.2 PCT patent applications/bn PPP\$ GDP [Ⓐ]	0.0	102
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	6.2	87
6.1.5 Citable documents H index	8.7	72
6.2 Knowledge impact	33.1	57 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	4.1	14 ●
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.0	123 ○
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.8	113
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	82
6.3 Knowledge diffusion	12.6	123
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	108 ○
6.3.2 High-tech exports less re-exports, % total trade	0.1	112
6.3.3 ICT services exports, % total trade [Ⓐ]	0.4	104
6.3.4 FDI net outflows, % GDP	0.0	109

7 Creative outputs **30.6** **64 ●**

7.1 Intangible assets	48.3	45 ●
7.1.1 Trademarks by origin/bn PPP\$ GDP	n/a	n/a
7.1.2 Industrial designs by origin/bn PPP\$ GDP	n/a	n/a
7.1.3 ICTs & business model creation [†]	51.8	94
7.1.4 ICTs & organizational model creation [†]	44.7	93
7.2 Creative goods & services	22.5	[51]
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	2.8	10 ●
7.2.5 Creative goods exports, % total trade [Ⓐ]	0.1	101
7.3 Online creativity	3.5	114
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.2	117
7.3.2 Country-code TLDs/th pop. 15–69	0.1	106
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	1.0	115
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Thailand

Key indicators

Population (millions)	68.1
GDP (US\$ billions)	390.6
GDP per capita, PPP\$	16,097.4
Income group	Upper-middle income
Region	South East Asia, East Asia, and Oceania

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	37.6	51
Innovation Output Sub-Index	32.2	43
Innovation Input Sub-Index	42.9	65
Innovation Efficiency Ratio	0.8	24
Global Innovation Index 2016 (out of 128)	36.5	52

1 Institutions	55.8	75
1.1 Political environment	46.0	79
1.1.1 Political stability & safety*	40.7	108 ○
1.1.2 Government effectiveness*	51.3	50
1.2 Regulatory environment	43.8	110 ○
1.2.1 Regulatory quality*	49.8	60
1.2.2 Rule of law*	36.3	65
1.2.3 Cost of redundancy dismissal, salary weeks	36.0	121 ○
1.3 Business environment	77.6	37
1.3.1 Ease of starting a business*	87.0	64
1.3.2 Ease of resolving insolvency*	77.1	21 ●
1.3.3 Ease of paying taxes*	68.7	80

2 Human capital & research	30.8	72
2.1 Education	40.6	85
2.1.1 Expenditure on education, % GDP	4.1	77
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	17.8	63
2.1.3 School life expectancy, years	16.0	32
2.1.4 PISA scales in reading, maths, & science	415.3	56
2.1.5 Pupil-teacher ratio, secondary	28.2	101 ○
2.2 Tertiary education	26.7	90
2.2.1 Tertiary enrolment, % gross	48.9	54
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, %	2.1	66
2.3 Research & development (R&D)	25.2	40
2.3.1 Researchers, FTE/mn pop.	874.3	51
2.3.2 Gross expenditure on R&D, % GDP	0.6	52
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	42.7	36
2.3.4 QS university ranking, average score top 3*	33.4	37

3 Infrastructure	45.0	71
3.1 Information & communication technologies (ICTs)	53.2	71
3.1.1 ICT access*	55.0	75
3.1.2 ICT use*	43.3	63
3.1.3 Government's online service*	55.1	77
3.1.4 E-participation*	59.3	65
3.2 General infrastructure	39.8	51
3.2.1 Electricity output, kWh/cap	2,563.6	69
3.2.2 Logistics performance*	55.1	44
3.2.3 Gross capital formation, % GDP	24.4	48
3.3 Ecological sustainability	42.0	77
3.3.1 GDP/unit of energy use	7.4	80
3.3.2 Environmental performance*	69.5	81
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	2.7	41

4 Market sophistication	51.2	42
4.1 Credit	36.9	58
4.1.1 Ease of getting credit*	50.0	72
4.1.2 Domestic credit to private sector, % GDP	151.3	8 ●
4.1.3 Microfinance gross loans, % GDP [Ⓐ]	0.0	81 ○

4.2 Investment	43.3	50
4.2.1 Ease of protecting minority investors*	66.7	26
4.2.2 Market capitalization, % GDP	88.3	14 ●
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	77 ○
4.3 Trade, competition, & market scale	73.3	26
4.3.1 Applied tariff rate, weighted mean, %	3.5	77
4.3.2 Intensity of local competition [†]	71.9	43
4.3.3 Domestic market scale, bn PPP\$	1,161.3	20 ●

5 Business sophistication	31.8	68
5.1 Knowledge workers	29.2	85
5.1.1 Knowledge-intensive employment, % [Ⓐ]	13.8	91 ○
5.1.2 Firms offering formal training, % firms	18.0	81 ○
5.1.3 GERD performed by business, % of GDP	0.4	36
5.1.4 GERD financed by business, %	66.2	6 ●
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	7.5	71
5.2 Innovation linkages	22.1	85
5.2.1 University/industry research collaboration [†]	46.2	40
5.2.2 State of cluster development [†]	46.2	58
5.2.3 GERD financed by abroad, %	1.5	81 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	47
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	77
5.3 Knowledge absorption	44.1	22
5.3.1 Intellectual property payments, % total trade	1.6	18 ●
5.3.2 High-tech imports less re-imports, % total trade	15.6	12 ●
5.3.3 ICT services imports, % total trade	0.2	117 ○
5.3.4 FDI net inflows, % GDP	2.4	73
5.3.5 Research talent, % in business enterprise	50.9	21

6 Knowledge & technology outputs	29.8	40
6.1 Knowledge creation	19.6	47
6.1.1 Patents by origin/bn PPP\$ GDP [Ⓐ]	0.9	66
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	60
6.1.3 Utility models by origin/bn PPP\$ GDP	1.9	16
6.1.4 Scientific & technical articles/bn PPP\$ GDP	6.5	84
6.1.5 Citable documents H index	19.3	38
6.2 Knowledge impact	39.7	35
6.2.1 Growth rate of PPP\$ GDP/worker, %	3.0	19 ●
6.2.2 New businesses/th pop. 15–64	0.9	75
6.2.3 Computer software spending, % GDP	0.3	47
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	7.8	44
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.4	19
6.3 Knowledge diffusion	30.1	39
6.3.1 Intellectual property receipts, % total trade	0.1	60
6.3.2 High-tech exports less re-exports, % total trade	15.2	9 ●
6.3.3 ICT services exports, % total trade	0.2	117 ○
6.3.4 FDI net outflows, % GDP	1.9	35

7 Creative outputs	34.6	53
7.1 Intangible assets	42.6	62
7.1.1 Trademarks by origin/bn PPP\$ GDP	30.0	72
7.1.2 Industrial designs by origin/bn PPP\$ GDP	3.0	37
7.1.3 ICTs & business model creation [†]	67.1	39
7.1.4 ICTs & organizational model creation [†]	58.9	43
7.2 Creative goods & services	34.4	20 ●
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	1.0	78
7.2.3 Global ent. & media market/th pop. 15–69	5.5	43
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.8	76
7.2.5 Creative goods exports, % total trade	9.5	5 ●
7.3 Online creativity	18.8	67
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	5.4	54
7.3.2 Country-code TLDs/th pop. 15–69	0.4	94
7.3.3 Wikipedia edits/mn pop. 15–69	4.3	75
7.3.4 Video uploads on YouTube/pop. 15–69	28.2	46

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	2.1
GDP (US\$ billions)	10.5
GDP per capita, PPP\$	14,009.1
Income group	Upper-middle income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	35.4	61
Innovation Output Sub-Index	26.3	63
Innovation Input Sub-Index	44.5	53
Innovation Efficiency Ratio	0.6	80
Global Innovation Index 2016 (out of 128)	35.4	58

1 Institutions	68.9	45
1.1 Political environment	52.2	63
1.1.1 Political stability & safety*	59.0	75
1.1.2 Government effectiveness*	45.4	63
1.2 Regulatory environment	67.0	52
1.2.1 Regulatory quality*	53.5	53
1.2.2 Rule of law*	34.3	70
1.2.3 Cost of redundancy dismissal, salary weeks	13.0	47
1.3 Business environment	87.4	12 ●
1.3.1 Ease of starting a business*	98.1	4 ●
1.3.2 Ease of resolving insolvency*	72.4	30 ●
1.3.3 Ease of paying taxes*	91.7	9 ●

2 Human capital & research	29.7	77
2.1 Education	51.5	51
2.1.1 Expenditure on education, % GDP	n/a	n/a
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years	12.8	76
2.1.4 PISA scales in reading, maths, & science	368.9	68 ○
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	9.6	21 ●
2.2 Tertiary education	32.4	75
2.2.1 Tertiary enrolment, % gross [Ⓐ]	39.6	66
2.2.2 Graduates in science & engineering, %	21.2	48
2.2.3 Tertiary inbound mobility, % [Ⓐ]	2.8	59
2.3 Research & development (R&D)	5.1	75
2.3.1 Researchers, FTE/mn pop.	858.8	52
2.3.2 Gross expenditure on R&D, % GDP	0.4	69
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	42.2	80
3.1 Information & communication technologies (ICTs)	60.1	61
3.1.1 ICT access*	66.8	60
3.1.2 ICT use*	51.7	56
3.1.3 Government's online service*	60.9	62
3.1.4 E-participation*	61.0	63
3.2 General infrastructure	15.0	124 ○
3.2.1 Electricity output, kWh/cap	2,583.7	66
3.2.2 Logistics performance*	20.7	100 ○
3.2.3 Gross capital formation, % GDP	n/a	n/a
3.3 Ecological sustainability	51.5	43
3.3.1 GDP/unit of energy use	10.0	48
3.3.2 Environmental performance*	78.0	49
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	4.3	22 ●

4 Market sophistication	47.4	59
4.1 Credit	35.2	64
4.1.1 Ease of getting credit*	80.0	15 ●
4.1.2 Domestic credit to private sector, % GDP	50.9	68
4.1.3 Microfinance gross loans, % GDP	0.3	40

4.2 Investment	49.7	30 ●
4.2.1 Ease of protecting minority investors*	73.3	13 ●
4.2.2 Market capitalization, % GDP [Ⓐ]	5.7	81 ○
4.2.3 Venture capital deals/bn PPP\$ GDP	n/a	n/a
4.3 Trade, competition, & market scale	57.4	81
4.3.1 Applied tariff rate, weighted mean, %	1.1	16 ●
4.3.2 Intensity of local competition [†]	73.0	40
4.3.3 Domestic market scale, bn PPP\$	30.1	108 ○

5 Business sophistication	34.5	56
5.1 Knowledge workers	41.4	54
5.1.1 Knowledge-intensive employment, %	27.3	51
5.1.2 Firms offering formal training, % firms	46.9	25
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.0	75 ○
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	12.9	49
5.2 Innovation linkages	33.9	48
5.2.1 University/industry research collaboration [†]	40.7	67
5.2.2 State of cluster development [†]	47.3	52
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	n/a	n/a
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	86
5.3 Knowledge absorption	28.1	86
5.3.1 Intellectual property payments, % total trade	1.0	31
5.3.2 High-tech imports less re-imports, % total trade	6.4	89
5.3.3 ICT services imports, % total trade	1.6	37
5.3.4 FDI net inflows, % GDP	2.4	75
5.3.5 Research talent, % in business enterprise [Ⓐ]	11.7	63

6 Knowledge & technology outputs	18.9	83
6.1 Knowledge creation	6.4	79
6.1.1 Patents by origin/bn PPP\$ GDP [Ⓐ]	0.0	119 ○
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	64
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	14.2	53
6.1.5 Citable documents H index	4.9	95 ○
6.2 Knowledge impact	31.2	63
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.3	45
6.2.2 New businesses/th pop. 15–64	3.7	32
6.2.3 Computer software spending, % GDP	0.1	80
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	12.5	29 ●
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.2	59
6.3 Knowledge diffusion	19.2	86
6.3.1 Intellectual property receipts, % total trade	0.2	44
6.3.2 High-tech exports less re-exports, % total trade	2.2	54
6.3.3 ICT services exports, % total trade	2.5	43
6.3.4 FDI net outflows, % GDP	(0.1)	115 ○

7 Creative outputs	33.7	56
7.1 Intangible assets	45.4	56
7.1.1 Trademarks by origin/bn PPP\$ GDP	n/a	n/a
7.1.2 Industrial designs by origin/bn PPP\$ GDP	1.6	49
7.1.3 ICTs & business model creation [†]	57.9	73
7.1.4 ICTs & organizational model creation [†]	51.2	70
7.2 Creative goods & services	20.9	55
7.2.1 Cultural & creative services exports, % of total trade	0.2	43
7.2.2 National feature films/mn pop. 15–69	6.4	29
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	2.6	12 ●
7.2.5 Creative goods exports, % total trade	0.2	81
7.3 Online creativity	23.1	56
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	6.6	50
7.3.2 Country-code TLDs/th pop. 15–69	1.4	71
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	6.2	36
7.3.4 Video uploads on YouTube/pop. 15–69	25.1	50

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Togo

Key indicators

Population (millions)	7.5
GDP (US\$ billions)	4.5
GDP per capita, PPP\$	1,483.4
Income group	Low income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	18.4	125 ○
Innovation Output Sub-Index	8.0	127 ○
Innovation Input Sub-Index	28.8	119
Innovation Efficiency Ratio	0.3	126 ○
Global Innovation Index 2016 (out of 128)	18.4	126

1 Institutions	49.4	96
1.1 Political environment	35.7	106
1.1.1 Political stability & safety*	59.6	73 ●
1.1.2 Government effectiveness*	11.9	125 ○
1.2 Regulatory environment	54.2	88
1.2.1 Regulatory quality*	21.1	113
1.2.2 Rule of law*	16.1	109
1.2.3 Cost of redundancy dismissal, salary weeks	13.1	51 ●
1.3 Business environment	58.2	103
1.3.1 Ease of starting a business*	81.7	94
1.3.2 Ease of resolving insolvency*	44.7	79
1.3.3 Ease of paying taxes*	48.2	116

2 Human capital & research	15.7	111
2.1 Education	37.4	96
2.1.1 Expenditure on education, % GDP	5.3	37 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	15.6	77
2.1.3 School life expectancy, years [Ⓐ]	12.0	88
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	26.2	96
2.2 Tertiary education	8.0	116
2.2.1 Tertiary enrolment, % gross	10.6	102
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, % [Ⓐ]	1.4	78
2.3 Research & development (R&D)	1.6	97
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	38.2	96
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.3	82
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	26.5	115
3.1 Information & communication technologies (ICTs)	25.4	112
3.1.1 ICT access*	25.9	119
3.1.2 ICT use*	4.9	121
3.1.3 Government's online service*	31.9	107
3.1.4 E-participation*	39.0	98
3.2 General infrastructure	32.0	87
3.2.1 Electricity output, kWh/cap.	19.9	118 ○
3.2.2 Logistics performance*	25.7	90
3.2.3 Gross capital formation, % GDP	26.0	37 ●
3.3 Ecological sustainability	22.0	123 ○
3.3.1 GDP/unit of energy use	2.9	113
3.3.2 Environmental performance*	46.1	114
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.2	109

4 Market sophistication	30.7	119
4.1 Credit	30.3	77
4.1.1 Ease of getting credit*	30.0	108
4.1.2 Domestic credit to private sector, % GDP	37.1	88
4.1.3 Microfinance gross loans, % GDP	2.7	14 ●

4.2 Investment	40.0	[64]
4.2.1 Ease of protecting minority investors*	40.0	111
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, & market scale	21.6	127 ○
4.3.1 Applied tariff rate, weighted mean, %	11.4	117
4.3.2 Intensity of local competition [†]	n/a	n/a
4.3.3 Domestic market scale, bn PPP\$	11.6	125 ○

5 Business sophistication	21.9	[117]
5.1 Knowledge workers	36.4	[69]
5.1.1 Knowledge-intensive employment, %	n/a	n/a
5.1.2 Firms offering formal training, % firms [Ⓐ]	31.0	50 ●
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	9.3	[126]
5.2.1 University/industry research collaboration [†]	n/a	n/a
5.2.2 State of cluster development [†]	n/a	n/a
5.2.3 GERD financed by abroad, % [Ⓐ]	5.5	63
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	n/a	n/a
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	n/a	n/a
5.3 Knowledge absorption	19.9	122
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.1	96
5.3.2 High-tech imports less re-imports, % total trade [Ⓐ]	2.7	123 ○
5.3.3 ICT services imports, % total trade [Ⓐ]	0.8	77
5.3.4 FDI net inflows, % GDP	2.5	71 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs	12.5	116
6.1 Knowledge creation	3.7	102
6.1.1 Patents by origin/bn PPP\$ GDP [Ⓐ]	0.3	88
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	6.7	80
6.1.5 Citable documents H index	0.9	124 ○
6.2 Knowledge impact	4.0	121
6.2.1 Growth rate of PPP\$ GDP/worker, %	n/a	n/a
6.2.2 New businesses/th pop. 15–64	0.3	93
6.2.3 Computer software spending, % GDP	0.1	93
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	2.0	92
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	29.8	41 ●
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	103
6.3.2 High-tech exports less re-exports, % total trade [Ⓐ]	0.0	121 ○
6.3.3 ICT services exports, % total trade [Ⓐ]	1.3	73 ●
6.3.4 FDI net outflows, % GDP	4.1	11 ●

7 Creative outputs	3.5	125 ○
7.1 Intangible assets	3.3	125 ○
7.1.1 Trademarks by origin/bn PPP\$ GDP	8.7	107
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.4	86
7.1.3 ICTs & business model creation [†]	n/a	n/a
7.1.4 ICTs & organizational model creation [†]	n/a	n/a
7.2 Creative goods & services	4.4	111
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	0.0	85
7.2.2 National feature films/mn pop. 15–69	4.6	42 ●
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade [Ⓐ]	0.0	123 ○
7.3 Online creativity	3.3	118
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.6	101
7.3.2 Country-code TLDs/th pop. 15–69	0.0	127 ○
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	0.9	118
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	1.4
GDP (US\$ billions)	22.8
GDP per capita, PPP\$	32,635.5
Income group	High income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	29.7	91
Innovation Output Sub-Index	21.3	86
Innovation Input Sub-Index	38.2	85
Innovation Efficiency Ratio	0.6	90
Global Innovation Index 2016 (out of 128)	n/a	n/a

1 Institutions **60.7** **65**

1.1 Political environment	59.3	49 ●
1.1.1 Political stability & safety*	70.4	49 ●
1.1.2 Government effectiveness*	48.2	56 ●
1.2 Regulatory environment	57.9	76
1.2.1 Regulatory quality*	45.8	66
1.2.2 Rule of law*	35.2	68
1.2.3 Cost of redundancy dismissal, salary weeks	20.5	84
1.3 Business environment	64.9	77
1.3.1 Ease of starting a business*	88.6	57 ●
1.3.2 Ease of resolving insolvency*	48.7	65
1.3.3 Ease of paying taxes*	57.3	101

2 Human capital & research **20.4** **[99]**

2.1 Education	40.4	[87]
2.1.1 Expenditure on education, % GDP	n/a	n/a
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years	n/a	n/a
2.1.4 PISA scales in reading, maths, & science	423.0	50
2.1.5 Pupil-teacher ratio, secondary	n/a	n/a
2.2 Tertiary education	n/a	n/a
2.2.1 Tertiary enrolment, % gross	n/a	n/a
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, %	n/a	n/a
2.3 Research & development (R&D)	0.5	109
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.1	107 ○
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure **35.9** **101**

3.1 Information & communication technologies (ICTs)	53.1	72
3.1.1 ICT access*	70.3	50 ●
3.1.2 ICT use*	45.3	62
3.1.3 Government's online service*	52.9	79
3.1.4 E-participation*	44.1	96
3.2 General infrastructure	21.9	116
3.2.1 Electricity output, kWh/cap	7,326.7	26 ●
3.2.2 Logistics performance*	15.5	113
3.2.3 Gross capital formation, % GDP	13.4	118 ○
3.3 Ecological sustainability	32.5	111
3.3.1 GDP/unit of energy use	2.1	118 ○
3.3.2 Environmental performance*	74.3	58
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.5	81

4 Market sophistication **45.0** **71**

4.1 Credit	26.3	95
4.1.1 Ease of getting credit*	65.0	40 ●
4.1.2 Domestic credit to private sector, % GDP	37.1	87
4.1.3 Microfinance gross loans, % GDP [Ⓐ]	0.0	77

4.2 Investment	60.0	[18]
4.2.1 Ease of protecting minority investors*	60.0	52
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, & market scale	48.6	105
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	8.3	108
4.3.2 Intensity of local competition [†]	70.3	57
4.3.3 Domestic market scale, bn PPP\$	43.6	94

5 Business sophistication **29.1** **77**

5.1 Knowledge workers	32.7	80
5.1.1 Knowledge-intensive employment, %	28.4	49
5.1.2 Firms offering formal training, % firms [Ⓐ]	28.0	57
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.0	87 ○
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	28.8	59
5.2.1 University/industry research collaboration [†]	31.7	102
5.2.2 State of cluster development [†]	41.5	78
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	n/a	n/a
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	85
5.3 Knowledge absorption	25.9	93
5.3.1 Intellectual property payments, % total trade	n/a	n/a
5.3.2 High-tech imports less re-imports, % total trade [Ⓐ]	4.9	110
5.3.3 ICT services imports, % total trade [Ⓐ]	0.1	122 ○
5.3.4 FDI net inflows, % GDP	8.0	17 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs **22.5** **56 ●**

6.1 Knowledge creation	3.4	107
6.1.1 Patents by origin/bn PPP\$ GDP	0.1	111
6.1.2 PCT patent applications/bn PPP\$ GDP	0.9	29 ●
6.1.3 Utility models by origin/bn PPP\$ GDP [Ⓐ]	0.0	62 ○
6.1.4 Scientific & technical articles/bn PPP\$ GDP	3.3	107
6.1.5 Citable documents H index	4.4	98
6.2 Knowledge impact	23.0	[97]
6.2.1 Growth rate of PPP\$ GDP/worker, %	(1.0)	98
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	n/a	n/a
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	2.6	84
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	41.2	20 ●
6.3.1 Intellectual property receipts, % total trade	n/a	n/a
6.3.2 High-tech exports less re-exports, % total trade [Ⓐ]	0.0	120 ○
6.3.3 ICT services exports, % total trade [Ⓐ]	0.1	123 ○
6.3.4 FDI net outflows, % GDP	5.6	9 ●

7 Creative outputs **20.0** **101**

7.1 Intangible assets	30.9	101
7.1.1 Trademarks by origin/bn PPP\$ GDP	17.3	87
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.4	83
7.1.3 ICTs & business model creation [†]	53.2	90
7.1.4 ICTs & organizational model creation [†]	45.6	89
7.2 Creative goods & services	2.0	[121]
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade [Ⓐ]	0.1	103
7.3 Online creativity	16.1	77
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	4.5	56 ●
7.3.2 Country-code TLDs/th pop. 15–69	1.5	69
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	4.4	71
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Tunisia

Key indicators

Population (millions)	11.4
GDP (US\$ billions)	42.4
GDP per capita, PPP\$	11,428.2
Income group	Lower-middle income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	32.3	74
Innovation Output Sub-Index	24.6	71
Innovation Input Sub-Index	40.0	81
Innovation Efficiency Ratio	0.6	65
Global Innovation Index 2016 (out of 128)	30.6	77

1 Institutions 54.9 **77**

1.1 Political environment	41.1	91
1.1.1 Political stability & safety*	42.8	102
1.1.2 Government effectiveness*	39.5	78
1.2 Regulatory environment	54.0	90
1.2.1 Regulatory quality*	32.0	94
1.2.2 Rule of law*	37.9	60
1.2.3 Cost of redundancy dismissal, salary weeks	21.6	89
1.3 Business environment	69.5	69
1.3.1 Ease of starting a business*	85.0	78
1.3.2 Ease of resolving insolvency*	54.5	55
1.3.3 Ease of paying taxes*	69.0	79

2 Human capital & research 38.0 **44**

2.1 Education	49.9	55
2.1.1 Expenditure on education, % GDP [Ⓐ]	6.3	19 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	24.4	34 ●
2.1.3 School life expectancy, years	14.8	55
2.1.4 PISA scales in reading, maths, & science	371.4	67 ○
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	13.6	54
2.2 Tertiary education	55.0	14 ●
2.2.1 Tertiary enrolment, % gross	34.6	75
2.2.2 Graduates in science & engineering, %	44.1	3 ●
2.2.3 Tertiary inbound mobility, %	2.0	69
2.3 Research & development (R&D)	9.1	61
2.3.1 Researchers, FTE/mn pop.	1,787.3	42
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.7	51
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure 45.2 **70**

3.1 Information & communication technologies (ICTs)	58.4	64
3.1.1 ICT access*	52.9	79
3.1.2 ICT use*	39.5	70
3.1.3 Government's online service*	71.7	40
3.1.4 E-participation*	69.5	43
3.2 General infrastructure	27.3	101
3.2.1 Electricity output, kWh/cap.	1,729.5	81
3.2.2 Logistics performance*	20.1	104 ○
3.2.3 Gross capital formation, % GDP	21.7	67
3.3 Ecological sustainability	49.8	48
3.3.1 GDP/unit of energy use	11.2	32 ●
3.3.2 Environmental performance*	77.3	52
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.8	50

4 Market sophistication 38.7 **98**

4.1 Credit	27.4	88
4.1.1 Ease of getting credit*	45.0	84
4.1.2 Domestic credit to private sector, % GDP	79.6	37 ●
4.1.3 Microfinance gross loans, % GDP	0.3	41

4.2 Investment	29.2	117 ○
4.2.1 Ease of protecting minority investors*	46.7	95
4.2.2 Market capitalization, % GDP [Ⓐ]	21.1	61
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	32
4.3 Trade, competition, & market scale	59.5	73
4.3.1 Applied tariff rate, weighted mean, %	3.9	78
4.3.2 Intensity of local competition [†]	64.2	81
4.3.3 Domestic market scale, bn PPP\$	130.8	71

5 Business sophistication 23.2 **112 ○**

5.1 Knowledge workers	27.7	91
5.1.1 Knowledge-intensive employment, % [Ⓐ]	21.0	70
5.1.2 Firms offering formal training, % firms	28.9	53
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.1	61
5.1.4 GERD financed by business, % [Ⓐ]	18.5	64
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	19.5	112 ○
5.2.1 University/industry research collaboration [†]	32.8	98
5.2.2 State of cluster development [†]	36.3	97
5.2.3 GERD financed by abroad, % [Ⓐ]	4.0	67
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	30 ●
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	69
5.3 Knowledge absorption	22.3	113 ○
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.1	103 ○
5.3.2 High-tech imports less re-imports, % total trade	10.5	38 ●
5.3.3 ICT services imports, % total trade [Ⓐ]	0.4	106 ○
5.3.4 FDI net inflows, % GDP	2.2	77
5.3.5 Research talent, % in business enterprise	4.0	75 ○

6 Knowledge & technology outputs 21.0 **69**

6.1 Knowledge creation	15.3	53
6.1.1 Patents by origin/bn PPP\$ GDP	1.4	57
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	84
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	31.8	24 ●
6.1.5 Citable documents H index	8.8	71
6.2 Knowledge impact	28.6	74
6.2.1 Growth rate of PPP\$ GDP/worker, %	(0.4)	92 ○
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	1.5	55
6.2.3 Computer software spending, % GDP	0.3	40 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	7.8	43
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.3	34
6.3 Knowledge diffusion	19.0	89
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.1	48
6.3.2 High-tech exports less re-exports, % total trade	4.3	37 ●
6.3.3 ICT services exports, % total trade [Ⓐ]	1.6	64
6.3.4 FDI net outflows, % GDP	0.1	99

7 Creative outputs 28.3 **76**

7.1 Intangible assets	42.1	63
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	62
7.1.3 ICTs & business model creation [†]	58.9	69
7.1.4 ICTs & organizational model creation [†]	43.7	99
7.2 Creative goods & services	17.7	66
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	1.4	72
7.2.3 Global ent. & media market/th pop. 15–69	0.9	58 ○
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.7	80
7.2.5 Creative goods exports, % total trade	2.1	24 ●
7.3 Online creativity	11.2	96
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	2.7	69
7.3.2 Country-code TLDs/th pop. 15–69	0.2	101
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	3.4	96
7.3.4 Video uploads on YouTube/pop. 15–69	9.2	63 ○

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	79.6
GDP (US\$ billions)	735.7
GDP per capita, PPP\$	20,437.8
Income group	Upper-middle income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	38.9	43
Innovation Output Sub-Index	35.5	36
Innovation Input Sub-Index	42.3	68
Innovation Efficiency Ratio	0.8	9 ●
Global Innovation Index 2016 (out of 128)	39.0	42

1 Institutions	50.6	95
1.1 Political environment	40.5	95
1.1.1 Political stability & safety*	32.9	117 ○
1.1.2 Government effectiveness*	48.1	57
1.2 Regulatory environment	50.5	97
1.2.1 Regulatory quality*	50.6	58
1.2.2 Rule of law*	37.7	62
1.2.3 Cost of redundancy dismissal, salary weeks	29.8	116 ○
1.3 Business environment	60.9	95
1.3.1 Ease of starting a business*	87.0	65
1.3.2 Ease of resolving insolvency*	35.0	106 ○
1.3.3 Ease of paying taxes*	60.8	92

2 Human capital & research	38.1	43
2.1 Education	45.5	72
2.1.1 Expenditure on education, % GDP	4.8	59
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	14.8	84
2.1.3 School life expectancy, years [Ⓐ]	16.4	24
2.1.4 PISA scales in reading, maths, & science	424.8	49
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	20.1	81
2.2 Tertiary education	39.8	48
2.2.1 Tertiary enrolment, % gross [Ⓐ]	86.3	8 ●
2.2.2 Graduates in science & engineering, % [Ⓐ]	20.9	50
2.2.3 Tertiary inbound mobility, % [Ⓐ]	0.9	84
2.3 Research & development (R&D)	29.0	38
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	1,156.5	46
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	1.0	37
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	51.2	29
2.3.4 QS university ranking, average score top 3*	28.0	41

3 Infrastructure	45.7	68
3.1 Information & communication technologies (ICTs)	56.7	67
3.1.1 ICT access*	62.0	69
3.1.2 ICT use*	41.8	67
3.1.3 Government's online service*	60.1	64
3.1.4 E-participation*	62.7	59
3.2 General infrastructure	34.6	76
3.2.1 Electricity output, kWh/cap	3,351.7	58
3.2.2 Logistics performance*	62.9	33
3.2.3 Gross capital formation, % GDP	17.4	101 ○
3.3 Ecological sustainability	45.7	59
3.3.1 GDP/unit of energy use	11.1	37
3.3.2 Environmental performance*	67.7	87
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.8	51

4 Market sophistication	47.8	57
4.1 Credit	27.2	89
4.1.1 Ease of getting credit*	50.0	72
4.1.2 Domestic credit to private sector, % GDP	80.0	36
4.1.3 Microfinance gross loans, % GDP	0.0	76 ○

4.2 Investment	38.5	72
4.2.1 Ease of protecting minority investors*	70.0	22 ●
4.2.2 Market capitalization, % GDP	26.3	55
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	73
4.3 Trade, competition, & market scale	77.9	14 ●
4.3.1 Applied tariff rate, weighted mean, %	3.2	70
4.3.2 Intensity of local competition [†]	81.3	11 ●
4.3.3 Domestic market scale, bn PPP\$	1,669.9	17 ●

5 Business sophistication	29.3	75
5.1 Knowledge workers	34.1	77
5.1.1 Knowledge-intensive employment, %	20.5	72
5.1.2 Firms offering formal training, % firms	28.4	54
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.5	34
5.1.4 GERD financed by business, % [Ⓐ]	50.9	19 ●
5.1.5 Females employed w/advanced degrees, % total	8.0	70 ○

5.2 Innovation linkages	21.2	96
5.2.1 University/industry research collaboration [†]	41.2	60
5.2.2 State of cluster development [†]	47.0	54
5.2.3 GERD financed by abroad, % [Ⓐ]	1.1	85 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	79
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.5	35
5.3 Knowledge absorption	32.7	65
5.3.1 Intellectual property payments, % total trade	0.3	72
5.3.2 High-tech imports less re-imports, % total trade	10.3	39
5.3.3 ICT services imports, % total trade	0.1	121 ○
5.3.4 FDI net inflows, % GDP	1.8	85
5.3.5 Research talent, % in business enterprise [Ⓐ]	46.7	28

6 Knowledge & technology outputs	27.6	46
6.1 Knowledge creation	28.8	33
6.1.1 Patents by origin/bn PPP\$ GDP	3.6	29
6.1.2 PCT patent applications/bn PPP\$ GDP	0.6	32
6.1.3 Utility models by origin/bn PPP\$ GDP	2.2	12 ●
6.1.4 Scientific & technical articles/bn PPP\$ GDP	17.5	43
6.1.5 Citable documents H index	25.0	36

6.2 Knowledge impact	34.6	47
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.4	43
6.2.2 New businesses/th pop. 15–64	1.1	64
6.2.3 Computer software spending, % GDP	0.5	18 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	5.4	61
6.2.5 High- & medium-high-tech manufactures, %	0.3	48
6.3 Knowledge diffusion	19.2	85
6.3.1 Intellectual property receipts, % total trade	n/a	n/a
6.3.2 High-tech exports less re-exports, % total trade	1.3	66
6.3.3 ICT services exports, % total trade	0.1	121 ○
6.3.4 FDI net outflows, % GDP	0.7	64

7 Creative outputs	43.4	31
7.1 Intangible assets	64.7	6 ●
7.1.1 Trademarks by origin/bn PPP\$ GDP	122.0	7 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	24.3	1 ●
7.1.3 ICTs & business model creation [†]	63.2	51
7.1.4 ICTs & organizational model creation [†]	50.8	73

7.2 Creative goods & services	20.7	56
7.2.1 Cultural & creative services exports, % of total trade	0.0	79 ○
7.2.2 National feature films/mn pop. 15–69	2.5	58
7.2.3 Global ent. & media market/th pop. 15–69	7.0	41
7.2.4 Printing & publishing manufactures, %	0.9	67
7.2.5 Creative goods exports, % total trade	3.1	17 ●

7.3 Online creativity	23.5	53
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	12.2	36
7.3.2 Country-code TLDs/th pop. 15–69	2.1	64
7.3.3 Wikipedia edits/mn pop. 15–69	5.2	54
7.3.4 Video uploads on YouTube/pop. 15–69	29.5	44

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Uganda

Key indicators

Population (millions)	40.3
GDP (US\$ billions)	25.6
GDP per capita, PPP\$	2,002.6
Income group	Low income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	27.0	102
Innovation Output Sub-Index	17.2	106
Innovation Input Sub-Index	36.7	93
Innovation Efficiency Ratio	0.5	113
Global Innovation Index 2016 (out of 128)	27.1	99

1 Institutions	54.6	79
1.1 Political environment	36.3	103
1.1.1 Political stability & safety*	42.9	100
1.1.2 Government effectiveness*	29.7	94
1.2 Regulatory environment	65.7	60
1.2.1 Regulatory quality*	35.9	84
1.2.2 Rule of law*	29.5	79
1.2.3 Cost of redundancy dismissal, salary weeks	8.7	22 ●
1.3 Business environment	61.8	89
1.3.1 Ease of starting a business*	71.3	117
1.3.2 Ease of resolving insolvency*	39.4	98
1.3.3 Ease of paying taxes*	74.7	61

2 Human capital & research	18.2	106
2.1 Education	21.4	123 ○
2.1.1 Expenditure on education, % GDP	1.7	116 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	10.7	94
2.1.3 School life expectancy, years [Ⓐ]	10.0	102
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	21.8	86
2.2 Tertiary education	29.6	82
2.2.1 Tertiary enrolment, % gross [Ⓐ]	4.5	116 ○
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, % [Ⓐ]	10.7	15 ●
2.3 Research & development (R&D)	3.5	84
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	38.1	97 ○
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.5	65
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	3.1	74

3 Infrastructure	40.5	84
3.1 Information & communication technologies (ICTs)	33.9	102
3.1.1 ICT access*	23.7	122 ○
3.1.2 ICT use*	12.7	108
3.1.3 Government's online service*	50.0	85
3.1.4 E-participation*	49.2	89
3.2 General infrastructure	48.6	31 ●
3.2.1 Electricity output, kWh/cap	n/a	n/a
3.2.2 Logistics performance*	45.3	57
3.2.3 Gross capital formation, % GDP	25.6	40 ●
3.3 Ecological sustainability	39.0	85
3.3.1 GDP/unit of energy use	n/a	n/a
3.3.2 Environmental performance*	57.6	105
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.3	96

4 Market sophistication	36.7	108
4.1 Credit	24.6	101
4.1.1 Ease of getting credit*	65.0	40
4.1.2 Domestic credit to private sector, % GDP	14.6	118 ○
4.1.3 Microfinance gross loans, % GDP	0.2	49

4.2 Investment	29.3	116
4.2.1 Ease of protecting minority investors*	50.0	89
4.2.2 Market capitalization, % GDP [Ⓐ]	31.0	45
4.2.3 Venture capital deals/bn PPP\$ GDP [Ⓐ]	0.0	63
4.3 Trade, competition, & market scale	56.2	87
4.3.1 Applied tariff rate, weighted mean, %	5.9	97
4.3.2 Intensity of local competition [†]	71.8	44 ●
4.3.3 Domestic market scale, bn PPP\$	84.9	79

5 Business sophistication	33.6	60
5.1 Knowledge workers	17.8	113
5.1.1 Knowledge-intensive employment, % [Ⓐ]	4.1	103 ○
5.1.2 Firms offering formal training, % firms	34.7	39 ●
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.2	55
5.1.4 GERD financed by business, % [Ⓐ]	13.7	68
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	2.7	82

5.2 Innovation linkages	46.7	14 ●
5.2.1 University/industry research collaboration [†]	46.5	39 ●
5.2.2 State of cluster development [†]	41.3	81
5.2.3 GERD financed by abroad, % [Ⓐ]	57.3	2 ●
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	71
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	118 ○
5.3 Knowledge absorption	36.3	49 ●
5.3.1 Intellectual property payments, % total trade	0.2	80
5.3.2 High-tech imports less re-imports, % total trade	6.9	78
5.3.3 ICT services imports, % total trade	1.3	57
5.3.4 FDI net inflows, % GDP	4.0	36 ●
5.3.5 Research talent, % in business enterprise [Ⓐ]	50.6	22 ●

6 Knowledge & technology outputs	15.6	103
6.1 Knowledge creation	6.7	77
6.1.1 Patents by origin/bn PPP\$ GDP	0.1	106
6.1.2 PCT patent applications/bn PPP\$ GDP [Ⓐ]	0.1	74
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	12.0	60
6.1.5 Citable documents H index	9.3	69

6.2 Knowledge impact	25.7	88
6.2.1 Growth rate of PPP\$ GDP/worker, %	2.2	36 ●
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	1.2	63
6.2.3 Computer software spending, % GDP	0.0	122 ○
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	1.1	105
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	14.3	114
6.3.1 Intellectual property receipts, % total trade	0.1	64
6.3.2 High-tech exports less re-exports, % total trade	0.2	105
6.3.3 ICT services exports, % total trade	1.0	83
6.3.4 FDI net outflows, % GDP	(0.0)	113

7 Creative outputs	18.9	107
7.1 Intangible assets	34.8	94
7.1.1 Trademarks by origin/bn PPP\$ GDP	13.1	96
7.1.2 Industrial designs by origin/bn PPP\$ GDP	n/a	n/a
7.1.3 ICTs & business model creation [†]	54.7	84
7.1.4 ICTs & organizational model creation [†]	43.4	101

7.2 Creative goods & services	1.4	[124]
7.2.1 Cultural & creative services exports, % of total trade	0.0	80
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.1	105

7.3 Online creativity	4.6	112
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.2	113
7.3.2 Country-code TLDs/th pop. 15–69	0.0	116
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	1.9	107
7.3.4 Video uploads on YouTube/pop. 15–69	0.0	73 ○

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	44.6
GDP (US\$ billions)	87.2
GDP per capita, PPP\$	7,518.8
Income group	Lower-middle income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	37.6	50
Innovation Output Sub-Index	34.2	40
Innovation Input Sub-Index	41.0	77
Innovation Efficiency Ratio	0.8	11 ●
Global Innovation Index 2016 (out of 128)	35.7	56

1 Institutions 47.9 101

1.1 Political environment	23.0	122 ○
1.1.1 Political stability & safety*	17.0	124 ○
1.1.2 Government effectiveness*	29.0	96
1.2 Regulatory environment	55.9	82
1.2.1 Regulatory quality*	27.3	105
1.2.2 Rule of law*	16.0	110
1.2.3 Cost of redundancy dismissal, salary weeks	13.0	47
1.3 Business environment	64.9	78
1.3.1 Ease of starting a business*	94.4	18 ●
1.3.2 Ease of resolving insolvency*	27.5	120 ○
1.3.3 Ease of paying taxes*	72.7	66

2 Human capital & research 39.6 41

2.1 Education	58.3	30
2.1.1 Expenditure on education, % GDP	6.0	22
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	26.2	22
2.1.3 School life expectancy, years	15.3	40
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	7.0	2 ●
2.2 Tertiary education	47.1	26
2.2.1 Tertiary enrolment, % gross [Ⓢ]	82.3	12 ●
2.2.2 Graduates in science & engineering, %	25.5	28
2.2.3 Tertiary inbound mobility, %	3.2	55
2.3 Research & development (R&D)	13.4	51
2.3.1 Researchers, FTE/mn pop.	1,006.0	49
2.3.2 Gross expenditure on R&D, % GDP	0.6	54
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	27.4	43

3 Infrastructure 39.3 90

3.1 Information & communication technologies (ICTs)	55.9	68
3.1.1 ICT access*	64.8	64
3.1.2 ICT use*	25.7	93
3.1.3 Government's online service*	58.7	70
3.1.4 E-participation*	74.6	32
3.2 General infrastructure	25.5	108
3.2.1 Electricity output, kWh/cap	4,011.7	53
3.2.2 Logistics performance*	31.2	79
3.2.3 Gross capital formation, % GDP	15.8	108 ○
3.3 Ecological sustainability	36.5	95
3.3.1 GDP/unit of energy use	3.3	112 ○
3.3.2 Environmental performance*	79.7	44
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.5	85

4 Market sophistication 43.2 81

4.1 Credit	32.4	71
4.1.1 Ease of getting credit*	75.0	19
4.1.2 Domestic credit to private sector, % GDP	57.0	54
4.1.3 Microfinance gross loans, % GDP	0.0	80 ○

4.2 Investment	30.6	107
4.2.1 Ease of protecting minority investors*	56.7	67
4.2.2 Market capitalization, % GDP [Ⓢ]	15.7	66
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	75
4.3 Trade, competition, & market scale	66.5	48
4.3.1 Applied tariff rate, weighted mean, %	1.9	55
4.3.2 Intensity of local competition [†]	60.2	99
4.3.3 Domestic market scale, bn PPP\$	349.8	47

5 Business sophistication 35.3 51

5.1 Knowledge workers	47.4	41
5.1.1 Knowledge-intensive employment, %	37.6	30
5.1.2 Firms offering formal training, % firms	22.6	68
5.1.3 GERD performed by business, % of GDP	0.4	40
5.1.4 GERD financed by business, %	40.3	35
5.1.5 Females employed w/advanced degrees, % total	29.7	3 ●
5.2 Innovation linkages	25.5	72
5.2.1 University/industry research collaboration [†]	41.8	55
5.2.2 State of cluster development [†]	32.5	114 ○
5.2.3 GERD financed by abroad, %	18.2	23
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	76
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.6	34
5.3 Knowledge absorption	33.0	63
5.3.1 Intellectual property payments, % total trade	0.7	46
5.3.2 High-tech imports less re-imports, % total trade	8.0	65
5.3.3 ICT services imports, % total trade	1.3	56
5.3.4 FDI net inflows, % GDP	2.2	78
5.3.5 Research talent, % in business enterprise	32.5	42

6 Knowledge & technology outputs 32.8 32

6.1 Knowledge creation	45.5	16 ●
6.1.1 Patents by origin/bn PPP\$ GDP	6.7	18 ●
6.1.2 PCT patent applications/bn PPP\$ GDP	0.5	37
6.1.3 Utility models by origin/bn PPP\$ GDP	24.9	1 ●
6.1.4 Scientific & technical articles/bn PPP\$ GDP	12.2	59
6.1.5 Citable documents H index	14.9	46
6.2 Knowledge impact	28.1	77
6.2.1 Growth rate of PPP\$ GDP/worker, %	(0.9)	97 ○
6.2.2 New businesses/th pop. 15–64 [Ⓢ]	0.9	74
6.2.3 Computer software spending, % GDP	0.7	6 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	3.1	78
6.2.5 High- & medium-high-tech manufactures, %	0.2	56
6.3 Knowledge diffusion	24.6	54
6.3.1 Intellectual property receipts, % total trade	0.2	43
6.3.2 High-tech exports less re-exports, % total trade	3.1	46
6.3.3 ICT services exports, % total trade	4.4	15 ●
6.3.4 FDI net outflows, % GDP	0.2	81

7 Creative outputs 35.6 49

7.1 Intangible assets	53.7	26
7.1.1 Trademarks by origin/bn PPP\$ GDP	106.8	12 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	12.6	11 ●
7.1.3 ICTs & business model creation [†]	47.0	112 ○
7.1.4 ICTs & organizational model creation [†]	52.2	66
7.2 Creative goods & services	9.3	92
7.2.1 Cultural & creative services exports, % of total trade	0.1	53
7.2.2 National feature films/mn pop. 15–69	0.1	102 ○
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	1.0	66
7.2.5 Creative goods exports, % total trade	0.4	63
7.3 Online creativity	25.8	47
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	4.4	59
7.3.2 Country-code TLDs/th pop. 15–69	5.1	50
7.3.3 Wikipedia edits/mn pop. 15–69	6.1	39
7.3.4 Video uploads on YouTube/pop. 15–69	34.9	41

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

United Arab Emirates

Key indicators

Population (millions)	9.3
GDP (US\$ billions)	375.0
GDP per capita, PPP\$	67,616.9
Income group	High income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	43.2	35
Innovation Output Sub-Index	28.5	56
Innovation Input Sub-Index	58.0	23
Innovation Efficiency Ratio	0.5	104 ○
Global Innovation Index 2016 (out of 128)	39.4	41

1 Institutions	80.6	25
1.1 Political environment	81.9	19
1.1.1 Political stability & safety*	82.2	28
1.1.2 Government effectiveness*	81.6	16
1.2 Regulatory environment	82.8	22
1.2.1 Regulatory quality*	71.1	28
1.2.2 Rule of law*	60.1	37
1.2.3 Cost of redundancy dismissal, salary weeks	8.0	1 ●
1.3 Business environment	77.1	38
1.3.1 Ease of starting a business*	91.2	45
1.3.2 Ease of resolving insolvency*	40.6	92 ○
1.3.3 Ease of paying taxes*	99.4	1 ●

2 Human capital & research	51.0	22
2.1 Education	75.6	[3]
2.1.1 Expenditure on education, % GDP	n/a	n/a
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years	n/a	n/a
2.1.4 PISA scales in reading, maths, & science	474.3	37
2.1.5 Pupil-teacher ratio, secondary	11.2	33
2.2 Tertiary education	59.1	8 ●
2.2.1 Tertiary enrolment, % gross	n/a	n/a
2.2.2 Graduates in science & engineering, %	20.4	52
2.2.3 Tertiary inbound mobility, %	46.9	1 ●
2.3 Research & development (R&D)	18.2	47
2.3.1 Researchers, FTE/mn pop.	2,003.4	38
2.3.2 Gross expenditure on R&D, % GDP	0.9	41
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	28.9	40

3 Infrastructure	57.5	29
3.1 Information & communication technologies (ICTs)	78.3	23
3.1.1 ICT access*	81.4	23
3.1.2 ICT use*	68.2	25
3.1.3 Government's online service*	89.1	13
3.1.4 E-participation*	74.6	32
3.2 General infrastructure	51.0	21
3.2.1 Electricity output, kWh/cap	12,098.9	10 ●
3.2.2 Logistics performance*	86.9	13 ●
3.2.3 Gross capital formation, % GDP	19.7	84 ○
3.3 Ecological sustainability	43.3	71
3.3.1 GDP/unit of energy use	8.1	68
3.3.2 Environmental performance*	69.4	82
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	2.9	36

4 Market sophistication	52.9	33
4.1 Credit	37.5	56
4.1.1 Ease of getting credit*	45.0	84 ○
4.1.2 Domestic credit to private sector, % GDP	76.5	39
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	47.3	33
4.2.1 Ease of protecting minority investors*	75.0	9 ●
4.2.2 Market capitalization, % GDP	52.9	30
4.2.3 Venture capital deals/bn PPP\$ GDP	0.1	28
4.3 Trade, competition, & market scale	73.9	25
4.3.1 Applied tariff rate, weighted mean, %	2.8	67
4.3.2 Intensity of local competition†	81.7	8 ●
4.3.3 Domestic market scale, bn PPP\$	667.2	31

5 Business sophistication	47.8	25
5.1 Knowledge workers	58.1	26
5.1.1 Knowledge-intensive employment, % ^②	36.1	33
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	0.4	39
5.1.4 GERD financed by business, % ^②	74.3	4 ●
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	47.4	12 ●
5.2.1 University/industry research collaboration†	58.5	24
5.2.2 State of cluster development†	73.7	2 ●
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	16
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	68
5.3 Knowledge absorption	37.8	42
5.3.1 Intellectual property payments, % total trade	0.6	51
5.3.2 High-tech imports less re-imports, % total trade	8.0	66
5.3.3 ICT services imports, % total trade	0.6	92 ○
5.3.4 FDI net inflows, % GDP	2.7	67
5.3.5 Research talent, % in business enterprise	60.9	10

6 Knowledge & technology outputs	20.9	71
6.1 Knowledge creation	3.9	99 ○
6.1.1 Patents by origin/bn PPP\$ GDP	0.1	114 ○
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	62
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	3.5	106 ○
6.1.5 Citable documents H index	9.4	67
6.2 Knowledge impact	30.7	65
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.3	47
6.2.2 New businesses/th pop. 15–64 ^②	1.4	58
6.2.3 Computer software spending, % GDP	0.3	37
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	7.7	45
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	28.1	45
6.3.1 Intellectual property receipts, % total trade	0.5	23
6.3.2 High-tech exports less re-exports, % total trade	0.3	95 ○
6.3.3 ICT services exports, % total trade	1.7	61
6.3.4 FDI net outflows, % GDP	2.3	26

7 Creative outputs	36.1	47
7.1 Intangible assets	45.7	55
7.1.1 Trademarks by origin/bn PPP\$ GDP ^②	11.4	101 ○
7.1.2 Industrial designs by origin/bn PPP\$ GDP ^②	0.1	102 ○
7.1.3 ICTs & business model creation†	79.9	10 ●
7.1.4 ICTs & organizational model creation†	74.4	13 ●
7.2 Creative goods & services	28.0	34
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	1.4	71
7.2.3 Global ent. & media market/th pop. 15–69	16.5	28
7.2.4 Printing & publishing manufactures, % ^②	2.5	14
7.2.5 Creative goods exports, % total trade	1.6	33
7.3 Online creativity	25.1	49
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	11.2	38
7.3.2 Country-code TLDs/th pop. 15–69	5.6	47
7.3.3 Wikipedia edits/mn pop. 15–69 ^②	4.6	68
7.3.4 Video uploads on YouTube/pop. 15–69	39.1	32

NOTES: ● indicates a strength; ○ a weakness; * an index; † a survey question.

② 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 181 of this appendix for details.

Key indicators

Population (millions)	65.1
GDP (US\$ billions)	2,649.9
GDP per capita, PPP\$	41,158.9
Income group	High income
Region	Europe

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	60.9	5
Innovation Output Sub-Index	53.5	6
Innovation Input Sub-Index	68.3	7
Innovation Efficiency Ratio	0.8	20
Global Innovation Index 2016 (out of 128)	61.9	3

1 Institutions	88.4	9
1.1 Political environment	82.1	18
1.1.1 Political stability & safety*	77.3	40
1.1.2 Government effectiveness*	86.8	13
1.2 Regulatory environment	94.1	7
1.2.1 Regulatory quality*	89.6	4 ●
1.2.2 Rule of law*	92.2	14
1.2.3 Cost of redundancy dismissal, salary weeks	9.3	27
1.3 Business environment	89.1	8
1.3.1 Ease of starting a business*	94.6	15
1.3.2 Ease of resolving insolvency*	82.0	12
1.3.3 Ease of paying taxes*	90.7	10

2 Human capital & research	63.3	6
2.1 Education	59.9	22
2.1.1 Expenditure on education, % GDP	5.8	25
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	23.1	39 ○
2.1.3 School life expectancy, years	17.9	10
2.1.4 PISA scales in reading, maths, & science	499.9	21
2.1.5 Pupil-teacher ratio, secondary [Ⓢ]	15.8	69 ○
2.2 Tertiary education	60.5	5
2.2.1 Tertiary enrolment, % gross [Ⓢ]	56.5	46 ○
2.2.2 Graduates in science & engineering, %	25.2	30
2.2.3 Tertiary inbound mobility, % [Ⓢ]	18.2	7
2.3 Research & development (R&D)	69.5	10
2.3.1 Researchers, FTE/mn pop.	4,470.8	18
2.3.2 Gross expenditure on R&D, % GDP	1.7	21
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	88.0	7
2.3.4 QS university ranking, average score top 3*	96.5	2 ●

3 Infrastructure	67.1	5
3.1 Information & communication technologies (ICTs)	93.3	1 ●
3.1.1 ICT access*	92.4	3 ●
3.1.2 ICT use*	80.9	9
3.1.3 Government's online service*	100.0	1 ●
3.1.4 E-participation*	100.0	1 ●
3.2 General infrastructure	43.6	43
3.2.1 Electricity output, kWh/cap	5,155.5	38
3.2.2 Logistics performance*	92.8	8
3.2.3 Gross capital formation, % GDP	17.3	102 ○
3.3 Ecological sustainability	64.5	7
3.3.1 GDP/unit of energy use	13.9	14
3.3.2 Environmental performance*	87.4	12
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	6.6	16

4 Market sophistication	70.2	5
4.1 Credit	64.3	10
4.1.1 Ease of getting credit*	75.0	19
4.1.2 Domestic credit to private sector, % GDP	134.1	14
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	63.0	16
4.2.1 Ease of protecting minority investors*	78.3	6
4.2.2 Market capitalization, % GDP [Ⓢ]	65.0	26
4.2.3 Venture capital deals/bn PPP\$ GDP	0.2	7
4.3 Trade, competition, & market scale	83.3	5
4.3.1 Applied tariff rate, weighted mean, %	1.6	23 ○
4.3.2 Intensity of local competition [†]	83.2	3 ●
4.3.3 Domestic market scale, bn PPP\$	2,787.7	9

5 Business sophistication	52.2	13
5.1 Knowledge workers	65.0	14
5.1.1 Knowledge-intensive employment, %	47.6	8
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	1.1	18
5.1.4 GERD financed by business, %	48.4	22
5.1.5 Females employed w/advanced degrees, % total	22.2	17
5.2 Innovation linkages	48.6	10
5.2.1 University/industry research collaboration [†]	74.5	6
5.2.2 State of cluster development [†]	72.3	5
5.2.3 GERD financed by abroad, %	17.6	24
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	13
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	2.5	21
5.3 Knowledge absorption	42.9	28
5.3.1 Intellectual property payments, % total trade	1.3	21
5.3.2 High-tech imports less re-imports, % total trade	12.7	21
5.3.3 ICT services imports, % total trade	1.8	27
5.3.4 FDI net inflows, % GDP	2.0	83 ○
5.3.5 Research talent, % in business enterprise	38.2	36 ○

6 Knowledge & technology outputs	46.5	13
6.1 Knowledge creation	56.0	10
6.1.1 Patents by origin/bn PPP\$ GDP	7.4	16
6.1.2 PCT patent applications/bn PPP\$ GDP	2.0	18
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	41.6	14
6.1.5 Citable documents H index	100.0	1 ●
6.2 Knowledge impact	53.2	6
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.8	65 ○
6.2.2 New businesses/th pop. 15–64 [Ⓢ]	12.9	9
6.2.3 Computer software spending, % GDP	0.8	4 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	14.9	24
6.2.5 High- & medium-high-tech manufactures, %	0.4	25
6.3 Knowledge diffusion	30.3	38
6.3.1 Intellectual property receipts, % total trade	2.0	10
6.3.2 High-tech exports less re-exports, % total trade	9.2	21
6.3.3 ICT services exports, % total trade	3.3	24
6.3.4 FDI net outflows, % GDP	(1.5)	122 ○

7 Creative outputs	60.5	4 ●
7.1 Intangible assets	63.9	8
7.1.1 Trademarks by origin/bn PPP\$ GDP	52.7	43 ○
7.1.2 Industrial designs by origin/bn PPP\$ GDP	n/a	n/a
7.1.3 ICTs & business model creation [†]	83.8	1 ●
7.1.4 ICTs & organizational model creation [†]	81.3	2 ●
7.2 Creative goods & services	45.6	6
7.2.1 Cultural & creative services exports, % of total trade	1.0	15
7.2.2 National feature films/mn pop. 15–69	6.6	27
7.2.3 Global ent. & media market/th pop. 15–69	71.6	5
7.2.4 Printing & publishing manufactures, %	1.9	23
7.2.5 Creative goods exports, % total trade	3.6	15
7.3 Online creativity	68.7	4 ●
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	61.9	10
7.3.2 Country-code TLDs/th pop. 15–69	69.5	7
7.3.3 Wikipedia edits/mn pop. 15–69	6.9	12
7.3.4 Video uploads on YouTube/pop. 15–69	76.4	3 ●

NOTES: ● indicates a strength; ○ a weakness; * 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>.

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United States of America

Key indicators

Population (millions)	324.1
GDP (US\$ billions)	18,561.9
GDP per capita, PPP\$	55,805.2
Income group	High income
Region	Northern America

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	61.4	4
Innovation Output Sub-Index	53.9	5
Innovation Input Sub-Index	68.9	5
Innovation Efficiency Ratio	0.8	21
Global Innovation Index 2016 (out of 128)	61.4	4

1 Institutions	86.2	17
1.1 Political environment	80.3	21
1.1.1 Political stability & safety*	80.8	31
1.1.2 Government effectiveness*	79.7	20
1.2 Regulatory environment	90.4	13
1.2.1 Regulatory quality*	75.3	19
1.2.2 Rule of law*	86.3	18
1.2.3 Cost of redundancy dismissal, salary weeks	8.0	1 ●
1.3 Business environment	88.1	10
1.3.1 Ease of starting a business*	91.2	44
1.3.2 Ease of resolving insolvency*	89.2	5
1.3.3 Ease of paying taxes*	83.9	32

2 Human capital & research	57.2	13
2.1 Education	54.7	41
2.1.1 Expenditure on education, % GDP	4.9	54
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	22.7	41
2.1.3 School life expectancy, years	16.5	20
2.1.4 PISA scales in reading, maths, & science	487.6	29
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	14.8	63 ○
2.2 Tertiary education	38.1	54
2.2.1 Tertiary enrolment, % gross	85.8	9
2.2.2 Graduates in science & engineering, %	14.9	85 ○
2.2.3 Tertiary inbound mobility, %	4.6	40
2.3 Research & development (R&D)	78.8	4
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	4,232.0	20
2.3.2 Gross expenditure on R&D, % GDP	2.8	10
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	100.0	1 ●
2.3.4 QS university ranking, average score top 3*	99.0	1 ●

3 Infrastructure	61.0	21
3.1 Information & communication technologies (ICTs)	85.2	11
3.1.1 ICT access*	82.7	19
3.1.2 ICT use*	75.7	17
3.1.3 Government's online service*	92.8	9
3.1.4 E-participation*	89.8	12
3.2 General infrastructure	52.8	16
3.2.1 Electricity output, kWh/cap	13,342.4	8
3.2.2 Logistics performance*	89.2	10
3.2.3 Gross capital formation, % GDP	19.8	82 ○
3.3 Ecological sustainability	45.0	61
3.3.1 GDP/unit of energy use	7.6	76 ○
3.3.2 Environmental performance*	84.7	26
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.3	91 ○

4 Market sophistication	83.4	1 ●
4.1 Credit	85.5	1 ●
4.1.1 Ease of getting credit*	95.0	2 ●
4.1.2 Domestic credit to private sector, % GDP	188.8	3 ●
4.1.3 Microfinance gross loans, % GDP	n/a	n/a

4.2 Investment	72.2	3 ●
4.2.1 Ease of protecting minority investors*	64.7	40
4.2.2 Market capitalization, % GDP	139.0	5
4.2.3 Venture capital deals/bn PPP\$ GDP	0.4	1 ●
4.3 Trade, competition, & market scale	92.7	1 ●
4.3.1 Applied tariff rate, weighted mean, %	1.6	50
4.3.2 Intensity of local competition [†]	83.0	5
4.3.3 Domestic market scale, bn PPP\$	18,561.9	2 ●

5 Business sophistication	56.4	8
5.1 Knowledge workers	67.4	11
5.1.1 Knowledge-intensive employment, % [Ⓐ]	38.0	28
5.1.2 Firms offering formal training, % firms	n/a	n/a
5.1.3 GERD performed by business, % of GDP	2.0	7
5.1.4 GERD financed by business, %	64.2	8
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a

5.2 Innovation linkages	46.6	15
5.2.1 University/industry research collaboration [†]	76.2	4
5.2.2 State of cluster development [†]	76.0	1 ●
5.2.3 GERD financed by abroad, %	4.7	66 ○
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	17
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	5.0	13
5.3 Knowledge absorption	55.2	6
5.3.1 Intellectual property payments, % total trade	1.6	19
5.3.2 High-tech imports less re-imports, % total trade	17.7	11
5.3.3 ICT services imports, % total trade	1.3	52
5.3.4 FDI net inflows, % GDP	1.7	90 ○
5.3.5 Research talent, % in business enterprise [Ⓐ]	71.0	4

6 Knowledge & technology outputs	54.4	7
6.1 Knowledge creation	63.4	7
6.1.1 Patents by origin/bn PPP\$ GDP	16.0	6
6.1.2 PCT patent applications/bn PPP\$ GDP	3.0	14
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	19.8	38
6.1.5 Citable documents H index	100.0	1 ●
6.2 Knowledge impact	52.5	7
6.2.1 Growth rate of PPP\$ GDP/worker, %	0.7	67 ○
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	1.1	1 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	1.8	94 ○
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.4	13
6.3 Knowledge diffusion	47.3	12
6.3.1 Intellectual property receipts, % total trade	5.1	1 ●
6.3.2 High-tech exports less re-exports, % total trade	7.1	26
6.3.3 ICT services exports, % total trade	1.5	68
6.3.4 FDI net outflows, % GDP	2.1	29

7 Creative outputs	53.5	10
7.1 Intangible assets	50.1	38
7.1.1 Trademarks by origin/bn PPP\$ GDP	21.5	81 ○
7.1.2 Industrial designs by origin/bn PPP\$ GDP	1.3	54
7.1.3 ICTs & business model creation [†]	79.2	12
7.1.4 ICTs & organizational model creation [†]	82.3	1 ●
7.2 Creative goods & services	48.2	5
7.2.1 Cultural & creative services exports, % of total trade [Ⓐ]	2.0	1 ●
7.2.2 National feature films/mn pop. 15–69	3.5	53
7.2.3 Global ent. & media market/th pop. 15–69	97.1	3 ●
7.2.4 Printing & publishing manufactures, % [Ⓐ]	1.9	24
7.2.5 Creative goods exports, % total trade	1.7	31
7.3 Online creativity	65.4	7
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	100.0	1 ●
7.3.2 Country-code TLDs/th pop. 15–69	2.9	58
7.3.3 Wikipedia edits/mn pop. 15–69	6.1	41
7.3.4 Video uploads on YouTube/pop. 15–69	100.0	1 ●

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	3.4
GDP (US\$ billions)	54.4
GDP per capita, PPP\$	21,506.5
Income group	High income
Region	Latin America and the Caribbean

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	34.5	67
Innovation Output Sub-Index	25.6	64
Innovation Input Sub-Index	43.5	61
Innovation Efficiency Ratio	0.6	82
Global Innovation Index 2016 (out of 128)	34.3	62

1 Institutions 69.0 44

1.1 Political environment	71.9	37 ●
1.1.1 Political stability & safety*	87.9	14 ●
1.1.2 Government effectiveness*	56.0	42
1.2 Regulatory environment	65.5	62
1.2.1 Regulatory quality*	53.7	51
1.2.2 Rule of law*	59.1	38 ●
1.2.3 Cost of redundancy dismissal, salary weeks	20.8	86
1.3 Business environment	69.4	70
1.3.1 Ease of starting a business*	89.8	51
1.3.2 Ease of resolving insolvency*	52.3	57
1.3.3 Ease of paying taxes*	66.1	82

2 Human capital & research 33.5 57

2.1 Education	56.9	37 ●
2.1.1 Expenditure on education, % GDP [Ⓐ]	4.4	69
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years [Ⓐ]	15.5	36
2.1.4 PISA scales in reading, maths, & science	430.0	48
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	11.3	35
2.2 Tertiary education	37.1	59
2.2.1 Tertiary enrolment, % gross [Ⓐ]	63.1	38
2.2.2 Graduates in science & engineering, % [Ⓐ]	15.6	83 ○
2.2.3 Tertiary inbound mobility, %	n/a	n/a
2.3 Research & development (R&D)	6.6	69
2.3.1 Researchers, FTE/mn pop.	524.3	63
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.3	77
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	12.6	60

3 Infrastructure 52.7 43

3.1 Information & communication technologies (ICTs)	70.8	34 ●
3.1.1 ICT access*	72.5	43
3.1.2 ICT use*	62.0	35 ●
3.1.3 Government's online service*	77.5	28 ●
3.1.4 E-participation*	71.2	39
3.2 General infrastructure	32.8	85
3.2.1 Electricity output, kWh/cap	3,804.4	55
3.2.2 Logistics performance*	42.2	64
3.2.3 Gross capital formation, % GDP	20.0	81
3.3 Ecological sustainability	54.7	31 ●
3.3.1 GDP/unit of energy use	14.1	13 ●
3.3.2 Environmental performance*	74.0	61
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	3.1	32 ●

4 Market sophistication 36.5 109 ○

4.1 Credit	23.8	104 ○
4.1.1 Ease of getting credit*	60.0	55
4.1.2 Domestic credit to private sector, % GDP	30.0	98
4.1.3 Microfinance gross loans, % GDP	0.0	71 ○

4.2 Investment	31.4	104 ○
4.2.1 Ease of protecting minority investors*	45.0	98 ○
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	59
4.3 Trade, competition, & market scale	54.3	96
4.3.1 Applied tariff rate, weighted mean, %	4.8	89
4.3.2 Intensity of local competition [†]	60.6	96
4.3.3 Domestic market scale, bn PPP\$	73.9	83

5 Business sophistication 25.6 100 ○

5.1 Knowledge workers	34.0	78
5.1.1 Knowledge-intensive employment, % [Ⓐ]	21.0	69
5.1.2 Firms offering formal training, % firms [Ⓐ]	48.6	24 ●
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.0	80 ○
5.1.4 GERD financed by business, % [Ⓐ]	4.6	78 ○
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	13.7	44
5.2 Innovation linkages	21.3	94
5.2.1 University/industry research collaboration [†]	40.7	66
5.2.2 State of cluster development [†]	37.9	91
5.2.3 GERD financed by abroad, % [Ⓐ]	7.4	53
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	66
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.1	60
5.3 Knowledge absorption	21.6	117 ○
5.3.1 Intellectual property payments, % total trade	0.4	68
5.3.2 High-tech imports less re-imports, % total trade	8.4	60
5.3.3 ICT services imports, % total trade	0.4	105 ○
5.3.4 FDI net inflows, % GDP	4.0	37 ●
5.3.5 Research talent, % in business enterprise	0.9	78 ○

6 Knowledge & technology outputs 20.3 76

6.1 Knowledge creation	10.8	63
6.1.1 Patents by origin/bn PPP\$ GDP	0.4	83
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	0.6	34
6.1.4 Scientific & technical articles/bn PPP\$ GDP	13.2	56
6.1.5 Citable documents H index	9.6	65
6.2 Knowledge impact	31.3	61
6.2.1 Growth rate of PPP\$ GDP/worker, %	1.2	50
6.2.2 New businesses/th pop. 15–64 [Ⓐ]	2.5	41
6.2.3 Computer software spending, % GDP	0.2	65
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	18.0	22 ●
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.1	68
6.3 Knowledge diffusion	18.9	90
6.3.1 Intellectual property receipts, % total trade	0.0	97 ○
6.3.2 High-tech exports less re-exports, % total trade	2.3	50
6.3.3 ICT services exports, % total trade	2.6	42
6.3.4 FDI net outflows, % GDP	0.2	87

7 Creative outputs 30.9 63

7.1 Intangible assets	42.9	61
7.1.1 Trademarks by origin/bn PPP\$ GDP	50.1	49
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.1	105 ○
7.1.3 ICTs & business model creation [†]	67.6	38
7.1.4 ICTs & organizational model creation [†]	57.0	48
7.2 Creative goods & services	11.2	84
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	4.7	41
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, % [Ⓐ]	1.2	44
7.2.5 Creative goods exports, % total trade	0.1	97
7.3 Online creativity	26.5	44
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	6.4	51
7.3.2 Country-code TLDs/th pop. 15–69	10.0	39
7.3.3 Wikipedia edits/mn pop. 15–69	6.5	28 ●
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Viet Nam

Key indicators

Population (millions)	94.4
GDP (US\$ billions)	200.5
GDP per capita, PPP\$	6,024.4
Income group	Lower-middle income
Region	South East Asia, East Asia, and Oceania

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	38.3	47
Innovation Output Sub-Index	34.9	38
Innovation Input Sub-Index	41.7	71
Innovation Efficiency Ratio	0.8	10 ●
Global Innovation Index 2016 (out of 128)	35.4	59

1 Institutions	52.8	87
1.1 Political environment	54.1	59
1.1.1 Political stability & safety*	64.1	59
1.1.2 Government effectiveness*	44.1	68
1.2 Regulatory environment	48.9	103
1.2.1 Regulatory quality*	29.4	100
1.2.2 Rule of law*	31.6	74
1.2.3 Cost of redundancy dismissal, salary weeks	24.6	101
1.3 Business environment	55.4	113 ○
1.3.1 Ease of starting a business*	81.8	92
1.3.2 Ease of resolving insolvency*	35.1	105
1.3.3 Ease of paying taxes*	49.4	115 ○

2 Human capital & research	31.0	70
2.1 Education	61.2	[17]
2.1.1 Expenditure on education, % GDP	5.7	26 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years	n/a	n/a
2.1.4 PISA scales in reading, maths, & science	502.0	20
2.1.5 Pupil-teacher ratio, secondary	n/a	n/a
2.2 Tertiary education	27.8	86
2.2.1 Tertiary enrolment, % gross	28.8	82
2.2.2 Graduates in science & engineering, %	22.4	40
2.2.3 Tertiary inbound mobility, %	0.1	103 ○
2.3 Research & development (R&D)	4.1	80
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	674.8	58
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.4	73
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	42.7	77
3.1 Information & communication technologies (ICTs)	52.0	75
3.1.1 ICT access*	46.0	90
3.1.2 ICT use*	35.1	77
3.1.3 Government's online service*	57.2	72
3.1.4 E-participation*	69.5	43
3.2 General infrastructure	39.8	52
3.2.1 Electricity output, kWh/cap	1,553.1	84
3.2.2 Logistics performance*	42.2	63
3.2.3 Gross capital formation, % GDP	28.0	29 ●
3.3 Ecological sustainability	36.4	97
3.3.1 GDP/unit of energy use	7.1	84
3.3.2 Environmental performance*	58.5	102
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	2.2	47

4 Market sophistication	52.8	34
4.1 Credit	59.0	17 ●
4.1.1 Ease of getting credit*	70.0	29
4.1.2 Domestic credit to private sector, % GDP	111.9	22 ●
4.1.3 Microfinance gross loans, % GDP	3.5	12 ●

4.2 Investment	30.5	109
4.2.1 Ease of protecting minority investors*	53.3	80
4.2.2 Market capitalization, % GDP	26.8	54
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	60
4.3 Trade, competition, & market scale	68.9	41
4.3.1 Applied tariff rate, weighted mean, %	3.1	69
4.3.2 Intensity of local competition [†]	65.9	77
4.3.3 Domestic market scale, bn PPP\$	594.9	34

5 Business sophistication	29.4	73
5.1 Knowledge workers	23.3	102
5.1.1 Knowledge-intensive employment, %	10.8	94 ○
5.1.2 Firms offering formal training, % firms	22.2	69
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.2	52
5.1.4 GERD financed by business, % [Ⓐ]	40.0	36
5.1.5 Females employed w/advanced degrees, % total	7.4	72
5.2 Innovation linkages	20.8	100
5.2.1 University/industry research collaboration [†]	38.9	76
5.2.2 State of cluster development [†]	47.5	50
5.2.3 GERD financed by abroad, % [Ⓐ]	1.5	82
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.0	65
5.2.5 Patent families 2+ offices/bn PPP\$ GDP	0.0	96
5.3 Knowledge absorption	44.1	23 ●
5.3.1 Intellectual property payments, % total trade	n/a	n/a
5.3.2 High-tech imports less re-imports, % total trade	22.6	3 ●
5.3.3 ICT services imports, % total trade [Ⓐ]	0.1	123 ○
5.3.4 FDI net inflows, % GDP	5.4	26 ●
5.3.5 Research talent, % in business enterprise [Ⓐ]	21.1	54

6 Knowledge & technology outputs	35.0	28 ●
6.1 Knowledge creation	8.0	73
6.1.1 Patents by origin/bn PPP\$ GDP	1.1	61
6.1.2 PCT patent applications/bn PPP\$ GDP	0.0	100 ○
6.1.3 Utility models by origin/bn PPP\$ GDP	0.6	35
6.1.4 Scientific & technical articles/bn PPP\$ GDP	5.6	94
6.1.5 Citable documents H index	10.6	58
6.2 Knowledge impact	55.8	5 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	6.9	1 ●
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.3	39
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	7.5	48
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.3	46
6.3 Knowledge diffusion	41.4	19 ●
6.3.1 Intellectual property receipts, % total trade	n/a	n/a
6.3.2 High-tech exports less re-exports, % total trade	26.8	4 ●
6.3.3 ICT services exports, % total trade [Ⓐ]	0.1	122 ○
6.3.4 FDI net outflows, % GDP	0.8	59

7 Creative outputs	34.8	52
7.1 Intangible assets	46.2	52
7.1.1 Trademarks by origin/bn PPP\$ GDP	81.7	20 ●
7.1.2 Industrial designs by origin/bn PPP\$ GDP	3.3	33
7.1.3 ICTs & business model creation [†]	57.1	78
7.1.4 ICTs & organizational model creation [†]	54.2	61
7.2 Creative goods & services	27.4	36
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69 [Ⓐ]	0.2	98 ○
7.2.3 Global ent. & media market/th pop. 15–69	0.9	57 ○
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.7	81
7.2.5 Creative goods exports, % total trade	6.0	7 ●
7.3 Online creativity	19.3	64
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	2.6	70
7.3.2 Country-code TLDs/th pop. 15–69	2.6	60
7.3.3 Wikipedia edits/mn pop. 15–69	4.9	64
7.3.4 Video uploads on YouTube/pop. 15–69	24.3	52

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	27.5
GDP (US\$ billions)	31.3
GDP per capita, PPP\$	2,670.6
Income group	Lower-middle income
Region	Northern Africa and Western Asia

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	15.6	127
Innovation Output Sub-Index	8.9	125
Innovation Input Sub-Index	22.4	127
Innovation Efficiency Ratio	0.4	119
Global Innovation Index 2016 (out of 128)	14.6	128

1 Institutions 30.6 126

1.1 Political environment	0.0	127
1.1.1 Political stability & safety*	0.0	127
1.1.2 Government effectiveness*	0.0	127
1.2 Regulatory environment	35.1	119
1.2.1 Regulatory quality*	14.0	123
1.2.2 Rule of law*	3.2	126
1.2.3 Cost of redundancy dismissal, salary weeks	27.4	110
1.3 Business environment	56.6	110
1.3.1 Ease of starting a business*	71.6	116
1.3.2 Ease of resolving insolvency*	26.7	122
1.3.3 Ease of paying taxes*	71.6	70

2 Human capital & research 13.5 120

2.1 Education	25.4	117
2.1.1 Expenditure on education, % GDP [Ⓐ]	4.6	66
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap [Ⓐ]	12.6	89
2.1.3 School life expectancy, years [Ⓐ]	9.0	106
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	n/a	n/a
2.2 Tertiary education	15.1	109
2.2.1 Tertiary enrolment, % gross [Ⓐ]	10.0	105
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, % [Ⓐ]	4.3	43
2.3 Research & development (R&D)	0.0	115
2.3.1 Researchers, FTE/mn pop.	n/a	n/a
2.3.2 Gross expenditure on R&D, % GDP	n/a	n/a
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43
2.3.4 QS university ranking, average score top 3*	0.0	75

3 Infrastructure 16.3 126

3.1 Information & communication technologies (ICTs)	16.5	121
3.1.1 ICT access*	26.6	116
3.1.2 ICT use*	11.2	111
3.1.3 Government's online service*	14.5	119
3.1.4 E-participation*	13.6	121
3.2 General infrastructure	1.6	127
3.2.1 Electricity output, kWh/cap.	292.1	109
3.2.2 Logistics performance* [Ⓐ]	5.6	122
3.2.3 Gross capital formation, % GDP	3.2	124
3.3 Ecological sustainability	30.7	115
3.3.1 GDP/unit of energy use	12.5	23
3.3.2 Environmental performance*	n/a	n/a
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.0	125

4 Market sophistication 32.1 117

4.1 Credit	0.6	127
4.1.1 Ease of getting credit*	0.0	126
4.1.2 Domestic credit to private sector, % GDP [Ⓐ]	5.6	125
4.1.3 Microfinance gross loans, % GDP	0.0	64

4.2 Investment	43.3	[47]
4.2.1 Ease of protecting minority investors*	43.3	101
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, & market scale	52.2	100
4.3.1 Applied tariff rate, weighted mean, %	5.1	91
4.3.2 Intensity of local competition [†]	54.6	115
4.3.3 Domestic market scale, bn PPP\$	73.4	84

5 Business sophistication 19.5 123

5.1 Knowledge workers	16.9	114
5.1.1 Knowledge-intensive employment, % [Ⓐ]	15.0	87
5.1.2 Firms offering formal training, % firms	14.3	86
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total [Ⓐ]	1.6	84
5.2 Innovation linkages	19.9	108
5.2.1 University/industry research collaboration [†]	14.8	123
5.2.2 State of cluster development [†]	32.4	115
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	n/a	n/a
5.2.5 Patent families 2+ offices/bn PPP\$ GDP [Ⓐ]	0.0	110
5.3 Knowledge absorption	21.8	114
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.0	109
5.3.2 High-tech imports less re-imports, % total trade [Ⓐ]	4.5	112
5.3.3 ICT services imports, % total trade [Ⓐ]	1.4	48
5.3.4 FDI net inflows, % GDP	(0.3)	126
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs 6.8 126

6.1 Knowledge creation	1.1	124
6.1.1 Patents by origin/bn PPP\$ GDP	0.1	112
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP [Ⓐ]	0.0	63
6.1.4 Scientific & technical articles/bn PPP\$ GDP	2.8	112
6.1.5 Citable documents H index	2.0	119
6.2 Knowledge impact	0.4	127
6.2.1 Growth rate of PPP\$ GDP/worker, %	(31.1)	110
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.0	118
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.3	121
6.2.5 High- & medium-high-tech manufactures, % [Ⓐ]	0.0	102
6.3 Knowledge diffusion	18.9	91
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.4	27
6.3.2 High-tech exports less re-exports, % total trade [Ⓐ]	0.0	123
6.3.3 ICT services exports, % total trade [Ⓐ]	2.0	53
6.3.4 FDI net outflows, % GDP	0.0	102

7 Creative outputs 11.0 124

7.1 Intangible assets	18.3	123
7.1.1 Trademarks by origin/bn PPP\$ GDP	17.5	86
7.1.2 Industrial designs by origin/bn PPP\$ GDP	0.1	109
7.1.3 ICTs & business model creation [†]	29.9	123
7.1.4 ICTs & organizational model creation [†]	25.7	123
7.2 Creative goods & services	1.0	126
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	0.0	63
7.2.4 Printing & publishing manufactures, % [Ⓐ]	0.4	95
7.2.5 Creative goods exports, % total trade [Ⓐ]	0.0	124
7.3 Online creativity	6.3	107
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.4	110
7.3.2 Country-code TLDs/th pop. 15–69	0.0	122
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	2.5	104
7.3.4 Video uploads on YouTube/pop. 15–69	0.8	71

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Zambia

Key indicators

Population (millions)	16.7
GDP (US\$ billions)	20.6
GDP per capita, PPP\$	3,868.1
Income group	Lower-middle income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	20.8	124 ○
Innovation Output Sub-Index	15.5	118
Innovation Input Sub-Index	26.1	125 ○
Innovation Efficiency Ratio	0.6	79
Global Innovation Index 2016 (out of 128)	19.9	125

1 Institutions	46.9	104
1.1 Political environment	46.9	76
1.1.1 Political stability & safety*	65.9	57 ●
1.1.2 Government effectiveness*	27.9	98
1.2 Regulatory environment	23.7	124 ○
1.2.1 Regulatory quality*	31.3	96
1.2.2 Rule of law*	32.0	73
1.2.3 Cost of redundancy dismissal, salary weeks	50.6	124 ○
1.3 Business environment	70.2	65 ●
1.3.1 Ease of starting a business*	85.0	80
1.3.2 Ease of resolving insolvency*	45.4	75
1.3.3 Ease of paying taxes*	80.2	49 ●

2 Human capital & research	0.8	[127]
2.1 Education	0.0	[127]
2.1.1 Expenditure on education, % GDP [Ⓐ]	1.1	117 ○
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	n/a	n/a
2.1.3 School life expectancy, years	n/a	n/a
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary	n/a	n/a
2.2 Tertiary education	n/a	n/a
2.2.1 Tertiary enrolment, % gross	n/a	n/a
2.2.2 Graduates in science & engineering, %	n/a	n/a
2.2.3 Tertiary inbound mobility, %	n/a	n/a
2.3 Research & development (R&D)	1.6	96
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	40.9	93
2.3.2 Gross expenditure on R&D, % GDP [Ⓐ]	0.3	81
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure	26.3	116
3.1 Information & communication technologies (ICTs)	28.2	110
3.1.1 ICT access*	28.4	114
3.1.2 ICT use*	11.7	110
3.1.3 Government's online service*	37.0	101
3.1.4 E-participation*	35.6	105
3.2 General infrastructure	36.8	66 ●
3.2.1 Electricity output, kWh/cap	919.3	95
3.2.2 Logistics performance*	17.0	108
3.2.3 Gross capital formation, % GDP	31.5	14 ●
3.3 Ecological sustainability	13.9	126 ○
3.3.1 GDP/unit of energy use	5.7	96
3.3.2 Environmental performance*	n/a	n/a
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	0.4	88

4 Market sophistication	38.4	100
4.1 Credit	27.9	87
4.1.1 Ease of getting credit*	75.0	19 ●
4.1.2 Domestic credit to private sector, % GDP	19.8	112
4.1.3 Microfinance gross loans, % GDP	0.1	58

4.2 Investment	29.3	115
4.2.1 Ease of protecting minority investors*	53.3	80
4.2.2 Market capitalization, % GDP [Ⓐ]	13.6	72
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	56
4.3 Trade, competition, & market scale	58.0	79
4.3.1 Applied tariff rate, weighted mean, % [Ⓐ]	3.4	72
4.3.2 Intensity of local competition [†]	69.9	62 ●
4.3.3 Domestic market scale, bn PPP\$	65.2	88

5 Business sophistication	18.3	125 ○
5.1 Knowledge workers	15.5	116
5.1.1 Knowledge-intensive employment, % [Ⓐ]	7.3	98
5.1.2 Firms offering formal training, % firms	28.2	56
5.1.3 GERD performed by business, % of GDP [Ⓐ]	0.0	84
5.1.4 GERD financed by business, % [Ⓐ]	3.2	82
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	19.8	109
5.2.1 University/industry research collaboration [†]	41.4	58 ●
5.2.2 State of cluster development [†]	45.3	64 ●
5.2.3 GERD financed by abroad, % [Ⓐ]	1.6	79
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP [Ⓐ]	0.0	105 ○
5.2.5 Patent families 2+ offices/bn PPP\$ GDP [Ⓐ]	0.0	98
5.3 Knowledge absorption	19.6	123 ○
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.0	112 ○
5.3.2 High-tech imports less re-imports, % total trade	5.2	106
5.3.3 ICT services imports, % total trade [Ⓐ]	0.4	108
5.3.4 FDI net inflows, % GDP	6.8	18 ●
5.3.5 Research talent, % in business enterprise [Ⓐ]	4.9	74

6 Knowledge & technology outputs	16.1	95
6.1 Knowledge creation	4.7	90
6.1.1 Patents by origin/bn PPP\$ GDP [Ⓐ]	0.2	92
6.1.2 PCT patent applications/bn PPP\$ GDP	n/a	n/a
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	5.4	96
6.1.5 Citable documents H index	5.9	88
6.2 Knowledge impact	33.4	54 ●
6.2.1 Growth rate of PPP\$ GDP/worker, %	4.3	12 ●
6.2.2 New businesses/th pop. 15–64	1.3	59 ●
6.2.3 Computer software spending, % GDP	0.0	114
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	0.8	112
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	10.4	125 ○
6.3.1 Intellectual property receipts, % total trade	n/a	n/a
6.3.2 High-tech exports less re-exports, % total trade	0.6	75
6.3.3 ICT services exports, % total trade [Ⓐ]	0.3	110
6.3.4 FDI net outflows, % GDP	(1.2)	121 ○

7 Creative outputs	14.9	120 ○
7.1 Intangible assets	28.0	113
7.1.1 Trademarks by origin/bn PPP\$ GDP [Ⓐ]	8.8	106
7.1.2 Industrial designs by origin/bn PPP\$ GDP [Ⓐ]	0.5	80
7.1.3 ICTs & business model creation [†]	48.6	108
7.1.4 ICTs & organizational model creation [†]	44.0	97
7.2 Creative goods & services	1.5	[122]
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade	0.0	106
7.3 Online creativity	2.2	121 ○
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	0.0	126 ○
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	0.7	120 ○
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.

Key indicators

Population (millions)	16.0
GDP (US\$ billions)	14.2
GDP per capita, PPP\$	2,096.2
Income group	Low income
Region	Sub-Saharan Africa

	Score 0–100 or value (hard data)	Rank
Global Innovation Index (out of 127)	21.8	121
Innovation Output Sub-Index	15.6	116
Innovation Input Sub-Index	28.0	124 ○
Innovation Efficiency Ratio	0.6	89
Global Innovation Index 2016 (out of 128)	n/a	n/a

1 Institutions 35.7 125 ○

1.1 Political environment	31.3	114
1.1.1 Political stability & safety*	49.8	93
1.1.2 Government effectiveness*	12.7	124 ○
1.2 Regulatory environment	32.9	121
1.2.1 Regulatory quality*	0.0	127 ○
1.2.2 Rule of law*	0.0	127 ○
1.2.3 Cost of redundancy dismissal, salary weeks	25.3	102
1.3 Business environment	42.9	126 ○
1.3.1 Ease of starting a business*	49.1	127 ○
1.3.2 Ease of resolving insolvency*	28.5	118
1.3.3 Ease of paying taxes*	51.2	112

2 Human capital & research 28.7 79

2.1 Education	54.5	42 ●
2.1.1 Expenditure on education, % GDP	8.4	3 ●
2.1.2 Gov't expenditure/pupil, secondary, % GDP/cap	35.1	10 ●
2.1.3 School life expectancy, years [Ⓐ]	10.3	101
2.1.4 PISA scales in reading, maths, & science	n/a	n/a
2.1.5 Pupil-teacher ratio, secondary [Ⓐ]	22.5	89
2.2 Tertiary education	31.3	77
2.2.1 Tertiary enrolment, % gross	8.4	109
2.2.2 Graduates in science & engineering, %	29.4	9 ●
2.2.3 Tertiary inbound mobility, %	0.5	91
2.3 Research & development (R&D)	0.3	111
2.3.1 Researchers, FTE/mn pop. [Ⓐ]	89.6	86
2.3.2 Gross expenditure on R&D, % GDP	n/a	n/a
2.3.3 Global R&D companies, avg. expend. top 3, mn \$US	0.0	43 ○
2.3.4 QS university ranking, average score top 3*	0.0	75 ○

3 Infrastructure 15.5 127 ○

3.1 Information & communication technologies (ICTs)	26.9	111
3.1.1 ICT access*	33.5	105
3.1.2 ICT use*	19.1	100
3.1.3 Government's online service*	26.1	111
3.1.4 E-participation*	28.8	107
3.2 General infrastructure	13.1	125 ○
3.2.1 Electricity output, kWh/cap	657.2	101
3.2.2 Logistics performance*	0.9	126 ○
3.2.3 Gross capital formation, % GDP	14.2	115
3.3 Ecological sustainability	6.4	127 ○
3.3.1 GDP/unit of energy use	2.3	117 ○
3.3.2 Environmental performance*	n/a	n/a
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.0	63

4 Market sophistication 37.2 105

4.1 Credit	25.1	98
4.1.1 Ease of getting credit*	50.0	72
4.1.2 Domestic credit to private sector, % GDP	n/a	n/a
4.1.3 Microfinance gross loans, % GDP	0.0	69

4.2 Investment	38.1	75
4.2.1 Ease of protecting minority investors*	51.7	86
4.2.2 Market capitalization, % GDP	n/a	n/a
4.2.3 Venture capital deals/bn PPP\$ GDP	0.0	36 ●
4.3 Trade, competition, & market scale	48.4	108
4.3.1 Applied tariff rate, weighted mean, %	5.4	95
4.3.2 Intensity of local competition [†]	63.6	85
4.3.3 Domestic market scale, bn PPP\$	28.3	110

5 Business sophistication 22.8 114

5.1 Knowledge workers	23.1	[104]
5.1.1 Knowledge-intensive employment, % [Ⓐ]	6.1	100
5.1.2 Firms offering formal training, % firms [Ⓐ]	31.2	49
5.1.3 GERD performed by business, % of GDP	n/a	n/a
5.1.4 GERD financed by business, %	n/a	n/a
5.1.5 Females employed w/advanced degrees, % total	n/a	n/a
5.2 Innovation linkages	20.2	106
5.2.1 University/industry research collaboration [†]	25.0	118
5.2.2 State of cluster development [†]	28.4	122 ○
5.2.3 GERD financed by abroad, %	n/a	n/a
5.2.4 JV-strategic alliance deals/bn PPP\$ GDP	0.1	28 ●
5.2.5 Patent families 2+ offices/bn PPP\$ GDP [Ⓐ]	0.1	71
5.3 Knowledge absorption	25.2	97
5.3.1 Intellectual property payments, % total trade [Ⓐ]	0.3	71
5.3.2 High-tech imports less re-imports, % total trade [Ⓐ]	8.4	61 ●
5.3.3 ICT services imports, % total trade [Ⓐ]	0.2	118
5.3.4 FDI net inflows, % GDP	3.0	58 ●
5.3.5 Research talent, % in business enterprise	n/a	n/a

6 Knowledge & technology outputs 14.0 110

6.1 Knowledge creation	7.6	76
6.1.1 Patents by origin/bn PPP\$ GDP	0.3	84
6.1.2 PCT patent applications/bn PPP\$ GDP	0.1	69
6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
6.1.4 Scientific & technical articles/bn PPP\$ GDP	15.6	49 ●
6.1.5 Citable documents H index	6.5	84
6.2 Knowledge impact	21.1	104
6.2.1 Growth rate of PPP\$ GDP/worker, %	(2.4)	103
6.2.2 New businesses/th pop. 15–64	n/a	n/a
6.2.3 Computer software spending, % GDP	0.4	24 ●
6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	4.6	63 ●
6.2.5 High- & medium-high-tech manufactures, %	n/a	n/a
6.3 Knowledge diffusion	13.3	120
6.3.1 Intellectual property receipts, % total trade [Ⓐ]	0.0	78
6.3.2 High-tech exports less re-exports, % total trade [Ⓐ]	0.2	98
6.3.3 ICT services exports, % total trade [Ⓐ]	0.0	125 ○
6.3.4 FDI net outflows, % GDP	0.3	77

7 Creative outputs 17.2 113

7.1 Intangible assets	28.2	112
7.1.1 Trademarks by origin/bn PPP\$ GDP	10.2	103
7.1.2 Industrial designs by origin/bn PPP\$ GDP	n/a	n/a
7.1.3 ICTs & business model creation [†]	46.6	113
7.1.4 ICTs & organizational model creation [†]	33.2	117
7.2 Creative goods & services	8.4	[95]
7.2.1 Cultural & creative services exports, % of total trade	n/a	n/a
7.2.2 National feature films/mn pop. 15–69	n/a	n/a
7.2.3 Global ent. & media market/th pop. 15–69	n/a	n/a
7.2.4 Printing & publishing manufactures, %	n/a	n/a
7.2.5 Creative goods exports, % total trade [Ⓐ]	0.3	70
7.3 Online creativity	4.1	113
7.3.1 Generic top-level domains (TLDs)/th pop. 15–69	0.4	109
7.3.2 Country-code TLDs/th pop. 15–69	0.1	114
7.3.3 Wikipedia edits/mn pop. 15–69 [Ⓐ]	1.2	113
7.3.4 Video uploads on YouTube/pop. 15–69	n/a	n/a

NOTES: ● indicates a strength; ○ a weakness; * 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 page 181 of this appendix for details.