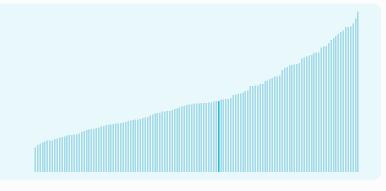


North Macedonia ranking in the Global Innovation Index 2024

North Macedonia ranks 58th among the 133 economies featured in the GII 2024.

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.



North Macedonia ranks 12th among the 34 uppermiddle-income group economies.



North Macedonia ranks 32nd among the 39 economies in Europe.



> North Macedonia GII Ranking (2020-2024)

The table shows the rankings of North Macedonia 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 North Macedonia in the GII 2024 is between ranks 56 and 69.

Year	GII Position	Innovation Inputs	Innovation Outputs
2020	57th	46th	63rd
2021	59th	40th	69th
2022	66th	60th	77th
2023	54th	49th	58th
2024	58th	60th	63rd

North Macedonia performs worse in innovation outputs than innovation inputs in 2024.

This year North
Macedonia ranks 60th in
innovation inputs. This
position is lower than last
year.

North Macedonia ranks 63rd in innovation outputs. This position is lower than last year.

North Macedonia has no clusters in the top 100 S&T clusters of the Global Innovation Index.



> Global Innovation Tracker

The Global Innovation Tracker 2024 shows what is the current state of innovation in North Macedonia, how rapidly is technology being embraced and what are the resulting societal impacts.



For North Macedonia, 7 indicators have improved in the short-term and 3 indicators have worsened.

Science and innovation investment

Scientific publications	R&D investments	Venture	International patent filings	
		Deal numbers	Deal values	
▼ -13% 2022 - 2023	▲ 5.3% 2020 - 2022	▲ 100% 2022 - 2023	▲ 150% 2022 - 2023	▲ 50% 2022 - 2023
▲ 4.7% 2013 - 2023	▼ -0.4% 2015 - 2022	n/a	n/a	▲ 19.6% 2013 - 2023

Technology adoption

Safe sanitation	Conne	ectivity	Robots	Electric vehicles
	Fixed broadband	5G		
▼ -0.2% 2021 - 2022	▲ 3.8% 2021 - 2022	n/a	n/a	n/a
▼ -0.4% 2012 - 2022	▲ 5.2% 2012 - 2022		n/a	n/a
12.2 per 100 inhabitants in 2022	24.6 per 100 inhabitants in 2022	n/a		n/a

Socioeconomic impact

Labor productivity	Life expectancy	Temperature change		
▲ 5.4% 2022 - 2023	▲ 1.6% 2021 - 2022	▲ 2.2°C 2023		
▲ 2.1% 2013 - 2023	▼ -0.1% 2012 - 2022	n/a		
54,274 USD in 2023	74.4 years in 2022			

Notes: Not all indicators of the Global Innovation Tracker are used to calculate the Global Innovation Index. Long-term annual growth refers to the compound annual growth rate (CAGR) over the indicated period. For each variable, a one-year growth rate is set for the short run, and ten-year CAGR is set for the long run; time windows might differ when gaps exist in data availability. The end period corresponds to the most recent available observation, which may differ among countries. Temperature change is an exception: it indicates the change in degrees Celsius with respect to the average temperature in the country from 1951–1980. Figures are rounded.

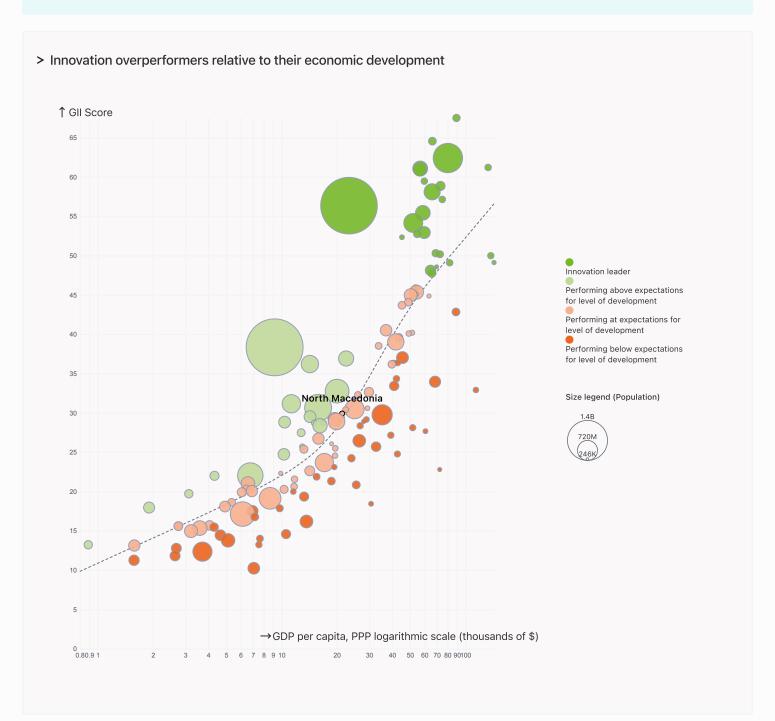


Expected vs. observed innovation performance

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



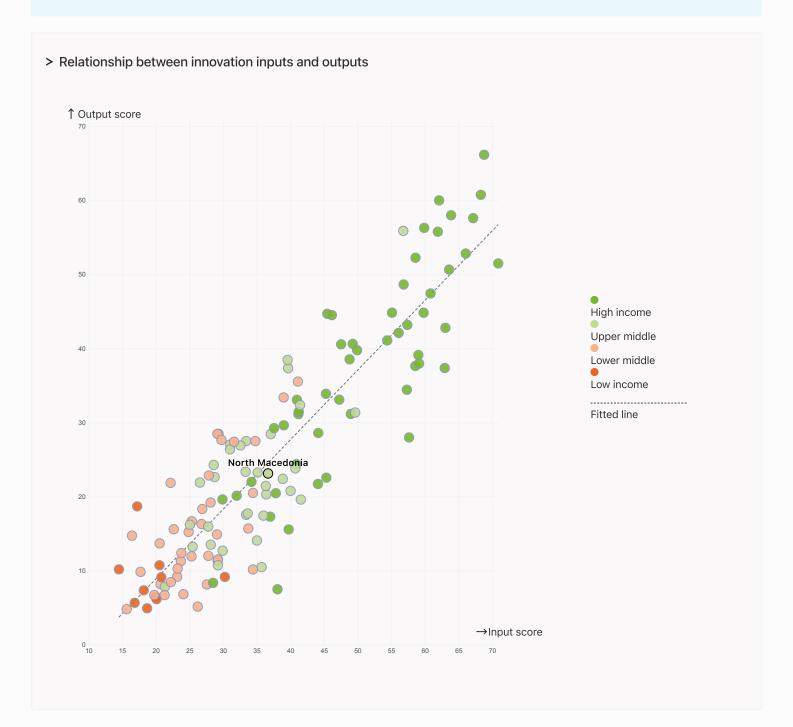


Effectively translating innovation investments into innovation outputs

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.



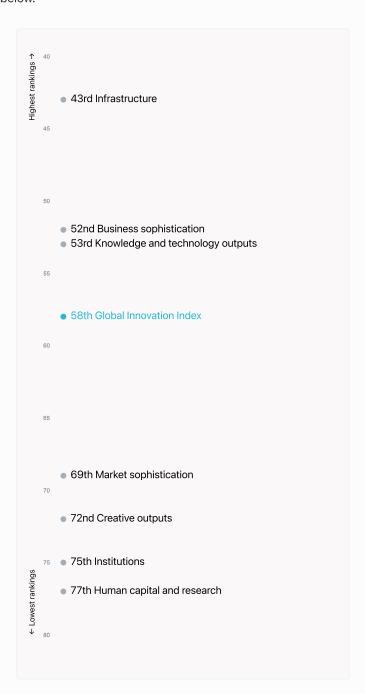
North Macedonia produces less innovation outputs relative to its level of innovation investments.





Overview of North Macedonia's rankings in the seven areas of the GII in 2024

The chart shows the ranking for each of the seven areas that the GII comprises. The strongest areas for North Macedonia are those that rank above the GII (shown in blue) and the weakest are those that rank below.



Highest rankings



North Macedonia ranks highest in Infrastructure (43rd), Business sophistication (52nd) and Knowledge and technology outputs (53rd).

Lowest rankings



North Macedonia ranks lowest in Human capital and research (77th), Institutions (75th) and Creative outputs (72nd).

The full WIPO Intellectual Property

Statistics profile for North Macedonia
can be found on this link.



Benchmark of North Macedonia against other economy groupings for each of the seven areas of the GII Index

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



Top 10 | Score: 56.54

Europe | Score: 39.15

Upper middle income | Score: 24.3

North Macedonia | Score: 22.49

Upper-Middle-Income economies

North Macedonia performs above the upper-middle-income group average in Institutions, Infrastructure, Business sophistication, Knowledge and technology outputs.



Europe

North Macedonia performs below the regional average in all pillars.

Institutions	Human capital and research	Infrastructure
Top 10 Score: 80.81	Top 10 Score: 61.30	Top 10 Score: 58.57
Europe Score: 59.14	Europe Score: 44.92	Europe Score: 51.74
North Macedonia Score: 44.41	Upper middle income Score: 29.5	North Macedonia Score: 49.09
Upper middle income Score: 43.0	North Macedonia Score: 27.90	Upper middle income Score: 39.8
Market sophistication	Business sophistication	Knowledge and technology outputs
Top 10 Score: 62.12	Top 10 Score: 63.64	Top 10 Score: 57.29
Europe Score: 42.79	Europe Score: 42.68	Europe Score: 36.30
Upper middle income Score: 32.9	North Macedonia Score: 29.90	North Macedonia Score: 23.68
North Macedonia Score: 32.17	Upper middle income Score: 27.6	Upper middle income Score: 20.6
Creative outputs		



Innovation strengths and weaknesses in North Macedonia

The table below gives an overview of the indicator strengths and weaknesses of North Macedonia in the GII 2024.



North Macedonia's main innovation strengths are **ISO 14001 environment/bn PPP\$ GDP** (rank 3), **High-tech manufacturing**, % (rank 10) and **Pupil-teacher ratio**, **secondary** (rank 10).

Strengths Weaknesses

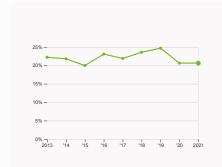
Rank	Code	Indicator name	Rank	Code	Indicator name
3	3.3.3	ISO 14001 environment/bn PPP\$ GDP	117	4.3.3	Domestic market scale, bn PPP\$
10	6.2.4	High-tech manufacturing, %	106	5.2.3	State of cluster development ⁺
10	2.1.5	Pupil-teacher ratio, secondary	104	4.2.4	VC received, value, % GDP
12	7.2.2	National feature films/mn pop. 15–69	102	1.3.1	Policy stability for doing business†
15	6.3.5	ISO 9001 quality/bn PPP\$ GDP	75	7.1.3	Global brand value, top 5,000, % GDP
16	5.3.1	Intellectual property payments, % total trade	75	7.1.1	Intangible asset intensity, top 15, %
19	7.2.1	Cultural and creative services exports, % total trade	75	2.3.4	QS university ranking, top 3*
24	6.3.4	ICT services exports, % total trade	73	2.1.4	PISA scales in reading, maths and science
25	5.1.2	Firms offering formal training, %	49	6.2.2	Unicorn valuation, % GDP
36	5.3.4	FDI net inflows, % GDP	41	2.3.3	Global corporate R&D investors, top 3, mn USD



North Macedonia's innovation system

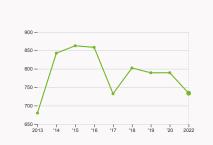
As far as practicable, the plots below present unscaled indicator data.

Innovation inputs in North Macedonia



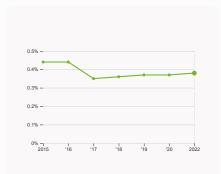
2.2.2 Graduates in science and engineering

was equal to 20.61 % of total graduates in 2021, up by 0.001 percentage points from the year prior – and equivalent to an indicator rank of 73.



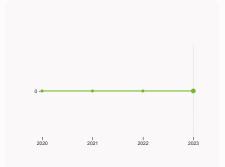
2.3.1 Researchers

was equal to 733.81 FTE per million population in 2022, down by 7.04% from the year prior – and equivalent to an indicator rank of 62.



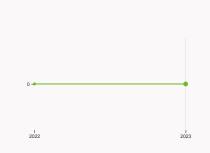
2.3.2 Gross expenditure on R&D

was equal to 0.38 % GDP in 2022, up by 0.01 percentage points from the year prior – and equivalent to an indicator rank of 66.



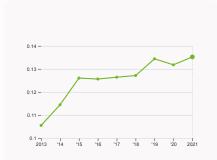
2.3.4 QS university ranking

was equal to an average score of 0 for the top three universities in 2023 with no change from the year prior – and equivalent to an indicator rank of 75.



4.2.4 VC received, value

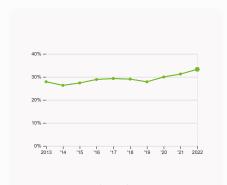
was equal to 0 USD in 2023 with no change from the year prior – and equivalent to an indicator rank of 104.



4.3.2 Domestic industry diversification

was equal to an index score of 0.14 in 2021, up by 2.62% from the year prior – and equivalent to an indicator rank of 54.



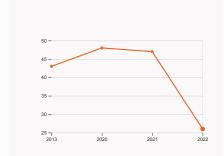


5.1.1 Knowledge-intensive employment

was equal to 33.27 % in 2022, up by 2.04 percentage points from the year prior – and equivalent to an indicator rank of 44.

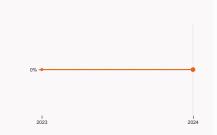


> Innovation outputs in North Macedonia



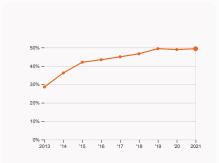
6.1.1 Patents by origin

was equal to 26 patents in 2022, down by 44.68% from the year prior – and equivalent to an indicator rank of 70.



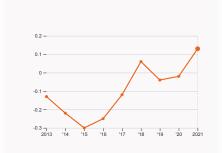
6.2.2 Unicorn valuation

was equal to 0 % GDP in 2024 with no change from the year prior – and equivalent to an indicator rank of 49.



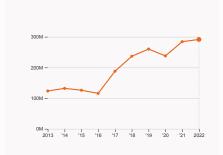
6.2.4 High-tech manufacturing

was equal to 49.36 % of total manufacturing output in 2021, up by 0.44 percentage points from the year prior – and equivalent to an indicator rank of 10.



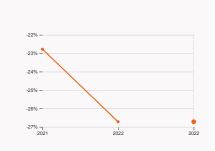
6.3.2 Production and export complexity

was equal to a score of 0.13 in 2021, up by 750% from the year prior – and equivalent to an indicator rank of 54.



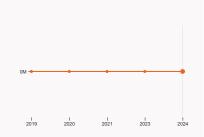
6.3.3 High-tech exports

was equal to 291.54 million USD in 2022, up by 2.56% from the year prior – and equivalent to an indicator rank of 52.



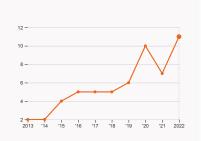
7.1.1 Intangible asset intensity

was equal to -26.72 % for the top 15 companies in 2022 with no change from the year prior – and equivalent to an indicator rank of 75.



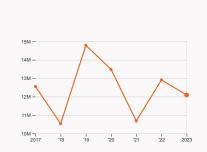
7.1.3 Global brand value

was equal to 0 million USD for the brands in the top 5,000 in 2024 with no change from the year prior – and equivalent to an indicator rank of 75.



7.2.2 National feature films

was equal to 11 films in 2022, up by 57.14% from the year prior – and equivalent to an indicator rank of 12.



7.3.3 Mobile app creation

was equal to 12.09 million global downloads of mobile apps in 2023, down by 6.35% from the year prior – and equivalent to an indicator rank of 58.



GII 2024 rank

58

North Macedonia

Output rank 63	Input rank 60	Income Upper middle		gion UR		Population (mn) 1.8	GDP, PPP\$ (bn) 44.1	GDP per cap 21,391		PPPS
			Score / Value	Rank				Score / Value	Rank	
			44.4	75		Business sophistication		29.9	52	
1.1 Institutional enviro	onment		54.3	65		5.1 Knowledge workers		39.5	49	
1.1.1 Operational stabili	ity for businesses*		66.7	51		5.1.1 Knowledge-intensive emp	loyment, %	33.3	44	•
1.1.2 Government effect	ctiveness*		41.9	76		5.1.2 Firms offering formal train	ning, %	44.3	25	•+
1.2 Regulatory enviro	nment		47.4	59		5.1.3 GERD performed by busin	ness, % GDP	0.1	61	
1.2.1 Regulatory quality	y*		53.7	51		5.1.4 GERD financed by busine	ss, %	25.9	65	
1.2.2 Rule of law*			41.1	68		5.1.5 Females employed w/adva	anced degrees, %	③ 17.1	41	
1.3 Business environr	ment		31.6	96		5.2 Innovation linkages		18.5	88	
1.3.1 Policy stability for	r doing business [†]		31.7	102	0	5.2.1 Public Research-Industry	co-publications, %	0.9	93	
1.3.2 Entrepreneurship	policies and culture ⁺		3 1.4	52		5.2.2 University-industry R&D	collaboration [†]	32	94	
Human capital a	and research		27.9	77		5.2.3 State of cluster developm	nent ⁺	30.5	106	0
						5.2.4 Joint venture/strategic al	liance deals/bn PPP\$ GDP	n/a	n/a	
2.1 Education				[63]		5.2.5 Patent families/bn PPP\$ (GDP	0.1	51	
2.1.1 Expenditure on ed			n/a			5.3 Knowledge absorption		31.7	52	
	ling/pupil, secondary, % GDP/cap		n/a			5.3.1 Intellectual property payn	nents, % total trade	1.7	16	•+
2.1.3 School life expec			13.1 375.7		0	5.3.2 High-tech imports, % total	al trade	7.6	74	
2.1.5 Pupil-teacher rat	ading, maths and science		S 8.1		• •	5.3.3 ICT services imports, % t	otal trade	1.2	65	
2.2 Tertiary education			28.2			5.3.4 FDI net inflows, % GDP		3.8	36	••
2.2.1 Tertiary enrolmen			41.7	80		5.3.5 Research talent, % in bus	sinesses	27.9	48	
	ence and engineering, %		20.6			Knowledge and technol	ogy outputs	23.7	53	
2.2.3 Tertiary inbound			8.4	34	•	6.1 Knowledge creation		10.5	79	
2.3 Research and dev			3.4			6.1.1 Patents by origin/bn PPP\$	GDP		70	
2.3.1 Researchers, FTE	, , ,		733.8			6.1.2 PCT patents by origin/bn			56	
2.3.2 Gross expenditur			0.4	66		6.1.3 Utility models by origin/br		-	-	
	R&D investors, top 3, mn USD		0		0 0	6.1.4 Scientific and technical ar		10.3	70	
2.3.4 QS university ran			0	75	0 0	6.1.5 Citable documents H-inde		6.5	90	
⇔ Infrastructure			49.1	/13	•	6.2 Knowledge impact		31.7	49	
· g illiastructure			45.1	45		6.2.1 Labor productivity growth	1, %	1.6	38	
3.1 Information and c	ommunication technologies (ICT	Гs)	74.5	59		6.2.2 Unicorn valuation, % GDF		0	49	00
3.1.1 ICT access*			90.1	64		6.2.3 Software spending, % GE	OP .	0.1	93	
3.1.2 ICT use*			72.4	81		6.2.4 High-tech manufacturing	, %	49.4	10	•+
3.1.3 Government's on	line service*		67.1			6.3 Knowledge diffusion		28.8	43	
3.1.4 E-participation*			68.6			6.3.1 Intellectual property recei	ipts, % total trade	0.1	49	
3.2 General infrastru			28			6.3.2 Production and export co	mplexity	46.4	54	
3.2.1 Electricity output			2,828			6.3.3 High-tech exports, % total	al trade	2.5	52	
3.2.2 Logistics perform			45.5			6.3.4 ICT services exports, % t	otal trade	4.3	24	•+
3.2.3 Gross capital for			n/a			6.3.5 ISO 9001 quality/bn PPP\$	GDP	17	15	•+
3.3 Ecological sustain	-		44.8	8	••	Creative outputs		22.5	72	
3.3.1 GDP/unit of energ				52		74 1-1		45.0	04	
3.3.2 Low-carbon ener			13.7			7.1 Intangible assets	A 4E 0/	_		0.0
3.3.3 ISO 14001 enviro	nment/on PPP\$ GDP		11.5		• •	7.1.1 Intangible asset intensity,				0 ◊
Магкеt sophistic	cation		32.2	69		7.1.2 Trademarks by origin/bn F			64	00
4.1 Credit			33.5	44		7.1.3 Global brand value, top 5,			75	0 0
4.1.1 Finance for startu	ıps and scaleups†		Q 48.4	42		7.1.4 Industrial designs by origi 7.2 Creative goods and servio		29.3	87	•
4.1.2 Domestic credit t	to private sector, % GDP		55.7	56		7.2.1 Cultural and creative serv			19	•
4.1.3 Loans from micro	finance institutions, % GDP		n/a	n/a		7.2.2 National feature films/mn			12	•+
4.2 Investment			4.6	[84]		7.2.3 Entertainment and media			n/a	- 4
4.2.1 Market capitaliza	tion, % GDP		n/a	n/a		7.2.4 Creative goods exports, 9			93	
4.2.2 Venture capital (VC) investors, deals/bn PPP\$ GDP		n/a	n/a		7.2.4 Cleative goods exports, 7		29.5		
4.2.3 VC recipients, de	eals/bn PPP\$ GDP		0.03	64		7.3.1 Top-level domains (TLDs)	/th pop. 15–69		49	
4.2.4 VC received, valu	ue, % GDP		0.000002	104	0	7.3.2 GitHub commits/mn pop.		12.8		
4.3 Trade, diversifica	ation and market scale		58.4	57		7.3.3 Mobile app creation/bn Pl		68.7		
4.3.1 Applied tariff rate	e, weighted avg., %		1.4	53		sapp stocklongstill i		33.7		
4.3.2 Domestic industr	ry diversification		85.2	54						
4.3.3 Domestic market	t scale, bn PPP\$		44.1	117	0					

NOTES: • indicates a strength; O a weakness; • an income group strength; o an income group weakness; * an index; † a survey question, • that the economy's data is outdated. Square brackets [] indicate the the data minimum coverage (DMC) requirements were not met at the sub-pillar or pillar level; n/a represents missing values; a dash - indicates an indicator which is not relevant to this economy and thus not considered for DMC thresholds.



Data availability

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



North Macedonia has missing data for nine indicators and outdated data for five indicators.

Missing data for North Macedonia

Code	Indicator name	Economy Year	Model Year	Source
2.1.1	Expenditure on education, % GDP	n/a	2022	UNESCO Institute for Statistics
2.1.2	Government funding/pupil, secondary, % GDP/cap	n/a	2020	UNESCO Institute for Statistics
3.2.3	Gross capital formation, % GDP	n/a	2023	International Monetary Fund
4.1.3	Loans from microfinance institutions, % GDP	n/a	2022	International Monetary Fund, Financial Access Survey (FAS)
4.2.1	Market capitalization, % GDP	n/a	2022	World Federation of Exchanges; World Bank
4.2.2	Venture capital (VC) investors, deals/bn PPP\$ GDP	n/a	2023	LSEG Data & Analytics; International Monetary Fund
5.2.4	Joint venture/strategic alliance deals/bn PPP\$ GDP	n/a	2023	LSEG Data & Analytics; International Monetary Fund
6.1.3	Utility models by origin/bn PPP\$ GDP	n/a	2022	World Intellectual Property Organization; International Monetary Fund
7.2.3	Entertainment and media market/th pop. 15–69	n/a	2023	PwC, GEMO; United Nations, World Population Prospects; International Monetary Fund

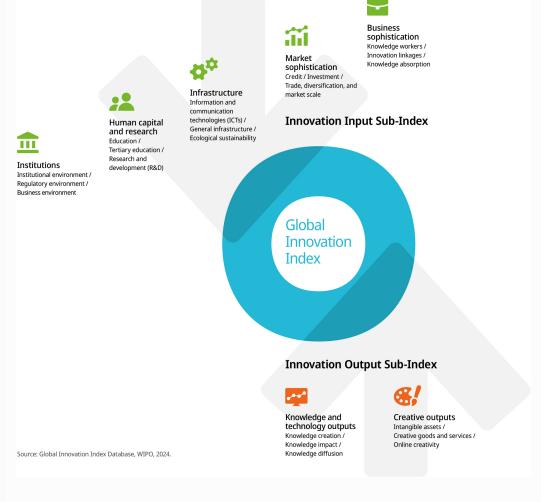
Outdated data for North Macedonia

Code	Indicator name	Economy Year	Model Year	Source
1.3.2	Entrepreneurship policies and culture [†]	2019	2023	Global Entrepreneurship Monitor
2.1.5	Pupil-teacher ratio, secondary	2021	2022	UNESCO Institute for Statistics
4.1.1	Finance for startups and scaleups [†]	2019	2023	Global Entrepreneurship Monitor
5.1.5	Females employed w/advanced degrees, %	2022	2023	International Labour Organization
7.1.1	Intangible asset intensity, top 15, %	2022	2023	Brand Finance



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.