



HUNGARY

34th Hungary ranks 34th 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 Hungary 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 Hungary in the GII 2022 is between ranks 32 and 35.

Rankings for Hungary (2020–2022)

GIIYR	GII	Innovation inputs	Innovation outputs
2020	35	37	32
2021	34	34	31
2022	34	36	34

- Hungary performs better in innovation outputs than innovation inputs in 2022.
- This year Hungary ranks 36th in innovation inputs, lower than last year but higher than 2020.
- As for innovation outputs, Hungary ranks 34th. This position is lower than both 2021 and 2020.

33rd Hungary ranks 33rd among the 48 high-income group economies.

22nd Hungary ranks 22nd among the 39 economies in Europe.

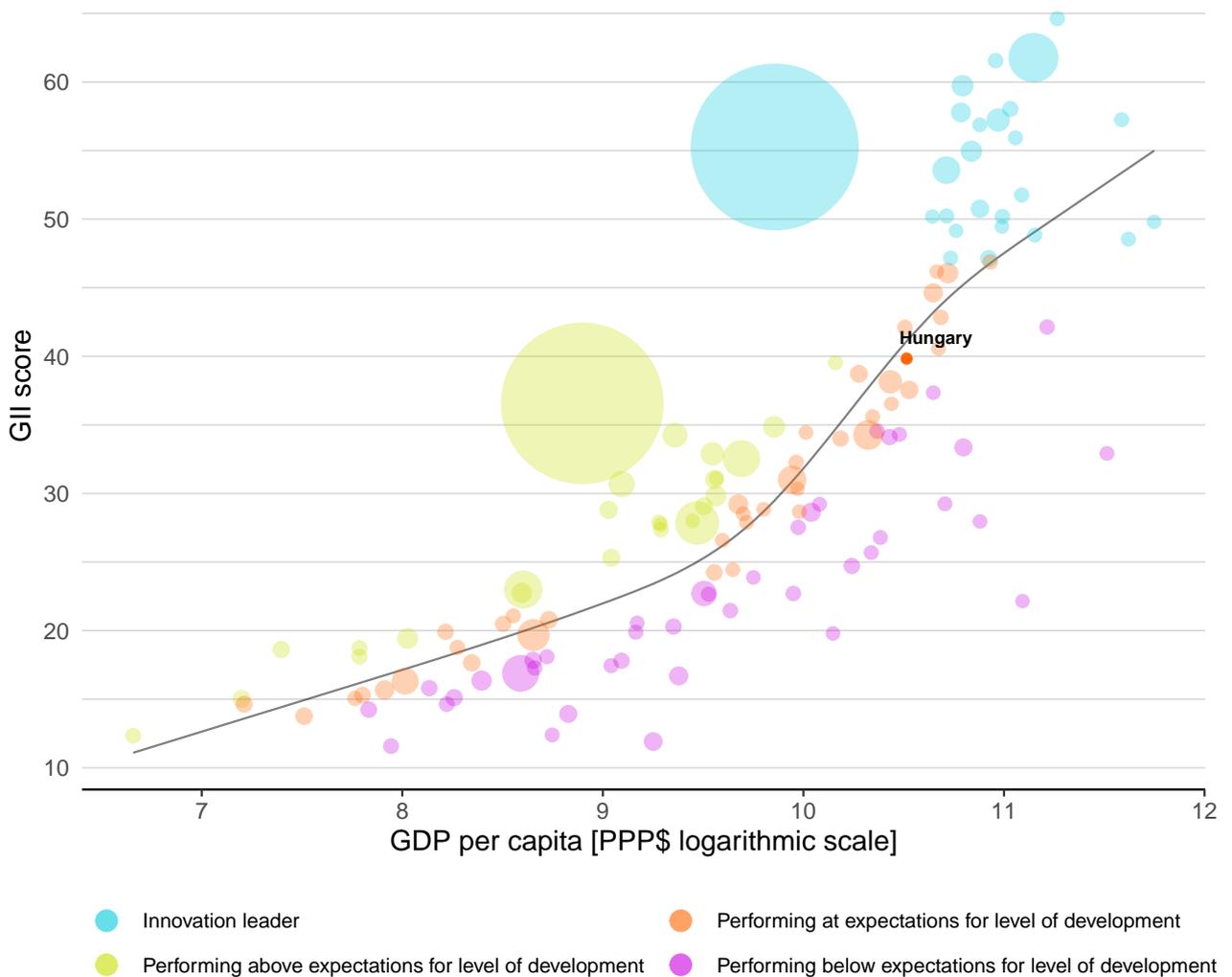


EXPECTED VS. OBSERVED INNOVATION PERFORMANCE

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, Hungary's performance is at expectations for its level of development.

The positive relationship between innovation and development



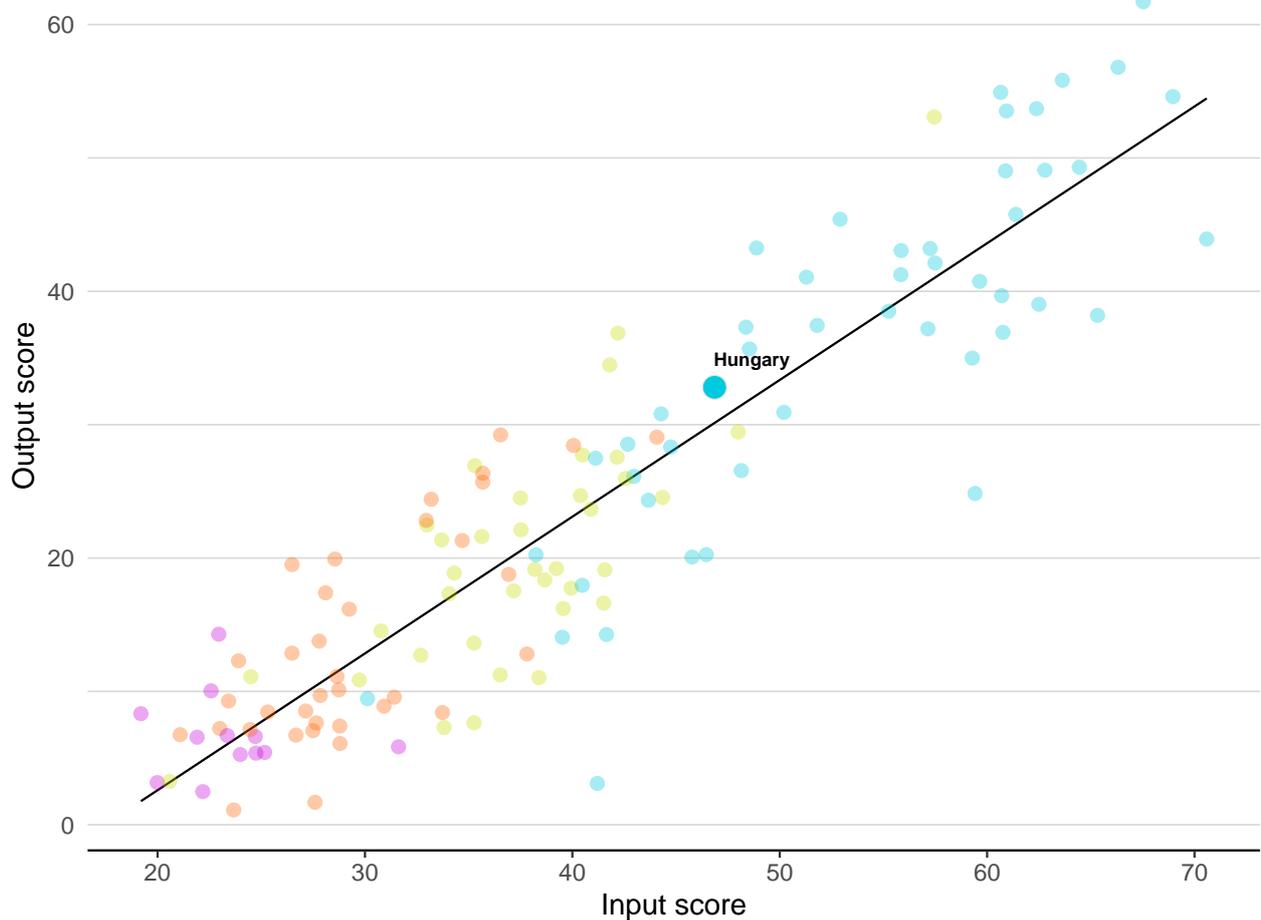


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

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

Innovation input to output performance

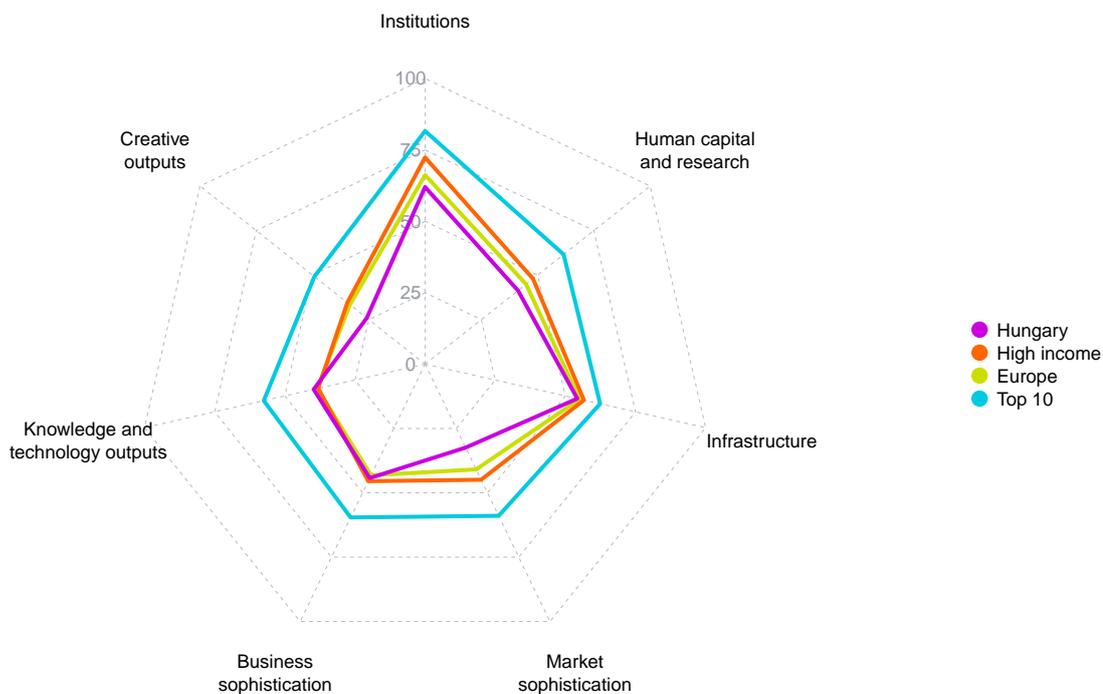


Income ● High income ● Upper middle ● Lower middle ● Low income — Fitted line



BENCHMARKING AGAINST OTHER HIGH-INCOME GROUP ECONOMIES AND EUROPE

The seven GII pillar scores for Hungary



High-income group economies

Hungary performs above the high-income group average in Knowledge and technology outputs.

Europe

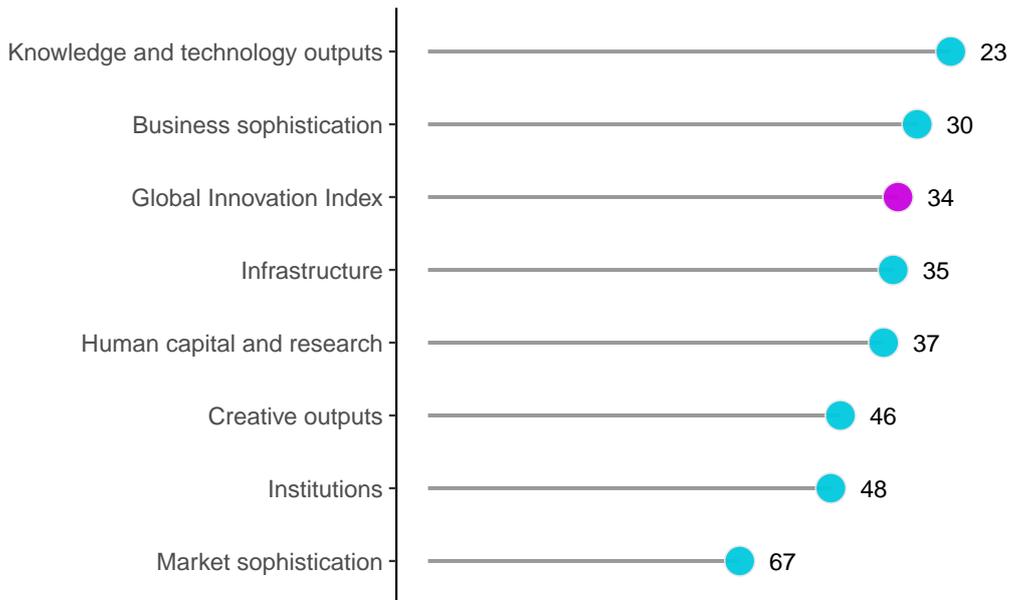
Hungary performs above the regional average in two pillars, namely: Business sophistication; and, Knowledge and technology outputs.



OVERVIEW OF RANKINGS IN THE SEVEN GII 2022 AREAS

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

The seven GII pillar ranks for Hungary



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

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

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

INNOVATION STRENGTHS AND WEAKNESSES

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

Strengths and weaknesses for Hungary

Strengths			Weaknesses		
Code	Indicator name	Rank	Code	Indicator name	Rank
2.1.5	Pupil-teacher ratio, secondary	10	1.3.1	Policies for doing business	86
2.2.3	Tertiary inbound mobility, %	16	2.2.2	Graduates in science and engineering, %	92
3.3.3	ISO 14001 environmental certificates/bn PPP\$ GDP	11	3.1.4	E-participation	75
5.3.2	High-tech imports, % total trade	15	4.1.2	Domestic credit to private sector, % GDP	84
5.3.4	FDI net inflows, % GDP	1	4.2.1	Market capitalization, % GDP	63
6.2.4	ISO 9001 quality certificates/bn PPP\$ GDP	9	4.2.3	Venture capital recipients, deals/bn PPP\$ GDP	64
6.2.5	High-tech manufacturing, %	5	4.2.4	Venture capital received, value, % GDP	67
6.3.2	Production and export complexity	10	7.1.1	Intangible asset intensity, top 15, %	49
6.3.3	High-tech exports, % total trade	10	7.1.2	Trademarks by origin/bn PPP\$ GDP	78
7.2.5	Creative goods exports, % total trade	7	7.2.4	Printing and other media, % manufacturing	68

Hungary

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Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$
34	36	High	EUR	9.6	359.9	36,849

	Score/Value	Rank		Score/Value	Rank
 Institutions	62.0	48	 Business sophistication	44.3	30
1.1 Political environment	72.0	39	5.1 Knowledge workers	48.5	34
1.1.1 Political and operational stability*	81.8	24	5.1.1 Knowledge-intensive employment, %	38.9	33
1.1.2 Government effectiveness*	62.2	42	5.1.2 Firms offering formal training, %	29.3	57
1.2 Regulatory environment	73.7	40	5.1.3 GERD performed by business, % GDP	1.2	19
1.2.1 Regulatory quality*	57.0	49	5.1.4 GERD financed by business, %	52.9	25
1.2.2 Rule of law*	59.4	44	5.1.5 Females employed w/advanced degrees, %	18.3	38
1.2.3 Cost of redundancy dismissal	13.4	48	5.2 Innovation linkages	29.0	42
1.3 Business environment	40.3	86	5.2.1 University-industry R&D collaboration [†]	45.6	58
1.3.1 Policies for doing business [†]	43.0	86	5.2.2 State of cluster development and depth [†]	48.9	57
1.3.2 Entrepreneurship policies and culture*	37.5	43	5.2.3 GERD financed by abroad, % GDP	0.2	20
			5.2.4 Joint venture/strategic alliance deals/bn PPP\$ GDP	0.0	71
			5.2.5 Patent families/bn PPP\$ GDP	0.4	34
 Human capital and research	41.3	37	5.3 Knowledge absorption	55.3	7
2.1 Education	57.7	49	5.3.1 Intellectual property payments, % total trade	1.1	33
2.1.1 Expenditure on education, % GDP	4.6	56	5.3.2 High-tech imports, % total trade	15.8	15
2.1.2 Government funding/pupil, secondary, % GDP/cap	20.6	51	5.3.3 ICT services imports, % total trade	1.6	56
2.1.3 School life expectancy, years	15.1	48	5.3.4 FDI net inflows, % GDP	42.8	1
2.1.4 PISA scales in reading, maths and science	479.3	33	5.3.5 Research talent, % in businesses	58.5	14
2.1.5 Pupil-teacher ratio, secondary	8.1	10	 Knowledge and technology outputs	39.7	23
2.2 Tertiary education	29.1	72	6.1 Knowledge creation	20.2	47
2.2.1 Tertiary enrolment, % gross	52.4	62	6.1.1 Patents by origin/bn PPP\$ GDP	1.7	45
2.2.2 Graduates in science and engineering, %	15.5	92	6.1.2 PCT patents by origin/bn PPP\$ GDP	0.3	38
2.2.3 Tertiary inbound mobility, %	12.6	16	6.1.3 Utility models by origin/bn PPP\$ GDP	0.7	31
2.3 Research and development (R&D)	37.1	30	6.1.4 Scientific and technical articles/bn PPP\$ GDP	26.6	35
2.3.1 Researchers, FTE/mn pop.	4,358.1	23	6.1.5 Citable documents H-index	29.6	33
2.3.2 Gross expenditure on R&D, % GDP	1.6	25	6.2 Knowledge impact	48.4	9
2.3.3 Global corporate R&D investors, top 3, mn USD	51.7	27	6.2.1 Labor productivity growth, %	2.1	33
2.3.4 QS university ranking, top 3*	20.1	50	6.2.2 New businesses/th pop. 15-64	4.0	35
			6.2.3 Software spending, % GDP	0.3	46
 Infrastructure	54.3	35	6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	22.4	9
3.1 Information and communication technologies (ICTs)	75.5	59	6.2.5 High-tech manufacturing, %	59.8	5
3.1.1 ICT access*	88.4	59	6.3 Knowledge diffusion	50.5	17
3.1.2 ICT use*	71.2	55	6.3.1 Intellectual property receipts, % total trade	1.2	19
3.1.3 Government's online service*	74.7	55	6.3.2 Production and export complexity	79.9	10
3.1.4 E-participation*	67.9	75	6.3.3 High-tech exports, % total trade	14.9	10
3.2 General infrastructure	40.6	38	6.3.4 ICT services exports, % total trade	2.3	57
3.2.1 Electricity output, GWh/mn pop.	3,581.5	58	 Creative outputs	25.9	46
3.2.2 Logistics performance*	63.7	30	7.1 Intangible assets	26.8	65
3.2.3 Gross capital formation, % GDP	28.2	31	7.1.1 Intangible asset intensity, top 15, %	52.3	49
3.3 Ecological sustainability	46.6	20	7.1.2 Trademarks by origin/bn PPP\$ GDP	28.8	78
3.3.1 GDP/unit of energy use	11.3	57	7.1.3 Global brand value, top 5,000, % GDP	9.1	59
3.3.2 Environmental performance*	55.1	31	7.1.4 Industrial designs by origin/bn PPP\$ GDP	2.3	45
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	8.9	11	7.2 Creative goods and services	30.8	26
			7.2.1 Cultural and creative services exports, % total trade	0.6	48
 Market sophistication	32.4	67	7.2.2 National feature films/mn pop. 15-69	2.8	39
4.1 Credit	28.0	63	7.2.3 Entertainment and media market/th pop. 15-69	13.8	29
4.1.1 Finance for startups and scaleups*	43.1	31	7.2.4 Printing and other media, % manufacturing	0.7	68
4.1.2 Domestic credit to private sector, % GDP	38.3	84	7.2.5 Creative goods exports, % total trade	8.2	7
4.1.3 Loans from microfinance institutions, % GDP	n/a	n/a	7.3 Online creativity	19.1	33
4.2 Investment	5.5	70	7.3.1 Generic top-level domains (TLDs)/th pop. 15-69	11.0	40
4.2.1 Market capitalization, % GDP	18.7	63	7.3.2 Country-code TLDs/th pop. 15-69	35.3	19
4.2.2 Venture capital investors, deals/bn PPP\$ GDP	0.0	46	7.3.3 GitHub commit pushes received/mn pop. 15-69	25.3	28
4.2.3 Venture capital recipients, deals/bn PPP\$ GDP	0.0	64	7.3.4 Mobile app creation/bn PPP\$ GDP	5.0	55
4.2.4 Venture capital received, value, % GDP	0.0	67			
4.3 Trade, diversification, and market scale	63.8	34			
4.3.1 Applied tariff rate, weighted avg., %	1.5	20			
4.3.2 Domestic industry diversification	93.2	33			
4.3.3 Domestic market scale, bn PPP\$	359.9	53			

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 Hungary.

Missing data for Hungary

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)

Outdated data for Hungary

Code	Indicator name	Economy year	Model year	Source
2.1.1	Expenditure on education, % GDP	2018	2020	UNESCO Institute for Statistics
2.1.3	School life expectancy, years	2018	2019	UNESCO Institute for Statistics

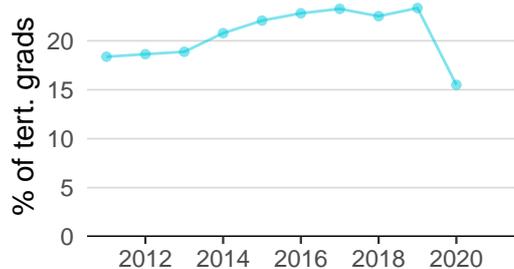
HUNGARY'S INNOVATION SYSTEM

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

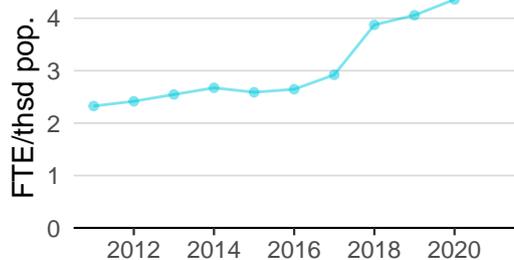
Innovation inputs



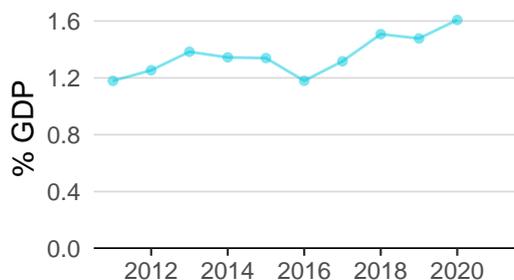
2.1.1 Expenditure on education was equal to 4.6% GDP in 2018—effectively unchanged from the year prior—and equivalent to an indicator rank of 56.



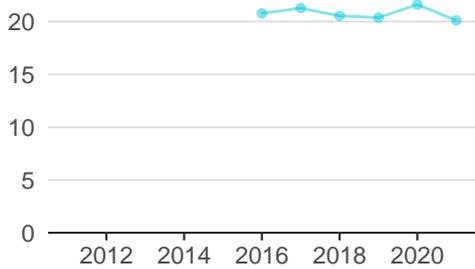
2.2.2 Graduates in science and engineering was equal to 15.5% of tert. grads in 2020—down by 34 percentage points from the year prior—and equivalent to an indicator rank of 92.



2.3.1 Researchers was equal to 4.4 FTE/thsd pop. in 2020—up by 7 percentage points from the year prior—and equivalent to an indicator rank of 23.



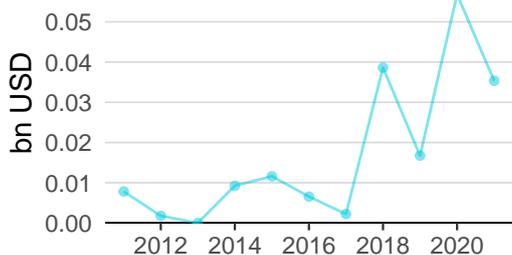
2.3.2 Gross expenditure on R&D was equal to 1.6% GDP in 2020—up by 9 percentage points from the year prior—and equivalent to an indicator rank of 25.



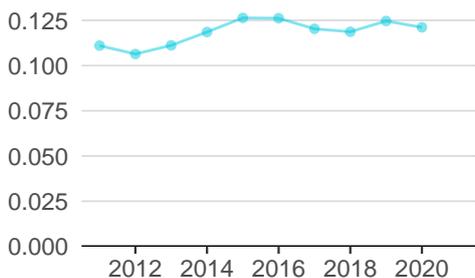
2.3.4 QS university ranking was equal to 20.1 in 2021—down by 7 percentage points from the year prior—and equivalent to an indicator rank of 50.



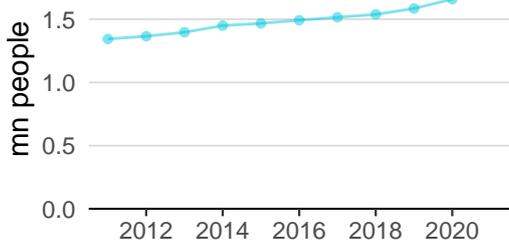
3.1.1 ICT access was equal to 8.8 in 2020 and equivalent to an indicator rank of 59.



4.2.4 Venture capital received was equal to 0.0 bn USD in 2021—down by 38 percentage points from the year prior—and equivalent to an indicator rank of 67.

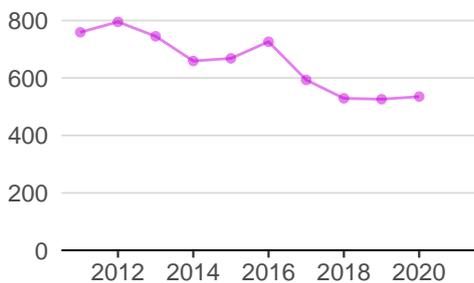


4.3.2 Domestic industry diversification was equal to 0.1 in 2020—down by 3 percentage points from the year prior—and equivalent to an indicator rank of 33.

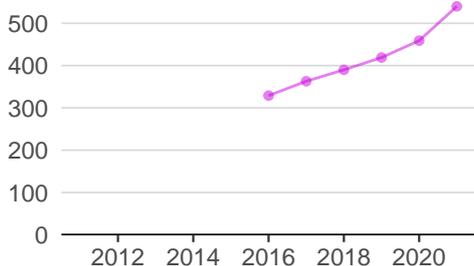


5.1.1 Knowledge-intensive employment was equal to 1.8 mn people in 2021—up by 9 percentage points from the year prior—and equivalent to an indicator rank of 33.

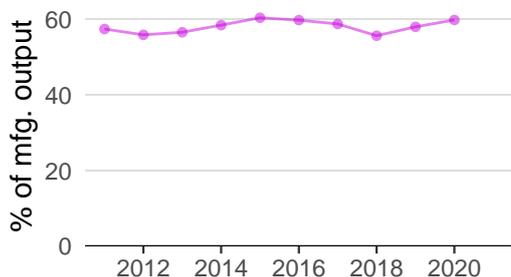
Innovation outputs



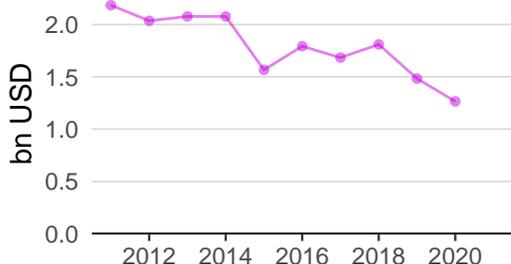
6.1.1 Patents by origin was equal to 535.0 in 2020—up by 2 percentage points from the year prior—and equivalent to an indicator rank of 45.



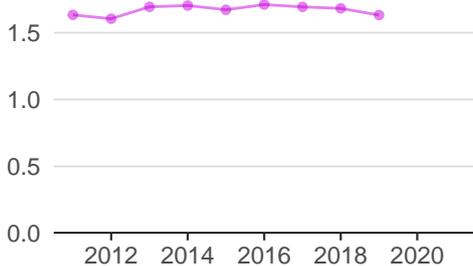
6.1.5 Citable documents H-index was equal to 540.0 in 2021—up by 18 percentage points from the year prior—and equivalent to an indicator rank of 33.



6.2.5 High-tech manufacturing was equal to 59.8% of mfg. output in 2020—up by 3 percentage points from the year prior—and equivalent to an indicator rank of 5.



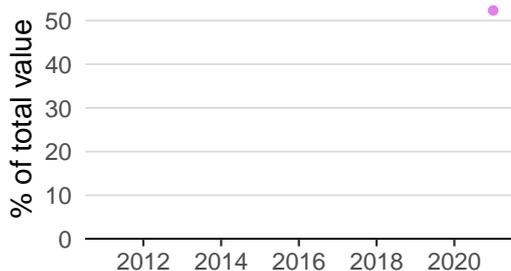
6.3.1 Intellectual property receipts was equal to 1.3 bn USD in 2020—down by 15 percentage points from the year prior—and equivalent to an indicator rank of 19.



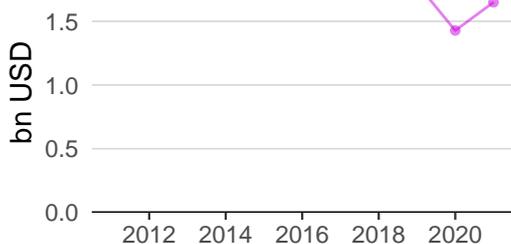
6.3.2 Production and export complexity was equal to 1.6 in 2019—down by 3 percentage points from the year prior—and equivalent to an indicator rank of 10.



6.3.3 High-tech exports was equal to 18.2 bn USD in 2020—down by 1 percentage point from the year prior—and equivalent to an indicator rank of 10.



7.1.1 Intangible asset intensity was equal to 52.3% of total value in 2021 and equivalent to an indicator rank of 49.



7.1.3 Global brand value was equal to 1.6 bn USD in 2021—up by 16 percentage points from the year prior—and equivalent to an indicator rank of 59.



7.2.1 Cultural and creative services exports was equal to 0.8 bn USD in 2020—down by 39 percentage points from the year prior—and equivalent to an indicator rank of 48.

HUNGARY'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]	[%]	[%]	
RICHTER GEDEON	Pharmaceuticals & Biotechnology	148	10.5	9.5	861

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 SZEGED	21.9	551-560
UNIVERSITY OF DEBRECEN	20.1	591-600
EOTVOS LORAND UNIVERSITY	18.3	651-700

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
OTP BANK	1
RICHTER GEDEON	2
OPUS GLOBAL NYILVANOSAN	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

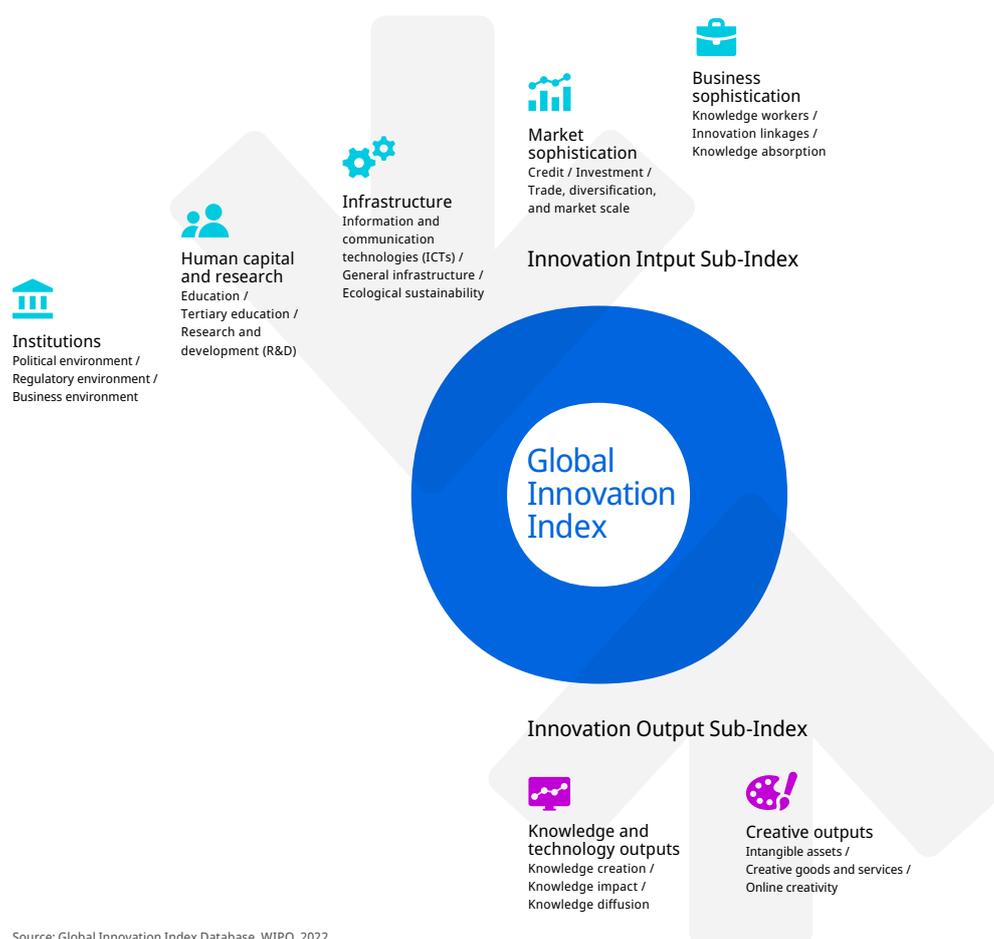
Brand	Industry	Rank
OTP BANK	Banking	1
WIZZ AIR	Airlines	2

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.