



BELGIUM

26th Belgium ranks 26th 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 Belgium 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 Belgium in the GII 2022 is between ranks 24 and 28.

Rankings for Belgium (2020–2022)

GIIYR	GII	Innovation inputs	Innovation outputs
2020	22	21	25
2021	22	21	26
2022	26	26	24

- Belgium performs better in innovation outputs than innovation inputs in 2022.
- This year Belgium ranks 26th in innovation inputs, lower than both 2021 and 2020.
- As for innovation outputs, Belgium ranks 24th. This position is higher than both 2021 and 2020.

25th Belgium ranks 25th among the 48 high-income group economies.

16th Belgium ranks 16th among the 39 economies in Europe.

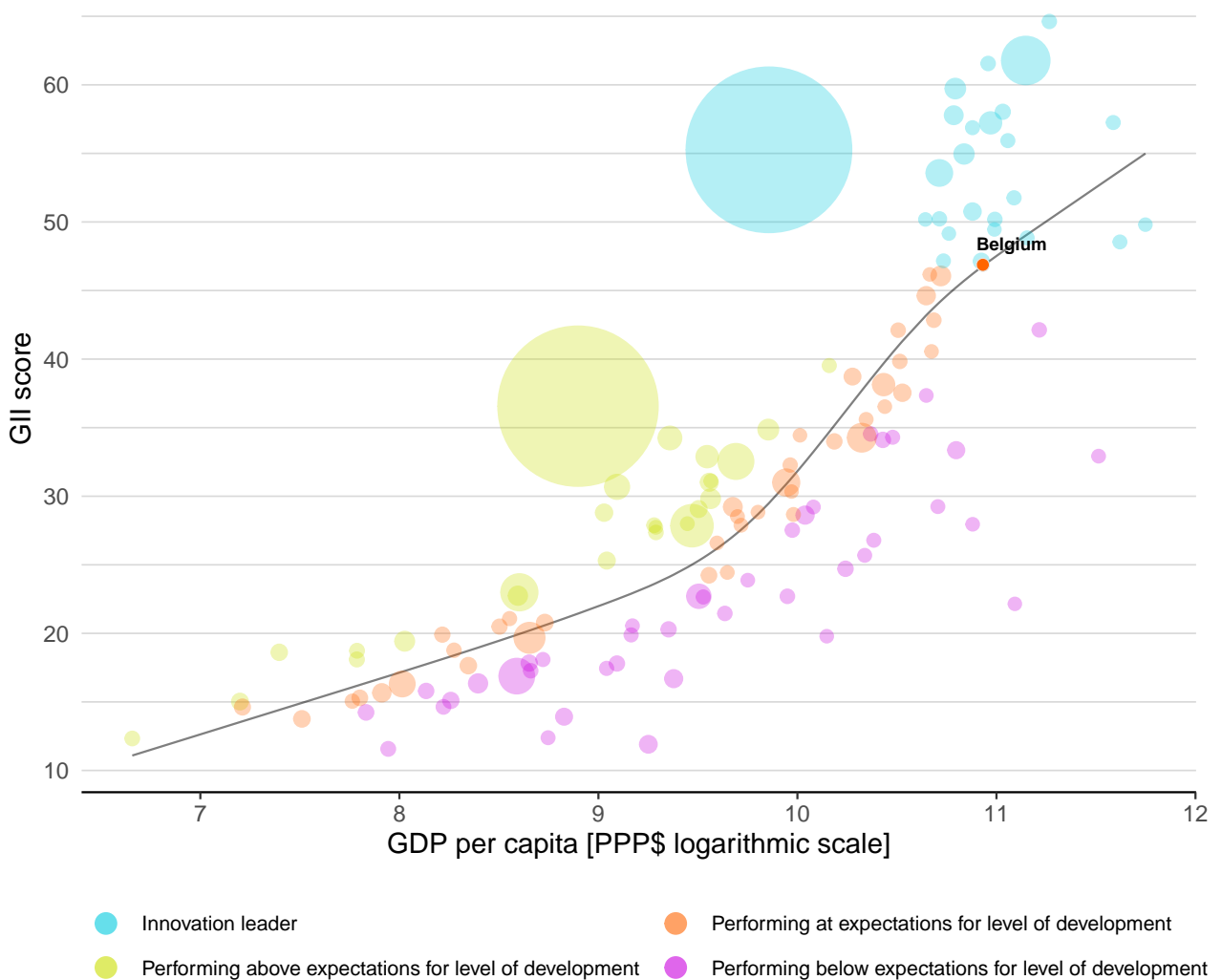


EXPECTED VS. OBSERVED INNOVATION PERFORMANCE

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, Belgium's performance is at expectations for its level of development.

The positive relationship between innovation and development



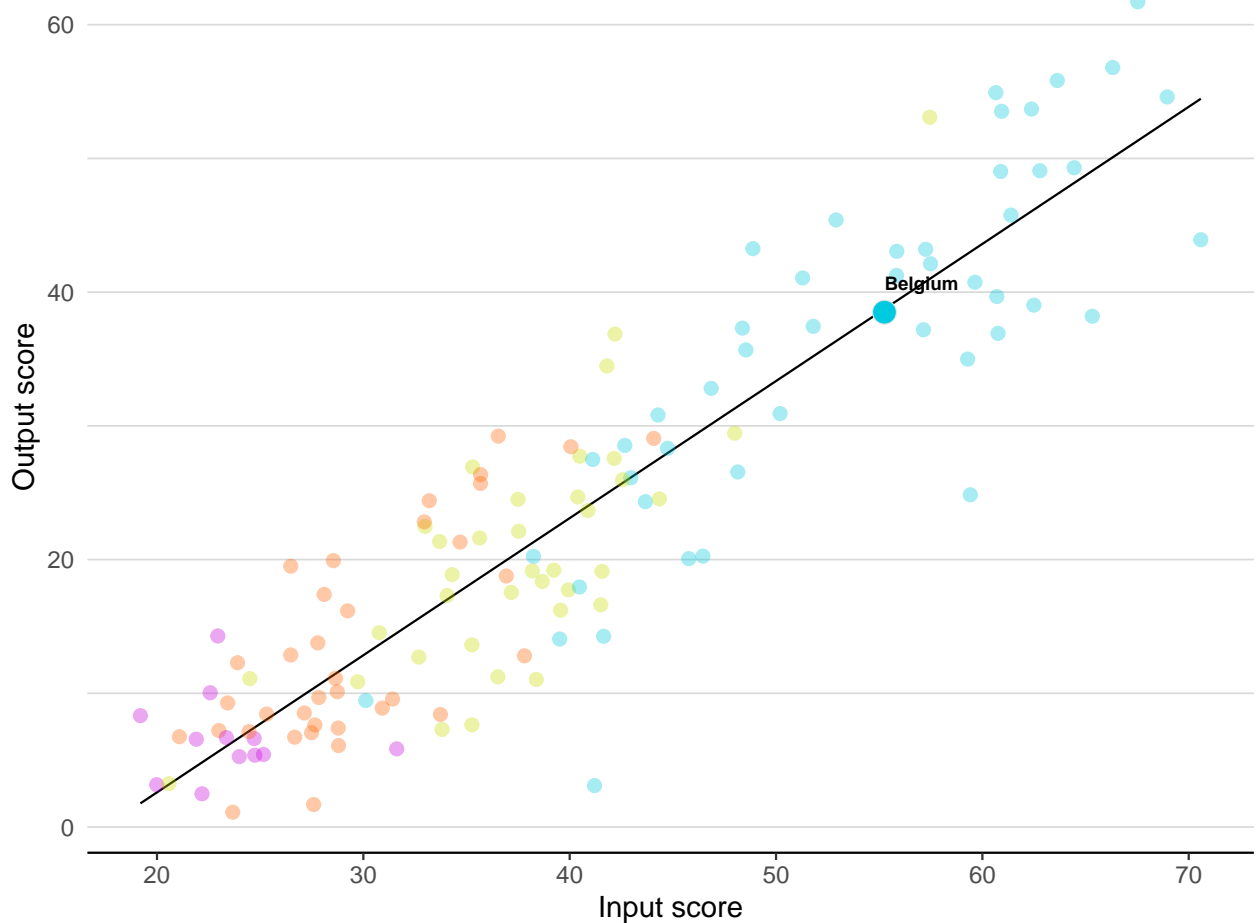


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

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

Innovation input to output performance

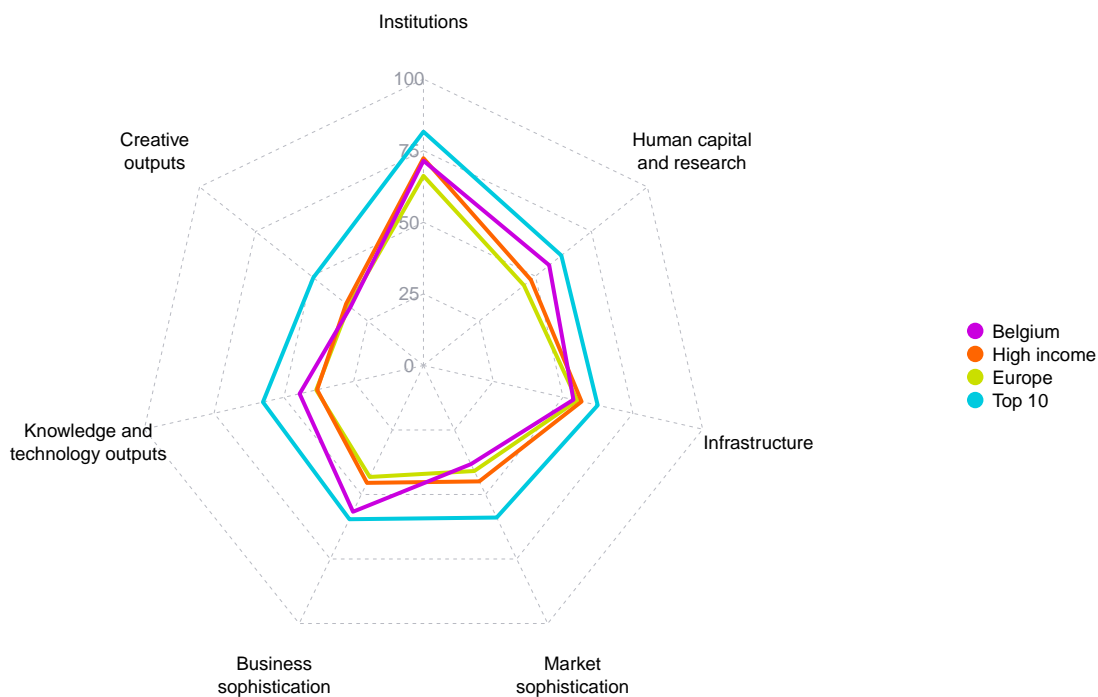


Income ● High income ● Upper middle ● Lower middle ● Low income — Fitted line



BENCHMARKING AGAINST OTHER HIGH-INCOME GROUP ECONOMIES AND EUROPE

The seven GII pillar scores for Belgium



High-income group economies

Belgium performs above the high-income group average in three pillars, namely: Human capital and research; Business sophistication; and, Knowledge and technology outputs.

Europe

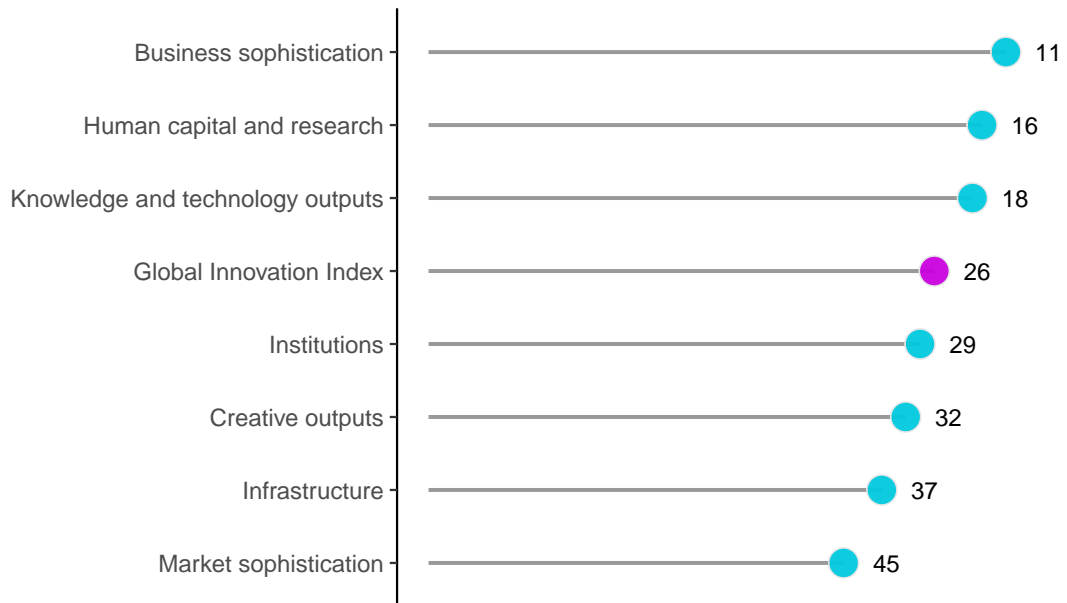
Belgium performs above the regional average in four pillars, namely: Institutions; Human capital and research; Business sophistication; and, Knowledge and technology outputs.



OVERVIEW OF RANKINGS IN THE SEVEN GII 2022 AREAS

Belgium performs best in Business sophistication and its weakest performance is in Market sophistication.

The seven GII pillar ranks for Belgium



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

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

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



INNOVATION STRENGTHS AND WEAKNESSES

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







Strengths and weaknesses for Belgium

Strengths			Weaknesses		
Code	Indicator name	Rank	Code	Indicator name	Rank
2.1.3	School life expectancy, years	4	1.2.3	Cost of redundancy dismissal	84
2.3.2	Gross expenditure on R&D, % GDP	4	2.2.2	Graduates in science and engineering, %	86
3.2.2	Logistics performance	3	3.1.3	Government's online service	76
5.1.1	Knowledge-intensive employment, %	9	3.1.4	E-participation	77
5.1.3	GERD performed by business, % GDP	6	3.3.1	GDP/unit of energy use	66
5.1.4	GERD financed by business, %	9	5.3.2	High-tech imports, % total trade	65
5.1.5	Females employed w/advanced degrees, %	7	5.3.4	FDI net inflows, % GDP	130
5.2.1	University-industry R&D collaboration	8	6.2.1	Labor productivity growth, %	91
5.2.3	GERD financed by abroad, % GDP	5	7.1.2	Trademarks by origin/bn PPP\$ GDP	64
6.2.3	Software spending, % GDP	10	7.3.4	Mobile app creation/bn PPP\$ GDP	70

Belgium

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Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$
24	26	High	EUR	11.6	645.4	55,919

	Score/ Value	Rank		Score/ Value	Rank
 Institutions	71.5	29	 Business sophistication	56.7	11
1.1 Political environment	77.0	27	5.1 Knowledge workers	74.4	5 ●◆
1.1.1 Political and operational stability*	80.0	30	5.1.1 Knowledge-intensive employment, %	49.6	9 ●
1.1.2 Government effectiveness*	73.9	26	5.1.2 Firms offering formal training, %	57.8	11
1.2 Regulatory environment	78.5	31	5.1.3 GERD performed by business, % GDP	2.5	6 ●◆
1.2.1 Regulatory quality*	78.7	20	5.1.4 GERD financed by business, %	64.3	9 ●
1.2.2 Rule of law*	81.6	20	5.1.5 Females employed w/advanced degrees, %	28.1	7 ●◆
1.2.3 Cost of redundancy dismissal	19.7	84 ○	5.2 Innovation linkages	55.9	9 ●
1.3 Business environment	59.0	[36]	5.2.1 University-industry R&D collaboration†	68.8	8 ●◆
1.3.1 Policies for doing business†	59.0	42	5.2.2 State of cluster development and depth†	63.7	18
1.3.2 Entrepreneurship policies and culture*	n/a	n/a	5.2.3 GERD financed by abroad, % GDP	0.5	5 ●◆
			5.2.4 Joint venture/strategic alliance deals/bn PPP\$ GDP	0.1	25
			5.2.5 Patent families/bn PPP\$ GDP	2.5	15
 Human capital and research	56.2	16	5.3 Knowledge absorption	39.7	37
2.1 Education	70.6	5 ●◆	5.3.1 Intellectual property payments, % total trade	0.8	51
2.1.1 Expenditure on education, % GDP	6.4	14 ◇	5.3.2 High-tech imports, % total trade	8.4	65 ○
2.1.2 Government funding/pupil, secondary, % GDP/cap	23.7	27	5.3.3 ICT services imports, % total trade	2.8	21
2.1.3 School life expectancy, years	19.6	4 ●◆	5.3.4 FDI net inflows, % GDP	-5.5	130 ○
2.1.4 PISA scales in reading, maths and science	499.9	19	5.3.5 Research talent, % in businesses	56.8	18
2.1.5 Pupil-teacher ratio, secondary	9.1	19			
2.2 Tertiary education	35.6	46	 Knowledge and technology outputs	44.4	18
2.2.1 Tertiary enrolment, % gross	80.1	22	6.1 Knowledge creation	49.7	13
2.2.2 Graduates in science and engineering, %	17.6	86 ○◇	6.1.1 Patents by origin/bn PPP\$ GDP	5.5	18
2.2.3 Tertiary inbound mobility, %	10.0	26	6.1.2 PCT patents by origin/bn PPP\$ GDP	2.1	16
2.3 Research and development (R&D)	62.3	15	6.1.3 Utility models by origin/bn PPP\$ GDP	n/a	n/a
2.3.1 Researchers, FTE/mn pop.	5,750.1	11	6.1.4 Scientific and technical articles/bn PPP\$ GDP	42.2	19
2.3.2 Gross expenditure on R&D, % GDP	3.5	4 ●◆	6.1.5 Citable documents H-index	53.8	14
2.3.3 Global corporate R&D investors, top 3, mn USD	66.9	17	6.2 Knowledge impact	37.9	30
2.3.4 QS university ranking, top 3*	55.1	17	6.2.1 Labor productivity growth, %	-0.0	91 ○
			6.2.2 New businesses/th pop. 15-64	4.7	30
			6.2.3 Software spending, % GDP	0.6	10 ●
			6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	5.1	57
			6.2.5 High-tech manufacturing, %	44.2	21
 Infrastructure	53.7	37	6.3 Knowledge diffusion	45.4	23
3.1 Information and communication technologies (ICTs)	74.5	64 ◇	6.3.1 Intellectual property receipts, % total trade	0.9	23
3.1.1 ICT access*	89.2	53	6.3.2 Production and export complexity	70.1	21
3.1.2 ICT use*	77.5	28	6.3.3 High-tech exports, % total trade	8.3	22
3.1.3 Government's online service*	65.9	76 ○◇	6.3.4 ICT services exports, % total trade	3.6	31
3.1.4 E-participation*	65.5	77 ○◇			
3.2 General infrastructure	54.6	16	 Creative outputs	32.6	32
3.2.1 Electricity output, GWh/mn pop.	7,614.4	24	7.1 Intangible assets	36.0	46
3.2.2 Logistics performance*	92.6	3 ●◆	7.1.1 Intangible asset intensity, top 15, %	69.4	25
3.2.3 Gross capital formation, % GDP	24.7	56	7.1.2 Trademarks by origin/bn PPP\$ GDP	39.5	64 ○
3.3 Ecological sustainability	32.0	49	7.1.3 Global brand value, top 5,000, % GDP	48.1	34
3.3.1 GDP/unit of energy use	10.3	66 ○	7.1.4 Industrial designs by origin/bn PPP\$ GDP	2.4	42
3.3.2 Environmental performance*	58.2	21	7.2 Creative goods and services	27.5	39
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.8	55	7.2.1 Cultural and creative services exports, % total trade	1.4	20
			7.2.2 National feature films/mn pop. 15-69	4.9	25
			7.2.3 Entertainment and media market/th pop. 15-69	48.2	19
			7.2.4 Printing and other media, % manufacturing	1.0	46
			7.2.5 Creative goods exports, % total trade	1.0	43
 Market sophistication	38.2	45	7.3 Online creativity	31.2	23
4.1 Credit	27.7	[64]	7.3.1 Generic top-level domains (TLDs)/th pop. 15-69	21.4	27
4.1.1 Finance for startups and scaleups*	n/a	n/a	7.3.2 Country-code TLDs/th pop. 15-69	62.1	13
4.1.2 Domestic credit to private sector, % GDP	75.8	43	7.3.3 GitHub commit pushes received/mn pop. 15-69	39.0	15
4.1.3 Loans from microfinance institutions, % GDP	n/a	n/a	7.3.4 Mobile app creation/bn PPP\$ GDP	2.1	70 ○
4.2 Investment	22.5	34			
4.2.1 Market capitalization, % GDP	75.2	23			
4.2.2 Venture capital investors, deals/bn PPP\$ GDP	0.2	22			
4.2.3 Venture capital recipients, deals/bn PPP\$ GDP	0.1	31			
4.2.4 Venture capital received, value, % GDP	0.0	32			
4.3 Trade, diversification, and market scale	64.5	30			
4.3.1 Applied tariff rate, weighted avg., %	1.5	20			
4.3.2 Domestic industry diversification	88.6	49			
4.3.3 Domestic market scale, bn PPP\$	645.4	36			

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 Belgium.

Missing data for Belgium

Code	Indicator name	Economy year	Model year	Source
1.3.2	Entrepreneurship policies and culture	n/a	2021	Global Entrepreneurship Monitor
4.1.1	Finance for startups and scaleups	n/a	2021	Global Entrepreneurship Monitor
4.1.3	Loans from microfinance institutions, % GDP	n/a	2020	International Monetary Fund, Financial Access Survey (FAS)
6.1.3	Utility models by origin/bn PPP\$ GDP	n/a	2020	World Intellectual Property Organization

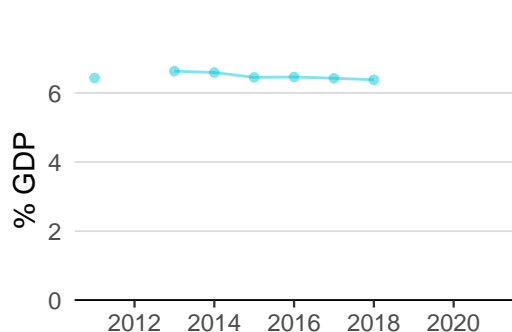
Outdated data for Belgium

Code	Indicator name	Economy year	Model year	Source
2.1.1	Expenditure on education, % GDP	2018	2020	UNESCO Institute for Statistics
4.2.1	Market capitalization, % GDP	2018	2020	World Federation of Exchanges

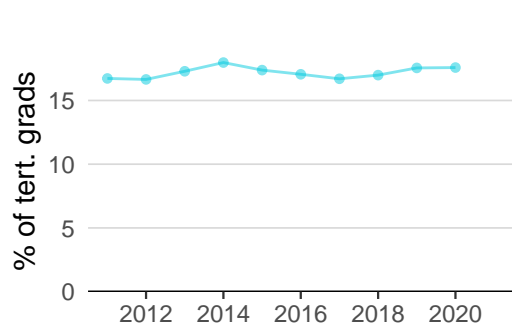
BELGIUM'S INNOVATION SYSTEM

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

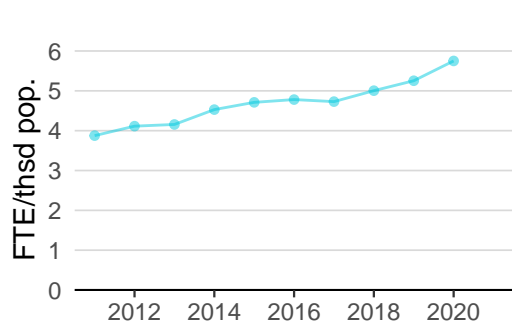
Innovation inputs



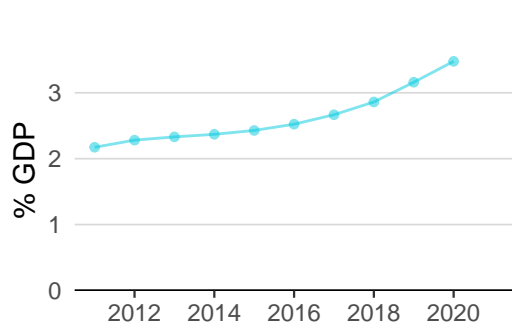
2.1.1 Expenditure on education was equal to 6.4% GDP in 2018—down by 1 percentage point from the year prior—and equivalent to an indicator rank of 14.



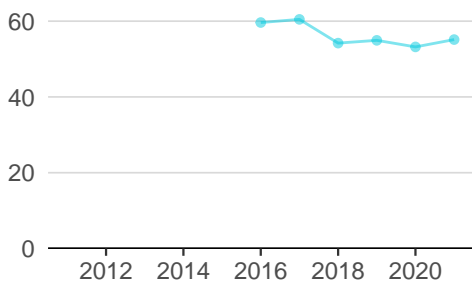
2.2.2 Graduates in science and engineering was equal to 17.6% of tert. grads in 2020—effectively unchanged from the year prior—and equivalent to an indicator rank of 86.



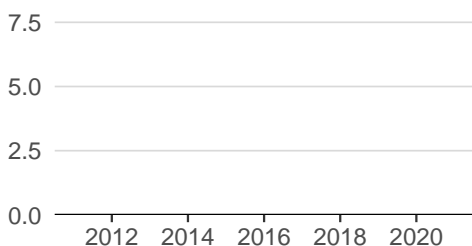
2.3.1 Researchers was equal to 5.8 FTE/thsd pop. in 2020—up by 9 percentage points from the year prior—and equivalent to an indicator rank of 11.



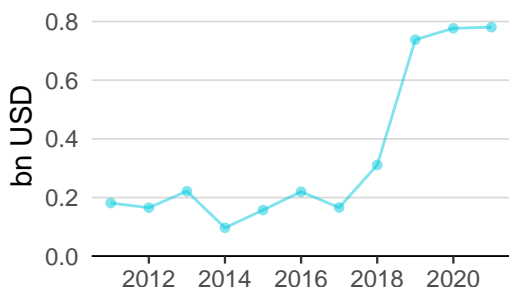
2.3.2 Gross expenditure on R&D was equal to 3.5% GDP in 2020—up by 10 percentage points from the year prior—and equivalent to an indicator rank of 4.



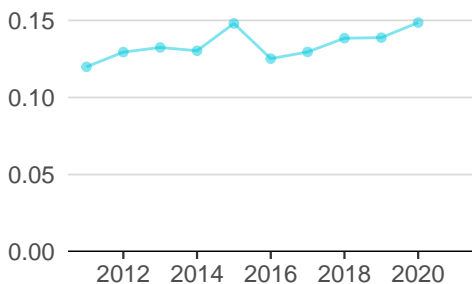
2.3.4 QS university ranking was equal to 55.1 in 2021—up by 4 percentage points from the year prior—and equivalent to an indicator rank of 17.



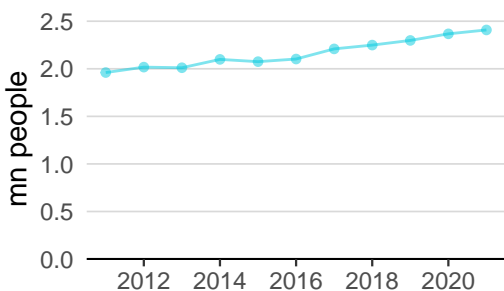
3.1.1 ICT access was equal to 8.9 in 2020 and equivalent to an indicator rank of 53.



4.2.4 Venture capital received was equal to 0.8 bn USD in 2021—up by 1 percentage point from the year prior—and equivalent to an indicator rank of 32.

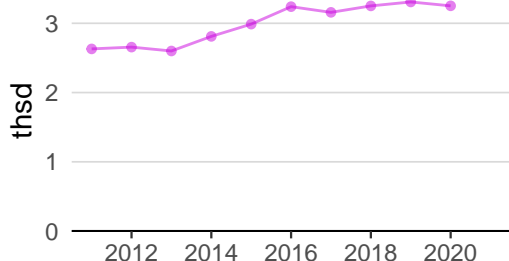


4.3.2 Domestic industry diversification was equal to 0.1 in 2020—up by 7 percentage points from the year prior—and equivalent to an indicator rank of 49.

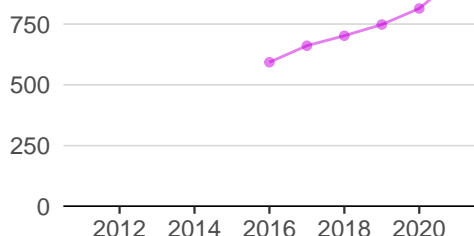


5.1.1 Knowledge-intensive employment was equal to 2.4 mn people in 2021—up by 2 percentage points from the year prior—and equivalent to an indicator rank of 9.

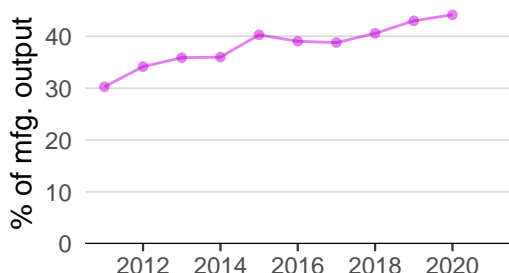
Innovation outputs



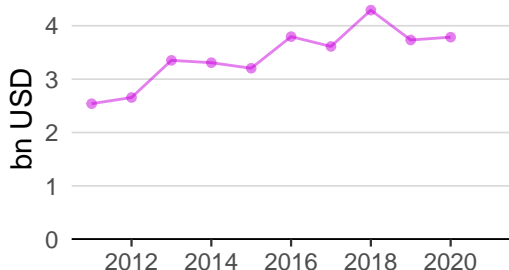
6.1.1 Patents by origin was equal to 3.3 thsd in 2020—down by 2 percentage points from the year prior—and equivalent to an indicator rank of 18.



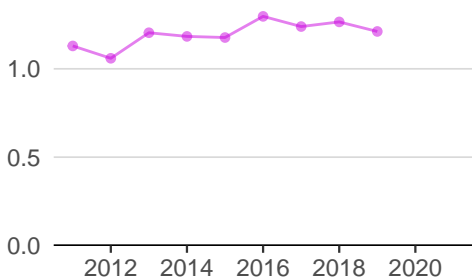
6.1.5 Citable documents H-index was equal to 942.0 in 2021—up by 16 percentage points from the year prior—and equivalent to an indicator rank of 14.



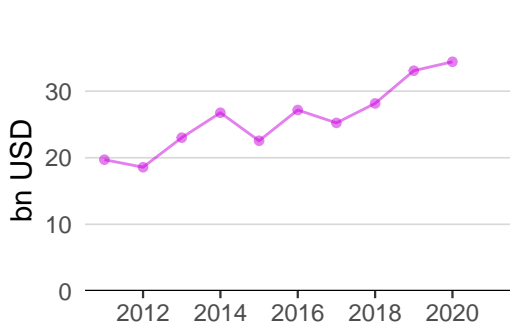
6.2.5 High-tech manufacturing was equal to 44.2% of mfg. output in 2020—up by 3 percentage points from the year prior—and equivalent to an indicator rank of 21.



6.3.1 Intellectual property receipts was equal to 3.8 bn USD in 2020—up by 1 percentage point from the year prior—and equivalent to an indicator rank of 23.



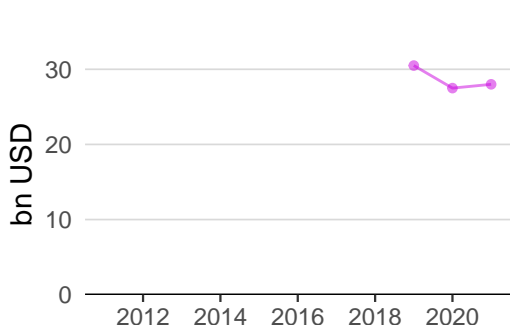
6.3.2 Production and export complexity was equal to 1.2 in 2019—down by 4 percentage points from the year prior—and equivalent to an indicator rank of 21.



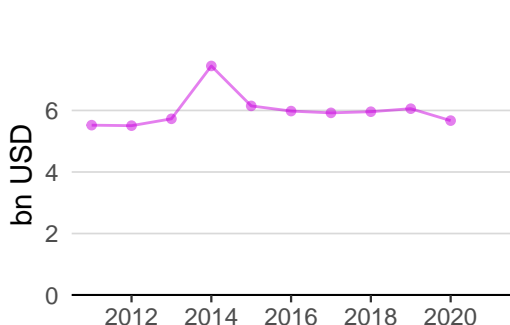
6.3.3 High-tech exports was equal to 34.4 bn USD in 2020—up by 4 percentage points from the year prior—and equivalent to an indicator rank of 22.



7.1.1 Intangible asset intensity was equal to 69.4% of total value in 2021 and equivalent to an indicator rank of 25.



7.1.3 Global brand value was equal to 28.0 bn USD in 2021—up by 2 percentage points from the year prior—and equivalent to an indicator rank of 34.



7.2.1 Cultural and creative services exports was equal to 5.7 bn USD in 2020—down by 6 percentage points from the year prior—and equivalent to an indicator rank of 20.

BELGIUM'S INNOVATION TOP PERFORMERS

2.3.3 Global corporate R&D investors

Firm	Industry	R&D	R&D Growth	R&D Intensity	Rank
		[mn EUR]	[%]	[%]	
UCB	Pharmaceuticals & Biotechnology	1,500	22.7	29.7	106
SOLVAY	Chemicals	268	-15.5	2.9	517
KBC	Banks	258	109.8	3.6	531

Source: European Commission's Joint Research Centre (<https://iri.jrc.ec.europa.eu/scoreboard/2021-eu-industrial-rd-investment-scoreboard>).
Note: European Commission's Joint Research Centre ranks the top 2,500 firms by R&D investment annually.

2.3.4 QS university ranking

University	Score	Rank
GHENT UNIVERSITY	52.6	141
UNIVERSITÉ CATHOLIQUE DE LOUVAIN	45.6	188
KU LEUVEN	67.2	70=

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

Firm	Rank
ANHEUSER-BUSCH INBEV	1
UCB	2
SOLVAY	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

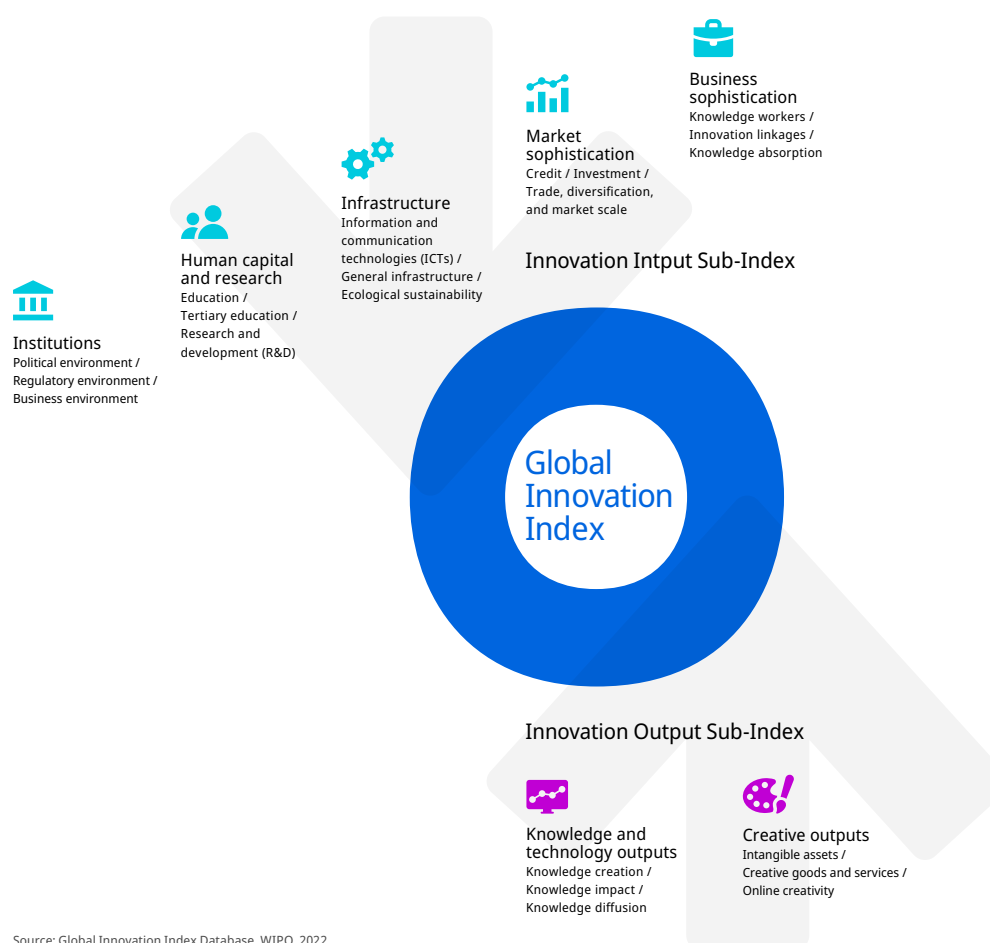
Brand	Industry	Rank
KBC	Banking	1
BDO GLOBAL	Commercial Services	2
AB INBEV	Beers	3

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.