

# Global Innovation Index 2023

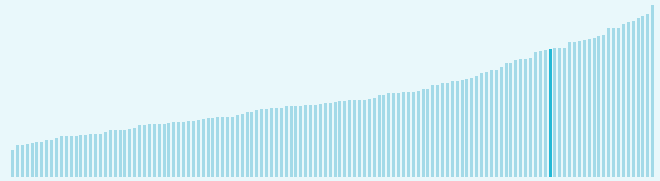


The Global Innovation Index (GII) **ranks world economies according to their innovation capabilities.**

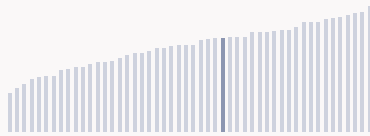
Consisting of **roughly 80 indicators**, grouped into innovation inputs and outputs, the GII **aims to capture the multi-dimensional facets of innovation.**

## Ireland ranking in the Global Innovation Index 2023

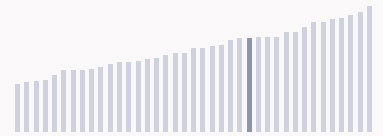
> Ireland ranks **22nd** among the 132 economies featured in the GII 2023.



> Ireland ranks **21st** among the 50 high-income group economies.



> Ireland ranks **14th** among the 39 economies in Europe.



### > Ireland GII Ranking (2020-2023)

The table shows the rankings of Ireland over the past four years. 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 2023 is between ranks 18 and 24.

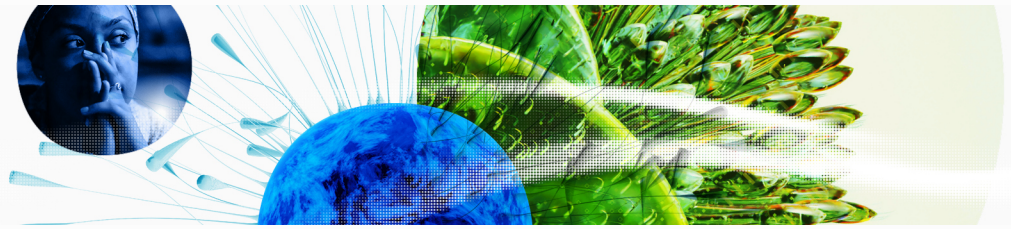
	GII Position	Innovation Inputs	Innovation Outputs
2020	15th	20th	11th
2021	19th	22nd	19th
2022	23rd	25th	19th
2023	22nd	26th	18th

Ireland performs better in innovation outputs than innovation inputs in 2023.

This year Ireland ranks **26th** in innovation inputs. This position is lower than last year.

Ireland ranks **18th** in innovation outputs. This position is higher than last year.

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## → Expected vs. observed innovation performance

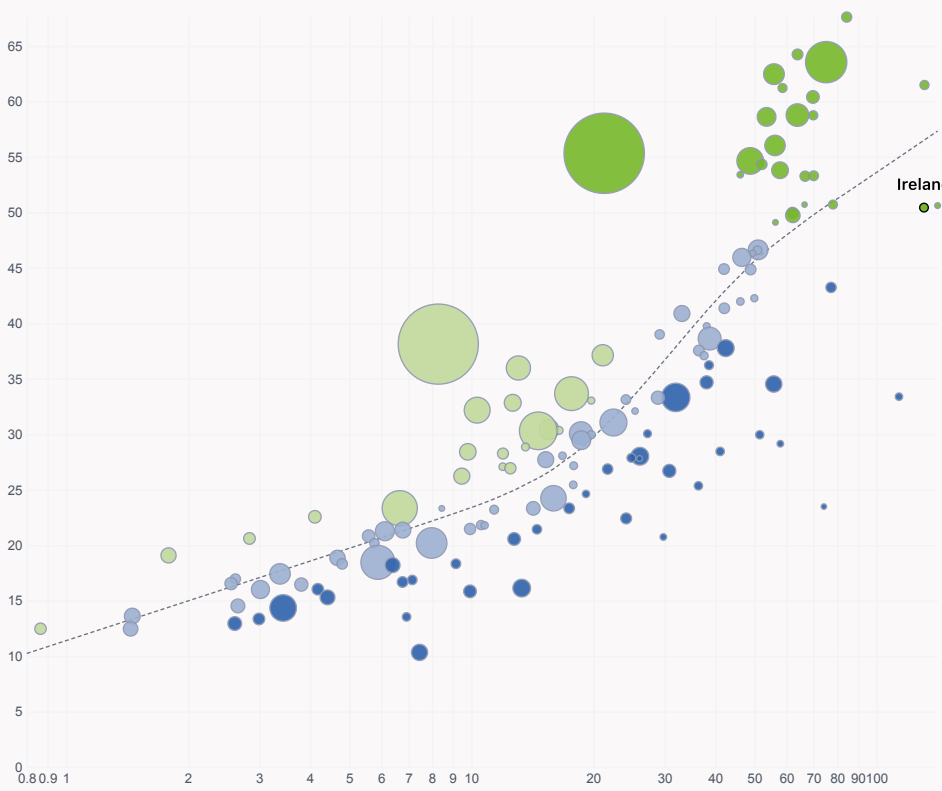
The bubble chart below shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The trend line gives an indication of the expected innovation performance according to income level. Economies appearing above the trend line are performing better than expected and those below are performing below expectations.



> Ireland is an innovation leader, ranking in the top 25 of the GII.

## > Innovation overperformers relative to their economic development

↑ GII Score



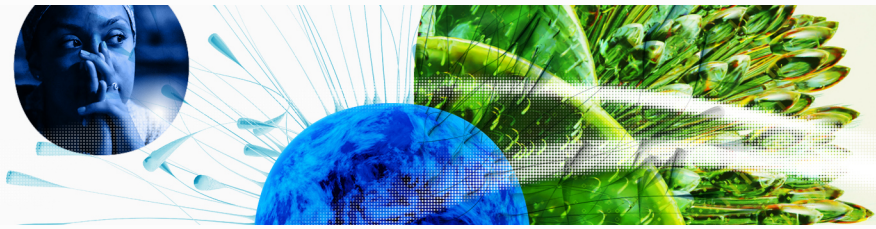
- Innovation leader
- Performing above expectations for level of development
- Performing at expectations for level of development
- Performing below expectations for level of development

Size legend (Population)



→ GDP per capita, PPP logarithmic scale (thousands of \$)

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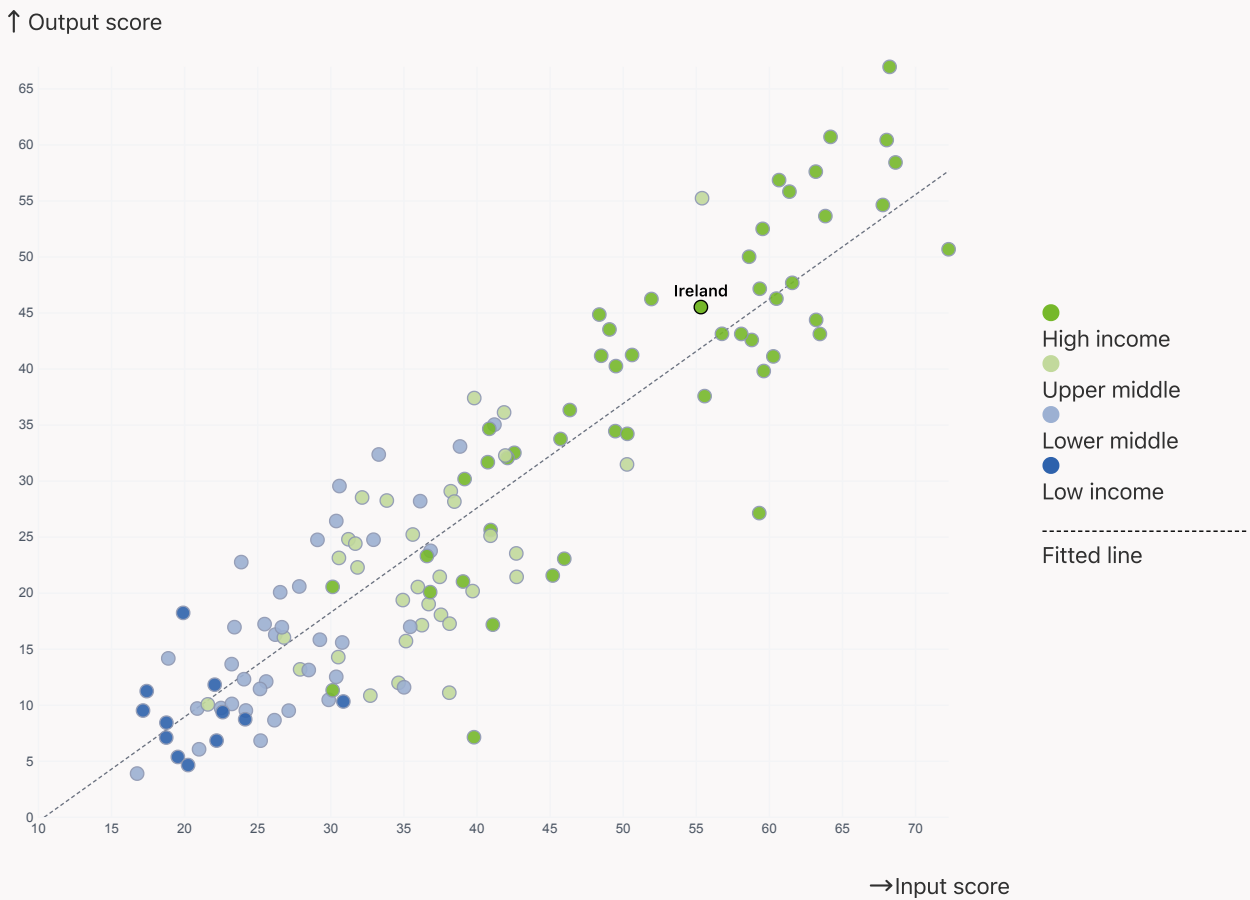
## → Effectively translating innovation investments into innovation outputs

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.

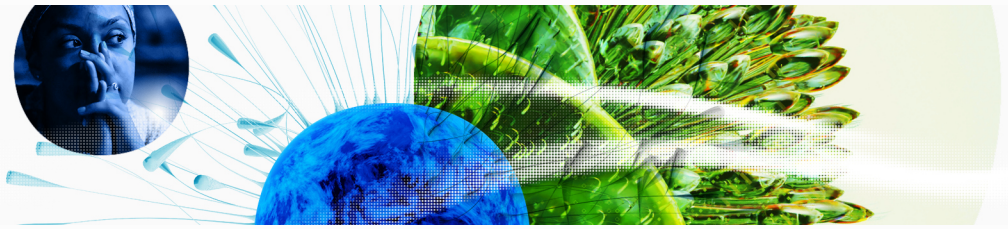


> Ireland produces more innovation outputs relative to its level of innovation investments.

### > Relationship between innovation inputs and outputs

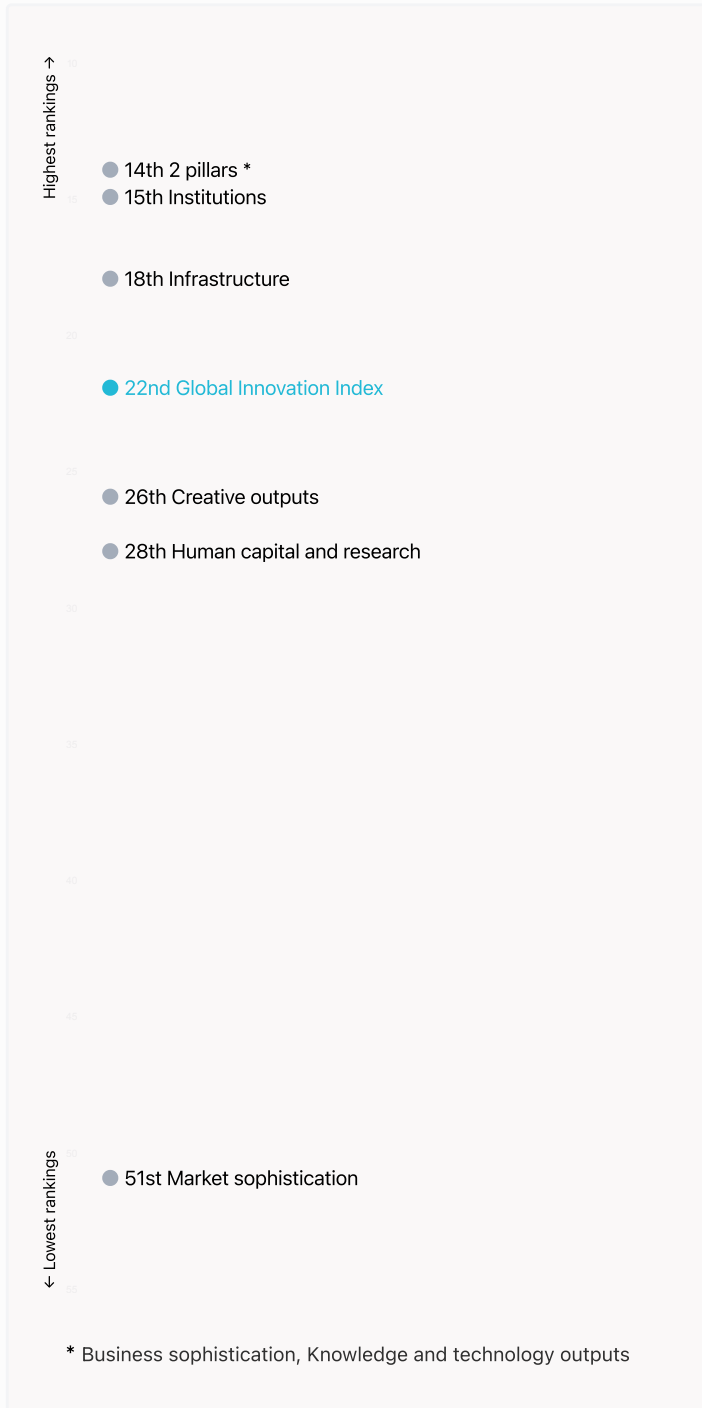


# Global Innovation Index 2023



## → Overview of Ireland's rankings in the seven areas of the GII in 2023

The chart shows the ranking for each of the seven areas that the GII comprises. The strongest areas for Ireland are those that rank above the GII (shown in blue) and the weakest are those that rank below.



### > Highest rankings



Ireland ranks highest in Business sophistication, Knowledge and technology outputs (14th), Institutions (15th) and Infrastructure (18th).

### > Lowest rankings



Ireland ranks lowest in Market sophistication (51st), Human capital and research (28th) and Creative outputs (26th).



The full WIPO Intellectual Property Statistics profile for Ireland can be found on [this link](#).

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## → Benchmark of Ireland against other country groupings for each of the seven areas of the GII Index

The charts show the relative position of Ireland (blue bar) against other country groupings (grey bars), for each of the seven areas of the GII Index.

### > High-Income economies

Ireland performs above the high-income group average in Knowledge and technology outputs, Creative outputs, Business sophistication, Infrastructure, Institutions.

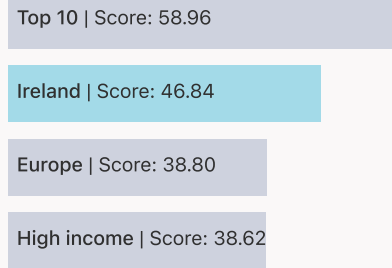


### > Europe

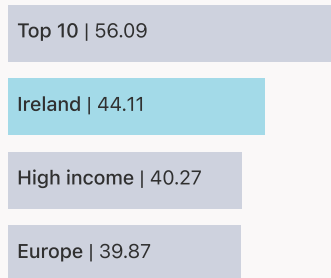
Ireland performs above the regional average in Knowledge and technology outputs, Creative outputs, Business sophistication, Human capital and research, Infrastructure, Institutions.



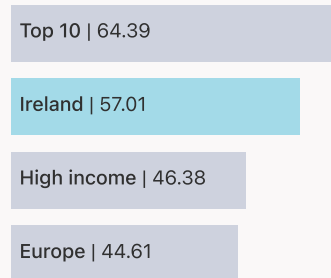
### Knowledge and technology outputs



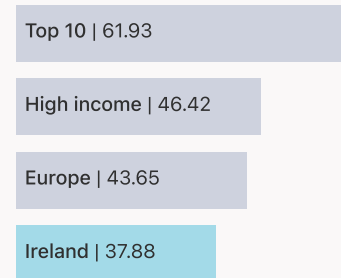
### Creative outputs



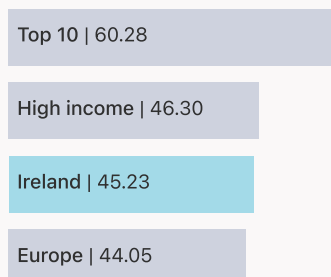
### Business sophistication



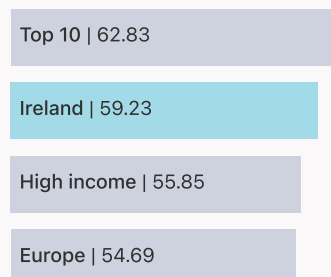
### Market sophistication



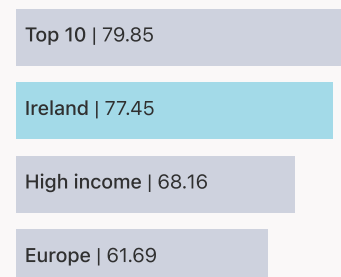
### Human capital and research



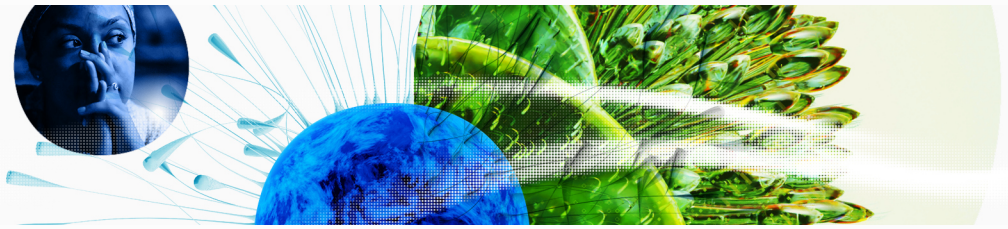
### Infrastructure



### Institutions



# Global Innovation Index 2023



## → Innovation strengths and weaknesses in Ireland

The table below gives an overview of the indicator strengths and weaknesses of Ireland in the GII 2023.



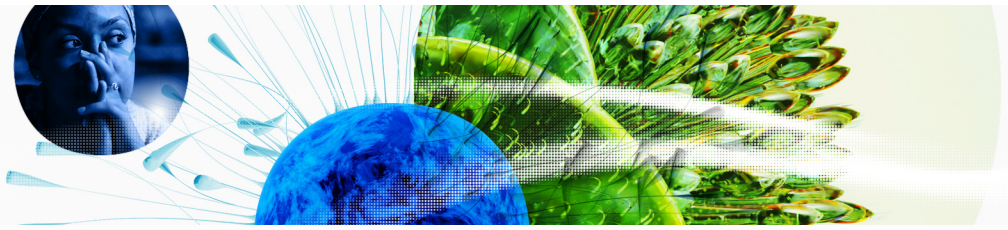
> Ireland's main innovation strengths are **GDP/unit of energy use (rank 1)**, **ICT services exports, % total trade (rank 1)** and **Intellectual property payments, % total trade (rank 1)**.

### Strengths

### Weaknesses

Rank	Code	Indicator name	Rank	Code	Indicator name
1	3.3.1	GDP/unit of energy use	102	6.2.1	Labor productivity growth, %
1	6.3.4	ICT services exports, % total trade	98	2.1.1	Expenditure on education, % GDP
1	5.3.1	Intellectual property payments, % total trade	93	4.1.2	Domestic credit to private sector, % GDP
4	5.1.5	Females employed w/advanced degrees, %	88	2.1.2	Government funding/pupil, secondary, % GDP/cap
5	7.1.1	Intangible asset intensity, top 15, %	88	5.3.2	High-tech imports, % total trade
6	7.2.2	National feature films/mn pop. 15-69	65	6.3.5	ISO 9001 quality/bn PPP\$ GDP
8	5.1.2	Firms offering formal training, %	64	7.1.4	Industrial designs by origin/bn PPP\$ GDP
9	2.1.3	School life expectancy, years	45	6.1.3	Utility models by origin/bn PPP\$ GDP
10	6.3.1	Intellectual property receipts, % total trade	41	4.2.1	Market capitalization, % GDP

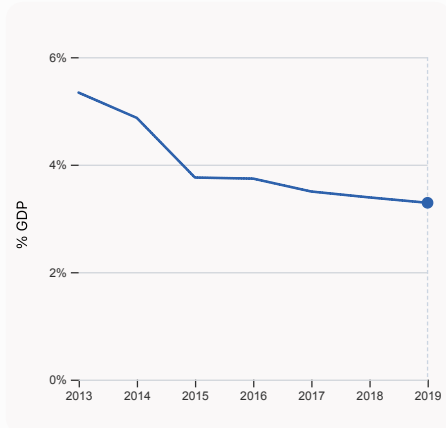
# Global Innovation Index 2023



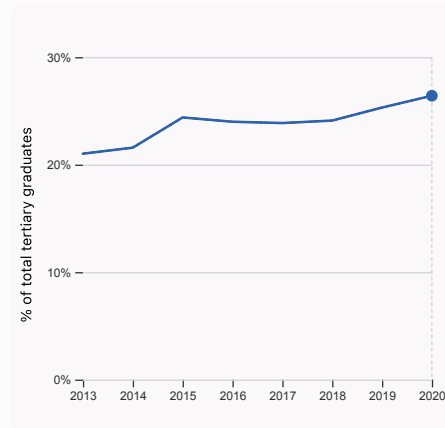
## → Ireland's innovation system

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

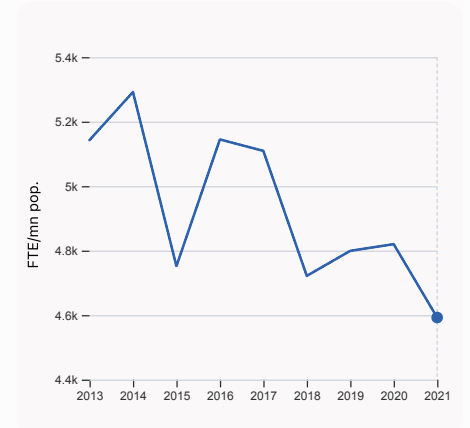
### > Innovation inputs in Ireland



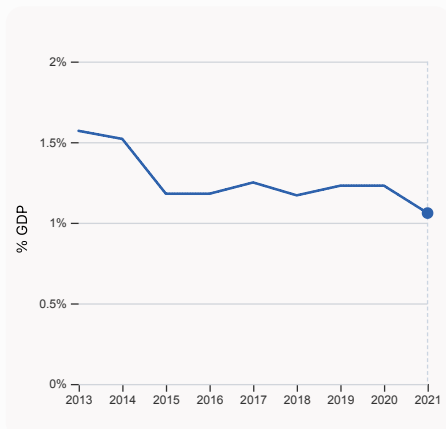
**2.1.1 Expenditure on education, % GDP** was equal to 3.29% GDP in 2019, down by 0.1 percentage points from the year prior – and equivalent to an indicator rank of 98.



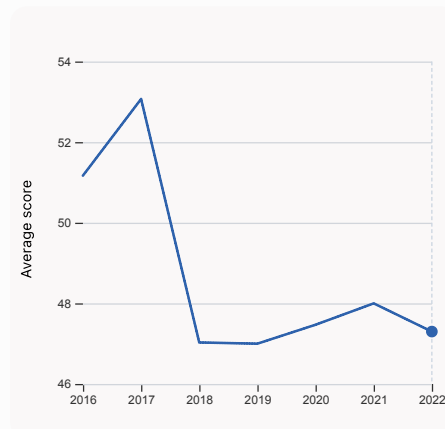
**2.2.2 Graduates in science and engineering, %** was equal to 26.41% of total tertiary graduates in 2020, up by 1.1 percentage points from the year prior – and equivalent to an indicator rank of 36.



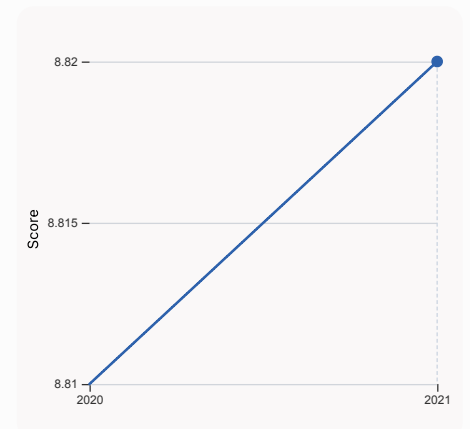
**2.3.1 Researchers, FTE/mn pop.** was equal to 4,592.59 FTE/mn pop. in 2021, down by 4.72% from the year prior – and equivalent to an indicator rank of 21.



**2.3.2 Gross expenditure on R&D, % GDP** was equal to 1.06% GDP in 2021, down by 0.17 percentage points from the year prior – and equivalent to an indicator rank of 38.

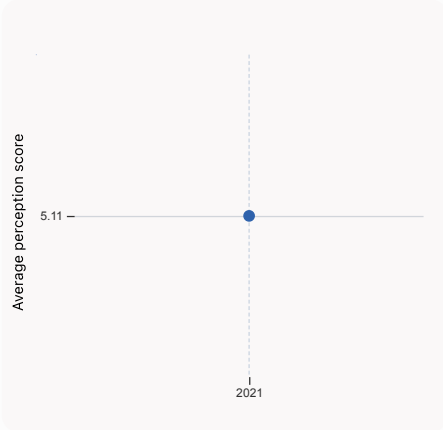
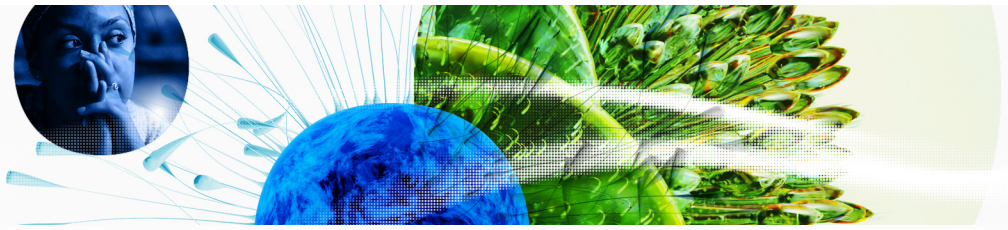


**2.3.4 QS university ranking, top 3** was equal to an average score of 47.3 for the top 3 universities in 2022, down by 1.46% from the year prior – and equivalent to an indicator rank of 23.

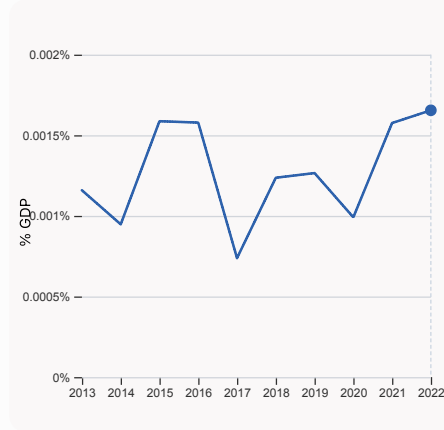


**3.1.1 ICT access** was equal to a score of 8.82 in 2021, up by 0.11% from the year prior – and equivalent to an indicator rank of 65.

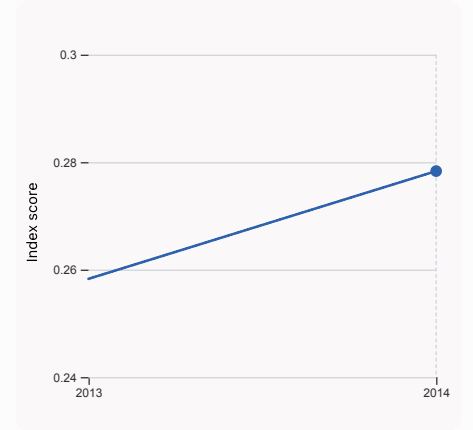
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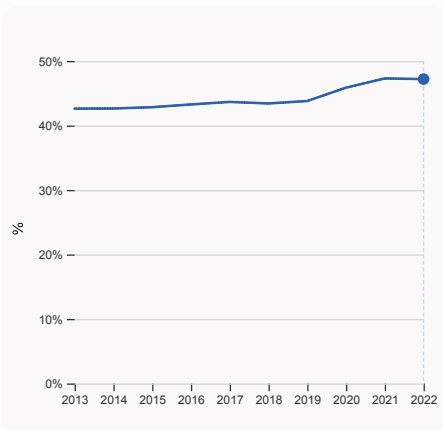
**4.1.1 Finance for startups and scaleups** was equal to an average perception score of 5.11 in 2021, equivalent to an indicator rank of 30.



**4.2.4 VC received, value, % GDP** was equal to 0.00165% GDP in 2022, up by 0.000079 percentage points from the year prior – and equivalent to an indicator rank of 42.



**4.3.2 Domestic industry diversification** was equal to an index score of 0.278 in 2014, up by 7.76% from the year prior – and equivalent to an indicator rank of 92.

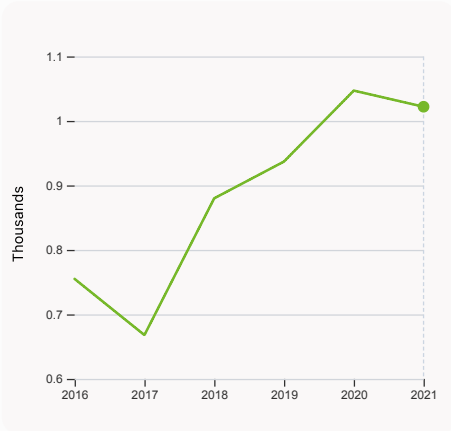


**5.1.1 Knowledge-intensive employment, %** was equal to 47.2% in 2022, down by 0.1 percentage points from the year prior – and equivalent to an indicator rank of 16.

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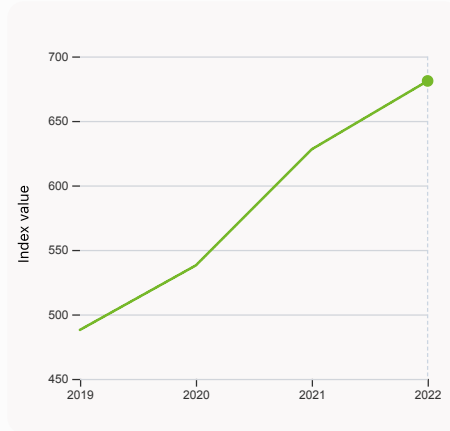


## > Innovation outputs in Ireland



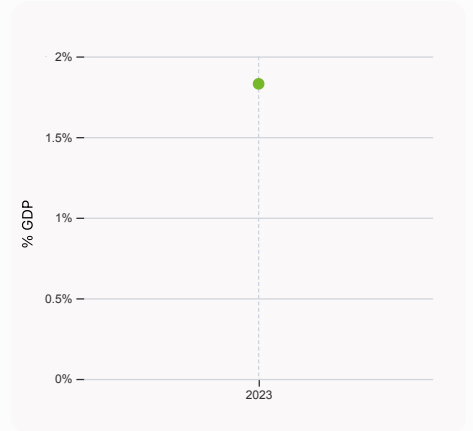
### 6.1.1 Patents by origin

was equal to 1.022 Thousands in 2021, down by 2.39% from the year prior – and equivalent to an indicator rank of 38.



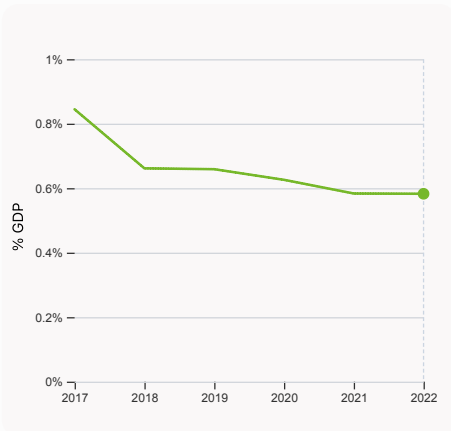
### 6.1.5 Citable documents H-index

was equal to an index value of 681 in 2022, up by 8.44% from the year prior – and equivalent to an indicator rank of 28.



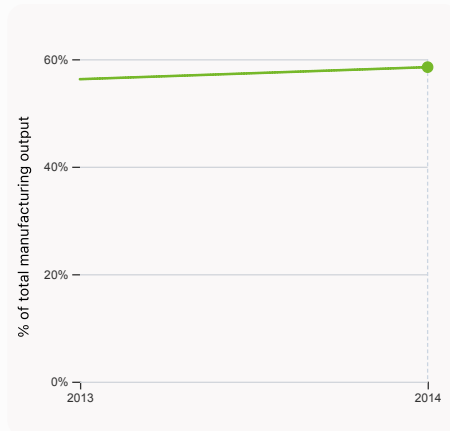
### 6.2.2 Unicorn valuation, % GDP

was equal to 1.83 % GDP in 2023 – and equivalent to an indicator rank of 23.



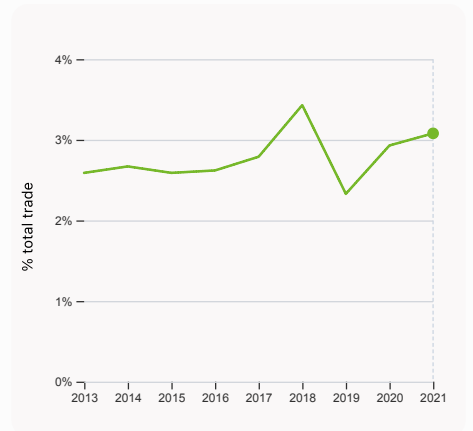
### 6.2.3 Software spending, % GDP

was equal to 0.583% GDP in 2022, down by 0.00086 percentage points from the year prior – and equivalent to an indicator rank of 17.



### 6.2.4 High-tech manufacturing, %

was equal to 58.52% of total manufacturing output in 2014, up by 2.24 percentage points from the year prior – and equivalent to an indicator rank of 6.



### 6.3.1 Intellectual property receipts, % total trade

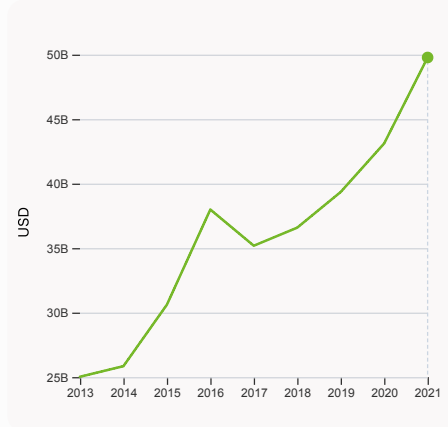
was equal to 3.08% total trade in 2021, up by 0.15 percentage points from the year prior – and equivalent to an indicator rank of 10.

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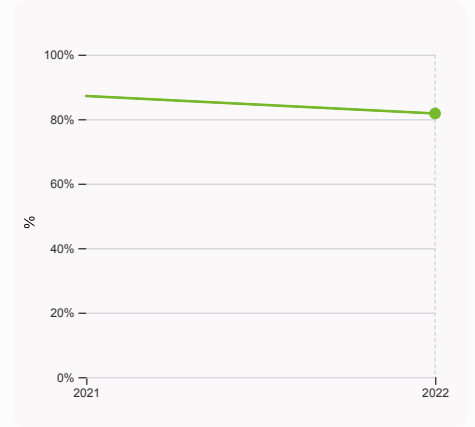
### 6.3.2 Production and export complexity

was equal to a score of 1.35 in 2020, up by with no change from the year prior – and equivalent to an indicator rank of 15.



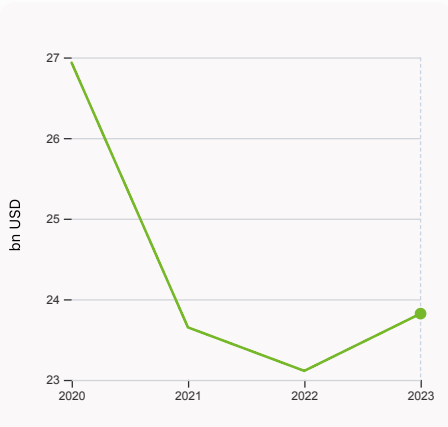
### 6.3.3 High-tech exports

was equal to 49,779,443,539 USD in 2021, up by 15.45% from the year prior – and equivalent to an indicator rank of 21.



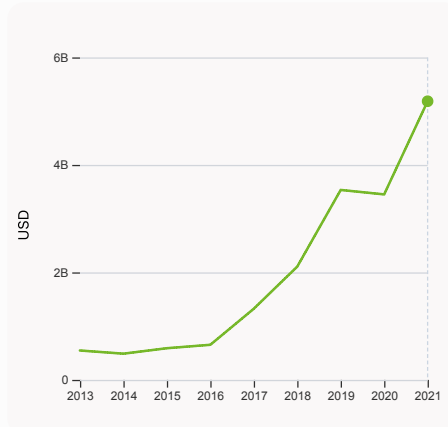
### 7.1.1 Intangible asset intensity, top 15, %

was equal to 81.76% in 2022, down by 5.42 percentage points from the year prior – and equivalent to an indicator rank of 5.



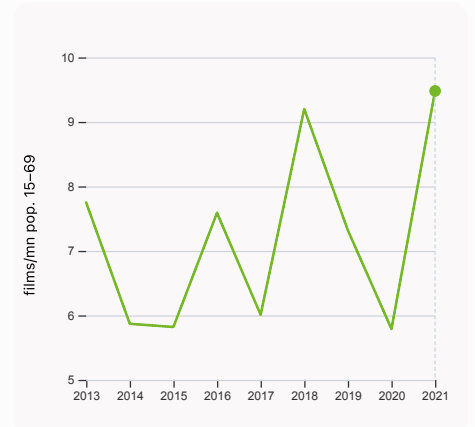
### 7.1.3 Global brand value, top 5,000

was equal to 23.822 bn USD in 2023, up by 3.072% from the year prior – and equivalent to an indicator rank of 37.



### 7.2.1 Cultural and creative services exports

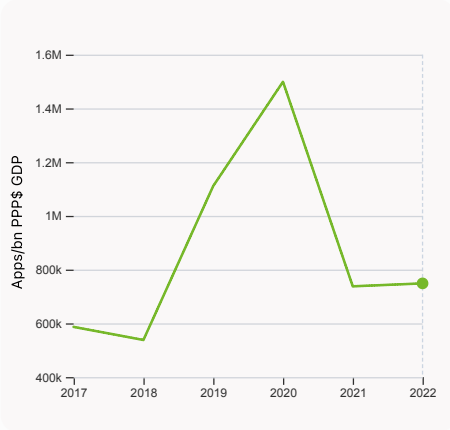
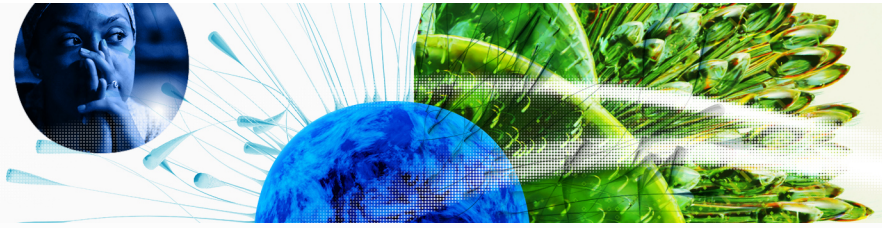
was equal to 5,184,627,000 USD in 2021, up by 50.22% from the year prior – and equivalent to an indicator rank of 35.



### 7.2.2 National feature films/mn pop. 15-69

was equal to 9.48 films/mn pop. 15-69 in 2021, up by 63.73% from the year prior – and equivalent to an indicator rank of 6.

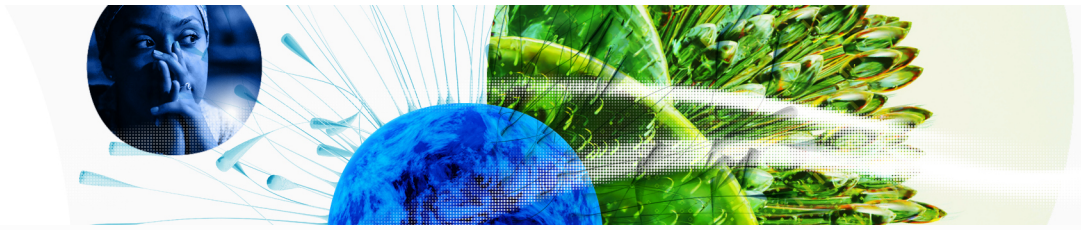
# Global Innovation Index 2023



## 7.3.4 Mobile app creation/bn PPP\$ GDP

was equal to 748,809.84 Apps/bn PPP\$ GDP in 2022, up by 1.48% from the year prior – and equivalent to an indicator rank of 29.

# Global Innovation Index 2023



## → Ireland's innovation top performers

### > 2.3.3 Global corporate R&D investors from Ireland

Rank	Firm	Industry	R&D	R&D Growth	R&D Intensity
			[mn EUR]	[%]	[%]
73	MEDTRONIC PUBLIC LIMITED	Health Care Equipment & Services	2,425	10	9
200	ACCENTURE	Support Services	987	28	2
236	SEAGATE TECHNOLOGY	Technology Hardware & Equipment	816	2	9
341	EATON CORPORATION	Electronic & Electrical Equipment	544	12	3

Source: European Commission's Joint Research Centre (<https://iri.jrc.ec.europa.eu/scoreboard/2022-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 of Ireland's top universities

Rank	University	Score
98	TRINITY COLLEGE DUBLIN (TCD)	59.10
181	UNIVERSITY COLLEGE DUBLIN (UCD)	45.60
270	NATIONAL UNIVERSITY OF IRELAND, GALWAY (NUIG)	37.20

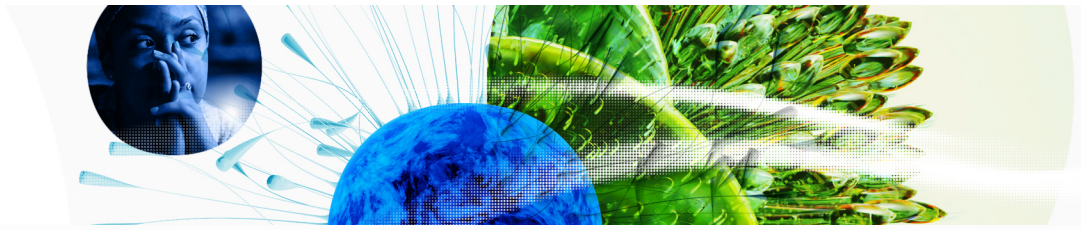
Source: QS Quacquarelli Symonds Ltd (<https://www.topuniversities.com/university-rankings/world-university-rankings/2023>).

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".

## > 6.2.2 Top Unicorn Companies in Ireland

Rank	Unicorn Company	Industry	City	Valuation, bn USD
1	BROWSERSTACK	Internet software & services	Dublin	4
2	WAYFLYER	Fintech	Dublin	2
3	FLIPDISH	Internet software & services	Dublin	1

Source: CBInsights, Tracker – The Complete List of Unicorn Companies: <https://www.cbinsights.com/research-unicorn-companies>



## > 7.1.1 Top 15 intangible-asset intensive companies in Ireland

Rank	Firm	Intensity, %
1	ACCENTURE PLC	94.02
2	TRANE TECHNOLOGIES PLC	97.04
3	EXPERIAN PLC	100.75

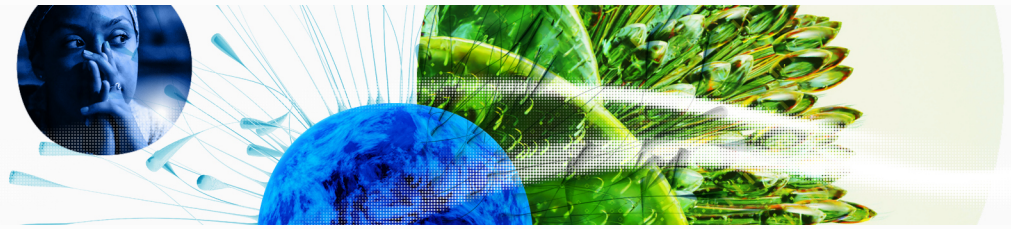
Source: Brand Finance (<https://brandirectory.com/reports/gift-2022>).  
Note: Brand Finance only provides within economy ranks.

## > 7.1.3 Top 5,000 companies in Ireland with highest global brand value

Rank	Brand	Industry	Brand Value, mn USD
1	GUINNESS	Beers	2,505.5
2	RYANAIR	Airlines	2,372.0
3	PRIMARK / PENNEY'S	Apparel	2,146.8

Source: Brand Finance (<https://brandirectory.com>).  
Note: Rank corresponds to within economy ranks.

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GII 2023 rank

22

## Ireland

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$
18	26	High	EUR	5.0	666.3	131,034.1
Score / Value Rank				Score / Value Rank		
<b>Institutions</b> 77.4 15				<b>Business sophistication</b> 57.0 14		
<b>1.1 Institutional environment</b> 75.6 16				<b>5.1 Knowledge workers</b> 68.3 8 ●◆		
1.1.1 Operational stability for businesses* 72.9 20				5.1.1 Knowledge-intensive employment, % 47.2 16		
1.1.2 Government effectiveness* 78.3 14				5.1.2 Firms offering formal training, % 59.8 8 ●◆		
<b>1.2 Regulatory environment</b> 85.5 18				5.1.3 GERD performed by business, % GDP 0.8 29		
1.2.1 Regulatory quality* 82.6 14				5.1.4 GERD financed by business, % 62.8 10		
1.2.2 Rule of law* 84.5 16				5.1.5 Females employed w/advanced degrees, % 29.5 4 ●◆		
1.2.3 Cost of redundancy dismissal 14.3 55				<b>5.2 Innovation linkages</b> 48.3 21		
<b>1.3 Business environment</b> 71.2 22				5.2.1 University-industry R&D collaboration+ 78.6 15		
1.3.1 Policies for doing business* 78.5 12				5.2.2 State of cluster development+ 63.6 34		
1.3.2 Entrepreneurship policies and culture* 63.9 19				5.2.3 GERD financed by abroad, % GDP 0.2 26		
<b>Human capital and research</b> 45.2 28 ◇				5.2.4 Joint venture/strategic alliance deals/bn PPP\$ GDP 0.1 23		
<b>2.1 Education</b> 47.2 75 ○◇				5.2.5 Patent families/bn PPP\$ GDP 2.3 18		
2.1.1 Expenditure on education, % GDP 3.3 98 ○◇				<b>5.3 Knowledge absorption</b> 54.5 12 ●◆		
2.1.2 Government funding/pupil, secondary, % GDP/cap 11.6 88 ○◇				5.3.1 Intellectual property payments, % total trade 20.4 1 ●◆		
2.1.3 School life expectancy, years 18.8 9 ●◆				5.3.2 High-tech imports, % total trade 6.9 88 ○		
2.1.4 PISA scales in reading, maths and science 504.6 10				5.3.3 ICT services imports, % total trade 1.7 52		
2.1.5 Pupil-teacher ratio, secondary n/a n/a				5.3.4 FDI net inflows, % GDP 4.2 29		
<b>2.2 Tertiary education</b> 41.8 29				5.3.5 Research talent, % in businesses 45.5 31		
2.2.1 Tertiary enrolment, % gross 74.7 28				<b>Knowledge and technology outputs</b> 46.8 14		
2.2.2 Graduates in science and engineering, % 26.4 36				<b>6.1 Knowledge creation</b> 23.9 43 ◇		
2.2.3 Tertiary inbound mobility, % 10.2 27				6.1.1 Patents by origin/bn PPP\$ GDP 1.8 38 ◇		
<b>2.3 Research and development (R&amp;D)</b> 46.7 21				6.1.2 PCT patents by origin/bn PPP\$ GDP 1.2 22 ◇		
2.3.1 Researchers, FTE/mn pop. 4,592.6 21				6.1.3 Utility models by origin/bn PPP\$ GDP 0.2 45 ○		
2.3.2 Gross expenditure on R&D, % GDP 1.1 38 ◇				6.1.4 Scientific and technical articles/bn PPP\$ GDP n/a n/a		
2.3.3 Global corporate R&D investors, top 3, mn US\$ 72.4 12				6.1.5 Citable documents H-index 35.5 28		
2.3.4 QS university ranking, top 3* 47.9 23				<b>6.2 Knowledge impact</b> 51.3 11 ●◆		
<b>Infrastructure</b> 59.2 18				6.2.1 Labor productivity growth, % -0.1 102 ○		
<b>3.1 Information and communication technologies (ICTs)</b> 78.3 42 ◇				6.2.2 Unicorn valuation, % GDP 1.8 23		
3.1.1 ICT access* 82.4 65 ◇				6.2.3 Software spending, % GDP 0.6 17		
3.1.2 ICT use* 87.7 27 ◇				6.2.4 High-tech manufacturing, % 58.5 6		
3.1.3 Government's online service* 75.6 45 ◇				<b>6.3 Knowledge diffusion</b> 65.3 3 ●◆		
3.1.4 E-participation* 67.4 47 ◇				6.3.1 Intellectual property receipts, % total trade 2.8 10 ●◆		
<b>3.2 General infrastructure</b> 40.4 31				6.3.2 Production and export complexity 80.8 15		
3.2.1 Electricity output, GWh/mn pop. 6,302.1 31				6.3.3 High-tech exports, % total trade 8.7 21		
3.2.2 Logistics performance* 68.2 25 ◇				6.3.4 ICT services exports, % total trade 35.2 1 ●◆		
3.2.3 Gross capital formation, % GDP 24.7 59				6.3.5 ISO 9001 quality/bn PPP\$ GDP 3.8 65 ○		
<b>3.3 Ecological sustainability</b> 59.0 4 ●◆				<b>Creative outputs</b> 44.1 26		
3.3.1 GDP/unit of energy use 36.3 1 ●◆				<b>7.1 Intangible assets</b> 43.8 36		
3.3.2 Environmental performance* 65.3 24				7.1.1 Intangible asset intensity, top 15, % 81.8 5 ●◆		
3.3.3 ISO 14001 environment/bn PPP\$ GDP 1.5 56				7.1.2 Trademarks by origin/bn PPP\$ GDP n/a n/a		
<b>Market sophistication</b> 37.9 51 ◇				7.1.3 Global brand value, top 5,000 4.3 37 ◇		
<b>4.1 Credit</b> 36.1 48 ◇				7.1.4 Industrial designs by origin/bn PPP\$ GDP 1.1 64 ○		
4.1.1 Finance for startups and scaleups+ 61.6 30				<b>7.2 Creative goods and services</b> 36.0 20		
4.1.2 Domestic credit to private sector, % GDP 32.4 93 ○◇				7.2.1 Cultural and creative services exports, % total trade 0.9 35		
4.1.3 Loans from microfinance institutions, % GDP n/a n/a				7.2.2 National feature films/mn pop. 15-69 9.5 6 ●◆		
<b>4.2 Investment</b> 18.5 38 ◇				7.2.3 Entertainment and media market/th pop. 15-69 51.8 14		
4.2.1 Market capitalization, % GDP 37.4 41 ○◇				7.2.4 Creative goods exports, % total trade 1.1 45		
4.2.2 Venture capital (VC) investors, deals/bn PPP\$ GDP 0.3 22				<b>7.3 Online creativity</b> 52.9 21		
4.2.3 VC recipients, deals/bn PPP\$ GDP 0.1 28				7.3.1 Generic top-level domains (TLDs)/th pop. 15-69 56.0 15		
4.2.4 VC received, value, % GDP 0.0 42 ◇				7.3.2 Country-code TLDs/th pop. 15-69 27.7 25		
<b>4.3 Trade, diversification, and market scale</b> 59.0 61				7.3.3 GitHub commits/mn pop. 15-69 53.3 18		
4.3.1 Applied tariff rate, weighted avg., % 1.5 20				7.3.4 Mobile app creation/bn PPP\$ GDP 74.4 29		
4.3.2 Domestic industry diversification 72.4 92						
4.3.3 Domestic market scale, bn PPP\$ 666.3 39						

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/gii-ranking>. 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.



> Ireland has missing data for three indicators and outdated data for eight indicators.

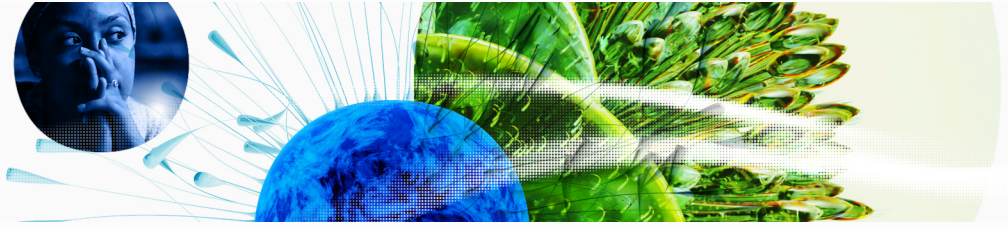
## > Missing data for Ireland

Code	Indicator name	Economy Year	Model Year	Source
2.1.5	Pupil-teacher ratio, secondary	n/a	2020	UNESCO Institute for Statistics
4.1.3	Loans from microfinance institutions, % GDP	n/a	2021	International Monetary Fund, Financial Access Survey (FAS)
7.1.2	Trademarks by origin/bn PPP\$ GDP	n/a	2021	World Intellectual Property Organization; International Monetary Fund

## > Outdated data for Ireland

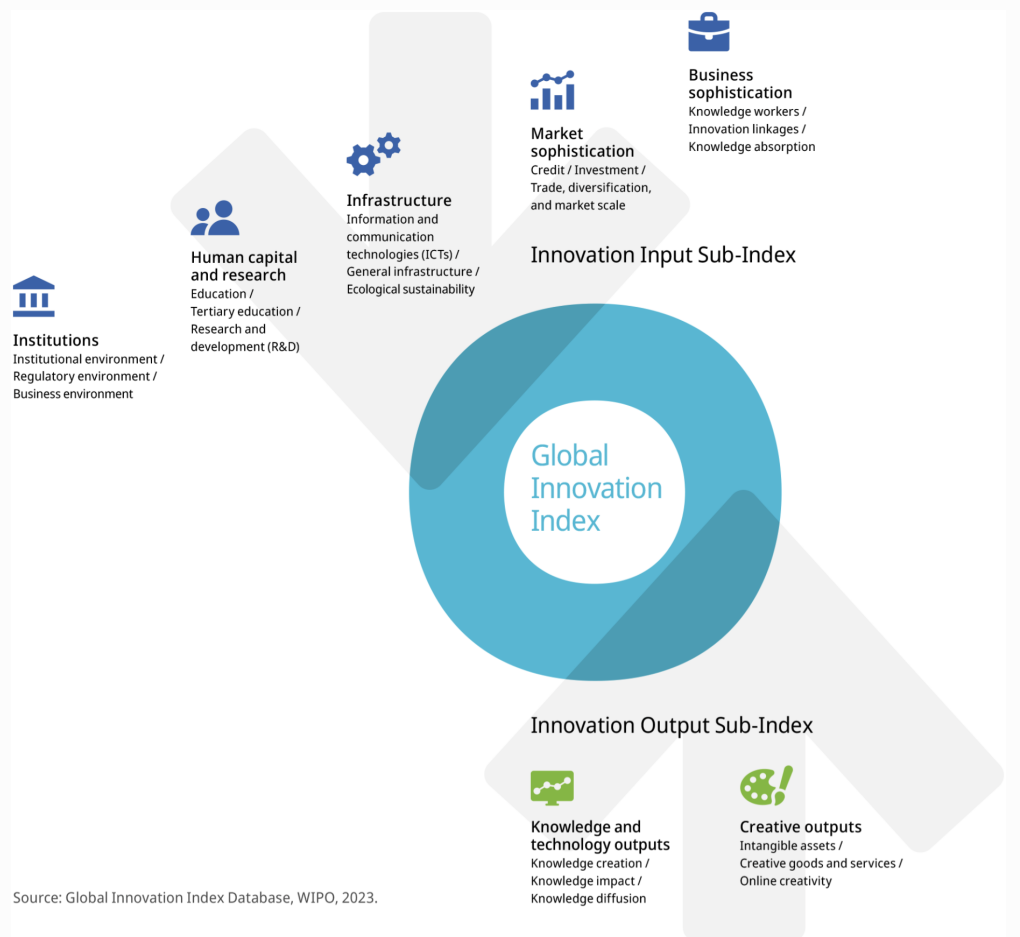
Code	Indicator name	Economy Year	Model Year	Source
1.3.2	Entrepreneurship policies and culture	2021	2022	Global Entrepreneurship Monitor
2.1.1	Expenditure on education, % GDP	2019	2021	UNESCO Institute for Statistics
4.1.1	Finance for startups and scaleups	2021	2022	Global Entrepreneurship Monitor
4.2.1	Market capitalization, % GDP	2018	2020	World Federation of Exchanges; World Bank
4.3.2	Domestic industry diversification	2014	2020	United Nations Industrial Development Organization
5.1.4	GERD financed by business, %	2019	2020	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
5.2.3	GERD financed by abroad, % GDP	2019	2020	UNESCO Institute for Statistics; Eurostat; OECD; RICYT
6.2.4	High-tech manufacturing, %	2014	2020	United Nations Industrial Development Organization

# Global Innovation Index 2023



## → 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.