



GLOBAL INNOVATION INDEX 2019

IRELAND

12th

Ireland ranks 12th among the 129 economies featured in the GII 2019.

The Global Innovation Index (GII) is a ranking of world economies based on 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 the GII model influence year-on-year comparisons of the GII ranks. The confidence interval for Ireland's ranking in the GII 2019 is between 12 and 16.

Ireland's Rankings, 2017 - 2019

	GII	Innovation Inputs	Innovation Outputs
2019	12	20	10
2018	10	18	9
2017	10	19	8

- Ireland performs better in Innovation Outputs than Inputs.
- This year Ireland ranks 20th in Innovation Inputs, worse than last year and compared to 2017.
- As for Innovation Outputs, Ireland ranks 10th. This position is worse than last year and compared to 2017.

12th

Ireland ranks 12th among the 50 high-income economies.

8th

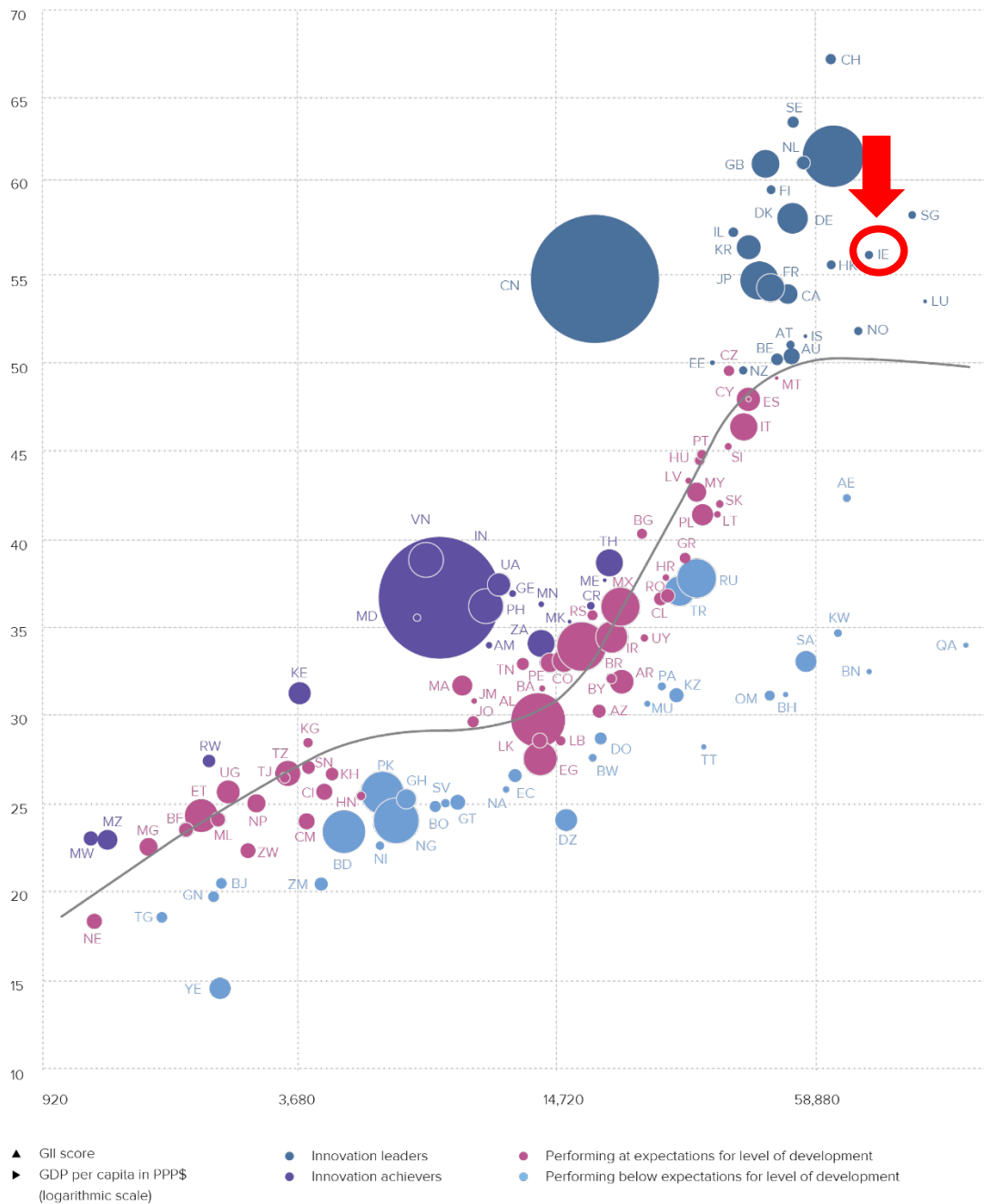
Ireland ranks 8th among the 39 economies in Europe.

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 considered Innovation under-performers relative to GDP.

Relative to GDP, Ireland performs above its expected level of development.

GII scores and GDP per capita in PPP US\$ (bubbles sized by population)

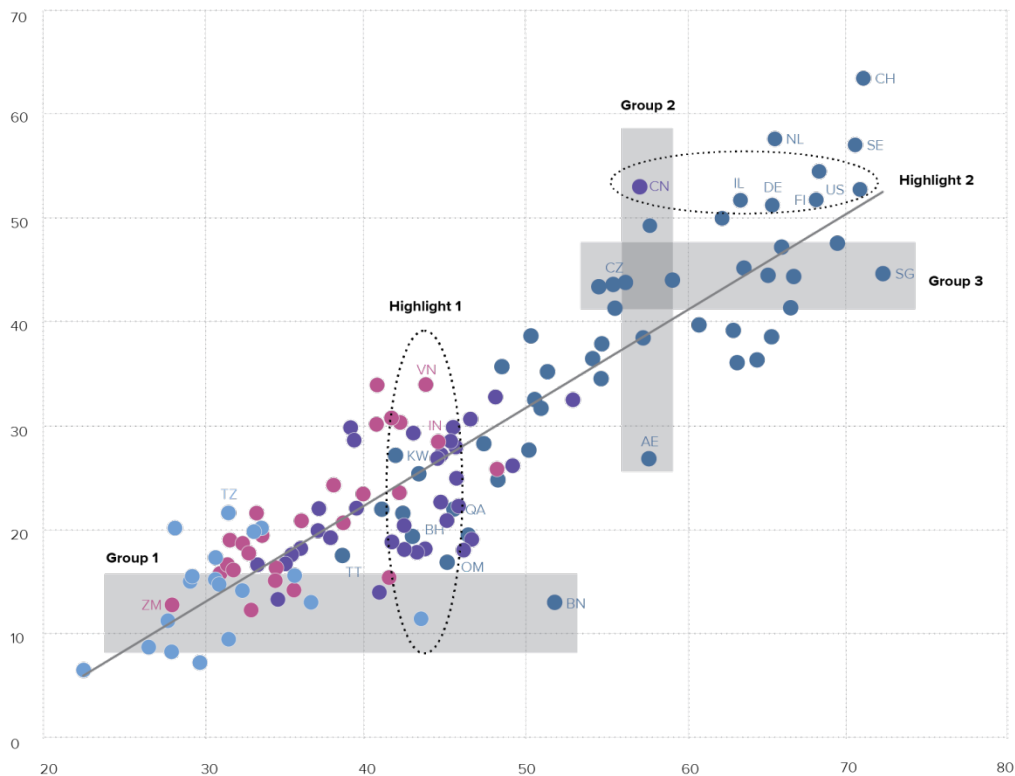


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

The chart below shows the relationship between innovation inputs and innovation outputs, indicating which economies best translate innovation inputs into innovation outputs. Economies appearing above the line are effectively translating their costly innovation investments into more and higher-quality outputs. In contrast, those below the line are not effectively translating innovation inputs into outputs.

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

Innovation input/output performance by income group, 2019



▲ Output score
▶ Input score

● High income
● Upper-middle income

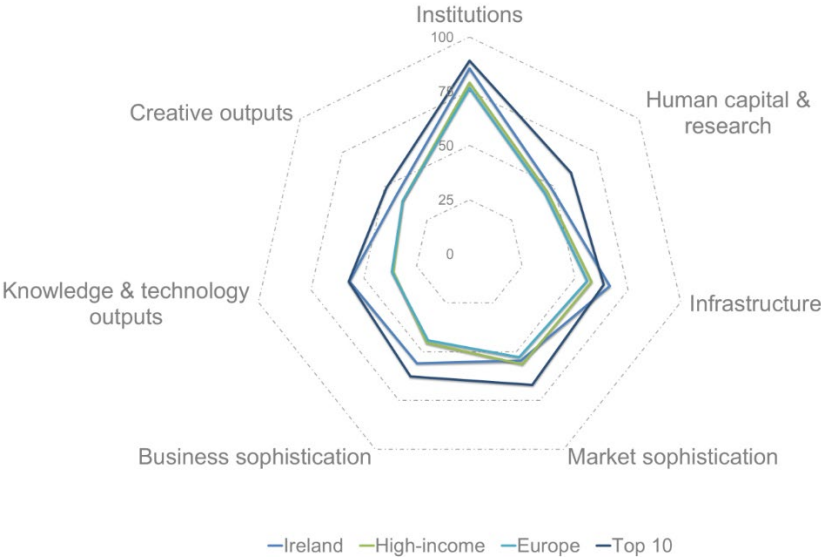
● Lower-middle income
● Low income

— Fitted values

- | | | | |
|-------------------------|-------------------|------------------------|--------------------------------|
| AE United Arab Emirates | CZ Czech Republic | NL Netherlands | TZ United Republic of Tanzania |
| BH Bahrain | DE Germany | OM Oman | US United States of America |
| BN Brunei Darussalam | FI Finland | QA Qatar | VN Viet Nam |
| CH Switzerland | IL Israel | SE Sweden | ZM Zambia |
| CN China | IN India | SG Singapore | |
| | KW Kuwait | TT Trinidad and Tobago | |

BENCHMARKING IRELAND TO OTHER HIGH-INCOME ECONOMIES AND THE EUROPE REGION

Ireland's scores in the seven GII pillars



High-income economies

Ireland has high scores in all GII pillars but Market sophistication, which is below the average of the high-income group.

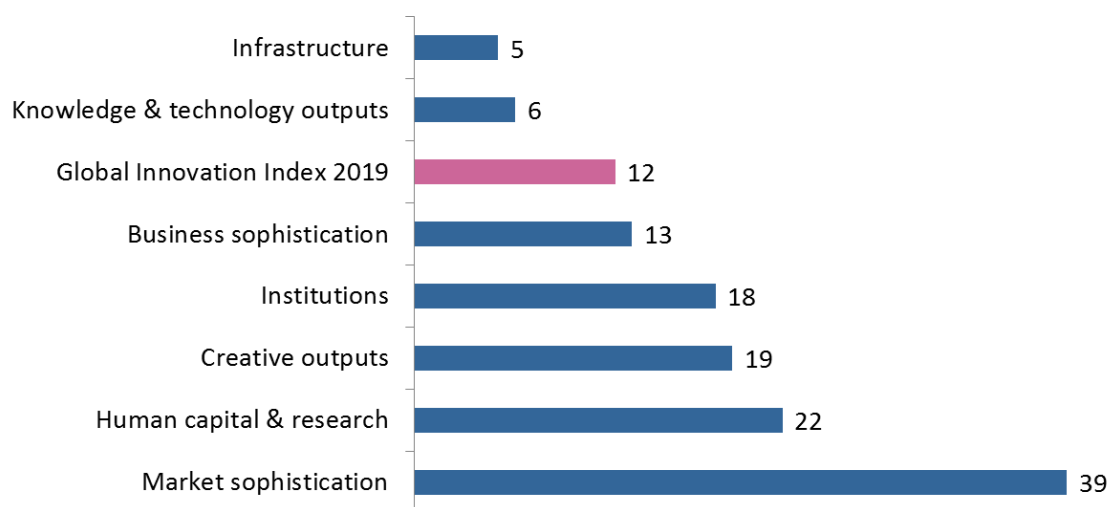
Europe Region

Compared to other economies in Europe, Ireland performs above average in all 7 GII pillars.

Top ranks are found in sub-pillars Ecological sustainability, Knowledge absorption, Knowledge impact, Knowledge diffusion, and Intangible assets where the country ranks in the top 10 worldwide.

OVERVIEW OF IRELAND'S RANKINGS IN THE 7 GII AREAS

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



*The highest possible ranking in each pillar is 1.

IRELAND'S INNOVATION STRENGTHS AND WEAKNESSES

The table below gives an overview of Ireland's strengths and weaknesses in the GII 2019.

Strengths		
Code	Indicator name	Rank
2.1.3	School life expectancy, years	9
3	Infrastructure	5
3.3	Ecological sustainability	4
3.3.1	GDP/unit of energy use	3
3.3.2	Environmental performance*	9
5.1.5	Females employed w/advanced degrees, %	9
5.3	Knowledge absorption	5
5.3.1	Intellectual property payments, % total trade	1
5.3.4	FDI net inflows, % GDP, 3-year average	4
6	Knowledge & technology outputs	6
6.2	Knowledge impact	3
6.2.3	Computer software spending, % GDP	2
6.2.5	High- & medium-high-tech manufactures, %	2
6.3	Knowledge diffusion	1
6.3.1	Intellectual property receipts, % total trade	7
6.3.3	ICT services exports, % total trade	1
6.3.4	FDI net outflows, % GDP, 3-year average	1
7.1	Intangible assets	8

Weaknesses		
Code	Indicator name	Rank
1.2.3	Cost of redundancy dismissal, salary weeks	56
2.1	Education	61
2.1.1	Expenditure on education, % GDP	88
2.1.2	Government funding/pupil, secondary, % GDP/cap	75
4.1.2	Domestic credit to private sector, % GDP	76
4.2.2	Market capitalization, % GDP	34
4.3.2	Intensity of local competition [†]	64
5.3.2	High-tech imports, % total trade	56
7.1.2	Industrial designs by origin/bn PPP\$ GDP	59
7.2	Creative goods & services	59
7.2.1	Cultural & creative services exports, % total trade	72
7.2.4	Printing & other media, % manufacturing	94

STRENGTHS

- GII strengths for Ireland are found in five of the seven GII pillars.
- Pillars Infrastructure (5) and Knowledge & technology outputs (6) are notable strengths for Ireland.
- Several of Ireland's strengths are in Knowledge & technology outputs (6). Here sub-pillars Knowledge impact (3) and Knowledge diffusion (1) are both GII strengths. Some of their indicators are also relative strengths for this country: Computer software spending (2), High- & medium-high-tech manufactures (2), Intellectual property receipts (7), ICT services exports, and FDI outflows. In the latter two, Ireland ranks first in the world.
- In Infrastructure (5), GII strengths are sub-pillar Ecological sustainability (4) and two of its three indicators - GDP per unit of energy use (3) and Environmental performance (9).
- Another GII pillar where Ireland presents a high number of strengths is Business sophistication (13). Here sub-pillar Knowledge absorption (5) is a GII strength. At the indicator level, strengths are Females employed with advanced degrees (9), FDI inflows (4), and Intellectual property payments – where Ireland places 1st worldwide.
- Other GII strengths for Ireland are indicator School life expectancy (9) in Human capital & research (22) and sub-pillar Intangible assets (8) in Creative outputs (19).

WEAKNESSES

- Ireland's weaknesses in the GII are found in five of the seven GII pillars.
- In Human capital & research (22), Ireland's weaknesses are sub-pillar Education (61) and two of its five indicators: Expenditure on education (88) and Government funding per pupil (75).
- In Market sophistication (39), Ireland shows weaknesses in three indicators: Domestic credit to private sector (76), Market capitalization (34), and Intensity of local competition (64).
- In Creative outputs (19), Ireland's weaknesses are sub-pillar Creative goods & services (59) and indicators Industrial designs by origin (59), Cultural & creative services exports (72), and Printing & other media (94).
- The last two weaknesses in the Irish innovation profile are found in indicators Cost of redundancy dismissal (56) in Institutions (18) and High-tech imports (56) in Business sophistication (13).

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$	GDP per capita, PPP\$	GII 2018 rank
10	20	High	EUR	4.8	378.5	78,784.8	10
				Score/Value	Rank		
INSTITUTIONS				85.5	18		
1.1	Political environment		81.7	18			
1.1.1	Political and operational stability*.....		89.5	15			
1.1.2	Government effectiveness*.....		77.8	23			
1.2	Regulatory environment		87.3	19			
1.2.1	Regulatory quality*.....		84.5	17			
1.2.2	Rule of law*.....		84.2	20			
1.2.3	Cost of redundancy dismissal, salary weeks.....		14.3	56 ○			
1.3	Business environment		87.5	12			
1.3.1	Ease of starting a business*.....		95.9	10			
1.3.2	Ease of resolving insolvency*.....		79.1	17			
HUMAN CAPITAL & RESEARCH				48.4	22		
2.1	Education		49.7	61 ○ ◇			
2.1.1	Expenditure on education, % GDP.....		3.8	88 ○ ◇			
2.1.2	Government funding/pupil, secondary, % GDP/cap... ..		16.5	75 ○ ◇			
2.1.3	School life expectancy, years.....		18.8	9 ●			
2.1.4	PISA scales in reading, maths, & science.....		509.0	10			
2.1.5	Pupil-teacher ratio, secondary.....		n/a	n/a			
2.2	Tertiary education		45.4	23			
2.2.1	Tertiary enrolment, % gross.....		77.6	21			
2.2.2	Graduates in science & engineering, %.....		25.2	29			
2.2.3	Tertiary inbound mobility, %.....		8.2	26			
2.3	Research & development (R&D)		50.0	20			
2.3.1	Researchers, FTE/mn pop.....		4,288.6	21			
2.3.2	Gross expenditure on R&D, % GDP.....		1.0	34 ◇			
2.3.3	Global R&D companies, avg. exp. top 3, mn US\$.....		78.4	12			
2.3.4	QS university ranking, average score top 3*.....		47.0	22			
INFRASTRUCTURE				66.3	5 ● ◇		
3.1	Information & communication technologies (ICTs)		83.8	23			
3.1.1	ICT access*.....		81.3	22			
3.1.2	ICT use*.....		77.9	20			
3.1.3	Government's online service*.....		82.6	39 ◇			
3.1.4	E-participation*.....		93.3	22			
3.2	General infrastructure		45.7	32			
3.2.1	Electricity output, kWh/mn pop.....		6,394.0	32			
3.2.2	Logistics performance*.....		67.7	28 ◇			
3.2.3	Gross capital formation, % GDP.....		27.1	34			
3.3	Ecological sustainability		69.6	4 ● ◇			
3.3.1	GDP/unit of energy use.....		23.3	3 ● ◇			
3.3.2	Environmental performance*.....		78.8	9 ●			
3.3.3	ISO 14001 environmental certificates/bn PPP\$ GDP..		2.8	34			
MARKET SOPHISTICATION				54.6	39		
4.1	Credit		44.8	44 ◇			
4.1.1	Ease of getting credit*.....		70.0	40			
4.1.2	Domestic credit to private sector, % GDP.....		44.4	76 ○ ◇			
4.1.3	Microfinance gross loans, % GDP.....		n/a	n/a			
4.2	Investment		50.1	38			
4.2.1	Ease of protecting minority investors*.....		75.0	14			
4.2.2	Market capitalization, % GDP.....		42.4	34 ○ ◇			
4.2.3	Venture capital deals/bn PPP\$ GDP.....		0.1	14			
4.3	Trade, competition, & market scale		69.0	37			
4.3.1	Applied tariff rate, weighted avg., %.....		1.8	23			
4.3.2	Intensity of local competition*.....		69.4	64 ○ ◇			
4.3.3	Domestic market scale, bn PPP\$.....		378.5	48			
BUSINESS SOPHISTICATION				55.8	13		
5.1	Knowledge workers		62.1	22			
5.1.1	Knowledge-intensive employment, %.....		42.5	21			
5.1.2	Firms offering formal training, % firms.....		n/a	n/a			
5.1.3	GERD performed by business, % GDP.....		0.7	27 ◇			
5.1.4	GERD financed by business, %.....		49.0	30			
5.1.5	Females employed w/advanced degrees, %.....		25.6	9 ● ◇			
5.2	Innovation linkages		46.2	17			
5.2.1	University/industry research collaboration*.....		69.9	11			
5.2.2	State of cluster development*.....		60.8	23			
5.2.3	GERD financed by abroad, %.....		23.6	16 ◇			
5.2.4	JV-strategic alliance deals/bn PPP\$ GDP.....		0.1	18			
5.2.5	Patent families 2+ offices/bn PPP\$ GDP.....		1.8	22			
5.3	Knowledge absorption		59.1	5 ●			
5.3.1	Intellectual property payments, % total trade.....		22.2	1 ● ◇			
5.3.2	High-tech imports, % total trade.....		8.1	56 ○			
5.3.3	ICT services imports, % total trade.....		1.5	46			
5.3.4	FDI net inflows, % GDP.....		35.3	4 ● ◇			
5.3.5	Research talent, % in business enterprise.....		53.3	22			
KNOWLEDGE & TECHNOLOGY OUTPUTS				56.9	6 ●		
6.1	Knowledge creation		28.7	31 ◇			
6.1.1	Patents by origin/bn PPP\$ GDP.....		2.2	39 ◇			
6.1.2	PCT patents by origin/bn PPP\$ GDP.....		1.6	22			
6.1.3	Utility models by origin/bn PPP\$ GDP.....		n/a	n/a			
6.1.4	Scientific & technical articles/bn PPP\$ GDP.....		13.2	39 ◇			
6.1.5	Citable documents H-index.....		33.2	28			
6.2	Knowledge impact		58.6	3 ● ◇			
6.2.1	Growth rate of PPP\$ GDP/worker, %.....		2.8	28 ◇			
6.2.2	New businesses/th pop. 15-64.....		6.7	21			
6.2.3	Computer software spending, % GDP.....		0.8	2 ● ◇			
6.2.4	ISO 9001 quality certificates/bn PPP\$ GDP.....		7.3	44			
6.2.5	High- & medium-high-tech manufactures, %.....		0.7	2 ● ◇			
6.3	Knowledge diffusion		83.4	1 ● ◇			
6.3.1	Intellectual property receipts, % total trade.....		2.8	7 ●			
6.3.2	High-tech net exports, % total trade.....		9.9	16			
6.3.3	ICT services exports, % total trade.....		22.7	1 ● ◇			
6.3.4	FDI net outflows, % GDP.....		28.7	1 ● ◇			
CREATIVE OUTPUTS				43.3	19		
7.1	Intangible assets		60.5	8 ●			
7.1.1	Trademarks by origin/bn PPP\$ GDP.....		n/a	n/a			
7.1.2	Industrial designs by origin/bn PPP\$ GDP.....		1.4	59 ○			
7.1.3	ICTs & business model creation*.....		76.5	14			
7.1.4	ICTs & organizational model creation*.....		70.8	20			
7.2	Creative goods & services		18.4	59 ○ ◇			
7.2.1	Cultural & creative services exports, % total trade.....		0.2	72 ○ ◇			
7.2.2	National feature films/mn pop. 15-69.....		8.9	21			
7.2.3	Entertainment & Media market/th pop. 15-69.....		49.6	18			
7.2.4	Printing & other media, % manufacturing.....		0.5	94 ○ ◇			
7.2.5	Creative goods exports, % total trade.....		1.3	40			
7.3	Online creativity		33.7	24			
7.3.1	Generic top-level domains (TLDs)/th pop. 15-69.....		61.0	11			
7.3.2	Country-code TLDs/th pop. 15-69.....		22.1	26			
7.3.3	Wikipedia edits/mn pop. 15-69.....		49.5	24			
7.3.4	Mobile app creation/bn PPP\$ GDP.....		18.3	25			

NOTES: ● indicates a strength; ○ a weakness; ◇ a strength relative to the other top 25-ranked GII economies; ◇ a weakness relative to the other top 25-ranked GII economies; * an index; † a survey question. Ⓞ indicates that the economy's data are older than the base year; see Appendix II for details, including the year of the data, at <http://globalinnovationindex.org>. Square brackets [] indicate that the data minimum coverage (DMC) requirements were not met at the sub-pillar or pillar level.

DATA AVAILABILITY

The following tables list data that are missing or are outdated for Ireland.

Missing data

Code	Indicator name	Country year	Model year	Source
2.1.5	Pupil-teacher ratio, secondary	n/a	2017	UNESCO Institute for Statistics
4.1.3	Microfinance gross loans, % GDP	n/a	2017	Microfinance Information Exchange
5.1.2	Firms offering formal training, % firms	n/a	2013	World Bank
6.1.3	Utility models by origin/bn PPP\$ GDP	n/a	2017	World Intellectual Property Organization
7.1.1	Trademarks by origin/bn PPP\$ GDP	n/a	2017	World Intellectual Property Organization

Outdated data

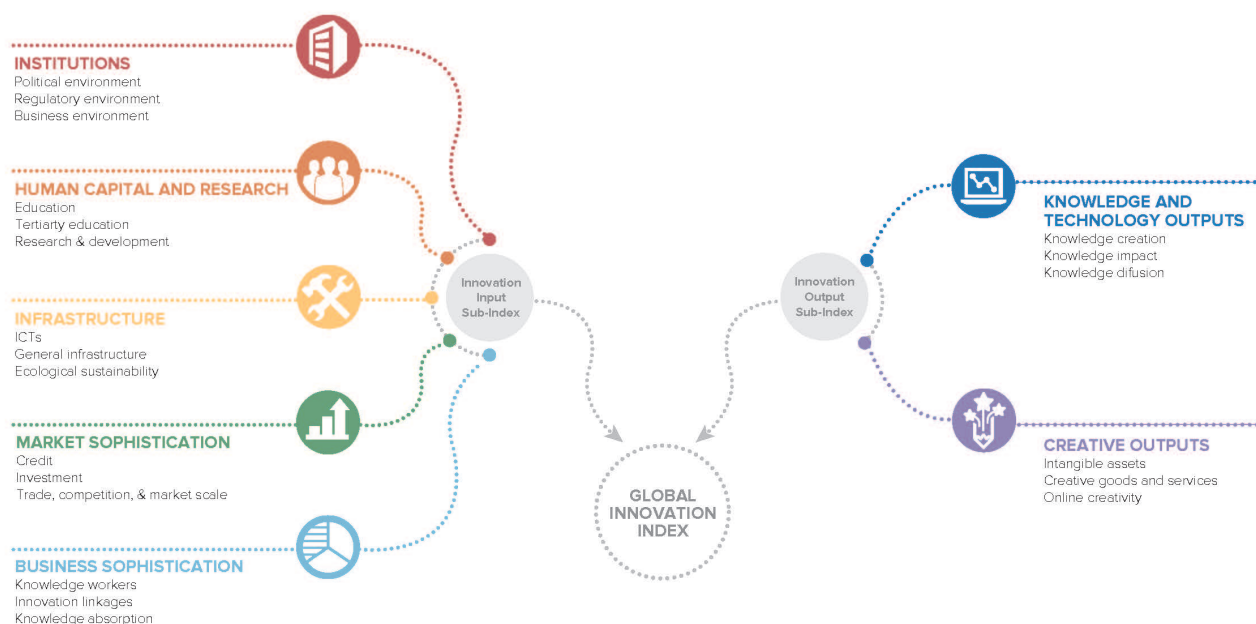
Code	Indicator name	Country year	Model year	Source
2.2.1	Tertiary enrolment, % gross	2016	2017	UNESCO Institute for Statistics
6.2.5	High- & medium-high-tech manufactures, %	2014	2016	United Nations Industrial Development Organization
7.2.2	National feature films/mn pop. 15–69	2016	2017	UNESCO Institute for Statistics

ABOUT THE GLOBAL INNOVATION INDEX

The Global Innovation Index (GII) is co-published by Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO), a specialized agency of the United Nations. In 2019, the GII presents its 12th edition devoted to the theme **Creating Healthy Lives—The Future of Medical Innovation**.

Recognizing that innovation is a key driver of economic development, the GII aims to provide a rich innovation ranking and 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 countries that incorporate the GII into their innovation agendas.

Framework of the Global Innovation Index 2019



The Index is a ranking of the innovation capabilities and results of world economies. It measures innovation based on criteria that includes 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 containing three sub-pillars.

