



ROMANIA

49th Romania ranks 49th 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 Romania 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 Romania in the GII 2022 is between ranks 45 and 50.

Rankings for Romania (2020–2022)

GIIYR	GII	Innovation inputs	Innovation outputs
2020	46	51	46
2021	48	54	50
2022	49	56	43

- Romania performs better in innovation outputs than innovation inputs in 2022.
- This year Romania ranks 56th in innovation inputs, lower than both 2021 and 2020.
- As for innovation outputs, Romania ranks 43rd. This position is higher than both 2021 and 2020.

8th Romania ranks 8th among the 36 upper-middle-income group economies.

31st Romania ranks 31st among the 39 economies in Europe.

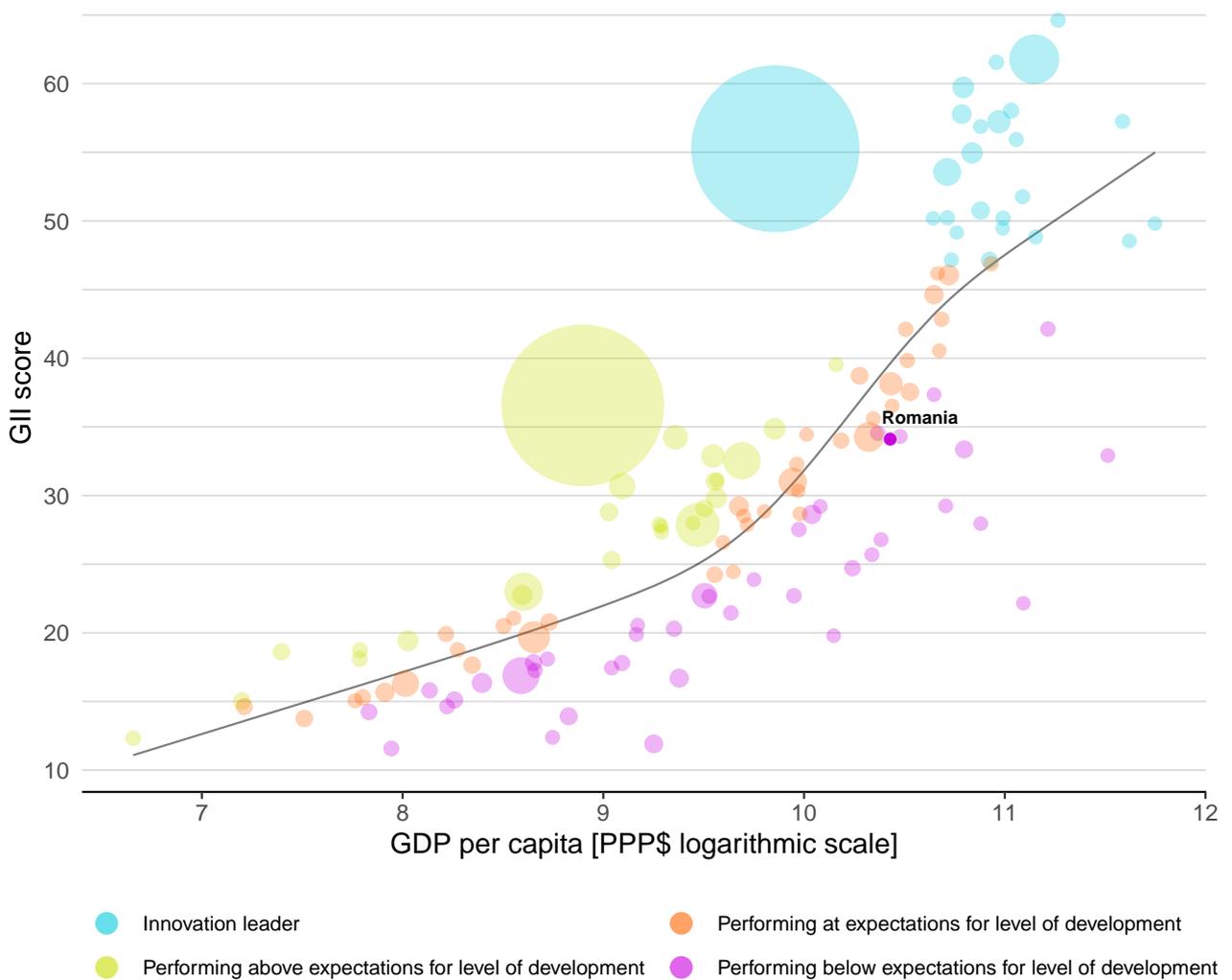


EXPECTED VS. OBSERVED INNOVATION PERFORMANCE

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, Romania's performance is below expectations for its level of development.

The positive relationship between innovation and development



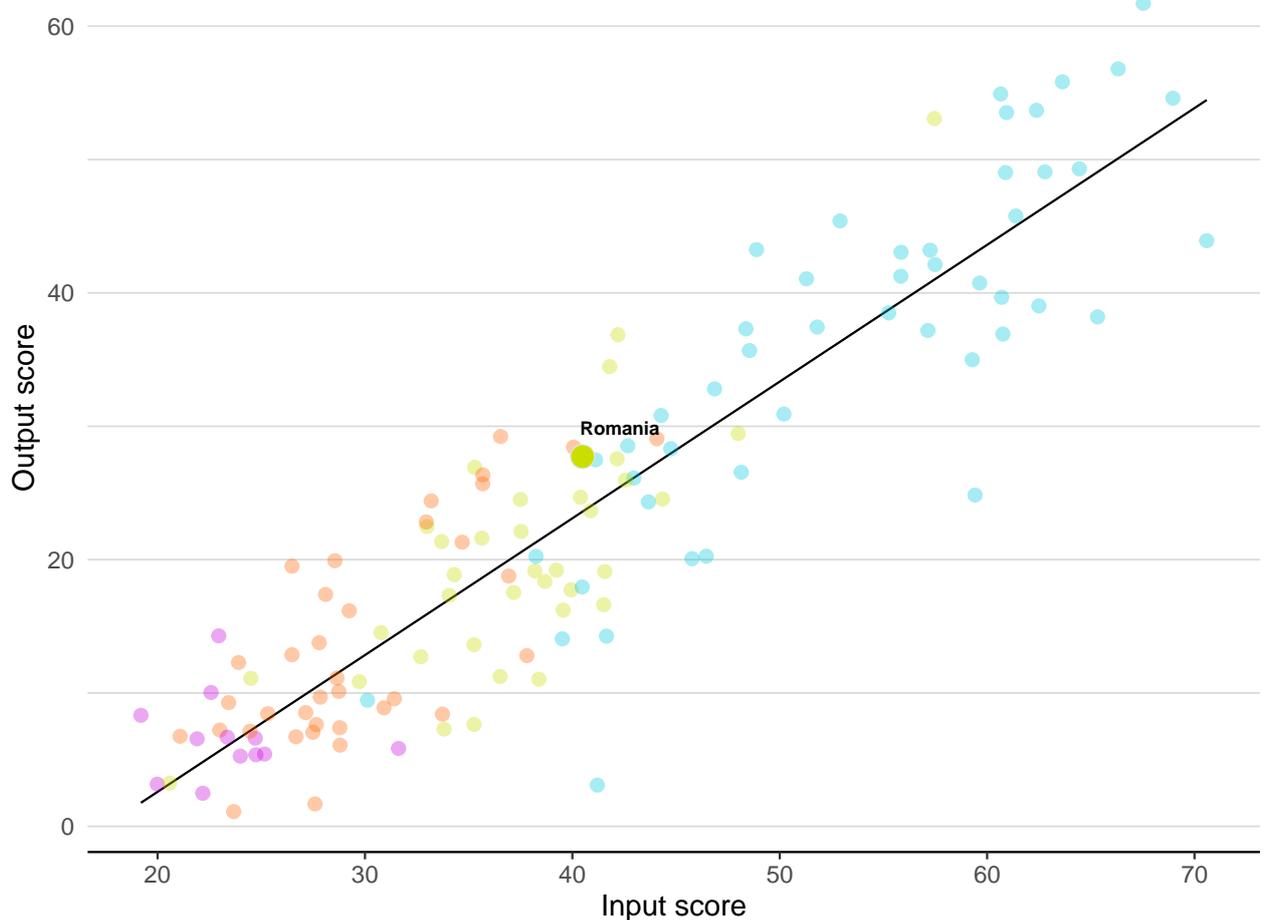


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

Romania produces more innovation outputs relative to its level of innovation investments.

Innovation input to output performance

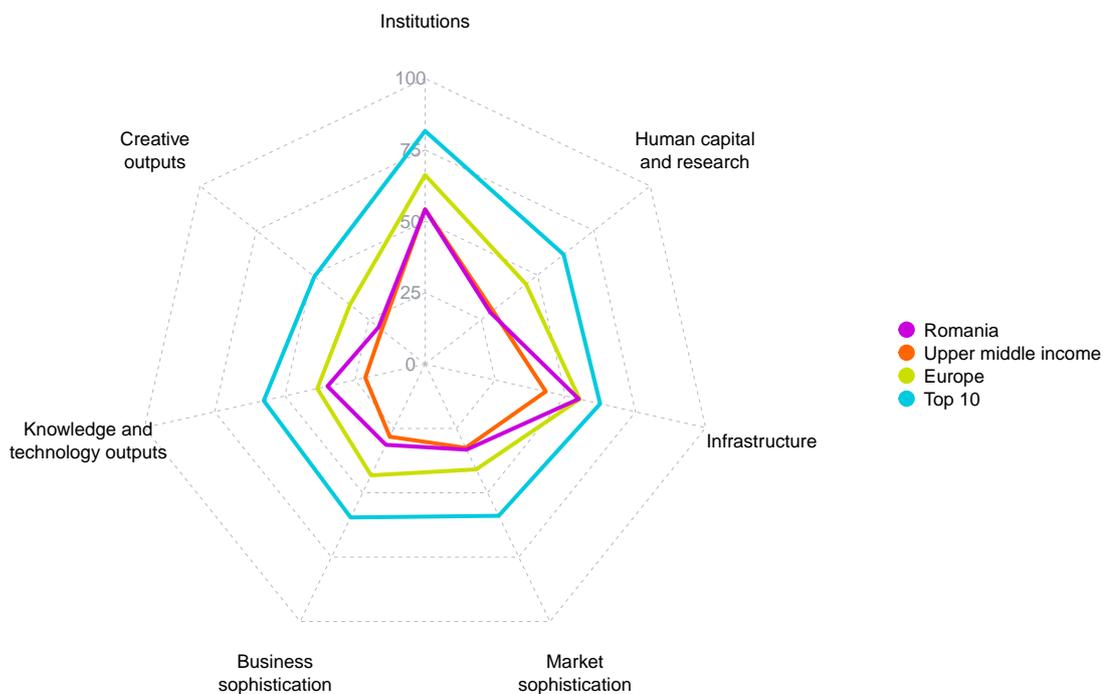


Income ● High income ● Upper middle ● Lower middle ● Low income — Fitted line



BENCHMARKING AGAINST OTHER UPPER MIDDLE-INCOME GROUP ECONOMIES AND EUROPE

The seven GII pillar scores for Romania



Upper-middle-income group economies

Romania performs above the upper-middle-income group average in five pillars, namely: Infrastructure; Market sophistication; Business sophistication; Knowledge and technology outputs; and, Creative outputs.

Europe

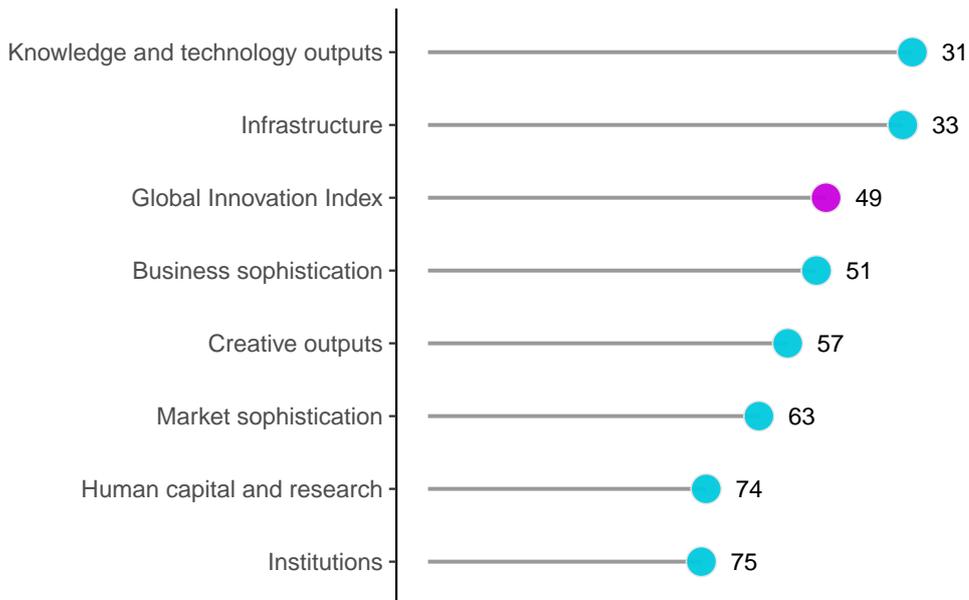
Romania performs below the regional average in all GII pillars.



OVERVIEW OF RANKINGS IN THE SEVEN GII 2022 AREAS

Romania performs best in Knowledge and technology outputs and its weakest performance is in Institutions.

The seven GII pillar ranks for Romania



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

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

https://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=RO.

INNOVATION STRENGTHS AND WEAKNESSES

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

Strengths and weaknesses for Romania

Strengths			Weaknesses		
Code	Indicator name	Rank	Code	Indicator name	Rank
1.2.3	Cost of redundancy dismissal	1	1.3.1	Policies for doing business	114
3.3.1	GDP/unit of energy use	19	1.3.2	Entrepreneurship policies and culture	58
3.3.3	ISO 14001 environmental certificates/bn PPP\$ GDP	10	2.3.3	Global corporate R&D investors, top 3, mn USD	38
4.1.3	Loans from microfinance institutions, % GDP	9	2.3.4	QS university ranking, top 3	72
5.3.3	ICT services imports, % total trade	14	4.1.2	Domestic credit to private sector, % GDP	105
6.2.1	Labor productivity growth, %	4	4.2.1	Market capitalization, % GDP	75
6.2.4	ISO 9001 quality certificates/bn PPP\$ GDP	17	4.2.2	Venture capital investors, deals/bn PPP\$ GDP	75
6.3.2	Production and export complexity	22	4.2.3	Venture capital recipients, deals/bn PPP\$ GDP	81
6.3.4	ICT services exports, % total trade	11	4.2.4	Venture capital received, value, % GDP	95
7.2.1	Cultural and creative services exports, % total trade	15	5.1.2	Firms offering formal training, %	78

Romania

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Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$
43	56	Upper middle	EUR	19.1	653.9	33,833

	Score/Value	Rank		Score/Value	Rank
 Institutions	54.1	75	 Business sophistication	31.4	51
1.1 Political environment	57.9	71	5.1 Knowledge workers	35.1	58
1.1.1 Political and operational stability*	70.9	53	5.1.1 Knowledge-intensive employment, %	27.2	53
1.1.2 Government effectiveness*	45.0	84	5.1.2 Firms offering formal training, %	20.5	78 ○
1.2 Regulatory environment	77.5	32 ◆	5.1.3 GERD performed by business, % GDP	0.3	49
1.2.1 Regulatory quality*	54.5	55	5.1.4 GERD financed by business, %	54.6	21 ◆
1.2.2 Rule of law*	55.6	47 ◆	5.1.5 Females employed w/advanced degrees, %	12.7	61
1.2.3 Cost of redundancy dismissal	8.0	1 ◆◆	5.2 Innovation linkages	20.1	92
1.3 Business environment	26.8	116 ○ ◇	5.2.1 University-industry R&D collaboration†	39.5	82
1.3.1 Policies for doing business†	32.2	114 ○	5.2.2 State of cluster development and depth†	46.5	72
1.3.2 Entrepreneurship policies and culture*	21.4	58 ○	5.2.3 GERD financed by abroad, % GDP	0.1	47
			5.2.4 Joint venture/strategic alliance deals/bn PPP\$ GDP	0.0	93
			5.2.5 Patent families/bn PPP\$ GDP	0.1	63
 Human capital and research	29.0	74	5.3 Knowledge absorption	38.9	40
2.1 Education	45.8	77	5.3.1 Intellectual property payments, % total trade	0.9	45
2.1.1 Expenditure on education, % GDP	3.3	99 ○	5.3.2 High-tech imports, % total trade	10.9	27
2.1.2 Government funding/pupil, secondary, % GDP/cap	17.6	66	5.3.3 ICT services imports, % total trade	3.2	14 ◆◆
2.1.3 School life expectancy, years	14.2	68	5.3.4 FDI net inflows, % GDP	2.5	59
2.1.4 PISA scales in reading, maths and science	427.8	49	5.3.5 Research talent, % in businesses	27.2	47
2.1.5 Pupil-teacher ratio, secondary	11.8	47	 Knowledge and technology outputs	34.8	31 ◆
2.2 Tertiary education	38.0	41	6.1 Knowledge creation	11.0	72
2.2.1 Tertiary enrolment, % gross	51.4	63	6.1.1 Patents by origin/bn PPP\$ GDP	1.5	50
2.2.2 Graduates in science and engineering, %	29.1	22 ◆	6.1.2 PCT patents by origin/bn PPP\$ GDP	0.0	79
2.2.3 Tertiary inbound mobility, %	5.7	44	6.1.3 Utility models by origin/bn PPP\$ GDP	0.1	57
2.3 Research and development (R&D)	3.2	78	6.1.4 Scientific and technical articles/bn PPP\$ GDP	15.3	63
2.3.1 Researchers, FTE/mn pop.	952.9	52	6.1.5 Citable documents H-index	18.9	43
2.3.2 Gross expenditure on R&D, % GDP	0.5	64	6.2 Knowledge impact	48.6	8 ◆◆
2.3.3 Global corporate R&D investors, top 3, mn USD	0.0	38 ○ ◇	6.2.1 Labor productivity growth, %	5.5	4 ◆◆
2.3.4 QS university ranking, top 3*	0.0	72 ○ ◇	6.2.2 New businesses/th pop. 15-64	6.2	24
			6.2.3 Software spending, % GDP	0.3	49
 Infrastructure	54.8	33 ◆	6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	17.1	17 ●
3.1 Information and communication technologies (ICTs)	78.9	50	6.2.5 High-tech manufacturing, %	43.5	23 ◆
3.1.1 ICT access*	90.0	47	6.3 Knowledge diffusion	44.8	24 ◆◆
3.1.2 ICT use*	72.3	50 ◆	6.3.1 Intellectual property receipts, % total trade	0.1	53
3.1.3 Government's online service*	72.4	61	6.3.2 Production and export complexity	69.8	22 ◆◆
3.1.4 E-participation*	81.0	46	6.3.3 High-tech exports, % total trade	7.1	26
3.2 General infrastructure	33.3	54	6.3.4 ICT services exports, % total trade	7.1	11 ◆◆
3.2.1 Electricity output, GWh/mn pop.	2,863.1	65	 Creative outputs	20.7	57
3.2.2 Logistics performance*	49.8	47	7.1 Intangible assets	28.5	63
3.2.3 Gross capital formation, % GDP	25.9	45	7.1.1 Intangible asset intensity, top 15, %	49.8	51
3.3 Ecological sustainability	52.1	6 ◆◆	7.1.2 Trademarks by origin/bn PPP\$ GDP	41.1	59
3.3.1 GDP/unit of energy use	15.9	19 ◆◆	7.1.3 Global brand value, top 5,000, % GDP	18.4	47
3.3.2 Environmental performance*	56.0	29 ◆	7.1.4 Industrial designs by origin/bn PPP\$ GDP	1.5	53
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	9.0	10 ◆◆	7.2 Creative goods and services	16.9	63
			7.2.1 Cultural and creative services exports, % total trade	1.8	15 ◆◆
 Market sophistication	33.2	63	7.2.2 National feature films/mn pop. 15-69	1.6	51
4.1 Credit	30.5	54	7.2.3 Entertainment and media market/th pop. 15-69	6.8	39
4.1.1 Finance for startups and scaleups*	34.6	50	7.2.4 Printing and other media, % manufacturing	0.9	51
4.1.2 Domestic credit to private sector, % GDP	26.1	105 ○	7.2.5 Creative goods exports, % total trade	0.9	47
4.1.3 Loans from microfinance institutions, % GDP	3.4	9 ●	7.3 Online creativity	8.9	46
4.2 Investment	2.3	101 ○	7.3.1 Generic top-level domains (TLDs)/th pop. 15-69	4.8	53
4.2.1 Market capitalization, % GDP	9.8	75 ○	7.3.2 Country-code TLDs/th pop. 15-69	13.4	36
4.2.2 Venture capital investors, deals/bn PPP\$ GDP	0.0	75 ○	7.3.3 GitHub commit pushes received/mn pop. 15-69	9.9	45 ◆
4.2.3 Venture capital recipients, deals/bn PPP\$ GDP	0.0	81 ○	7.3.4 Mobile app creation/bn PPP\$ GDP	7.5	49
4.2.4 Venture capital received, value, % GDP	0.0	95 ○			
4.3 Trade, diversification, and market scale	66.8	25			
4.3.1 Applied tariff rate, weighted avg., %	1.5	20			
4.3.2 Domestic industry diversification	95.6	23			
4.3.3 Domestic market scale, bn PPP\$	653.9	35			

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 Romania.

Missing data for Romania

Code	Indicator name	Economy year	Model year	Source
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Outdated data for Romania

Code	Indicator name	Economy year	Model year	Source
2.1.1	Expenditure on education, % GDP	2018	2020	UNESCO Institute for Statistics

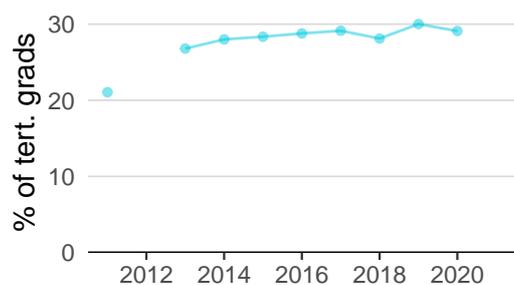
ROMANIA'S INNOVATION SYSTEM

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

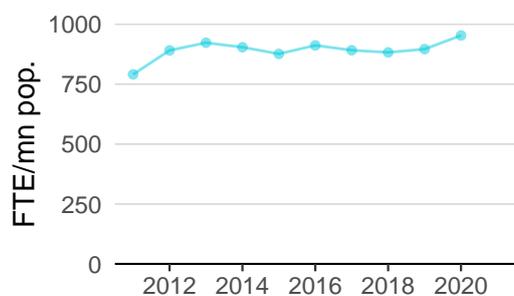
Innovation inputs



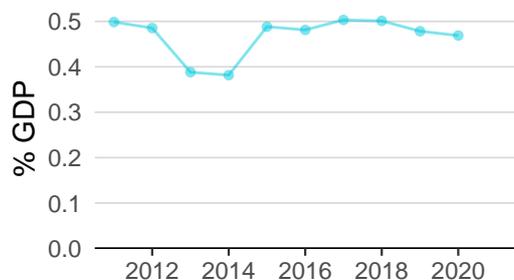
2.1.1 Expenditure on education was equal to 3.3% GDP in 2018—up by 8 percentage points from the year prior—and equivalent to an indicator rank of 99.



2.2.2 Graduates in science and engineering was equal to 29.1% of tert. grads in 2020—down by 3 percentage points from the year prior—and equivalent to an indicator rank of 22.



2.3.1 Researchers was equal to 952.9 FTE/mn pop. in 2020—up by 6 percentage points from the year prior—and equivalent to an indicator rank of 52.



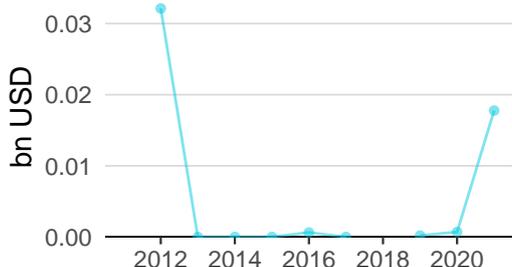
2.3.2 Gross expenditure on R&D was equal to 0.5% GDP in 2020—down by 2 percentage points from the year prior—and equivalent to an indicator rank of 64.



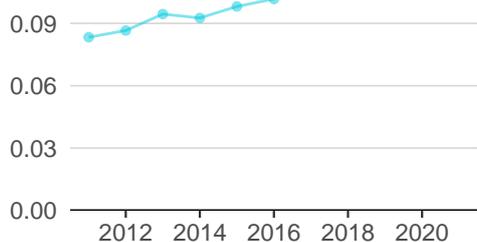
2.3.4 QS university ranking was equal to 0.0 in 2021—down by 100 percentage points from the year prior—and equivalent to an indicator rank of 72.



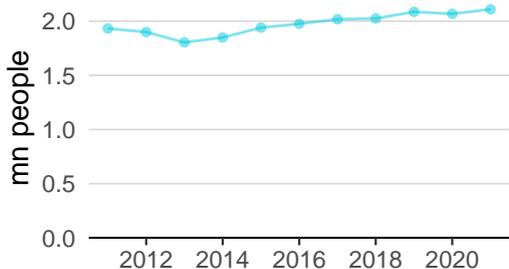
3.1.1 ICT access was equal to 9.0 in 2020 and equivalent to an indicator rank of 47.



4.2.4 Venture capital received was equal to 0.0 bn USD in 2021—up by 2439 percentage points from the year prior—and equivalent to an indicator rank of 95.

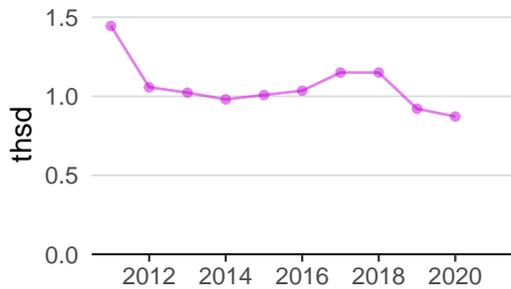


4.3.2 Domestic industry diversification was equal to 0.1 in 2019—down by 2 percentage points from the year prior—and equivalent to an indicator rank of 23.

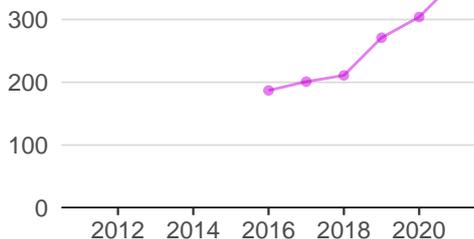


5.1.1 Knowledge-intensive employment was equal to 2.1 mn people in 2021—up by 2 percentage points from the year prior—and equivalent to an indicator rank of 53.

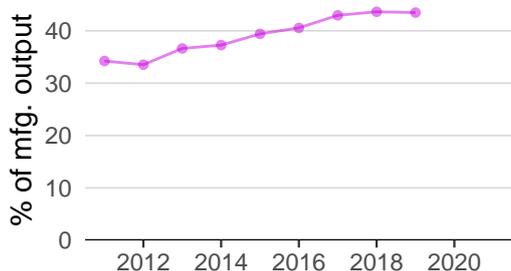
Innovation outputs



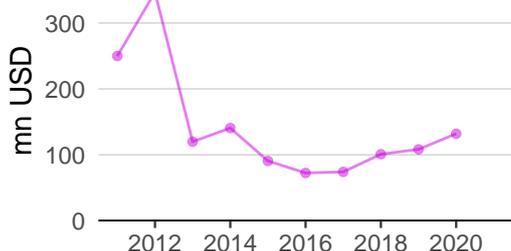
6.1.1 Patents by origin was equal to 0.9 thsd in 2020—down by 5 percentage points from the year prior—and equivalent to an indicator rank of 50.



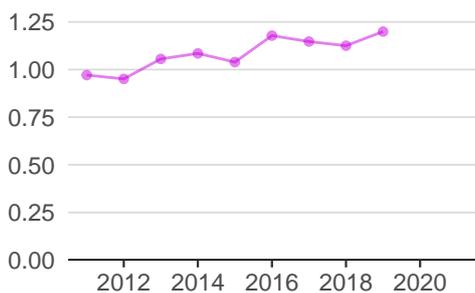
6.1.5 Citable documents H-index was equal to 364.0 in 2021—up by 20 percentage points from the year prior—and equivalent to an indicator rank of 43.



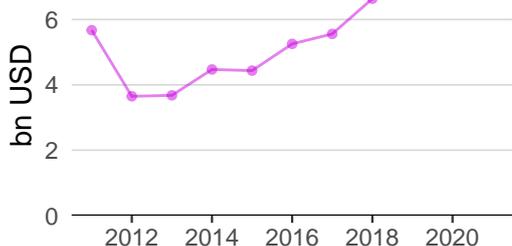
6.2.5 High-tech manufacturing was equal to 43.5% of mfg. output in 2019—effectively unchanged from the year prior—and equivalent to an indicator rank of 23.



6.3.1 Intellectual property receipts was equal to 132.0 mn USD in 2020—up by 22 percentage points from the year prior—and equivalent to an indicator rank of 53.



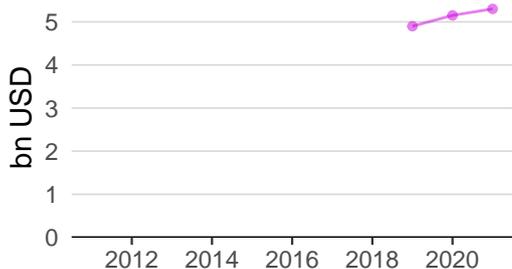
6.3.2 Production and export complexity was equal to 1.2 in 2019—up by 7 percentage points from the year prior—and equivalent to an indicator rank of 22.



6.3.3 High-tech exports was equal to 7.0 bn USD in 2020—effectively unchanged from the year prior—and equivalent to an indicator rank of 26.



7.1.1 Intangible asset intensity was equal to 49.8% of total value in 2021 and equivalent to an indicator rank of 51.



7.1.3 Global brand value was equal to 5.3 bn USD in 2021—up by 3 percentage points from the year prior—and equivalent to an indicator rank of 47.



7.2.1 Cultural and creative services exports was equal to 1.7 bn USD in 2020—up by 3 percentage points from the year prior—and equivalent to an indicator rank of 15.

ROMANIA'S INNOVATION TOP PERFORMERS

2.3.3 Global corporate R&D investors

Firm	Industry	R&D	R&D Growth	R&D Intensity	Rank
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No observations

Source: European Commission's Joint Research Centre (<https://iri.jrc.ec.europa.eu/scoreboard/2021-eu-industrial-rd-investment-scoreboard>).

2.3.4 QS university ranking

University	Score	Rank
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No observations

Source: QS Quacquarelli Symonds Ltd (<https://www.topuniversities.com/university-rankings/world-university-rankings/2022>).

7.1.1 Intangible asset intensity, top 15

Firm	Rank
SOCIETATEA ENERGETICA ELECTR	1
TRANSGAZ	2
BANCA TRANSILVANIA	3

Source: Brand Finance (<https://brandirectory.com/reports/gift-2021>).

Note: Brand Finance only provides within economy ranks.

7.1.3 Global brand value, top 5,000

Brand	Industry	Rank
EMAG	Retail	1
DACIA	Automobiles	2
DEDEMAN	Retail	3

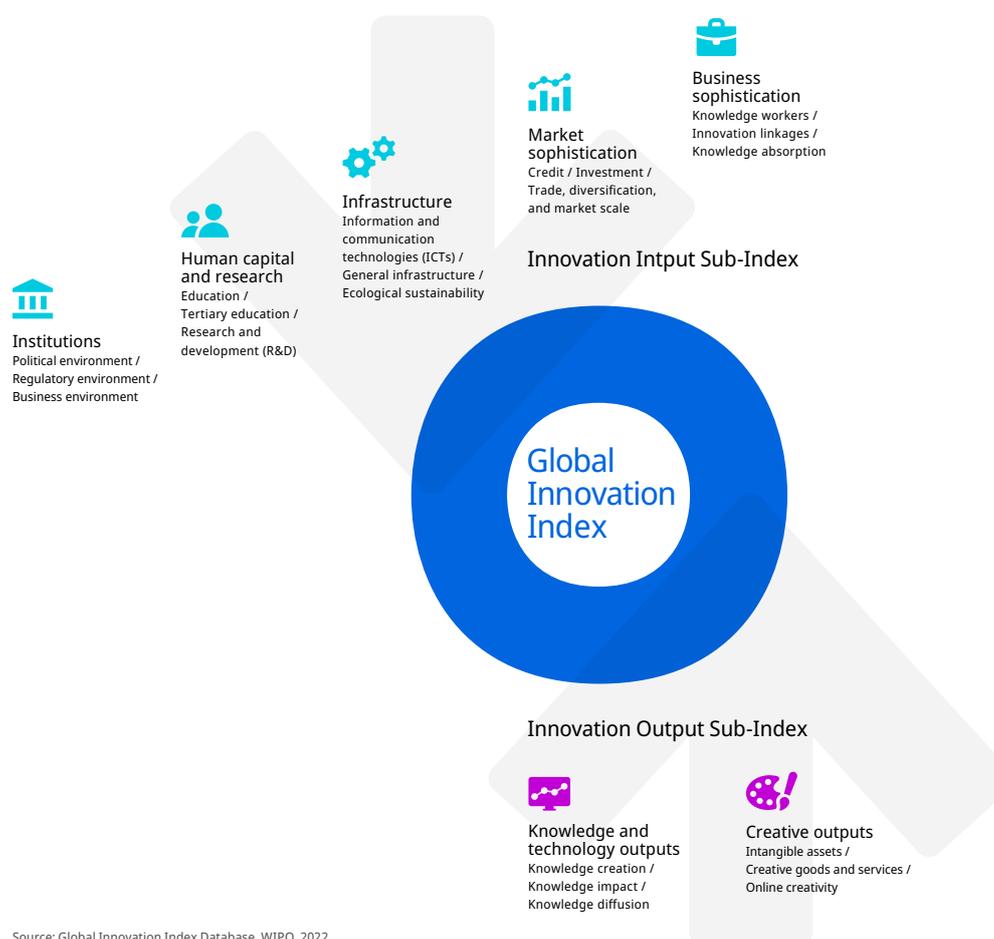
Source: Brand Finance (<https://brandirectory.com>).

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.