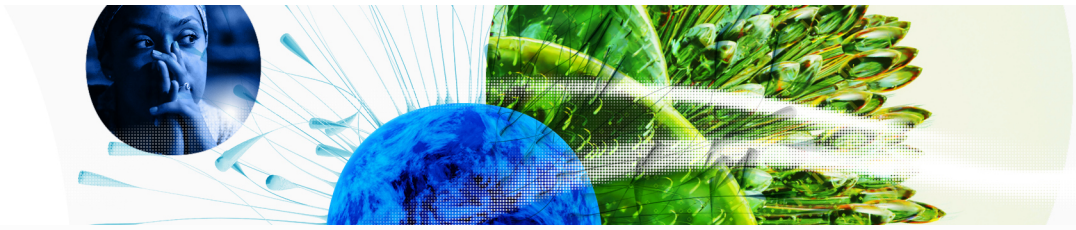
Global Innovation Index 2023



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**.

Hungary ranking in the Global Innovation Index 2023

> Hungary ranks 35th among the 132 economies featured in the GII 2023.

> Hungary ranks 34th among the 50 high-income group economies.

> Hungary ranks 23rd among the 39 economies in Europe.

> Hungary GII Ranking (2020-2023)

The table shows the rankings of Hungary 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 Hungary in the GII 2023 is between ranks 32 and 36.

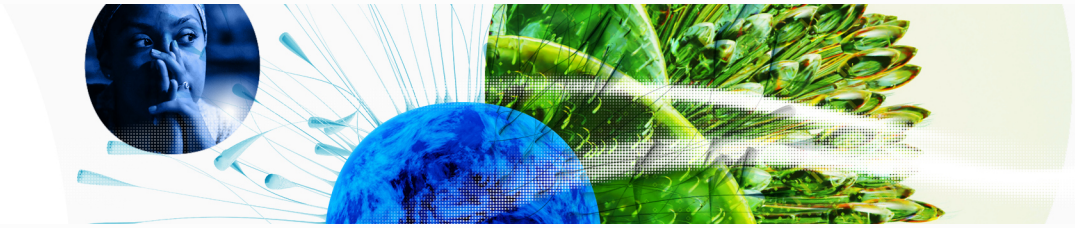
	GII Position	Innovation Inputs	Innovation Outputs
2020	35th	37th	32nd
2021	34th	34th	31st
2022	34th	36th	34th
2023	35th	36th	33rd

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

This year Hungary ranks 36th in innovation inputs. This position is the same as last year.

Hungary ranks 33rd in innovation outputs. This position is higher than last year.

Global Innovation Index 2023

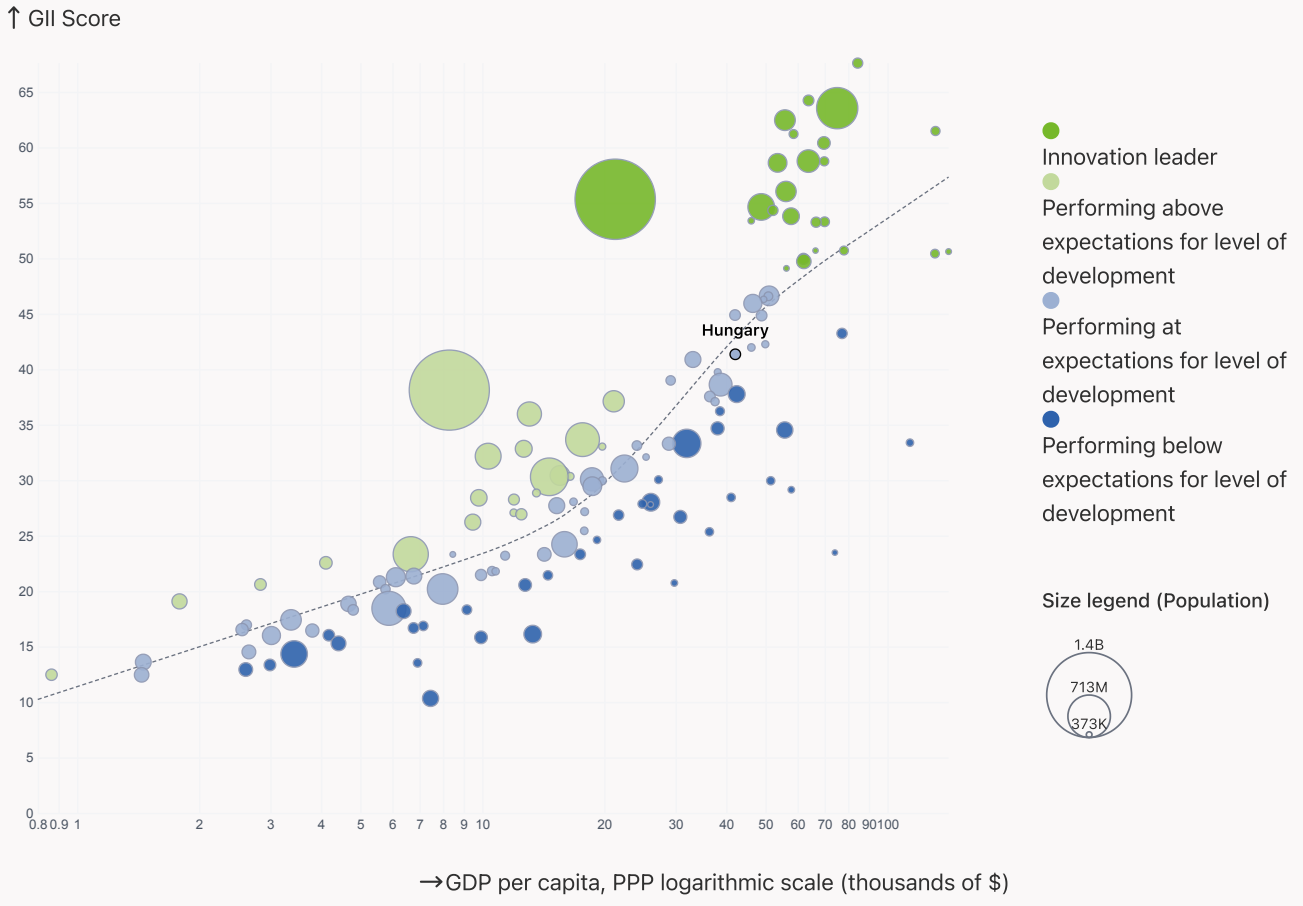


→ Expected vs. observed innovation performance

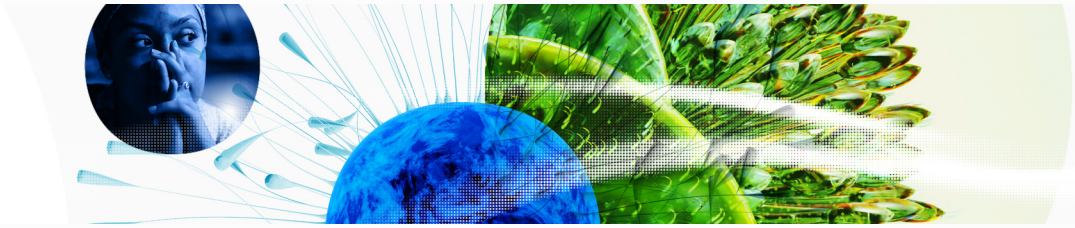
The bubble chart below shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The trend line gives an indication of the expected innovation performance according to income level. Economies appearing above the trend line are performing better than expected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

> Relative to GDP, Hungary's performance is at expectations for its level of development.

> Innovation overperformers relative to their economic development



Global Innovation Index 2023

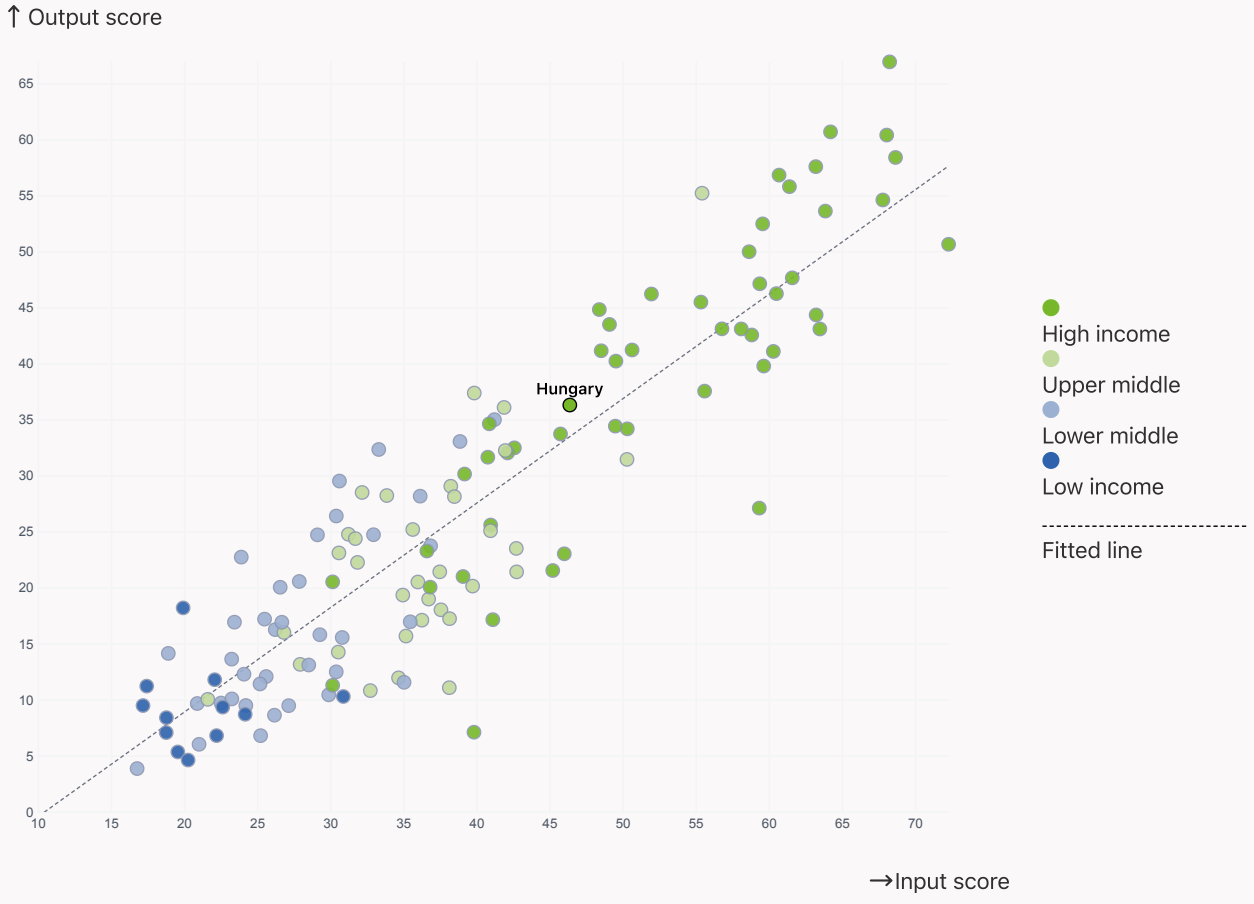


→ Effectively translating innovation investments into innovation outputs

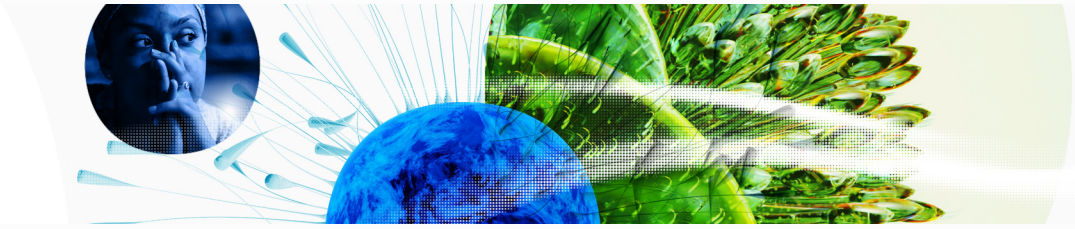
The chart below shows the relationship between innovation inputs and innovation outputs. Economies above the line are effectively translating costly innovation investments into more and higher-quality outputs.

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

> Relationship between innovation inputs and outputs

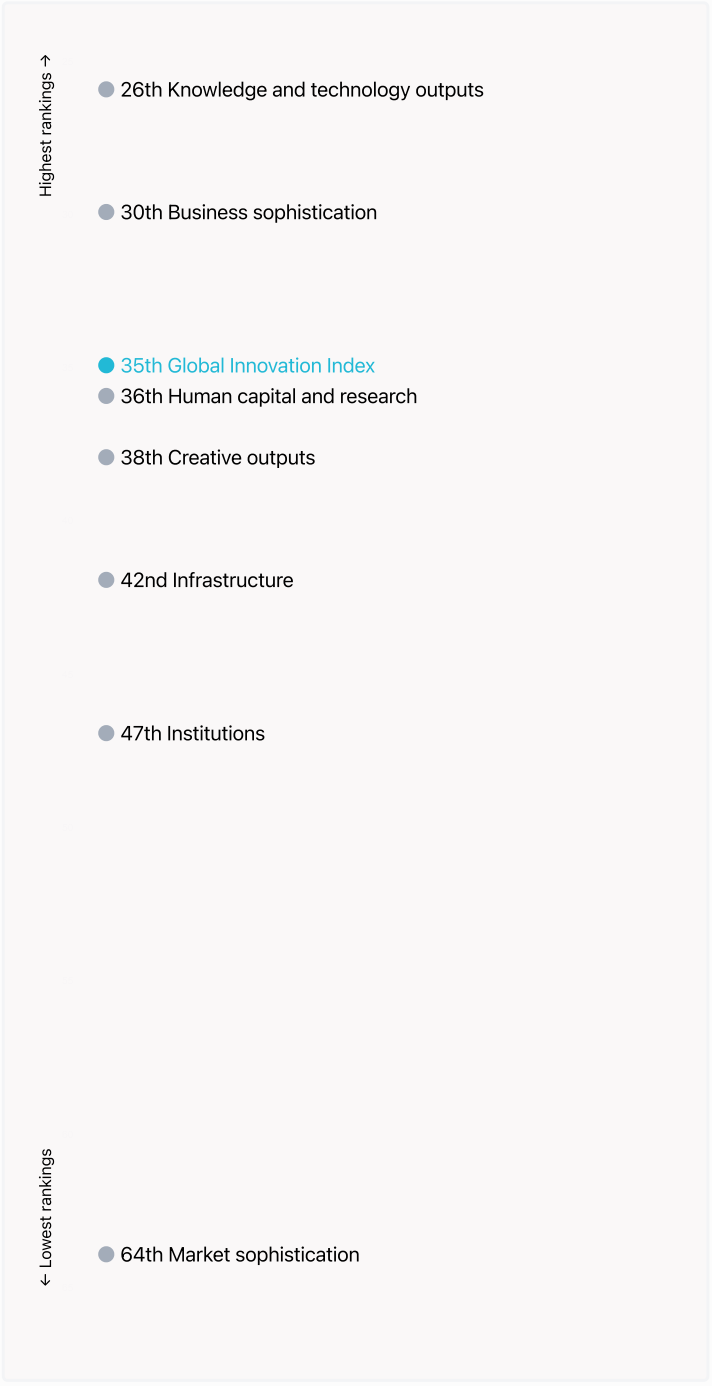


Global Innovation Index 2023



→ Overview of Hungary'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 Hungary are those that rank above the GII (shown in blue) and the weakest are those that rank below.



> Highest rankings

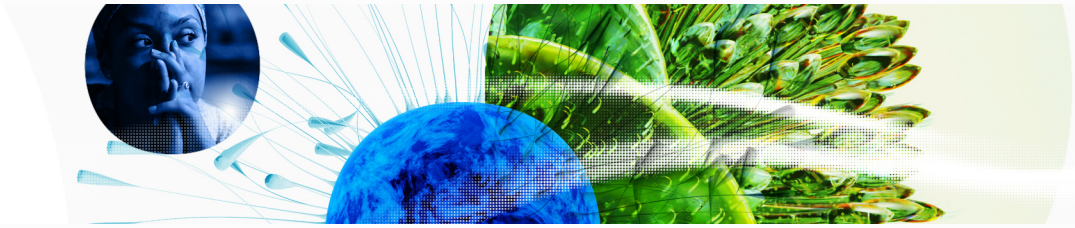
Hungary ranks highest in Knowledge and technology outputs (26th) and Business sophistication (30th).

> Lowest rankings

Hungary ranks lowest in Market sophistication (64th), Institutions (47th) and Infrastructure (42nd).

The full WIPO Intellectual Property Statistics profile for Hungary can be found on this link.

Global Innovation Index 2023



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

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

> High-Income economies

Hungary performs below the high-income group average in all the pillars.

> Europe

Hungary performs below the regional average in Knowledge and technology outputs, Creative outputs, Market sophistication, Human capital and research, Infrastructure, Institutions.

Knowledge and technology outputs

- Top 10 | Score: 58.96
- Europe | Score: 38.80
- High income | Score: 38.62
- Hungary | Score: 38.42

Creative outputs

- Top 10 | 56.09
- High income | 40.27
- Europe | 39.87
- Hungary | 34.15

Business sophistication

- Top 10 | 64.39
- High income | 46.38
- Hungary | 45.09
- Europe | 44.61

Market sophistication

- Top 10 | 61.93
- High income | 46.42
- Europe | 43.65
- Hungary | 35.26

Human capital and research

- Top 10 | 60.28
- High income | 46.30
- Europe | 44.05
- Hungary | 40.19

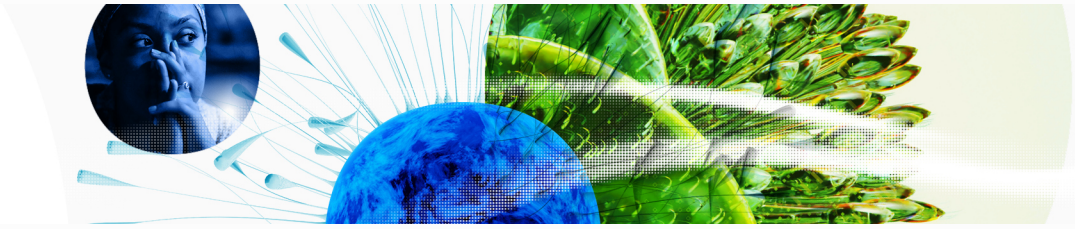
Infrastructure

- Top 10 | 62.83
- High income | 55.85
- Europe | 54.69
- Hungary | 53.01

Institutions

- Top 10 | 79.85
- High income | 68.16
- Europe | 61.69
- Hungary | 58.42

Global Innovation Index 2023



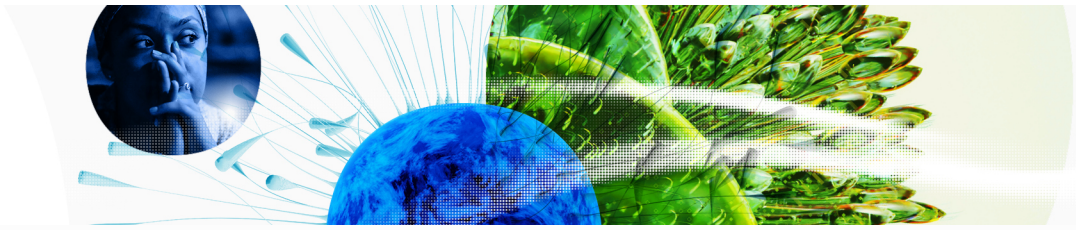
→ Innovation strengths and weaknesses in Hungary

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

> Hungary's main innovation strengths are **FDI net inflows, % GDP** (rank 1), **High-tech manufacturing, %** (rank 5) and **ISO 9001 quality/bn PPP$ GDP** (rank 7).

Strengths			Weaknesses		
Rank	Code	Indicator name	Rank	Code	Indicator name
1	5.3.4	FDI net inflows, % GDP	98	2.2.2	Graduates in science and engineering, %
5	6.2.4	High-tech manufacturing, %	87	4.1.2	Domestic credit to private sector, % GDP
7	6.3.5	ISO 9001 quality/bn PPP$ GDP	81	7.1.2	Trademarks by origin/bn PPP$ GDP
9	7.2.4	Creative goods exports, % total trade	76	4.2.3	VC recipients, deals/bn PPP$ GDP
9	6.3.2	Production and export complexity	65	4.2.4	VC received, value, % GDP
9	3.3.3	ISO 14001 environment/bn PPP$ GDP	61	4.2.1	Market capitalization, % GDP
10	6.3.3	High-tech exports, % total trade	59	4.2.2	Venture capital (VC) investors, deals/bn PPP$ GDP
12	5.2.3	GERD financed by abroad, % GDP	57	7.1.1	Intangible asset intensity, top 15, %
15	5.3.2	High-tech imports, % total trade	53	1.3.2	Entrepreneurship policies and culture
15	2.2.3	Tertiary inbound mobility, %	48	6.2.2	Unicorn valuation, % GDP

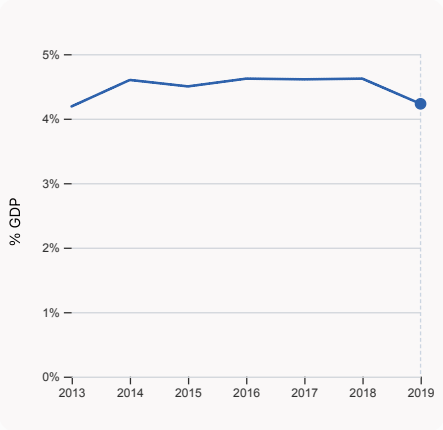
Global Innovation Index 2023



→ Hungary's innovation system

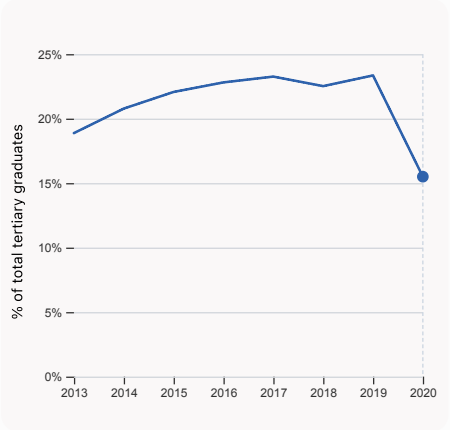
As far as practicable, the plots below present unscaled indicator data.

> Innovation inputs in Hungary



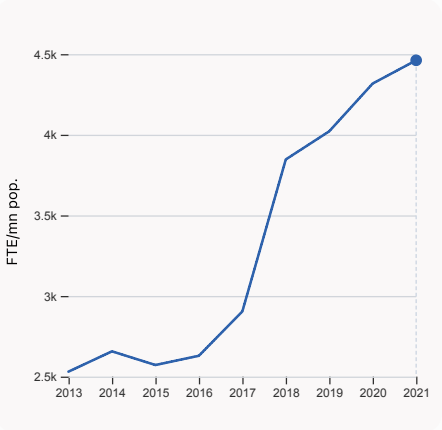
2.1.1 Expenditure on education, % GDP

was equal to 4.23% GDP in 2019, down by 0.39 percentage points from the year prior – and equivalent to an indicator rank of 64.



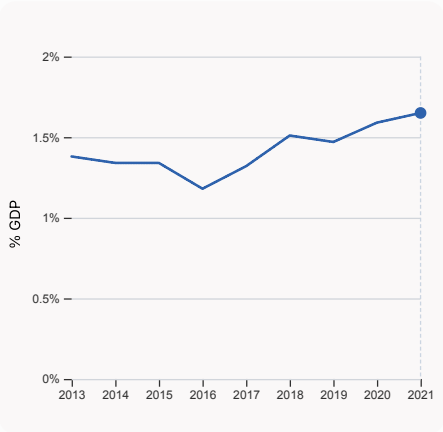
2.2.2 Graduates in science and engineering, %

was equal to 15.5% of total tertiary graduates in 2020, down by 7.85 percentage points from the year prior – and equivalent to an indicator rank of 98.



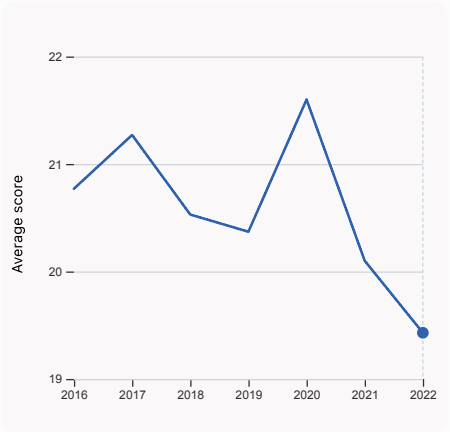
2.3.1 Researchers, FTE/mn pop.

was equal to 4,461.84 FTE/mn pop. in 2021, up by 3.34% from the year prior – and equivalent to an indicator rank of 25.



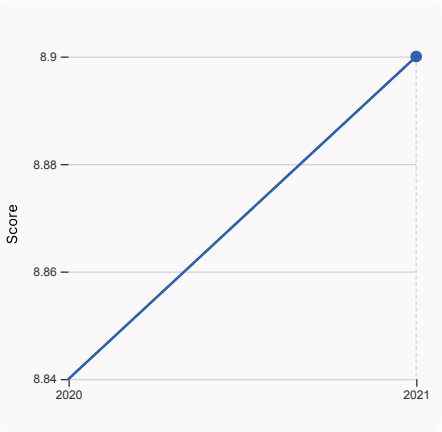
2.3.2 Gross expenditure on R&D, % GDP

was equal to 1.65% GDP in 2021, up by 0.06 percentage points from the year prior – and equivalent to an indicator rank of 24.



2.3.4 QS university ranking, top 3

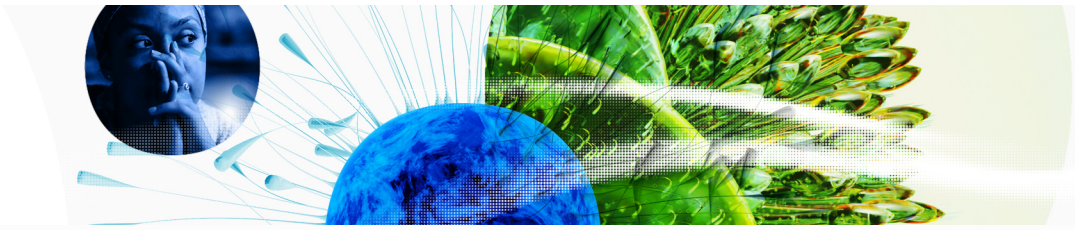
was equal to an average score of 19.43 for the top 3 universities in 2022, down by 3.33% from the year prior – and equivalent to an indicator rank of 54.

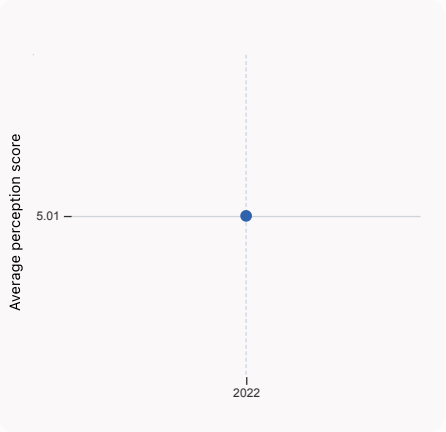


3.1.1 ICT access

was equal to a score of 8.9 in 2021, up by 0.68% from the year prior – and equivalent to an indicator rank of 61.

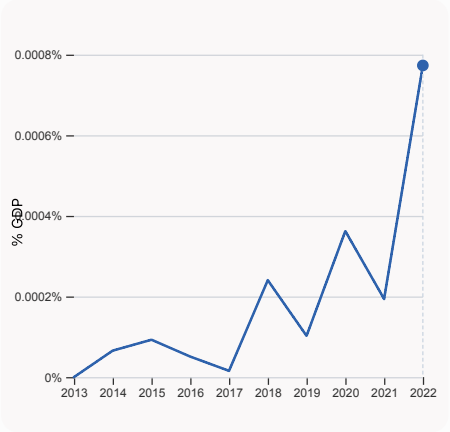
Global Innovation Index 2023





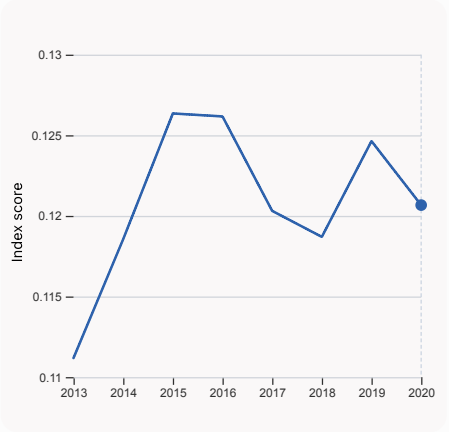
4.1.1 Finance for startups and scaleups

was equal to an average perception score of 5.01 in 2022, equivalent to an indicator rank of 33.



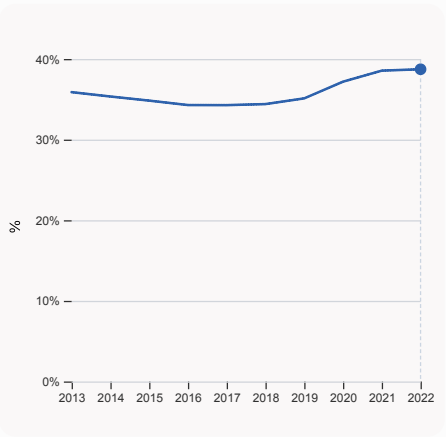
4.2.4 VC received, value, % GDP

was equal to 0.00077% GDP in 2022, up by 0.00058 percentage points from the year prior – and equivalent to an indicator rank of 65.



4.3.2 Domestic industry diversification

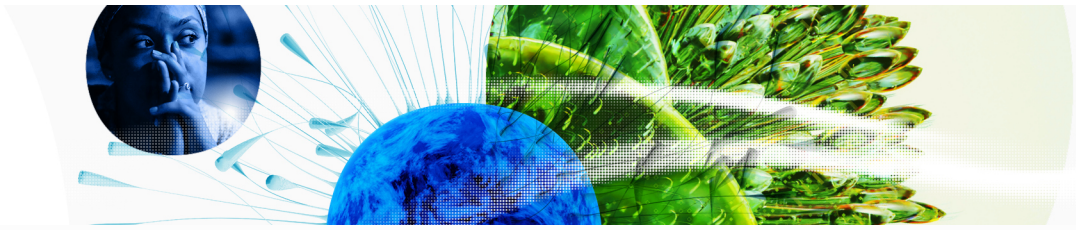
was equal to an index score of 0.121 in 2020, down by 3.18% from the year prior – and equivalent to an indicator rank of 32.



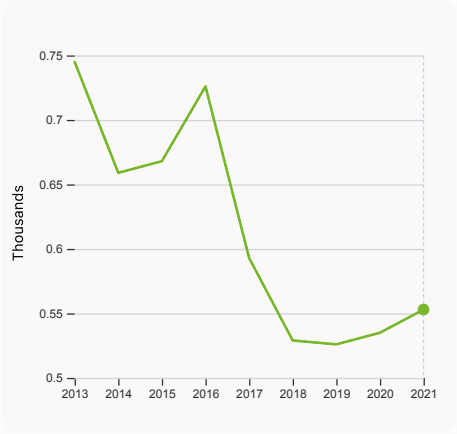
5.1.1 Knowledge-intensive employment, %

was equal to 38.73% in 2022, up by 0.17 percentage points from the year prior – and equivalent to an indicator rank of 32.

Global Innovation Index 2023

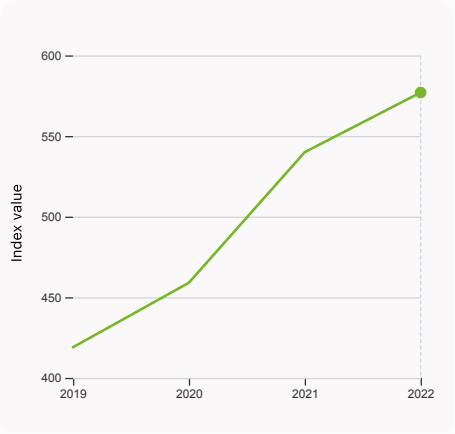


> Innovation outputs in Hungary



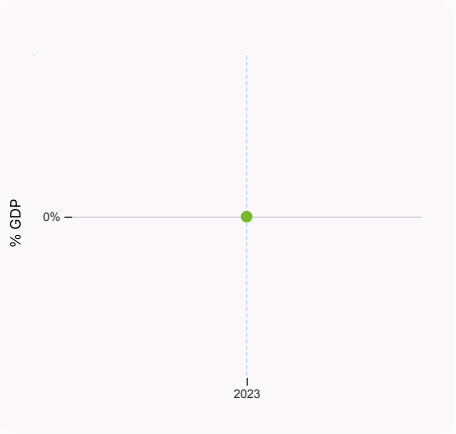
6.1.1 Patents by origin

was equal to 0.55 Thousands in 2021, up by 3.36% from the year prior – and equivalent to an indicator rank of 45.



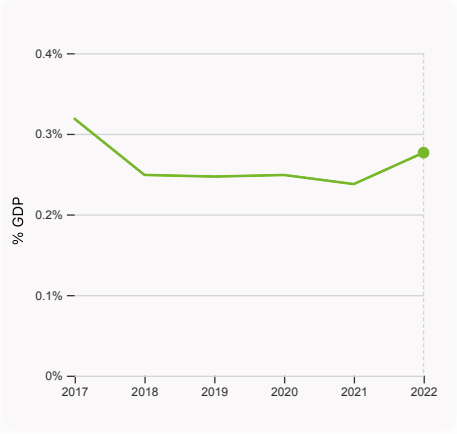
6.1.5 Citable documents H-index

was equal to an index value of 577 in 2022, up by 6.85% from the year prior – and equivalent to an indicator rank of 33.



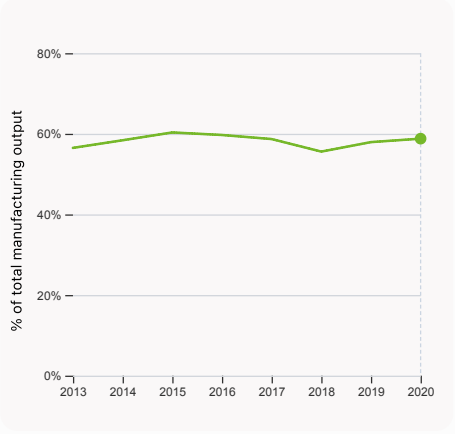
6.2.2 Unicorn valuation, % GDP

was equal to 0 % GDP in 2023 – and equivalent to an indicator rank of 48.



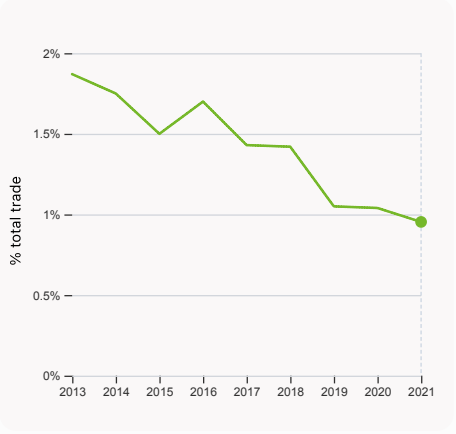
6.2.3 Software spending, % GDP

was equal to 0.277% GDP in 2022, up by 0.039 percentage points from the year prior – and equivalent to an indicator rank of 51.



6.2.4 High-tech manufacturing, %

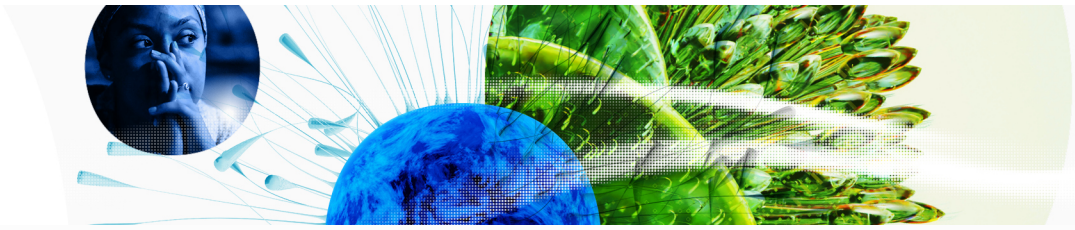
was equal to 58.8% of total manufacturing output in 2020, up by 0.86 percentage points from the year prior – and equivalent to an indicator rank of 5.

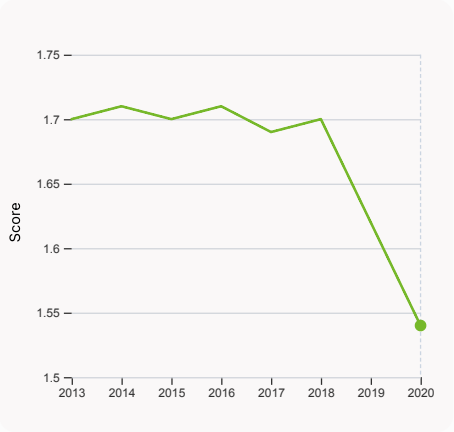


6.3.1 Intellectual property receipts, % total trade

was equal to 0.954% total trade in 2021, down by 0.086 percentage points from the year prior – and equivalent to an indicator rank of 21.

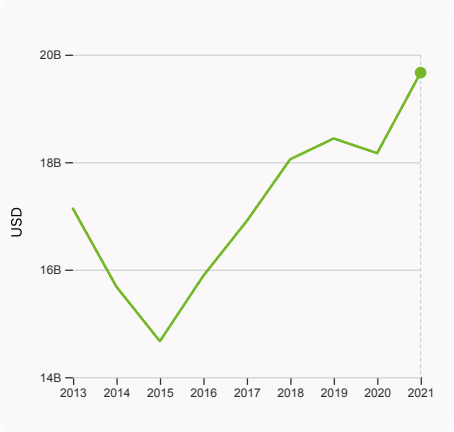
Global Innovation Index 2023





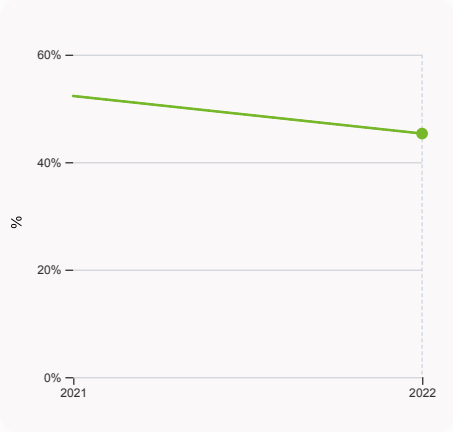
6.3.2 Production and export complexity

was equal to a score of 1.54 in 2020, down by 4.94% from the year prior – and equivalent to an indicator rank of 9.



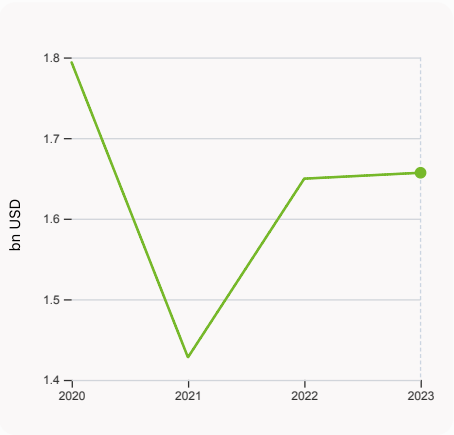
6.3.3 High-tech exports

was equal to 19,665,114,994 USD in 2021, up by 8.25% from the year prior – and equivalent to an indicator rank of 10.



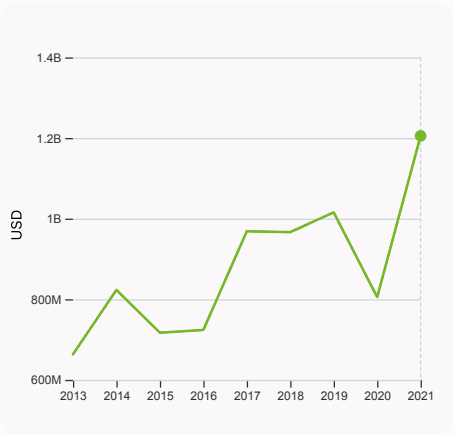
7.1.1 Intangible asset intensity, top 15, %

was equal to 45.32% in 2022, down by 6.99 percentage points from the year prior – and equivalent to an indicator rank of 57.



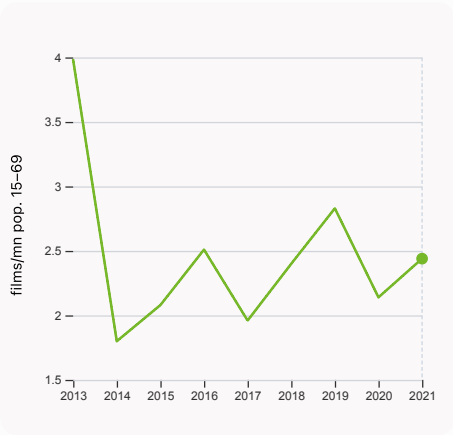
7.1.3 Global brand value, top 5,000

was equal to 1.657 bn USD in 2023, up by 0.44% from the year prior – and equivalent to an indicator rank of 56.



7.2.1 Cultural and creative services exports

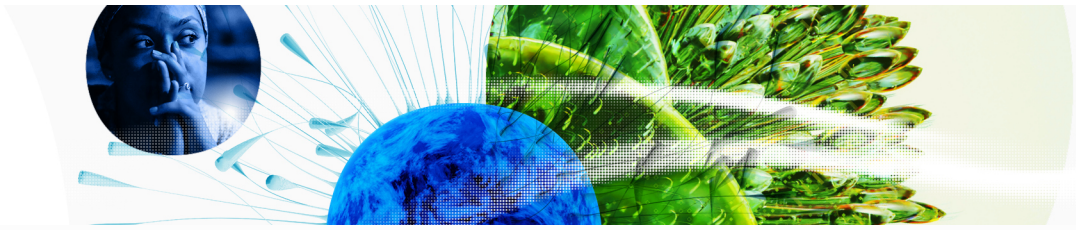
was equal to 1,205,434,000 USD in 2021, up by 49.69% from the year prior – and equivalent to an indicator rank of 39.

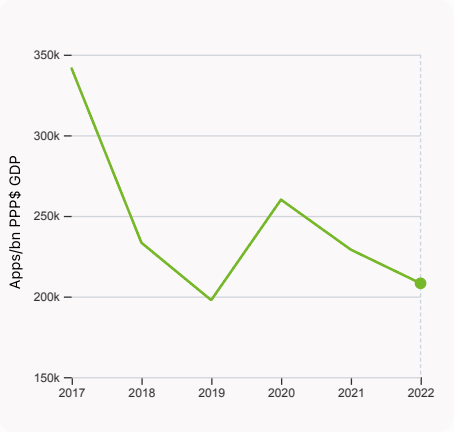


7.2.2 National feature films/mn pop. 15-69

was equal to 2.44 films/mn pop. 15–69 in 2021, up by 14.019% from the year prior – and equivalent to an indicator rank of 43.

Global Innovation Index 2023

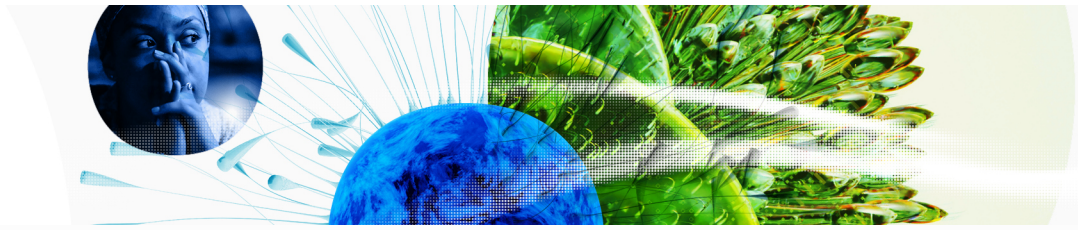




7.3.4 Mobile app creation/bn PPP$ GDP

was equal to 208,171.91 Apps/bn PPP$ GDP in 2022, down by 9.13% from the year prior – and equivalent to an indicator rank of 58.

Global Innovation Index 2023



→ Hungary's innovation top performers

> 2.3.4 QS university ranking of Hungary's top universities

Rank	University	Score
551-560	UNIVERSITY OF SZEGED	22.30
651-700	UNIVERSITY OF DEBRECEN	18.70
701-750	UNIVERSITY OF PECS	17.30

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".

> 7.1.1 Top 15 intangible-asset intensive companies in Hungary

Rank	Firm	Intensity, %
1	RICHTER GEDEON NYRT	42.58
2	4IG NYRT	42.75
3	MASTERPLAST NYRT	50.13

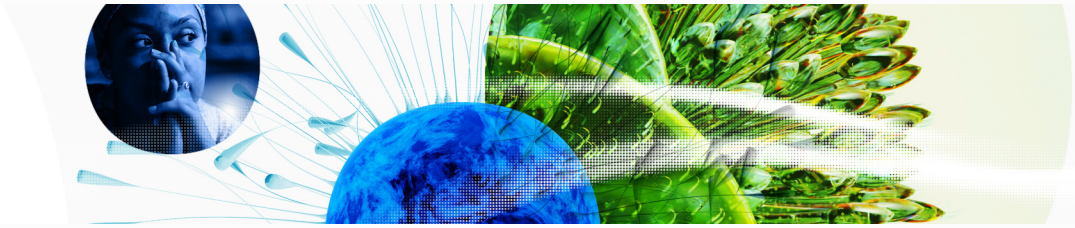
Source: Brand Finance (https://brandirectory.com/reports/gift-2022).
Note: Brand Finance only provides within economy ranks.

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

Rank	Brand	Industry	Brand Value, mn USD
1	OTP BANK	Banking	853.6
2	WIZZ AIR	Airlines	803.3

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

Global Innovation Index 2023



Hungary

GII 2023 rank **35**

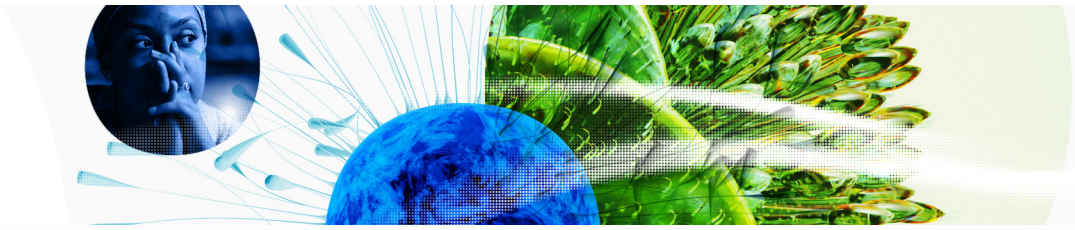
Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$
33	36	High	EUR	10.0	409.8	42,132.3

	Score / Value	Rank	
Institutions	**58.4**	**47**	
1.1 Institutional environment	**62.9**	**37**	
1.1.1 Operational stability for businesses*	71.5	26	
1.1.2 Government effectiveness*	54.3	42	
1.2 Regulatory environment	**72.2**	**40**	
1.2.1 Regulatory quality*	55.0	47	◇
1.2.2 Rule of law*	55.3	41	
1.2.3 Cost of redundancy dismissal	13.4	48	
1.3 Business environment	**40.2**	**85**	
1.3.1 Policies for doing business†	43.3	75	
1.3.2 Entrepreneurship policies and culture†	37.0	53	○
Human capital and research	**40.2**	**36**	
2.1 Education	**54.0**	**58**	
2.1.1 Expenditure on education, % GDP	4.2	64	
2.1.2 Government funding/pupil, secondary, % GDP/cap	19.1	59	
2.1.3 School life expectancy, years	15.1	51	
2.1.4 PISA scales in reading, maths and science	479.3	33	
2.1.5 Pupil-teacher ratio, secondary	10.4	36	
2.2 Tertiary education	**29.8**	**67**	◇
2.2.1 Tertiary enrolment, % gross	55.2	62	
2.2.2 Graduates in science and engineering, %	15.5	98	○ ◇
2.2.3 Tertiary inbound mobility, %	13.5	15	●
2.3 Research and development (R&D)	**36.7**	**30**	
2.3.1 Researchers, FTE/mn pop.	4,461.8	25	
2.3.2 Gross expenditure on R&D, % GDP	1.6	24	
2.3.3 Global corporate R&D investors, top 3, mn US$	51.6	30	
2.3.4 QS university ranking, top 3*	19.7	54	
Infrastructure	**53.0**	**42**	
3.1 Information and communication technologies (ICTs)	**72.1**	**60**	◇
3.1.1 ICT access*	83.5	61	
3.1.2 ICT use*	83.0	50	
3.1.3 Government's online service*	72.0	56	
3.1.4 E-participation*	50.0	75	◇
3.2 General infrastructure	**33.6**	**45**	
3.2.1 Electricity output, GWh/mn pop.	3,720.9	59	
3.2.2 Logistics performance*	50.0	50	◇
3.2.3 Gross capital formation, % GDP	31.4	22	
3.3 Ecological sustainability	**53.3**	**15**	
3.3.1 GDP/unit of energy use	11.5	53	
3.3.2 Environmental performance*	61.4	31	
3.3.3 ISO 14001 environment/bn PPP$ GDP	9.1	9	●
Market sophistication	**35.3**	**64**	
4.1 Credit	**36.2**	**47**	
4.1.1 Finance for startups and scaleups†	59.5	33	
4.1.2 Domestic credit to private sector, % GDP	37.9	87	○ ◇
4.1.3 Loans from microfinance institutions, % GDP	n/a	n/a	
4.2 Investment	**5.1**	**75**	
4.2.1 Market capitalization, % GDP	18.6	61	○
4.2.2 Venture capital (VC) investors, deals/bn PPP$ GDP	0.0	59	○
4.2.3 VC recipients, deals/bn PPP$ GDP	0.0	76	○
4.2.4 VC received, value, % GDP	0.0	65	○
4.3 Trade, diversification, and market scale	**64.5**	**32**	
4.3.1 Applied tariff rate, weighted avg., %	1.5	20	
4.3.2 Domestic industry diversification	94.3	32	
4.3.3 Domestic market scale, bn PPP$	409.8	52	

	Score / Value	Rank	
Business sophistication	**45.1**	**30**	
5.1 Knowledge workers	**47.5**	**36**	
5.1.1 Knowledge-intensive employment, %	38.7	32	
5.1.2 Firms offering formal training, %	29.3	58	
5.1.3 GERD performed by business, % GDP	1.2	20	
5.1.4 GERD financed by business, %	50.2	28	
5.1.5 Females employed w/advanced degrees, %	18.3	37	
5.2 Innovation linkages	**32.2**	**39**	
5.2.1 University-industry R&D collaboration†	49.0	52	
5.2.2 State of cluster development†	55.7	38	
5.2.3 GERD financed by abroad, % GDP	0.3	12	●
5.2.4 Joint venture/strategic alliance deals/bn PPP$ GDP	0.0	64	
5.2.5 Patent families/bn PPP$ GDP	0.3	37	
5.3 Knowledge absorption	**55.6**	**9**	
5.3.1 Intellectual property payments, % total trade	1.1	31	
5.3.2 High-tech imports, % total trade	15.1	15	●
5.3.3 ICT services imports, % total trade	1.6	57	
5.3.4 FDI net inflows, % GDP	61.0	1	●
5.3.5 Research talent, % in businesses	60.6	13	
Knowledge and technology outputs	**38.4**	**26**	
6.1 Knowledge creation	**22.4**	**47**	
6.1.1 Patents by origin/bn PPP$ GDP	1.5	45	
6.1.2 PCT patents by origin/bn PPP$ GDP	0.4	35	
6.1.3 Utility models by origin/bn PPP$ GDP	0.5	32	
6.1.4 Scientific and technical articles/bn PPP$ GDP	n/a	n/a	
6.1.5 Citable documents H-index	29.7	33	
6.2 Knowledge impact	**41.8**	**26**	
6.2.1 Labor productivity growth, %	2.4	24	
6.2.2 Unicorn valuation, % GDP	0.0	48	○ ◇
6.2.3 Software spending, % GDP	0.3	51	
6.2.4 High-tech manufacturing, %	58.8	5	●
6.3 Knowledge diffusion	**51.1**	**16**	
6.3.1 Intellectual property receipts, % total trade	1.0	21	
6.3.2 Production and export complexity	84.8	9	●
6.3.3 High-tech exports, % total trade	13.3	10	●
6.3.4 ICT services exports, % total trade	2.0	60	
6.3.5 ISO 9001 quality/bn PPP$ GDP	21.8	7	●
Creative outputs	**34.1**	**38**	
7.1 Intangible assets	**33.8**	**57**	
7.1.1 Intangible asset intensity, top 15, %	45.3	57	○
7.1.2 Trademarks by origin/bn PPP$ GDP	27.9	81	○
7.1.3 Global brand value, top 5,000	0.8	56	
7.1.4 Industrial designs by origin/bn PPP$ GDP	2.8	35	
7.2 Creative goods and services	**31.4**	**27**	
7.2.1 Cultural and creative services exports, % total trade	0.8	39	
7.2.2 National feature films/mn pop. 15-69	2.4	43	
7.2.3 Entertainment and media market/th pop. 15-69	13.5	29	◇
7.2.4 Creative goods exports, % total trade	6.8	9	●
7.3 Online creativity	**37.6**	**32**	
7.3.1 Generic top-level domains (TLDs)/th pop. 15-69	12.4	39	
7.3.2 Country-code TLDs/th pop. 15-69	35.3	20	
7.3.3 GitHub commits/mn pop. 15-69	34.9	31	
7.3.4 Mobile app creation/bn PPP$ GDP	67.7	58	

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.

Global Innovation Index 2023



→ Data availability

The following tables list indicators that are either missing or outdated for Hungary.

> Hungary has missing data for one indicator and outdated data for one indicator.

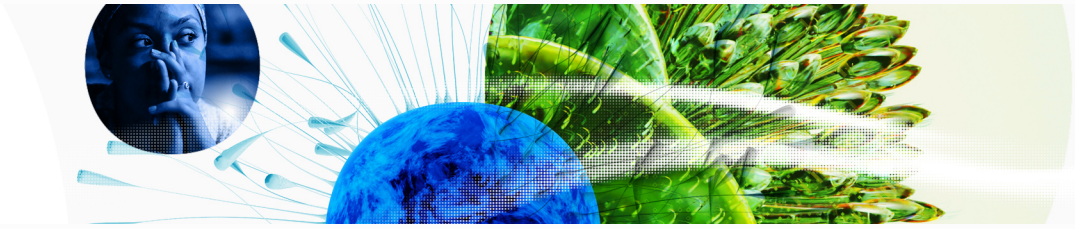
> Missing data for Hungary

Code	Indicator name	Economy Year	Model Year	Source
4.1.3	Loans from microfinance institutions, % GDP	n/a	2021	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	2019	2021	UNESCO Institute for Statistics

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.

Source: Global Innovation Index Database, WIPO, 2023.

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.