



IRELAND

23rd Ireland ranks 23rd 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 Ireland 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 Ireland in the GII 2022 is between ranks 21 and 23.

Rankings for Ireland (2020–2022)

GIIYR	GII	Innovation inputs	Innovation outputs
2020	15	20	11
2021	19	22	19
2022	23	25	19

- Ireland performs better in innovation outputs than innovation inputs in 2022.
- This year Ireland ranks 25th in innovation inputs, lower than both 2021 and 2020.
- As for innovation outputs, Ireland ranks 19th. This position is the same as last year but lower than 2020.

22nd Ireland ranks 22nd among the 48 high-income group economies.

15th Ireland ranks 15th among the 39 economies in Europe.

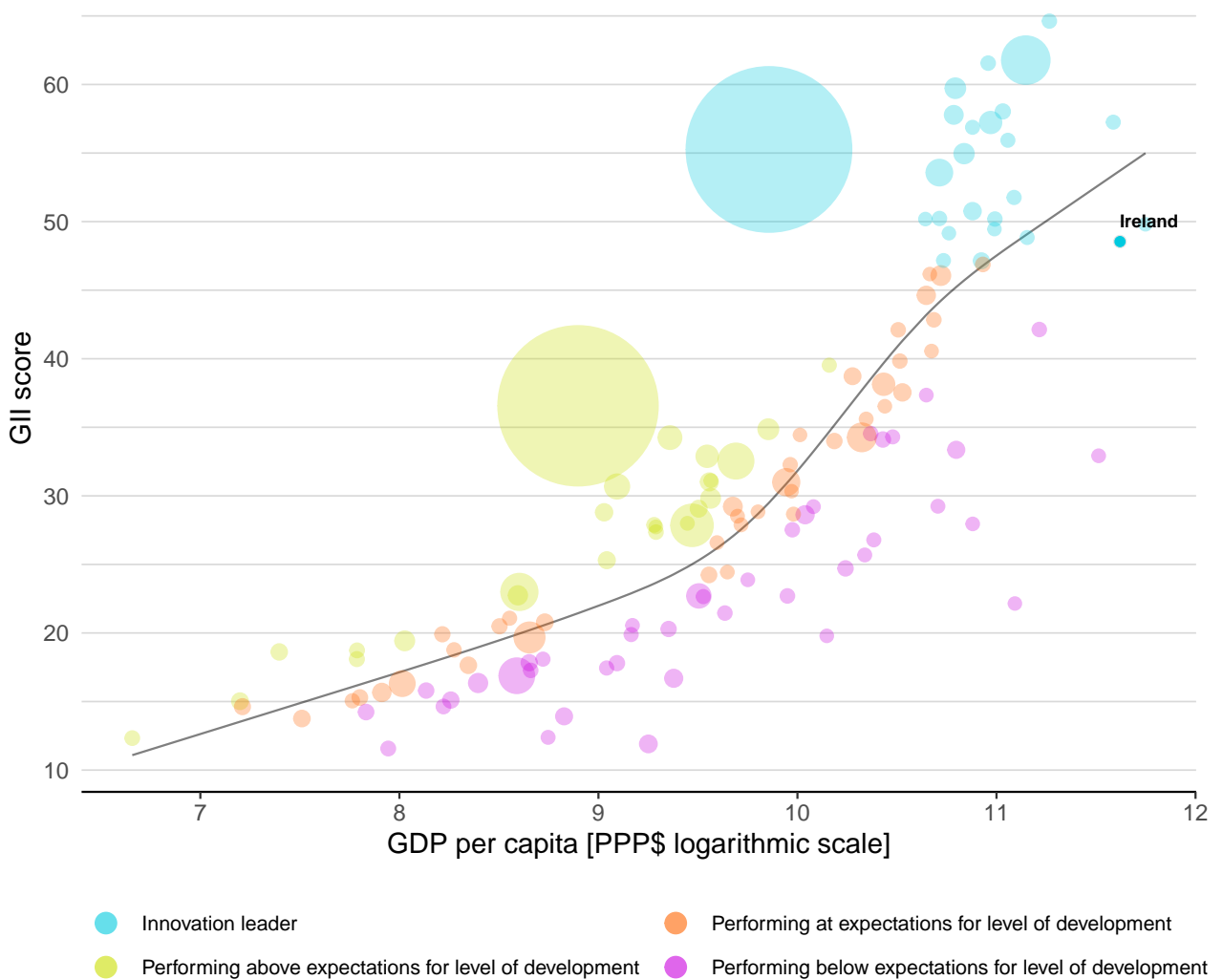


EXPECTED VS. OBSERVED INNOVATION PERFORMANCE

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, Ireland's performance is above expectations for its level of development.

The positive relationship between innovation and development



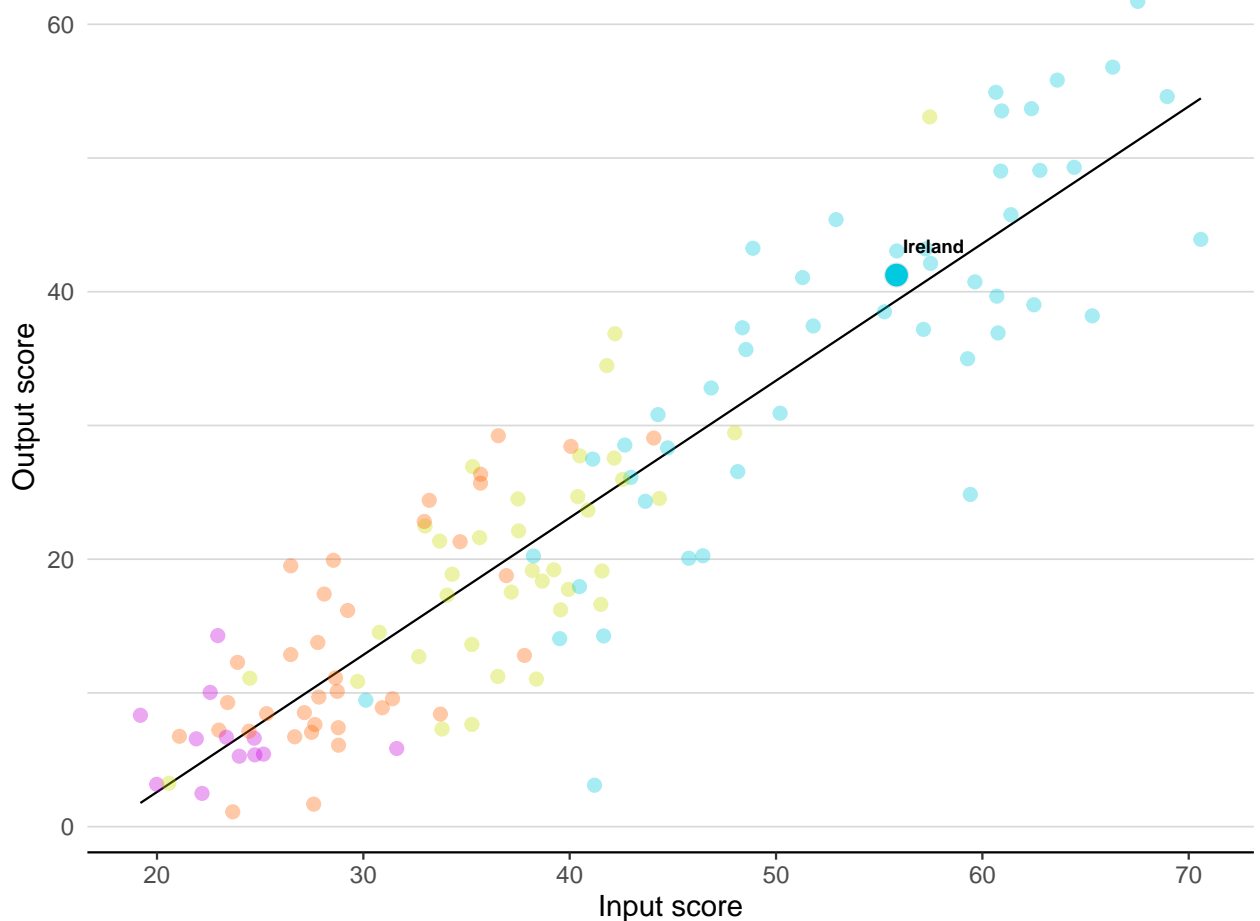


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

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

Innovation input to output performance

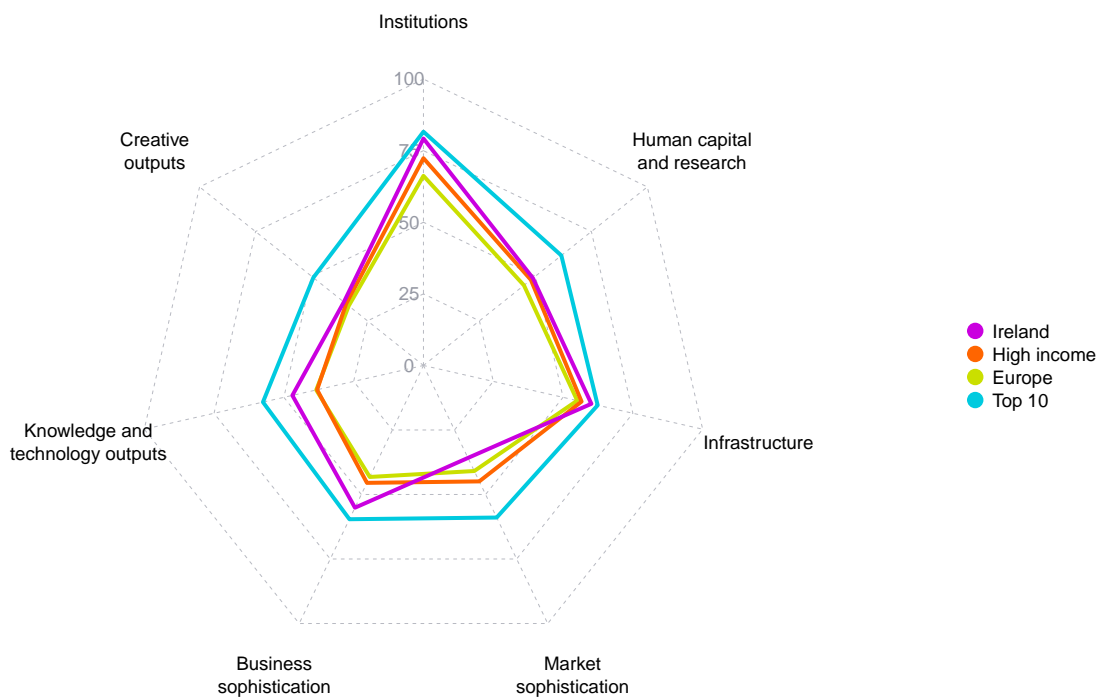


Income ● High income ● Upper middle ● Lower middle ● Low income — Fitted line



BENCHMARKING AGAINST OTHER HIGH-INCOME GROUP ECONOMIES AND EUROPE

The seven GII pillar scores for Ireland



High-income group economies

Ireland performs above the high-income group average in six pillars, namely: Institutions; Human capital and research; Infrastructure; Business sophistication; Knowledge and technology outputs; and, Creative outputs.

Europe

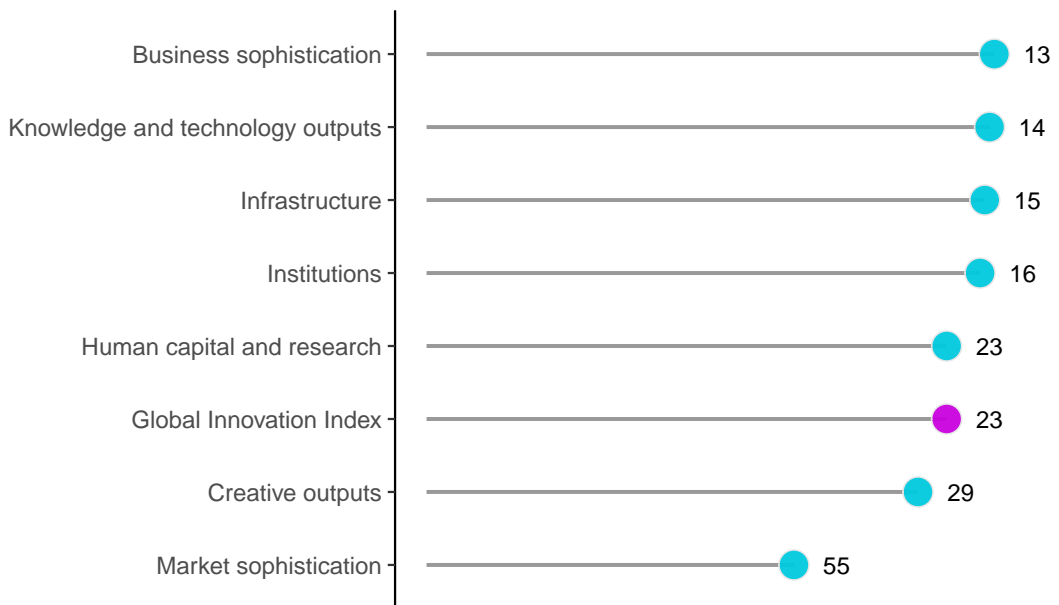
Ireland performs above the regional average in six pillars, namely: Institutions; Human capital and research; Infrastructure; Business sophistication; Knowledge and technology outputs; and, Creative outputs.



OVERVIEW OF RANKINGS IN THE SEVEN GII 2022 AREAS

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

The seven GII pillar ranks for Ireland



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

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

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



INNOVATION STRENGTHS AND WEAKNESSES

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








Strengths and weaknesses for Ireland

Strengths			Weaknesses		
Code	Indicator name	Rank	Code	Indicator name	Rank
2.1.3	School life expectancy, years	8	2.1.1	Expenditure on education, % GDP	97
3.3.1	GDP/unit of energy use	1	2.1.2	Government funding/pupil, secondary, % GDP/cap	94
5.1.5	Females employed w/advanced degrees, %	4	3.2.3	Gross capital formation, % GDP	87
5.2.1	University-industry R&D collaboration	6	4.1.2	Domestic credit to private sector, % GDP	90
5.3.1	Intellectual property payments, % total trade	1	4.3.2	Domestic industry diversification	92
6.2.3	Software spending, % GDP	4	5.3.2	High-tech imports, % total trade	101
6.2.5	High-tech manufacturing, %	6	5.3.3	ICT services imports, % total trade	74
6.3.1	Intellectual property receipts, % total trade	9	6.1.3	Utility models by origin/bn PPP\$ GDP	46
6.3.4	ICT services exports, % total trade	1	6.2.1	Labor productivity growth, %	98
7.1.1	Intangible asset intensity, top 15, %	5	7.2.4	Printing and other media, % manufacturing	92

Ireland

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Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$
19	25	High	EUR	5.0	561.5	111,360

	Score/Value	Rank		Score/Value	Rank
 Institutions	79.2	16	 Business sophistication	55.1	13
1.1 Political environment	81.7	19	5.1 Knowledge workers	67.8	11
1.1.1 Political and operational stability*	81.8	24	5.1.1 Knowledge-intensive employment, %	47.3	16
1.1.2 Government effectiveness*	81.6	16	5.1.2 Firms offering formal training, %	59.8	9
1.2 Regulatory environment	85.4	19	5.1.3 GERD performed by business, % GDP	0.9	26
1.2.1 Regulatory quality*	81.7	16	5.1.4 GERD financed by business, %	62.8	11
1.2.2 Rule of law*	85.0	17	5.1.5 Females employed w/advanced degrees, %	29.0	4 ●◆
1.2.3 Cost of redundancy dismissal	14.3	55	5.2 Innovation linkages	45.5	22
1.3 Business environment	70.6	17	5.2.1 University-industry R&D collaboration†	69.2	6 ●
1.3.1 Policies for doing business†	74.6	10	5.2.2 State of cluster development and depth†	58.8	31
1.3.2 Entrepreneurship policies and culture*	66.5	16	5.2.3 GERD financed by abroad, % GDP	0.2	24
			5.2.4 Joint venture/strategic alliance deals/bn PPP\$ GDP	0.1	21
			5.2.5 Patent families/bn PPP\$ GDP	2.1	17
 Human capital and research	48.9	23	5.3 Knowledge absorption	52.1	11
2.1 Education	48.7	70 ◊	5.3.1 Intellectual property payments, % total trade	20.2	1 ●◆
2.1.1 Expenditure on education, % GDP	3.4	97 ◊◊	5.3.2 High-tech imports, % total trade	6.3	101 ◊
2.1.2 Government funding/pupil, secondary, % GDP/cap	11.7	94 ◊◊	5.3.3 ICT services imports, % total trade	1.3	74 ◊◊
2.1.3 School life expectancy, years	18.9	8 ●	5.3.4 FDI net inflows, % GDP	4.5	21
2.1.4 PISA scales in reading, maths and science	504.6	10	5.3.5 Research talent, % in businesses	55.0	19
2.1.5 Pupil-teacher ratio, secondary	n/a	n/a	 Knowledge and technology outputs	47.0	14
2.2 Tertiary education	45.0	25	6.1 Knowledge creation	23.1	40 ◊
2.2.1 Tertiary enrolment, % gross	75.2	27	6.1.1 Patents by origin/bn PPP\$ GDP	2.2	33 ◊
2.2.2 Graduates in science and engineering, %	26.4	32	6.1.2 PCT patents by origin/bn PPP\$ GDP	1.5	21 ◊
2.2.3 Tertiary inbound mobility, %	10.7	22	6.1.3 Utility models by origin/bn PPP\$ GDP	0.2	46 ◊
2.3 Research and development (R&D)	53.0	21	6.1.4 Scientific and technical articles/bn PPP\$ GDP	20.5	46 ◊
2.3.1 Researchers, FTE/mn pop.	4,769.1	20	6.1.5 Citable documents H-index	34.9	28
2.3.2 Gross expenditure on R&D, % GDP	1.2	33 ◊	6.2 Knowledge impact	44.4	13
2.3.3 Global corporate R&D investors, top 3, mn USD	72.5	12	6.2.1 Labor productivity growth, %	-0.3	98 ◊
2.3.4 QS university ranking, top 3*	48.0	21	6.2.2 New businesses/th pop. 15-64	6.8	22
			6.2.3 Software spending, % GDP	0.6	4 ●
 Infrastructure	60.1	15	6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	5.4	53
3.1 Information and communication technologies (ICTs)	81.8	41 ◊	6.2.5 High-tech manufacturing, %	58.5	6 ●◆
3.1.1 ICT access*	88.1	62 ◊	6.3 Knowledge diffusion	73.4	1 ●◆
3.1.2 ICT use*	76.3	33 ◊	6.3.1 Intellectual property receipts, % total trade	2.9	9 ●
3.1.3 Government's online service*	77.1	47 ◊	6.3.2 Production and export complexity	72.9	17
3.1.4 E-participation*	85.7	29	6.3.3 High-tech exports, % total trade	9.0	20
3.2 General infrastructure	42.0	34 ◊	6.3.4 ICT services exports, % total trade	32.1	1 ●◆
3.2.1 Electricity output, GWh/mn pop.	6,427.7	31	 Creative outputs	35.5	29 ◊
3.2.2 Logistics performance*	67.9	28	7.1 Intangible assets	41.2	34
3.2.3 Gross capital formation, % GDP	20.8	87 ◊	7.1.1 Intangible asset intensity, top 15, %	87.2	5 ●◆
3.3 Ecological sustainability	56.6	2 ●◆	7.1.2 Trademarks by origin/bn PPP\$ GDP	n/a	n/a
3.3.1 GDP/unit of energy use	32.9	1 ●◆	7.1.3 Global brand value, top 5,000, % GDP	44.8	36 ◊
3.3.2 Environmental performance*	57.4	24	7.1.4 Industrial designs by origin/bn PPP\$ GDP	1.8	50
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	2.0	48	7.2 Creative goods and services	23.0	53 ◊
			7.2.1 Cultural and creative services exports, % total trade	0.4	56
 Market sophistication	35.8	55 ◊	7.2.2 National feature films/mn pop. 15-69	7.4	16
4.1 Credit	28.1	62 ◊	7.2.3 Entertainment and media market/th pop. 15-69	49.2	15
4.1.1 Finance for startups and scaleups*	45.6	24	7.2.4 Printing and other media, % manufacturing	0.3	92 ◊◊
4.1.2 Domestic credit to private sector, % GDP	32.4	90 ◊◊	7.2.5 Creative goods exports, % total trade	1.4	38
4.1.3 Loans from microfinance institutions, % GDP	n/a	n/a	7.3 Online creativity	36.8	17
4.2 Investment	22.8	32	7.3.1 Generic top-level domains (TLDs)/th pop. 15-69	58.6	12
4.2.1 Market capitalization, % GDP	37.5	42 ◊	7.3.2 Country-code TLDs/th pop. 15-69	27.5	25
4.2.2 Venture capital investors, deals/bn PPP\$ GDP	0.2	18	7.3.3 GitHub commit pushes received/mn pop. 15-69	44.0	13
4.2.3 Venture capital recipients, deals/bn PPP\$ GDP	0.1	16	7.3.4 Mobile app creation/bn PPP\$ GDP	17.1	18
4.2.4 Venture capital received, value, % GDP	0.0	35			
4.3 Trade, diversification, and market scale	56.6	67			
4.3.1 Applied tariff rate, weighted avg., %	1.5	20			
4.3.2 Domestic industry diversification	66.8	92 ◊◊			
4.3.3 Domestic market scale, bn PPP\$	561.5	40			

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 Ireland.

Missing data for Ireland

Code	Indicator name	Economy year	Model year	Source
2.1.5	Pupil-teacher ratio, secondary	n/a	2019	UNESCO Institute for Statistics
4.1.3	Loans from microfinance institutions, % GDP	n/a	2020	International Monetary Fund, Financial Access Survey (FAS)
7.1.2	Trademarks by origin/bn PPP\$ GDP	n/a	2020	World Intellectual Property Organization

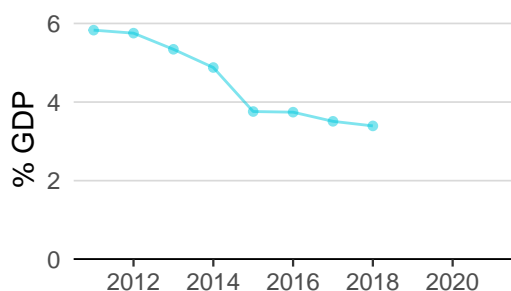
Outdated data for Ireland

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
4.3.2	Domestic industry diversification	2014	2019	United Nations Industrial Development Organization
6.2.5	High-tech manufacturing, %	2014	2019	United Nations Industrial Development Organization
7.2.1	Cultural and creative services exports, % total trade	2019	2020	World Trade Organization and United Nations Conference on Trade and Development

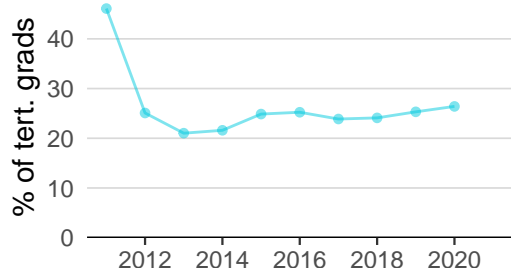
IRELAND'S INNOVATION SYSTEM

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

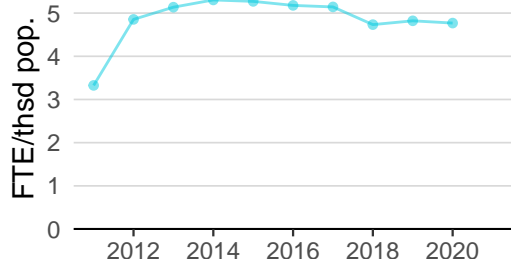
Innovation inputs



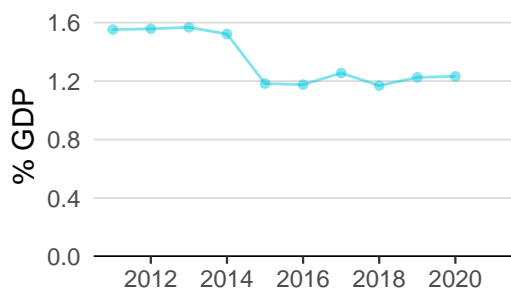
2.1.1 Expenditure on education was equal to 3.4% GDP in 2018—down by 3 percentage points from the year prior—and equivalent to an indicator rank of 97.



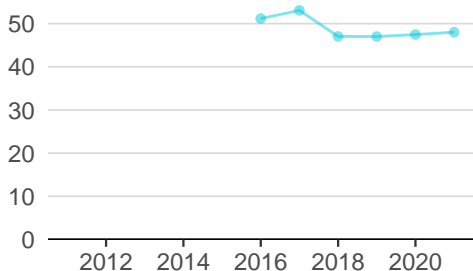
2.2.2 Graduates in science and engineering was equal to 26.4% of tert. grads in 2020—up by 4 percentage points from the year prior—and equivalent to an indicator rank of 32.



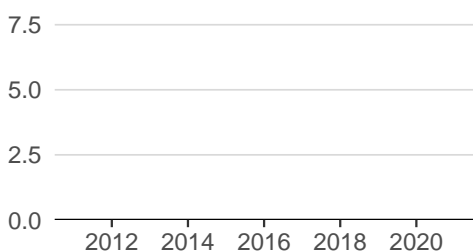
2.3.1 Researchers was equal to 4.8 FTE/thsd pop. in 2020—down by 1 percentage point from the year prior—and equivalent to an indicator rank of 20.



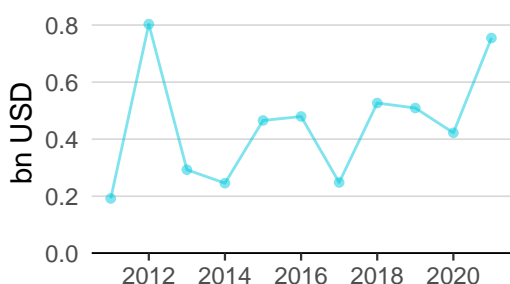
2.3.2 Gross expenditure on R&D was equal to 1.2% GDP in 2020—up by 1 percentage point from the year prior—and equivalent to an indicator rank of 33.



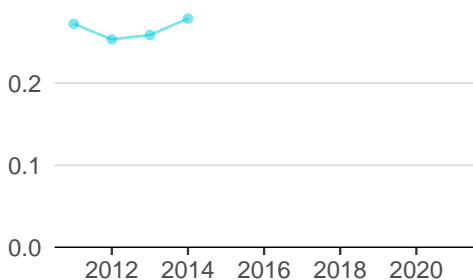
2.3.4 QS university ranking was equal to 48.0 in 2021—up by 1 percentage point from the year prior—and equivalent to an indicator rank of 21.



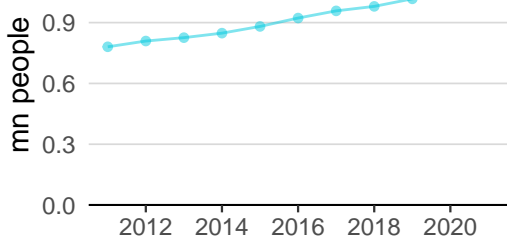
3.1.1 ICT access was equal to 8.8 in 2020 and equivalent to an indicator rank of 62.



4.2.4 Venture capital received was equal to 0.8 bn USD in 2021—up by 79 percentage points from the year prior—and equivalent to an indicator rank of 35.

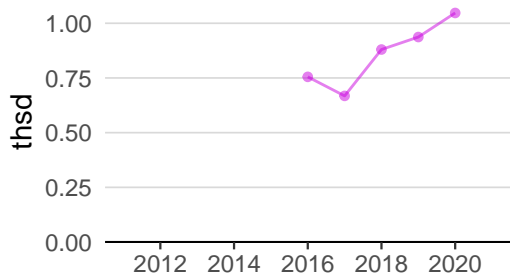


4.3.2 Domestic industry diversification was equal to 0.3 in 2014—up by 8 percentage points from the year prior—and equivalent to an indicator rank of 92.

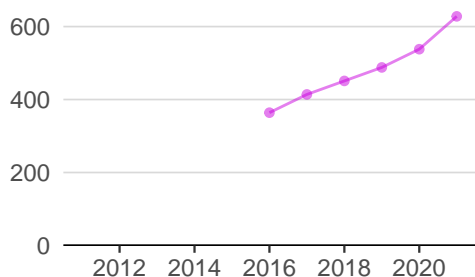


5.1.1 Knowledge-intensive employment was equal to 1.1 mn people in 2021—up by 7 percentage points from the year prior—and equivalent to an indicator rank of 16.

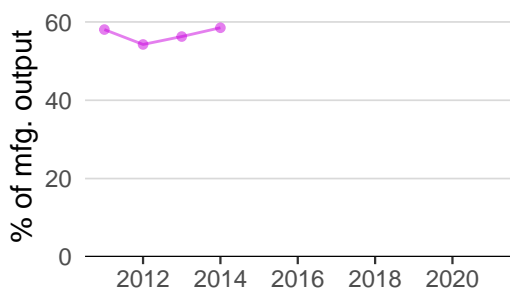
Innovation outputs



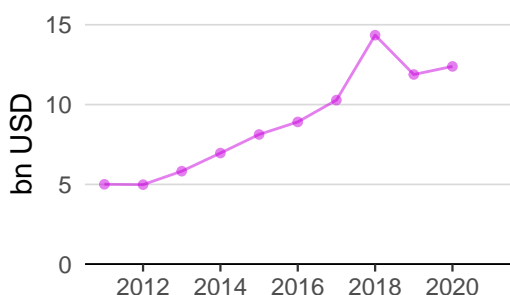
6.1.1 Patents by origin was equal to 1.0 thsd in 2020—up by 12 percentage points from the year prior—and equivalent to an indicator rank of 33.



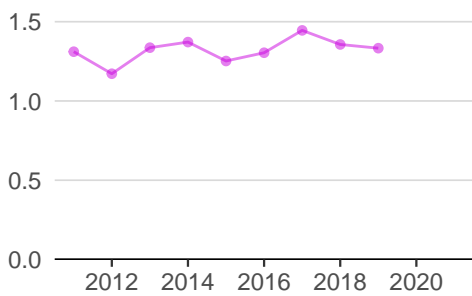
6.1.5 Citable documents H-index was equal to 628.0 in 2021—up by 17 percentage points from the year prior—and equivalent to an indicator rank of 28.



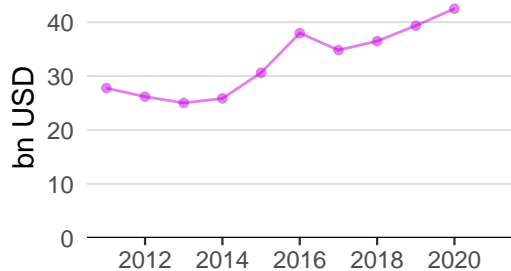
6.2.5 High-tech manufacturing was equal to 58.5% of mfg. output in 2014—up by 4 percentage points from the year prior—and equivalent to an indicator rank of 6.



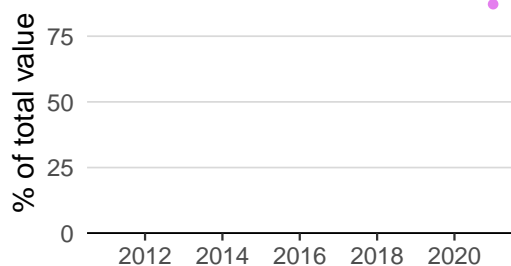
6.3.1 Intellectual property receipts was equal to 12.4 bn USD in 2020—up by 4 percentage points from the year prior—and equivalent to an indicator rank of 9.



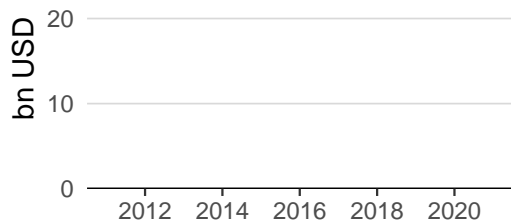
6.3.2 Production and export complexity was equal to 1.3 in 2019—down by 2 percentage points from the year prior—and equivalent to an indicator rank of 17.



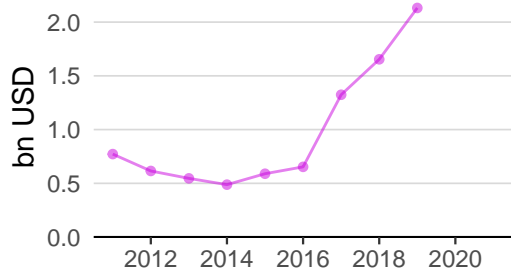
6.3.3 High-tech exports was equal to 42.5 bn USD in 2020—up by 8 percentage points from the year prior—and equivalent to an indicator rank of 20.



7.1.1 Intangible asset intensity was equal to 87.2% of total value in 2021 and equivalent to an indicator rank of 5.



7.1.3 Global brand value was equal to 23.1 bn USD in 2021—down by 2 percentage points from the year prior—and equivalent to an indicator rank of 36.



7.2.1 Cultural and creative services exports was equal to 2.1 bn USD in 2019—up by 29 percentage points from the year prior—and equivalent to an indicator rank of 56.

IRELAND'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]	[%]	[%]	
MEDTRONIC PUBLIC LIMITED	Health Care Equipment & Services	2,032	6.9	8.3	77
SEAGATE TECHNOLOGY	Technology Hardware & Equipment	793	-1.8	9.3	230
ACCENTURE	Support Services	709	8.9	2.0	237

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
TRINITY COLLEGE DUBLIN	59.5	101
UNIVERSITY COLLEGE DUBLIN	46.9	173=
NATIONAL UNIVERSITY OF IRELAND, GALWAY	37.6	258=

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
MEDTRONIC	1
ACCENTURE	2
TRANE TECHNOLOGIES	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

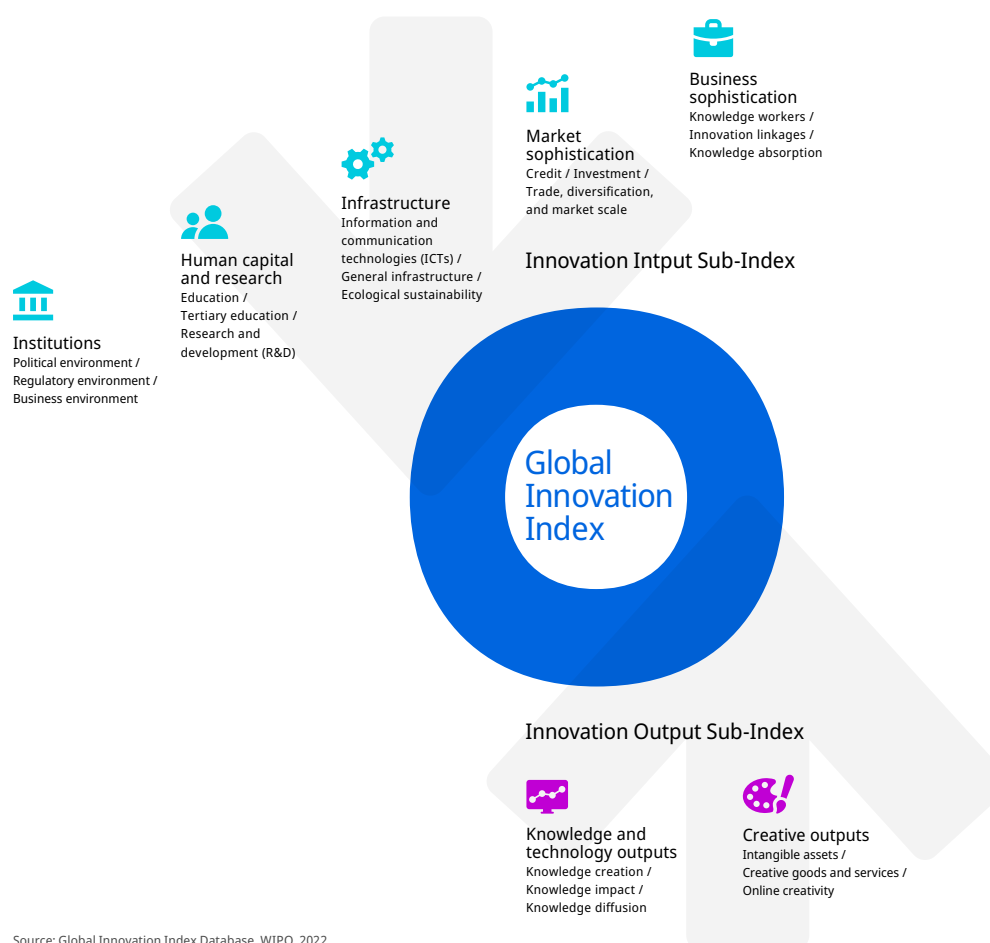
Brand	Industry	Rank
GUINNESS	Beers	1
PRIMARK / PENNEY'S	Apparel	2
RYANAIR	Airlines	3

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.