Global Innovation Index 2021

NORTH MACEDONIA

59th North Macedonia ranks 59th among the 132 economies featured in the GII 2021.

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 North Macedonia 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 North Macedonia in the GII 2021 is between ranks 55 and 61.

Rankings for North Macedonia (2019–2021)

	GII	Innovation inputs	Innovation outputs
2021	59	40	69
2020	57	46	63
2019	59	52	63

- North Macedonia performs better in innovation inputs than innovation outputs in 2021.
- This year North Macedonia ranks 40th in innovation inputs, higher than both 2020 and 2019.
- As for innovation outputs, North Macedonia ranks 69th. This position is lower than both 2020 and 2019.

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

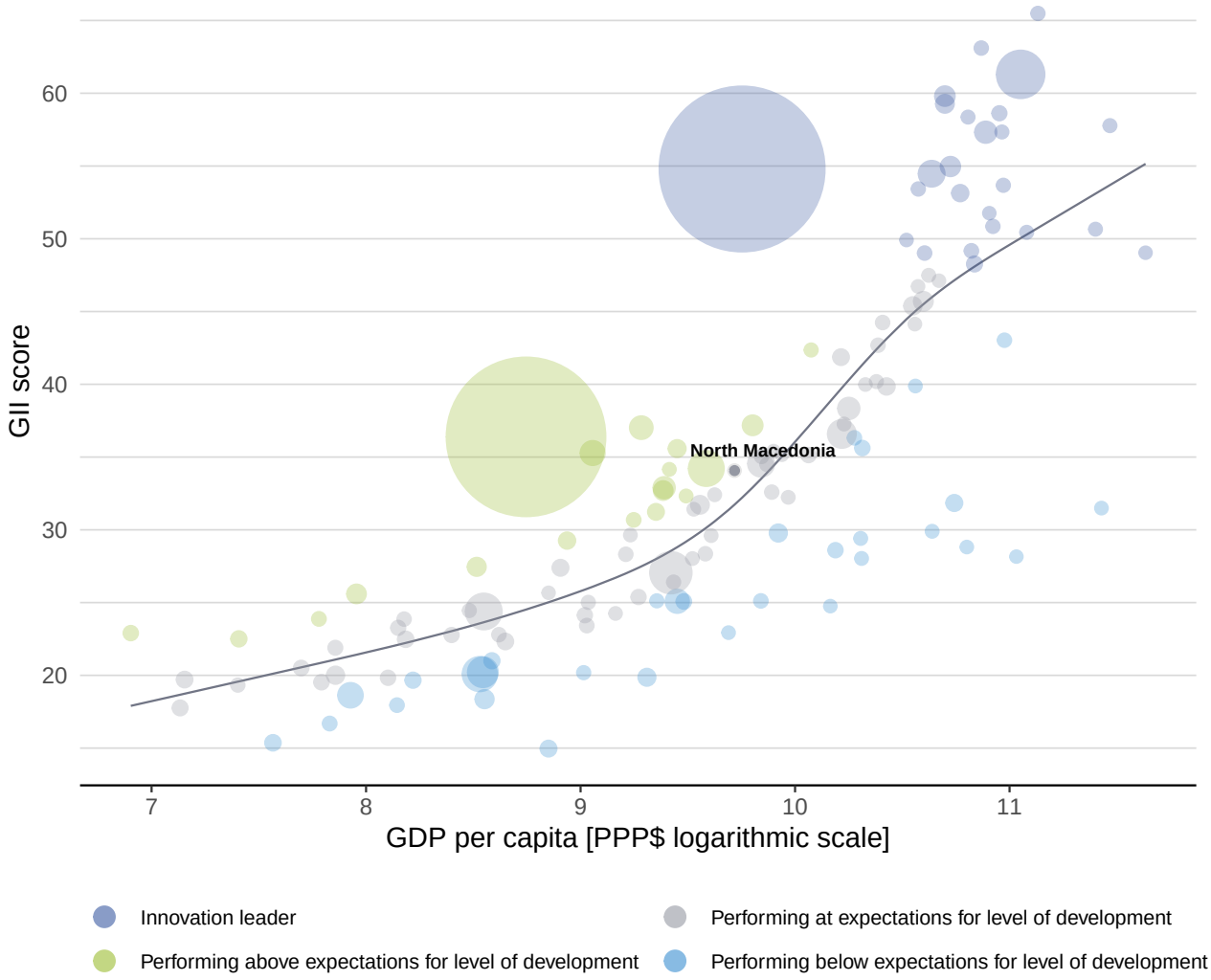
35th North Macedonia ranks 35th among the 39 economies in Europe.

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

The positive relationship between innovation and development

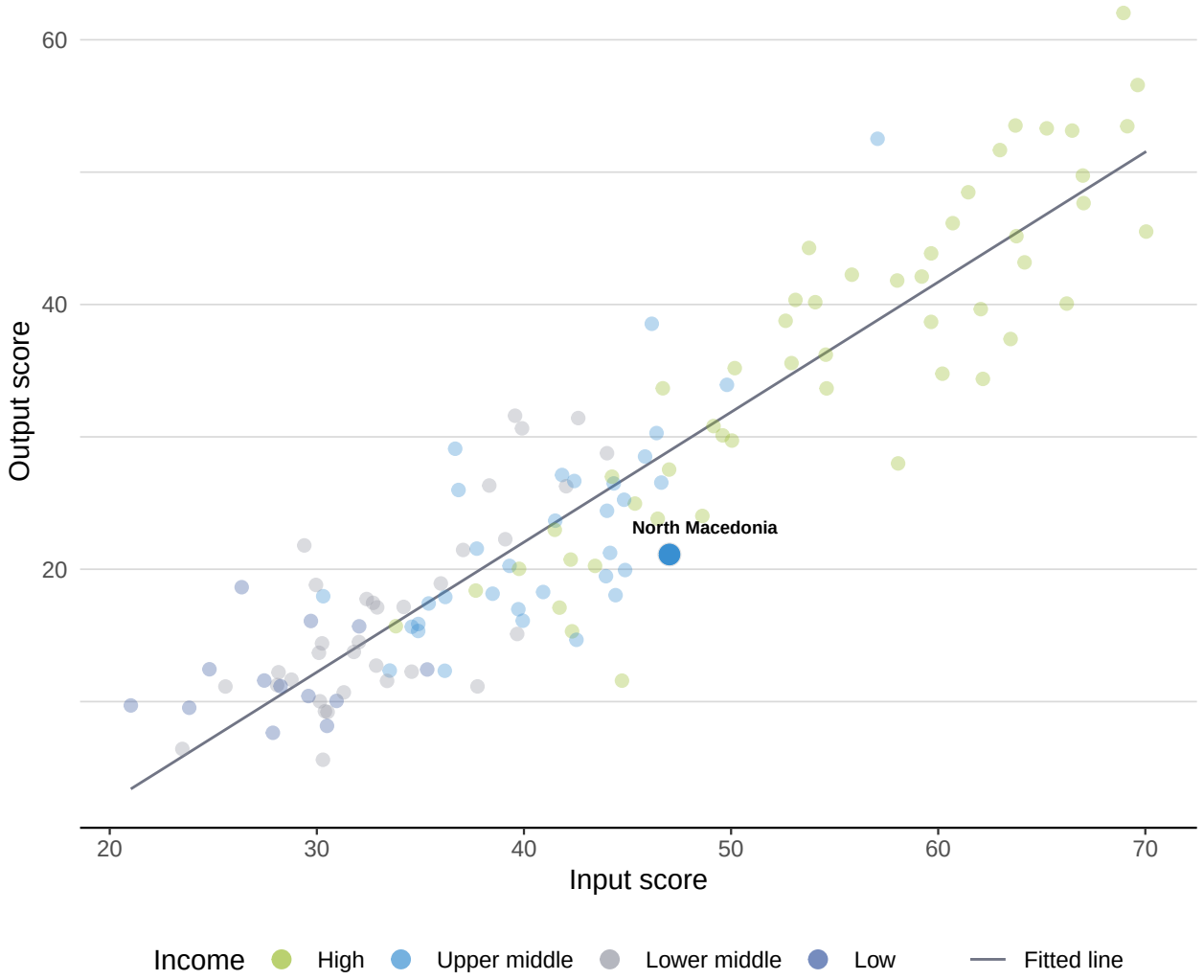


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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

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

Innovation input to output performance



BENCHMARKING AGAINST OTHER UPPER MIDDLE-INCOME GROUP ECONOMIES AND EUROPE

The seven GII pillar scores for North Macedonia

Upper middle-income group economies

North Macedonia performs above the upper middle-income group average in four pillars, namely: Institutions; Infrastructure; Market sophistication; and, Knowledge and technology outputs.

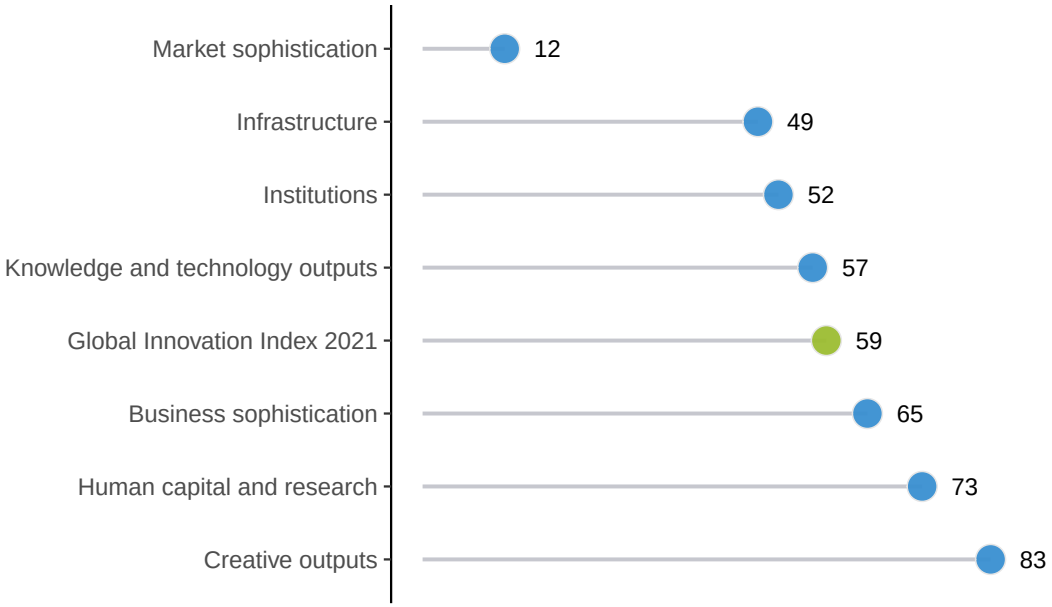
Europe

North Macedonia performs above the regional average in Market sophistication.

OVERVIEW OF RANKINGS IN THE SEVEN GII 2021 AREAS

North Macedonia performs best in Market sophistication and its weakest performance is in Creative outputs.

The seven GII pillar ranks for North Macedonia



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

INNOVATION STRENGTHS AND WEAKNESSES

The table below gives an overview of the strengths and weaknesses of North Macedonia in the GII 2021.

Strengths and weaknesses for North Macedonia

Strengths			Weaknesses		
Code	**Indicator name**	**Rank**	**Code**	**Indicator name**	**Rank**
1.3	Business environment	30	2.1.4	PISA scales in reading, maths and science	67
1.3.2	Ease of resolving insolvency	28	2.3.3	Global corporate R&D investors, top 3, mn US$	41
2.1.5	Pupil-teacher ratio, secondary	13	2.3.4	QS university ranking, top 3	74
3.3	Ecological sustainability	18	3.2	General infrastructure	109
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	5	4.3.3	Domestic market scale, bn PPP$	118
4.1.1	Ease of getting credit	23	5.2	Innovation linkages	116
4.2.1	Ease of protecting minority investors	12	5.2.1	University-industry R&D collaboration	112
5.3.1	Intellectual property payments, % total trade	21	5.2.2	State of cluster development and depth	108
5.3.4	FDI net inflows, % GDP	26	5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP	94
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	17	5.3.2	High-tech imports, % total trade	103
6.2.5	High-tech manufacturing, %	22	7.1	Intangible assets	109
7.2.4	Printing and other media, % manufacturing	12	7.1.2	Global brand value, top 5,000, % GDP	80
			7.1.4	ICTs and organizational model creation	112

North Macedonia

GII 2021 rank **59**

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$	GII 2020 rank
69	40	Upper middle	EUR	2.1	34.5	16,609	57

		Score/ Value	Rank	
Institutions		**68.9**	**52**	
1.1	**Political environment**	**58.1**	**65**	
1.1.1	Political and operational stability*	73.2	44	
1.1.2	Government effectiveness*	50.6	74	
1.2	**Regulatory environment**	**67.9**	**58**	
1.2.1	Regulatory quality*	56.8	49	◆
1.2.2	Rule of law*	40.3	75	
1.2.3	Cost of redundancy dismissal	14.4	55	
1.3	**Business environment**	**80.7**	**30**	● ◆
1.3.1	Ease of starting a business*	88.6	63	
1.3.2	Ease of resolving insolvency*	72.7	28	● ◆
Human capital and research		**30.2**	**73**	
2.1	**Education**	**55.6**	**[47]**	
2.1.1	Expenditure on education, % GDP	n/a	n/a	
2.1.2	Government funding/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	13.5	77	
2.1.4	PISA scales in reading, maths and science	400.1	67	○
2.1.5	Pupil-teacher ratio, secondary ◴	8.3	13	● ◆
2.2	**Tertiary education**	**31.0**	**72**	
2.2.1	Tertiary enrolment, % gross	43.1	68	
2.2.2	Graduates in science and engineering, %	23.6	48	
2.2.3	Tertiary inbound mobility, %	5.2	48	
2.3	**Research and development (R&D)**	**4.1**	**83**	
2.3.1	Researchers, FTE/mn pop.	786.7	55	
2.3.2	Gross expenditure on R&D, % GDP	0.4	74	
2.3.3	Global corporate R&D investors, top 3, mn US$	0.0	41	○ ◇
2.3.4	QS university ranking, top 3*	0.0	74	○ ◇
Infrastructure		**46.9**	**49**	
3.1	**Information and communication technologies (ICTs)**	**71.2**	**56**	
3.1.1	ICT access*	67.4	65	
3.1.2	ICT use*	60.1	61	
3.1.3	Government's online service*	74.1	58	
3.1.4	E-participation*	83.3	38	
3.2	**General infrastructure**	**20.1**	**109**	○
3.2.1	Electricity output, GWh/mn pop.	2,691.8	71	
3.2.2	Logistics performance*	30.6	80	
3.2.3	Gross capital formation, % GDP	n/a	n/a	
3.3	**Ecological sustainability**	**49.2**	**18**	● ◆
3.3.1	GDP/unit of energy use	11.8	52	
3.3.2	Environmental performance*	55.4	41	◆
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	9.9	5	● ◆
Market sophistication		**63.7**	**12**	● ◆
4.1	**Credit**	**41.0**	**64**	
4.1.1	Ease of getting credit*	80.0	23	●
4.1.2	Domestic credit to private sector, % GDP	51.5	65	
4.1.3	Microfinance gross loans, % GDP	0.3	43	
4.2	**Investment**	**82.0**	**[2]**	
4.2.1	Ease of protecting minority investors*	82.0	12	● ◆
4.2.2	Market capitalization, % GDP	n/a	n/a	
4.2.3	Venture capital investors, deals/bn PPP$ GDP	n/a	n/a	
4.2.4	Venture capital recipients, deals/bn PPP$ GDP	n/a	n/a	
4.3	**Trade, diversification, and market scale**	**68.1**	**70**	
4.3.1	Applied tariff rate, weighted avg., %	1.9	54	
4.3.2	Domestic industry diversification	91.5	47	
4.3.3	Domestic market scale, bn PPP$	34.5	118	○ ◇

		Score/ Value	Rank	
Business sophistication		**25.4**	**65**	
5.1	**Knowledge workers**	**32.5**	**62**	
5.1.1	Knowledge-intensive employment, %	29.9	48	
5.1.2	Firms offering formal training, %	39.0	31	
5.1.3	GERD performed by business, % GDP	0.1	62	
5.1.4	GERD financed by business, %	23.6	63	
5.1.5	Females employed w/advanced degrees, %	15.3	48	
5.2	**Innovation linkages**	**13.5**	**116**	○
5.2.1	University-industry R&D collaboration†	30.2	112	○ ◇
5.2.2	State of cluster development and depth† ◴	38.6	108	○
5.2.3	GERD financed by abroad, % GDP	0.0	65	
5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP ◴	0.0	94	○
5.2.5	Patent families/bn PPP$ GDP	0.0	71	
5.3	**Knowledge absorption**	**30.2**	**57**	
5.3.1	Intellectual property payments, % total trade	1.6	21	● ◆
5.3.2	High-tech imports, % total trade	5.7	103	○
5.3.3	ICT services imports, % total trade	1.1	66	
5.3.4	FDI net inflows, % GDP	4.3	26	●
5.3.5	Research talent, % in businesses	26.6	47	
Knowledge and technology outputs		**22.7**	**57**	
6.1	**Knowledge creation**	**11.5**	**73**	
6.1.1	Patents by origin/bn PPP$ GDP ◴	1.6	43	
6.1.2	PCT patents by origin/bn PPP$ GDP	0.2	54	
6.1.3	Utility models by origin/bn PPP$ GDP	n/a	n/a	
6.1.4	Scientific and technical articles/bn PPP$ GDP	13.4	66	
6.1.5	Citable documents H-index	6.2	94	
6.2	**Knowledge impact**	**36.8**	**35**	
6.2.1	Labor productivity growth, %	–1.1	85	
6.2.2	New businesses/th pop. 15–64	3.6	39	
6.2.3	Software spending, % GDP	0.1	79	
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	15.5	17	●
6.2.5	High-tech manufacturing, %	42.4	22	● ◆
6.3	**Knowledge diffusion**	**20.0**	**55**	
6.3.1	Intellectual property receipts, % total trade	0.1	47	
6.3.2	Production and export complexity	45.5	57	
6.3.3	High-tech exports, % total trade	2.9	50	
6.3.4	ICT services exports, % total trade	2.7	41	
Creative outputs		**19.5**	**83**	
7.1	**Intangible assets**	**18.4**	**109**	○
7.1.1	Trademarks by origin/bn PPP$ GDP	n/a	n/a	
7.1.2	Global brand value, top 5,000, % GDP	0.0	80	○ ◇
7.1.3	Industrial designs by origin/bn PPP$ GDP	2.0	48	
7.1.4	ICTs and organizational model creation†	41.1	112	○ ◇
7.2	**Creative goods and services**	**17.9**	**60**	
7.2.1	Cultural and creative services exports, % total trade	0.9	30	
7.2.2	National feature films/mn pop. 15–69	5.1	44	
7.2.3	Entertainment and media market/th pop. 15–69	n/a	n/a	
7.2.4	Printing and other media, % manufacturing ◴	2.2	12	● ◆
7.2.5	Creative goods exports, % total trade	0.2	84	
7.3	**Online creativity**	**23.2**	**52**	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	6.8	47	
7.3.2	Country-code TLDs/th pop. 15–69	5.6	52	
7.3.3	Wikipedia edits/mn pop. 15–69	68.6	41	◆
7.3.4	Mobile app creation/bn PPP$ GDP	9.3	48	

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 Appendix IV for details, including the year of the data, at http://globalinnovationindex.org. 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 data that are either missing or outdated for North Macedonia.

Missing data for North Macedonia

Code	Indicator name	Economy year	Model year	Source
2.1.1	Expenditure on education, % GDP	n/a	2017	UNESCO Institute for Statistics
2.1.2	Government funding/pupil, secondary, % GDP/cap	n/a	2017	UNESCO Institute for Statistics
3.2.3	Gross capital formation, % GDP	n/a	2020	International Monetary Fund
4.2.2	Market capitalization, % GDP	n/a	2019	World Federation of Exchanges
4.2.3	Venture capital investors, deals/bn PPP$ GDP	n/a	2020	Refinitiv Eikon
4.2.4	Venture capital recipients, deals/bn PPP$ GDP	n/a	2020	Refinitiv Eikon
6.1.3	Utility models by origin/bn PPP$ GDP	n/a	2019	World Intellectual Property Organization
7.1.1	Trademarks by origin/bn PPP$ GDP	n/a	2019	World Intellectual Property Organization
7.2.3	Entertainment and media market/th pop. 15–69	n/a	2020	PwC

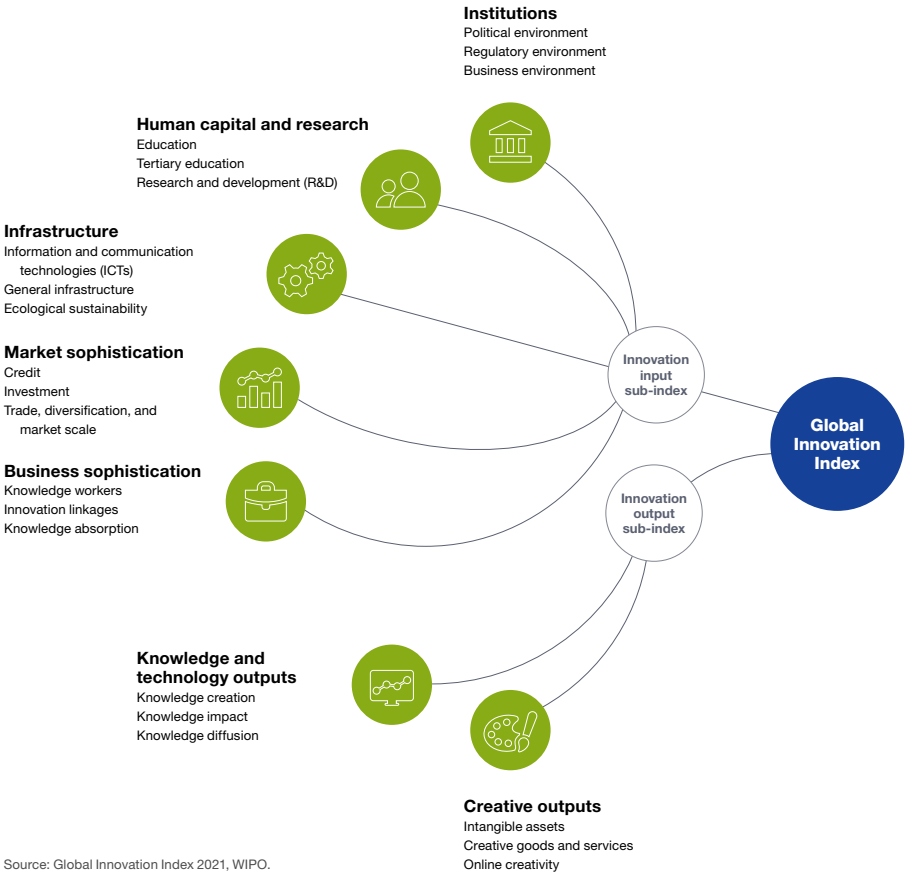
Outdated data for North Macedonia

Code	Indicator name	Economy year	Model year	Source
2.1.5	Pupil-teacher ratio, secondary	2018	2019	UNESCO Institute for Statistics
5.2.2	State of cluster development and depth	2019	2020	World Economic Forum
5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP	2019	2020	Refinitiv
6.1.1	Patents by origin/bn PPP$ GDP	2013	2019	World Intellectual Property Organization
7.2.4	Printing and other media, % manufacturing	2017	2018	United Nations Industrial Development Organization

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 2021, WIPO.

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.