

# GLOBAL INNOVATION INDEX 2018

## Bulgaria

**37<sup>th</sup>** Bulgaria is ranked 37th in the GII 2018, dropping 1 position from the previous year.

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

**Bulgaria's ranking over time**

	GII	Input	Output	Efficiency
<b>2018</b>	37	44	34	19
<b>2017</b>	36	45	32	15
<b>2016</b>	38	49	35	16

- 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).

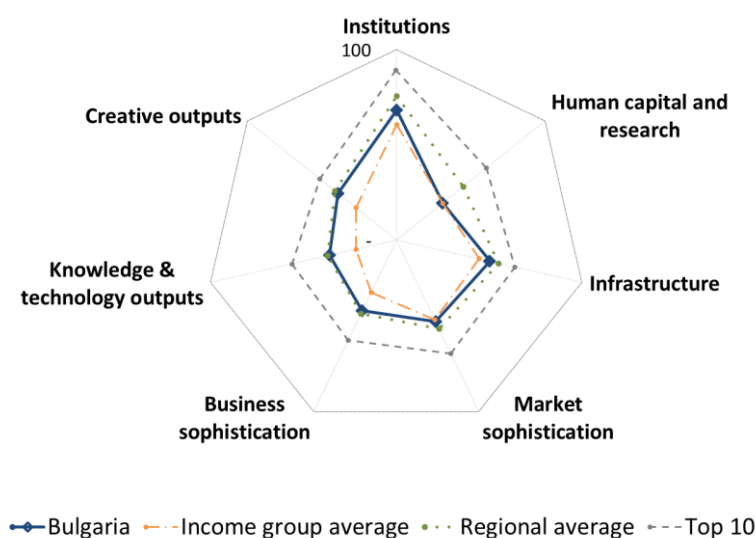
**3<sup>rd</sup>** Bulgaria is ranked 3rd among the 34 upper-middle-income countries in the GII 2018.

**25<sup>th</sup>** Bulgaria is ranked 25th among the 39 countries in Europe.

<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 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 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* (9<sup>th</sup>) are marked as GII strengths.

## Weaknesses

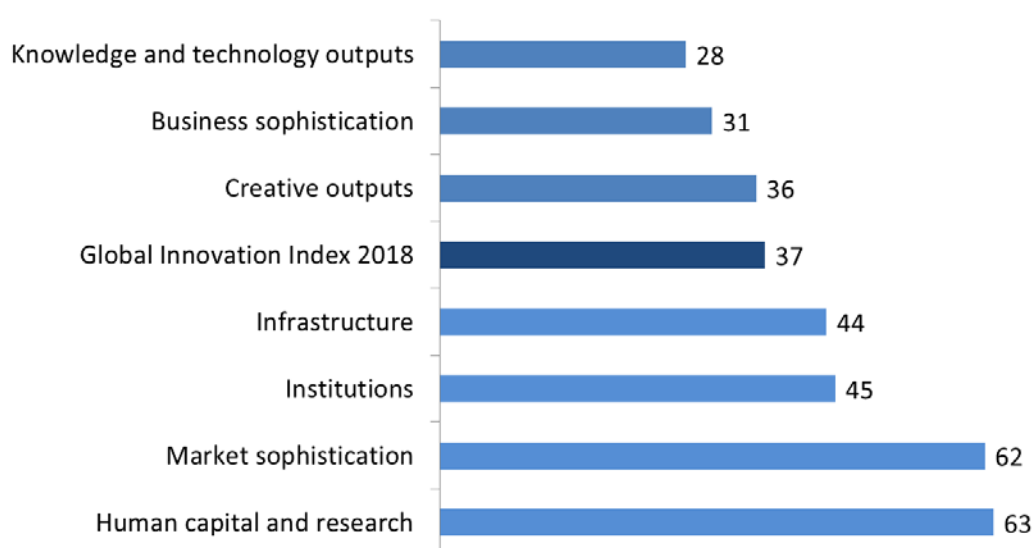
- All Bulgaria's relative weaknesses are accrued among innovation inputs. No weakness is found on the innovation output side.
- In **Human Capital & Research** (63rd), relative weaknesses lie in indicators *Expenditure on education* (77th), *PISA results* (45th), *Graduates in science & engineering* (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.

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

Rank 1 is the highest possible in each pillar

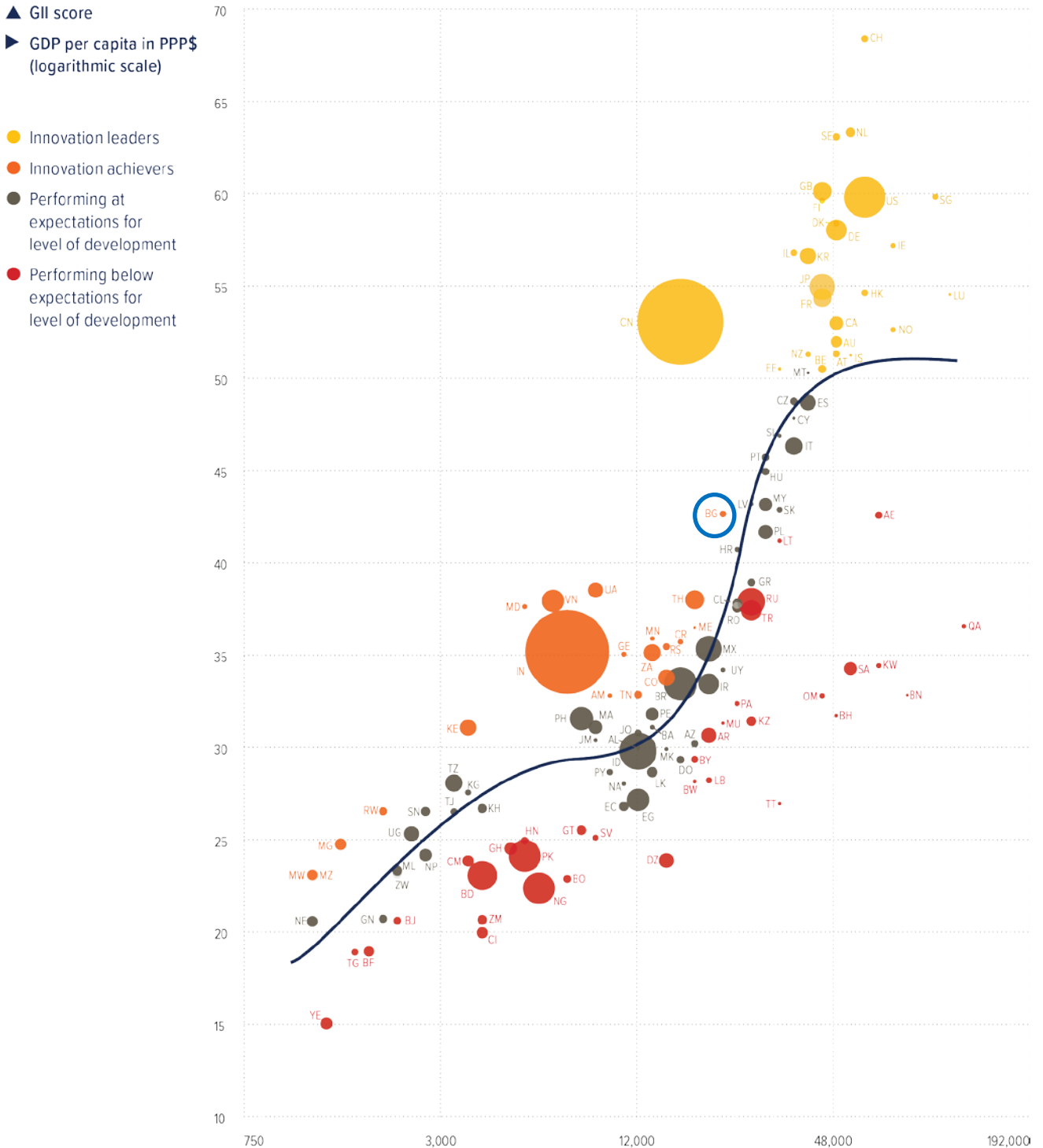
Total number of countries: 126



## 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, 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








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

### Outdated Data

Code	Indicator	Country Year	Model Year	Source
2.1.1	Expenditure on education, % GDP	2013	2014	UNESCO Institute for Statistics
2.1.2	Government funding/pupil, secondary, % GDP/cap	2013	2014	UNESCO Institute for Statistics
4.2.2	Market capitalization, % GDP	2011	2016	World Bank, World Development Indicators
7.2.1	Cultural & creative 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
34	44	Upper-middle	EUR	19 ●	7.1	152.4	21,686.6	36

		Score/Value	Rank			Score/Value	Rank
	<b>Institutions</b> .....	<b>68.3</b>	<b>45</b> ◆		<b>Business sophistication</b> .....	<b>41.3</b>	<b>31</b> ◆
1.1	Political environment.....	56.7	53	5.1	Knowledge workers.....	47.5	40
1.1.1	Political stability & safety*.....	65.2	65	5.1.1	Knowledge-intensive employment, %.....	32.4	42 ◆
1.1.2	Government effectiveness*.....	52.4	52	5.1.2	Firms offering formal training, % firms.....	42.7	28
1.2	Regulatory environment.....	75.5	35 ◆	5.1.3	GERD performed by business, % GDP.....	0.6	34
1.2.1	Regulatory quality*.....	61.0	41 ◆	5.1.4	GERD financed by business, %.....	35.6	49
1.2.2	Rule of law*.....	42.9	64	5.1.5	Females employed w/advanced degrees, %.....	19.8	25 ◆
1.2.3	Cost of redundancy dismissal, salary weeks.....	8.6	18 ●	5.2	Innovation linkages.....	45.7	21 ◆
1.3	Business environment.....	72.7	52	5.2.1	University/industry research collaboration <sup>†</sup> .....	39.3	71 ○
1.3.1	Ease of starting a business*.....	85.4	74	5.2.2	State of cluster development <sup>†</sup> .....	45.7	66
1.3.2	Ease of resolving insolvency*.....	60.0	46	5.2.3	GERD financed by abroad, %.....	43.8	6 ◆◆
				5.2.4	JV–strategic alliance deals/bn PPP\$ GDP.....	0.1	31
				5.2.5	Patent families 2+ offices/bn PPP\$ GDP.....	0.1	49
	<b>Human capital &amp; research</b> .....	<b>30.9</b>	<b>63</b>	5.3	Knowledge absorption.....	30.7	62
2.1	Education.....	45.4	73	5.3.1	Intellectual property payments, % total trade.....	0.5	63
2.1.1	Expenditure on education, % GDP <sup>Ⓔ</sup> .....	4.1	77 ○	5.3.2	High-tech net imports, % total trade.....	7.7	67
2.1.2	Government funding/pupil, secondary, % GDP/cap <sup>Ⓔ</sup> .....	21.7	43	5.3.3	ICT services imports, % total trade.....	1.0	68
2.1.3	School life expectancy, years.....	14.8	55	5.3.4	FDI net inflows, % GDP.....	3.8	40
2.1.4	PISA scales in reading, maths & science.....	439.6	45 ○	5.3.5	Research talent, % in business enterprise.....	38.2	30
2.1.5	Pupil-teacher ratio, secondary.....	12.6	49		<b>Knowledge &amp; technology outputs</b> .....	<b>36.1</b>	<b>28</b> ◆
2.2	Tertiary education.....	34.4	52	6.1	Knowledge creation.....	29.0	33 ◆
2.2.1	Tertiary enrolment, % gross.....	71.2	23 ◆	6.1.1	Patents by origin/bn PPP\$ GDP.....	1.7	50
2.2.2	Graduates in science & engineering, %.....	19.7	63 ○	6.1.2	PCT patents by origin/bn PPP\$ GDP.....	0.3	43
2.2.3	Tertiary inbound mobility, %.....	4.6	44	6.1.3	Utility models by origin/bn PPP\$ GDP.....	3.1	8 ◆◆
2.3	Research & development (R&D).....	12.7	51	6.1.4	Scientific & technical articles/bn PPP\$ GDP.....	12.6	40
2.3.1	Researchers, FTE/mn pop.....	2,243.7	36 ◆	6.1.5	Citable documents H index.....	14.5	50
2.3.2	Gross expenditure on R&D, % GDP.....	0.8	46	6.2	Knowledge impact.....	57.1	6 ◆◆
2.3.3	Global R&D companies, top 3, mn US\$.....	0.0	40 ○◇	6.2.1	Growth rate of PPP\$ GDP/worker, %.....	2.9	18 ●
2.3.4	QS university ranking, average score top 3*.....	5.8	70	6.2.2	New businesses/th pop. 15–64.....	10.9	11 ◆◆
	<b>Infrastructure</b> .....	<b>50.2</b>	<b>44</b> ◆	6.2.3	Computer software spending, % GDP.....	0.3	53
3.1	Information & communication technologies (ICTs).....	64.2	50	6.2.4	ISO 9001 quality certificates/bn PPP\$ GDP.....	41.2	1 ◆◆
3.1.1	ICT access*.....	68.3	59	6.2.5	High- & medium-high-tech manufactures, %.....	0.2	51
3.1.2	ICT use*.....	62.3	40 ◆	6.3	Knowledge diffusion.....	22.4	48
3.1.3	Government's online service*.....	56.5	74	6.3.1	Intellectual property receipts, % total trade.....	0.2	45
3.1.4	E-participation*.....	69.5	43	6.3.2	High-tech net exports, % total trade.....	3.9	39
3.2	General infrastructure.....	34.0	78 ○	6.3.3	ICT services exports, % total trade.....	3.3	28 ◆
3.2.1	Electricity output, kWh/cap.....	6,788.6	31 ◆	6.3.4	FDI net outflows, % GDP.....	1.1	49
3.2.2	Logistics performance*.....	34.4	72		<b>Creative outputs</b> .....	<b>39.2</b>	<b>36</b> ◆
3.2.3	Gross capital formation, % GDP.....	20.1	87 ○	7.1	Intangible assets.....	54.7	25 ◆
3.3	Ecological sustainability.....	52.4	19 ●◆	7.1.1	Trademarks by origin/bn PPP\$ GDP.....	111.4	8 ◆◆
3.3.1	GDP/unit of energy use.....	6.5	88 ○	7.1.2	Industrial designs by origin/bn PPP\$ GDP.....	8.5	13 ◆◆
3.3.2	Environmental performance*.....	67.9	29 ◆	7.1.3	ICTs & business model creation <sup>†</sup> .....	61.0	57
3.3.3	ISO 14001 environmental certificates/bn PPP\$ GDP.....	12.6	4 ●◆	7.1.4	ICTs & organizational model creation <sup>†</sup> .....	55.5	56
	<b>Market sophistication</b> .....	<b>47.4</b>	<b>62</b>	7.2	Creative goods & services.....	29.7	42
4.1	Credit.....	30.4	86 ○	7.2.1	Cultural & creative services exports, % total trade <sup>Ⓔ</sup> .....	1.3	9 ◆◆
4.1.1	Ease of getting credit*.....	70.0	38	7.2.2	National feature films/mn pop. 15–69.....	4.8	39
4.1.2	Domestic credit to private sector, % GDP.....	52.8	66	7.2.3	Entertainment & Media market/th pop. 15–69.....	n/a	n/a
4.1.3	Microfinance gross loans, % GDP.....	0.0	72 ○	7.2.4	Printing & other media, % manufacturing.....	1.2	49
4.2	Investment.....	48.9	38	7.2.5	Creative goods exports, % total trade.....	0.9	48
4.2.1	Ease of protecting minority investors*.....	70.0	24	7.3	Online creativity.....	17.8	41 ◆
4.2.2	Market capitalization, % GDP <sup>Ⓔ</sup> .....	15.2	70 ○	7.3.1	Generic top-level domains (TLDs)/th pop. 15–69.....	22.7	25 ◆
4.2.3	Venture capital deals/bn PPP\$ GDP.....	n/a	n/a	7.3.2	Country-code TLDs/th pop. 15–69.....	2.0	67
4.3	Trade, competition, & market scale.....	62.9	58	7.3.3	Wikipedia edits/mn pop. 15–69.....	46.2	30 ◆
4.3.1	Applied tariff rate, weighted mean, %.....	1.6	19	7.3.4	Mobile app creation/bn PPP\$ GDP.....	15.5	49
4.3.2	Intensity of local competition <sup>†</sup> .....	63.6	86 ○				
4.3.3	Domestic market scale, bn PPP\$.....	152.4	68				

NOTES: ● indicates a strength; ○ 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 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.