The GII indicators are grouped into innovation inputs and outputs. The following table reflects Bulgaria’s ranking over time.

<table>
<thead>
<tr>
<th>Year</th>
<th>GII</th>
<th>Input</th>
<th>Output</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>37</td>
<td>44</td>
<td>34</td>
<td>19</td>
</tr>
<tr>
<td>2017</td>
<td>36</td>
<td>45</td>
<td>32</td>
<td>15</td>
</tr>
<tr>
<td>2016</td>
<td>38</td>
<td>49</td>
<td>35</td>
<td>16</td>
</tr>
</tbody>
</table>

- Bulgaria performs better in innovation outputs than inputs.
- Over the last three years Bulgaria improves in innovation inputs, reaching the 44th position this year, up from the 45th last year and the 49th in 2016.
- Its rank in innovation outputs slightly deteriorates, moving down 2 positions and ranking 34th.
- Bulgaria is highly efficient in translating innovation inputs into outputs. This is shown in the Innovation Efficiency Ratio, which ranks 19th this year. In spite of a decrease from the 15th spot last year, in this Ratio Bulgaria ranks higher than in the overall GII (37th). The Ratio is positively influenced by a higher ranking in innovation outputs (34th) compared to inputs (44th).

Bulgaria is ranked 37th in the GII 2018, dropping 1 position from the previous year.

Bulgaria is ranked 3rd among the 34 upper-middle-income countries in the GII 2018.

Bulgaria is ranked 25th among the 39 countries in Europe.

Note that year-on-year comparisons of the GII ranks are imperfect and influenced by changes in the GII model and data availability.
Benchmarking Bulgaria to other upper-middle-income countries and the Europe region

Bulgaria’s scores by area

Upper-middle-income countries

Bulgaria has high scores in 6 of the 7 GII areas – Institutions, Infrastructure, Market Sophistication, Business Sophistication, Knowledge & Technology Outputs, and Creative Outputs, in which it scores above the average of the upper-middle-income group.

Top scores in the areas Regulatory environment, Information & Communication Technologies (ICTs), Trade, competition & market scale, Knowledge workers, Knowledge impact, and Intangible assets are behind these high rankings.

Europe region

Compared to other countries in the Europe region, Bulgaria performs below-average in all GII areas.

Bulgaria’s innovation profile

Strengths

- The most important strength for Bulgaria is the Innovation Efficiency Ratio, in which it positions 19th globally.

- In Infrastructure (44th), Bulgaria demonstrates strong performance in the area Ecological sustainability (19th) and its indicator ISO 14001 environmental certificates, where it ranks 4th globally.

- Bulgaria also shows strength in indicator Cost of redundancy dismissal (18th) within Institutions (45th) and R&D financed by abroad (6th) within Business Sophistication (31st).

- On the innovation output side, Bulgaria achieves remarkable results in Knowledge & Technology Outputs (28th) – the top-ranked GII area for the country. Here strengths are exhibited in the area Knowledge impact (6th) and three of its five indicators – Productivity growth (18th), New business density (11th), and ISO 9001 quality certificates – in which it positions 1st in the world. Another strong indicators in Knowledge & Technology Outputs is Utility models by origin (8th).

- In Creative Outputs (36th), indicators Trademarks by origin (8th), Industrial designs by origin (13th), and Cultural & creative services exports (9th) are marked as GII strengths.
Weaknesses

- All Bulgaria’s relative weaknesses are accrued among innovation inputs. No weakness is found on the innovation output side.

- In **Human Capital & Research** (63rd), relative weaknesses lie in indicators *Expenditure on education* (77th), *PISA results* (45th), *Graduates in science & engineering* (63rd), and *Global R&D companies expenditure* (40th).

- In **Infrastructure** (44th), the area *General infrastructure* (78th) as well as indicators *Gross capital formation* (87th) and *GDP per unit of energy use* (88th) present a relatively weak performance.

- In **Market Sophistication** (62nd), Bulgaria is relatively weak in the area *Credit* (86th) and its indicator *Microfinance gross loans* (72nd). *Market capitalization* (70th) and *Intensity of local competition* (86th) are also marked as relative weaknesses.

- In **Business Sophistication** (31st), a single GII weakness is exhibited in indicator *University-industry research collaboration* (71st).

The following figure presents a summary of Bulgaria’s ranks in the 7 GII areas, as well as the overall rank in the GII 2018.
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, Bulgaria performs above 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 Bulgaria that is not available or that is outdated.

**Missing Data**

<table>
<thead>
<tr>
<th>Code</th>
<th>Indicator</th>
<th>Country Year</th>
<th>Model Year</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.2.3</td>
<td>Venture capital deals/bn PPP$ GDP</td>
<td>n/a</td>
<td>2017</td>
<td>Thomson Reuters, Thomson One Banker Private Equity, SDC Platinum</td>
</tr>
<tr>
<td>7.2.3</td>
<td>Entertainment &amp; Media market/th pop. 15–69</td>
<td>n/a</td>
<td>2016</td>
<td>PwC's Global Entertainment and Media Outlook, 2017–2021</td>
</tr>
</tbody>
</table>

**Outdated Data**

<table>
<thead>
<tr>
<th>Code</th>
<th>Indicator</th>
<th>Country Year</th>
<th>Model Year</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.1.1</td>
<td>Expenditure on education, % GDP</td>
<td>2013</td>
<td>2014</td>
<td>UNESCO Institute for Statistics</td>
</tr>
<tr>
<td>2.1.2</td>
<td>Government funding/pupil, secondary, % GDP/cap</td>
<td>2013</td>
<td>2014</td>
<td>UNESCO Institute for Statistics</td>
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<tr>
<td>4.2.2</td>
<td>Market capitalization, % GDP</td>
<td>2011</td>
<td>2016</td>
<td>World Bank, World Development Indicators</td>
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<tr>
<td>7.2.1</td>
<td>Cultural &amp; creative services exports, % total trade</td>
<td>2015</td>
<td>2016</td>
<td>WTO, Trade in Commercial Services</td>
</tr>
</tbody>
</table>
### Bulgaria

#### Country/Economy Profiles

#### GII 2018 rank

<table>
<thead>
<tr>
<th>Output rank</th>
<th>Input rank</th>
<th>Income</th>
<th>Region</th>
<th>Efficiency ratio</th>
<th>Population (mn)</th>
<th>GDP, PPP$</th>
<th>GDP per capita, PPP$</th>
<th>GII 2017 rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>34</td>
<td>44</td>
<td>Upper-middle</td>
<td>EUR</td>
<td>19</td>
<td>71</td>
<td>152.4</td>
<td>21,686.6</td>
<td>36</td>
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</table>

#### Institutions

<table>
<thead>
<tr>
<th>Score/Value</th>
<th>Rank</th>
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</thead>
<tbody>
<tr>
<td>68.3</td>
<td>45</td>
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#### Human capital & research

<table>
<thead>
<tr>
<th>Score/Value</th>
<th>Rank</th>
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<tbody>
<tr>
<td>30.9</td>
<td>63</td>
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#### Infrastructure

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<th>Score/Value</th>
<th>Rank</th>
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<tbody>
<tr>
<td>50.2</td>
<td>44</td>
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#### Market sophistication

<table>
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<th>Score/Value</th>
<th>Rank</th>
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</thead>
<tbody>
<tr>
<td>47.4</td>
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#### Business sophistication

<table>
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<th>Rank</th>
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<td>41.3</td>
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#### Knowledge & technology outputs

<table>
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<th>Score/Value</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>36.1</td>
<td>28</td>
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</table>

#### Creative outputs

<table>
<thead>
<tr>
<th>Score/Value</th>
<th>Rank</th>
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</thead>
<tbody>
<tr>
<td>39.2</td>
<td>36</td>
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#### Knowledge & innovation

<table>
<thead>
<tr>
<th>Score/Value</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>71</td>
<td>38</td>
</tr>
</tbody>
</table>

#### Institutions

- **Political engagement**: 56.7
- **Political stability & safety**: 65.2
- **Government effectiveness**: 52.4

#### Human capital & research

- **Education**: 45.4
- **Expenditure on education, % GDP**: 41
- **Government funding/pupil, secondary, % GDP/cap**: 217
- **School life expectancy, years**: 14.8
- **PISA scales in reading, maths & science**: 439.6
- **Pupil-teacher ratio, secondary**: 12.6

#### Infrastructure

- **Information & communication technologies (ICTs)**: 64.2
- **ICT access**: 68.3
- **ICT use**: 62.3
- **Government’s online service**: 56.5
- **E-participation**: 69.5

#### Market sophistication

- **Credit**: 30.4
- **Ease of getting credit**: 70.0
- **Domestic credit to private sector, % GDP**: 52.8
- **Microfinance gross loans, % GDP**: 0.0
- **Investment**: 49.9
- **Ease of protecting minority investors**: 70.0
- **Market capitalization, % GDP**: 15.0
- **Venture capital deals/bn PPP$**: n/a
- **Trade, competition, & market scale**: 62.9
- **Applied tariff rate, weighted mean, %**: 1.6
- **Intensity of local competition**: 63.6
- **Domestic market scale, bn PPP$**: 152.4

#### Business sophistication

- **Knowledge workers**: 475.4
- **Knowledge-intensive employment, %**: 32.4
- **Firms offering formal training, % firms**: 42.7
- **GERD performed by business, % GDP**: 0.6
- **GERD financed by business, %**: 35.6
- **Females employed w/advanced degrees, %**: 19.8

#### Knowledge & technology outputs

- **Knowledge creation**: 29.0
- **Patents by origin/bn PPP$ GDP**: 1.7
- **PCT patents by origin/bn PPP$ GDP**: 0.3
- **Utility models by origin/bn PPP$ GDP**: 3.1
- **Scientific & technical articles/bn PPP$ GDP**: 12.6
- **Citable documents H index**: 14.5
- **Knowledge impact**: 57.1
- **Growth rate of PPP$ GDP/worker**: 2.9
- **New businesses/th pop 15–64**: 10.9
- **Computer software spending, % GDP**: 0.3
- **ISO 9001 quality certificates/bn PPP$ GDP**: 41.1
- **High- & medium-high-tech manufactures, %**: 0.7
- **Knowledge diffusion**: 22.4
- **Intellectual property receipts, % total trade**: 0.2
- **High-tech net exports, % total trade**: 3.9
- **ICT services exports, % total trade**: 3.3
- **FDI net inflows, % GDP**: 11.4

#### Creative outputs

- **Intangible assets**: 54.7
- **Trademarks by origin/bn PPP$ GDP**: 11.4
- **Industrial designs by origin/bn PPP$ GDP**: 8.5
- **ICTs & business model creation**: 61.0
- **ICTs & organizational model creation**: 55.5
- **Creative goods & services**: 297.4
- **Cultural & creative services exports, % total trade**: 1.3
- **National feature films/mn pop. 15–69**: 4.8
- **Entertainment & Media market/th pop. 15–69**: n/a
- **Printing & other media, % manufacturing**: 1.2
- **Creative goods exports, % total trade**: 0.9
- **Online creativity**: 178.4

#### Notes:

- * indicates a strength; o a weakness; an income group strength; an income group weakness; * an index; † a survey question.
- $ indicates that the country’s data are older than the base year; see Appendix 2 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.