COLOMBIA

63rd  Colombia ranks 63rd among the 132 economies featured in the GII 2022.

The Global Innovation Index (GII) ranks world economies according to their innovation capabilities. Consisting of roughly 80 indicators, grouped into innovation inputs and outputs, the GII aims to capture the multi-dimensional facets of innovation.

The following table shows the rankings of Colombia over the past three years, noting that data availability and changes to the GII model framework influence year-on-year comparisons of the GII rankings. The statistical confidence interval for the ranking of Colombia in the GII 2022 is between ranks 62 and 67.

<table>
<thead>
<tr>
<th>GIIYR</th>
<th>GII</th>
<th>Innovation inputs</th>
<th>Innovation outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td>68</td>
<td>56</td>
<td>74</td>
</tr>
<tr>
<td>2021</td>
<td>67</td>
<td>58</td>
<td>75</td>
</tr>
<tr>
<td>2022</td>
<td>63</td>
<td>63</td>
<td>70</td>
</tr>
</tbody>
</table>

- Colombia performs better in innovation inputs than innovation outputs in 2022.
- This year Colombia ranks 63rd in innovation inputs, lower than both 2021 and 2020.
- As for innovation outputs, Colombia ranks 70th. This position is higher than both 2021 and 2020.

15th  Colombia ranks 15th among the 36 upper-middle-income group economies.

4th  Colombia ranks 4th among the 18 economies in Latin America and the Caribbean.
EXPECTED VS. OBSERVED INNOVATION PERFORMANCE

The bubble chart below shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The trend line gives an indication of the expected innovation performance according to income level. Economies appearing above the trend line are performing better than expected and those below are performing below expectations.

Relative to GDP, Colombia’s performance is at expectations for its level of development.

The positive relationship between innovation and development
EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

The chart below shows the relationship between innovation inputs and innovation outputs. Economies above the line are effectively translating costly innovation investments into more and higher-quality outputs.

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

Innovation input to output performance

Input score vs Output score for different income levels: High income, Upper middle, Lower middle, Low income, and Fitted line.
BENCHMARKING AGAINST OTHER UPPER MIDDLE-INCOME GROUP ECONOMIES AND LATIN AMERICA AND THE CARIBBEAN

The seven GII pillar scores for Colombia

Upper-middle-income group economies

Colombia performs above the upper-middle-income group average in three pillars, namely: Institutions; Infrastructure; and, Business sophistication.

Latin America and the Caribbean

Colombia performs above the regional average in all GII pillars.
OVERVIEW OF RANKINGS IN THE SEVEN GII 2022 AREAS

Colombia performs best in Business sophistication and its weakest performance is in Human capital and research.

The seven GII pillar ranks for Colombia

<table>
<thead>
<tr>
<th>Pillar</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business sophistication</td>
<td>42</td>
</tr>
<tr>
<td>Infrastructure</td>
<td>59</td>
</tr>
<tr>
<td>Global Innovation Index</td>
<td>63</td>
</tr>
<tr>
<td>Market sophistication</td>
<td>66</td>
</tr>
<tr>
<td>Knowledge and technology outputs</td>
<td>67</td>
</tr>
<tr>
<td>Institutions</td>
<td>72</td>
</tr>
<tr>
<td>Creative outputs</td>
<td>75</td>
</tr>
<tr>
<td>Human capital and research</td>
<td>79</td>
</tr>
</tbody>
</table>

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

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

INNOVATION STRENGTHS AND WEAKNESSES

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

### Strengths and weaknesses for Colombia

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Code</td>
<td>Indicator name</td>
</tr>
<tr>
<td>3.1.4</td>
<td>E-participation</td>
</tr>
<tr>
<td>3.3.1</td>
<td>GDP/unit of energy use</td>
</tr>
<tr>
<td>3.3.3</td>
<td>ISO 14001 environmental certificates/bn PPP$/GDP</td>
</tr>
<tr>
<td>5.1.2</td>
<td>Firms offering formal training, %</td>
</tr>
<tr>
<td>5.1.4</td>
<td>GERD financed by business, %</td>
</tr>
<tr>
<td>5.3.2</td>
<td>High-tech imports, % total trade</td>
</tr>
<tr>
<td>5.3.3</td>
<td>ICT services imports, % total trade</td>
</tr>
<tr>
<td>6.2.1</td>
<td>Labor productivity growth, %</td>
</tr>
<tr>
<td>6.2.4</td>
<td>ISO 9001 quality certificates/tn PPP$/GDP</td>
</tr>
<tr>
<td>7.3.2</td>
<td>Country-code TLDs/th pop. 15–69</td>
</tr>
</tbody>
</table>
### Colombia

<table>
<thead>
<tr>
<th>Output rank</th>
<th>Input rank</th>
<th>Income</th>
<th>Region</th>
<th>Population (mn)</th>
<th>GDP, PPP$ (bn)</th>
<th>GDP per capita, PPP$</th>
</tr>
</thead>
<tbody>
<tr>
<td>70</td>
<td>63</td>
<td>Upper middle</td>
<td>LCN</td>
<td>51.3</td>
<td>812.8</td>
<td>15,922</td>
</tr>
</tbody>
</table>

#### Institutions

<table>
<thead>
<tr>
<th>Score/Value</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>54.6</td>
<td>72</td>
</tr>
</tbody>
</table>

- **1.1 Political environment**
  - Political and operational stability*
    - Score: 56.2
    - Rank: 78
  - Government effectiveness*
    - Score: 61.8
    - Rank: 87
- **1.2 Regulatory environment**
  - Regulatory quality*
    - Score: 52.9
    - Rank: 57
  - Rule of law*
    - Score: 33.3
    - Rank: 92
  - Cost of redundancy dismissal
    - Score: 16.7
    - Rank: 68
- **1.3 Business environment**
  - Score: 44.6
    - Rank: 74
  - Policies for doing business*
    - Score: 46.1
    - Rank: 79
  - Entrepreneurship policies and culture*
    - Score: 43.1
    - Rank: 38

#### Human capital and research

<table>
<thead>
<tr>
<th>Score/Value</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>27.4</td>
<td>79</td>
</tr>
</tbody>
</table>

- **2.1 Education**
  - Expenditure on education, % GDP
    - Score: 42.2
    - Rank: 90
  - Government funding/pupil, secondary, % GDP/cap
    - Score: 21.4
    - Rank: 71
  - School life expectancy, years
    - Score: 14.4
    - Rank: 63
- **2.2 Tertiary education**
  - Tertiary enrolment, % gross
    - Score: 54.2
    - Rank: 59
  - Graduates in science and engineering, %
    - Score: 23.5
    - Rank: 44
- **2.3 Research and development (R&D)**
  - Researchers, FTE/mn pop.
    - Score: 26.1
    - Rank: 108
  - Global corporate R&D investors, top 3, mn USD
    - Score: 34.9
    - Rank: 35

#### Infrastructure

<table>
<thead>
<tr>
<th>Score/Value</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>45.0</td>
<td>59</td>
</tr>
</tbody>
</table>

- **3.1 Information and communication technologies (ICTs)**
  - ICT access*
    - Score: 75.7
    - Rank: 58
  - ICT use*
    - Score: 85.3
    - Rank: 70
  - Government’s online service*
    - Score: 54.0
    - Rank: 88
  - E-participation*
    - Score: 76.5
    - Rank: 49
- **3.2 General infrastructure**
  - Electricity output, GWh/mn pop.
    - Score: 1,454.2
    - Rank: 92
  - Logistics performance
    - Score: 41.4
    - Rank: 57
  - Gross capital formation, % GDP
    - Score: 19.4
    - Rank: 97
- **3.3 Ecological sustainability**
  - GDP/unit of energy use
    - Score: 16.7
    - Rank: 15
  - Environmental performance*
    - Score: 42.4
    - Rank: 63
  - ISO 14001 environmental certificates/bn PPP$ GDP
    - Score: 4.0
    - Rank: 23

#### Market sophistication

<table>
<thead>
<tr>
<th>Score/Value</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>32.5</td>
<td>66</td>
</tr>
</tbody>
</table>

- **4.1 Credit**
  - Finance for startups and scaleups*
    - Score: 24.3
    - Rank: 74
  - Domestic credit to private sector, % GDP
    - Score: 54.1
    - Rank: 65
  - Loans from microfinance institutions, % GDP
    - Score: n/a
    - Rank: n/a
- **4.2 Investment**
  - Market capitalization, % GDP
    - Score: 37.0
    - Rank: 43
  - Venture capital investors, deals/bn PPP$ GDP
    - Score: 0.0
    - Rank: 86
  - Venture capital recipients, deals/bn PPP$ GDP
    - Score: 0.0
    - Rank: 71
  - Venture capital received, value, % GDP
    - Score: 0.0
    - Rank: 30
- **4.3 Trade, diversification, and market scale**
  - Applied tariff rate, weighted avg., %
    - Score: 2.4
    - Rank: 66
  - Domestic industry diversification
    - Score: 85.3
    - Rank: 61
  - Domestic market scale, bn PPP$
    - Score: 812.8
    - Rank: 32

#### Business sophistication

<table>
<thead>
<tr>
<th>Score/Value</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>35.6</td>
<td>42</td>
</tr>
</tbody>
</table>

- **5.1 Knowledge workers**
  - Knowledge-intensive employment, %
    - Score: 51.0
    - Rank: 77
  - Firms offering formal training, %
    - Score: 63.0
    - Rank: 7
  - GERD performed by business, % GDP
    - Score: 0.1
    - Rank: 51
  - GERD financed by business, % GDP
    - Score: 53.4
    - Rank: 24
  - Females employed w/advanced degrees, %
    - Score: 14.9
    - Rank: 50
- **5.2 Innovation linkages**
  - University-industry R&D & collaboration*
    - Score: 46.7
    - Rank: 55
  - State of cluster development and depth*
    - Score: 50.3
    - Rank: 48
  - GERD financed by abroad, % GDP
    - Score: 0.0
    - Rank: 68
  - Joint venture/strategic alliance deals/bn PPP$ GDP
    - Score: 0.0
    - Rank: 89
- **5.3 Trade, diversification, and market scale**
  - Imports/exports ratio, % GDP
    - Score: 0.4
    - Rank: 59

#### Knowledge and technology outputs

<table>
<thead>
<tr>
<th>Score/Value</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>28.5</td>
<td>67</td>
</tr>
</tbody>
</table>

- **6.1 Knowledge creation**
  - Patents by origin/bn PPP$ GDP
    - Score: 0.5
    - Rank: 76
  - PCT patents by origin/bn PPP$ GDP
    - Score: 0.1
    - Rank: 60
  - Utility models by origin/bn PPP$ GDP
    - Score: 0.3
    - Rank: 44
  - Scientific and technical articles/bn PPP$ GDP
    - Score: 10.1
    - Rank: 86
  - Citable documents H-index
    - Score: 18.5
    - Rank: 45
- **6.2 Knowledge impact**
  - Labor productivity growth, %
    - Score: 3.6
    - Rank: 136
  - New businesses/th pop. 15–64
    - Score: 2.0
    - Rank: 62
  - Software spending, % GDP
    - Score: 0.2
    - Rank: 70
  - ISO 9001 quality certificates/bn PPP$ GDP
    - Score: 14.0
    - Rank: 21
  - High-tech exports, % total trade
    - Score: 43.7
    - Rank: 55
- **6.3 Knowledge diffusion**
  - Intellectual property receipts, % total trade
    - Score: 0.2
    - Rank: 45
  - Production and export complexity
    - Score: 43.7
    - Rank: 55
  - High-tech exports, % total trade
    - Score: 1.6
    - Rank: 67
  - ICT services exports, % total trade
    - Score: 0.8
    - Rank: 89

#### Creative outputs

<table>
<thead>
<tr>
<th>Score/Value</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.9</td>
<td>75</td>
</tr>
</tbody>
</table>

- **7.1 Intangible assets**
  - Intangible asset intensity, top 15, %
    - Score: 26.4
    - Rank: 66
  - Trademarks by origin/bn PPP$ GDP
    - Score: 43.0
    - Rank: 55
  - Global brand value, top 5,000, % GDP
    - Score: 31.1
    - Rank: 44
  - Industrial designs by origin/bn PPP$ GDP
    - Score: 0.5
    - Rank: 85
- **7.2 Creative goods and services**
  - Creative outputs, % GDP
    - Score: 10.2
    - Rank: 81
  - Creative services exports, % total trade
    - Score: 0.2
    - Rank: 70
  - National feature films/mn pop. 15–69
    - Score: 1.3
    - Rank: 54
  - Entertainment and media market/th pop. 15–69
    - Score: 6.0
    - Rank: 43
  - Printing and other media, % manufacturing
    - Score: 1.2
    - Rank: 32
  - Creative goods exports, % total trade
    - Score: 0.3
    - Rank: 70
- **7.3 Online creativity**
  - Generic top-level domains (TLDs)/th pop. 15–69
    - Score: 2.9
    - Rank: 66
  - Domain name registrations (TLDs)/th pop. 15–69
    - Score: 246.8
    - Rank: 28
  - GitHub commit pushes received/mn pop. 15–69
    - Score: 4.9
    - Rank: 60
  - Mobile app creation/bn PPP$ GDP
    - Score: 2.1
    - Rank: 72

**NOTES:** ● indicates a strength; ○ a weakness; ◆ an income group strength; ◇ an income group weakness; * an index; a survey question. ○ indicates that the economy’s data are older than the base year; see appendices for details, including the year of the data, at https://www.wipo.int/global_innovation_index/en/2022. Square brackets [ ] indicate that the data minimum coverage (DMC) requirements were not met at the sub-pillar or pillar level.
DATA AVAILABILITY

The following tables list indicators that are either missing or outdated for Colombia.

### Missing data for Colombia

<table>
<thead>
<tr>
<th>Code</th>
<th>Indicator name</th>
<th>Economy year</th>
<th>Model year</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1.3</td>
<td>Loans from microfinance institutions, % GDP</td>
<td>n/a</td>
<td>2020</td>
<td>International Monetary Fund, Financial Access Survey (FAS)</td>
</tr>
</tbody>
</table>

### Outdated data for Colombia

<table>
<thead>
<tr>
<th>Code</th>
<th>Indicator name</th>
<th>Economy year</th>
<th>Model year</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.3.1</td>
<td>Researchers, FTE/mn pop.</td>
<td>2017</td>
<td>2020</td>
<td>UNESCO Institute for Statistics</td>
</tr>
<tr>
<td>5.1.2</td>
<td>Firms offering formal training, %</td>
<td>2017</td>
<td>2019</td>
<td>World Bank Enterprise Surveys</td>
</tr>
<tr>
<td>5.3.5</td>
<td>Research talent, % in businesses</td>
<td>2017</td>
<td>2020</td>
<td>UNESCO Institute for Statistics</td>
</tr>
</tbody>
</table>
COLOMBIA’S INNOVATION SYSTEM

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

**Innovation inputs**

2.1.1 Expenditure on education was equal to 4.9% GDP in 2020—up by 9 percentage points from the year prior—and equivalent to an indicator rank of 44.

2.2.2 Graduates in science and engineering was equal to 23.5% of tert. grads in 2020—down by 5 percentage points from the year prior—and equivalent to an indicator rank of 44.

2.3.1 Researchers was equal to 88.0 FTE/mn pop. in 2017—down by 2 percentage points from the year prior—and equivalent to an indicator rank of 92.

2.3.2 Gross expenditure on R&D was equal to 0.3% GDP in 2020—down by 10 percentage points from the year prior—and equivalent to an indicator rank of 79.
2.3.4 **QS university ranking** was equal to 34.9 in 2021—up by 1 percentage point from the year prior—and equivalent to an indicator rank of 35.

3.1.1 **ICT access** was equal to 8.5 in 2020 and equivalent to an indicator rank of 70.

4.2.4 **Venture capital received** was equal to 1.3 bn USD in 2021—up by 398 percentage points from the year prior—and equivalent to an indicator rank of 30.

4.3.2 **Domestic industry diversification** was equal to 0.2 in 2019—up by 1 percentage point from the year prior—and equivalent to an indicator rank of 61.

5.1.1 **Knowledge-intensive employment** was equal to 7.9 mn people in 2021—up by 4 percentage points from the year prior—and equivalent to an indicator rank of 34.
6.1.1 Patents by origin was equal to 369.0 in 2020—down by 13 percentage points from the year prior—and equivalent to an indicator rank of 76.

6.1.5 Citable documents H-index was equal to 356.0 in 2021—up by 23 percentage points from the year prior—and equivalent to an indicator rank of 45.

6.2.5 High-tech manufacturing was equal to 19.9% of mfg. output in 2019—up by 2 percentage points from the year prior—and equivalent to an indicator rank of 65.

6.3.1 Intellectual property receipts was equal to 89.3 mn USD in 2020—down by 4 percentage points from the year prior—and equivalent to an indicator rank of 45.
6.3.2 Production and export complexity was equal to 0.1 in 2019–down by 31 percentage points from the year prior–and equivalent to an indicator rank of 55.

6.3.3 High-tech exports was equal to 689.6 mn USD in 2020–down by 8 percentage points from the year prior–and equivalent to an indicator rank of 67.

7.1.1 Intangible asset intensity was equal to 38.7% of total value in 2021 and equivalent to an indicator rank of 63.

7.1.3 Global brand value was equal to 9.4 bn USD in 2021–up by 17 percentage points from the year prior–and equivalent to an indicator rank of 44.

7.2.1 Cultural and creative services exports was equal to 104.8 mn USD in 2020–down by 24 percentage points from the year prior–and equivalent to an indicator rank of 70.
COLOMBIA’S INNOVATION TOP PERFORMERS

2.3.3 Global corporate R&D investors

<table>
<thead>
<tr>
<th>Firm</th>
<th>Industry</th>
<th>R&amp;D</th>
<th>R&amp;D Growth</th>
<th>R&amp;D Intensity</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>No observations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


2.3.4 QS university ranking

<table>
<thead>
<tr>
<th>University</th>
<th>Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNIVERSIDAD DE LOS ANDES</td>
<td>39.6</td>
<td>236=</td>
</tr>
<tr>
<td>UNIVERSIDAD NACIONAL DE COLOMBIA</td>
<td>37.6</td>
<td>258=</td>
</tr>
<tr>
<td>PONTIFICIA UNIVERSIDAD JAEVERIANA</td>
<td>27.5</td>
<td>412=</td>
</tr>
</tbody>
</table>

Note: QS Quacquarelli Symonds Ltd annually assesses over 1,200 universities across the globe and scores them between [0,100]. Ranks can represent a single value “x”, a tie “x=“ or a range “x-y”.

7.1.1 Intangible asset intensity, top 15

<table>
<thead>
<tr>
<th>Firm</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECOPETROL</td>
<td>1</td>
</tr>
<tr>
<td>GRUPO AVAL ACCIONES Y VAL</td>
<td>2</td>
</tr>
<tr>
<td>INTERCONEXION ELECTRICA</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: Brand Finance only provides within economy ranks.

7.1.3 Global brand value, top 5,000

<table>
<thead>
<tr>
<th>Brand</th>
<th>Industry</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>ECOPETROL</td>
<td>Oil &amp; Gas</td>
<td>1</td>
</tr>
<tr>
<td>BANCOLOMBIA</td>
<td>Banking</td>
<td>2</td>
</tr>
<tr>
<td>BANCO DE BOGOTÁ</td>
<td>Banking</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: Rank corresponds to within economy ranks.
ABOUT THE GLOBAL INNOVATION INDEX

The Global Innovation Index (GII) is published by the World Intellectual Property Organization (WIPO), a specialized agency of the United Nations.

Recognizing that innovation is a key driver of economic development, the GII aims to provide an innovation ranking and rich analysis referencing around 130 economies. Over the last decade, the GII has established itself as both a leading reference on innovation and a “tool for action” for economies that incorporate the GII into their innovation agendas.

The Index is a ranking of the innovation capabilities and results of world economies. It measures innovation based on criteria that include institutions, human capital and research, infrastructure, credit, investment, linkages; the creation, absorption and diffusion of knowledge; and creative outputs.

The GII has two sub-indices: the Innovation Input Sub-Index and the Innovation Output Sub-Index, and seven pillars, each consisting of three sub-pillars.