

Appendix B

Methodology of the TTCI 2019

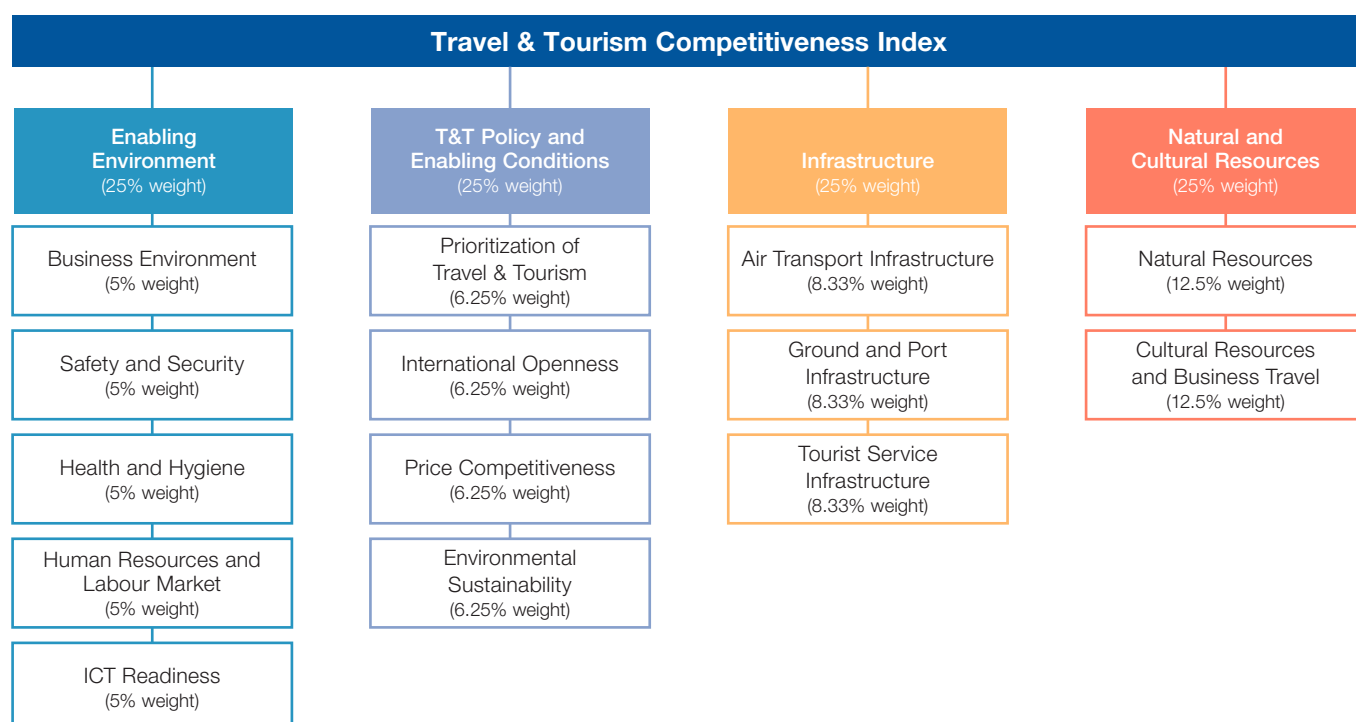
This section provides details about the methodology of the 2019 edition of the Travel & Tourism Competitiveness Index (TTCI). It is composed of the following parts:

- **Composition and Calculation:** An overview of the index composition and calculation methodology.
- **Imputations:** An overview of imputations for missing indicator values.
- **Indicator Changes and Comparability:** An explanation of key changes in indicators from the 2017 edition of the TTCI.
- **Exclusion Filters:** An overview of indicators that include filters that exclude economy values and the economies impacted by them.

Composition and Calculation

The TTCI structure (see table below) is composed of 14 pillars organized into four subindexes: **A) Enabling Environment** (5 pillars): 1. Business Environment, 2. Safety and Security, 3. Health and Hygiene, 4. Human Resources and Labour Market, 5. ICT Readiness; **B) T&T Policy and Enabling Conditions** (4 pillars): 6. Prioritization of Travel & Tourism, 7. International Openness, 8. Price Competitiveness, 9. Environmental Sustainability; **C) Infrastructure** (3 pillars): 10. Air Transport Infrastructure, 11. Ground and Port Infrastructure, 12. Tourist Service Infrastructure; and **D) Natural and Cultural Resources** (2 pillars): 13. Natural Resources and 14. Cultural Resources and Business Travel.

Figure B1: Composition of the TTCI 2019



These 14 pillars are comprised of 90 indicators that are calculated on the basis of data derived from the Executive Opinion Survey (Survey) as well as quantitative data from other sources. The survey data is derived from responses to the World Economic Forum's Executive Opinion Survey and ranges in value from 1 (worst) to 7 (best).

Hard data (non-survey data) was collected from various sources, which are described in the Data Definitions and Sources section in Appendix C. All the data used in the calculation of the TTCI can be found by visiting the online version of the *Travel & Tourism Competitiveness Report 2019* online (<http://reports.weforum.org/ttcr>).

The TTCI is calculated as an average (arithmetic mean) of the four component subindexes, which are themselves calculated as averages (arithmetic means) of their pillars. Each of the pillars is calculated as an un-weighted average of the individual component variables. Note that the Human Resources and Labour Market pillar is the un-weighted average of its two subpillars: Qualification of the labour force and Labour market.

The number of pillars per subindex decreases as the subindex becomes more directly linked to travel and tourism. As a result, pillar weights increase. For instance, Tourist Service Infrastructure (pillar 12) has a higher weight than Business Environment (pillar 1) because such infrastructure is most relevant to the travel & tourism industry; while the data captured in the Business Environment pillar represents a broader set of factors that influence business and services in the country.

Hard data indicators used in the TTCI are normalized to a 1-to-7 scale in order to align them with the Executive Opinion Survey's results. The standard formula for converting each hard data indicator to the 1-to-7 scale is:

$$6 \times \left(\frac{\text{country score} - \text{sample minimum}}{\text{sample maximum} - \text{sample minimum}} \right) + 1$$

The *sample minimum* and *sample maximum* are the lowest and highest scores of the overall sample, respectively. For those hard data indicators for which a higher value indicates a worse outcome (e.g. fuel price levels), we rely on a normalization formula that, in addition to converting the series to a 1-to-7 scale, reverses it, so that 1 and 7 still correspond to the worst and best, respectively:

$$-6 \times \left(\frac{\text{country score} - \text{sample minimum}}{\text{sample maximum} - \text{sample minimum}} \right) + 7$$

In some instances, adjustments were made to account for extreme outliers in the data.

Indicator List

The indicators that make up each pillar—and subpillar, if available—are described below. An asterisk identifies indicators *not derived* from the Executive Opinion Survey.

Subindex A: Enabling Environment

Pillar 1: Business Environment

- 1.01 Property rights
- 1.02 Impact of rules on FDI
- 1.03 Efficiency of legal framework in settling disputes¹
- 1.04 Efficiency of legal framework in challenging regulations¹
- 1.05 Time required to deal with construction permits¹
- 1.06 Cost to deal with construction permits¹
- 1.07 Extent of market dominance
- 1.08 Time required to start a business¹
- 1.09 Cost to start a business¹
- 1.10 Extent and effect of taxation on incentives to work¹
- 1.11 Extent and effect of taxation on incentives to invest¹
- 1.12 Total tax rate*

Pillar 2: Safety and Security

- 2.01 Business costs of crime and violence
- 2.02 Reliability of police services
- 2.03 Business costs of terrorism
- 2.04 Index of terrorism incidence*
- 2.05 Homicide rate*

Pillar 3: Health and Hygiene

- 3.01 Physician density*
- 3.02 Use of basic sanitation¹
- 3.03 Use of basic drinking water¹
- 3.04 Hospital beds*
- 3.05 HIV prevalence*
- 3.06 Malaria incidence*

Pillar 4: Human Resources and Labour Market

Qualification of the labour force

- 4.01 Primary education enrolment rate*
- 4.02 Secondary education enrolment rate*
- 4.03 Extent of staff training
- 4.04 Treatment of customers

Labour market

- 4.05 Hiring and firing practices
- 4.06 Ease of finding skilled employees
- 4.07 Ease of hiring foreign labour
- 4.08 Pay and productivity
- 4.09 Female labour force participation*

Pillar 5: ICT Readiness

- 5.01 ICT use for business-to-business transactions¹
- 5.02 Internet use for business-to-consumer transactions¹
- 5.03 Individuals using the internet*
- 5.04 Broadband internet subscribers*
- 5.05 Mobile telephone subscriptions*
- 5.06 Mobile broadband subscriptions*
- 5.07 Mobile network coverage*
- 5.08 Quality of electricity supply

Subindex B: T&T Policy and Enabling Conditions

Pillar 6: Prioritization of Travel & Tourism

- 6.01 Government prioritization of the T&T industry
- 6.02 T&T government expenditure*
- 6.03 Effectiveness of marketing to attract tourists
- 6.04 Comprehensiveness of annual T&T data*¹
- 6.05 Timeliness of providing monthly/quarterly T&T data*¹
- 6.06 Country Brand Strategy rating*

Pillar 7: International Openness

- 7.01 Visa requirements*
- 7.02 Openness of bilateral Air Service Agreements*
- 7.03 Number of regional trade agreements in force*

Pillar 8: Price Competitiveness

- 8.01 Ticket taxes and airport charges*
- 8.02 Hotel price index*
- 8.03 Purchasing power parity*
- 8.04 Fuel price levels*

Pillar 9: Environmental Sustainability

- 9.01 Stringency of environmental regulations¹
- 9.02 Enforcement of environmental regulations¹
- 9.03 Sustainability of travel and tourism industry development
- 9.04 Particulate matter (2.5) concentration*
- 9.05 Number of environmental treaty ratifications*
- 9.06 Baseline water stress*
- 9.07 Threatened species*
- 9.08 Forest cover change*³
- 9.09 Wastewater treatment*
- 9.10 Fish stock status*³

Subindex C: Infrastructure

Pillar 10: Air Transport Infrastructure

- 10.01 Quality of air transport infrastructure
- 10.02 Available seat kilometres, domestic*²
- 10.03 Available seat kilometres, international*²
- 10.04 Aircraft departures*³
- 10.05 Airport density*
- 10.06 Number of operating airlines*

Pillar 11: Ground and Port Infrastructure

- 11.01 Quality of roads
- 11.02 Road density*¹
- 11.03 Paved road density*¹
- 11.04 Quality of railroad infrastructure^{1,3}
- 11.05 Railroad density*^{1,3}
- 11.06 Quality of port infrastructure
- 11.07 Ground transport efficiency

Pillar 12: Tourist Service Infrastructure

- 12.01 Hotel rooms*
- 12.02 Quality of tourism infrastructure
- 12.03 Presence of major car rental companies*
- 12.04 Automated teller machines per adult population*

Subindex D: Natural and Cultural Resources

Pillar 13: Natural Resources

- 13.01 Number of World Heritage natural sites*
- 13.02 Total known species*
- 13.03 Total protected areas*
- 13.04 Natural tourism digital demand*
- 13.05 Attractiveness of natural assets

Pillar 14: Cultural Resources and Business Travel

- 14.01 Number of World Heritage cultural sites*²
- 14.02 Number of oral and intangible cultural heritage expressions*²
- 14.03 Number of sports stadiums*
- 14.04 Number of international association meetings*
- 14.05 Cultural and entertainment tourism digital demand*

Notes

- 1 These indicators are combined applying a simple average aggregation to form one single indicator. Consequently, they are implicitly weighted by a factor of 0.5.
- 2 Indicators 10.02, *Available seat kilometers, domestic*, and 10.03, *Available seat kilometers, international*, are summed to form a single indicator. Similarly, indicators 14.01, *Number of World Heritage cultural sites*, and 14.02, *Number of oral and intangible cultural heritage expressions*, are summed to form a single indicator.
- 3 Indicators 9.08, *Forest cover change*, 9.10, *Fish stock status*, 10.04, *Aircraft departures*, 11.04, *Quality of railroad infrastructure*, and 11.05, *Railroad density*, are subject to exclusion filters (see Exclusions Filters section on page 90).

Imputation

In order to present a more accurate representation of current conditions for the 2019 TTCI, values older than 2008 are imputed for the purpose of the calculation. The table below presents the imputation method and the imputed values by indicator. Note that in the Regional Profiles, rankings tables and other parts of the report that present raw indicator data, imputed values are not shown.

Table B1: TTCI 2019 imputation methodology and imputation values

Indicator	Imputation method	Economy	Imputed value
3.04 Hospital beds	Growth rate of peer group average applied to the latest country data. Peer group is based on region and income level defined by the World Bank and World Economic Forum.	Angola	7.89
		Congo, Democratic Rep.	5.76
		Lesotho	17.11
		Mauritania	5.26
		Nigeria	5.00
		Sierra Leone	2.88
4.01 Primary education enrolment rate	Imputed value from <i>The Global Competitiveness Report 2017-2018</i> ; see Appendix D of that report.	Haiti	86.69
9.09 Wastewater treatment	2018 Environmental Protection Index imputation method. For further detail, see https://epi.envirocenter.yale.edu/downloads/epi2018technicalappendixv05.pdf .	Brunei Darussalam	0.38
		Seychelles	0.10
9.10 Fish stock status	Peer group mean. Group is "Eastern Asia-Pacific" as defined by World Economic Forum.	Hong Kong SAR	36.35
	2018 Environmental Protection Index imputation method. For further detail, see https://epi.envirocenter.yale.edu/downloads/epi2018technicalappendixv05.pdf .	Albania	41.11
		Bahrain	26.64
		Belgium	35.90
		Benin	23.05
		Bulgaria	41.11
		Cameroon	23.05
		Côte d'Ivoire	23.05
		Gambia, The	23.05
		Georgia	41.11
		Israel	26.64
		Kuwait	26.64
		Lebanon	26.64
		Lithuania	41.11
		Montenegro	41.11
		Qatar	26.64
		Romania	41.11
		Singapore	28.22
10.04 Aircraft departures	Eurostat economy air flight departure figures market share growth rates applied to available registered departure figures for Scandinavia (defined by the source as Denmark, Norway and Sweden).	Denmark	18.68
		Norway	56.55
		Sweden	22.81
	Linear regression forecast.	Eswatini	2.83
11.02 Road density	Estimate based on 2004 to 2016 motorway, highway, main, national, regional and secondary road growth.	Luxembourg	
		Italy	
	Linear regression forecast.	Côte d'Ivoire	
		Yemen, Rep.	
		Liberia	
		Albania	
		Sierra Leone	
		Eswatini	
	Mean growth rate of peer group. Peer group is based on region defined by World Economic Forum economies with poor time series were excluded from peer group).	Rwanda	
		Tajikistan	
		Zambia	

(continued on next page)

Table B1: TTCI 2019 imputation methodology and imputed values *(continued)*

Indicator	Imputation method	Economy	Imputed value
11.03 Paved road density	Linear regression forecast.	Albania	Data redacted due to an agreement with the data provider.
		Armenia	
		Chad	
		Colombia	
		Greece	
		Italy	
		Kuwait	
		Kyrgyz Republic	
		Liberia	
		Luxembourg	
		Qatar	
		Venezuela	
		Yemen	
		Zambia	
		Zimbabwe	
	Mean growth rate of peer group. Peer group is based on region defined by World Economic Forum (countries with insufficient time series were excluded from peer group).	Portugal Tajikistan	
12.01 Hotel rooms	Linear regression forecast.	Canada	1.27
		Haiti	0.03
		Malawi	0.17
		Mauritania	0.16
		Tajikistan	0.01
		Liberia	0.10

Indicator Changes and Comparability

As part of the constant refinement of the TTCI, indicators that are no longer being published, have been replaced by the source, or have had a significant change in methodology have been swapped out. Moreover, please note that even for indicators that have not been replaced, source data revisions can occur. Therefore, while efforts were made to keep TTCI results comparable from one edition to the next, refinement in indicators and data revisions could cause shifts in ranking and scores that are not due to actual performance.

Below are details of the changes for 2019:

- TTCI 2017 indicator 3.02, *Access to improved sanitation*, has been replaced by 3.02, *Use of basic sanitation*. The indicator has been changed because the World Health Organization no longer publishes the former and instead publishes the latter.
- TTCI 2017 indicator 3.03, *Access to improved drinking water*, has been replaced by 3.03, *Use of basic drinking water*. The indicator has been changed because the World Health Organization no longer publishes the former and instead publishes the latter.
- TTCI 2017 indicator 9.10, *Coastal shelf fishing pressure*, has been replaced by 9.10, *Fish stock status*. The indicator has been changed because the Environmental Protection Index has not used it since the 2014 edition, and has replaced it with the fish stock status. We also believe the new indicator is a better measure of marine environmental sustainability.
- Indicator 13.03, *Total protected areas*, was based on 2014 data in the 2017 edition of the TTCI. In subsequent years, the World Database on Protected Areas (WDPA) has updated and revised data standards. Some of these changes have led to substantial changes in indicator results, especially for marine protected areas. Therefore, because TTCI 2019 uses more updated data (mostly from 2017), comparability with previous figures are more difficult to make. For more information please visit: <https://www.protectedplanet.net/>.

Exclusion Filters

Certain indicators are subject to exclusion filters, which will lead to an “n/a” value even if there had been historical underlying data.

Table B2: Exclusion filters

Indicator	Exclusion filter	Affected economies	
9.08 Forest cover change	An economy will receive an “n/a” value if it meets the 2018 Environmental Protection Index criteria for “lack of forest”, defined as total forested ($\geq 30\%$ canopy cover) area < 200 km ² and does not have underlying raw data. For further detail, see https://epi.envirocenter.yale.edu/downloads/epi2018technicalappendixv05.pdf .	Bahrain Iceland Kuwait Oman	Qatar Saudi Arabia United Arab Emirates Yemen
9.10 Fish stock status	An economy will receive an “n/a” value if it meets the 2018 Environmental Protection Index criteria for “lack of sea”, defined as landlocked or coastline land area ratio < 0.01 and does not have underlying raw data. For further detail, see https://epi.envirocenter.yale.edu/downloads/epi2018technicalappendixv05.pdf .	Armenia Austria Azerbaijan Bolivia Bosnia and Herzegovina Botswana Burkina Faso Burundi Chad Congo, Democratic Rep. Czech Republic Ethiopia Hungary Jordan Kazakhstan Kyrgyz Republic Lao PDR Lesotho	Luxembourg North Macedonia Malawi Mali Moldova Mongolia Nepal Paraguay Rwanda Serbia Slovak Republic Slovenia Eswatini Switzerland Tajikistan Uganda Zambia Zimbabwe
10.04 Aircraft departures	An economy will receive an “n/a” value if it does not have a registered airline at the time of the World Economic Forum’s research on registration (11/06/2019).	Guinea Lesotho Liberia	Mali North Macedonia Sierra Leone
11.04 Quality of railroad infrastructure and 11.05 Railroad density	An economy will receive an “n/a” value if it does not have an operational railroad service at the time of the World Economic Forum’s research (20/05/2019).	Bahrain Brunei Darussalam Burundi Cape Verde Chad Costa Rica Cyprus Dominican Republic Ecuador El Salvador Gambia, The Guatemala Guinea Haiti Honduras Iceland Jamaica Kuwait	Lao PDR Lebanon Lesotho Liberia Malta Mauritius Nepal Nicaragua Oman Paraguay Qatar Rwanda Seychelles Sierra Leone Trinidad and Tobago United Arab Emirates Yemen

Appendix C

Data Definitions and Sources

This section complements the data tables by providing full descriptions and sources of all the indicators used for the calculation of the Travel & Tourism Competitiveness Index 2019 (TTCI).

The number of the indicator corresponds to the number of the data table that shows the ranks and scores for all countries/economies on this particular indicator. The data used in this report includes data derived from the Executive Opinion Survey as well as statistical data from other organizations. In the case of indicators derived from the Executive Opinion Survey (the Survey), the full question and associated answers are provided. For more details on Survey indicators, refer to Appendix B of *The Global Competitiveness Report 2018*.

For indicators sourced from other organizations or national sources, because of space limitations it is not possible to reproduce in this report all the additional information associated with specific data points. The data used in the computation of the TTCI 2019 represents the most recent and/or best data available at the time when it was collected. It is possible that data was updated or revised subsequently. Throughout the statistical tables in this publication, “n/a” denotes that the value is not available.

PILLAR 1: BUSINESS ENVIRONMENT

1.01 Property rights

Response to the survey question “In your country, how strong is the protection of property rights, including financial assets?” [1 = extremely weak, 7 = extremely strong] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

1.02 Impact of rules on FDI

Response to the survey question “In your country, how restrictive are rules and regulations on foreign direct investment (FDI)?” [1 = extremely restrictive, 7 = not restrictive at all] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

1.03 Efficiency of legal framework in settling disputes

Response to the survey question “In your country, how efficient are the legal and judicial systems for companies in settling disputes?” [1 = extremely inefficient, 7 = extremely efficient] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

1.04 Efficiency of legal framework in challenging regulations

Response to the survey question “In your country, how easy is it for private businesses to challenge government actions and/or regulations through the legal system?” [1 = extremely difficult, 7 = extremely easy] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

1.05 Time required to deal with construction permits

Total number of days required to deal with procedures necessary to build a warehouse | 2018

This indicator measures the median duration (in number of days) that local experts indicate is necessary in practice for a business to build a warehouse. The duration takes into account the following procedures: obtaining and submitting all relevant project-specific documents (for example, building plans, site maps and certificates of urbanism) to the authorities; hiring external third-party supervisors, engineers or inspectors; obtaining all necessary clearances, licenses, permits and certificates; submitting all required notifications; and requesting and receiving all necessary inspections as well as all procedures for obtaining connections for water and sewerage. For further details, visit <http://www.doingbusiness.org/en/methodology>.

Source: World Bank, *Doing Business 2019: Training for Reform*.

1.06 Cost to deal with construction permits

Cost is recorded as a percentage of the warehouse value | 2018

This indicator measures the cost associated with the procedures necessary for a business to build a warehouse (respect to its value). This cost is related to the following procedures: obtaining and submitting all relevant project-specific documents (for example, building plans, site maps and certificates of urbanism) to the authorities; hiring external third-party supervisors, engineers or inspectors; obtaining all necessary clearances, licenses, permits and certificates; submitting all required notifications; and requesting and receiving all necessary inspections as well as all procedures for obtaining connections for water and sewerage. For further details, visit <http://www.doingbusiness.org/en/methodology>.

Source: World Bank, *Doing Business 2019: Training for Reform*.

1.07 Extent of market dominance

Response to the survey question “In your country, how do you characterize corporate activity?” [1 = dominated by a few business groups, 7 = spread among many firms] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

1.08 Time required to start a business**Number of days required to start a business | 2018**

This indicator measures the median duration that incorporation lawyers indicate is necessary to complete a procedure with minimum follow-up with government agencies and no unofficial payments. For further details, visit <http://www.doingbusiness.org/en/methodology>.

Source: World Bank, *Doing Business 2019: Training for Reform*.

1.09 Cost to start a business**Cost to start a business as a percentage of the economy's income (GNI) per capita | 2018**

This indicator measures all official fees and fees for legal or professional services if such services are required by law or commonly used in practice. For further details, visit <http://www.doingbusiness.org/en/methodology>.

Source: World Bank, *Doing Business 2019: Training for Reform*.

1.10 Extent and effect of taxation on incentives to work

Response to the survey question "In your country, to what extent do taxes and social contributions reduce the incentive to work?" [1 = to a great extent, 7 = not at all] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

1.11 Extent and effect of taxation on incentives to invest

Response to the survey question "In your country, to what extent do taxes reduce the incentive to invest?" [1 = to a great extent, 7 = not at all] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

1.12 Total tax rate**A combination of profit tax, labour tax and contribution and other taxes (% of profits) | 2018**

The total tax rate measures the amount of taxes and mandatory contributions payable by a medium-size company, expressed as a share of commercial profits. The total amount of taxes is the sum of five different types of taxes and contributions payable after accounting for deductions and exemptions: profit or corporate income tax, social contributions and labour taxes paid by the employer (for which all mandatory contributions are included, even if paid to a private entity such as a required pension fund), property taxes, turnover taxes and other taxes (such as municipal fees and vehicle taxes). For more details about the methodology employed and the assumptions made to compute this indicator, visit <http://www.doingbusiness.org/en/methodology>.

Source: World Bank, *Doing Business 2019: Training for Reform*.

1.12a Labour and contributions tax rate**Amount of taxes and mandatory contributions on labour paid by the business as a percentage of commercial profits | 2018**

Source: World Bank, *Doing Business 2019: Training for Reform*.

1.12b Profit tax rate**Amount of taxes on profits paid by the business as a percentage of commercial profit | 2018**

Source: World Bank, *Doing Business 2019: Training for Reform*.

1.12c Other taxes rate**Amount of taxes and mandatory contributions paid by the business as a percentage of commercial profit that are not already included in the categories of profit or labour taxes | 2018**

Source: World Bank, *Doing Business 2019: Training for Reform*.

PILLAR 2: SAFETY AND SECURITY

2.01 Business costs of crime and violence

Response to the survey question "In your country, to what extent does the incidence of crime and violence impose costs on businesses?" [1 = to a great extent, imposes huge costs; 7 = no costs at all] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

2.02 Reliability of police services

Response to the survey question "In your country, to what extent can police services be relied upon to enforce law and order?" [1 = not at all, 7 = to a great extent] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

2.03 Business costs of terrorism

Response to the survey question "In your country, to what extent does the threat of terrorism impose costs on businesses?" [1 = to a great extent, imposes huge costs; 7 = no costs at all] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

2.04 Index of terrorism incidence

Simple average of the number of terrorism-related casualties (injuries and fatalities) and the number of terrorist attacks, each normalized on a scale of 1 to 7 | 2013–2017 total

This index has been created on the basis of data contained in the START Database (National Consortium for the Study of Terrorism and Responses to Terrorism). It is the average of the total number of "terrorism attacks" during the 2013–2017 period and the total number of "terrorism casualties" (fatalities plus injured people) over the same period. Prior to aggregation, both totals were transformed on a scale ranging from 1 (most attacks/casualties) to 7 (no attack/casualty) using a min-max formula. On both measures, economies whose terrorism incidence is above the 95th percentile are assigned a transformed score of 1.

Source: World Economic Forum's calculations based on National Consortium for the Study of Terrorism and Responses to Terrorism (START), *Global Terrorism Database*, <https://www.start.umd.edu/gtd>.

2.05 Homicide rate**Number of homicide cases per 100,000 population | 2016 or most recent**

The United Nations Office on Drugs and Crime (UNODC) collects statistics on homicide occurrences worldwide, pooling information from national sources as well as other international institutions such as Interpol, Eurostat, the Organization of American States, UNICEF and the World Health Organization (WHO).

Note: Higher value means worse outcome.

Source: United Nations Office on Drugs and Crime (UNODC).

PILLAR 3: HEALTH AND HYGIENE

3.01 Physician density**Physician density per 1,000 population | 2016 or most recent**

This indicator measures the number of physicians in the country per 1,000 population. Physicians include generalist medical practitioners and specialist medical practitioners.

Sources: The World Bank, *World Development Indicators* database (accessed May 2019) and The World Health Organization, *Global Health Observatory Data Repository*.

3.02 Use of basic sanitation

People using at least basic sanitation services as a percentage of total population | 2015 or most recent

The percentage of people using at least basic sanitation services; that is, improved sanitation facilities that are not shared with other households. This indicator encompasses both people using basic sanitation services as well as those using safely managed sanitation services. Improved sanitation facilities include flush/pour flush to piped sewer systems, septic tanks or pit latrines; ventilated improved pit latrines, composting toilets; or pit latrines with slabs.

Source: The World Bank, *World Development Indicators* database (accessed May 2019).

3.03 Use of basic drinking water

People using at least basic drinking water services as a percentage of total population | 2015 or most recent

The percentage of people using at least basic water services. This indicator encompasses both people using basic water services as well as those using safely managed water services. Basic drinking water services is defined as drinking water from an improved source, provided collection time is not more than 30 minutes for a round trip. Improved water sources include piped water, boreholes or tubewells, protected dug wells, protected springs, and packaged or delivered water.

Source: The World Bank, *World Development Indicators* database (accessed May 2019).

3.04 Hospital beds

Hospital beds per 10,000 population | 2013 or most recent

Hospital beds include inpatient beds available in public, private, general and specialized hospitals and rehabilitation centres. In most cases, beds for both acute and chronic care are included.

Source: The World Bank, *World Development Indicators* database (accessed May 2019).

3.05 HIV prevalence

HIV prevalence as a percentage of adults aged 15–49 years | 2017 or most recent

HIV prevalence refers to the percentage of people aged 15–49 who are infected with HIV at a particular point in time, no matter when infection occurred.

Source: Joint United Nations Programme on HIV and AIDS (UNAIDS), *AIDSINFO* database.

3.06 Malaria incidence

Estimated number of malaria cases per 100,000 population | 2017 or most recent

This indicator refers to the estimated number of new cases of malaria in the economy per 100,000 population. M.F. and S.L. indicate respectively that the World Health Organization (WHO) has declared the area malaria-free (M.F.) or that it has included it in the supplementary list (S.L.) of areas where malaria has never existed or has disappeared without specific measures. Hong Kong SAR and Taiwan, China have been considered malaria-free (M.F.) following the assessment by the United States Centers for Disease Control and Prevention (CDC).

Sources: The World Health Organization, *World Malaria Report*, 2018 edition, and the United States Centers for Disease Control and Prevention (CDC), *Yellow Book 2018*. In the Country/Economy profiles of these economies, the following abbreviations are used: *M.F.*, for malaria-free economies; *P.R.* indicates prevention of reintroduction phase; and *S.L.* means the economy is on the WHO's supplementary list.

PILLAR 4: HUMAN RESOURCES AND LABOUR MARKET**4.01 Primary education enrolment rate**

Net primary education enrolment rate | 2017 or most recent

The reported value corresponds to the ratio of children of official school age (as defined by the national education system) who are enrolled in school to the population of the corresponding official school age. Primary education (ISCED level 1) provides children with basic reading, writing and mathematics skills along with an elementary understanding of such subjects as history, geography, natural science, social science, art and music.

Sources: UNESCO Institute for Statistics, Data Centre (accessed March 2019).

4.02 Secondary education enrolment rate

Gross secondary education enrolment rate | 2017 or most recent

The reported value corresponds to the ratio of total secondary enrolment, regardless of age, to the population of the age group that officially corresponds to the secondary education level. Secondary education (ISCED levels 2 and 3) completes the provision of basic education that began at the primary level and aims to lay the foundations for lifelong learning and human development by offering more subject- or skills-oriented instruction using more specialized teachers.

Sources: UNESCO Institute for Statistics, Data Centre (accessed January 2019).

4.03 Extent of staff training

Response to the survey question "In your country, to what extent do companies invest in training and employee development?" [1 = not at all, 7 = to a great extent] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

4.04 Treatment of customers

Response to the survey question "In your country, how well do companies treat customers?" [1 = poorly - mostly indifferent to customer satisfaction; 7 = extremely well - highly responsive to customers and seek customer retention] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

4.05 Hiring and firing practices

Response to the survey question "In your country, to what extent do regulations allow flexible hiring and firing of workers?" [1 = not at all, 7 = to a great extent] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

4.06 Ease of finding skilled employees

Response to the survey question "In your country, to what extent can companies find people with the skills required to fill their vacancies?" [1 = not at all, 7 = to a great extent] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

4.07 Ease of hiring foreign labour

Response to the survey question "In your country, how restrictive are regulations related to the hiring of foreign labour?" [1 = highly restrictive, 7 = not restrictive at all] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

4.08 Pay and productivity

Response to the survey question “In your country, to what extent is pay related to employee productivity?” [1 = not at all, 7 = to a great extent] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

4.09 Female labour force participation

Ratio of women to men in the labour force | 2018 or most recent

This indicator is the percentage of women aged 15–64 participating in the labour force divided by the percentage of men aged 15–64 participating in the labour force.

Source: International Labour Organization, *ILOSTAT* database (accessed February 2019).

PILLAR 5: ICT READINESS

5.01 ICT use for business-to-business transactions

Response to the survey question “In your country, to what extent do businesses use ICTs for transactions with other businesses?” [1 = not at all, 7 = to a great extent] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

5.02 Internet use for business-to-consumer transactions

Response to the survey question “In your country, to what extent do businesses use the internet for selling their goods and services to consumers?” [1 = not at all, 7 = to a great extent] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

5.03 Individuals using the internet

Percentage of individuals using the internet | 2017 or most recent

Internet users are people using the internet from any device (including mobile phones) in the last 12 months. Data is based on surveys generally carried out by national statistical offices or estimated based on the number of internet subscriptions.

Source: International Telecommunication Union, *World Telecommunication Indicators 2018*, December update.

5.04 Broadband internet subscribers

Fixed broadband internet subscriptions per 100 population | 2017 or most recent

This refers to total fixed (wired) broadband internet subscriptions (that is, subscriptions to high-speed access to the public internet—a TCP/IP connection—at downstream speeds equal to or greater than 256 kb/s).

Source: International Telecommunication Union, *World Telecommunication Indicators 2018*, December update.

5.05 Mobile telephone subscriptions

Number of mobile telephone subscriptions per 100 population | 2017 or most recent

A mobile-cellular telephone subscription refers to the number of subscriptions to a public mobile-telephone service that provide access to the PSTN using cellular technology. The indicator includes (and is split into) the number of postpaid subscriptions and the number of active prepaid accounts (i.e. that have been used during the last three months). The indicator applies to all mobile-cellular subscriptions that offer voice communications. It excludes subscriptions via data cards or USB modems; subscriptions to public mobile data services; private trunked mobile radio; telepoint; radio paging and telemetry services.

Source: International Telecommunication Union, *World Telecommunication Indicators 2018*, December update.

5.06 Mobile broadband subscriptions

Mobile broadband subscriptions per 100 population | 2017 or most recent

Active mobile-broadband subscriptions per 100 inhabitants.

Source: International Telecommunication Union, *World Telecommunication Indicators 2018*, December update.

5.07 Mobile network coverage

Percentage of total population covered by a mobile network signal | 2017 or most recent

This indicator measures the percentage of the population covered by a mobile-cellular network refers to the percentage of inhabitants within range of a mobile-cellular signal, irrespective of whether or not they are subscribers or users. This is calculated by dividing the number of inhabitants within range of a mobile-cellular signal by the total population and multiplying by 100. Note that this is not the same as the mobile subscription density or penetration.

Source: International Telecommunication Union, *World Telecommunication Indicators 2018*, December update.

5.08 Quality of electricity supply

Response to the survey question “In your country, how reliable is the electricity supply (lack of interruptions and lack of voltage fluctuations)?” [1 = extremely unreliable, 7 = extremely reliable] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

PILLAR 6: PRIORITIZATION OF TRAVEL & TOURISM

6.01 Government prioritization of the travel & tourism industry

Response to the survey question “How high a priority is the development of the travel and tourism industry for the government of your country?” [1 = not a priority at all, 7 = a top priority] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

6.02 T&T government expenditure

T&T government expenditure as a percentage of total government budget | 2018 or most recent

This indicator includes expenditures (transfers or subsidies) made by government agencies to provide T&T services such as cultural (e.g. art museums), recreational (e.g. national parks), clearance (e.g. immigration/customs) and so on to visitors.

Source: World Travel & Tourism Council, Tourism Satellite Account Research 2019.

6.03 Effectiveness of marketing and branding to attract tourists

Response to the survey question “How effective are your country’s marketing and branding campaigns in attracting tourists?” [1 = not effective at all, 7 = extremely effective] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

6.04 Comprehensiveness of annual T&T data

Number of data available (0 = no data, 120 = all selected indicators are available) | 2014–2017

This indicator shows how many of the yearly data provided by national administrations on 30 different concepts from the UNWTO Compendium of Tourism Statistics are available. It covers 2014 through 2017. The scores range from a minimum of 0 to a maximum of 120, where 120 can be obtained by a country providing data for all the 30 concepts in all of the four years taken into consideration.

Source: World Tourism Organization, UNWTO Database, latest available data, UNWTO, Madrid.

6.05 Timeliness of providing monthly/quarterly T&T data

Number of latest data available (0 = no data, 22.5 = data reported for all the periods considered) | 2017–2018

This indicator shows the availability of two key T&T indicators (international tourist arrivals and tourism receipts) on a monthly or quarterly basis, covering the period from October 2017 to December 2018. The UNWTO has calculated the score of each country based on the data included in the latest available UNWTO World Tourism Barometer by adding the number of months for which data on the international tourist arrivals are available to the number of months for which data on international tourism receipts are available. Half weight has been applied to the lower of the two scores, so the scores range from a minimum of 0 to a maximum of 22.5.

Source: World Tourism Organization, UNWTO Database, latest available data, UNWTO, Madrid.

6.06 Country Brand Strategy rating

This indicator evaluates the accuracy of the strategy of National Tourism Organizations (NTO) by a formula that compares the most popular brandtags (as measured by the proprietary Digital Demand-D2 tool) for a specific country to the brandtags most heavily promoted by that country's NTO. A country brand receives a higher rating if that country's NTO focuses its strategic and promotional positioning on the tourism-related brandtags with the highest demand (as measured by total online searches) from international tourists. A poor rating can suggest either the inappropriate promotion of the least popular brandtags (as measured by total online searches) by an NTO or the lack of focus on the brandtags in highest demand.

Source: Bloom Consulting based on *Country Brand Ranking, Tourism Edition*. Available at <https://www.bloom-consulting.com/en/country-brand-ranking>.

PILLAR 7: INTERNATIONAL OPENNESS

7.01 Visa requirements

Visa requirements for entry in the destination country for a tourism visit of a limited duration for visitors from worldwide source markets (100 = no visa required for visitors from all source markets, 0 = traditional visa required for visitors from every source market) | 2018

This indicator measures to what extent a destination country is facilitating inbound tourism through its visa policy, distinguishing whether the country can be visited without a visa, a visa can be obtained on arrival or an electronic visa is available. It is calculated as a percentage of the world population that is exempt from a visa or is eligible for visa on arrival or electronic visa when visiting the destination country, where: A) the population of source markets that can visit the destination country without a visa is fully counted (i.e. weight 1); B) the population of source markets that can obtain a visa on arrival when entering the destination country is weighted by 0.7; and C) the population of source markets that can use an electronic visa is weighted by 0.5. The indicator is consistent with the UNWTO's *Visa openness report 2015* that can be downloaded from <https://www.e-unwto.org/doi/book/10.18111/9789284417384>.

Source: World Tourism Organization, UNWTO Database, latest available data, UNWTO, Madrid.

7.02 Openness of bilateral Air Service Agreements

Index measuring the average openness of air service agreements (0 = most restricted, 38 = most liberal) | 2011

This index measures the weighted average openness of all bilateral Air Service Agreements (ASAs) concluded by International Civil Aviation Organization (ICAO) signatories as registered in ICAO's World's Air Services Agreements (WASA) database (2010 update). The weights are the bilateral scheduled passenger traffic taking place under each ASA. Regulatory data come from ICAO's WASA database and traffic data were obtained from IATA.

Source: World Trade Organization, based on ICAO and IATA data.

7.03 Number of regional trade agreements in force

Number of goods (RTAs) and services (EIAs) notifications | 2019

This indicator assesses the level of openness of a country to foreign goods and services as measured by the sum of the number of Regional Trade Agreements (RTA) and the number of Economic Integration Agreements (EIA) in force to the WTO. Members entering into RTAs are required to notify RTA to the WTO, either under Article XXIV of the GATT 1994 or the Enabling Clause (for RTAs covering trade in goods), or under Article V of the GATS (for RTAs covering trade in services). In a case of an RTA covering both goods and services, two notifications are required. The notification should be made following ratification of the RTA and before the application of preferential treatment between the parties.

Source: World Trade Organization, *Regional Trade Agreements Information System (RTA-IS)*, available at <http://rtais.wto.org/UI/PublicMaintainRTAHome.aspx>.

PILLAR 8: PRICE COMPETITIVENESS

8.01 Ticket taxes and airport charges

Index of relative cost of access (ticket taxes and airport charges) to international air transport services (0 = highest cost, 100 = lowest cost) | 2018 or most recent

This index measures the relative cost of access to international air transport services based on the level of airport charges, passenger ticket taxes and value-added taxation. It reflects the costs associated with narrow-body and wide-body passenger plane arrival and departure at the major international airports in each country. Charges include landing, terminal navigation and passenger and security charges as listed in the IATA Airport and Air Navigation Charges manual. Ticket taxes applicable to international travel were applied as described in the IATA List of Ticket and Airport Taxes and Fees manual. Per-passenger charges were calculated by applying a 75% load factor to a typical seating configuration of each type of aircraft. Value-added taxes (VATs) were calculated based on an average ticket price for each country, applied to half of the departing passengers, because the VAT is normally charged only on itineraries originating in the country concerned. A higher score indicates a lower level of charges and taxes.

Source: International Air Transport Association, *SRS Analyser*.

8.02 Hotel price index

Average room rates calculated for "midscale" to "upper upscale" hotels for calendar year (US dollars) | October 2017–October 2018 average or most recent

This index measures the average price, in US dollars, of midscale to upper upscale hotel accommodation in each country. The index is calculated by using the average room rate achieved by midscale to upper upscale hotels in each country over a 12-month period from October 2017 through October 2018 to mitigate the impact of any seasonality fluctuations. Data may refer to earlier period where the 2018 update is not available.

Source: STR Global.

8.03 Purchasing power parity

Ratio of purchasing power parity (PPP) conversion factor to official exchange rate | 2017 or most recent

The World Bank defines the purchasing power parity (PPP) conversion factor as the number of units of a country's currency required to buy the same amount of goods and services in the domestic market as a US dollar would buy in the United States. Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual average based on monthly averages (local currency units relative to the US dollar). The variable shown is the PPP conversion factor to market exchange rate ratio as reported by the World Bank's *World Development Indicators* database.

Source: The World Bank, *World Development Indicators* database (retrieved May 2019).

8.04 Fuel price levels

Retail diesel fuel prices expressed as US cents per litre | 2016 or most recent

This indicator refers to the pump prices of the most widely sold grade diesel fuel.

Source: The World Bank, *World Development Indicators* database (retrieved May 2019).

9.05 Number of environmental treaty ratifications

Total number of ratified environmental treaties (0–29 scale, where 29 is best) | 2019

This indicator measures the total number of international treaties from a set of 29 for which a state is a participant. A state is acknowledged as a participant whenever its status for each treaty appears as Ratified, Accession, or In Force. The treaties included are: the International Convention for the Regulation of Whaling; the Convention on Wetlands of International Importance especially as Waterfowl Habitat, 1971 Ramsar; the Convention Concerning the Protection of the World Cultural and Natural Heritage, 1972 Paris; the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, 1972 London, Mexico City, Moscow, Washington; the Convention on International Trade in Endangered Species of Wild Fauna and Flora, 1973 Washington; the International Convention for the Prevention of Pollution from Ships (MARPOL) as modified by the Protocol of 1978, London; the Convention on the Conservation of Migratory Species of Wild Animals, 1979 Bonn; the United Nations Convention on the Law of the Sea, 1982 Montego Bay; the Convention on the Protection of the Ozone Layer, 1985 Vienna; the Protocol on Substances that Deplete the Ozone Layer, 1987 Montreal; the Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, 1989 Basel; the International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 London; the United Nations Framework Convention on Climate Change, 1992 New York; the Convention on Biological Diversity, 1992 Rio de Janeiro; the International Convention to Combat Desertification in Those countries Experiencing Serious Drought and/or Desertification, particularly Africa, 1994 Paris; the Agreement relating to the Implementation of Part XI of the United Nations Convention on the Law of the Sea of 10 December 1982, 1994 New York; the Agreement relating to the Provisions of the United Nations Convention on the Law of the Sea relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, 1995 New York; the Kyoto Protocol to the United Nations Framework Convention on the Climate Change, Kyoto 1997; the Convention on the Law of the Non-navigational Uses of International Watercourses, 1997; the Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade, 1998 Rotterdam; the Cartagena Protocol of Biosafety to the Convention on Biological Diversity, 2000 Montreal; the Protocol on Preparedness, Response and co-operation to Pollution Incidents by Hazardous and Noxious Substances, 2000 London; the Stockholm Convention on Persistent Organic Pollutants, 2001 Stockholm; the International Treaty on Plant Genetic Resources for Food and Agriculture, 2001 Rome; the International Tropical Timber Agreement, 2006 Geneva; the Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety, 2010 Nagoya – Kuala Lumpur; the Protocol on Access to Genetic Resources and their Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity, Nagoya 2010; the Convention on Mercury, Minamata, 2013; and the Paris Agreement 2015.

Source: The International Union for Conservation of Nature (IUCN), Environmental Law Centre, *ELIS Treaty* database.

PILLAR 9: ENVIRONMENTAL SUSTAINABILITY

9.01 Stringency of environmental regulations

Response to the survey question “How do you assess the stringency of your country’s environmental regulations?” [1 = very lax – among the worst in the world; 7 = among the world’s most stringent] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

9.02 Enforcement of environmental regulations

Response to the survey question “In your country, how do you assess the enforcement of environmental regulations?” [1 = very lax – among the worst in the world; 7 = among the world’s most rigorous] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

9.03 Sustainability of travel and tourism industry development

Response to the survey question “In your country, to what extent is the travel and tourism sector developed in an environmentally sustainable way?” [1 = not at all, 7 = to a great extent] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

9.04 Particulate matter (2.5) concentration

Population-weighted exposure to PM2.5 (micro-grams per cubic meter) | 2015

PM2.5, also known as fine particulate matter, refers to particles or droplets in the air that are 2.5 micrometres or less in width. Although invisible to the naked human eye as individual particles, PM2.5 can reduce visibility and cause the air to appear hazy when its levels are elevated. PDS (Gridded Population of the World) was resampled at the same 10 x 10 km spatial resolution as the PMC (Annual global surface PM2.5 concentrations), and the fraction of country population in each grid cell was calculated. The fraction of country population is multiplied times the PM2.5 concentrations in each grid cell, and the result is summed over the entire country to create a population-weighted ambient concentration of PM2.5. For more details, refer to: <https://epi.envirocenter.yale.edu/downloads/epi2018technicalappendix05.pdf>.

Source: Wendling, Z.A., J.W. Emerson, D.C. Esty, M.A. Levy, A. de Sherbinin, et al., *2018 Environmental Performance Index*. New Haven, CT: Yale Center for Environmental Law & Policy, 2018, <https://epi.yale.edu/>.

9.06 Baseline water stress

Normalized (0–5) projected water stress | 2014

Based on annual water withdrawal data, this indicator estimates projected future country-level water stress for 2020 under a business-as-usual (BAU) scenario. For more details, see Luck, M., M. Landis, and F. Gassert, *Aqueduct Water Stress Projections: Decadal Projections of Water Supply and Demand Using CMIP5 GCMs*, Technical note (Washington, DC: World Resources Institute, April 2015), <http://www.wri.org/publication/aqueduct-water-stress-projections>.

Source: World Resources Institute, *Aqueduct*.

9.07 Threatened species

Threatened species as a percentage of total species (mammals, birds and amphibians) | 2018

This indicator measures the total number of Critically Endangered, Endangered and Vulnerable species as a percentage of total known species for mammals, birds and amphibians

Source: The International Union for Conservation of Nature (IUCN), *Red List of Threatened Species 2018*.

9.08 Forest cover change

Forest loss in > 30% tree cover since 2000 | 2016

This indicator measures the loss in the sum of annual tree cover between 2000 and 2016 in areas with greater than 30% tree cover, divided by 2000 forest extent. Thirty-meter resolution satellite images are used to quantify the area of forest loss. Trees are defined as all vegetation taller than 5m in height. Forest loss is defined as a standard-replacement disturbance or the complete removal of tree cover canopy at the Landsat pixel scale. Results are disaggregated by reference percent tree cover stratum (e.g. >30% crown cover to ~0% crown cover) and by year. No value is calculated for countries with less than 200 sq. km. (according to FAO FRA 2010) of >30% tree cover in 2000 or less than 3% of land area covered by >30% tree cover. For more information refer to: <https://epi.envirocenter.yale.edu/downloads/epi2018technicalappendixv05.pdf>.

Source: World Economic Forum's calculations based on 2018 Environmental Performance Index: <https://epi.yale.edu/>.

9.09 Wastewater treatment

Percentage of wastewater that receives treatment weighted by connection to wastewater treatment rate | 2016

This indicator measures the percentage of wastewater that is treated before it is released back into ecosystems. Wastewater treatment performance is measured by volume of wastewater that is treated over time. Performance metrics are established by public or privately-owned operated utilities for a municipal area. A number of datasets were collated to compute this indicator: A source-type hierarchy was used to find a value for each data point: 1) country-level statistical data and reports; 2) OECD and EuroStat values were then used ("population connected to a wastewater treatment plant") and; 3) United Nations Statistics Division's "Population connected to wastewater treatment" variable; 4) percentage of wastewater treated to secondary and tertiary treatment levels from the Global Water Intelligence and the Pinsent-Masons Water Yearbook; 5) FAO-AQUASTAT values ("Total volume of wastewater treated" / "Total volume of wastewater collected" * 100) for a given year, country. For more information refer to: <https://epi.envirocenter.yale.edu/downloads/epi2018technicalappendixv05.pdf>.

Source: Wendling, Z.A., J.W. Emerson, D.C. Esty, M.A. Levy, A. de Sherbinin, et al., *2018 Environmental Performance Index*. New Haven, CT: Yale Center for Environmental Law & Policy, 2018, <https://epi.yale.edu/>.

9.10 Fish stock status

Overexploited or collapsed fish stock caught in an exclusive economic zone (EEZ) (% of total catch) | 2014

This indicator is based on an assessment of the percentage of fish stocks caught within a country's Exclusive Economic Zone (EEZ) that are overexploited or collapsed. For more information refer to: <https://epi.envirocenter.yale.edu/downloads/epi2018technicalappendixv05.pdf>.

Source: Source: Wendling, Z.A., J.W. Emerson, D.C. Esty, M.A. Levy, A. de Sherbinin, et al., *2018 Environmental Performance Index*. New Haven, CT: Yale Center for Environmental Law & Policy, 2018, <https://epi.yale.edu/>.

PILLAR 10: AIR TRANSPORT INFRASTRUCTURE

10.01 Quality of air transport infrastructure

Response to the survey question "In your country, how is the quality (extensiveness and condition) of transport infrastructure for the following: Air transport?" [1 = extremely underdeveloped – among the worst in the world; 7 = extensive and efficient – among the best in the world] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

10.02 Available seat kilometres, domestic

Scheduled available domestic seat kilometres originating in country per week (year average) | 2018

This indicator measures an airline's passenger-carrying capacity. It is composed of the number of seats available on each domestic flight multiplied by the flight distance in kilometres. The final value represents the weekly average for the year (Jan–Dec), taking into account flights scheduled beforehand by airline companies.

Source: International Air Transport Association, *SRS Analyser*.

10.03 Available seat kilometres, international

Scheduled available international seat kilometres originating in country per week (year average) | 2018

This indicator measures an airline's passenger-carrying capacity. It is composed of the number of seats available on each international flight multiplied by the flight distance in kilometres. The final value represents the weekly average for the year (Jan–Dec), taking into account flights scheduled beforehand by airline companies.

Source: International Air Transport Association, *SRS Analyser*.

10.04 Aircraft departures

Number of aircraft departures per 1,000 population | 2017 or most recent

Aircraft departures are the number of domestic and international take-offs of air carriers registered in the country.

Source: The World Bank, *World Development Indicators* database (accessed May 2019).

10.05 Airport density

Number of airports with at least one scheduled flight per million of urban population | 2018

Urban population refers to people living in urban areas as defined by national statistical offices.

Source: World Economic Forum's calculation based on International Air Transport Association, *SRS Analyser*, and United Nations, *World Urbanization Prospects: The 2018 Revision, Online Edition*.

10.06 Number of operating airlines

Number of airlines with scheduled flights originating in country | 2018

Source: International Air Transport Association, *SRS Analyser*.

PILLAR 11: GROUND AND PORT INFRASTRUCTURE

11.01 Quality of roads

Response to the survey question “In your country, how is the quality (extensiveness and condition) of transport infrastructure for the following: a. Roads?” [1 = extremely underdeveloped – among the worst in the world; 7 = extensive and efficient – among the best in the world] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

11.02 Road density

Kilometres of road per 100 square kilometres of land | 2016 or most recent

Road density is the ratio of the length of the country's total road network to the country's land area. The road network includes all roads in the country: motorways, highways, main or national roads, secondary or regional roads and other urban and rural roads.

Source: International Road Federation, *IRF World Road Statistics 2018* and *The World Factbook 2019*, Central Intelligence Agency, 2019.

11.03 Paved road density

Kilometres of paved road per square kilometre of land | 2016 or most recent

Road density is the ratio of the length of the country's total paved road network to the country's land area. Paved roads are those surfaced with crushed stone (macadam) and hydrocarbon binder or bituminized agents, with concrete, or with cobblestones, as a percentage of all the country's roads, measured in length.

Source: International Road Federation, *IRF World Road Statistics 2018* and *The World Factbook 2019*, Central Intelligence Agency, 2019.

11.04 Quality of railroad infrastructure

Response to the survey question “In your country, how is the quality (extensiveness and condition) of transport infrastructure for the following: b. Railroads?” [1 = extremely underdeveloped – among the worst in the world; 7 = extensive and efficient – among the best in the world] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

11.05 Railroad density

Kilometres of railroad per 100 square kilometres of land | 2017 or most recent available

Railroad density is the ratio of the length of the country's total railroad network to the country's land area. Rail lines are the length of railway routes available for train service, irrespective of the number of parallel tracks.

Sources: The World Bank, *World Development Indicators* database (retrieved on May 2019) and *The World Factbook 2019*, Central Intelligence Agency, 2019.

11.06 Quality of port infrastructure

Response to the survey question “In your country, how is the quality (extensiveness and condition) of transport infrastructure for the following: d. Seaports (for landlocked countries – please assess access to seaports)?” [1 = extremely underdeveloped – among the worst in the world; 7 = extensive and efficient – among the best in the world] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

11.07 Ground transport efficiency

Average score across the two components of the following Executive Opinion Survey questions: “In your country, how efficient (i.e. frequency, punctuality, speed, price) are the following transport services? a. Ground transportation (buses, subways, taxis)?” [1 = extremely inefficient – among the worst in the world; 7 = extremely efficient – among the best in the world] and “In your country, how efficient (i.e. frequency, punctuality, speed, price) are the following transport services? b. Train services?” [1 = extremely inefficient – among the worst in the world; 7 = extremely efficient – among the best in the world] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

PILLAR 12: TOURIST SERVICE INFRASTRUCTURE

12.01 Hotel rooms

Number of hotel rooms per 100 population | 2017 or most recent

Source: World Tourism Organization, UNWTO Database, latest available data, UNWTO.

12.02 Quality of tourism infrastructure

Response to the question “In your country, how do you assess the quality of tourism infrastructure (e.g. hotels, resorts, entertainment facilities)?” [1 = very poor – among the worst in the world; 7 = excellent – among the best in the world] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

12.03 Presence of major car rental companies

Presence of major car rental companies (0 = no company is present, 7 = all seven considered companies are present) | 2018 or most recent

This indicator measures the presence of seven major car rental companies: Avis, Budget, Europcar, Hertz, National Car Rental, Sixt and Thrifty. For each country we calculate how many of these companies operate via online research.

Source: World Economic Forum's calculations based on the individual rental car websites.

12.04 Automated teller machines per adult population

Number of automated teller machines (ATMs) per 100,000 adult population | 2017

Source: The World Bank, *World Development Indicators* database (retrieved on May 2019).

PILLAR 13: NATURAL RESOURCES

13.01 Number of World Heritage natural sites

Number of World Heritage natural sites in the country | 2018 or most recent

World Heritage natural sites are those properties that the World Heritage Committee considers as having outstanding universal value.

Source: UNESCO World Heritage List (accessed January 2019), available at <http://whc.unesco.org/en/syndication>.

13.02 Total known species

Total known species of mammals, birds and amphibians in the country | 2018

This indicator measures the total known species of mammals, birds and amphibians.

Source: The International Union for Conservation of Nature (IUCN), Red List Threatened Species.

13.03 Total protected areas

Total square kilometres of terrestrial and marine areas under protection as a share of country's total territorial area | 2017

Terrestrial protected areas are totally or partially protected areas of at least 1,000 hectares that are designated by national authorities as scientific reserves with limited public access, national parks, natural monuments, nature reserves or wildlife sanctuaries, protected landscapes, and areas managed mainly for sustainable use. Marine protected areas are areas of intertidal or subtidal terrain—and overlying water and associated flora and fauna and historical and cultural features—that have been reserved by law or other effective means to protect part or all of the enclosed environment. Sites protected under local or provincial law are excluded.

Source: *World Database on Protected Areas (WDPA)*, via The World Bank, *World Development Indicators* database (retrieved on February 2019).

13.04 Natural tourism digital demand

Number of online searches index (0–100 scale, where 100 is best) | 2016, 2017, 2018 moving average

This indicator measures the total online search volume related to the following nature-related brandtags: Beaches, Adventure and Extreme, Diving, Fishing, Hiking, Surfing, Water Sports, Winter Sports, Animal Watching, Protected Areas and Sustainable and Rural Tourism. The calculation is based on the proprietary D2 tool which assesses the attractiveness of each country by analyzing online tourism-related search data across the relevant brandtags, each comprising destination-specific keywords correlated to tourist activities and attractions. A total of 3,818,000 keywords were analysed across nine languages: English, Spanish, French, Italian, German, Portuguese, Russian, Japanese and Chinese.

Source: Bloom Consulting based on *Country Brand Ranking, Tourism Edition*. Available at <https://www.bloom-consulting.com/en/country-brand-ranking>.

13.05 Attractiveness of natural assets

Response to the question “To what extent do international tourists visit your country mainly for its natural assets (i.e. parks, beaches, mountains, wildlife, etc.)?” [1 = not at all, 7 = to a great extent] | 2017–2018 weighted average

Source: World Economic Forum, Executive Opinion Survey.

PILLAR 14: CULTURAL RESOURCES AND BUSINESS TRAVEL

14.01 Number of World Heritage cultural sites

Number of World Heritage cultural sites in the country | 2018 or most recent

World Heritage cultural sites are those properties that the World Heritage Committee considers as having outstanding universal value.

Source: UNESCO World Heritage List (accessed January 2019), available at <http://whc.unesco.org/en/syndication>.

14.02 Oral and intangible cultural heritage expressions

Number of oral and intangible heritage practices and expressions | 2018 or most recent

Intangible cultural heritage practices are those practices, representations, expressions, knowledge, skills—as well as the instruments, objects, artifacts and cultural spaces associated therewith—that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment and their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity. The Intergovernmental Committee for the Safeguarding of the Intangible Cultural Heritage evaluates annually nominations proposed by States Parties to the Convention for the Safeguarding of the Intangible Cultural Heritage and decides whether or not to inscribe those cultural practices and expressions of intangible heritage on the Convention's Lists. For more details about the criteria for inscription, please visit <http://www.unesco.org/culture/ich/en/lists>.

Source: UNESCO World Heritage List (accessed January 2019), available at <http://www.unesco.org/culture/ich/en/lists>.

14.03 Number of large sports stadiums

Total number of sports stadiums with a capacity larger than 20,000 seats | 2018 or most recent

The count of stadiums with a capacity greater than 20,000 is a proxy for the ability of the country to host significant sports or entertainment events (i.e. concerts, shows).

Source: World Economic Forum's calculations based on Worldstadiums.com.

14.04 Number of international association meetings

Number of international association meeting held in the country annually | 2015–2017 or most recent

This indicator measures the average number of international associations meetings held annually in each country between 2015 and 2017. These figures are based on the ICCA Association database, which includes meetings organized by international associations, matching the following criteria: a) take place on a regular basis, b) rotate between a minimum of three countries and, c) have at least 50 participants. Note: For El Salvador, Kazakhstan, Lao PDR, Namibia and Zambia, value includes an author's estimate for 2016 figure based on the country share of 2013–2015 mean multiplied by total 2016 meetings.

Source: The International Congress and Convention Association (ICCA).

14.05 Cultural and entertainment tourism digital demand

Number of online searches index (0–100 scale, where 100 is best) | 2016, 2017, 2018 moving average

This indicator measures the total online search volume related to the following cultural brandtags: Historical Sites, Local People, Local Traditions, Museums, Performing Arts, UNESCO, City Tourism, Religious Tourism, Local Gastronomy, Entertainment Parks, Leisure Activities, Nightlife and Special Events. The calculation is based on the proprietary D2 tool which assesses the attractiveness of each country by analysing online tourism-related search data across the relevant brandtags, each comprising destination-specific keywords correlated to tourist activities and attractions. A total of 3,818,000 keywords were analysed across nine languages: English, Spanish, French, Italian, German, Portuguese, Russian, Japanese and Chinese.

Source: Bloom Consulting based on *Country Brand Ranking, Tourism Edition*. Available at <https://www.bloom-consulting.com/en/country-brand-ranking>.