



SLOVAKIA

46th

Slovakia ranks 46th 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 Slovakia 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 Slovakia in the GII 2022 is between ranks 45 and 50.

Rankings for Slovakia (2020–2022)

GIIYR	GII	Innovation inputs	Innovation outputs
2020	39	43	34
2021	37	42	35
2022	46	54	45

- Slovakia performs better in innovation outputs than innovation inputs in 2022.
- This year Slovakia ranks 54th in innovation inputs, lower than both 2021 and 2020.
- As for innovation outputs, Slovakia ranks 45th. This position is lower than both 2021 and 2020.

39th

Slovakia ranks 39th among the 48 high-income group economies.

29th

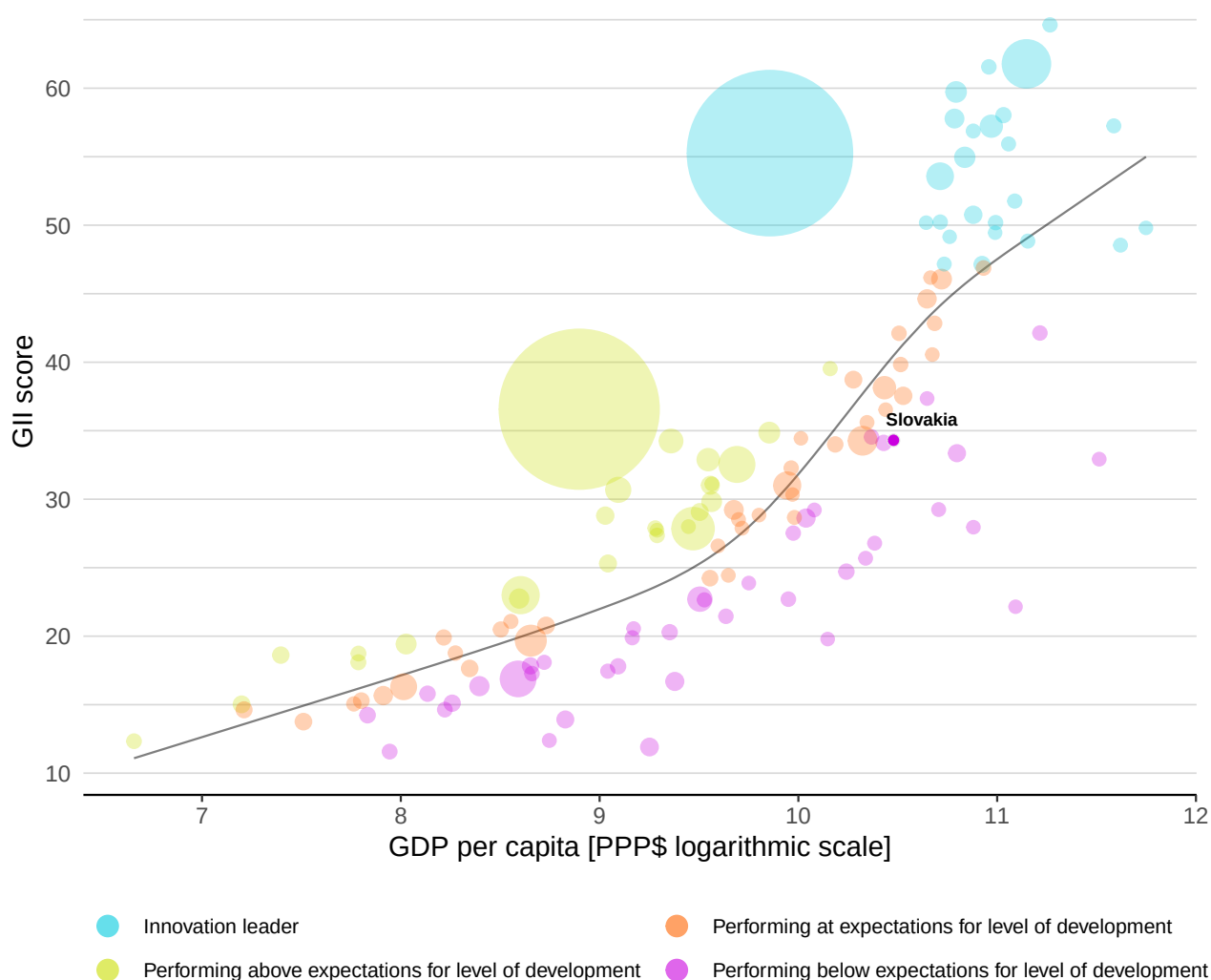
Slovakia ranks 29th among the 39 economies in Europe.

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, Slovakia's performance is below expectations for its level of development.

The positive relationship between innovation and development

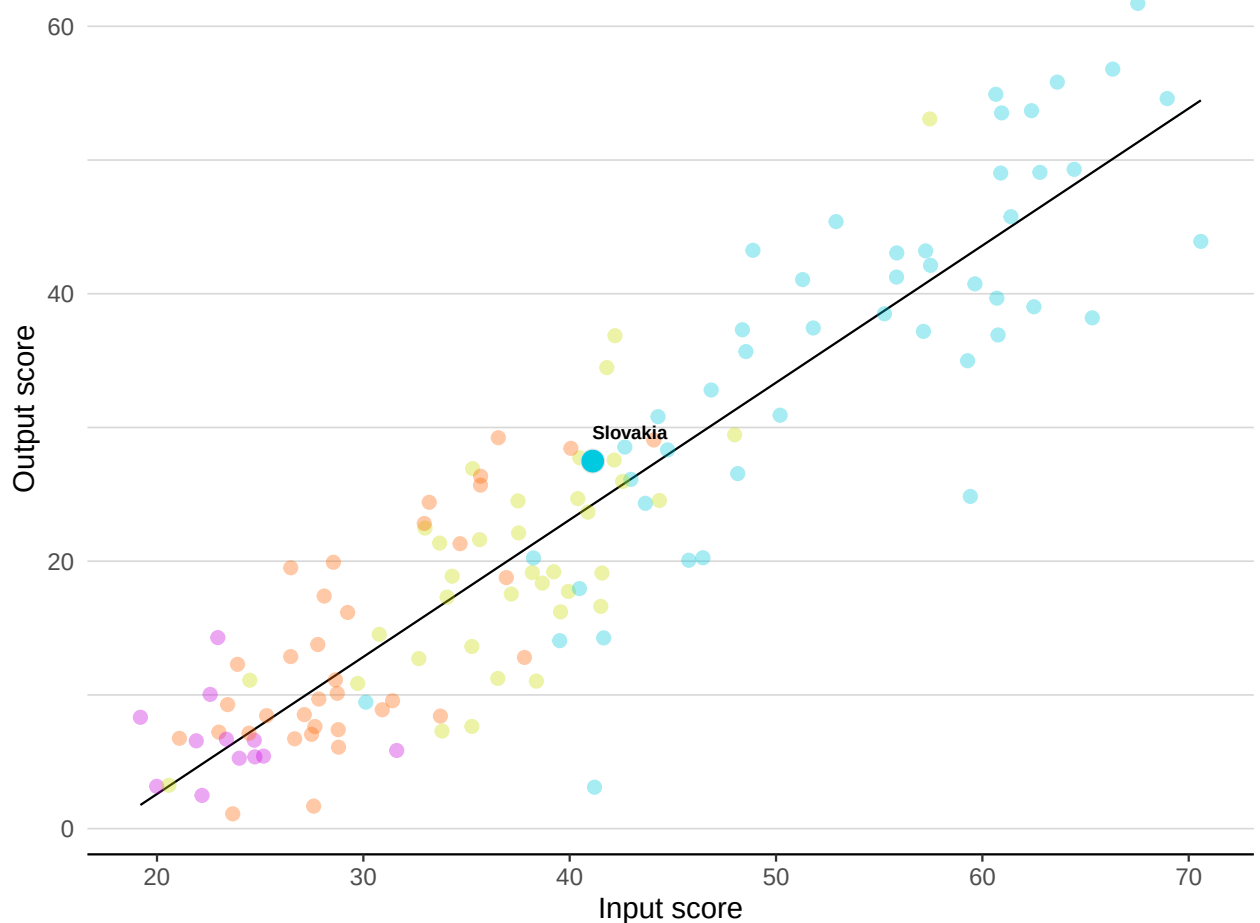


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

Slovakia 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 Slovakia



High-income group economies

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

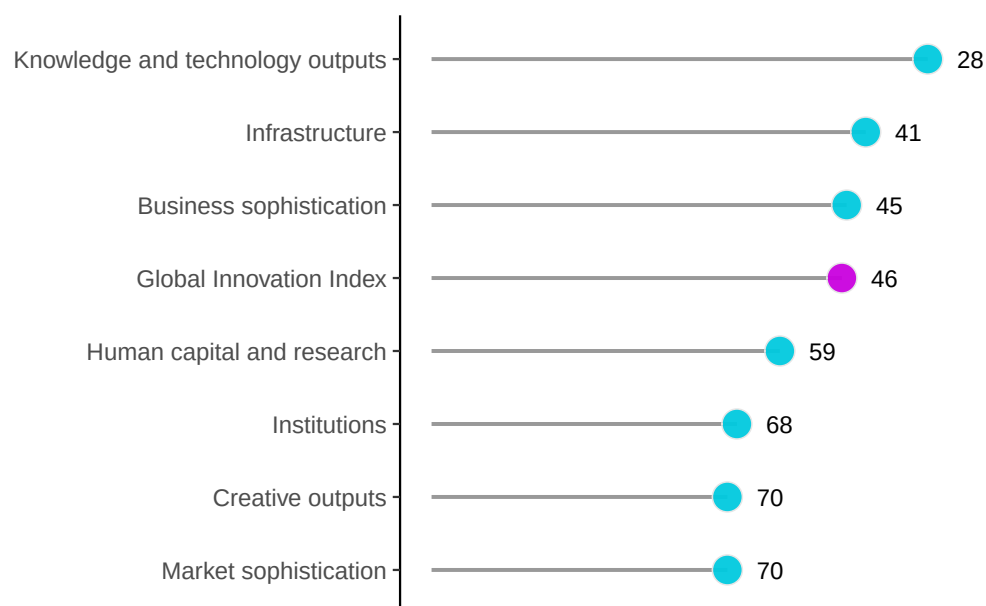
Europe

Slovakia performs below the regional average in all GII pillars.

OVERVIEW OF RANKINGS IN THE SEVEN GII 2022 AREAS

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

The seven GII pillar ranks for Slovakia



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

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

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

INNOVATION STRENGTHS AND WEAKNESSES

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

Strengths and weaknesses for Slovakia

Strengths			Weaknesses		
Code	Indicator name	Rank	Code	Indicator name	Rank
3.3.2	Environmental performance	18	1.3.1	Policies for doing business	102
3.3.3	ISO 14001 environmental certificates/bn PPP\$ GDP	7	1.3.2	Entrepreneurship policies and culture	69
5.3.2	High-tech imports, % total trade	21	2.3.3	Global corporate R&D investors, top 3, mn USD	38
6.1.3	Utility models by origin/bn PPP\$ GDP	12	3.2.3	Gross capital formation, % GDP	101
6.2.4	ISO 9001 quality certificates/bn PPP\$ GDP	11	4.2.1	Market capitalization, % GDP	77
6.2.5	High-tech manufacturing, %	3	4.2.3	Venture capital recipients, deals/bn PPP\$ GDP	86
6.3.2	Production and export complexity	14	4.2.4	Venture capital received, value, % GDP	83
6.3.3	High-tech exports, % total trade	21	5.2.4	Joint venture/strategic alliance deals/bn PPP\$ GDP	112
7.2.5	Creative goods exports, % total trade	9	7.1.1	Intangible asset intensity, top 15, %	78
7.3.2	Country-code TLDs/th pop. 15–69	22	7.2.4	Printing and other media, % manufacturing	82

Slovakia

46

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$
45	54	High	EUR	5.5	194.1	35,547
		Score/Value	Rank			
 Institutions		55.5	68	 Business sophistication		33.3 45
1.1	Political environment	72.5	37	5.1	Knowledge workers	46.7 36
1.1.1	Political and operational stability*	83.6	16	5.1.1	Knowledge-intensive employment, %	37.6 37
1.1.2	Government effectiveness*	61.4	43	5.1.2	Firms offering formal training, %	43.3 27
1.2	Regulatory environment	71.4	45	5.1.3	GERD performed by business, % GDP	0.5 40
1.2.1	Regulatory quality*	64.5	39	5.1.4	GERD financed by business, %	43.7 36
1.2.2	Rule of law*	63.7	38	5.1.5	Females employed w/advanced degrees, %	18.4 37
1.2.3	Cost of redundancy dismissal	18.8	81	5.2	Innovation linkages	22.3 69
1.3	Business environment	22.5	122	5.2.1	University-industry R&D collaboration†	37.5 92
1.3.1	Policies for doing business†	36.4	102	5.2.2	State of cluster development and depth†	44.6 79
1.3.2	Entrepreneurship policies and culture*	8.6	69	5.2.3	GERD financed by abroad, % GDP	0.1 30
 Human capital and research		33.1	59	5.2.4	Joint venture/strategic alliance deals/bn PPP\$ GDP	0.0 112
2.1	Education	52.8	64	5.2.5	Patent families/bn PPP\$ GDP	0.1 50
2.1.1	Expenditure on education, % GDP	4.0	77	5.3	Knowledge absorption	31.0 61
2.1.2	Government funding/pupil, secondary, % GDP/cap	20.5	54	5.3.1	Intellectual property payments, % total trade	0.7 57
2.1.3	School life expectancy, years	14.5	61	5.3.2	High-tech imports, % total trade	12.3 21
2.1.4	PISA scales in reading, maths and science	469.4	38	5.3.3	ICT services imports, % total trade	1.3 75
2.1.5	Pupil-teacher ratio, secondary	11.0	39	5.3.4	FDI net inflows, % GDP	1.3 90
2.2	Tertiary education	32.1	63	5.3.5	Research talent, % in businesses	24.6 50
2.2.1	Tertiary enrolment, % gross	46.4	69	 Knowledge and technology outputs		36.1 28
2.2.2	Graduates in science and engineering, %	22.2	55	6.1	Knowledge creation	22.6 43
2.2.3	Tertiary inbound mobility, %	9.0	29	6.1.1	Patents by origin/bn PPP\$ GDP	1.5 52
2.3	Research and development (R&D)	14.4	48	6.1.2	PCT patents by origin/bn PPP\$ GDP	0.2 53
2.3.1	Researchers, FTE/mn pop.	3,164.3	30	6.1.3	Utility models by origin/bn PPP\$ GDP	1.9 12
2.3.2	Gross expenditure on R&D, % GDP	0.9	43	6.1.4	Scientific and technical articles/bn PPP\$ GDP	26.9 34
2.3.3	Global corporate R&D investors, top 3, mn USD	0.0	38	6.1.5	Citable documents H-index	17.0 50
2.3.4	QS university ranking, top 3*	16.8	55	6.2	Knowledge impact	48.2 10
 Infrastructure		52.5	41	6.2.1	Labor productivity growth, %	1.0 61
3.1	Information and communication technologies (ICTs)	75.9	56	6.2.2	New businesses/th pop. 15–64	5.1 29
3.1.1	ICT access*	90.0	45	6.2.3	Software spending, % GDP	0.3 41
3.1.2	ICT use*	71.5	54	6.2.4	ISO 9001 quality certificates/bn PPP\$ GDP	22.2 11
3.1.3	Government's online service*	71.8	63	6.2.5	High-tech manufacturing, %	61.5 3
3.1.4	E-participation*	70.2	70	6.3	Knowledge diffusion	37.6 34
3.2	General infrastructure	31.2	60	6.3.1	Intellectual property receipts, % total trade	0.1 72
3.2.1	Electricity output, GWh/mn pop.	5,183.2	41	6.3.2	Production and export complexity	75.6 14
3.2.2	Logistics performance*	45.6	51	6.3.3	High-tech exports, % total trade	8.8 21
3.2.3	Gross capital formation, % GDP	18.6	101	6.3.4	ICT services exports, % total trade	1.9 66
3.3	Ecological sustainability	50.3	11	 Creative outputs		18.8 70
3.3.1	GDP/unit of energy use	10.8	63	7.1	Intangible assets	14.6 90
3.3.2	Environmental performance*	60.0	18	7.1.1	Intangible asset intensity, top 15, %	–114.2 78
3.3.3	ISO 14001 environmental certificates/bn PPP\$ GDP	10.1	7	7.1.2	Trademarks by origin/bn PPP\$ GDP	56.6 43
 Market sophistication		31.2	70	7.1.3	Global brand value, top 5,000, % GDP	2.7 74
4.1	Credit	33.6	41	7.1.4	Industrial designs by origin/bn PPP\$ GDP	2.7 39
4.1.1	Finance for startups and scaleups*	42.9	32	7.2	Creative goods and services	31.5 23
4.1.2	Domestic credit to private sector, % GDP	67.2	51	7.2.1	Cultural and creative services exports, % total trade	0.3 65
4.1.3	Loans from microfinance institutions, % GDP	n/a	n/a	7.2.2	National feature films/mn pop. 15–69	5.7 19
4.2	Investment	2.0	104	7.2.3	Entertainment and media market/th pop. 15–69	n/a n/a
4.2.1	Market capitalization, % GDP	5.6	77	7.2.4	Printing and other media, % manufacturing	0.5 82
4.2.2	Venture capital investors, deals/bn PPP\$ GDP	0.0	66	7.2.5	Creative goods exports, % total trade	6.9 9
4.2.3	Venture capital recipients, deals/bn PPP\$ GDP	0.0	86	7.3	Online creativity	14.7 38
4.2.4	Venture capital received, value, % GDP	0.0	83	7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	3.3 61
4.3	Trade, diversification, and market scale	58.0	62	7.3.2	Country-code TLDs/th pop. 15–69	31.8 22
4.3.1	Applied tariff rate, weighted avg., %	1.5	20	7.3.3	GitHub commit pushes received/mn pop. 15–69	14.9 36
4.3.2	Domestic industry diversification	79.4	70	7.3.4	Mobile app creation/bn PPP\$ GDP	8.9 43
4.3.3	Domestic market scale, bn PPP\$	194.1	69			

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 Slovakia.

Missing data for Slovakia

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)
7.2.3	Entertainment and media market/th pop. 15–69	n/a	2021	PwC, GEMO

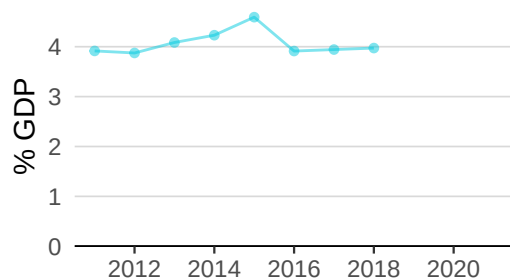
Outdated data for Slovakia

Code	Indicator name	Economy year	Model year	Source
2.1.1	Expenditure on education, % GDP	2018	2020	UNESCO Institute for Statistics
4.2.1	Market capitalization, % GDP	2014	2020	World Federation of Exchanges

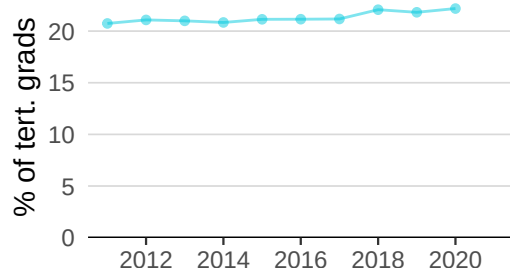
SLOVAKIA'S INNOVATION SYSTEM

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

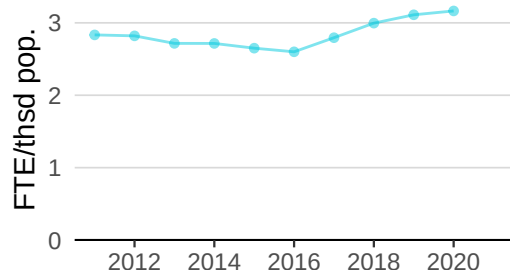
Innovation inputs



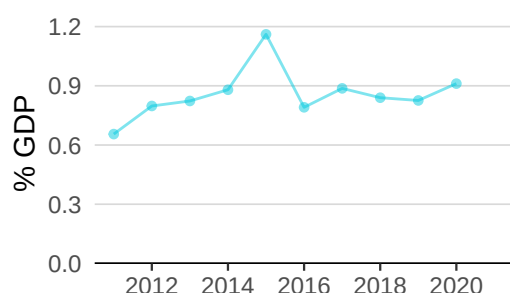
2.1.1 Expenditure on education was equal to 4.0% GDP in 2018—up by 1 percentage point from the year prior—and equivalent to an indicator rank of 77.



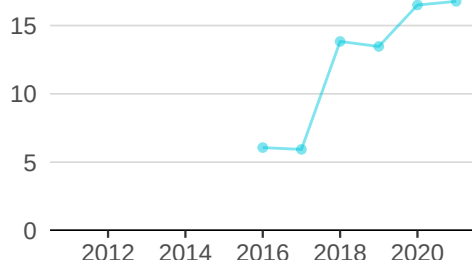
2.2.2 Graduates in science and engineering was equal to 22.2% of tert. grads in 2020—up by 2 percentage points from the year prior—and equivalent to an indicator rank of 55.



2.3.1 Researchers was equal to 3.2 FTE/thsd pop. in 2020—up by 2 percentage points from the year prior—and equivalent to an indicator rank of 30.



2.3.2 Gross expenditure on R&D was equal to 0.9% GDP in 2020—up by 10 percentage points from the year prior—and equivalent to an indicator rank of 43.



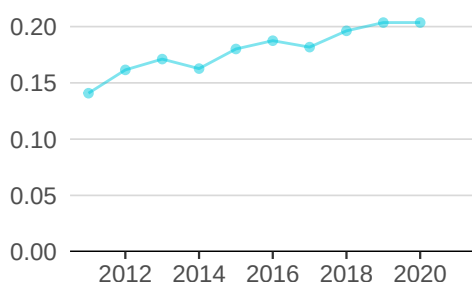
2.3.4 QS university ranking was equal to 16.8 in 2021—up by 2 percentage points from the year prior—and equivalent to an indicator rank of 55.



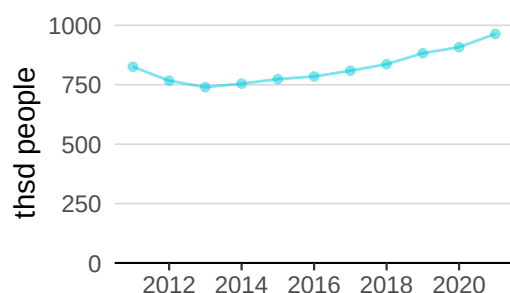
3.1.1 ICT access was equal to 9.0 in 2020 and equivalent to an indicator rank of 45.



4.2.4 Venture capital received was equal to 0.0 bn USD in 2021—up by Inf percentage points from the year prior—and equivalent to an indicator rank of 83.

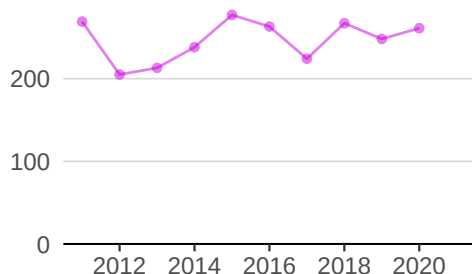


4.3.2 Domestic industry diversification was equal to 0.2 in 2020—effectively unchanged from the year prior—and equivalent to an indicator rank of 70.

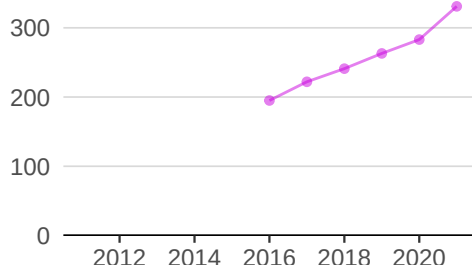


5.1.1 Knowledge-intensive employment was equal to 963.8 thsd people in 2021—up by 6 percentage points from the year prior—and equivalent to an indicator rank of 37.

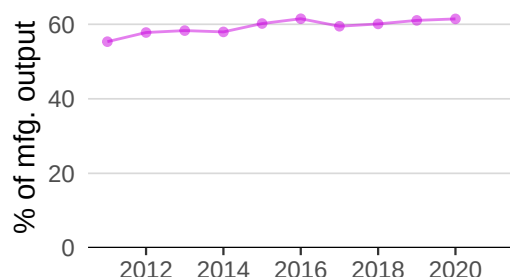
Innovation outputs



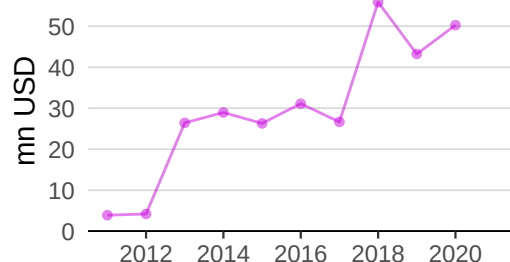
6.1.1 Patents by origin was equal to 261.0 in 2020—up by 5 percentage points from the year prior—and equivalent to an indicator rank of 52.



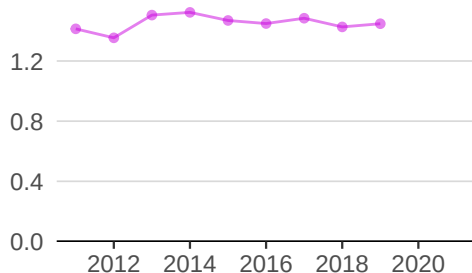
6.1.5 Citable documents H-index was equal to 331.0 in 2021—up by 17 percentage points from the year prior—and equivalent to an indicator rank of 50.



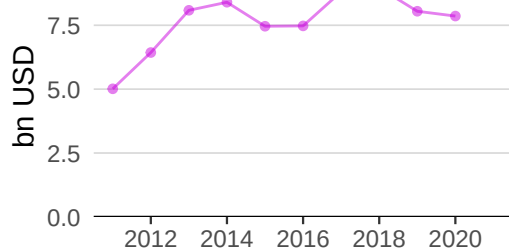
6.2.5 High-tech manufacturing was equal to 61.5% of mfg. output in 2020—up by 1 percentage point from the year prior—and equivalent to an indicator rank of 3.



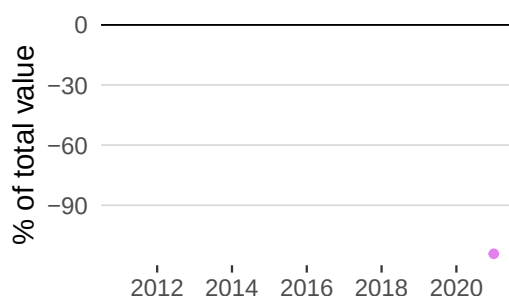
6.3.1 Intellectual property receipts was equal to 50.3 mn USD in 2020—up by 16 percentage points from the year prior—and equivalent to an indicator rank of 72.



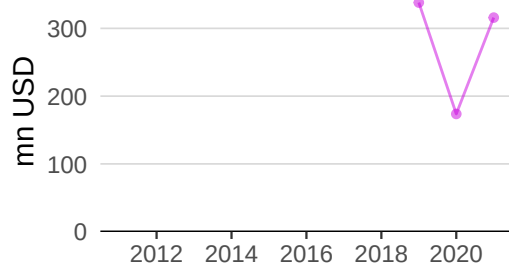
6.3.2 Production and export complexity was equal to 1.4 in 2019—up by 1 percentage point from the year prior—and equivalent to an indicator rank of 14.



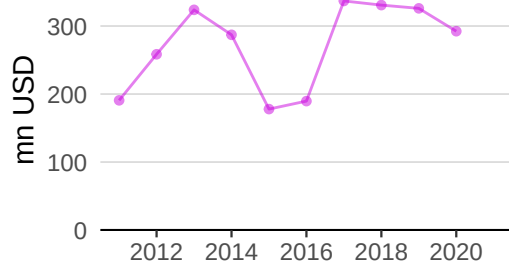
6.3.3 High-tech exports was equal to 7.9 bn USD in 2020—down by 2 percentage points from the year prior—and equivalent to an indicator rank of 21.



7.1.1 Intangible asset intensity was equal to -114.2% of total value in 2021 and equivalent to an indicator rank of 78.



7.1.3 Global brand value was equal to 315.9 mn USD in 2021—up by 82 percentage points from the year prior—and equivalent to an indicator rank of 74.



7.2.1 Cultural and creative services exports was equal to 292.4 mn USD in 2020—down by 10 percentage points from the year prior—and equivalent to an indicator rank of 65.

SLOVAKIA'S INNOVATION TOP PERFORMERS

2.3.3 Global corporate R&D investors

Firm	Industry	R&D	R&D Growth	R&D Intensity	Rank
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No observations

Source: European Commission's Joint Research Centre (<https://iri.jrc.ec.europa.eu/scoreboard/2021-eu-industrial-rd-investment-scoreboard>).

2.3.4 QS university ranking

University	Score	Rank
PAVOL JOSEF SAFARIK UNIVERSITY	19.1	601-650
COMENIUS UNIVERSITY IN BRATISLAVA	17.6	651-700
SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA	13.6	801-1000

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
ZENTIVA	1
TATRY MOUNTAIN RESORTS	2
TATRA BANKA	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
SLOVNAFT	Oil & Gas	1

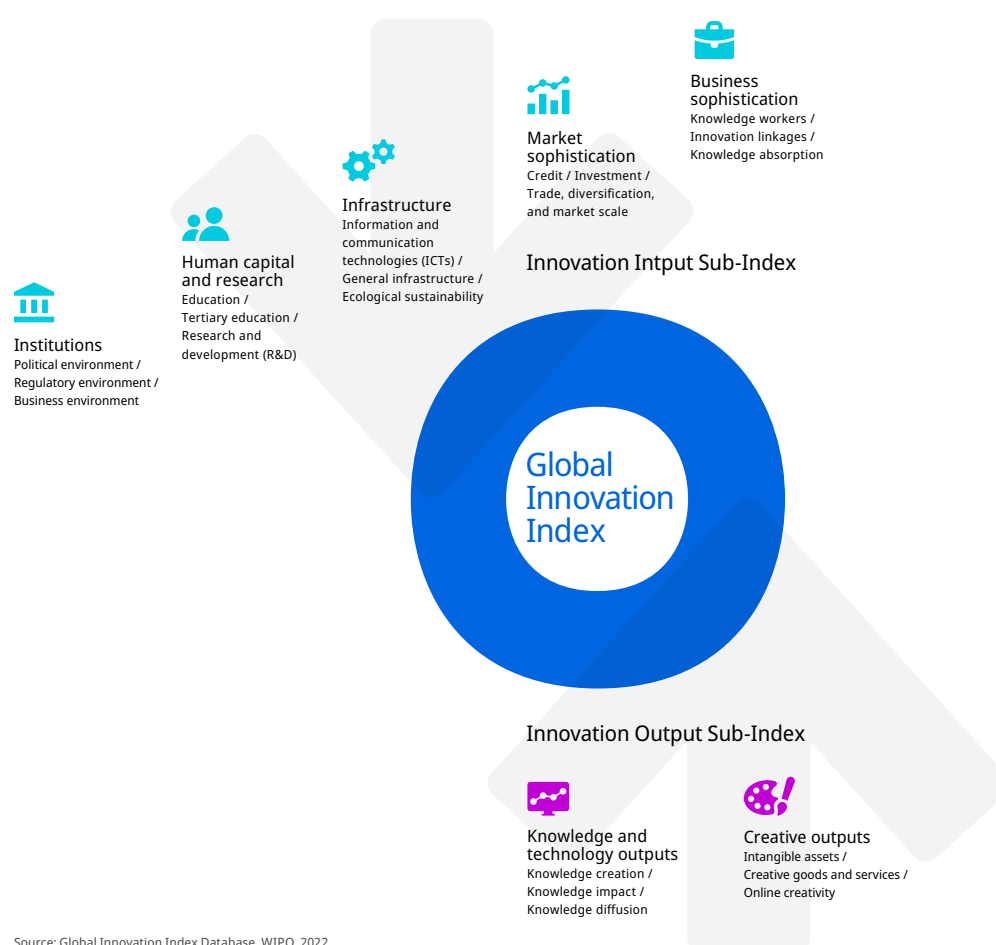
Source: Brand Finance (<https://brandirectory.com>).

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.