

# GLOBAL INNOVATION INDEX 2018

Peru

**71<sup>st</sup>** Peru is ranked 71st in the GII 2018, moving down 1 position from the previous year.

The GII indicators are grouped into innovation inputs and outputs. The following table reflects Peru's rankings over time<sup>1</sup>.

| Peru's ranking over time |     |       |        |            |
|--------------------------|-----|-------|--------|------------|
|                          | GII | Input | Output | Efficiency |
| 2018                     | 71  | 59    | 83     | 100        |
| 2017                     | 70  | 56    | 85     | 106        |
| 2016                     | 71  | 56    | 87     | 109        |

- Peru ranks better in innovation inputs than outputs.
- This year it improves in innovation outputs, ranking 83rd and moving up 2 spots from 2017.
- Its position in innovation inputs slightly deteriorates, taking the 59th spot, down from the 56 rank it held over 2016-2017.
- In the Innovation Efficiency Ratio, Peru improves and reaches the 100th position this year. Relative to its overall GII position (71th), this Ratio ranks rather low, indicating that the country could improve its efficiency in translating its good-quality innovation inputs into more outputs. Indeed, this low rank is partly influenced by a lower ranking in innovation outputs (83rd) compared to inputs (59th).

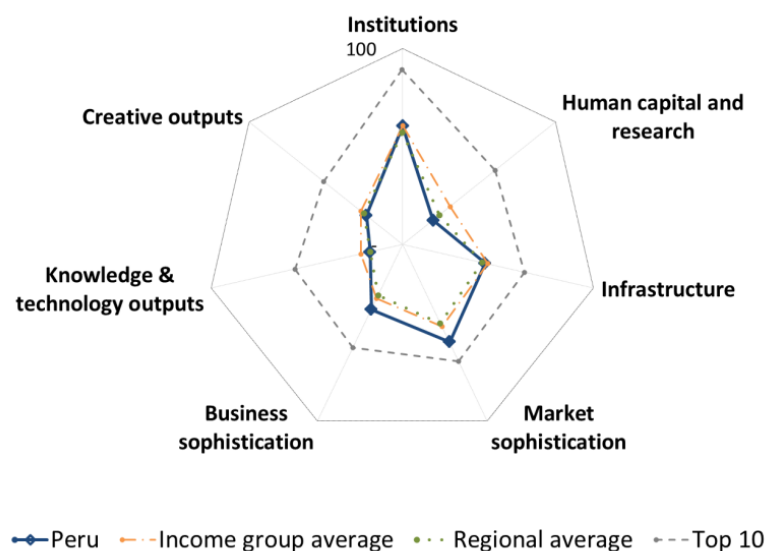
**18<sup>th</sup>** Peru is ranked 18th among the 34 upper-middle-income countries in the GII 2018.

**8<sup>th</sup>** Peru is ranked 8th among the 18 countries in Latin America and the Caribbean.

<sup>1</sup> Note that year-on-year comparisons of the GII ranks are imperfect and influenced by changes in the GII model and data availability.

## Benchmarking Peru to other upper-middle-income countries and the Latin America and the Caribbean region

Peru's scores by area



### Upper-middle-income countries

Peru has high scores in 2 out of the 7 GII areas – **Market Sophistication** and **Business Sophistication**, in which it scores above the average of the upper-middle-income group.

Top scores in areas such as *Trade, competition & market scale* and *Knowledge workers* are behind these high rankings.

### Latin America and the Caribbean region

Compared to other countries in the Latin America and the Caribbean region, Peru performs above-average in 4 out of the 7 GII areas: Institutions, Infrastructure, Market Sophistication, and Business Sophistication.

## Peru's innovation profile

### Strengths

- Most comparative strengths for Peru are identified among **innovation inputs**, and especially in **Market Sophistication** (27th) and **Business Sophistication** (42nd).
- **Market Sophistication** (27th), the top-ranked GII area for Peru, is a strength for the country. Here it shows particularly strong performance in two of its three components – *Credit* (17th) and *Trade, competition & market scale* (33rd) – and in the indicators *Ease of getting credit* (18th) and *Microfinance gross loans* (5th).
- In **Business Sophistication** (42nd), the area *Knowledge workers* (26th) is marked as a GII strength. At the indicator level, *Firms offering formal training* (8th), *Females employed with advanced degrees* (33rd), and *High-tech imports* (35th) present strong performance.
- Other GII strengths are identified in **Infrastructure** (69th), where Peru performs strongly in the area *Ecological sustainability* (40th) and one of its indicators, *GDP per unit of energy use* (13th).
- Finally, on the innovation input side, in **Institutions** (69th), the indicator *Cost of redundancy dismissal* (37th) is marked as a GII strength.

- On the **innovation output** side, two of the three comparative strengths for Peru are found in **Knowledge & Technology Outputs** (88th), where the country has strong performance in the indicators *Productivity growth* (25th) and *New business density* (35th).
- *Printing & other media* (15th) is signaled as a GII strength within **Creative Outputs** (81st).

## Weaknesses

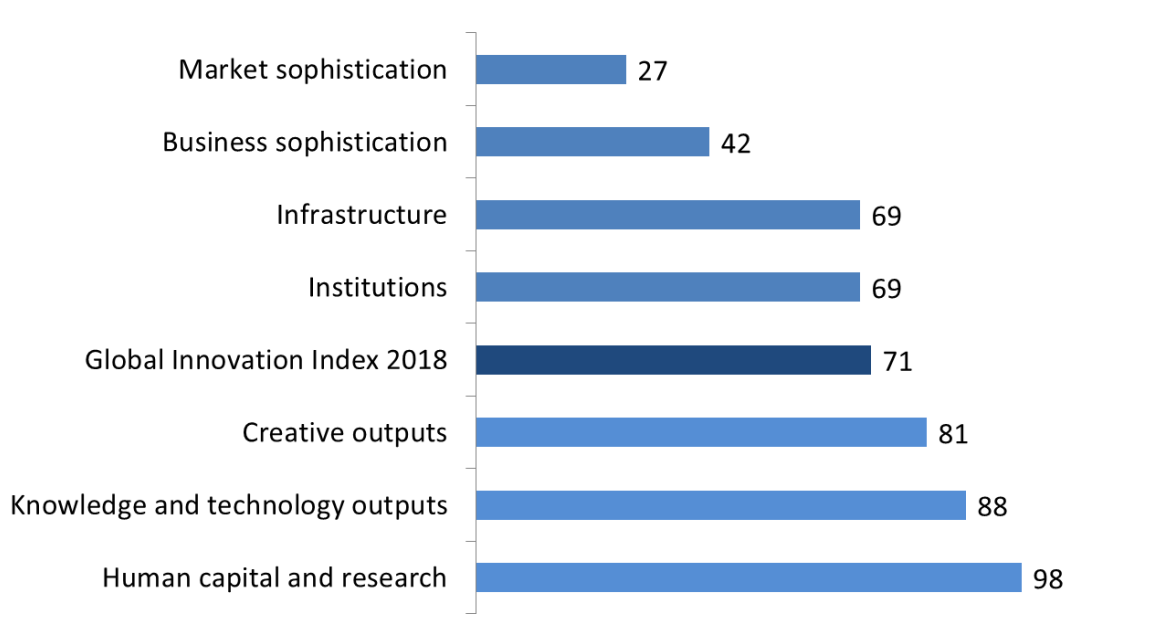
- Among **innovation inputs**, Peru presents most of its relative weaknesses in **Human Capital & Research** (98th), the lowest-ranked GII area for the country. Here three indicators – *PISA results* (65th), *Gross expenditure on R&D* (101st), and *Global R&D companies expenditures* (40th) – are marked as weak.
- Peru also shows two weaknesses in the indicators *University-industry research collaboration* (98th) and *Joint ventures-strategic alliance deals* (99th) in **Business Sophistication** (42nd).
- In **Market Sophistication** (27th), the country performs relatively weakly in one indicator, *Venture capital deals* (70th).
- On the **innovation output** side, three of the GII weaknesses for Peru are identified in **Knowledge & Technology Outputs** (88th), where the area *Knowledge diffusion* (115th) and the indicators *Scientific & technical articles* (114th) and *ICT services exports* (109th) present a relatively weak performance.
- Finally, in **Creative Outputs** (81st), Peru demonstrates relative weaknesses in two indicators: *Industrial designs by origin* (101st) and *Mobile app creation* (80th).

The following figure presents a summary of Peru's ranks in the 7 GII areas, as well as the overall rank in the GII 2018.

### Peru's rank in the GII 2018 and the 7 GII areas

Rank 1 is the highest possible in each pillar

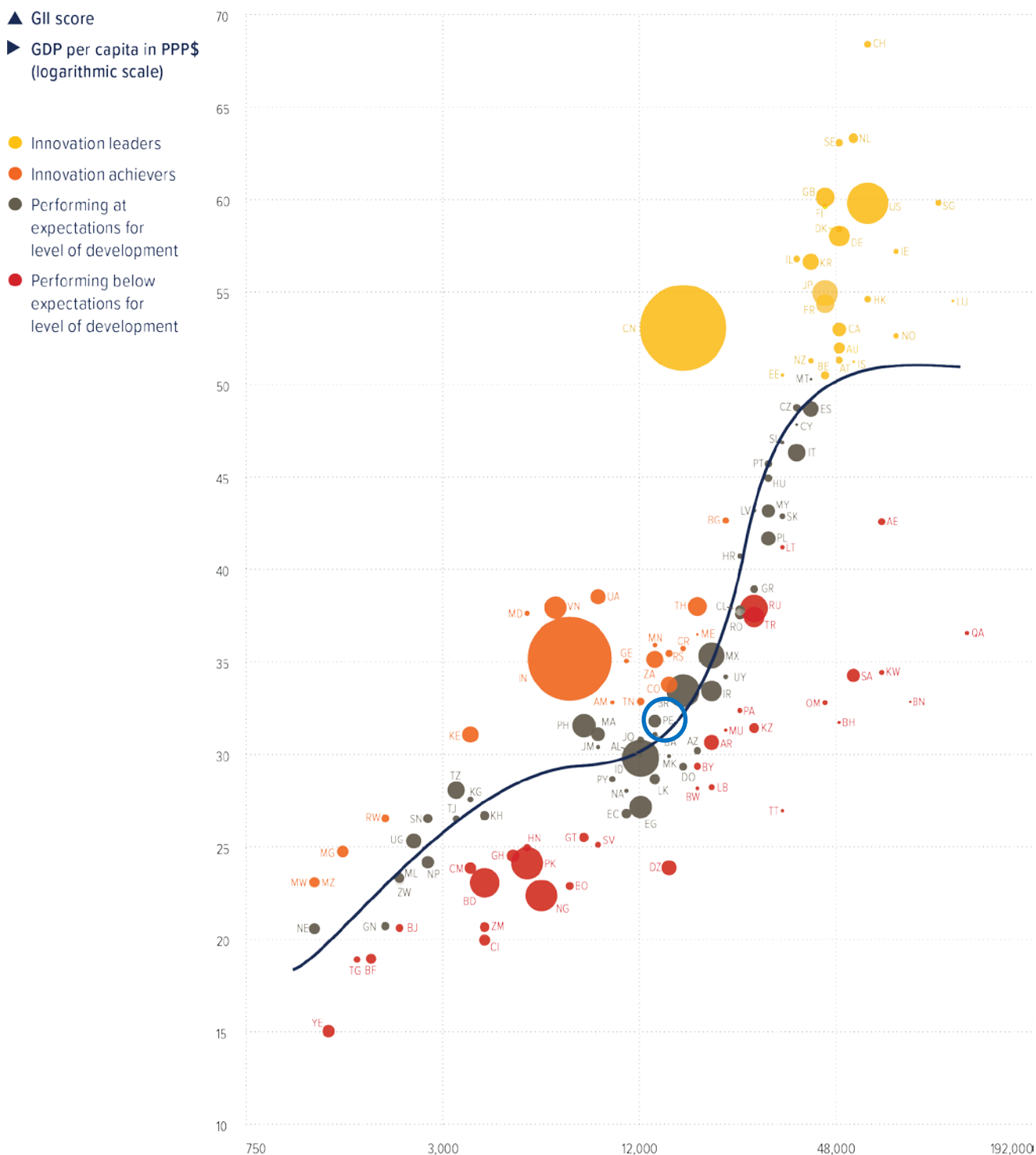
Total number of countries: 126



## Expected vs. Observed Innovation Performance

The GII bubble chart shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The depicted trendline gives an indication of the expected innovation performance at different levels of income. Countries located above the trendline are performing better than what would be expected based on their income level. Countries below the line are Innovation Under-performers relative to GDP.

Relative to GDP, Peru performs at its expected level of development.



## Missing and Outdated Data

More and better data improves the ability of a country to understand its strengths and weaknesses and give policymakers greater capacity to plan and adapt public policies accordingly. The GII 2018 covers 126 countries that complied with the minimum indicator coverage of 35 indicators in the Innovation Input Sub-Index (66%) and 18 indicators in the Innovation Output Sub-Index (66%).

The following tables show data for Peru that is not available or that is outdated.

### Missing Data

| Code  | Indicator                                 | Country Year | Model Year | Source                          |
|-------|---|--------------|------------|---------------------------------|
| 2.1.3 | School life expectancy, years             | n/a          | 2016       | UNESCO Institute for Statistics |
| 2.2.1 | Tertiary enrolment, % gross               | n/a          | 2016       | UNESCO Institute for Statistics |
| 2.2.2 | Graduates in science & engineering, %     | n/a          | 2016       | UNESCO Institute for Statistics |
| 2.2.3 | Tertiary inbound mobility, %              | n/a          | 2016       | UNESCO Institute for Statistics |
| 2.3.1 | Researchers, FTE/mn pop.                  | n/a          | 2016       | UNESCO Institute for Statistics |
| 5.1.3 | GERD performed by business, % GDP         | n/a          | 2016       | UNESCO Institute for Statistics |
| 5.1.4 | GERD financed by business, %              | n/a          | 2015       | UNESCO Institute for Statistics |
| 5.2.3 | GERD financed by abroad, %                | n/a          | 2015       | UNESCO Institute for Statistics |
| 5.3.5 | Research talent, % in business enterprise | n/a          | 2016       | UNESCO Institute for Statistics |





### Outdated Data




| Code  | Indicator                                     | Country Year | Model Year | Source                                   |
|-------|---|--------------|------------|--|
| 2.3.2 | Gross expenditure on R&D, % GDP               | 2015         | 2016       | UNESCO Institute for Statistics          |
| 4.3.1 | Applied tariff rate, weighted mean, %         | 2015         | 2016       | World Bank, World Development Indicators |
| 5.1.2 | Firms offering formal training, % firms       | 2010         | 2013       | World Bank, Enterprise Surveys           |
| 5.3.1 | Intellectual property payments, % total trade | 2015         | 2016       | WTO, Trade in Commercial Services        |
| 5.3.3 | ICT services imports, % total trade           | 2015         | 2016       | WTO, Trade in Commercial Services        |
| 6.3.1 | Intellectual property receipts, % total trade | 2015         | 2016       | WTO, Trade in Commercial Services        |
| 6.3.3 | ICT services exports, % total trade           | 2015         | 2016       | WTO, Trade in Commercial Services        |





| Output rank | Input rank | Income       | Region | Efficiency ratio | Population (mn) | GDP, PPP\$ | GDP per capita, PPP\$ | GII 2017 rank |
|-------------|------------|--------------|--------|------------------|-----------------|------------|-----------------------|---------------|
| 83          | 59         | Upper-middle | LCN    | 100              | 32.2            | 424.6      | 13,333.9              | 70            |

|   | Score/Value | Rank          |
|---|-------------|---------------|
|  <b>Institutions</b> .....                 | <b>60.5</b> | <b>69</b>     |
| 1.1 Political environment.....  | 47.6        | 76            |
| 1.1.1 Political stability & safety*.....  | 61.0        | 74            |
| 1.1.2 Government effectiveness*.....  | 40.9        | 79            |
| 1.2 Regulatory environment.....   | 69.3        | 55            |
| 1.2.1 Regulatory quality*.....  | 57.1        | 49            |
| 1.2.2 Rule of law*.....   | 30.4        | 92            |
| 1.2.3 Cost of redundancy dismissal, salary weeks.....   | 11.4        | 37 ●          |
| 1.3 Business environment.....   | 64.5        | 80            |
| 1.3.1 Ease of starting a business*.....   | 83.4        | 88            |
| 1.3.2 Ease of resolving insolvency*.....  | 45.7        | 76            |
|  <b>Human capital &amp; research</b> ..... | <b>20.0</b> | <b>98</b> ◇   |
| 2.1 Education.....  | 32.9        | 102           |
| 2.1.1 Expenditure on education, % GDP.....  | 3.8         | 83            |
| 2.1.2 Government funding/pupil, secondary, % GDP/cap.....   | 14.3        | 77            |
| 2.1.3 School life expectancy, years.....  | n/a         | n/a           |
| 2.1.4 PISA scales in reading, maths & science.....  | 393.6       | 65 ○          |
| 2.1.5 Pupil-teacher ratio, secondary.....   | 14.3        | 62            |
| 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).....   | 7.0         | 70            |
| 2.3.1 Researchers, FTE/mn pop.....  | n/a         | n/a           |
| 2.3.2 Gross expenditure on R&D, % GDP <sup>②</sup> .....  | 0.1         | 101 ○ ◇       |
| 2.3.3 Global R&D companies, top 3, mn US\$.....   | 0.0         | 40 ○ ◇        |
| 2.3.4 QS university ranking, average score top 3*.....  | 18.6        | 53            |
|  <b>Infrastructure</b> .....             | <b>43.2</b> | <b>69</b>     |
| 3.1 Information & communication technologies (ICTs).....  | 51.5        | 80            |
| 3.1.1 ICT access*.....  | 49.0        | 84 ◇          |
| 3.1.2 ICT use*.....   | 39.6        | 77            |
| 3.1.3 Government's online service*.....   | 63.0        | 57            |
| 3.1.4 E-participation*.....   | 54.2        | 80            |
| 3.2 General infrastructure.....   | 32.5        | 84            |
| 3.2.1 Electricity output, kWh/cap.....  | 1,537.6     | 86 ◇          |
| 3.2.2 Logistics performance*.....   | 38.4        | 68            |
| 3.2.3 Gross capital formation, % GDP.....   | 22.0        | 70            |
| 3.3 Ecological sustainability.....  | 45.6        | 40 ●          |
| 3.3.1 GDP/unit of energy use.....   | 14.5        | 13 ● ◆        |
| 3.3.2 Environmental performance*.....   | 61.9        | 57            |
| 3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP.....  | 1.1         | 64            |
|  <b>Market sophistication</b> .....      | <b>55.2</b> | <b>27</b> ● ◆ |
| 4.1 Credit.....   | 61.0        | 17 ● ◆        |
| 4.1.1 Ease of getting credit*.....  | 80.0        | 18 ●          |
| 4.1.2 Domestic credit to private sector, % GDP.....   | 36.2        | 86            |
| 4.1.3 Microfinance gross loans, % GDP.....  | 5.5         | 5 ● ◆         |
| 4.2 Investment.....   | 35.2        | 94            |
| 4.2.1 Ease of protecting minority investors*.....   | 61.7        | 50            |
| 4.2.2 Market capitalization, % GDP.....   | 37.1        | 39            |
| 4.2.3 Venture capital deals/bn PPP\$ GDP.....   | 0.0         | 70 ○          |
| 4.3 Trade, competition, & market scale.....   | 69.3        | 33 ●          |
| 4.3.1 Applied tariff rate, weighted mean, % <sup>②</sup> .....  | 1.8         | 51            |
| 4.3.2 Intensity of local competition <sup>†</sup> .....   | 69.0        | 64            |
| 4.3.3 Domestic market scale, bn PPP\$.....  | 424.6       | 44            |

|   | Score/Value | Rank      |
|---|-------------|-----------|
|  <b>Business sophistication</b> .....            | <b>36.8</b> | <b>42</b> |
| 5.1 Knowledge workers.....  | 56.1        | 26 ● ◆    |
| 5.1.1 Knowledge-intensive employment, %.....  | 24.8        | 61        |
| 5.1.2 Firms offering formal training, % firms <sup>②</sup> .....  | 60.1        | 8 ● ◆     |
| 5.1.3 GERD performed by business, % GDP.....  | n/a         | n/a       |
| 5.1.4 GERD financed by business, %.....   | n/a         | n/a       |
| 5.1.5 Females employed w/advanced degrees, %.....   | 17.0        | 33 ●      |
| 5.2 Innovation linkages.....  | 21.8        | 94        |
| 5.2.1 University/industry research collaboration <sup>†</sup> .....   | 32.0        | 98 ○      |
| 5.2.2 State of cluster development <sup>†</sup> .....   | 36.9        | 95        |
| 5.2.3 GERD financed by abroad, %.....   | n/a         | n/a       |
| 5.2.4 JV—strategic alliance deals/bn PPP\$ GDP.....   | 0.0         | 99 ○      |
| 5.2.5 Patent families 2+ offices/bn PPP\$ GDP.....  | 0.0         | 89        |
| 5.3 Knowledge absorption.....   | 32.5        | 51        |
| 5.3.1 Intellectual property payments, % total trade <sup>②</sup> .....  | 0.7         | 51        |
| 5.3.2 High-tech net imports, % total trade.....   | 10.6        | 35 ●      |
| 5.3.3 ICT services imports, % total trade <sup>②</sup> .....  | 1.4         | 48        |
| 5.3.4 FDI net inflows, % GDP.....   | 3.4         | 46        |
| 5.3.5 Research talent, % in business enterprise.....  | n/a         | n/a       |
|  <b>Knowledge &amp; technology outputs</b> ..... | <b>17.1</b> | <b>88</b> |
| 6.1 Knowledge creation.....   | 6.3         | 85        |
| 6.1.1 Patents by origin/bn PPP\$ GDP.....   | 0.2         | 99        |
| 6.1.2 PCT patents by origin/bn PPP\$ GDP.....   | 0.0         | 87        |
| 6.1.3 Utility models by origin/bn PPP\$ GDP.....  | 0.6         | 33        |
| 6.1.4 Scientific & technical articles/bn PPP\$ GDP.....   | 1.7         | 114 ○     |
| 6.1.5 Citable documents H index.....  | 12.3        | 55        |
| 6.2 Knowledge impact.....   | 33.9        | 72        |
| 6.2.1 Growth rate of PPP\$ GDP/worker, %.....   | 2.7         | 25 ●      |
| 6.2.2 New businesses/th pop. 15–64.....   | 3.6         | 35 ●      |
| 6.2.3 Computer software spending, % GDP.....  | 0.2         | 63        |
| 6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP.....   | 3.2         | 75        |
| 6.2.5 High- & medium-high-tech manufactures, %.....   | 0.1         | 73        |
| 6.3 Knowledge diffusion.....  | 11.2        | 115 ○ ◇   |
| 6.3.1 Intellectual property receipts, % total trade <sup>②</sup> .....  | 0.1         | 67        |
| 6.3.2 High-tech net exports, % total trade.....   | 0.4         | 86        |
| 6.3.3 ICT services exports, % total trade <sup>②</sup> .....  | 0.3         | 109 ○     |
| 6.3.4 FDI net outflows, % GDP.....  | 0.2         | 93        |
|  <b>Creative outputs</b> .....                 | <b>23.8</b> | <b>81</b> |
| 7.1 Intangible assets.....  | 36.4        | 87        |
| 7.1.1 Trademarks by origin/bn PPP\$ GDP.....  | 47.6        | 55        |
| 7.1.2 Industrial designs by origin/bn PPP\$ GDP.....  | 0.3         | 101 ○     |
| 7.1.3 ICTs & business model creation <sup>†</sup> .....   | 57.6        | 75        |
| 7.1.4 ICTs & organizational model creation <sup>†</sup> .....   | 47.2        | 91        |
| 7.2 Creative goods & services.....  | 19.6        | 69        |
| 7.2.1 Cultural & creative services exports, % total trade.....  | 0.1         | 54        |
| 7.2.2 National feature films/mn pop. 15–69.....   | 1.4         | 70        |
| 7.2.3 Entertainment & Media market/th pop. 15–69.....   | 6.4         | 42        |
| 7.2.4 Printing & other media, % manufacturing.....  | 2.1         | 15 ●      |
| 7.2.5 Creative goods exports, % total trade.....  | 0.3         | 65        |
| 7.3 Online creativity.....  | 2.8         | 83        |
| 7.3.1 Generic top-level domains (TLDs)/th pop. 15–69.....   | 5.2         | 55        |
| 7.3.2 Country-code TLDs/th pop. 15–69.....  | 1.3         | 73        |
| 7.3.3 Wikipedia edits/mn pop. 15–69.....  | 5.8         | 76        |
| 7.3.4 Mobile app creation/bn PPP\$ GDP.....   | 0.8         | 80 ○      |

NOTES: ● indicates a strength; ○ a weakness; ◆ an income group strength; ◇ an income group 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 75 of this appendix for details.