Global Innovation Index 2021

KAZAKHSTAN

79th Kazakhstan ranks 79th 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 Kazakhstan 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 Kazakhstan in the GII 2021 is between ranks 77 and 83.

Rankings for Kazakhstan (2019–2021)

	GII	Innovation inputs	Innovation outputs
2021	79	61	101
2020	77	60	94
2019	79	64	92

- Kazakhstan performs better in innovation inputs than innovation outputs in 2021.
- This year Kazakhstan ranks 61st in innovation inputs, lower than last year but higher than 2019.
- As for innovation outputs, Kazakhstan ranks 101st. This position is lower than both 2020 and 2019.

23rd Kazakhstan ranks 23rd among the 34 upper middle-income group economies.

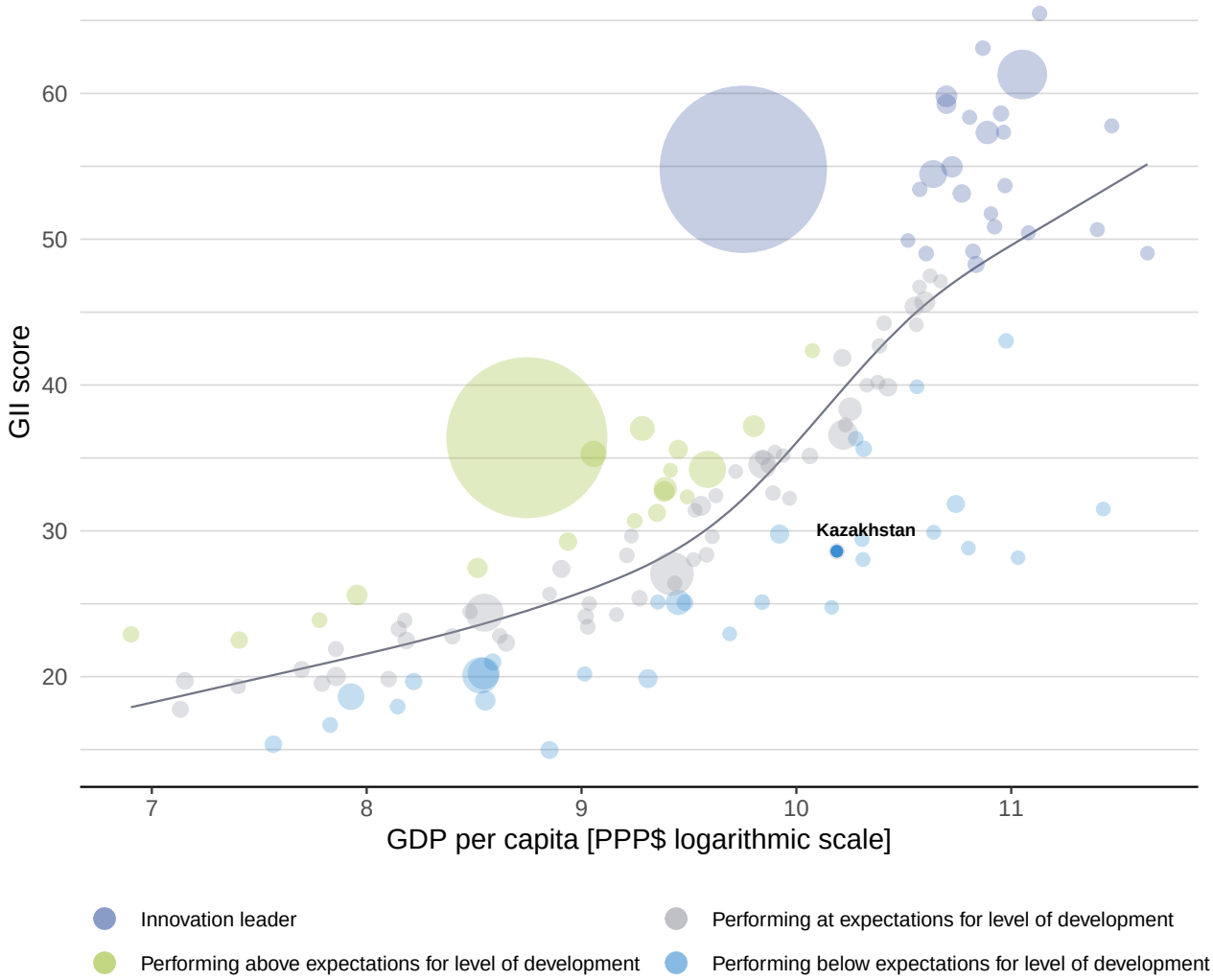
3rd Kazakhstan ranks 3rd among the 10 economies in Central and Southern Asia.

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

The positive relationship between innovation and development

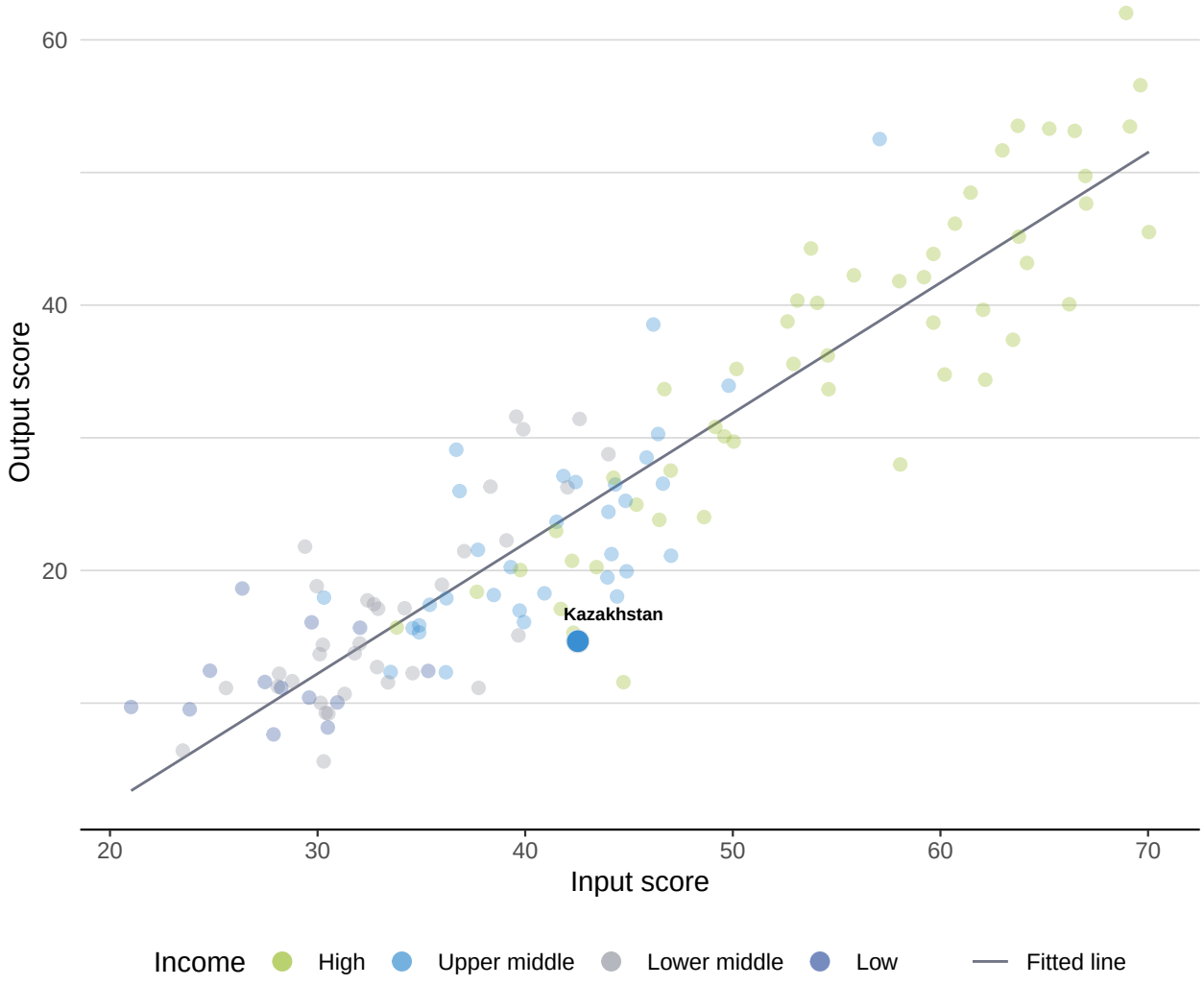


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

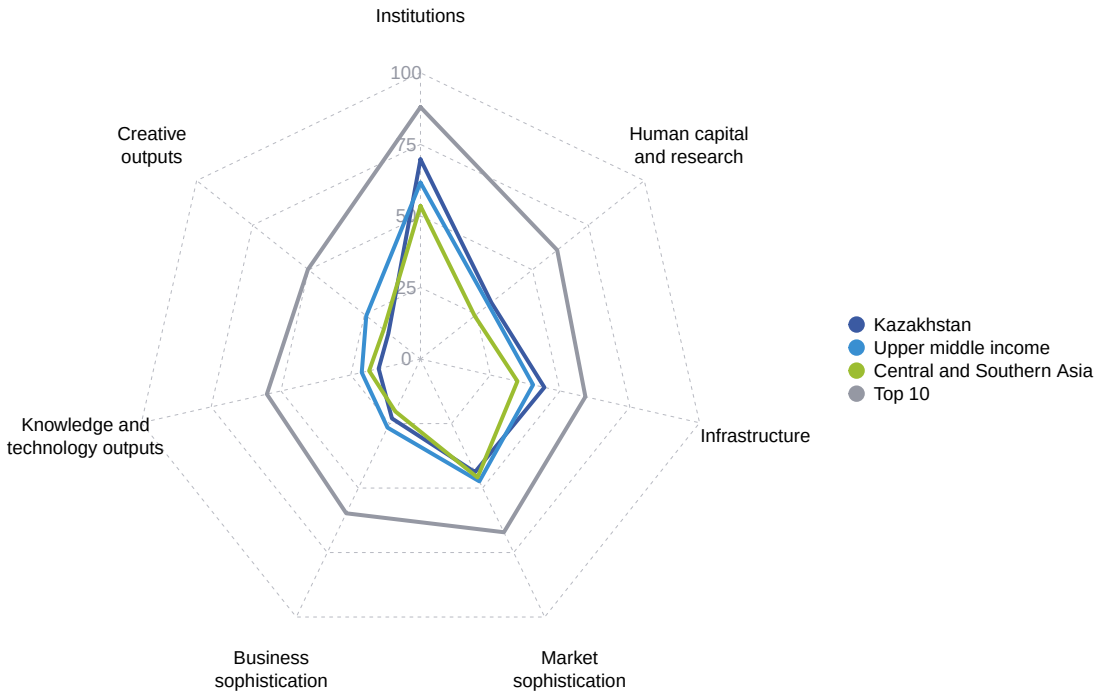
Kazakhstan produces less innovation outputs relative to its level of innovation investments.

Innovation input to output performance



BENCHMARKING AGAINST OTHER UPPER MIDDLE-INCOME GROUP ECONOMIES AND CENTRAL AND SOUTHERN ASIA

The seven GII pillar scores for Kazakhstan



Upper middle-income group economies

Kazakhstan performs above the upper middle-income group average in three pillars, namely: Institutions; Human capital and research; and, Infrastructure.

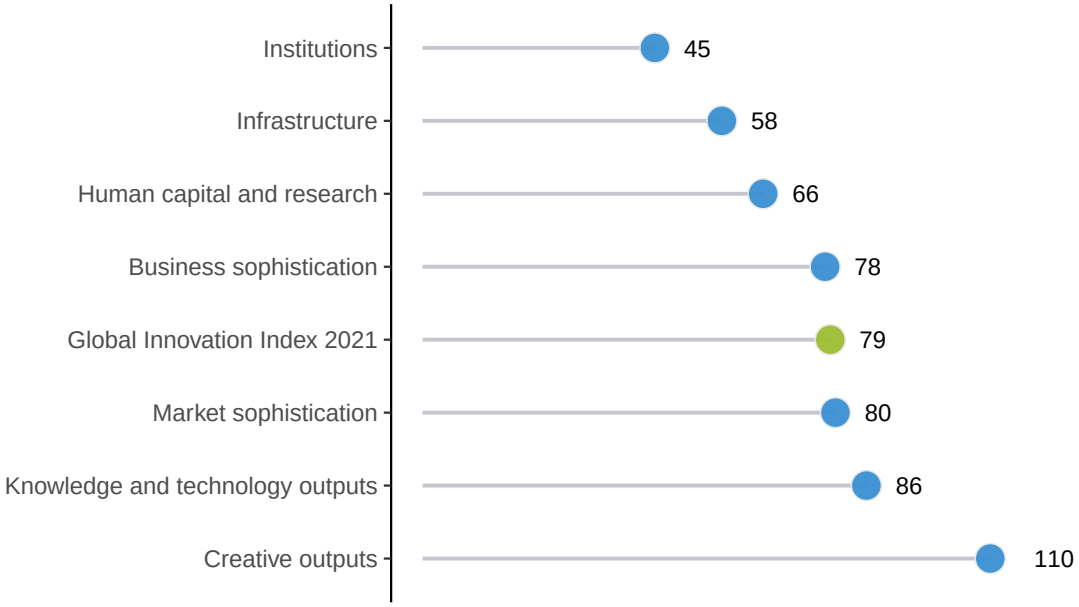
Central and Southern Asia

Kazakhstan performs above the regional average in four pillars, namely: Institutions; Human capital and research; Infrastructure; and, Business sophistication.

OVERVIEW OF RANKINGS IN THE SEVEN GII 2021 AREAS

Kazakhstan performs best in Institutions and its weakest performance is in Creative outputs.

The seven GII pillar ranks for Kazakhstan



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 Kazakhstan in the GII 2021.

Strengths and weaknesses for Kazakhstan

Strengths			Weaknesses		
Code	**Indicator name**	**Rank**	**Code**	**Indicator name**	**Rank**
1.2.3	Cost of redudancy dismissal	18	2.3.2	Gross expenditure on R&D, % GDP	103
1.3	Business environment	31	2.3.3	Global corporate R&D investors, top 3, mn US$	41
1.3.1	Ease of starting a business	20	4.2.3	Venture capital investors, deals/bn PPP$ GDP	89
2.1.5	Pupil-teacher ratio, secondary	12	4.2.4	Venture capital recipients, deals/bn PPP$ GDP	94
2.2.1	Tertiary enrolment, % gross	31	5.2	Innovation linkages	120
3.1	Information and communication technologies (ICTs)	29	5.2.2	State of cluster development and depth	117
3.1.3	Government's online service	11	6.1.4	Scientific and technical articles/bn PPP$ GDP	119
3.1.4	E-participation	26	6.2.3	Software spending, % GDP	118
3.2.3	Gross capital formation, % GDP	24	6.3.1	Intellectual property receipts, % total trade	102
4.2.1	Ease of protecting minority investors	7	6.3.4	ICT services exports, % total trade	122
5.1.5	Females employed w/advanced degrees, %	29	7.2.4	Printing and other media, % manufacturing	96
6.1.3	Utility models by origin/bn PPP$ GDP	14			

Kazakhstan

GII 2021 rank
79

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$	GII 2020 rank
101	**61**	**Upper middle**	**CSA**	**18.8**	**501.8**	**26,589**	**77**

		Score/ Value	Rank	
Institutions		**69.8**	**45**	◆
1.1	**Political environment**	**58.8**	**62**	
1.1.1	Political and operational stability*	69.6	60	
1.1.2	Government effectiveness*	53.4	63	
1.2	**Regulatory environment**	**69.9**	**49**	
1.2.1	Regulatory quality*	47.1	62	
1.2.2	Rule of law*	35.3	90	
1.2.3	Cost of redundancy dismissal	8.7	18	●
1.3	**Business environment**	**80.6**	**31**	● ◆
1.3.1	Ease of starting a business*	94.4	20	● ◆
1.3.2	Ease of resolving insolvency*	66.7	39	
Human capital and research		**31.7**	**66**	
2.1	**Education**	**45.8**	**78**	
2.1.1	Expenditure on education, % GDP	2.9	101	◇
2.1.2	Government funding/pupil, secondary, % GDP/cap ⏲	21.2	41	
2.1.3	School life expectancy, years	15.8	40	
2.1.4	PISA scales in reading, maths and science	402.4	64	
2.1.5	Pupil-teacher ratio, secondary	8.3	12	● ◆
2.2	**Tertiary education**	**38.3**	**48**	
2.2.1	Tertiary enrolment, % gross	70.7	31	●
2.2.2	Graduates in science and engineering, %	24.1	46	
2.2.3	Tertiary inbound mobility, %	3.3	65	
2.3	**Research and development (R&D)**	**10.9**	**54**	
2.3.1	Researchers, FTE/mn pop. ⏲	666.9	61	
2.3.2	Gross expenditure on R&D, % GDP ⏲	0.1	103	○ ◇
2.3.3	Global corporate R&D investors, top 3, mn US$	0.0	41	○ ◇
2.3.4	QS university ranking, top 3*	33.8	36	
Infrastructure		**44.4**	**58**	
3.1	**Information and communication technologies (ICTs)**	**80.5**	**29**	● ◆
3.1.1	ICT access*	76.6	43	◆
3.1.2	ICT use*	64.9	56	
3.1.3	Government's online service*	92.3	11	● ◆
3.1.4	E-participation*	88.1	26	●
3.2	**General infrastructure**	**32.6**	**49**	
3.2.1	Electricity output, GWh/mn pop.	5,887.8	35	◆
3.2.2	Logistics performance*	35.4	70	
3.2.3	Gross capital formation, % GDP	28.3	24	●
3.3	**Ecological sustainability**	**20.1**	**99**	◇
3.3.1	GDP/unit of energy use	6.4	104	◇
3.3.2	Environmental performance*	44.7	75	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	0.4	88	
Market sophistication		**43.8**	**80**	
4.1	**Credit**	**35.9**	**81**	
4.1.1	Ease of getting credit*	80.0	23	
4.1.2	Domestic credit to private sector, % GDP	24.3	108	
4.1.3	Microfinance gross loans, % GDP	0.2	47	
4.2	**Investment**	**23.0**	**101**	
4.2.1	Ease of protecting minority investors*	84.0	7	● ◆
4.2.2	Market capitalization, % GDP	23.4	54	
4.2.3	Venture capital investors, deals/bn PPP$ GDP	0.0	89	○ ◇
4.2.4	Venture capital recipients, deals/bn PPP$ GDP	0.0	94	○ ◇
4.3	**Trade, diversification, and market scale**	**72.6**	**53**	
4.3.1	Applied tariff rate, weighted avg., %	2.3	57	
4.3.2	Domestic industry diversification	76.3	87	
4.3.3	Domestic market scale, bn PPP$	501.8	40	

		Score/ Value	Rank	
Business sophistication		**23.0**	**78**	
5.1	**Knowledge workers**	**37.1**	**52**	
5.1.1	Knowledge-intensive employment, % ⏲	34.3	40	◆
5.1.2	Firms offering formal training, %	21.8	71	
5.1.3	GERD performed by business, % GDP ⏲	0.1	74	
5.1.4	GERD financed by business, %	47.4	31	
5.1.5	Females employed w/advanced degrees, % ⏲	20.7	29	● ◆
5.2	**Innovation linkages**	**12.9**	**120**	○ ◇
5.2.1	University-industry R&D collaboration†	36.0	95	
5.2.2	State of cluster development and depth†	32.8	117	○ ◇
5.2.3	GERD financed by abroad, % GDP	0.0	90	
5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP	0.0	82	
5.2.5	Patent families/bn PPP$ GDP	0.1	54	
5.3	**Knowledge absorption**	**19.0**	**97**	
5.3.1	Intellectual property payments, % total trade	0.3	87	
5.3.2	High-tech imports, % total trade	7.4	70	
5.3.3	ICT services imports, % total trade	0.7	93	
5.3.4	FDI net inflows, % GDP	1.6	91	
5.3.5	Research talent, % in businesses	n/a	n/a	
Knowledge and technology outputs		**15.0**	**86**	
6.1	**Knowledge creation**	**14.9**	**66**	
6.1.1	Patents by origin/bn PPP$ GDP ⏲	1.9	39	
6.1.2	PCT patents by origin/bn PPP$ GDP	0.1	73	
6.1.3	Utility models by origin/bn PPP$ GDP ⏲	1.6	14	●
6.1.4	Scientific and technical articles/bn PPP$ GDP	3.2	119	○ ◇
6.1.5	Citable documents H-index	5.3	102	
6.2	**Knowledge impact**	**19.1**	**110**	◇
6.2.1	Labor productivity growth, %	0.9	48	
6.2.2	New businesses/th pop. 15–64	2.0	56	
6.2.3	Software spending, % GDP	0.0	118	○ ◇
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	1.0	111	
6.2.5	High-tech manufacturing, %	13.5	81	
6.3	**Knowledge diffusion**	**11.0**	**91**	
6.3.1	Intellectual property receipts, % total trade	0.0	102	○ ◇
6.3.2	Production and export complexity	30.2	92	
6.3.3	High-tech exports, % total trade	3.9	42	
6.3.4	ICT services exports, % total trade	0.2	122	○
Creative outputs		**14.3**	**110**	◇
7.1	**Intangible assets**	**19.2**	**105**	
7.1.1	Trademarks by origin/bn PPP$ GDP	22.6	87	
7.1.2	Global brand value, top 5,000, % GDP	3.8	70	
7.1.3	Industrial designs by origin/bn PPP$ GDP ⏲	0.2	103	
7.1.4	ICTs and organizational model creation†	48.2	88	
7.2	**Creative goods and services**	**6.5**	**96**	
7.2.1	Cultural and creative services exports, % total trade	0.1	89	
7.2.2	National feature films/mn pop. 15–69	6.1	38	
7.2.3	Entertainment and media market/th pop. 15–69	n/a	n/a	
7.2.4	Printing and other media, % manufacturing	0.4	96	○ ◇
7.2.5	Creative goods exports, % total trade	0.2	80	
7.3	**Online creativity**	**12.4**	**83**	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	0.3	115	
7.3.2	Country-code TLDs/th pop. 15–69	3.7	60	
7.3.3	Wikipedia edits/mn pop. 15–69	44.8	77	
7.3.4	Mobile app creation/bn PPP$ GDP	1.5	72	

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 Kazakhstan.

Missing data for Kazakhstan

Code	Indicator name	Economy year	Model year	Source
5.3.5	Research talent, % in businesses	n/a	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
7.2.3	Entertainment and media market/th pop. 15–69	n/a	2020	PwC

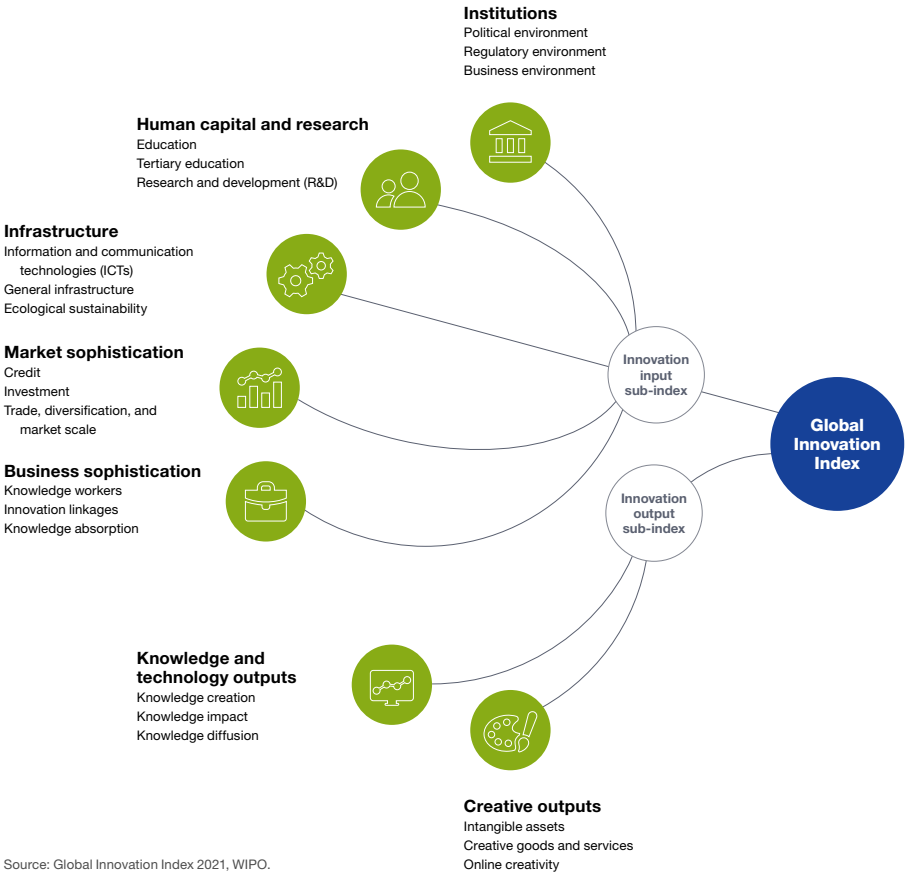
Outdated data for Kazakhstan

Code	Indicator name	Economy year	Model year	Source
2.1.2	Government funding/pupil, secondary, % GDP/cap	2016	2017	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2018	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
2.3.2	Gross expenditure on R&D, % GDP	2018	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
5.1.1	Knowledge-intensive employment, %	2017	2019	International Labour Organization
5.1.3	GERD performed by business, % GDP	2018	2019	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
5.1.5	Females employed w/advanced degrees, %	2017	2019	International Labour Organization
6.1.1	Patents by origin/bn PPP$ GDP	2018	2019	World Intellectual Property Organization
6.1.3	Utility models by origin/bn PPP$ GDP	2018	2019	World Intellectual Property Organization
7.1.3	Industrial designs by origin/bn PPP$ GDP	2018	2019	World Intellectual Property 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.