# GLOBAL INNOVATION INDEX 2020


# KAZAKHSTAN

**77th** Kazakhstan ranks 77th among the 131 economies featured in the GII 2020.

**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 2020 is between ranks 74 and 80.

**Rankings of Kazakhstan (2018–2020)**

| | GII | Innovation inputs | Innovation outputs |
|---|---|---|---|
| **2020** | 77 | 60 | 94 |
| **2019** | 79 | 64 | 92 |
| **2018** | 74 | 55 | 91 |

- Kazakhstan performs better in innovation inputs than innovation outputs in 2020.
- This year Kazakhstan ranks 60th in innovation inputs, higher than last year and lower compared to 2018.
- As for innovation outputs, Kazakhstan ranks 94th. This position is lower than last year and lower compared to 2018.

**24th** Kazakhstan ranks 24th among the 37 upper middle-income group economies.

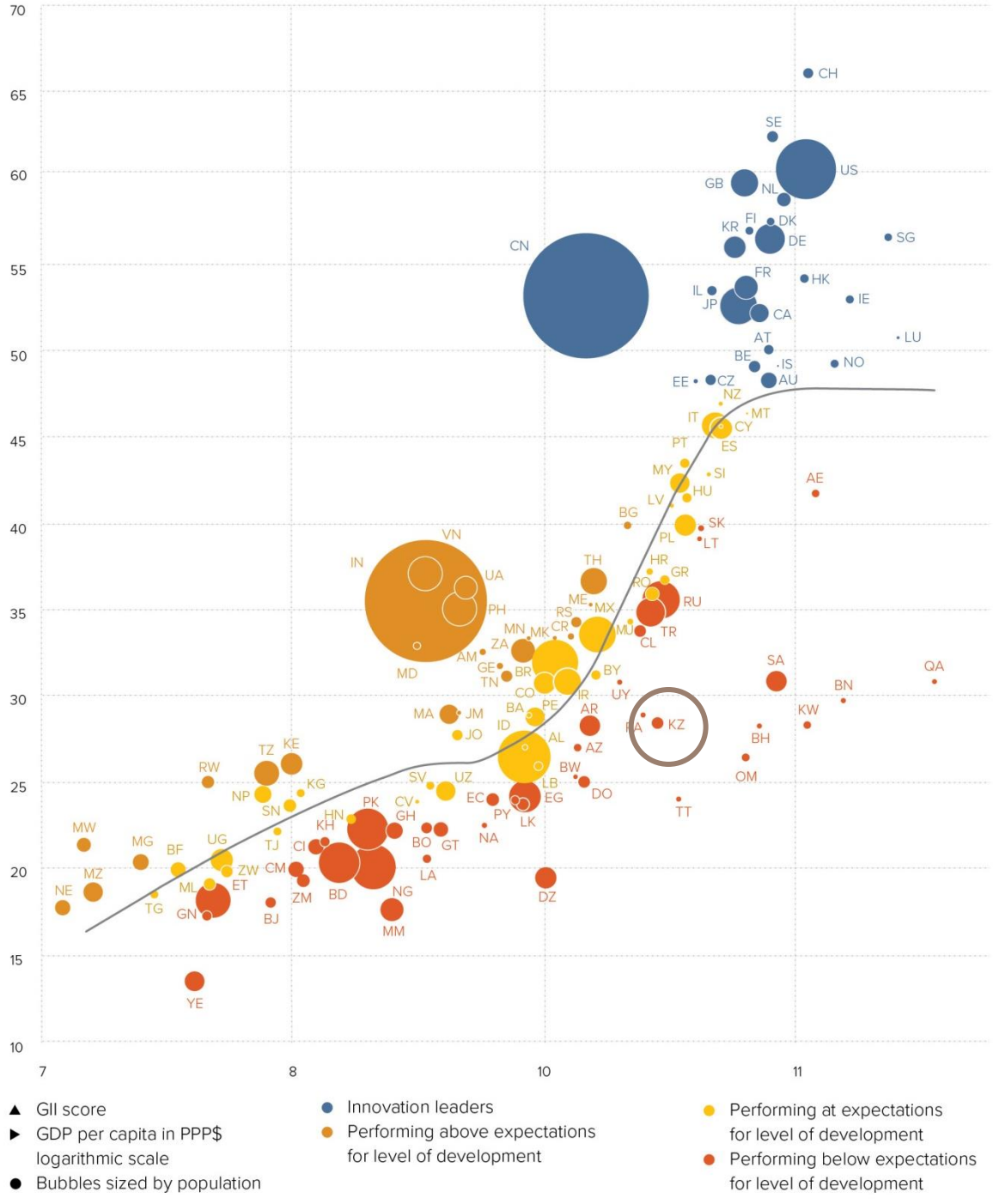
**3rd** Kazakhstan ranks 3rd among the 10 economies in Central and Southern Asia.

# 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 is performing below expectations for its level of development.

## The positive relationship between innovation and development

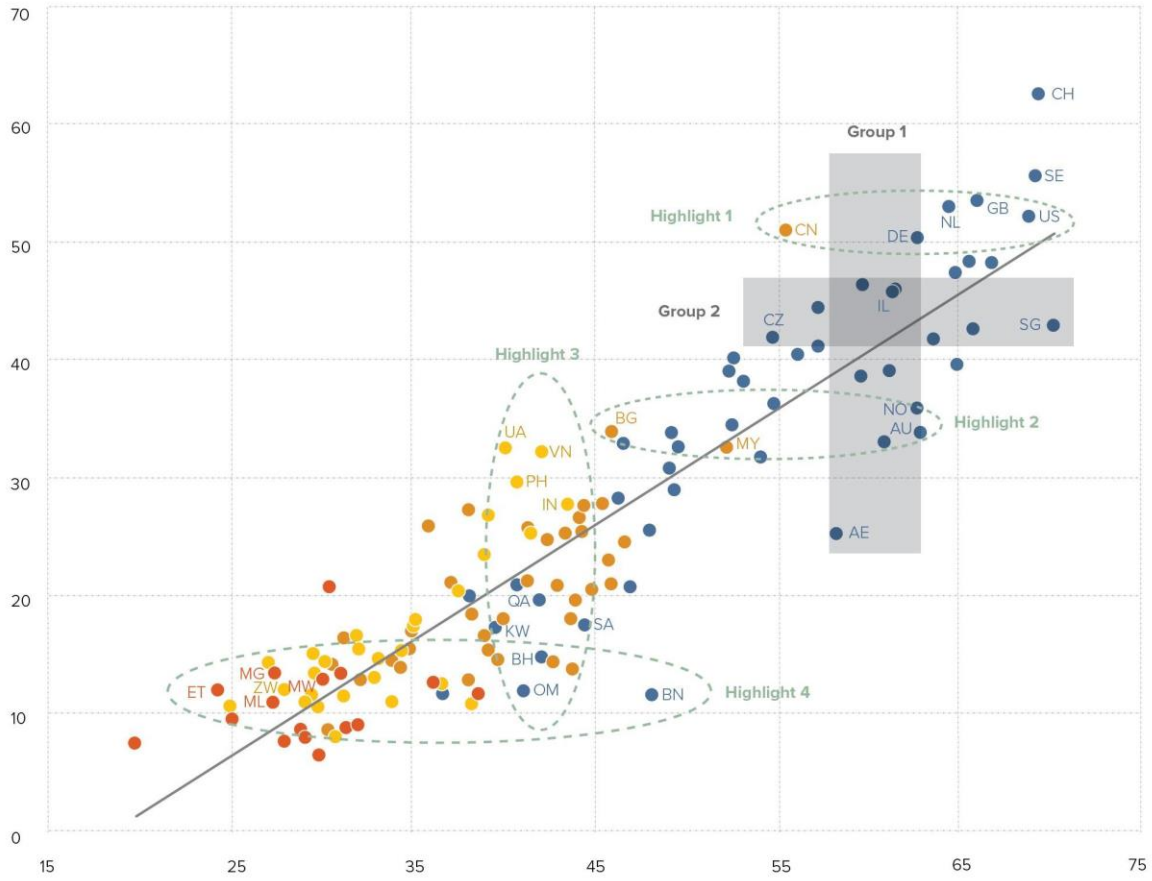


# EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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, 2020




▲ Output score
► Input score

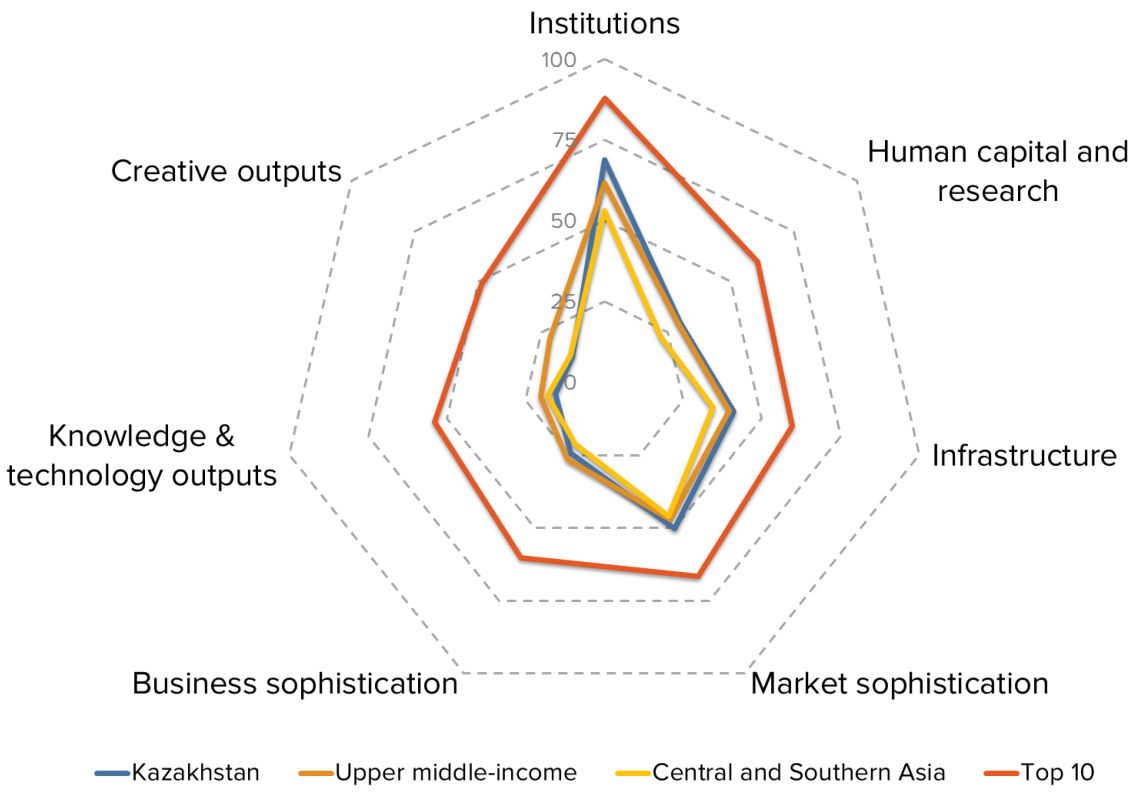
● High income group
● Upper middle-income group
● Lower middle-income group
● Low income group

— Fitted values

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| AU | Australia | IN | India | NL | Netherlands | CH | Switzerland |
| BH | Bahrain | IL | Israel | NO | Norway | UA | Ukraine |
| BN | Brunei Darussalam | KW | Kuwait | OM | Oman | AE | United Arab Emirates |
| BG | Bulgaria | MG | Madagascar | PH | Philippines | GB | United Kingdom |
| CN | China | MW | Malawi | QA | Qatar | US | United States of America |
| CZ | Czech Republic | ML | Mali | SA | Saudi Arabia | VN | Viet Nam |
| ET | Ethiopia | MY | Malaysia | SG | Singapore | ZW | Zimbabwe |
| DE | Germany | | | SE | Sweden | | |

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

**Kazakhstan's scores in the seven GII pillars**




**Upper middle-income group economies**

Kazakhstan has high scores in four out of the seven GII pillars: Institutions, Human capital & research, Infrastructure and Market sophistication, which are above average for the upper middle-income group.

Conversely, Kazakhstan scores below the average for its income group in three pillars: Business sophistication, Knowledge & technology outputs, and Creative outputs.

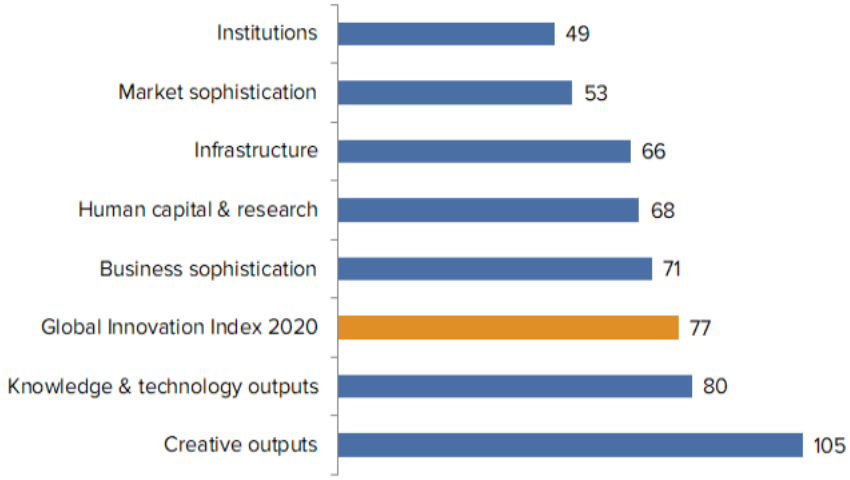
**Central and Southern Asia**

Compared to other economies in Central and Southern Asia, Kazakhstan performs:

- above average in five out of the seven GII pillars: Institutions, Human capital & research, Infrastructure, Market sophistication and Business sophistication; and
- below average in two out of the seven GII pillars: Knowledge & technology outputs and Creative outputs.

# OVERVIEW OF KAZAKHSTAN RANKINGS IN THE SEVEN GII AREAS

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




*The highest possible ranking in each pillar is 1.

# INNOVATION STRENGTHS AND WEAKNESSES

The table below gives an overview of the strengths and weaknesses of Kazakhstan in the GII 2020.

**Strengths**

| Code | Indicator name | Rank |
|---|---|---|
| 1.2.3 | Cost of redundancy dismissal, salary weeks | 18 |
| 1.3 | Business environment | 31 |
| 1.3.1 | Ease of starting a business* | 20 |
| 2.1.5 | Pupil-teacher ratio, secondary | 8 |
| 3.1.3 | Government's online service* | 32 |
| 4.1.1 | Ease of getting credit* | 23 |
| 4.2 | Investment | 28 |
| 4.2.1 | Ease of protecting minority investors* | 7 |
| 5.1.5 | Females employed w/advanced degrees, % | 27 |
| 5.3.4 | FDI net inflows, % GDP | 25 |
| 6.1.3 | Utility models by origin/bn PPP$ GDP | 15 |
| 6.2.1 | Growth rate of PPP$ GDP/worker, % | 25 |

**Weaknesses**

| Code | Indicator name | Rank |
|---|---|---|
| 2.1.1 | Expenditure on education, % GDP | 104 |
| 2.3.3 | Global R&D companies, top 3, mn US$ | 42 |
| 3.3.1 | GDP/unit of energy use | 111 |
| 5.2 | Innovation linkages | 124 |
| 5.2.2 | State of cluster development† | 114 |
| 6.1.4 | Scientific & technical articles/bn PPP$ GDP | 117 |
| 6.2.3 | Computer software spending, % GDP | 118 |
| 6.3.1 | Intellectual property receipts, % total trade | 99 |
| 6.3.3 | ICT services exports, % total trade | 115 |
| 7.2.4 | Printing & other media, % manufacturing | 90 |
| 7.3.4 | Mobile app creation/bn PPP$ GDP | 94 |

## STRENGTHS

GII strengths for Kazakhstan are found in six of the seven GII pillars.

- Institutions (49): exhibits strengths in the sub-pillar Business environment (31) and in the indicators Cost of redundancy dismissal (18) and Ease of starting a business (20).
- Human capital & research (68): the indicator Pupil–teacher ratio (8) is a strength.
- Infrastructure (66): the indicator Government's online service (32) is a strength.
- Market sophistication (53): has strengths in the sub-pillar Investment (28) and in the indicators Ease of getting credit (23) and Ease of protecting minority investors (7).
- Business sophistication (71): shows strengths in the indicators Females employed with advanced degrees (27) and FDI net inflows (25).
- Knowledge & technology outputs (80): reveals strengths in the indicators Utility models by origin (15) and Growth rate per worker (25).

## WEAKNESSES

GII weaknesses for Kazakhstan are found in five of the seven GII pillars.

- Human capital & research (68): has weaknesses in the indicators Expenditure on education (104) and Global R&D companies (42).
- Infrastructure (66): the indicator GDP per unit of energy use (111) is a weakness.
- Business sophistication (71): demonstrates weaknesses in the sub-pillar Innovation linkages (124) and in the indicator State of cluster development (114).
- Knowledge & technology outputs (80): shows weaknesses in the indicators Scientific & technical articles (117), Computer software spending (118), Intellectual property receipts (99) and ICT services exports (115).
- Creative outputs (105): has weaknesses in the indicators Printing and other media (90) and Mobile app creation (94).

# KAZAKHSTAN

GII 2020 rank

**77**

| Output rank | Input rank | Income | Region | Population (mn) | GDP, PPP$ | GDP per capita, PPP$ | GII 2019 rank |
|---|---|---|---|---|---|---|---|
| 94 | 60 | Upper middle | CSA | 18.6 | 537.7 | 25,186.2 | 79 |

| | | Score/Value | Rank | |
|---|---|---|---|---|
| | **INSTITUTIONS** | **69.0** | **49** | |
| **1.1** | **Political environment** | **57.0** | **68** | |
| 1.1.1 | Political and operational stability* | 69.6 | 70 | |
| 1.1.2 | Government effectiveness* | 50.6 | 70 | |
| **1.2** | **Regulatory environment** | **69.6** | **48** | |
| 1.2.1 | Regulatory quality* | 45.5 | 63 | |
| 1.2.2 | Rule of law* | 35.4 | 92 | |
| 1.2.3 | Cost of redundancy dismissal, salary weeks | 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 & RESEARCH** | **29.7** | **68** | |
| **2.1** | **Education** | **41.4** | **76** | |
| 2.1.1 | Expenditure on education, % GDP | 2.8 | 104 | ○ |
| 2.1.2 | Government funding/pupil, secondary, % GDP/cap | 21.2 | 43 | |
| 2.1.3 | School life expectancy, years | 15.6 | 40 | |
| 2.1.4 | PISA scales in reading, maths, & science | 402.4 | 64 | |
| 2.1.5 | Pupil-teacher ratio, secondary | 7.7 | 8 | ● ◆ |
| **2.2** | **Tertiary education** | **37.4** | **55** | |
| 2.2.1 | Tertiary enrolment, % gross | 61.7 | 45 | |
| 2.2.2 | Graduates in science & engineering, % | 24.7 | 39 | |
| 2.2.3 | Tertiary inbound mobility, % | 3.3 | 62 | |
| **2.3** | **Research & development (R&D)** | **10.4** | **57** | |
| 2.3.1 | Researchers, FTE/mn pop | 666.9 | 62 | |
| 2.3.2 | Gross expenditure on R&D, % GDP | 0.1 | 101 | |
| 2.3.3 | Global R&D companies, avg. exp. top 3, mn $US | 0.0 | 42 | ○ ◇ |
| 2.3.4 | QS university ranking, average score top 3* | 31.6 | 37 | |
| | **INFRASTRUCTURE** | **40.8** | **66** | |
| **3.1** | **Information & communication technologies (ICTs)** | **76.3** | **42** | ◆ |
| 3.1.1 | ICT access* | 75.2 | 42 | ◆ |
| 3.1.2 | ICT use* | 59.6 | 58 | |
| 3.1.3 | Government's online service* | 86.8 | 32 | ● ◆ |
| 3.1.4 | E-participation* | 83.7 | 42 | |
| **3.2** | **General infrastructure** | **26.6** | **69** | |
| 3.2.1 | Electricity output, kWh/mn pop | 5,716.6 | 36 | ◆ |
| 3.2.2 | Logistics performance* | 34.7 | 70 | |
| 3.2.3 | Gross capital formation, % GDP | 25.5 | 48 | |
| **3.3** | **Ecological sustainability** | **19.6** | **103** | ◇ |
| 3.3.1 | GDP/unit of energy use | 5.0 | 111 | ○ ◇ |
| 3.3.2 | Environmental performance* | 44.7 | 75 | |
| 3.3.3 | ISO 14001 environmental certificates/bn PPP$ GDP | 0.5 | 82 | |
| | **MARKET SOPHISTICATION** | **50.0** | **53** | |
| **4.1** | **Credit** | **36.7** | **82** | |
| 4.1.1 | Ease of getting credit* | 80.0 | 23 | ● |
| 4.1.2 | Domestic credit to private sector, % GDP | 27.3 | 100 | |
| 4.1.3 | Microfinance gross loans, % GDP | 0.2 | 48 | |
| **4.2** | **Investment** | **47.8** | **28** | ● |
| 4.2.1 | Ease of protecting minority investors* | 84.0 | 7 | ● ◆ |
| 4.2.2 | Market capitalization, % GDP | 25.7 | 51 | |
| 4.2.3 | Venture capital deals/bn PPP$ GDP | n/a | n/a | |
| **4.3** | **Trade, competition, and market scale** | **65.5** | **50** | |
| 4.3.1 | Applied tariff rate, weighted avg., % | 2.4 | 60 | |
| 4.3.2 | Intensity of local competition+ | 60.0 | 107 | ◇ |
| 4.3.3 | Domestic market scale, bn PPP$ | 537.7 | 40 | |

| | | Score/Value | Rank | |
|---|---|---|---|---|
| | **BUSINESS SOPHISTICATION** | **24.3** | **71** | |
| **5.1** | **Knowledge workers** | **37.3** | **52** | |
| 5.1.1 | Knowledge-intensive employment, % | 34.3 | 39 | ◆ |
| 5.1.2 | Firms offering formal training, % | 21.8 | 69 | |
| 5.1.3 | GERD performed by business, % GDP | 0.1 | 70 | |
| 5.1.4 | GERD financed by business, % | 47.4 | 34 | |
| 5.1.5 | Females employed w/advanced degrees, % | 20.7 | 27 | ● ◆ |
| **5.2** | **Innovation linkages** | **13.0** | **124** | ○ ◇ |
| 5.2.1 | University/industry research collaboration+ | 40.9 | 68 | |
| 5.2.2 | State of cluster development+ | 33.9 | 114 | ○ ◇ |
| 5.2.3 | GERD financed by abroad, % GDP | 0.0 | 89 | |
| 5.2.4 | JV-strategic alliance deals/bn PPP$ GDP | 0.0 | 99 | |
| 5.2.5 | Patent families 2+ offices/bn PPP$ GDP | 0.0 | 89 | |
| **5.3** | **Knowledge absorption** | **22.6** | **91** | |
| 5.3.1 | Intellectual property payments, % total trade | 0.3 | 80 | |
| 5.3.2 | High-tech imports, % total trade | 7.1 | 72 | |
| 5.3.3 | ICT services imports, % total trade | 0.7 | 92 | |
| 5.3.4 | FDI net inflows, % GDP | 5.2 | 25 | ● |
| 5.3.5 | Research talent, % in business enterprise | n/a | n/a | |
| | **KNOWLEDGE & TECHNOLOGY OUTPUTS** | **15.8** | **80** | |
| **6.1** | **Knowledge creation** | **11.7** | **72** | |
| 6.1.1 | Patents by origin/bn PPP$ GDP | 1.7 | 44 | |
| 6.1.2 | PCT patents by origin/bn PPP$ GDP | 0.1 | 79 | |
| 6.1.3 | Utility models by origin/bn PPP$ GDP | 1.5 | 15 | ● |
| 6.1.4 | Scientific & technical articles/bn PPP$ GDP | 2.1 | 117 | ○ |
| 6.1.5 | Citable documents H-index | 5.1 | 103 | |
| **6.2** | **Knowledge impact** | **15.6** | **97** | |
| 6.2.1 | Growth rate of PPP$ GDP/worker, % | 3.0 | 25 | ● |
| 6.2.2 | New businesses/th pop. 15-64 | 2.0 | 56 | |
| 6.2.3 | Computer software spending, % GDP | 0.0 | 118 | ○ ◇ |
| 6.2.4 | ISO 9001 quality certificates/bn PPP$ GDP | 1.1 | 100 | |
| 6.2.5 | High- and medium-high-tech manufacturing, % | 9.6 | 84 | |
| **6.3** | **Knowledge diffusion** | **20.2** | **76** | |
| 6.3.1 | Intellectual property receipts, % total trade | 0.0 | 99 | ○ ◇ |
| 6.3.2 | High-tech net exports, % total trade | 3.2 | 44 | |
| 6.3.3 | ICT services exports, % total trade | 0.2 | 115 | ○ |
| 6.3.4 | FDI net outflows, % GDP | 0.2 | 95 | |
| | **CREATIVE OUTPUTS** | **12.9** | **105** | ◇ |
| **7.1** | **Intangible assets** | **16.6** | **107** | |
| 7.1.1 | Trademarks by origin/bn PPP$ GDP | 20.8 | 93 | |
| 7.1.2 | Global brand value, top 5,000, % GDP | 3.6 | 72 | |
| 7.1.3 | Industrial designs by origin/bn PPP$ GDP | 0.2 | 106 | |
| 7.1.4 | ICTs & organizational model creation+ | 48.2 | 88 | |
| **7.2** | **Creative goods and services** | **6.6** | **96** | |
| 7.2.1 | Cultural & 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 & Media market/th pop. 15-69 | n/a | n/a | |
| 7.2.4 | Printing and other media, % manufacturing | 0.5 | 90 | ○ ◇ |
| 7.2.5 | Creative goods exports, % total trade | 0.2 | 87 | |
| **7.3** | **Online creativity** | **11.6** | **79** | |
| 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 | 45.4 | 70 | |
| 7.3.4 | Mobile app creation/bn PPP$ GDP | 0.0 | 94 | ○ |

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 II 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

| Code | Indicator name | Country year | Model year | Source |
|---|---|---|---|---|
| 4.2.3 | Venture capital deals/bn PPP$ GDP | n/a | 2019 | Thomson Reuters |
| 5.3.5 | Research talent, % in business enterprise | n/a | 2018 | UNESCO Institute for Statistics; Eurostat; OECD – Main Science and Technology Indicators |
| 7.2.3 | Entertainment & Media market/th pop. 15–69 | n/a | 2018 | PwC |

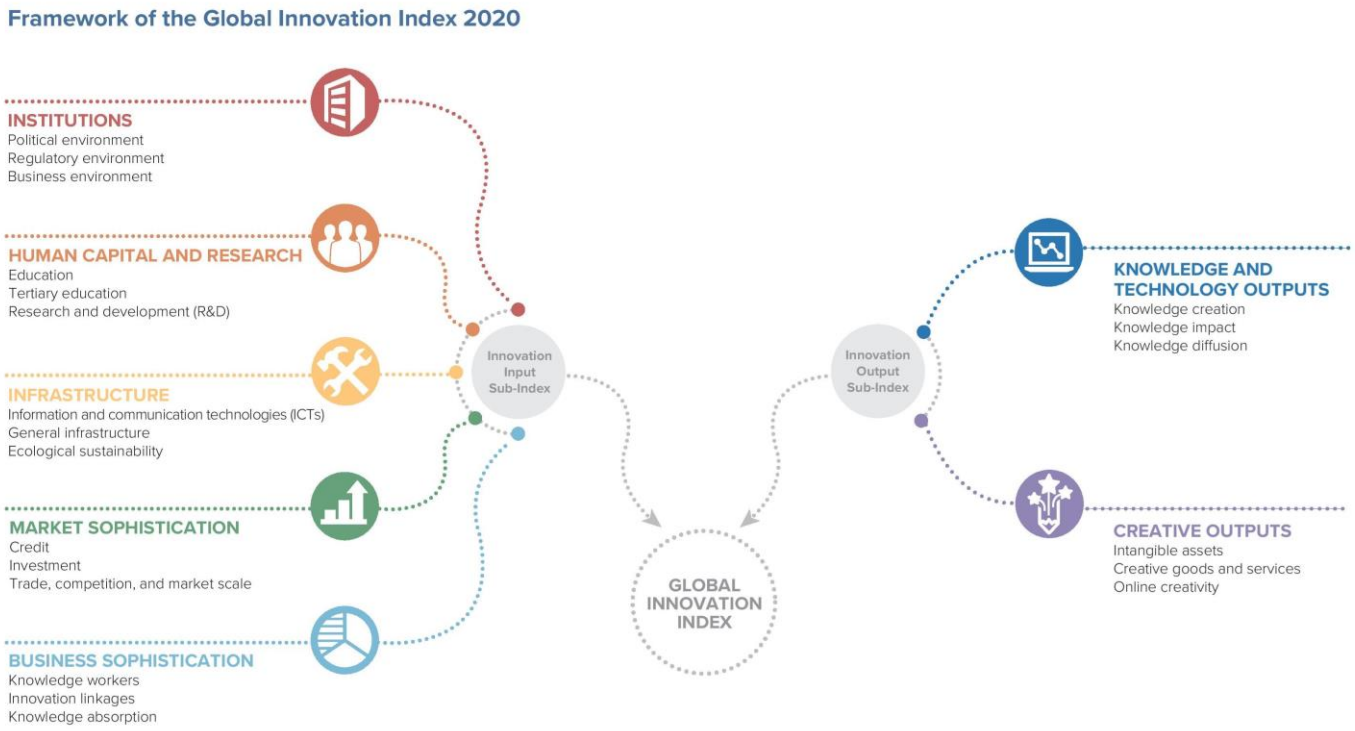
### Outdated data

| Code | Indicator name | Country year | Model year | Source |
|---|---|---|---|---|
| 5.1.1 | Knowledge-intensive employment, % | 2017 | 2018 | International Labour Organization |
| 5.1.5 | Females employed w/advanced degrees, % | 2017 | 2018 | International Labour Organization |

# ABOUT THE GLOBAL INNOVATION INDEX

The Global Innovation Index (GII) is co-published by Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO), a specialized agency of the United Nations. In 2020, the GII presents its 13th edition devoted to the theme *Who Will Finance Innovation?*

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.