FINLAND

9th Finland ranks 9th 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 Finland 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 Finland in the GII 2022 is between ranks 7 and 10.

Rankings for Finland (2020–2022)

GIIYR	GII	Innovation inputs	Innovation outputs
2020	7	8	8
2021	7	6	9
2022	9	6	9

- Finland performs better in innovation inputs than innovation outputs in 2022.
- This year Finland ranks 6th in innovation inputs, the same as last year but higher than 2020.
- As for innovation outputs, Finland ranks 9th. This position is the same as last year but lower than 2020.

9th Finland ranks 9th among the 48 high-income group economies.

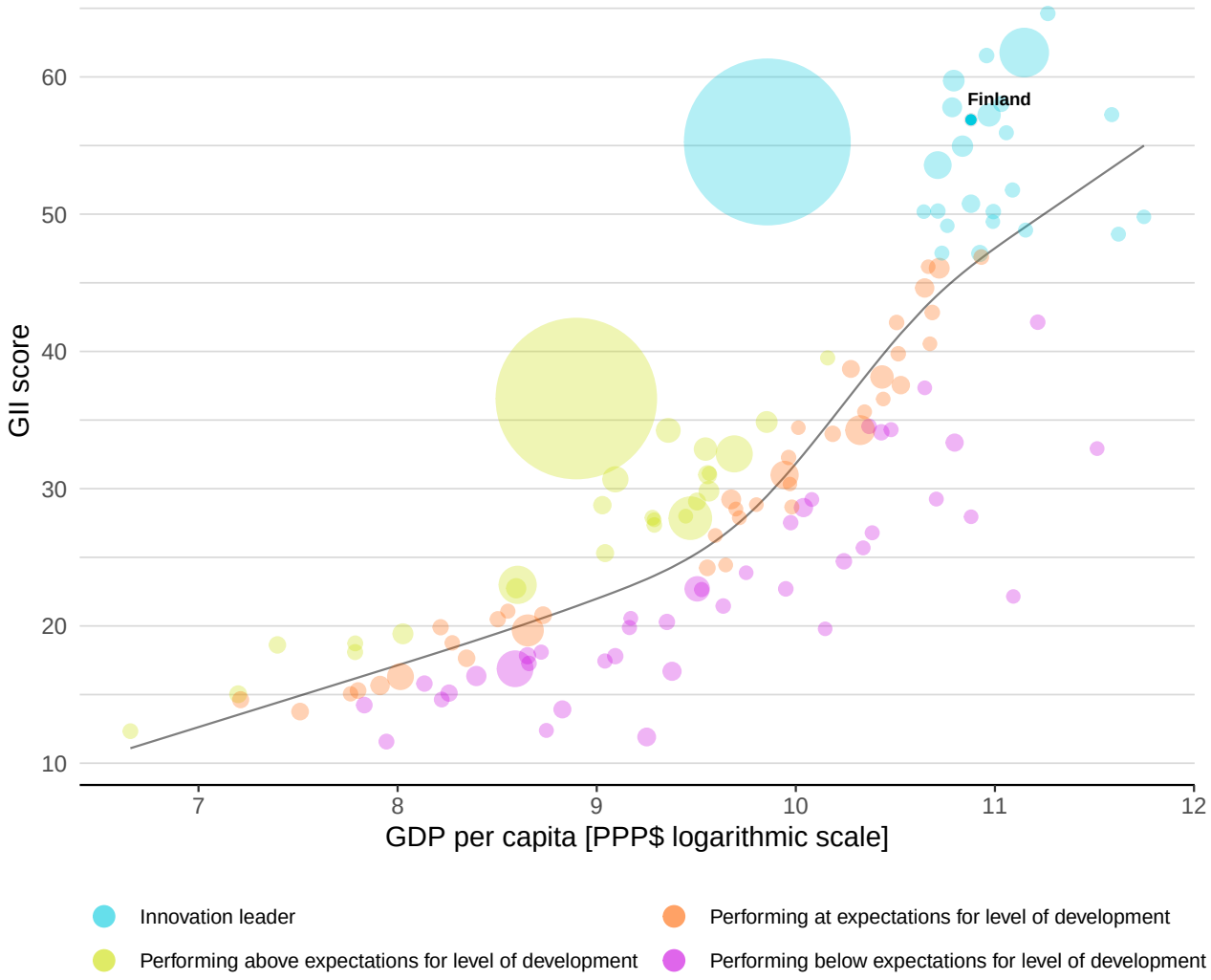
6th Finland ranks 6th among the 39 economies in Europe.

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

The positive relationship between innovation and development

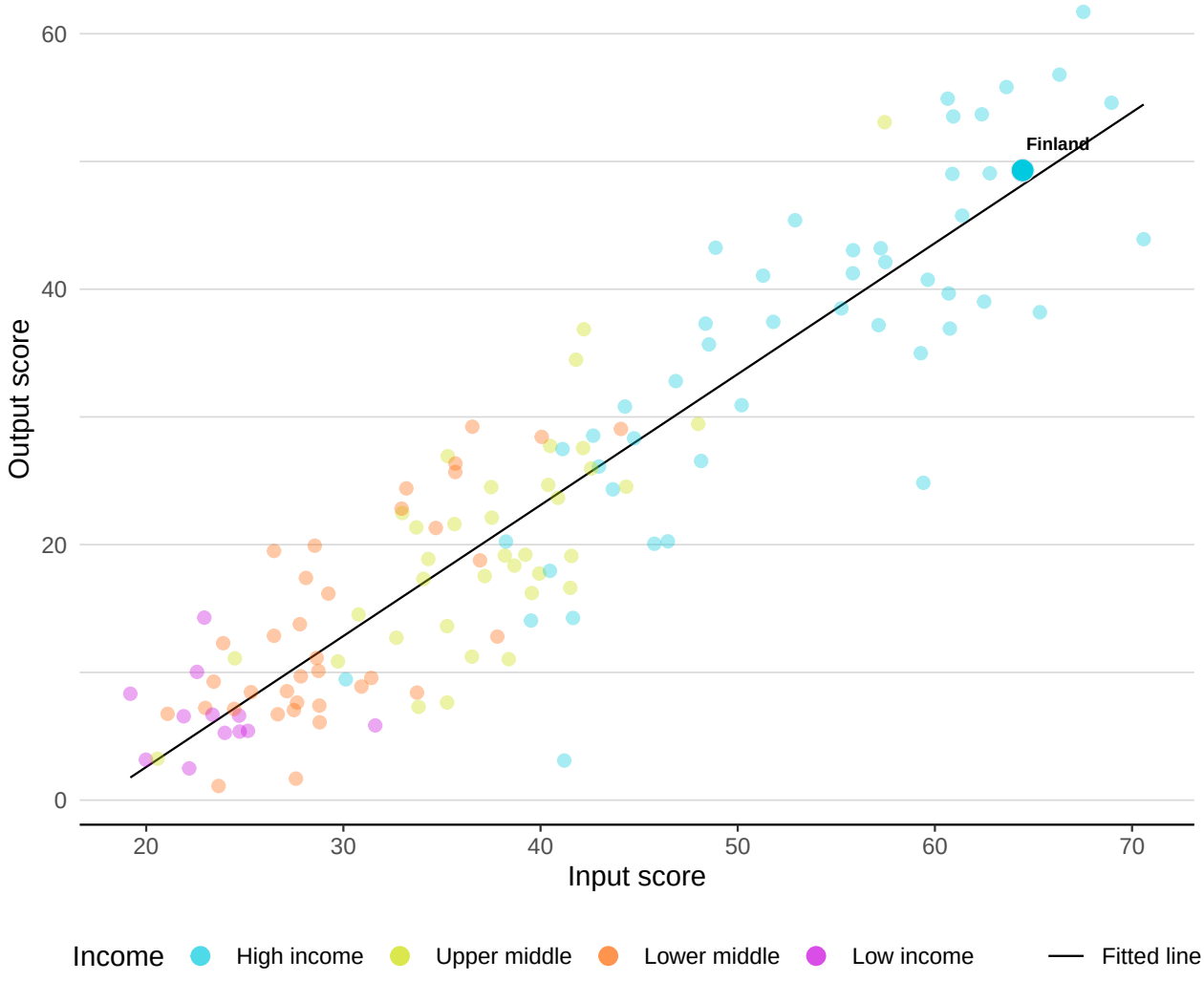


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

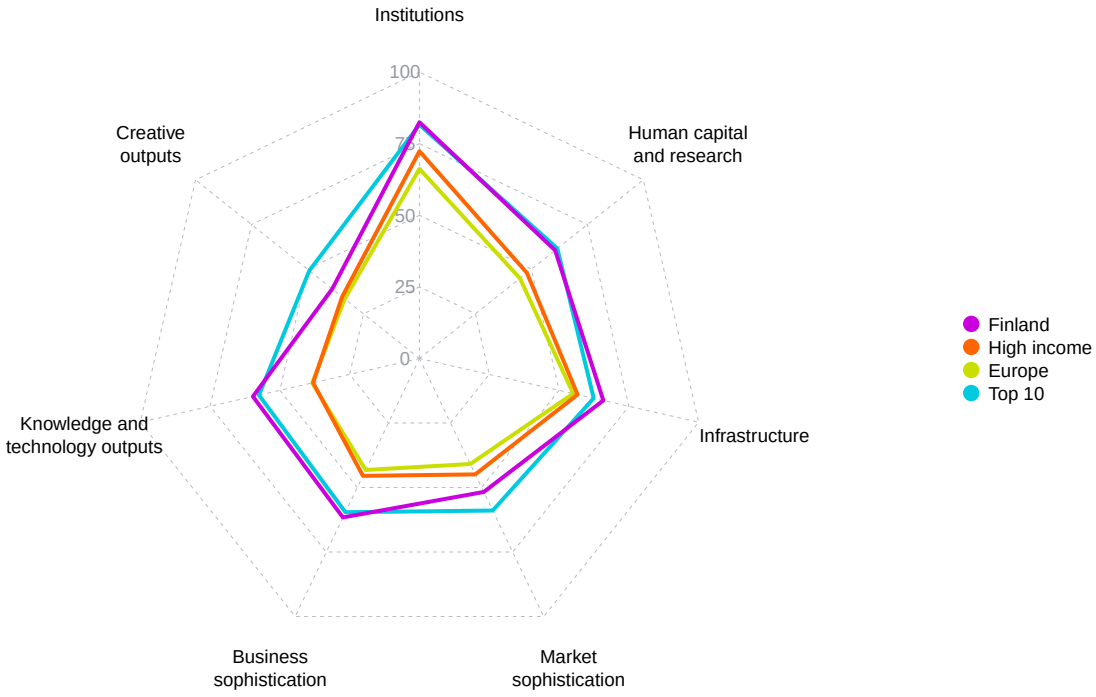
Finland produces more innovation outputs relative to its level of innovation investments.

Innovation input to output performance



BENCHMARKING AGAINST OTHER HIGH-INCOME GROUP ECONOMIES AND EUROPE

The seven GII pillar scores for Finland



High-income group economies

Finland performs above the high-income group average in all GII pillars.

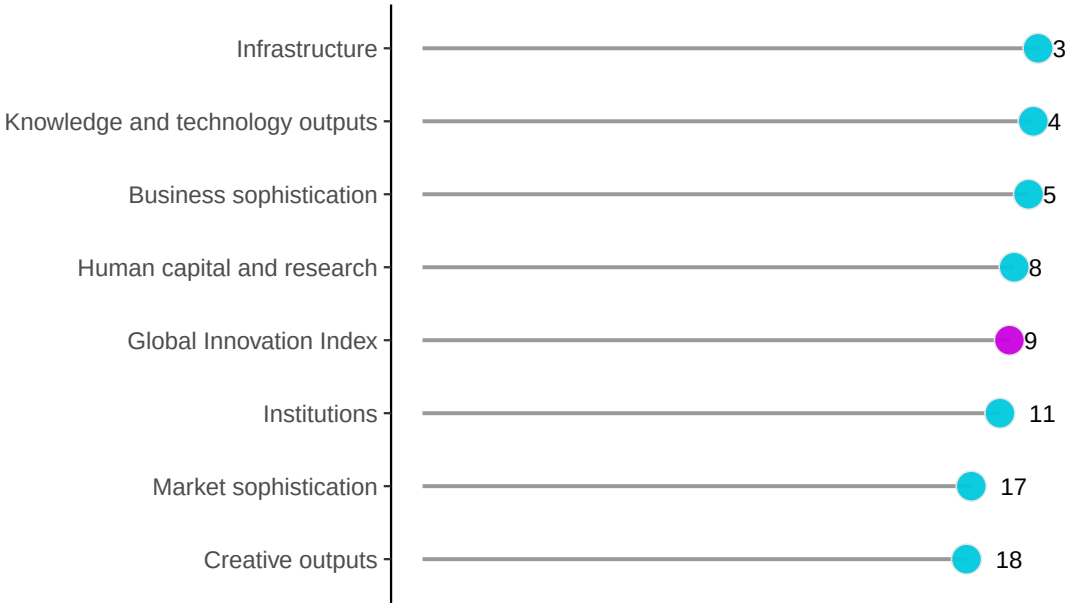
Europe

Finland performs above the regional average in all GII pillars.

OVERVIEW OF RANKINGS IN THE SEVEN GII 2022 AREAS

Finland performs best in Infrastructure and its weakest performance is in Creative outputs.

The seven GII pillar ranks for Finland



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

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

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

INNOVATION STRENGTHS AND WEAKNESSES

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

Strengths and weaknesses for Finland

Strengths			Weaknesses		
Code	**Indicator name**	**Rank**	**Code**	**Indicator name**	**Rank**
1.1.2	Government effectiveness	3	2.1.5	Pupil-teacher ratio, secondary	55
1.2.1	Regulatory quality	3	3.2.3	Gross capital formation, % GDP	59
1.2.2	Rule of law	1	3.3.1	GDP/unit of energy use	94
2.3.1	Researchers, FTE/mn pop.	4	4.3.3	Domestic market scale, bn PPP$	58
3.1.3	Government's online service	3	5.3.2	High-tech imports, % total trade	80
3.3.2	Environmental performance	3	5.3.4	FDI net inflows, % GDP	118
4.1.1	Finance for startups and scaleups	1	6.2.1	Labor productivity growth, %	84
5.2.5	Patent families/bn PPP$ GDP	5	7.2.1	Cultural and creative services exports, % total trade	49
5.3.3	ICT services imports, % total trade	1	7.2.4	Printing and other media, % manufacturing	58
6.1.2	PCT patents by origin/bn PPP$ GDP	1	7.2.5	Creative goods exports, % total trade	62
6.3.4	ICT services exports, % total trade	5			

GII 2022 rank

Finland

9

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$
9	6	High	EUR	5.5	293.6	53,084

		Score/ Value	Rank	
Institutions		**82.5**	**11**	
1.1	**Political environment**	88.6	7	
1.1.1	Political and operational stability*	85.5	10	
1.1.2	Government effectiveness*	91.7	3	● ◆
1.2	**Regulatory environment**	95.7	3	●
1.2.1	Regulatory quality*	91.2	3	●
1.2.2	Rule of law*	100.0	1	● ◆
1.2.3	Cost of redundancy dismissal	10.1	30	
1.3	**Business environment**	63.1	28	
1.3.1	Policies for doing business†	71.5	17	
1.3.2	Entrepreneurship policies and culture*	54.7	28	
Human capital and research		**60.6**	**8**	
2.1	**Education**	68.4	9	◆
2.1.1	Expenditure on education, % GDP	6.3	15	
2.1.2	Government funding/pupil, secondary, % GDP/cap	22.8	34	
2.1.3	School life expectancy, years	19.1	7	
2.1.4	PISA scales in reading, maths and science	516.4	8	
2.1.5	Pupil-teacher ratio, secondary	12.9	55	○
2.2	**Tertiary education**	48.5	15	
2.2.1	Tertiary enrolment, % gross	93.0	8	
2.2.2	Graduates in science and engineering, %	27.9	26	
2.2.3	Tertiary inbound mobility, %	8.1	32	
2.3	**Research and development (R&D)**	64.8	13	
2.3.1	Researchers, FTE/mn pop.	7,527.4	4	● ◆
2.3.2	Gross expenditure on R&D, % GDP	2.9	11	
2.3.3	Global corporate R&D investors, top 3, mn USD	74.3	11	
2.3.4	QS university ranking, top 3*	50.1	18	
Infrastructure		**65.9**	**3**	● ◆
3.1	**Information and communication technologies (ICTs)**	92.7	5	●
3.1.1	ICT access*	92.3	26	
3.1.2	ICT use*	86.2	7	
3.1.3	Government's online service*	97.1	3	● ◆
3.1.4	E-participation*	95.2	14	
3.2	**General infrastructure**	61.2	8	
3.2.1	Electricity output, GWh/mn pop.	12,468.4	10	
3.2.2	Logistics performance*	89.3	10	
3.2.3	Gross capital formation, % GDP	24.2	59	○
3.3	**Ecological sustainability**	43.7	25	
3.3.1	GDP/unit of energy use	7.9	94	○
3.3.2	Environmental performance*	76.5	3	● ◆
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	5.8	18	◆
Market sophistication		**51.7**	**17**	
4.1	**Credit**	51.6	13	
4.1.1	Finance for startups and scaleups*	65.5	1	● ◆
4.1.2	Domestic credit to private sector, % GDP	101.0	27	
4.1.3	Loans from microfinance institutions, % GDP	n/a	n/a	
4.2	**Investment**	38.5	18	
4.2.1	Market capitalization, % GDP	n/a	n/a	
4.2.2	Venture capital investors, deals/bn PPP$ GDP	0.2	21	
4.2.3	Venture capital recipients, deals/bn PPP$ GDP	0.1	10	
4.2.4	Venture capital received, value, % GDP	0.0	19	
4.3	**Trade, diversification, and market scale**	65.1	28	
4.3.1	Applied tariff rate, weighted avg., %	1.5	20	
4.3.2	Domestic industry diversification	98.3	12	
4.3.3	Domestic market scale, bn PPP$	293.6	58	○

		Score/ Value	Rank	
Business sophistication		**61.6**	**5**	●
5.1	**Knowledge workers**	65.7	13	
5.1.1	Knowledge-intensive employment, %	47.2	17	
5.1.2	Firms offering formal training, %	50.2	20	
5.1.3	GERD performed by business, % GDP	2.0	10	
5.1.4	GERD financed by business, %	54.3	22	
5.1.5	Females employed w/advanced degrees, %	26.4	15	
5.2	**Innovation linkages**	66.4	3	● ◆
5.2.1	University-industry R&D collaboration†	67.0	11	
5.2.2	State of cluster development and depth†	61.2	24	
5.2.3	GERD financed by abroad, % GDP	0.4	6	◆
5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP	0.2	12	
5.2.5	Patent families/bn PPP$ GDP	6.0	5	●
5.3	**Knowledge absorption**	52.7	9	
5.3.1	Intellectual property payments, % total trade	1.0	36	
5.3.2	High-tech imports, % total trade	7.5	80	○
5.3.3	ICT services imports, % total trade	5.5	1	● ◆
5.3.4	FDI net inflows, % GDP	0.4	118	○
5.3.5	Research talent, % in businesses	59.1	13	
Knowledge and technology outputs		**59.6**	**4**	● ◆
6.1	**Knowledge creation**	68.7	5	●
6.1.1	Patents by origin/bn PPP$ GDP	12.7	7	◆
6.1.2	PCT patents by origin/bn PPP$ GDP	6.5	1	● ◆
6.1.3	Utility models by origin/bn PPP$ GDP	1.1	20	
6.1.4	Scientific and technical articles/bn PPP$ GDP	55.5	8	
6.1.5	Citable documents H-index	42.6	19	
6.2	**Knowledge impact**	40.3	22	
6.2.1	Labor productivity growth, %	0.2	84	○
6.2.2	New businesses/th pop. 15–64	5.9	26	
6.2.3	Software spending, % GDP	0.5	19	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	10.5	28	
6.2.5	High-tech manufacturing, %	44.6	19	
6.3	**Knowledge diffusion**	70.0	2	● ◆
6.3.1	Intellectual property receipts, % total trade	3.2	8	
6.3.2	Production and export complexity	76.3	13	
6.3.3	High-tech exports, % total trade	4.6	38	
6.3.4	ICT services exports, % total trade	13.1	5	● ◆
Creative outputs		**39.0**	**18**	
7.1	**Intangible assets**	46.0	26	
7.1.1	Intangible asset intensity, top 15, %	71.2	18	
7.1.2	Trademarks by origin/bn PPP$ GDP	43.1	54	
7.1.3	Global brand value, top 5,000, % GDP	112.8	16	
7.1.4	Industrial designs by origin/bn PPP$ GDP	4.4	28	
7.2	**Creative goods and services**	27.0	40	◇
7.2.1	Cultural and creative services exports, % total trade	0.6	49	○
7.2.2	National feature films/mn pop. 15–69	8.5	7	
7.2.3	Entertainment and media market/th pop. 15–69	56.5	10	
7.2.4	Printing and other media, % manufacturing	0.9	58	○
7.2.5	Creative goods exports, % total trade	0.5	62	○
7.3	**Online creativity**	36.8	18	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	29.7	21	
7.3.2	Country-code TLDs/th pop. 15–69	40.2	18	
7.3.3	GitHub commit pushes received/mn pop. 15–69	48.2	11	
7.3.4	Mobile app creation/bn PPP$ GDP	28.9	9	

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 Finland.

Missing data for Finland

Code	Indicator name	Economy year	Model year	Source
4.1.3	Loans from microfinance institutions, % GDP	n/a	2020	International Monetary Fund, Financial Access Survey (FAS)
4.2.1	Market capitalization, % GDP	n/a	2020	World Federation of Exchanges

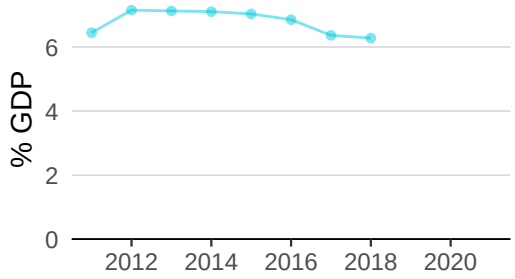
Outdated data for Finland

Code	Indicator name	Economy year	Model year	Source
2.1.1	Expenditure on education, % GDP	2018	2020	UNESCO Institute for Statistics

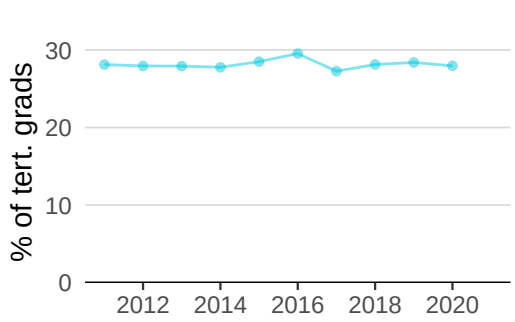
FINLAND'S INNOVATION SYSTEM

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

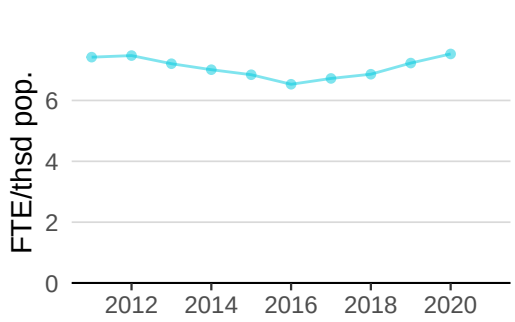
Innovation inputs



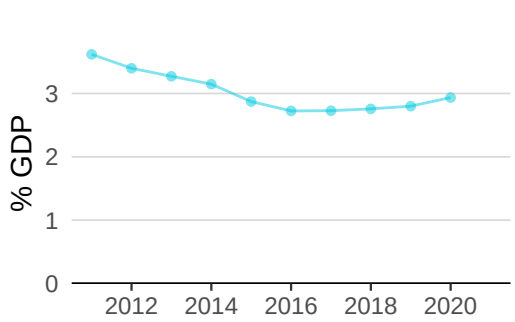
2.1.1 Expenditure on education was equal to 6.3% GDP in 2018–down by 1 percentage point from the year prior–and equivalent to an indicator rank of 15.



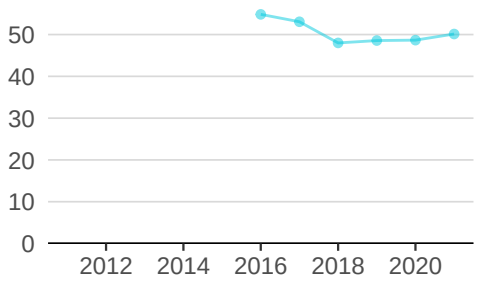
2.2.2 Graduates in science and engineering was equal to 27.9% of tert. grads in 2020–down by 2 percentage points from the year prior–and equivalent to an indicator rank of 26.



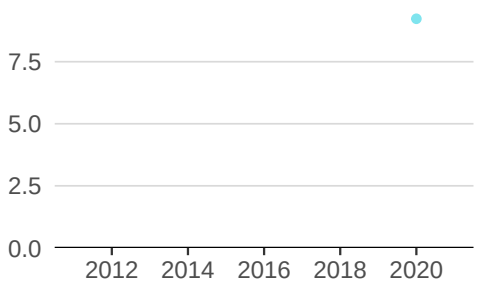
2.3.1 Researchers was equal to 7.5 FTE/thsd pop. in 2020–up by 4 percentage points from the year prior–and equivalent to an indicator rank of 4.



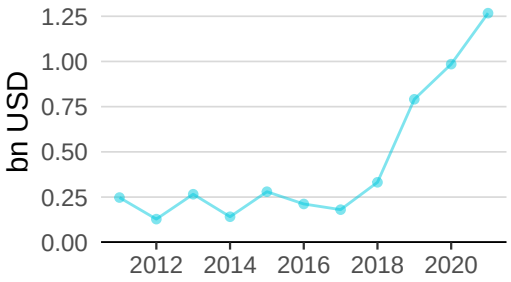
2.3.2 Gross expenditure on R&D was equal to 2.9% GDP in 2020–up by 5 percentage points from the year prior–and equivalent to an indicator rank of 11.



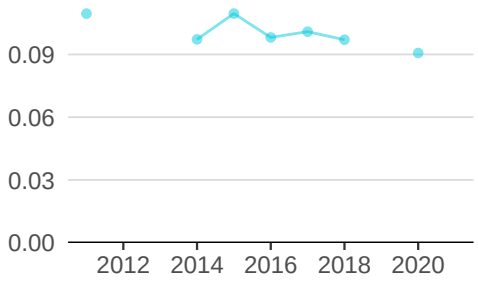
2.3.4 QS university ranking was equal to 50.1 in 2021–up by 3 percentage points from the year prior–and equivalent to an indicator rank of 18.



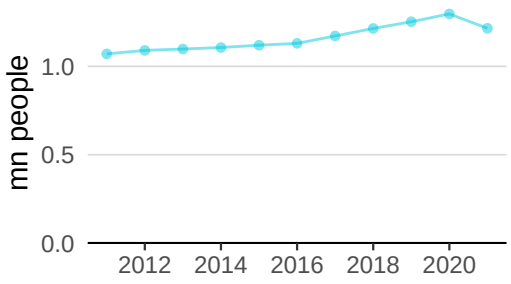
3.1.1 ICT access was equal to 9.2 in 2020 and equivalent to an indicator rank of 26.



4.2.4 Venture capital received was equal to 1.3 bn USD in 2021–up by 29 percentage points from the year prior–and equivalent to an indicator rank of 19.

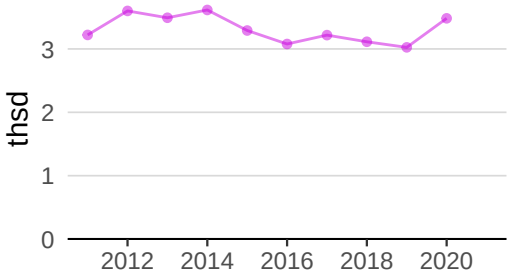


4.3.2 Domestic industry diversification was equal to 0.1 in 2020 and equivalent to an indicator rank of 12.

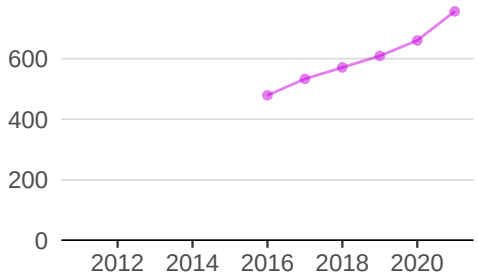


5.1.1 Knowledge-intensive employment was equal to 1.2 mn people in 2021–down by 6 percentage points from the year prior–and equivalent to an indicator rank of 17.

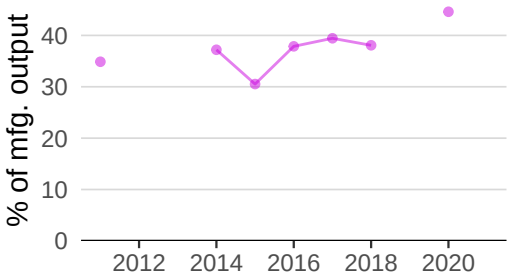
Innovation outputs



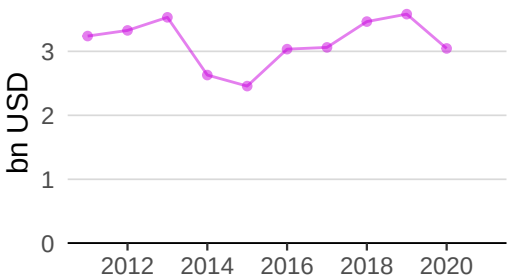
6.1.1 Patents by origin was equal to 3.5 thsd in 2020–up by 15 percentage points from the year prior–and equivalent to an indicator rank of 7.



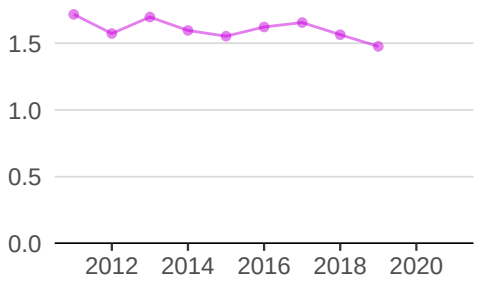
6.1.5 Citable documents H-index was equal to 756.0 in 2021–up by 15 percentage points from the year prior–and equivalent to an indicator rank of 19.



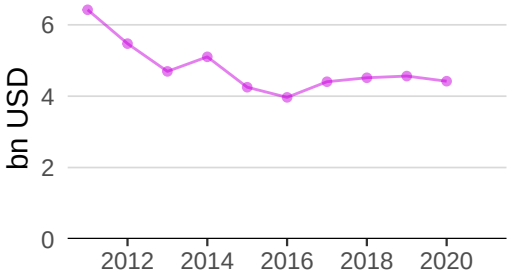
6.2.5 High-tech manufacturing was equal to 44.6% of mfg. output in 2020 and equivalent to an indicator rank of 19.



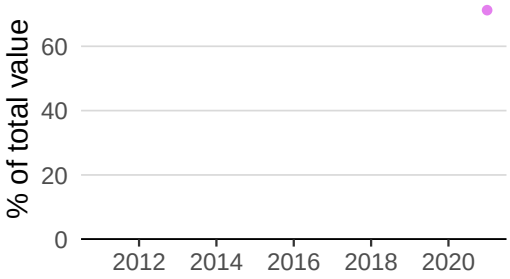
6.3.1 Intellectual property receipts was equal to 3.0 bn USD in 2020–down by 15 percentage points from the year prior–and equivalent to an indicator rank of 8.



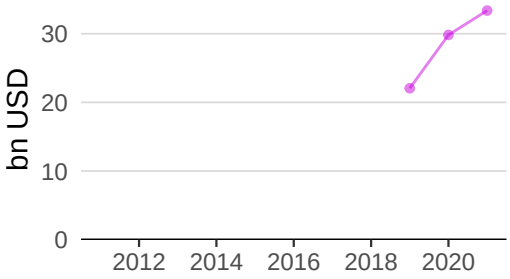
6.3.2 Production and export complexity was equal to 1.5 in 2019–down by 6 percentage points from the year prior–and equivalent to an indicator rank of 13.



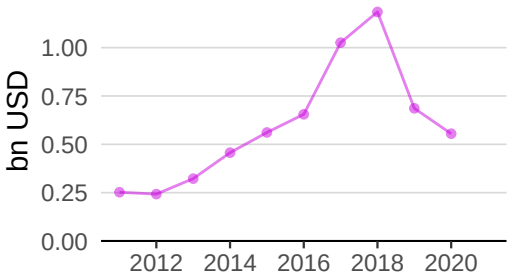
6.3.3 High-tech exports was equal to 4.4 bn USD in 2020–down by 3 percentage points from the year prior–and equivalent to an indicator rank of 38.



7.1.1 Intangible asset intensity was equal to 71.2% of total value in 2021 and equivalent to an indicator rank of 18.



7.1.3 Global brand value was equal to 33.4 bn USD in 2021–up by 12 percentage points from the year prior–and equivalent to an indicator rank of 16.



7.2.1 Cultural and creative services exports was equal to 0.6 bn USD in 2020–down by 19 percentage points from the year prior–and equivalent to an indicator rank of 49.

FINLAND'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]	[%]	[%]	
NOKIA	Technology Hardware & Equipment	3,841	-12.9	17.6	44
WARTSILA	Industrial Engineering	205	-3.8	4.5	645
KONE	Industrial Engineering	180	5.1	1.8	737

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
UNIVERSITY OF HELSINKI	58.5	104
AALTO UNIVERSITY	57.0	112=
UNIVERSITY OF TURKU	34.9	295=

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
KONE	1
NESTE	2
SAMPO	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

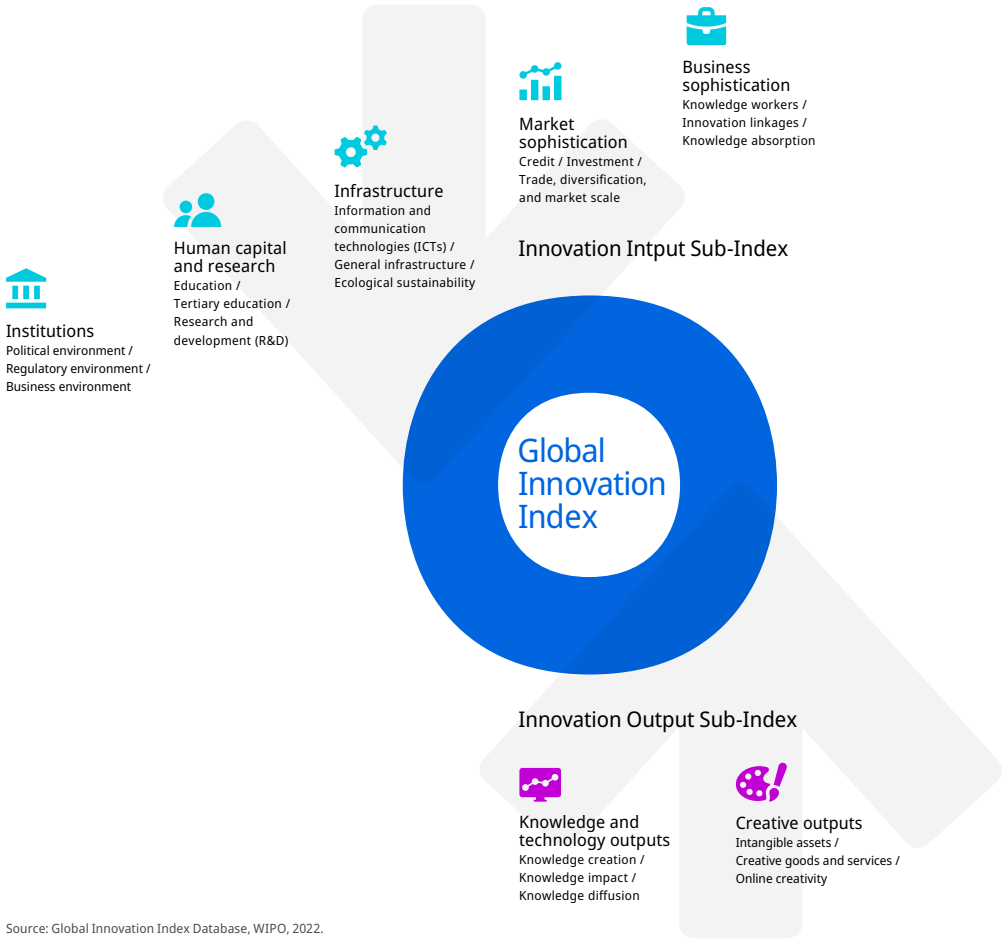
Brand	Industry	Rank
NOKIA	Tech	1
NESTE	Oil & Gas	2
KONE	Engineering & Construction	3

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.



Source: Global Innovation Index Database, WIPO, 2022.

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.