GLOBAL INNOVATION INDEX 2020

IRELAND

15th Ireland ranks 15th among the 131 economies featured in the GII 2020.

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 2020 is between ranks 14 and 17.

Rankings of Ireland (2018–2020)

	GII	Innovation inputs	Innovation outputs
2020	15	20	11
2019	12	20	10
2018	10	18	9

- Ireland performs better in innovation outputs than innovation inputs in 2020.
- This year Ireland ranks 20th in innovation inputs, the same as last year and lower compared to 2018.
- As for innovation outputs, Ireland ranks 11th. This position is lower than last year and lower compared to 2018.

**14th** Ireland ranks 14th among the 49 high-income group economies.

9th Ireland ranks 9th 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 is performing above expectations for its level of development.

The positive relationship between innovation and development

Legend:
- ▲ GII score
- ▶ GDP per capita in PPP$ logarithmic scale
- ● Bubbles sized by population
- ● Innovation leaders
- ● Performing above expectations for level of development
- ● Performing at expectations for level of development
- ● Performing below expectations for level of development
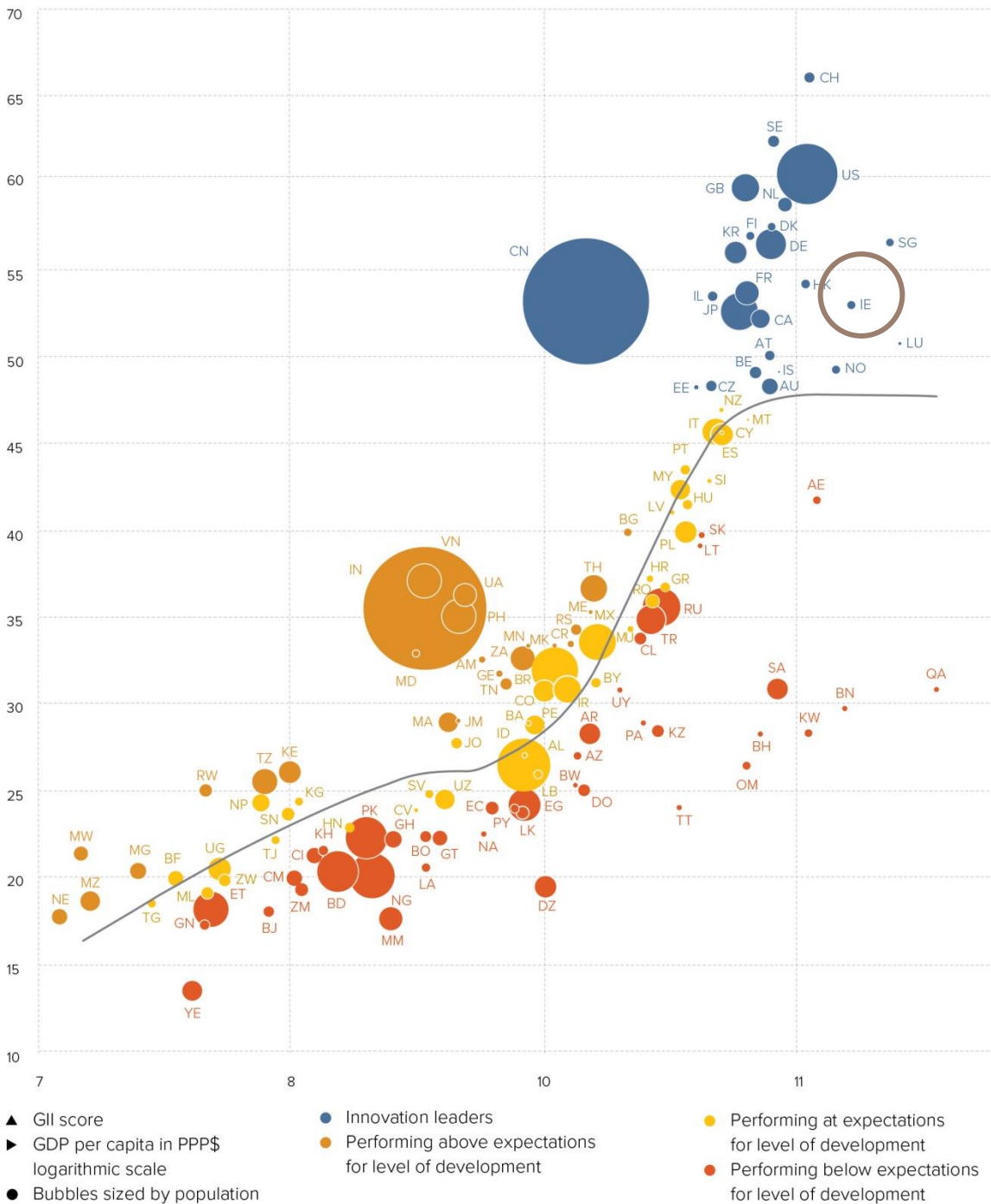
EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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, 2020
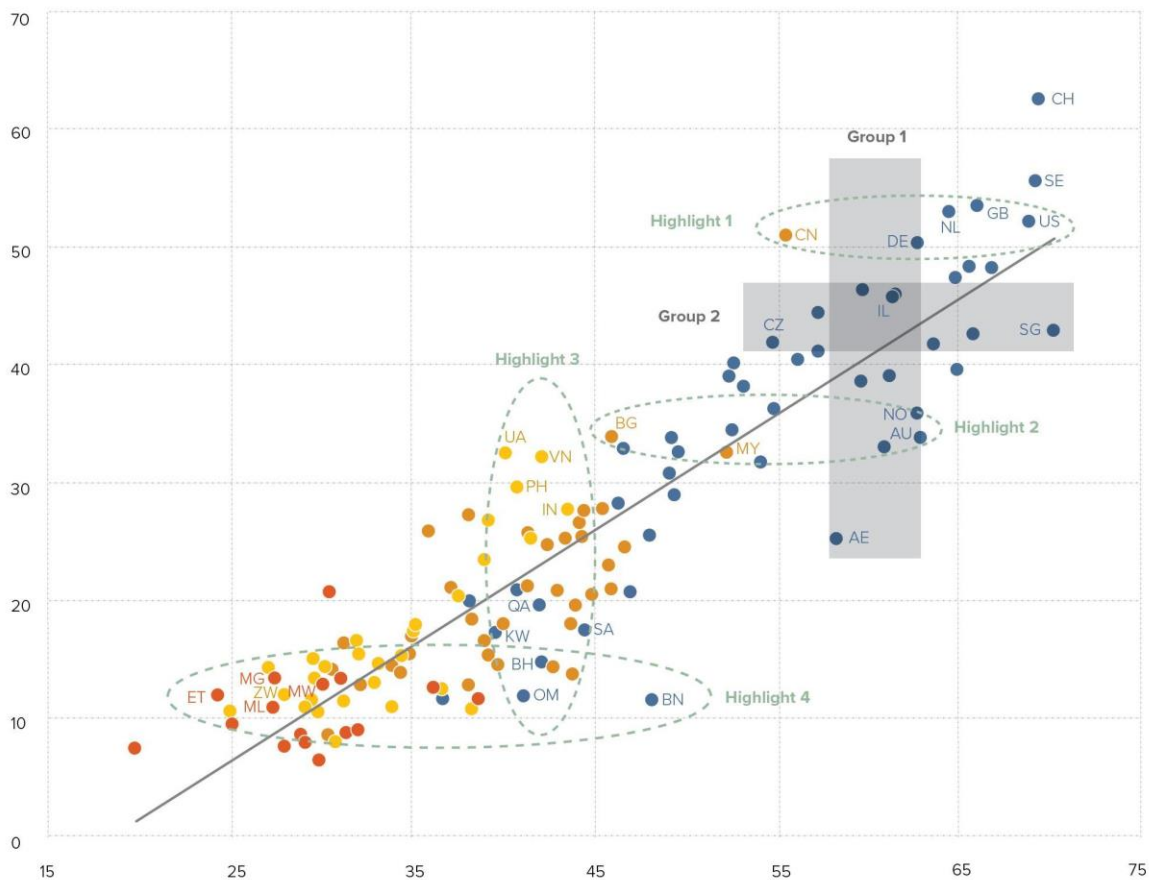
| ▲ | Output score | ● | High income group | ● | Lower middle-income group | — | Fitted values |
| ▶ | Input score | ● | Upper middle-income group | ● | Low income group | | |

AU	Australia	IN	India	NL	Netherlands	CH	Switzerland
BH	Bahrain	IL	Israel	NO	Norway	UA	Ukraine
BN	Brunei Darussalam	KW	Kuwait	OM	Oman	AE	United Arab Emirates
BG	Bulgaria	MG	Madagascar	PH	Philippines	GB	United Kingdom
CN	China	MW	Malawi	QA	Qatar	US	United States of America
CZ	Czech Republic	ML	Mali	SA	Saudi Arabia	VN	Viet Nam
ET	Ethiopia	MY	Malaysia	SG	Singapore	ZW	Zimbabwe
DE	Germany			SE	Sweden		

BENCHMARKING IRELAND AGAINST OTHER HIGH-INCOME GROUP ECONOMIES AND EUROPE

Ireland's scores in the seven GII pillars
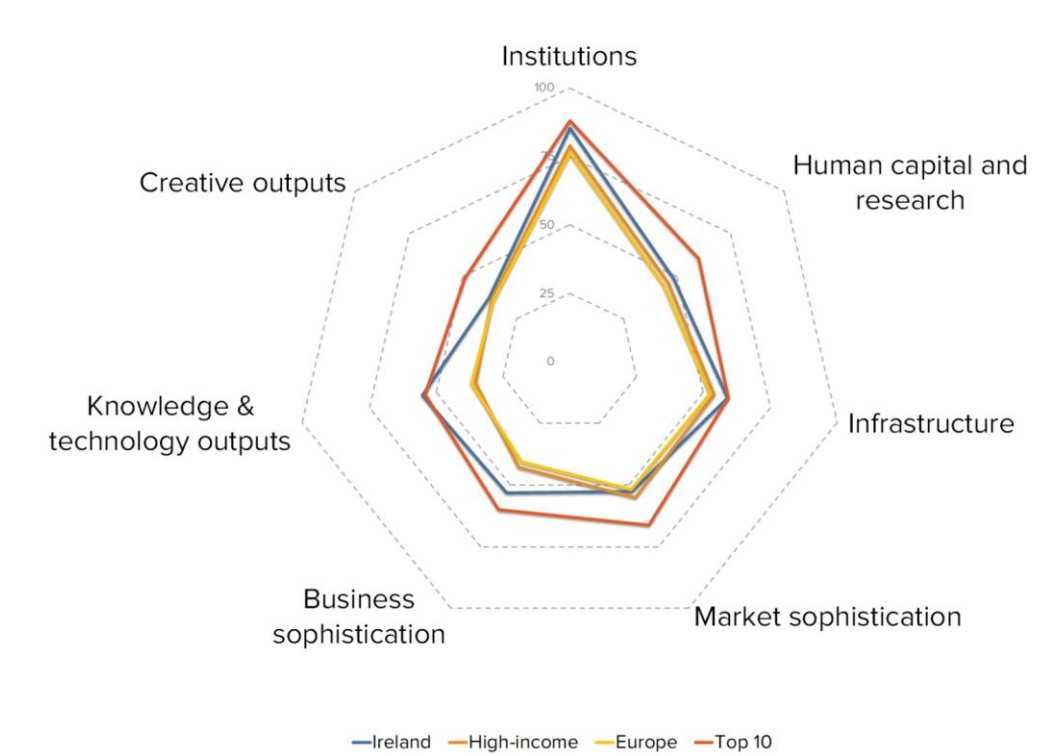
High-income group economies

Ireland has high scores in six out of the seven GII pillars: Institutions, Human capital & research, Infrastructure, Business sophistication, Knowledge & technology outputs and Creative outputs, which above average for the high-income group.

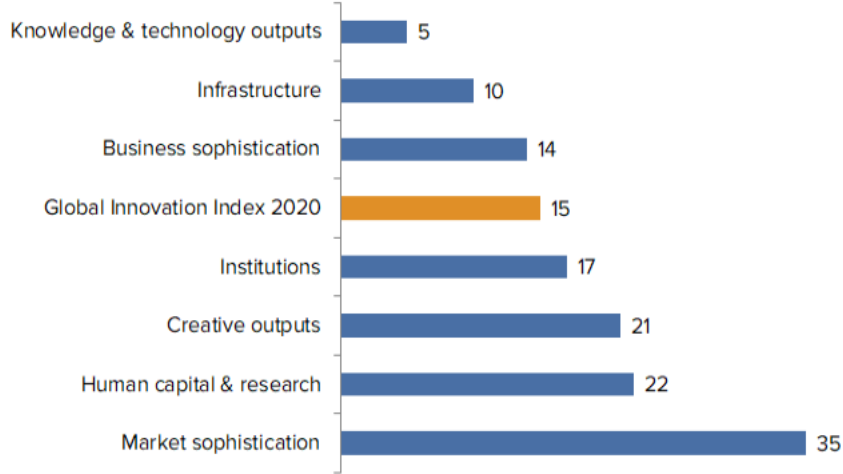Conversely, Ireland scores below average for its income group on one pillar: Market sophistication.

Europe

Compared to other economies in Europe, Ireland performs:

- above average in all seven GII pillars: Institutions, Human capital & research, Infrastructure, Market sophistication, Business sophistication, Knowledge & technology outputs and Creative outputs.

OVERVIEW OF IRELAND RANKINGS IN THE SEVEN GII AREAS

Ireland performs best in Knowledge & technology outputs and its weakest performance is in Market sophistication.

Knowledge & technology outputs	5
Infrastructure	10
Business sophistication	14
Global Innovation Index 2020	15
Institutions	17
Creative outputs	21
Human capital & research	22
Market sophistication	35

*The highest possible ranking in each pillar is 1.

INNOVATION STRENGTHS AND WEAKNESSES

The table below gives an overview of the strengths and weaknesses of Ireland in the GII 2020.

Strengths			**Weaknesses**		
Code	**Indicator name**	**Rank**	**Code**	**Indicator name**	**Rank**
2.1.3	School life expectancy, years	9	2.1	Education	67
3.3	Ecological sustainability	5	2.1.1	Expenditure on education, % GDP	84
3.3.1	GDP/unit of energy use	2	2.1.2	Government funding/pupil, secondary, % GDP/cap	73
5.1.5	Females employed w/advanced degrees, %	8	3.2.3	Gross capital formation, % GDP	58
5.3	Knowledge absorption	3	4.1.2	Domestic credit to private sector, % GDP	79
5.3.1	Intellectual property payments, % total trade	1	4.2.2	Market capitalization, % GDP	40
5.3.4	FDI net inflows, % GDP	6	4.3.2	Intensity of local competition[†]	64
6	Knowledge & technology outputs	5	6.1.3	Utility models by origin/bn PPP$ GDP	40
6.2	Knowledge impact	1	7.1.3	Industrial designs by origin/bn PPP$ GDP	58
6.2.3	Computer software spending, % GDP	2	7.2.1	Cultural & creative services exports, % total trade	79
6.2.5	High- & medium-high-tech manufacturing, %	2	7.2.4	Printing & other media, % manufacturing	88
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	1			

STRENGTHS

GII strengths for Ireland are found in four of the seven GII pillars.

- Human capital & research (22): the indicator School life expectancy (9) is a strength.

- Infrastructure (10): demonstrates strengths in the sub-pillar Ecological sustainability (5) and in the indicator GDP per unit of energy use (2).

- Business sophistication (14): displays strengths in the sub-pillar Knowledge absorption (3) and in the indicators Females employed with advanced degrees (8), Intellectual property payments (1) and FDI net inflows (6).

- Knowledge & technology outputs (5): reveals strengths in the sub-pillars Knowledge impact (1) and Knowledge diffusion (1), and in the indicators Computer software spending (2), High- & medium-high-tech manufacturing (2), Intellectual property receipts (7), ICT services exports (1) and FDI net outflows (1).

WEAKNESSES

GII weaknesses for Ireland are found in five of the seven GII pillars.

- Human capital & research (22): has weaknesses in the sub-pillar Education (67) and in the indicators Expenditure on education (84) and Government funding per pupil (73).

- Infrastructure (10): the indicator Gross capital formation (58) is a weakness.

- Market sophistication (35): shows weaknesses in the indicators Domestic credit to private sector (79), Market capitalization (40) and Intensity of local competition (64).

- Knowledge & technology outputs (5): the indicator Utility models by origin (40) is a weakness.

- Creative outputs (21): has weaknesses in the indicators Industrial designs by origin (58), Cultural & creative services exports (79) and Printing and other media (88).

IRELAND

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$	GDP per capita, PPP$	GII 2019 rank
11	20	High	EUR	4.9	412.8	72,810.0	12

		Score/Value	Rank	
🏛	**INSTITUTIONS**........................	**85.3**	**17**	
1.1	**Political environment**............................	83.2	19	
1.1.1	Political and operational stability*...........................	85.7	17	
1.1.2	Government effectiveness*................................	81.9	20	
1.2	**Regulatory environment**........................	85.9	17	
1.2.1	Regulatory quality*..................................	83.9	15	
1.2.2	Rule of law*.......................................	84.8	18	
1.2.3	Cost of redundancy dismissal, salary weeks...........	14.3	54	
1.3	**Business environment**........................	86.8	13	
1.3.1	Ease of starting a business*.............................	94.4	21	
1.3.2	Ease of resolving insolvency*...........................	79.2	18	

		Score/Value	Rank	
👥	**HUMAN CAPITAL & RESEARCH**..............	**48.5**	**22**	◇
2.1	**Education**..............................	45.5	67	○ ◇
2.1.1	Expenditure on education, % GDP.ⓣ............	3.7	84	○ ◇
2.1.2	Government funding/pupil, secondary, % GDP/cap..	15.8	73	○ ◇
2.1.3	School life expectancy, years.................	18.7	9	●
2.1.4	PISA scales in reading, maths, & science........	504.6	10	
2.1.5	Pupil-teacher ratio, secondary...................	n/a	n/a	
2.2	**Tertiary education**.........................	47.5	22	
2.2.1	Tertiary enrolment, % gross....................	77.8	21	
2.2.2	Graduates in science & engineering, %.ⓣ........	25.2	37	
2.2.3	Tertiary inbound mobility, %...............	8.9	23	
2.3	**Research & development (R&D)**..............	52.5	20	
2.3.1	Researchers, FTE/mn pop.....................5,243.1		14	
2.3.2	Gross expenditure on R&D, % GDP................	1.1	35	◇
2.3.3	Global R&D companies, avg. exp. top 3, mn $US.......	77.2	11	
2.3.4	QS university ranking, average score top 3*...........	47.0	23	

		Score/Value	Rank	
🛠	**INFRASTRUCTURE**..........................	**59.2**	**10**	
3.1	**Information & communication technologies (ICTs)**....	83.8	23	
3.1.1	ICT access*.........................	81.2	25	
3.1.2	ICT use*..........................	78.0	24	
3.1.3	Government's online service*..................	82.6	39	◇
3.1.4	E-participation*......................	93.3	22	
3.2	**General infrastructure**......................	34.3	34	◇
3.2.1	Electricity output, kWh/mn pop.............6,314.5		33	
3.2.2	Logistics performance*......................	67.6	28	◇
3.2.3	Gross capital formation, % GDP................	24.1	58	○
3.3	**Ecological sustainability**...................	59.6	5	● ◆
3.3.1	GDP/unit of energy use......................	25.0	2	● ◆
3.3.2	Environmental performance*.................	72.8	16	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP.......	2.5	32	

		Score/Value	Rank	
📊	**MARKET SOPHISTICATION**..................	**52.5**	**35**	◇
4.1	**Credit**...........................	43.3	58	◇
4.1.1	Ease of getting credit*.................	70.0	44	
4.1.2	Domestic credit to private sector, % GDP................	41.1	79	○ ◇
4.1.3	Microfinance gross loans, % GDP................	n/a	n/a	
4.2	**Investment**......................	45.1	33	
4.2.1	Ease of protecting minority investors*...........	80.0	13	
4.2.2	Market capitalization, % GDP.................	37.5	40	○ ◇
4.2.3	Venture capital deals/bn PPP$ GDP...................	0.2	13	
4.3	**Trade, competition, and market scale**..............	69.1	34	
4.3.1	Applied tariff rate, weighted avg., %..................	1.7	22	
4.3.2	Intensity of local competition+................	69.4	64	○ ◇
4.3.3	Domestic market scale, bn PPP$...................	412.8	46	

		Score/Value	Rank	
🍩	**BUSINESS SOPHISTICATION**................	**53.1**	**14**	
5.1	**Knowledge workers**............................	55.8	23	
5.1.1	Knowledge-intensive employment, %..................	43.4	21	
5.1.2	Firms offering formal training, %.................	n/a	n/a	
5.1.3	GERD performed by business, % GDP.....................	0.9	24	
5.1.4	GERD financed by business, %........................	52.2	24	
5.1.5	Females employed w/advanced degrees, %..........	26.3	8	●
5.2	**Innovation linkages**...........................	43.2	21	
5.2.1	University/industry research collaboration+...........	67.3	15	
5.2.2	State of cluster development+........................	58.3	28	◇
5.2.3	GERD financed by abroad, % GDP...................	0.3	9	
5.2.4	JV-strategic alliance deals/bn PPP$ GDP.................	0.1	20	
5.2.5	Patent families 2+ offices/bn PPP$ GDP...........	1.5	24	◇
5.3	**Knowledge absorption**.........................	60.3	3	● ◆
5.3.1	Intellectual property payments, % total trade..........	21.9	1	● ◆
5.3.2	High-tech imports, % total trade......................	9.2	42	
5.3.3	ICT services imports, % total trade...................	1.6	38	
5.3.4	FDI net inflows, % GDP.............................	20.2	6	● ◆
5.3.5	Research talent, % in business enterprise..............	48.3	27	

		Score/Value	Rank	
🖼	**KNOWLEDGE & TECHNOLOGY OUTPUTS**....	**55.1**	**5**	●
6.1	**Knowledge creation**............................	24.6	41	◇
6.1.1	Patents by origin/bn PPP$ GDP....................	2.3	37	◇
6.1.2	PCT patents by origin/bn PPP$ GDP..................	1.6	21	◇
6.1.3	Utility models by origin/bn PPP$ GDP.................	0.3	40	○
6.1.4	Scientific & technical articles/bn PPP$ GDP.............	13.4	41	◇
6.1.5	Citable documents H-index............................	34.3	28	
6.2	**Knowledge impact**...........................	54.3	1	● ◆
6.2.1	Growth rate of PPP$ GDP/worker, %........................	4.1	19	◆
6.2.2	New businesses/th pop. 15-64......................	7.1	23	
6.2.3	Computer software spending, % GDP..................	0.0	2	● ◆
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP.............	6.4	42	
6.2.5	High- and medium-high-tech manufacturing, %.ⓣ.....	65.3	2	● ◆
6.3	**Knowledge diffusion**.............................	86.4	1	● ◆
6.3.1	Intellectual property receipts, % total trade.............	3.1	7	● ◆
6.3.2	High-tech net exports, % total trade...................	9.3	17	
6.3.3	ICT services exports, % total trade...................	25.8	1	● ◆
6.3.4	FDI net outflows, % GDP..............................	19.9	1	● ◆

		Score/Value	Rank	
⚜	**CREATIVE OUTPUTS**........................	**37.6**	**21**	◇
7.1	**Intangible assets**..............................	39.7	27	
7.1.1	Trademarks by origin/bn PPP$ GDP..................	n/a	n/a	
7.1.2	Global brand value, top 5,000, % GDP................	70.0	27	◇
7.1.3	Industrial designs by origin/bn PPP$ GDP.............	1.3	58	○
7.1.4	ICTs & organizational model creation+......................	70.8	20	
7.2	**Creative goods and services**........................	21.2	49	◇
7.2.1	Cultural & creative services exports, % total trade.......	0.1	79	○ ◇
7.2.2	National feature films/mn pop. 15-69.ⓣ..............	8.9	23	
7.2.3	Entertainment & Media market/th pop. 15-69.........	50.7	19	
7.2.4	Printing and other media, % manufacturing............	0.5	88	○
7.2.5	Creative goods exports, % total trade.....................	1.4	37	
7.3	**Online creativity**...............................	49.9	20	
7.3.1	Generic top-level domains (TLDs)/th pop. 15-69..........	59.5	12	
7.3.2	Country-code TLDs/th pop. 15-69...................	25.7	26	
7.3.3	Wikipedia edits/mn pop. 15-69.....................	79.1	28	
7.3.4	Mobile app creation/bn PPP$ GDP...................	36.4	14	

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 either missing or outdated for Ireland.

Missing data

Code	Indicator name	Country year	Model year	Source
2.1.5	Pupil-teacher ratio, secondary	n/a	2018	UNESCO Institute for Statistics
4.1.3	Microfinance gross loans, % GDP	n/a	2018	Microfinance Information Exchange
5.1.2	Firms offering formal training, %	n/a	2018	World Bank
7.1.1	Trademarks by origin/bn PPP$ GDP	n/a	2018	World Intellectual Property Organization

Outdated data

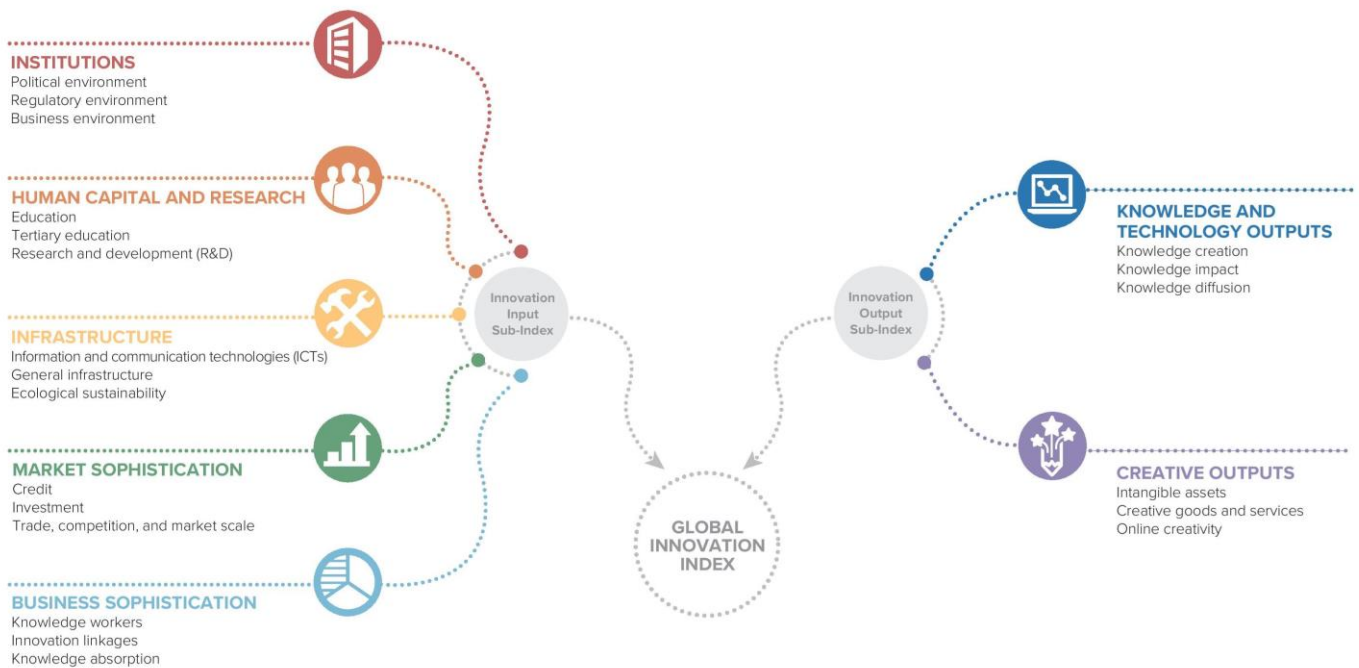| Code	Indicator name	Country year	Model year	Source
2.1.1	Expenditure on education, % GDP	2016	2018	UNESCO Institute for Statistics
2.2.2	Graduates in science & engineering, %	2016	2017	UNESCO Institute for Statistics
6.2.5	High- & medium-high-tech manufacturing, %	2014	2017	United Nations Industrial 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 2020, the GII presents its 13th edition devoted to the theme *Who Will Finance Innovation?*

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.

Framework of the Global Innovation Index 2020

INSTITUTIONS
Political environment
Regulatory environment
Business environment

HUMAN CAPITAL AND RESEARCH
Education
Tertiary education
Research and development (R&D)

INFRASTRUCTURE
Information and communication technologies (ICTs)
General infrastructure
Ecological sustainability

MARKET SOPHISTICATION
Credit
Investment
Trade, competition, and market scale

BUSINESS SOPHISTICATION
Knowledge workers
Innovation linkages
Knowledge absorption

Innovation Input Sub-Index

Innovation Output Sub-Index

KNOWLEDGE AND TECHNOLOGY OUTPUTS
Knowledge creation
Knowledge impact
Knowledge diffusion

CREATIVE OUTPUTS
Intangible assets
Creative goods and services
Online creativity

GLOBAL INNOVATION INDEX

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.