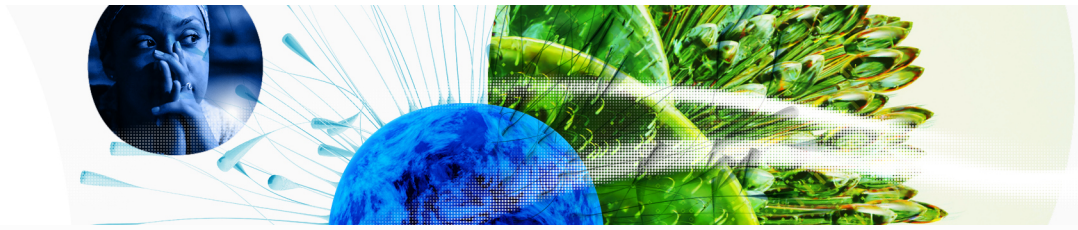
Global Innovation Index 2023



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**.

Czech Republic ranking in the Global Innovation Index 2023

> Czech Republic ranks 31st among the 132 economies featured in the GII 2023.

> Czech Republic ranks 30th among the 50 high-income group economies.

> Czech Republic ranks 20th among the 39 economies in Europe.

> Czech Republic GII Ranking (2020-2023)

The table shows the rankings of Czech Republic 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 Czech Republic in the GII 2023 is between ranks 26 and 31.

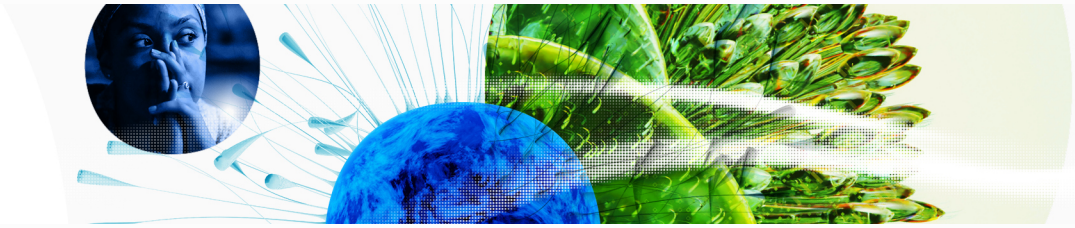
	GII Position	Innovation Inputs	Innovation Outputs
2020	24th	28th	17th
2021	24th	30th	15th
2022	30th	33rd	27th
2023	31st	34th	27th

Czech Republic performs better in innovation outputs than innovation inputs in 2023.

This year Czech Republic ranks 34th in innovation inputs. This position is lower than last year.

Czech Republic ranks 27th in innovation outputs. This position is the same as last year.

Global Innovation Index 2023

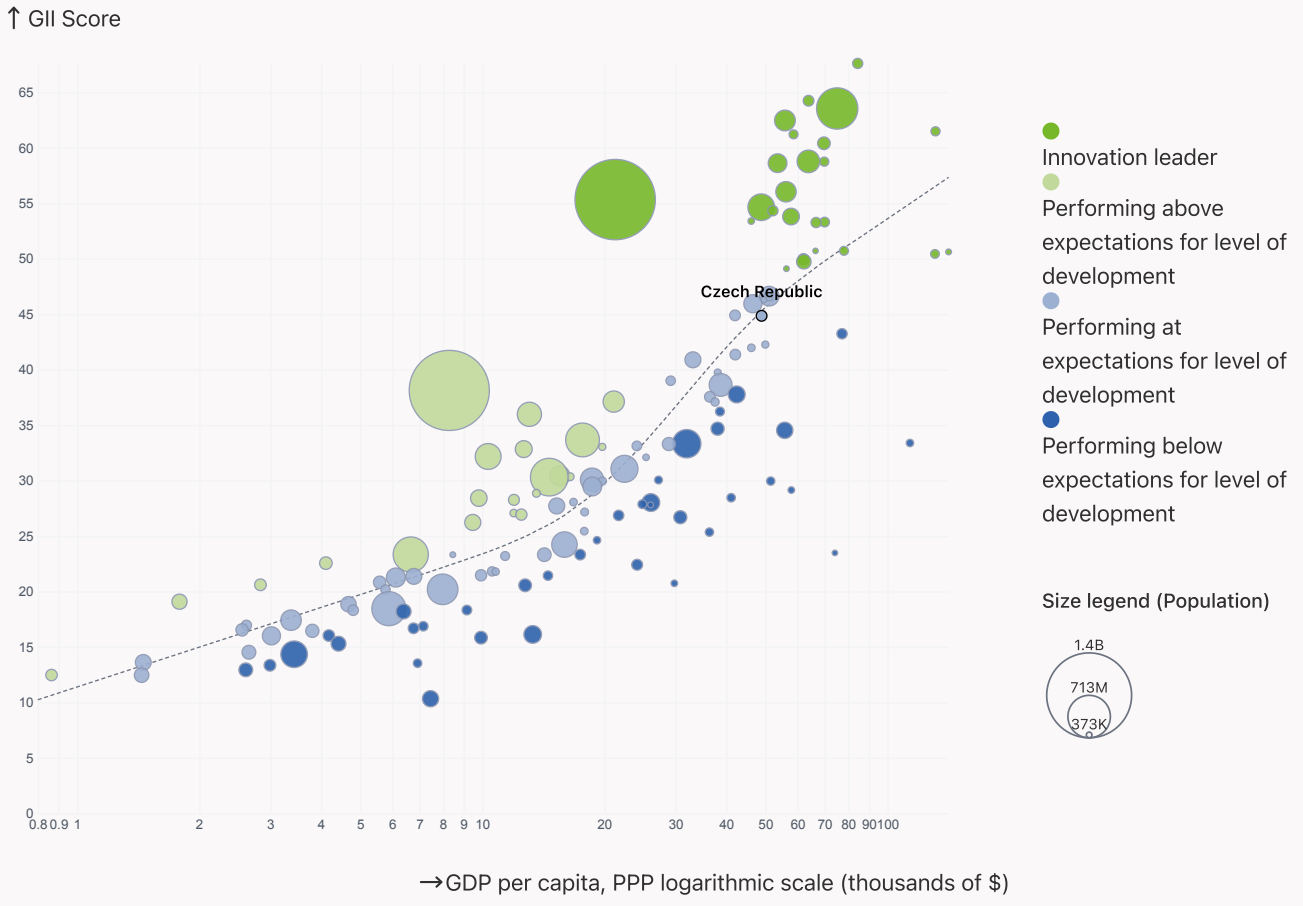


→ Expected vs. observed innovation performance

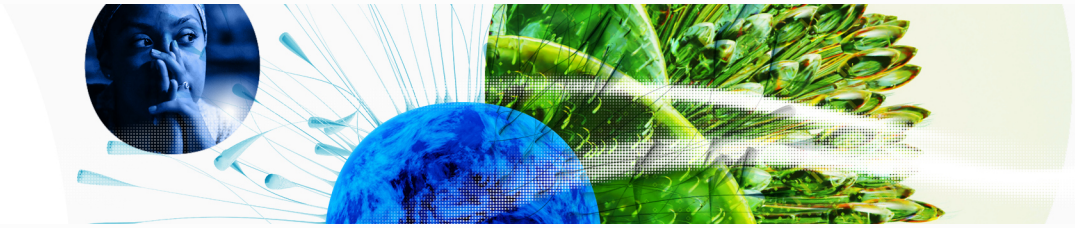
The bubble chart below shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The trend line gives an indication of the expected innovation performance according to income level. Economies appearing above the trend line are performing better than expected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

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

> Innovation overperformers relative to their economic development



Global Innovation Index 2023

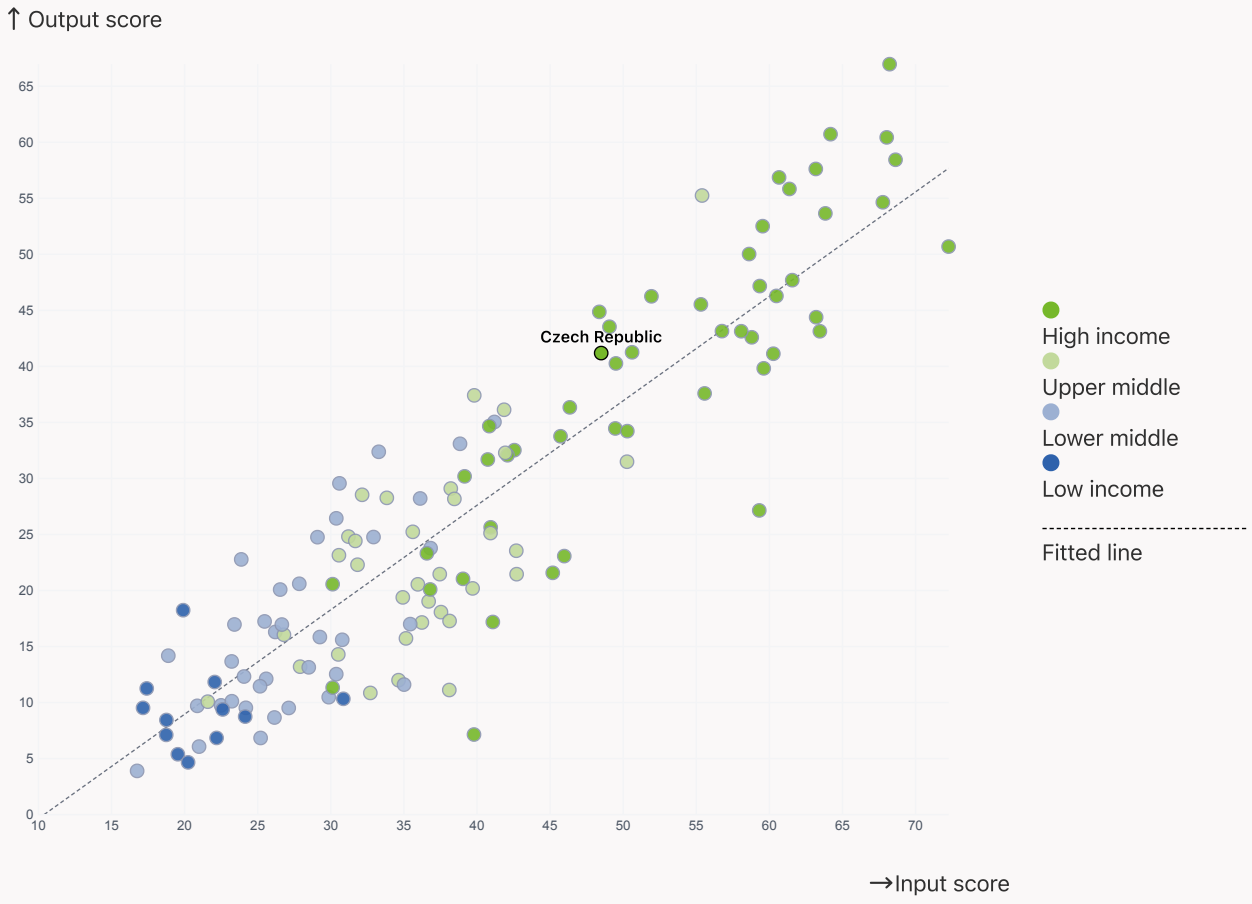


→ Effectively translating innovation investments into innovation outputs

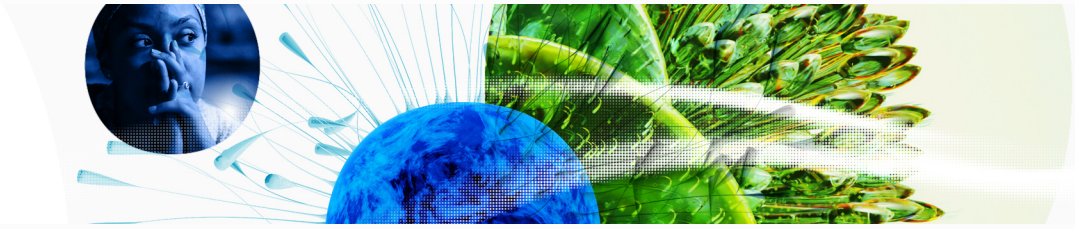
The chart below shows the relationship between innovation inputs and innovation outputs. Economies above the line are effectively translating costly innovation investments into more and higher-quality outputs.

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

> Relationship between innovation inputs and outputs

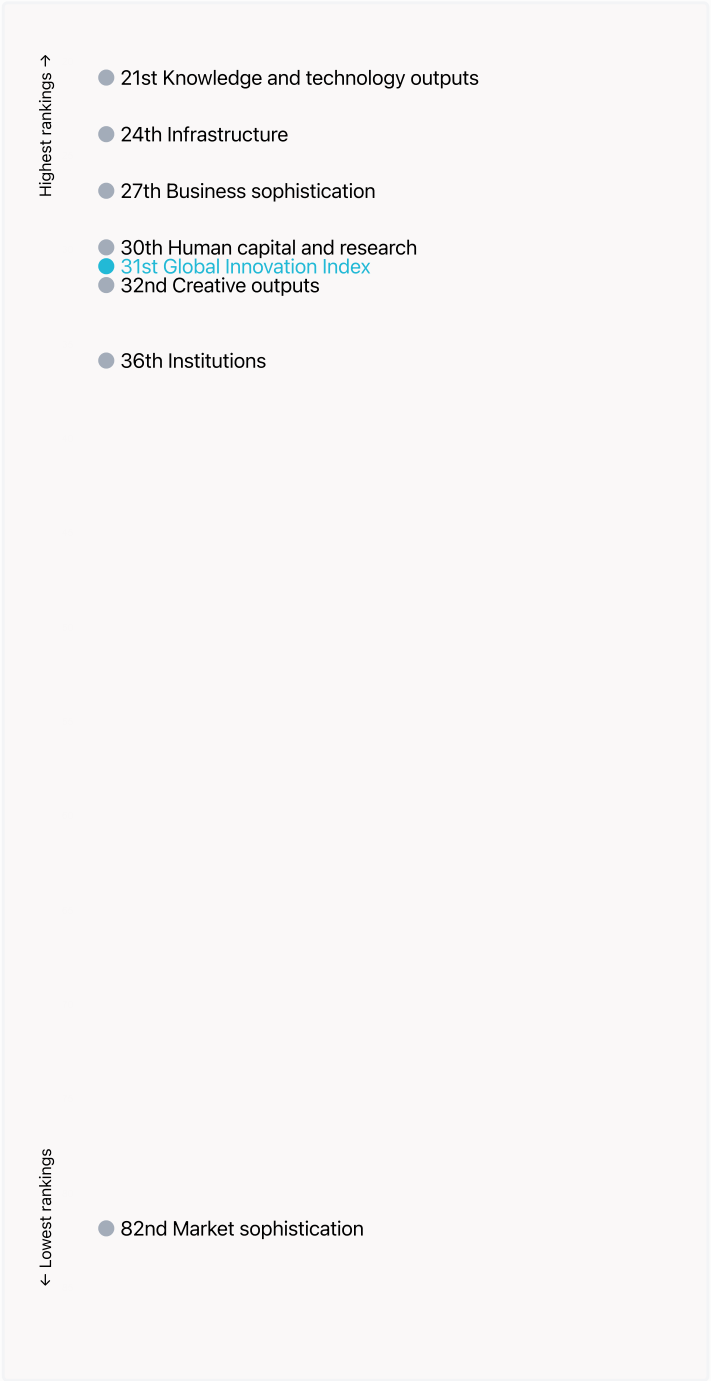


Global Innovation Index 2023



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



> Highest rankings

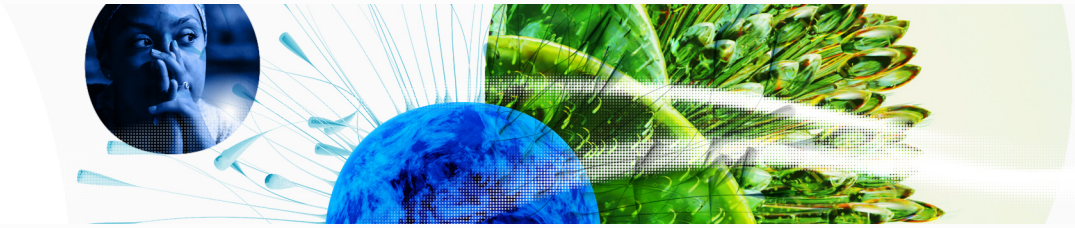
Czech Republic ranks highest in Knowledge and technology outputs (21st), Infrastructure (24th), Business sophistication (27th) and Human capital and research (30th).

> Lowest rankings

Czech Republic ranks lowest in Market sophistication (82nd), Institutions (36th) and Creative outputs (32nd).

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

Global Innovation Index 2023



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

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

> High-Income economies

Czech Republic performs below the high-income group average in Creative outputs, Market sophistication, Human capital and research, Institutions.

> Europe

Czech Republic performs below the regional average in Creative outputs, Market sophistication.

Knowledge and technology outputs

- Top 10 | Score: 58.96
- Czech Republic | Score: 43.51
- Europe | Score: 38.80
- High income | Score: 38.62

Creative outputs

- Top 10 | 56.09
- High income | 40.27
- Europe | 39.87
- Czech Republic | 38.74

Business sophistication

- Top 10 | 64.39
- Czech Republic | 47.19
- High income | 46.38
- Europe | 44.61

Market sophistication

- Top 10 | 61.93
- High income | 46.42
- Europe | 43.65
- Czech Republic | 30.41

Human capital and research

- Top 10 | 60.28
- High income | 46.30
- Czech Republic | 44.58
- Europe | 44.05

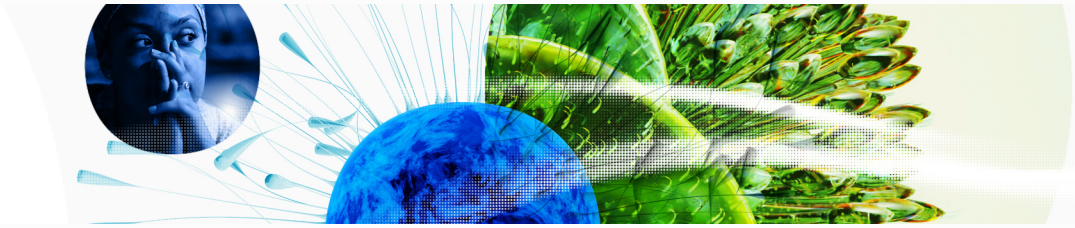
Infrastructure

- Top 10 | 62.83
- Czech Republic | 56.84
- High income | 55.85
- Europe | 54.69

Institutions

- Top 10 | 79.85
- High income | 68.16
- Czech Republic | 63.68
- Europe | 61.69

Global Innovation Index 2023



→ Innovation strengths and weaknesses in Czech Republic

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

> Czech Republic's main innovation strengths are **Creative goods exports, % total trade** (rank 1), **GERD financed by abroad, % GDP** (rank 1) and **High-tech manufacturing, %** (rank 4).

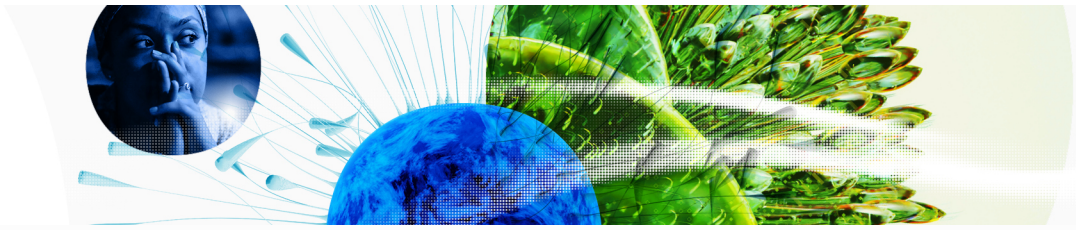
Strengths

Rank	Code	Indicator name
1	7.2.4	Creative goods exports, % total trade
1	5.2.3	GERD financed by abroad, % GDP
4	6.2.4	High-tech manufacturing, %
4	6.3.5	ISO 9001 quality/bn PPP$ GDP
6	6.3.2	Production and export complexity
6	3.3.3	ISO 14001 environment/bn PPP$ GDP
7	5.3.2	High-tech imports, % total trade
7	6.3.3	High-tech exports, % total trade
7	6.1.3	Utility models by origin/bn PPP$ GDP
14	7.3.3	GitHub commits/mn pop. 15-69

Weaknesses

Rank	Code	Indicator name
87	1.2.3	Cost of redundancy dismissal
80	5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP
77	3.3.1	GDP/unit of energy use
72	3.1.3	Government's online service
70	4.1.2	Domestic credit to private sector, % GDP
70	4.2.1	Market capitalization, % GDP
69	1.3.1	Policies for doing business
61	4.2.3	VC recipients, deals/bn PPP$ GDP
52	5.1.4	GERD financed by business, %
40	2.3.3	Global corporate R&D investors, top 3, mn US$

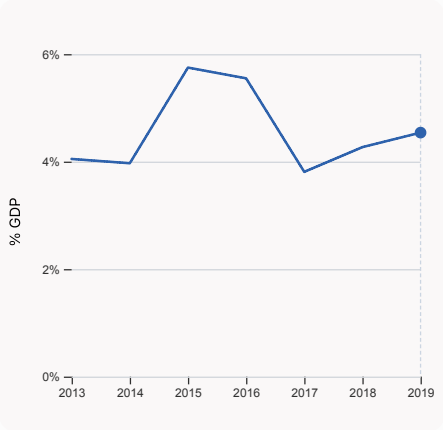
Global Innovation Index 2023



→ Czech Republic's innovation system

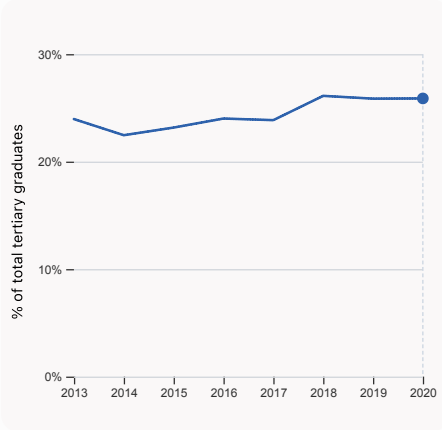
As far as practicable, the plots below present unscaled indicator data.

> Innovation inputs in Czech Republic



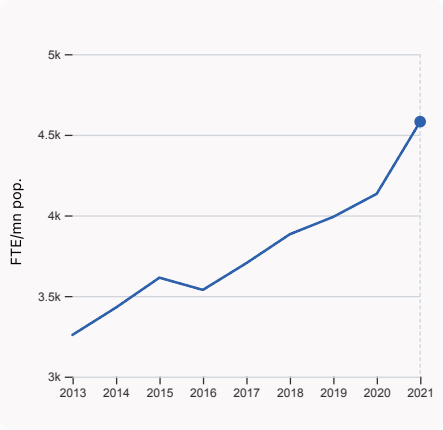
2.1.1 Expenditure on education, % GDP

was equal to 4.54% GDP in 2019, up by 0.27 percentage points from the year prior – and equivalent to an indicator rank of 53.



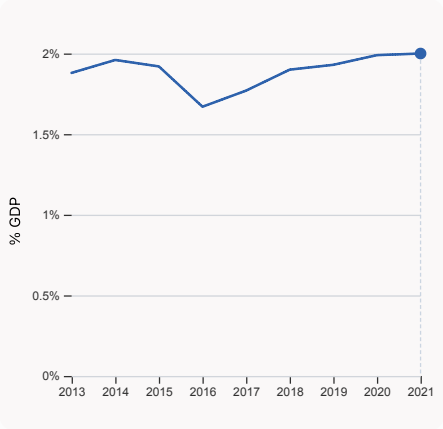
2.2.2 Graduates in science and engineering, %

was equal to 25.88% of total tertiary graduates in 2020, up by 0.02 percentage points from the year prior – and equivalent to an indicator rank of 40.



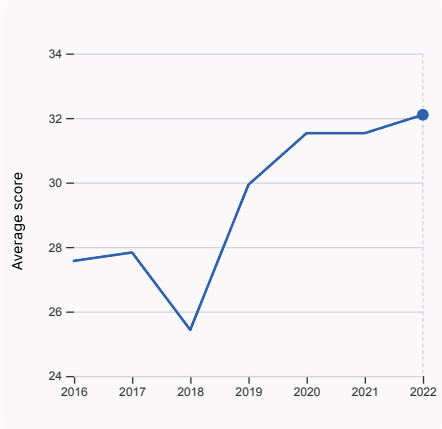
2.3.1 Researchers, FTE/mn pop.

was equal to 4,581.3 FTE/mn pop. in 2021, up by 10.83% from the year prior – and equivalent to an indicator rank of 22.



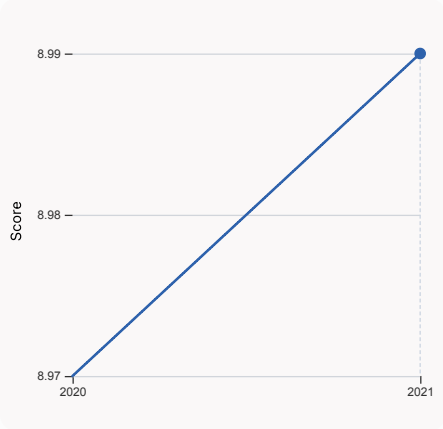
2.3.2 Gross expenditure on R&D, % GDP

was equal to 2% GDP in 2021, up by 0.01 percentage points from the year prior – and equivalent to an indicator rank of 19.



2.3.4 QS university ranking, top 3

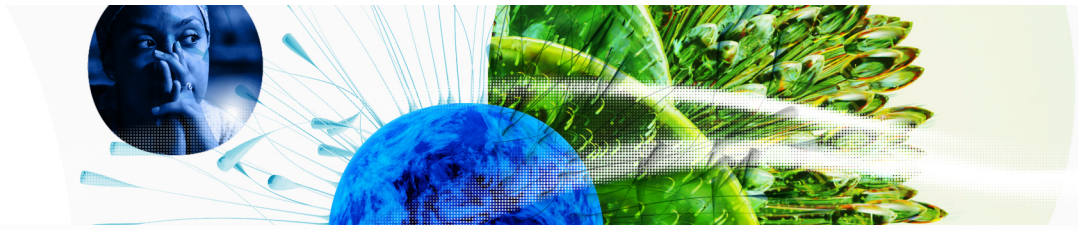
was equal to an average score of 32.1 for the top 3 universities in 2022, up by 1.81% from the year prior – and equivalent to an indicator rank of 39.

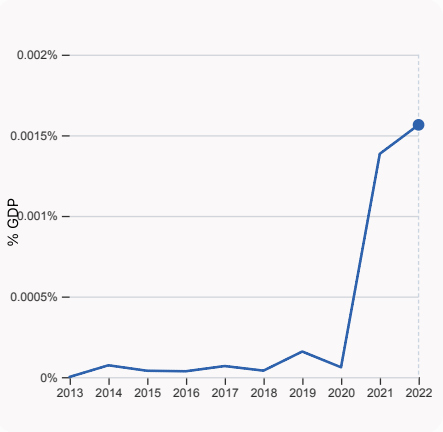


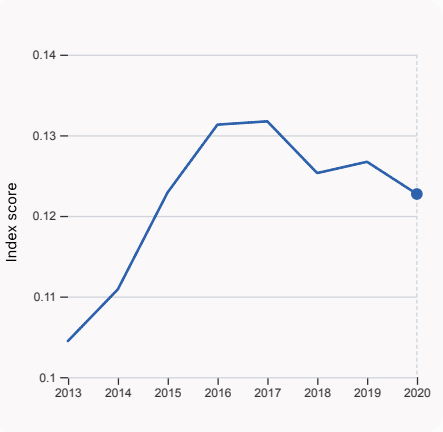
3.1.1 ICT access

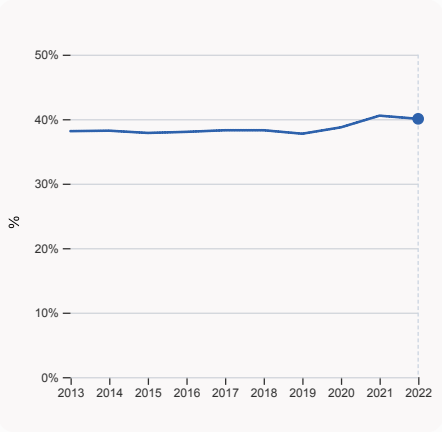
was equal to a score of 8.99 in 2021, up by 0.22% from the year prior – and equivalent to an indicator rank of 50.

Global Innovation Index 2023









4.2.4 VC received, value, % GDP

was equal to 0.00156% GDP in 2022, up by 0.00018 percentage points from the year prior – and equivalent to an indicator rank of 49.

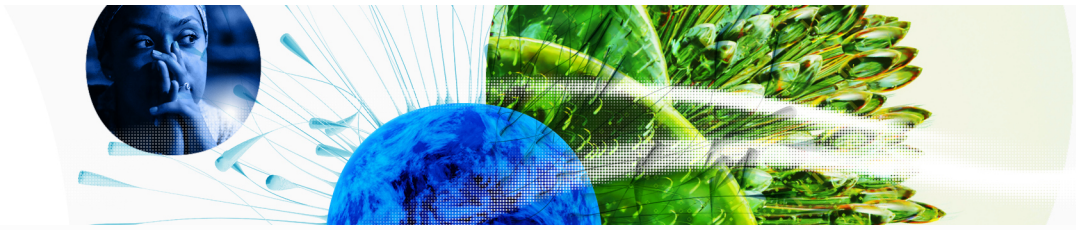
4.3.2 Domestic industry diversification

was equal to an index score of 0.123 in 2020, down by 3.16% from the year prior – and equivalent to an indicator rank of 34.

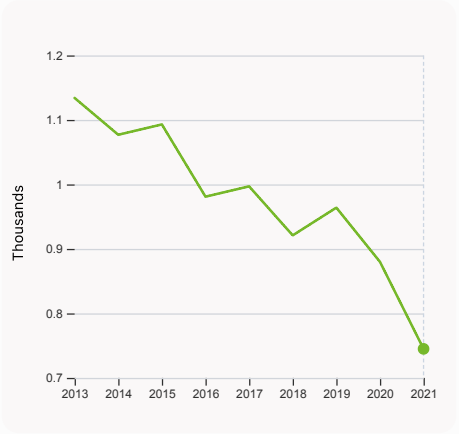
5.1.1 Knowledge-intensive employment, %

was equal to 40.05% in 2022, down by 0.49 percentage points from the year prior – and equivalent to an indicator rank of 30.

Global Innovation Index 2023

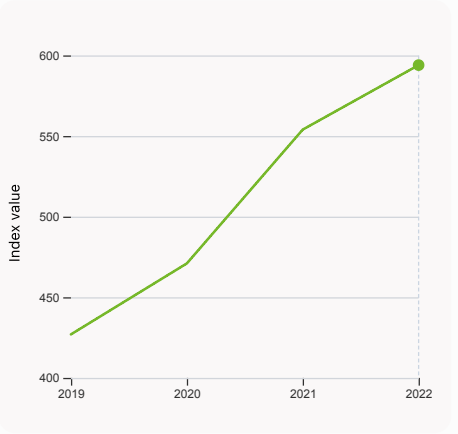


> Innovation outputs in Czech Republic



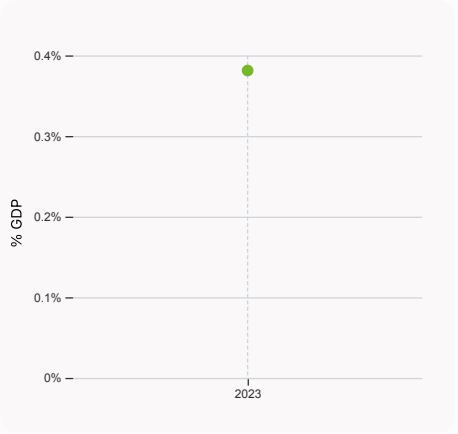
6.1.1 Patents by origin

was equal to 0.74 Thousands in 2021, down by 15.34% from the year prior – and equivalent to an indicator rank of 44.



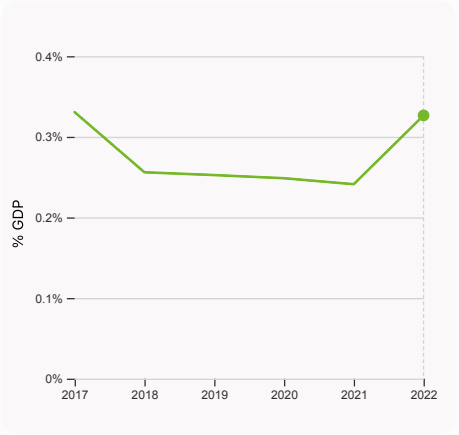
6.1.5 Citable documents H-index

was equal to an index value of 594 in 2022, up by 7.22% from the year prior – and equivalent to an indicator rank of 32.



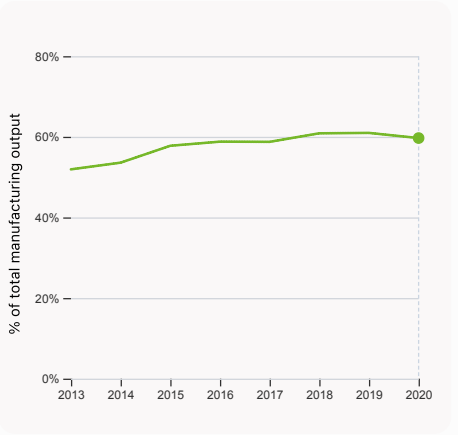
6.2.2 Unicorn valuation, % GDP

was equal to 0.381 % GDP in 2023 – and equivalent to an indicator rank of 40.



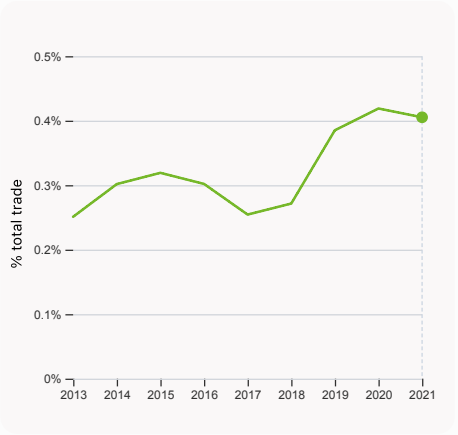
6.2.3 Software spending, % GDP

was equal to 0.327% GDP in 2022, up by 0.085 percentage points from the year prior – and equivalent to an indicator rank of 34.



6.2.4 High-tech manufacturing, %

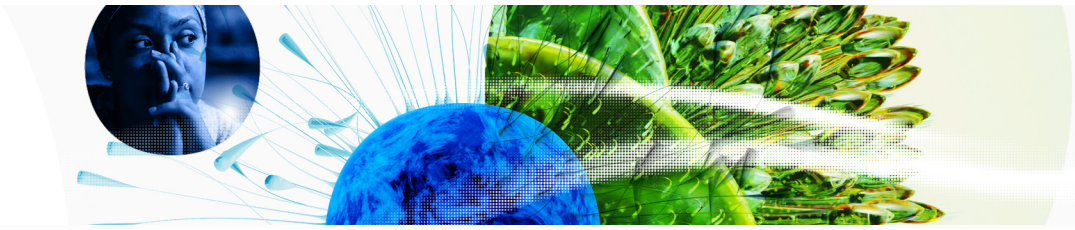
was equal to 59.69% of total manufacturing output in 2020, down by 1.28 percentage points from the year prior – and equivalent to an indicator rank of 4.



6.3.1 Intellectual property receipts, % total trade

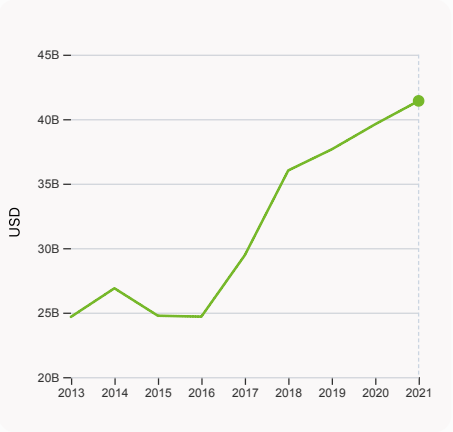
was equal to 0.405% total trade in 2021, down by 0.014 percentage points from the year prior – and equivalent to an indicator rank of 28.

Global Innovation Index 2023



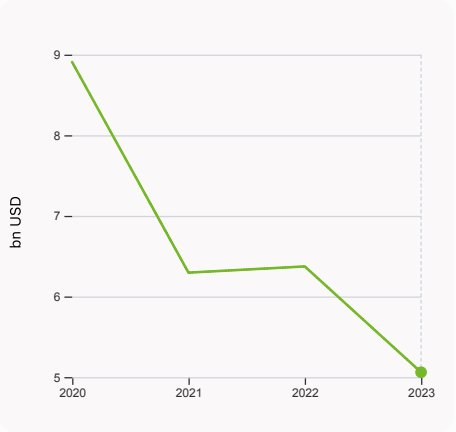
6.3.2 Production and export complexity

was equal to a score of 1.78 in 2020, down by 0.56% from the year prior – and equivalent to an indicator rank of 6.



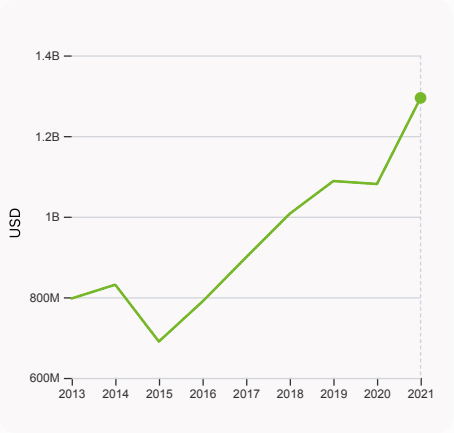
6.3.3 High-tech exports

was equal to 41,415,751,649 USD in 2021, up by 4.58% from the year prior – and equivalent to an indicator rank of 7.



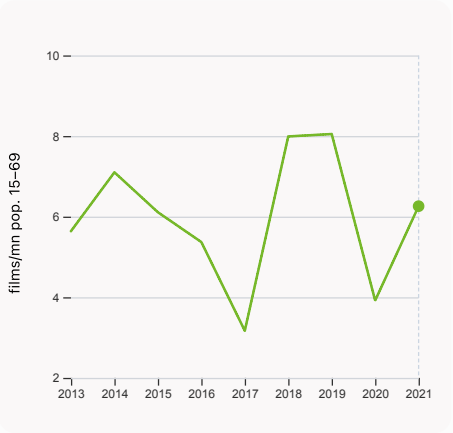
7.1.3 Global brand value, top 5,000

was equal to 5.06 bn USD in 2023, down by 20.59% from the year prior – and equivalent to an indicator rank of 47.



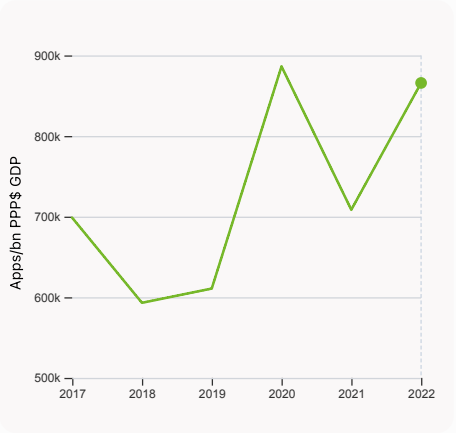
7.2.1 Cultural and creative services exports

was equal to 1,294,589,000 USD in 2021, up by 19.76% from the year prior – and equivalent to an indicator rank of 45.



7.2.2 National feature films/mn pop. 15-69

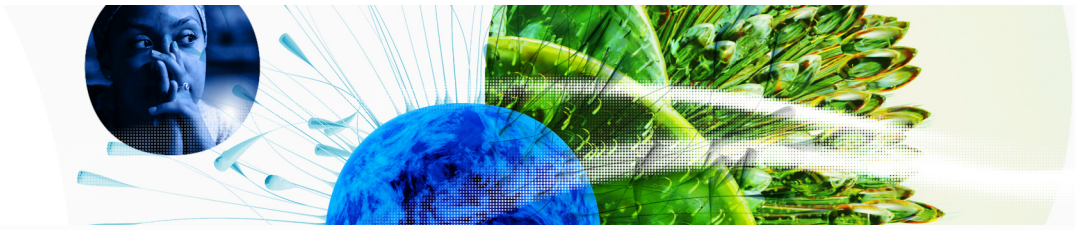
was equal to 6.26 films/mn pop. 15–69 in 2021, up by 59.69% from the year prior – and equivalent to an indicator rank of 16.



7.3.4 Mobile app creation/bn PPP$ GDP

was equal to 865,862 Apps/bn PPP$ GDP in 2022, up by 22.2% from the year prior – and equivalent to an indicator rank of 26.

Global Innovation Index 2023



→ Czech Republic's innovation top performers

> 2.3.4 QS university ranking of Czech Republic's top universities

Rank	University	Score
288	CHARLES UNIVERSITY	36.00
358	UNIVERSITY OF CHEMISTRY AND TECHNOLOGY, PRAGUE	30.60
378	CZECH TECHNICAL UNIVERSITY IN PRAGUE	29.70

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".

> 6.2.2 Top Unicorn Companies in Czech Republic

Rank	Unicorn Company	Industry	City	Valuation, bn USD
1	ROHLIK GROUP	Supply chain, logistics, & delivery	Prague	1

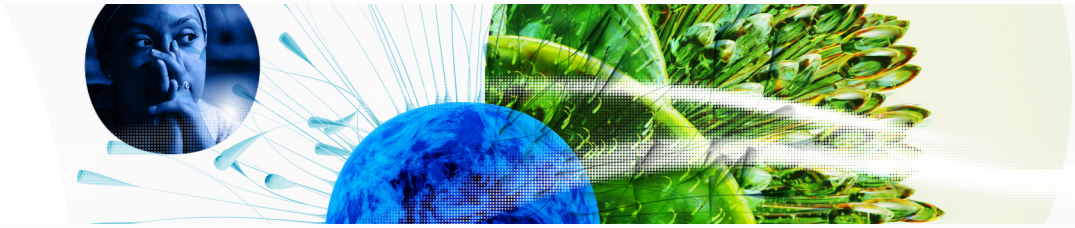
Source: CBInsights, Tracker – The Complete List of Unicorn Companies: https://www.cbinsights.com/research-unicorn-companies

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

Rank	Brand	Industry	Brand Value, mn USD
1	SKODA	Automobiles	2,062.8
2	KOMERCNI BANKA	Banking	890.9
3	VELKOPOPOVICKY KOZEL	Beers	506.2

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

Global Innovation Index 2023



Czech Republic

GII 2023 rank **31**

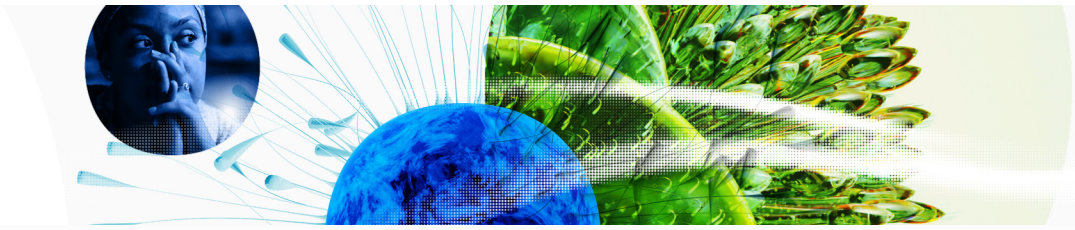
Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$
27	34	High	EUR	10.5	514.7	48,918.6

	Score / Value	Rank
Institutions	**63.7**	**36**
1.1 Institutional environment	**69.8**	**23**
1.1.1 Operational stability for businesses*	72.2	22
1.1.2 Government effectiveness*	67.4	29
1.2 Regulatory environment	**75.3**	**34**
1.2.1 Regulatory quality*	77.1	21
1.2.2 Rule of law*	72.7	25
1.2.3 Cost of redundancy dismissal	20.2	87 ○
1.3 Business environment	**45.9**	**66**
1.3.1 Policies for doing business†	45.9	69 ○
1.3.2 Entrepreneurship policies and culture†	n/a	n/a
Human capital and research	**44.6**	**30**
2.1 Education	**60.7**	**32**
2.1.1 Expenditure on education, % GDP	4.5	53
2.1.2 Government funding/pupil, secondary, % GDP/cap	27.1	13
2.1.3 School life expectancy, years	16.3	30
2.1.4 PISA scales in reading, maths and science	495.5	23
2.1.5 Pupil-teacher ratio, secondary	11.5	48
2.2 Tertiary education	**44.1**	**23**
2.2.1 Tertiary enrolment, % gross	68.1	45
2.2.2 Graduates in science and engineering, %	25.9	40
2.2.3 Tertiary inbound mobility, %	15.0	13
2.3 Research and development (R&D)	**28.9**	**36**
2.3.1 Researchers, FTE/mn pop.	4,581.3	22
2.3.2 Gross expenditure on R&D, % GDP	2.0	19
2.3.3 Global corporate R&D investors, top 3, mn US$	0.0	40 ○ ◇
2.3.4 QS university ranking, top 3*	32.5	39
Infrastructure	**56.8**	**24**
3.1 Information and communication technologies (ICTs)	**73.3**	**56**
3.1.1 ICT access*	84.9	50
3.1.2 ICT use*	85.5	38
3.1.3 Government's online service*	63.5	72 ○ ◇
3.1.4 E-participation*	59.3	57
3.2 General infrastructure	**41.7**	**30**
3.2.1 Electricity output, GWh/mn pop.	7,824.6	22
3.2.2 Logistics performance*	54.5	42
3.2.3 Gross capital formation, % GDP	30.7	23
3.3 Ecological sustainability	**55.5**	**12**
3.3.1 GDP/unit of energy use	9.4	77 ○
3.3.2 Environmental performance*	69.5	19
3.3.3 ISO 14001 environment/bn PPP$ GDP	9.7	6 ●
Market sophistication	**30.4**	**82 ◇**
4.1 Credit	**18.8**	**94**
4.1.1 Finance for startups and scaleups†	n/a	n/a
4.1.2 Domestic credit to private sector, % GDP	53.1	70 ○
4.1.3 Loans from microfinance institutions, % GDP	n/a	n/a
4.2 Investment	**7.3**	**64**
4.2.1 Market capitalization, % GDP	10.6	70 ○ ◇
4.2.2 Venture capital (VC) investors, deals/bn PPP$ GDP	0.1	44
4.2.3 VC recipients, deals/bn PPP$ GDP	0.0	61 ○
4.2.4 VC received, value, % GDP	0.0	49
4.3 Trade, diversification, and market scale	**65.2**	**28**
4.3.1 Applied tariff rate, weighted avg., %	1.5	20
4.3.2 Domestic industry diversification	94.0	34
4.3.3 Domestic market scale, bn PPP$	514.7	47

	Score / Value	Rank
Business sophistication	**47.2**	**27**
5.1 Knowledge workers	**45.9**	**39**
5.1.1 Knowledge-intensive employment, %	40.0	30
5.1.2 Firms offering formal training, %	43.6	27
5.1.3 GERD performed by business, % GDP	1.3	19
5.1.4 GERD financed by business, %	36.1	52 ○
5.1.5 Females employed w/advanced degrees, %	13.9	54
5.2 Innovation linkages	**45.8**	**25**
5.2.1 University-industry R&D collaboration†	72.4	23
5.2.2 State of cluster development†	41.4	66
5.2.3 GERD financed by abroad, % GDP	0.6	1 ●
5.2.4 Joint venture/strategic alliance deals/bn PPP$ GDP	0.0	80 ○
5.2.5 Patent families/bn PPP$ GDP	0.5	32
5.3 Knowledge absorption	**49.9**	**19**
5.3.1 Intellectual property payments, % total trade	0.8	48
5.3.2 High-tech imports, % total trade	21.2	7 ●
5.3.3 ICT services imports, % total trade	1.7	53
5.3.4 FDI net inflows, % GDP	3.5	39
5.3.5 Research talent, % in businesses	53.3	20
Knowledge and technology outputs	**43.5**	**21**
6.1 Knowledge creation	**35.0**	**27**
6.1.1 Patents by origin/bn PPP$ GDP	1.6	44
6.1.2 PCT patents by origin/bn PPP$ GDP	0.5	33
6.1.3 Utility models by origin/bn PPP$ GDP	2.2	7 ●
6.1.4 Scientific and technical articles/bn PPP$ GDP	n/a	n/a
6.1.5 Citable documents H-index	30.7	32
6.2 Knowledge impact	**41.5**	**27**
6.2.1 Labor productivity growth, %	0.9	67
6.2.2 Unicorn valuation, % GDP	0.4	40
6.2.3 Software spending, % GDP	0.3	34
6.2.4 High-tech manufacturing, %	59.7	4 ●
6.3 Knowledge diffusion	**54.0**	**11**
6.3.1 Intellectual property receipts, % total trade	0.4	28
6.3.2 Production and export complexity	89.8	6 ●
6.3.3 High-tech exports, % total trade	20.7	7 ●
6.3.4 ICT services exports, % total trade	3.1	39
6.3.5 ISO 9001 quality/bn PPP$ GDP	24.4	4 ●
Creative outputs	**38.7**	**32**
7.1 Intangible assets	**28.4**	**71**
7.1.1 Intangible asset intensity, top 15, %	n/a	n/a
7.1.2 Trademarks by origin/bn PPP$ GDP	61.7	37
7.1.3 Global brand value, top 5,000	1.6	47
7.1.4 Industrial designs by origin/bn PPP$ GDP	2.9	34
7.2 Creative goods and services	**45.1**	**8**
7.2.1 Cultural and creative services exports, % total trade	0.6	45
7.2.2 National feature films/mn pop. 15-69	6.3	16
7.2.3 Entertainment and media market/th pop. 15-69	27.2	25
7.2.4 Creative goods exports, % total trade	10.9	1 ●
7.3 Online creativity	**53.1**	**20**
7.3.1 Generic top-level domains (TLDs)/th pop. 15-69	20.6	30
7.3.2 Country-code TLDs/th pop. 15-69	59.1	16
7.3.3 GitHub commits/mn pop. 15-69	58.0	14 ●
7.3.4 Mobile app creation/bn PPP$ GDP	74.8	26

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 Czech Republic.

> Czech Republic has missing data for four indicators and outdated data for two indicators.

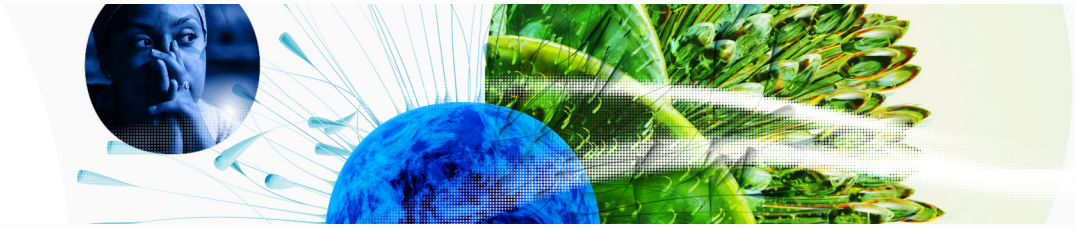
> Missing data for Czech Republic

Code	Indicator name	Economy Year	Model Year	Source
1.3.2	Entrepreneurship policies and culture	n/a	2022	Global Entrepreneurship Monitor
4.1.1	Finance for startups and scaleups	n/a	2022	Global Entrepreneurship Monitor
4.1.3	Loans from microfinance institutions, % GDP	n/a	2021	International Monetary Fund, Financial Access Survey (FAS)
7.1.1	Intangible asset intensity, top 15, %	n/a	2022	Brand Finance

> Outdated data for Czech Republic

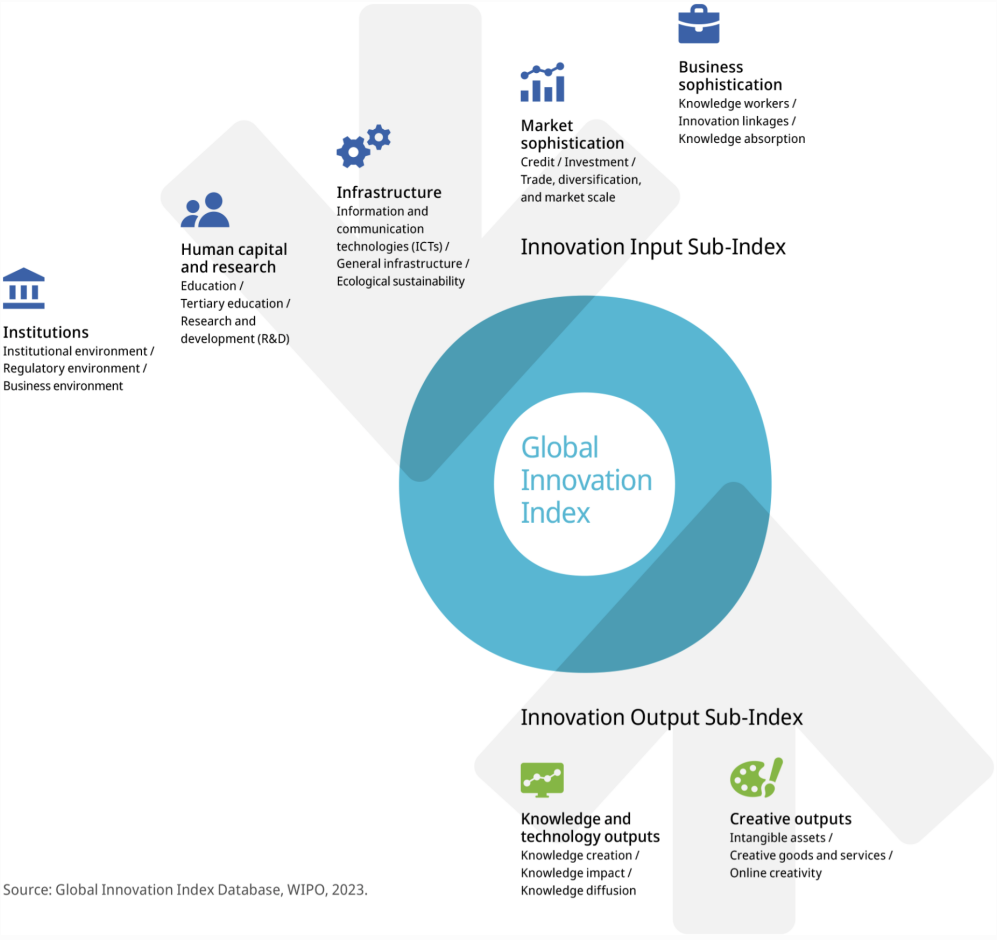
Code	Indicator name	Economy Year	Model Year	Source
2.1.1	Expenditure on education, % GDP	2019	2021	UNESCO Institute for Statistics
2.1.5	Pupil-teacher ratio, secondary	2013	2020	UNESCO Institute for Statistics

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.