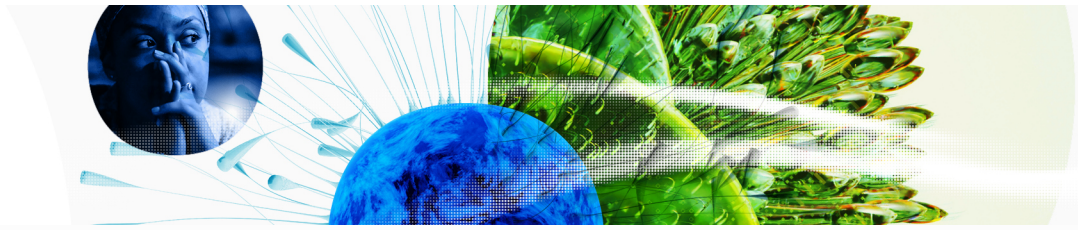
Global Innovation Index 2023



The Global Innovation Index (GII) **ranks world economies according to their innovation capabilities.**

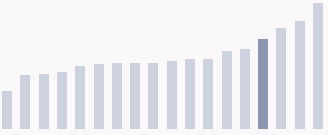
Consisting of **roughly 80 indicators**, grouped into innovation inputs and outputs, the GII **aims to capture the multi-dimensional facets of innovation**.

Türkiye ranking in the Global Innovation Index 2023

> Türkiye ranks 39th among the 132 economies featured in the GII 2023.

> Türkiye ranks 4th among the 33 upper-middle-income group economies.

> Türkiye ranks 4th among the 18 economies in Northern Africa and Western Asia.



> Türkiye GII Ranking (2020-2023)

The table shows the rankings of Türkiye 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 Türkiye in the GII 2023 is between ranks 36 and 42.

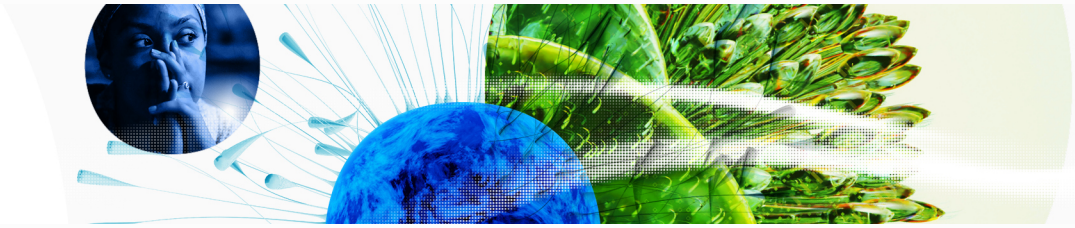
	GII Position	Innovation Inputs	Innovation Outputs
2020	51st	52nd	53rd
2021	41st	45th	41st
2022	37th	49th	33rd
2023	39th	52nd	32nd

Türkiye performs better in innovation outputs than innovation inputs in 2023.

This year Türkiye ranks 52nd in innovation inputs. This position is lower than last year.

Türkiye ranks 32nd in innovation outputs. This position is higher than last year.

Global Innovation Index 2023

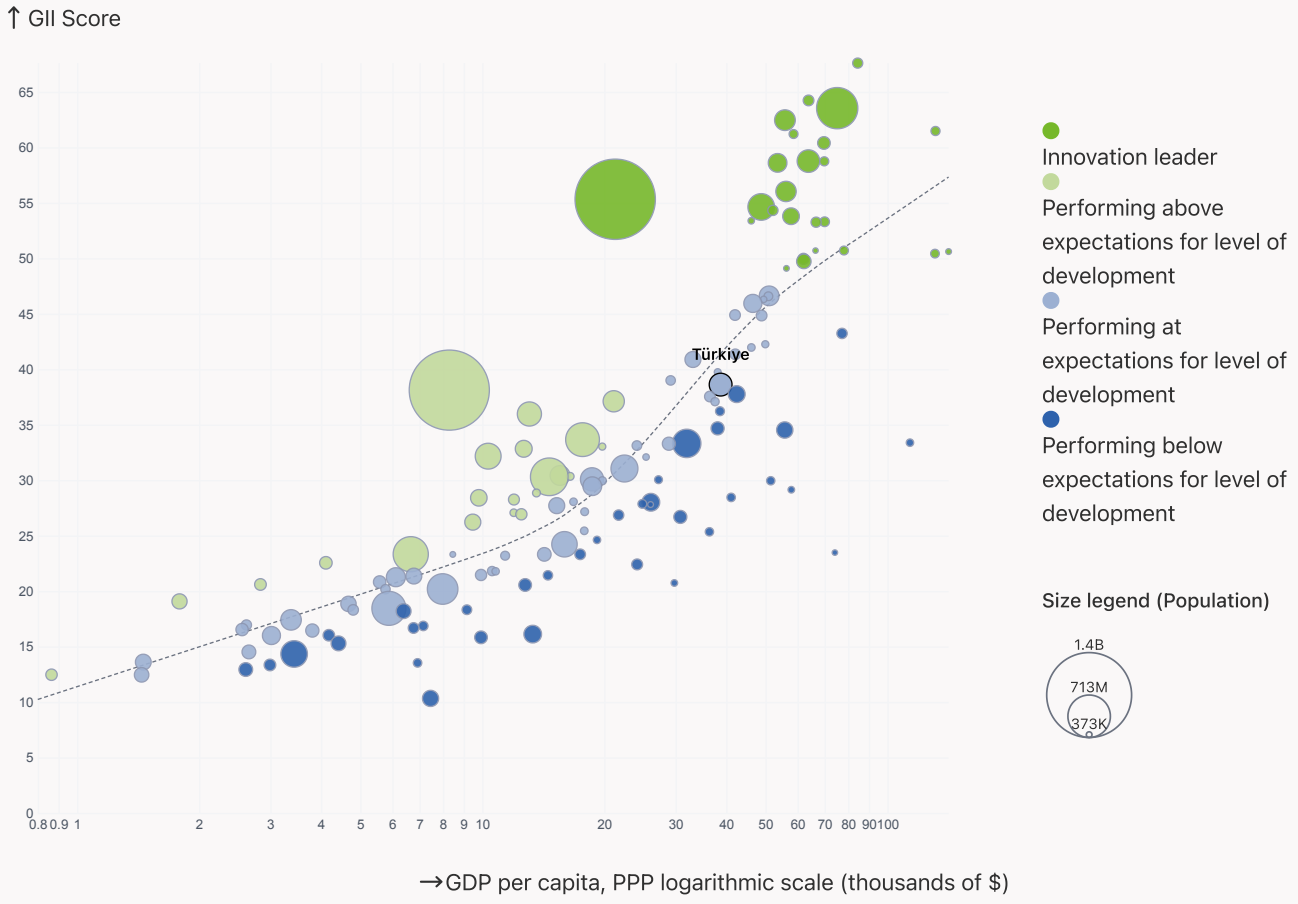


→ Expected vs. observed innovation performance

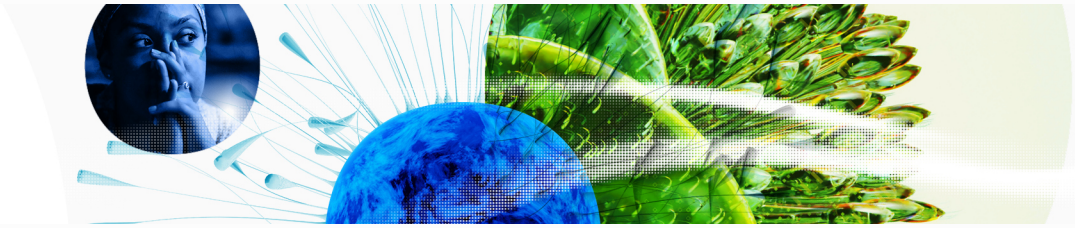
The bubble chart below shows the relationship between income levels (GDP per capita) and innovation performance (GII score). The trend line gives an indication of the expected innovation performance according to income level. Economies appearing above the trend line are performing better than expected and those below are performing below expectations.

> Relative to GDP, Türkiye's performance is at expectations for its level of development.

> Innovation overperformers relative to their economic development



Global Innovation Index 2023

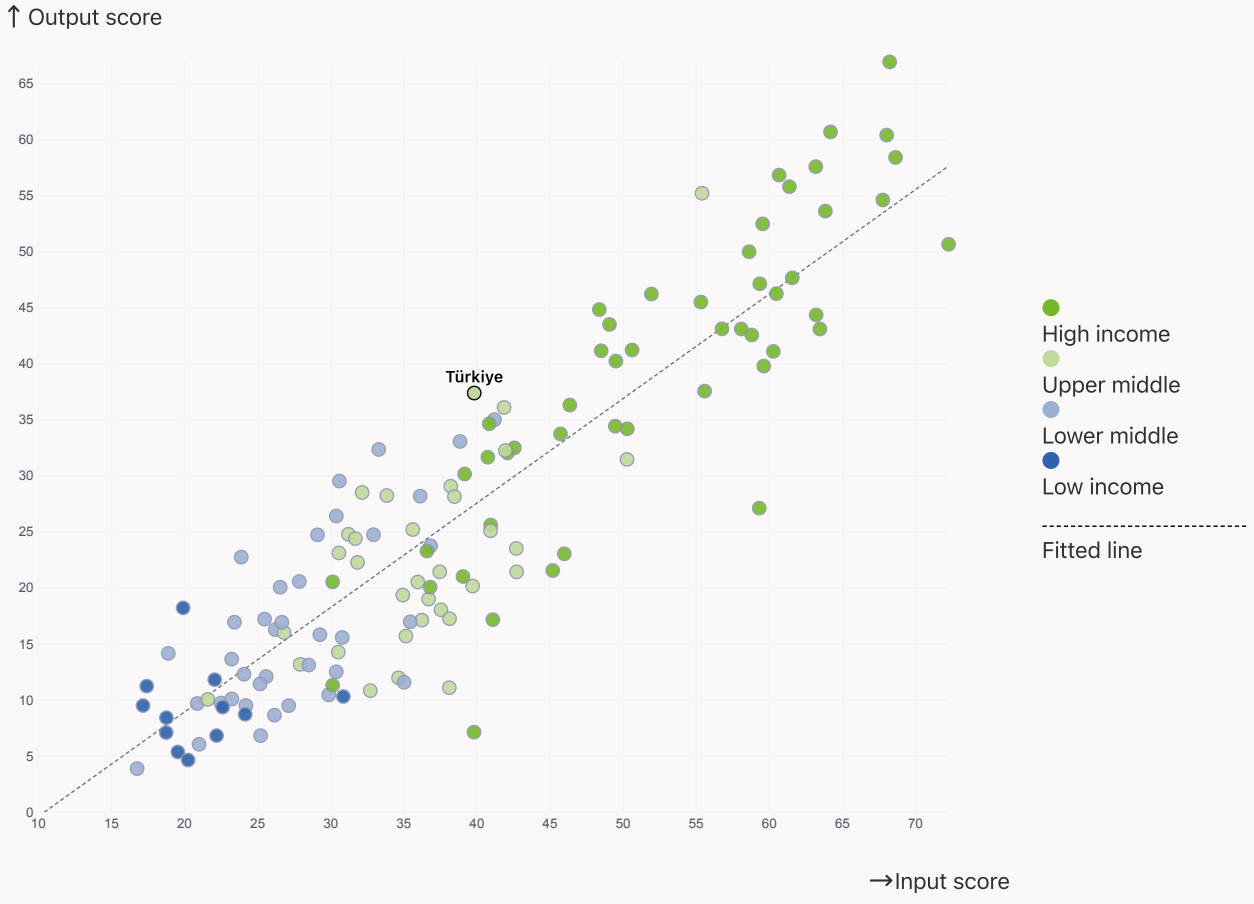


→ Effectively translating innovation investments into innovation outputs

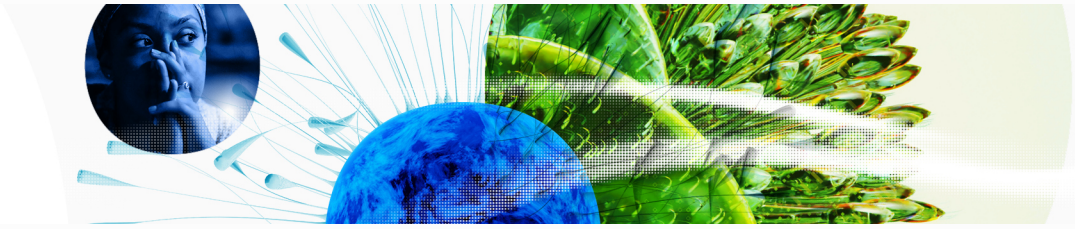
The chart below shows the relationship between innovation inputs and innovation outputs. Economies above the line are effectively translating costly innovation investments into more and higher-quality outputs.

> Türkiye produces more innovation outputs relative to its level of innovation investments.

> Relationship between innovation inputs and outputs

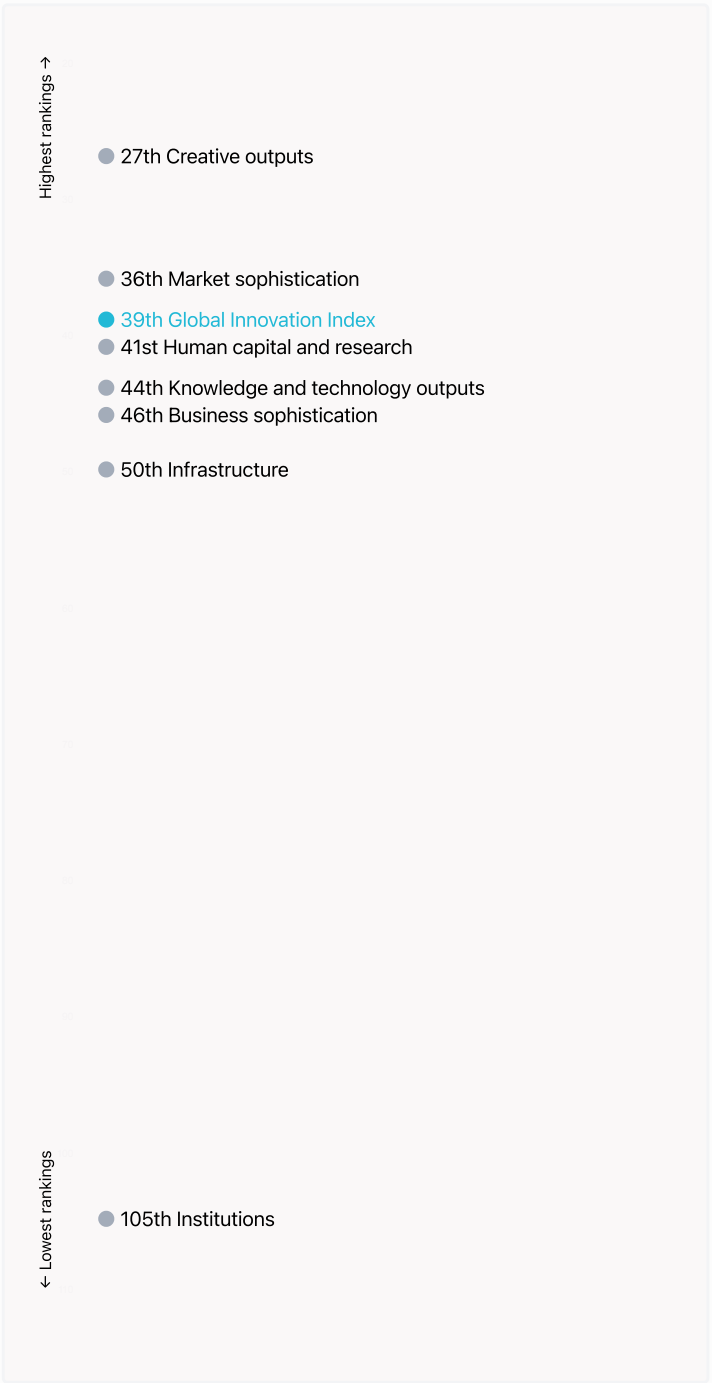


Global Innovation Index 2023



→ Overview of Türkiye's rankings in the seven areas of the GII in 2023

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



> Highest rankings

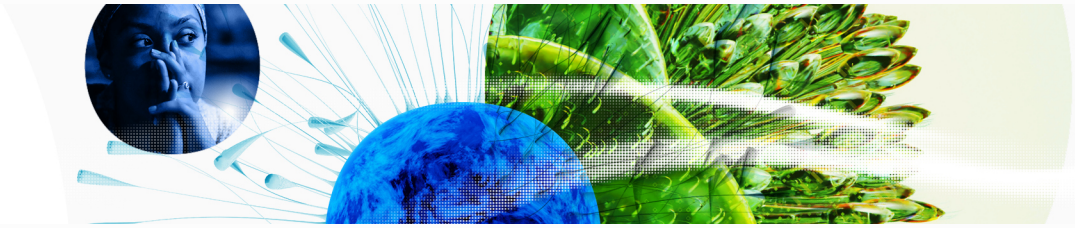
Türkiye ranks highest in Creative outputs (27th) and Market sophistication (36th).

> Lowest rankings

Türkiye ranks lowest in Institutions (105th), Infrastructure (50th) and Business sophistication (46th).

The full WIPO Intellectual Property Statistics profile for Türkiye can be found on this link.

Global Innovation Index 2023



→ Benchmark of Türkiye against other country groupings for each of the seven areas of the GII Index

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

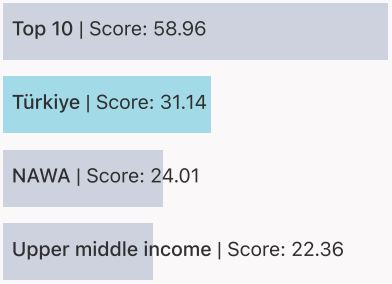
> Upper-Middle-Income economies

Türkiye performs above the upper-middle-income group average in Knowledge and technology outputs, Creative outputs, Business sophistication, Market sophistication, Human capital and research, Infrastructure.

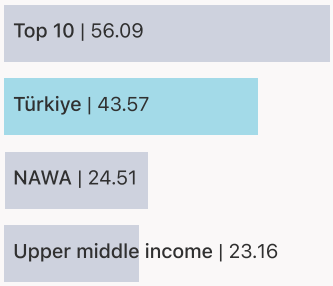
> Northern Africa And Western Asia

Türkiye performs above the regional average in Knowledge and technology outputs, Creative outputs, Business sophistication, Market sophistication, Human capital and research, Infrastructure.

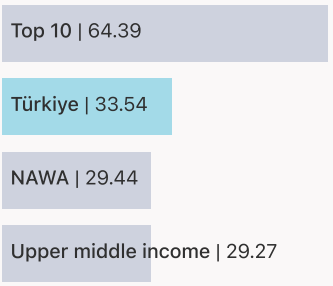
Knowledge and technology outputs



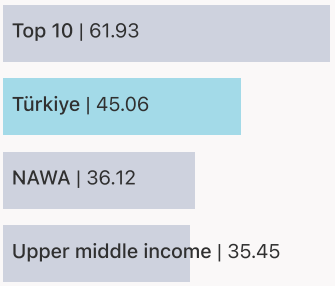
Creative outputs



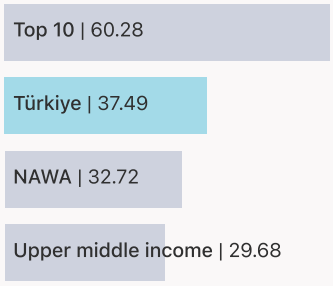
Business sophistication



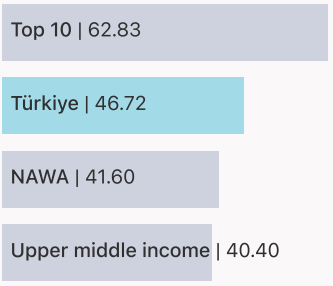
Market sophistication



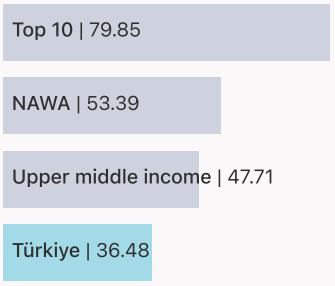
Human capital and research



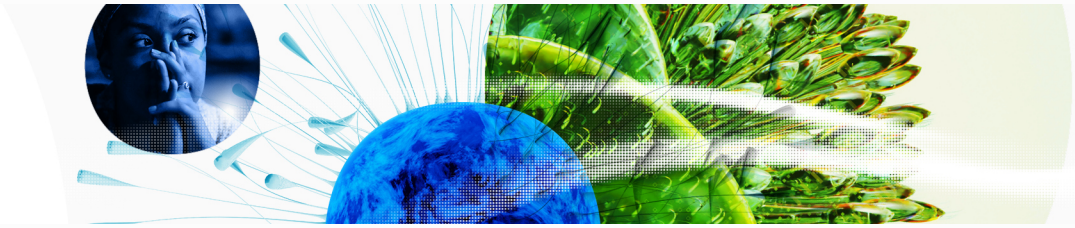
Infrastructure



Institutions



Global Innovation Index 2023



→ Innovation strengths and weaknesses in Türkiye

The table below gives an overview of the indicator strengths and weaknesses of Türkiye in the GII 2023.

> Türkiye's main innovation strengths are **Tertiary enrolment, % gross** (rank 2), **Domestic industry diversification** (rank 4) and **Industrial designs by origin/bn PPP$ GDP** (rank 4).

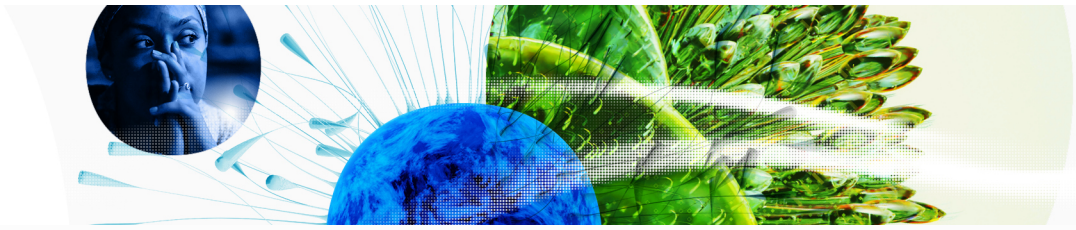
Strengths

Rank	Code	Indicator name
2	2.2.1	Tertiary enrolment, % gross
4	4.3.2	Domestic industry diversification
4	7.1.4	Industrial designs by origin/bn PPP$ GDP
5	7.1.2	Trademarks by origin/bn PPP$ GDP
7	5.3.5	Research talent, % in businesses
11	4.3.3	Domestic market scale, bn PPP$
11	2.1.3	School life expectancy, years
11	6.1.3	Utility models by origin/bn PPP$ GDP
12	5.1.4	GERD financed by business, %
15	3.2.3	Gross capital formation, % GDP

Weaknesses

Rank	Code	Indicator name
127	3.3.2	Environmental performance
118	1.2.3	Cost of redundancy dismissal
114	5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP
114	1.3.1	Policies for doing business
100	2.2.2	Graduates in science and engineering, %
96	2.1.1	Expenditure on education, % GDP
95	1.1.1	Operational stability for businesses
94	5.3.4	FDI net inflows, % GDP
76	2.1.2	Government funding/pupil, secondary, % GDP/cap
74	4.2.2	Venture capital (VC) investors, deals/bn PPP$ GDP

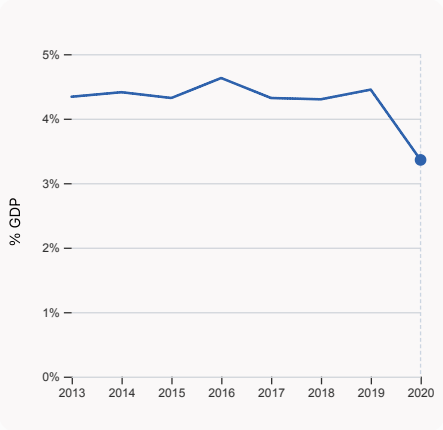
Global Innovation Index 2023



→ Türkiye's innovation system

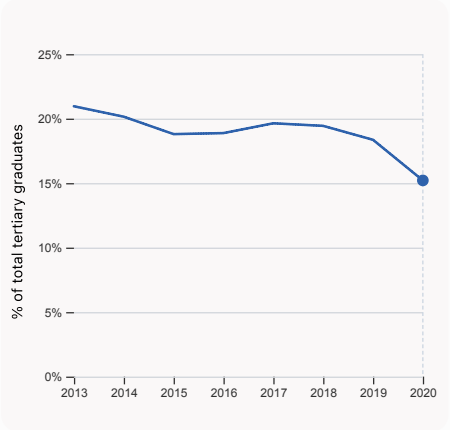
As far as practicable, the plots below present unscaled indicator data.

> Innovation inputs in Türkiye



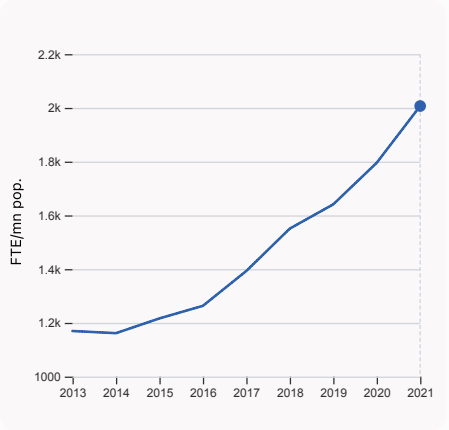
2.1.1 Expenditure on education, % GDP

was equal to 3.36% GDP in 2020, down by 1.09 percentage points from the year prior – and equivalent to an indicator rank of 96.



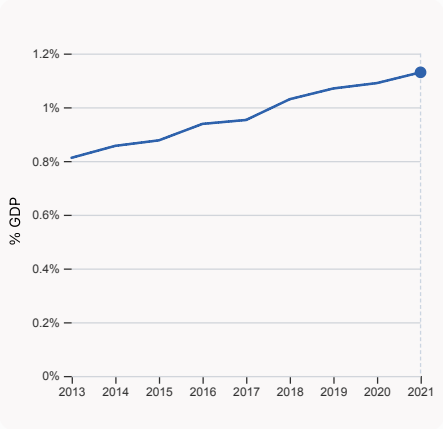
2.2.2 Graduates in science and engineering, %

was equal to 15.21% of total tertiary graduates in 2020, down by 3.15 percentage points from the year prior – and equivalent to an indicator rank of 100.



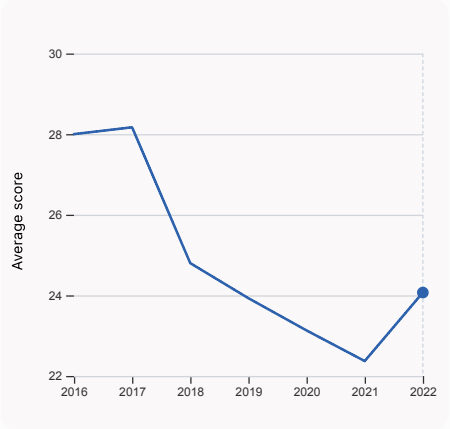
2.3.1 Researchers, FTE/mn pop.

was equal to 2,006.95 FTE/mn pop. in 2021, up by 11.77% from the year prior – and equivalent to an indicator rank of 42.



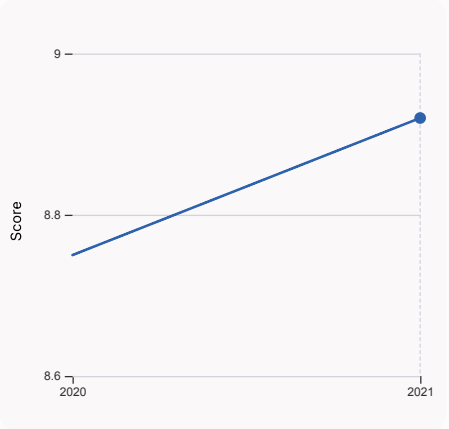
2.3.2 Gross expenditure on R&D, % GDP

was equal to 1.13% GDP in 2021, up by 0.04 percentage points from the year prior – and equivalent to an indicator rank of 35.



2.3.4 QS university ranking, top 3

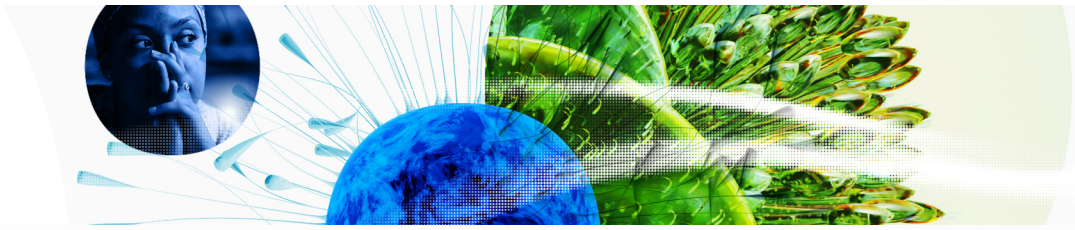
was equal to an average score of 24.07 for the top 3 universities in 2022, up by 7.6% from the year prior – and equivalent to an indicator rank of 45.

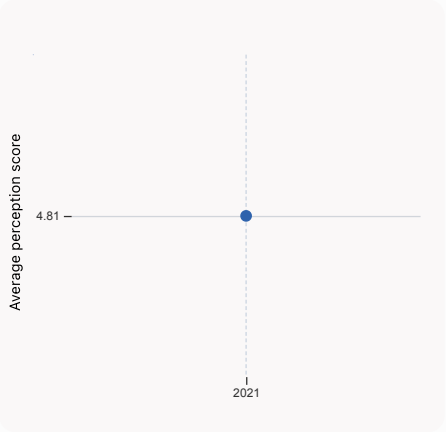


3.1.1 ICT access

was equal to a score of 8.92 in 2021, up by 1.94% from the year prior – and equivalent to an indicator rank of 59.

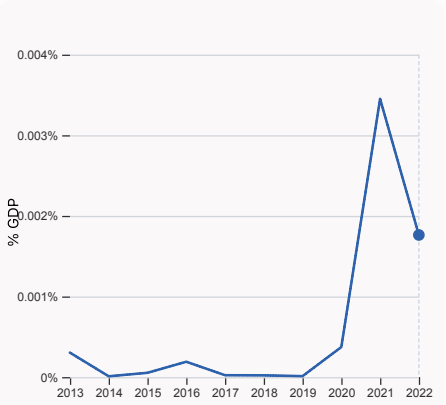
Global Innovation Index 2023





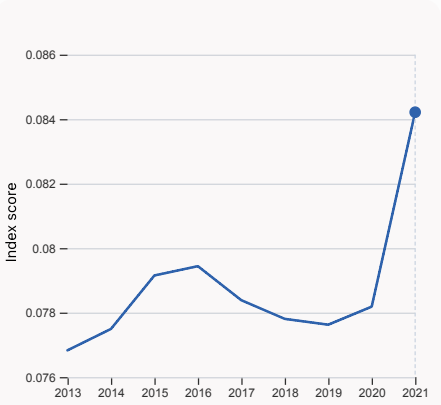
4.1.1 Finance for startups and scaleups

was equal to an average perception score of 4.81 in 2021, equivalent to an indicator rank of 37.



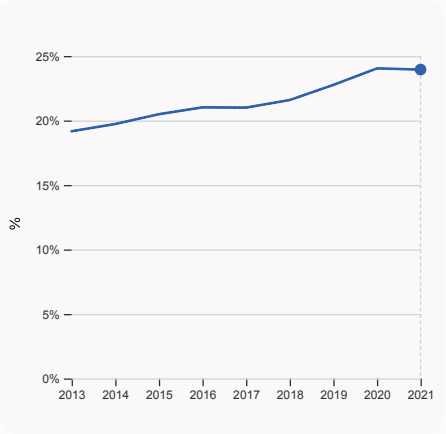
4.2.4 VC received, value, % GDP

was equal to 0.00176% GDP in 2022, down by 0.0017 percentage points from the year prior – and equivalent to an indicator rank of 34.



4.3.2 Domestic industry diversification

was equal to an index score of 0.084 in 2021, up by 7.71% from the year prior – and equivalent to an indicator rank of 4.



5.1.1 Knowledge-intensive employment, %

was equal to 23.95% in 2021, down by 0.09 percentage points from the year prior – and equivalent to an indicator rank of 59.

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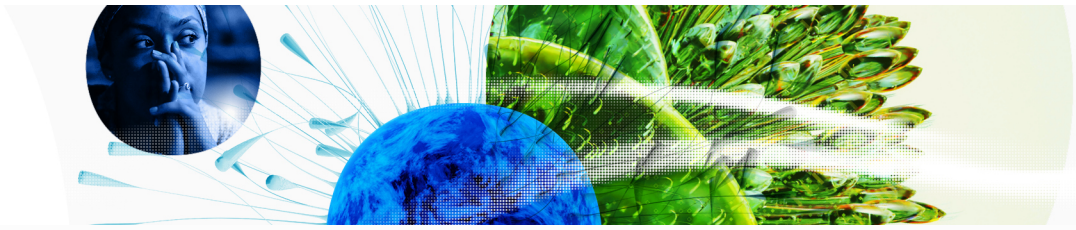
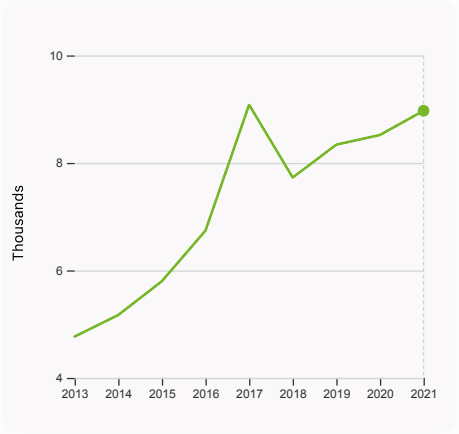
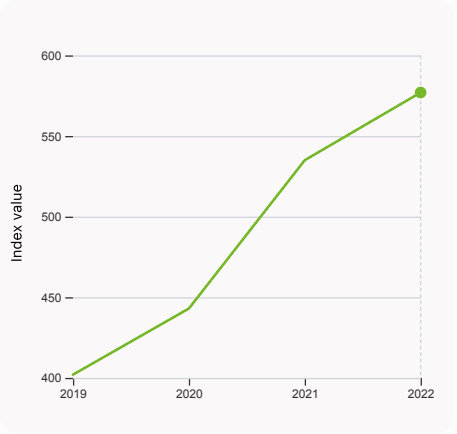


> Innovation outputs in Türkiye



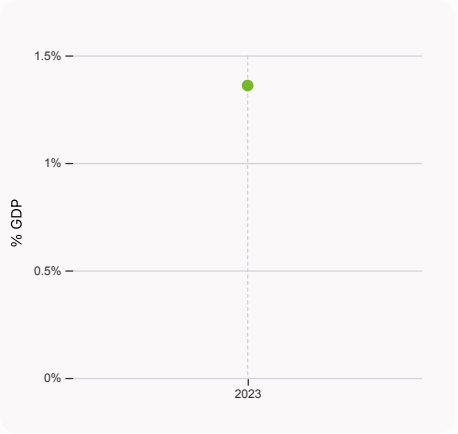
6.1.1 Patents by origin

was equal to 8.97 Thousands in 2021, up by 5.29% from the year prior – and equivalent to an indicator rank of 25.



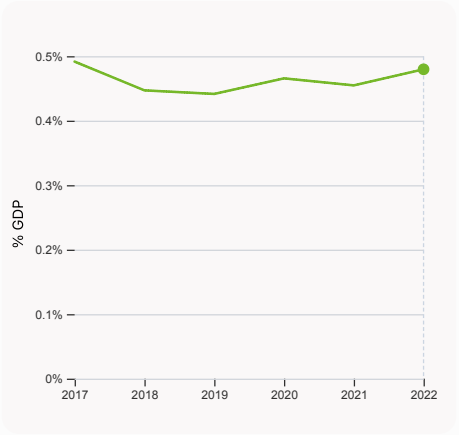
6.1.5 Citable documents H-index

was equal to an index value of 577 in 2022, up by 7.85% from the year prior – and equivalent to an indicator rank of 33.



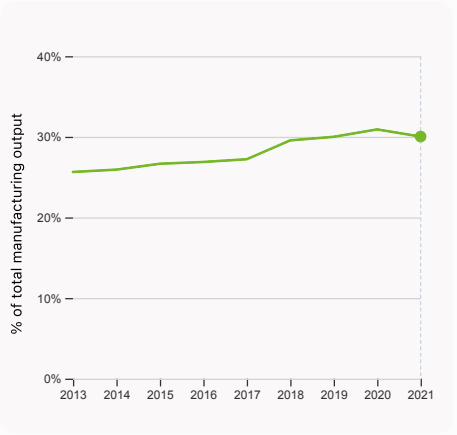
6.2.2 Unicorn valuation, % GDP

was equal to 1.36 % GDP in 2023 – and equivalent to an indicator rank of 30.



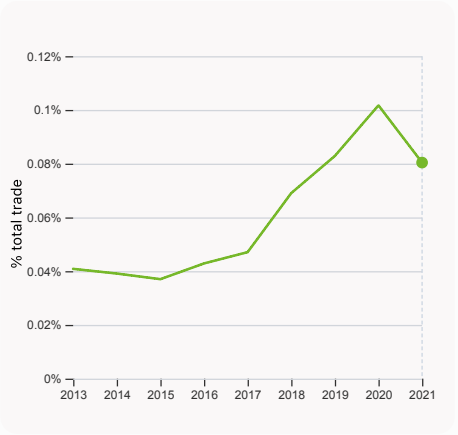
6.2.3 Software spending, % GDP

was equal to 0.48% GDP in 2022, up by 0.025 percentage points from the year prior – and equivalent to an indicator rank of 23.



6.2.4 High-tech manufacturing, %

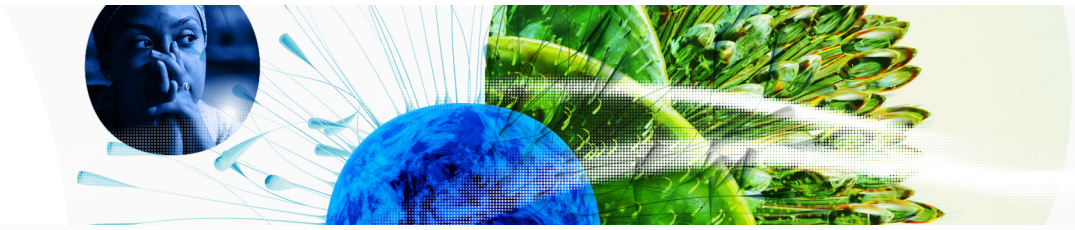
was equal to 30.03% of total manufacturing output in 2021, down by 0.89 percentage points from the year prior – and equivalent to an indicator rank of 36.



6.3.1 Intellectual property receipts, % total trade

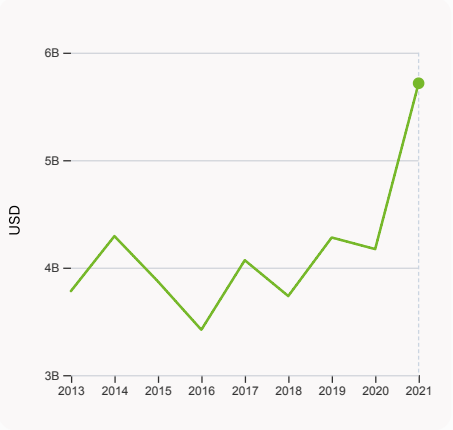
was equal to 0.08% total trade in 2021, down by 0.021 percentage points from the year prior – and equivalent to an indicator rank of 60.

Global Innovation Index 2023



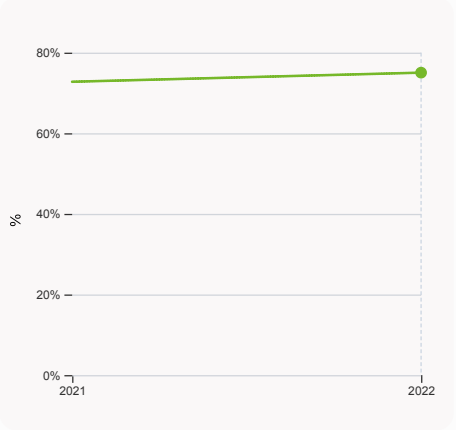
6.3.2 Production and export complexity

was equal to a score of 0.627 in 2020, up by 4.39% from the year prior – and equivalent to an indicator rank of 41.



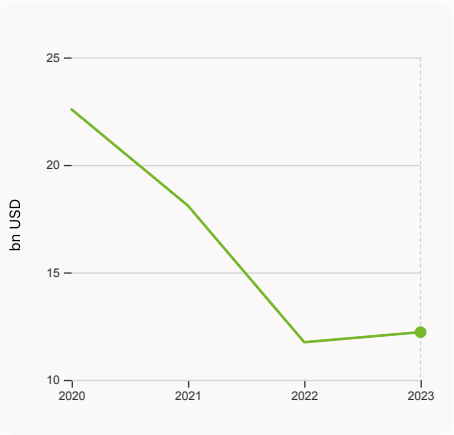
6.3.3 High-tech exports

was equal to 5,715,250,950 USD in 2021, up by 36.97% from the year prior – and equivalent to an indicator rank of 60.



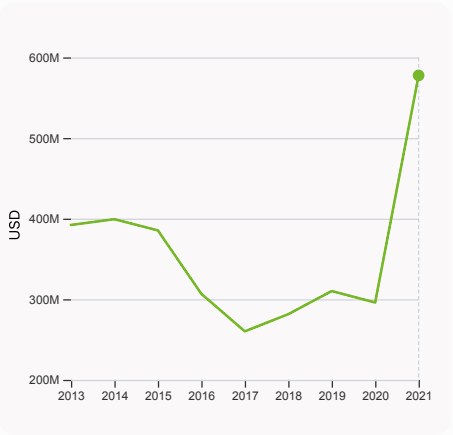
7.1.1 Intangible asset intensity, top 15, %

was equal to 75.04% in 2022, up by 2.26 percentage points from the year prior – and equivalent to an indicator rank of 12.



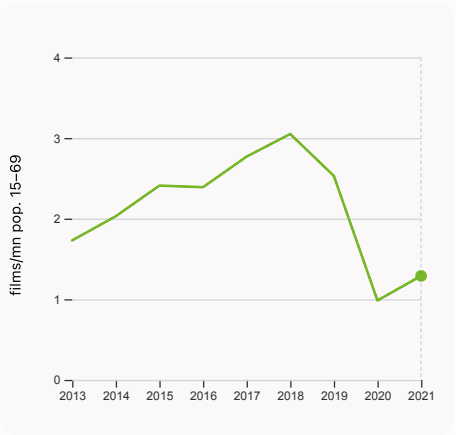
7.1.3 Global brand value, top 5,000

was equal to 12.22 bn USD in 2023, up by 3.99% from the year prior – and equivalent to an indicator rank of 51.



7.2.1 Cultural and creative services exports

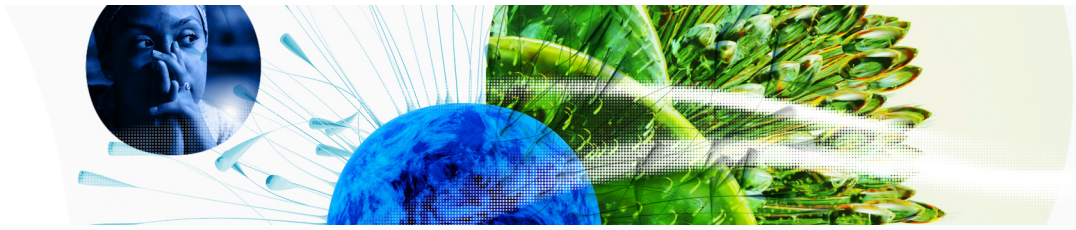
was equal to 577,693,000 USD in 2021, up by 95.17% from the year prior – and equivalent to an indicator rank of 71.

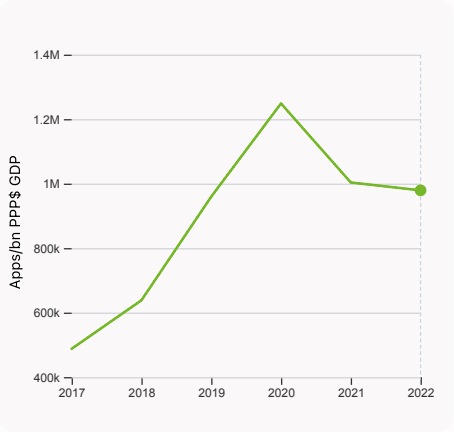


7.2.2 National feature films/mn pop. 15-69

was equal to 1.29 films/mn pop. 15–69 in 2021, up by 30.94% from the year prior – and equivalent to an indicator rank of 56.

Global Innovation Index 2023

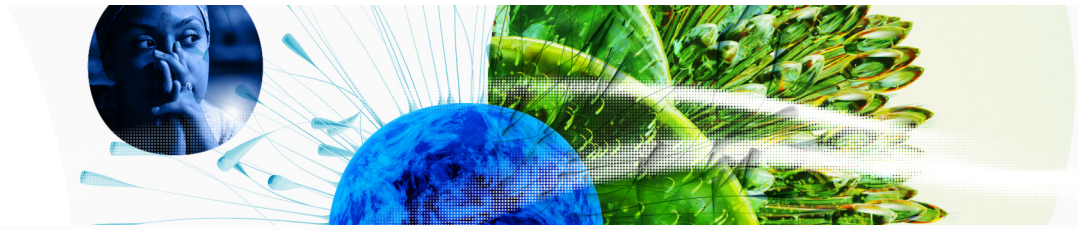




7.3.4 Mobile app creation/bn PPP$ GDP

was equal to 979,196.38 Apps/bn PPP$ GDP in 2022, down by 2.43% from the year prior – and equivalent to an indicator rank of 18.

Global Innovation Index 2023



→ Türkiye's innovation top performers

> 2.3.3 Global corporate R&D investors from Türkiye

Rank	Firm	Industry	R&D	R&D Growth	R&D Intensity
			[mn EUR]	[%]	[%]
1141	TUSAS TURK HAVACILIK VE UZAY SANAYII	Aerospace & Defence	132	210	15
1520	FORD OTOMOTIV	Automobiles & Parts	92	113	2
1527	KOC	General Industrials	91	43	0

Source: European Commission's Joint Research Centre (https://iri.jrc.ec.europa.eu/scoreboard/2022-eu-industrial-rd-investment-scoreboard).
Note: European Commission's Joint Research Centre ranks the top 2,500 firms by R&D investment annually.

> 2.3.4 QS university ranking of Türkiye's top universities

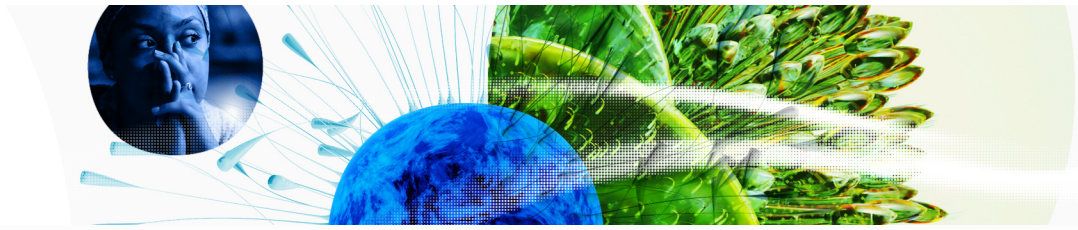
Rank	University	Score
477	KOC UNIVERSITY	24.90
501-510	MIDDLE EAST TECHNICAL UNIVERSITY	24.10
531-540	SABANCI UNIVERSITY	23.20

Source: QS Quacquarelli Symonds Ltd (https://www.topuniversities.com/university-rankings/world-university-rankings/2023).
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".

> 6.2.2 Top Unicorn Companies in Türkiye

Rank	Unicorn Company	Industry	City	Valuation, bn USD
1	GETIR	Supply chain, logistics, & delivery	Istanbul	9
2	DREAM GAMES	Mobile & telecommunications	Istanbul	3
3	INSIDER	Internet software & services	Istanbul	1

Source: CBInsights, Tracker – The Complete List of Unicorn Companies: https://www.cbinsights.com/research-unicorn-companies



> 7.1.1 Top 15 intangible-asset intensive companies in Türkiye

Rank	Firm	Intensity, %
1	SASA POLYESTER SANAYI AS	92.17
2	FORD OTOMOTIV SANAYI AS	78.49
3	QNB FINANSBANK AS	72.12

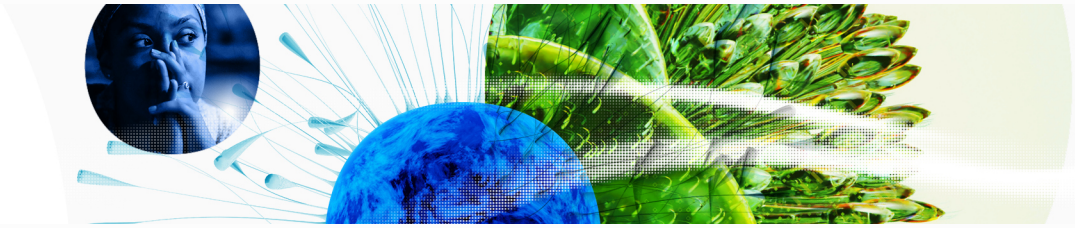
Source: Brand Finance (https://brandirectory.com/reports/gift-2022).
Note: Brand Finance only provides within economy ranks.

> 7.1.3 Top 5,000 companies in Türkiye with highest global brand value

Rank	Brand	Industry	Brand Value, mn USD
1	TURKISH AIRLINES	Airlines	2,025.3
2	ARCELIK	Electronics	1,512.6
3	GARANTI BBVA	Banking	767.3

Source: Brand Finance (https://brandirectory.com).
Note: Rank corresponds to within economy ranks.

Global Innovation Index 2023



Türkiye

GII 2023 rank
39

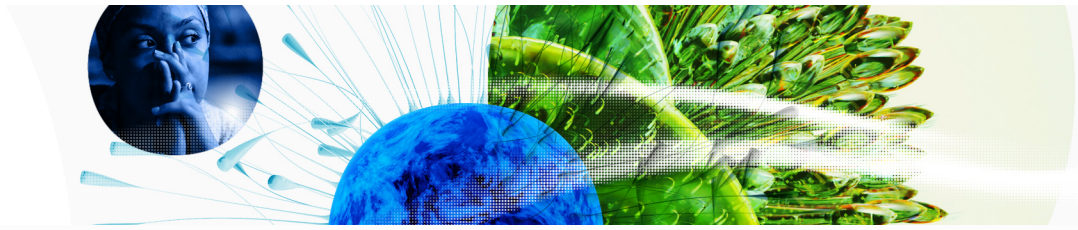
Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$
32	52	Upper middle	NAWA	85.3	3,321.0	38,759.4

	Score / Value	Rank
Institutions	**36.5**	**105**
1.1 Institutional environment	**37.0**	**85**
1.1.1 Operational stability for businesses*	39.6	95 ○
1.1.2 Government effectiveness*	34.4	77
1.2 Regulatory environment	**45.3**	**110** ◇
1.2.1 Regulatory quality*	40.0	77
1.2.2 Rule of law*	27.5	88
1.2.3 Cost of redundancy dismissal	29.8	118 ○ ◇
1.3 Business environment	**27.2**	**107**
1.3.1 Policies for doing business†	25.5	114 ○
1.3.2 Entrepreneurship policies and culture†	28.9	60
Human capital and research	**37.5**	**41**
2.1 Education	**50.7**	**67**
2.1.1 Expenditure on education, % GDP	3.4	96 ○
2.1.2 Government funding/pupil, secondary, % GDP/cap	14.6	76 ○
2.1.3 School life expectancy, years	18.5	11 ●
2.1.4 PISA scales in reading, maths and science	462.5	41
2.1.5 Pupil-teacher ratio, secondary	15.1	76
2.2 Tertiary education	**33.7**	**56**
2.2.1 Tertiary enrolment, % gross	117.1	2 ●
2.2.2 Graduates in science and engineering, %	15.2	100 ○
2.2.3 Tertiary inbound mobility, %	2.3	74
2.3 Research and development (R&D)	**28.1**	**37**
2.3.1 Researchers, FTE/mn pop.	2,007.0	42
2.3.2 Gross expenditure on R&D, % GDP	1.1	35
2.3.3 Global corporate R&D investors, top 3, mn US$	47.2	35
2.3.4 QS university ranking, top 3*	24.4	45
Infrastructure	**46.7**	**50**
3.1 Information and communication technologies (ICTs)	**80.5**	**39**
3.1.1 ICT access*	83.8	59
3.1.2 ICT use*	75.8	60
3.1.3 Government's online service*	84.5	24
3.1.4 E-participation*	77.9	18
3.2 General infrastructure	**38.5**	**34**
3.2.1 Electricity output, GWh/mn pop.	3,939.4	56
3.2.2 Logistics performance*	59.1	37
3.2.3 Gross capital formation, % GDP	34.2	15 ●
3.3 Ecological sustainability	**21.1**	**77**
3.3.1 GDP/unit of energy use	16.7	17
3.3.2 Environmental performance*	12.5	127 ○ ◇
3.3.3 ISO 14001 environment/bn PPP$ GDP	1.1	62
Market sophistication	**45.1**	**36**
4.1 Credit	**41.4**	**39**
4.1.1 Finance for startups and scaleups†	55.3	37
4.1.2 Domestic credit to private sector, % GDP	75.2	46
4.1.3 Loans from microfinance institutions, % GDP	n/a	n/a
4.2 Investment	**9.6**	**56**
4.2.1 Market capitalization, % GDP	25.5	51
4.2.2 Venture capital (VC) investors, deals/bn PPP$ GDP	0.0	74 ○
4.2.3 VC recipients, deals/bn PPP$ GDP	0.0	70
4.2.4 VC received, value, % GDP	0.0	34
4.3 Trade, diversification, and market scale	**84.1**	**11**
4.3.1 Applied tariff rate, weighted avg., %	2.9	71
4.3.2 Domestic industry diversification	99.4	4 ●
4.3.3 Domestic market scale, bn PPP$	3,321.0	11 ●

	Score / Value	Rank
Business sophistication	**33.5**	**46**
5.1 Knowledge workers	**39.8**	**48**
5.1.1 Knowledge-intensive employment, %	23.9	59
5.1.2 Firms offering formal training, %	30.7	55
5.1.3 GERD performed by business, % GDP	0.8	32
5.1.4 GERD financed by business, %	62.4	12 ●
5.1.5 Females employed w/advanced degrees, %	11.3	69
5.2 Innovation linkages	**19.0**	**81**
5.2.1 University-industry R&D collaboration†	39.4	76
5.2.2 State of cluster development†	44.4	57
5.2.3 GERD financed by abroad, % GDP	0.0	60
5.2.4 Joint venture/strategic alliance deals/bn PPP$ GDP	0.0	114 ○
5.2.5 Patent families/bn PPP$ GDP	0.3	39
5.3 Knowledge absorption	**41.9**	**39**
5.3.1 Intellectual property payments, % total trade	1.0	39
5.3.2 High-tech imports, % total trade	8.2	66
5.3.3 ICT services imports, % total trade	1.0	87
5.3.4 FDI net inflows, % GDP	1.3	94 ○
5.3.5 Research talent, % in businesses	66.9	7 ●
Knowledge and technology outputs	**31.1**	**44**
6.1 Knowledge creation	**27.4**	**36**
6.1.1 Patents by origin/bn PPP$ GDP	3.0	25
6.1.2 PCT patents by origin/bn PPP$ GDP	0.5	31
6.1.3 Utility models by origin/bn PPP$ GDP	1.5	11 ●
6.1.4 Scientific and technical articles/bn PPP$ GDP	n/a	n/a
6.1.5 Citable documents H-index	29.7	33
6.2 Knowledge impact	**43.7**	**23**
6.2.1 Labor productivity growth, %	2.6	21
6.2.2 Unicorn valuation, % GDP	1.4	30
6.2.3 Software spending, % GDP	0.5	23
6.2.4 High-tech manufacturing, %	30.0	36
6.3 Knowledge diffusion	**22.4**	**64**
6.3.1 Intellectual property receipts, % total trade	0.1	60
6.3.2 Production and export complexity	65.7	41
6.3.3 High-tech exports, % total trade	2.0	60
6.3.4 ICT services exports, % total trade	0.9	89
6.3.5 ISO 9001 quality/bn PPP$ GDP	3.2	71
Creative outputs	**43.6**	**27**
7.1 Intangible assets	**68.0**	**5**
7.1.1 Intangible asset intensity, top 15, %	75.0	12
7.1.2 Trademarks by origin/bn PPP$ GDP	133.8	5 ●
7.1.3 Global brand value, top 5,000	1.3	51
7.1.4 Industrial designs by origin/bn PPP$ GDP	20.1	4 ●
7.2 Creative goods and services	**13.9**	**61**
7.2.1 Cultural and creative services exports, % total trade	0.2	71
7.2.2 National feature films/mn pop. 15-69	1.3	56
7.2.3 Entertainment and media market/th pop. 15-69	4.6	43
7.2.4 Creative goods exports, % total trade	3.3	18
7.3 Online creativity	**24.4**	**53**
7.3.1 Generic top-level domains (TLDs)/th pop. 15-69	12.4	40
7.3.2 Country-code TLDs/th pop. 15-69	2.2	70
7.3.3 GitHub commits/mn pop. 15-69	7.0	63
7.3.4 Mobile app creation/bn PPP$ GDP	76.0	18

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/gii-ranking. Square brackets [ ] indicate that the data minimum coverage (DMC) requirements were not met at the sub-pillar or pillar level.

Global Innovation Index 2023



→ Data availability

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

> Türkiye has missing data for one indicator and outdated data for five indicators.

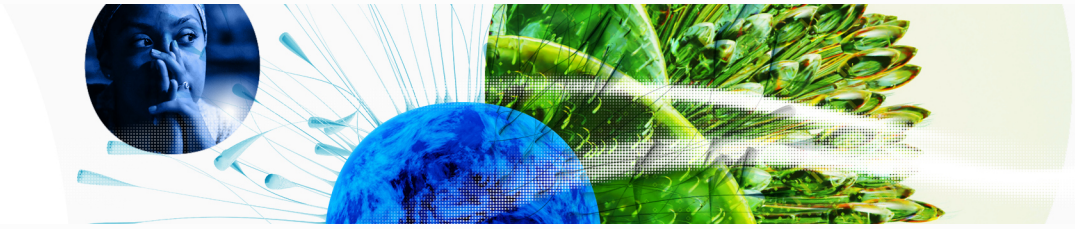
> Missing data for Türkiye

Code	Indicator name	Economy Year	Model Year	Source
4.1.3	Loans from microfinance institutions, % GDP	n/a	2021	International Monetary Fund, Financial Access Survey (FAS)

> Outdated data for Türkiye

Code	Indicator name	Economy Year	Model Year	Source
1.3.2	Entrepreneurship policies and culture	2021	2022	Global Entrepreneurship Monitor
2.1.1	Expenditure on education, % GDP	2020	2021	UNESCO Institute for Statistics
4.1.1	Finance for startups and scaleups	2021	2022	Global Entrepreneurship Monitor
5.1.1	Knowledge-intensive employment, %	2021	2022	International Labour Organization
5.1.5	Females employed w/advanced degrees, %	2021	2022	International Labour Organization

Global Innovation Index 2023



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 Database, WIPO, 2023.

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.