Global Innovation Index 2022

CROATIA

42nd Croatia ranks 42nd among the 132 economies featured in the GII 2022.

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 Croatia 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 Croatia in the GII 2022 is between ranks 42 and 42.

Rankings for Croatia (2020–2022)

GIIYR	GII	Innovation inputs	Innovation outputs
2020	41	44	43
2021	42	41	48
2022	42	45	40

- Croatia performs better in innovation outputs than innovation inputs in 2022.
- This year Croatia ranks 45th in innovation inputs, lower than both 2021 and 2020.
- As for innovation outputs, Croatia ranks 40th. This position is higher than both 2021 and 2020.

37th Croatia ranks 37th among the 48 high-income group economies.

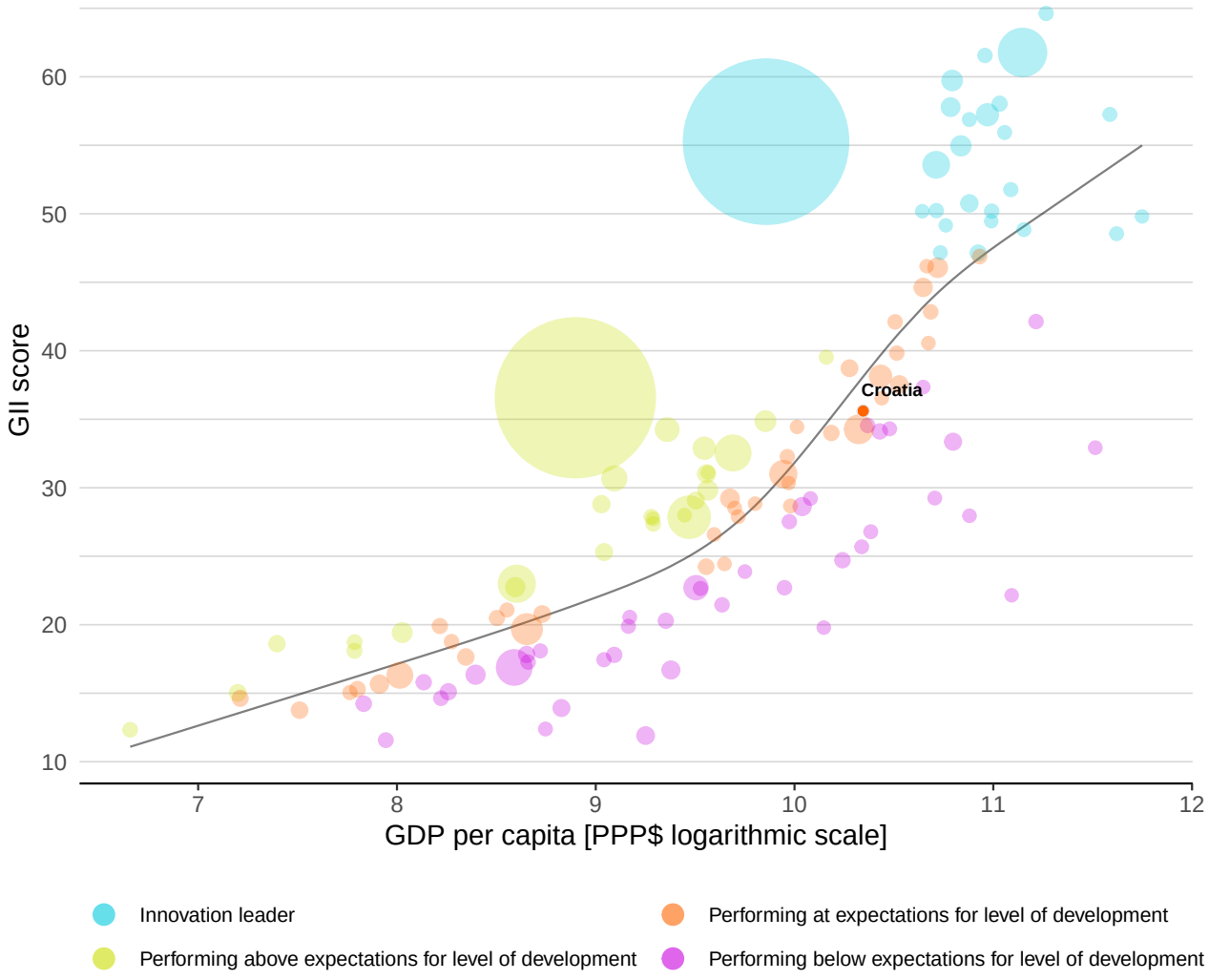
27th Croatia ranks 27th among the 39 economies in Europe.

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

The positive relationship between innovation and development

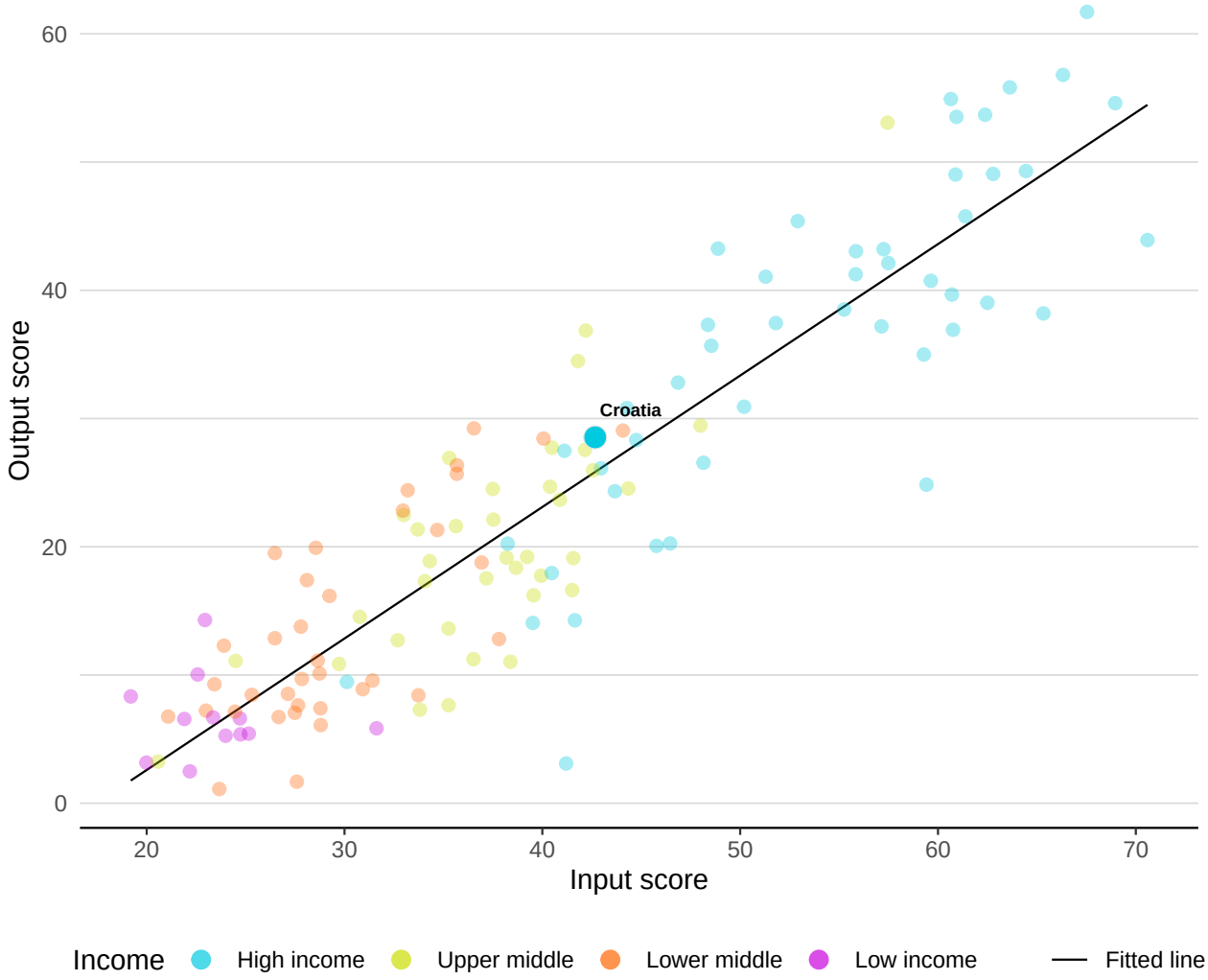


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

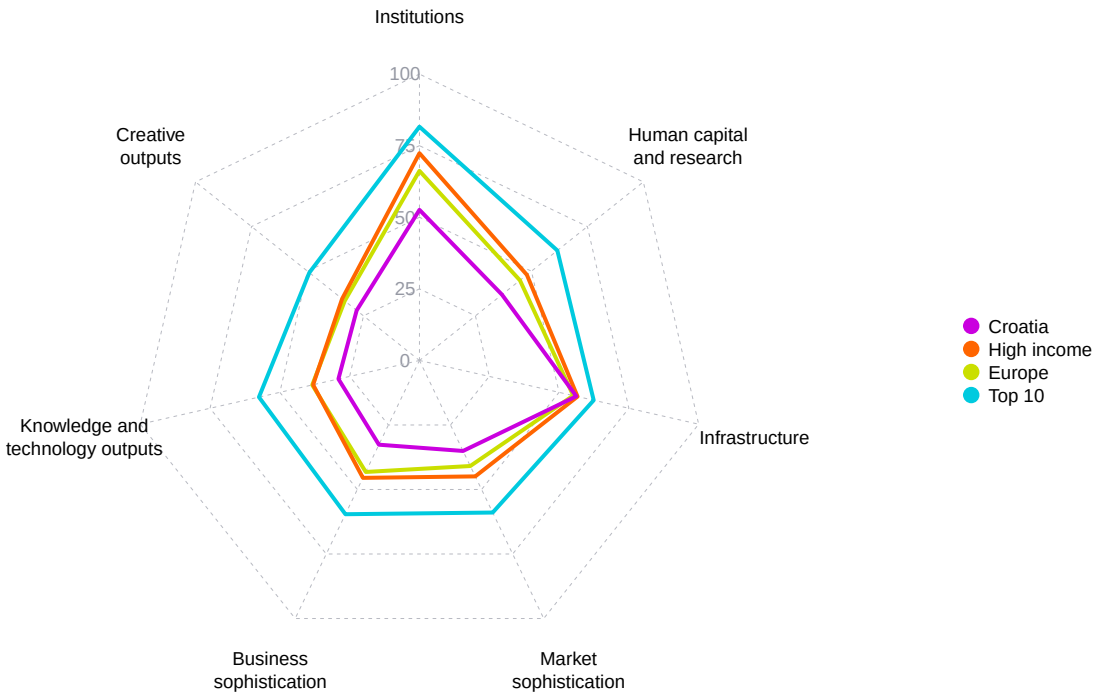
Croatia produces more innovation outputs relative to its level of innovation investments.

Innovation input to output performance



BENCHMARKING AGAINST OTHER HIGH-INCOME GROUP ECONOMIES AND EUROPE

The seven GII pillar scores for Croatia



High-income group economies

Croatia performs below the high-income group average in all GII pillars.

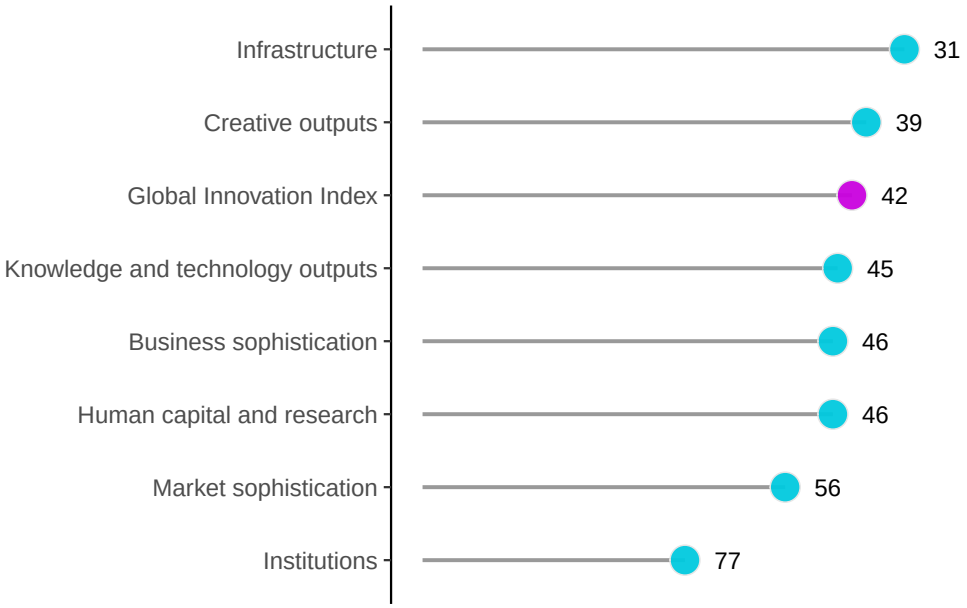
Europe

Croatia performs above the regional average in Infrastructure.

OVERVIEW OF RANKINGS IN THE SEVEN GII 2022 AREAS

Croatia performs best in Infrastructure and its weakest performance is in Institutions.

The seven GII pillar ranks for Croatia



Note: The highest possible ranking in each pillar is 1.

The full WIPO Intellectual Property Statistics profile for Croatia can be found at:

https://www.wipo.int/ipstats/en/statistics/country_profile/profile.jsp?code=HR.

INNOVATION STRENGTHS AND WEAKNESSES

The table below gives an overview of the indicator strengths and weaknesses of Croatia in the GII 2022.

Strengths and weaknesses for Croatia

Strengths			Weaknesses		
Code	**Indicator name**	**Rank**	**Code**	**Indicator name**	**Rank**
2.1.5	Pupil-teacher ratio, secondary	1	1.3.1	Policies for doing business	115
3.1.4	E-participation	23	1.3.2	Entrepreneurship policies and culture	72
3.3.2	Environmental performance	16	2.3.3	Global corporate R&D investors, top 3, mn USD	38
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	8	4.2.2	Venture capital investors, deals/bn PPP$ GDP	81
5.2.3	GERD financed by abroad, % GDP	11	5.2.1	University-industry R&D collaboration	108
6.1.4	Scientific and technical articles/bn PPP$ GDP	23	5.2.2	State of cluster development and depth	122
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	8	6.1.3	Utility models by origin/bn PPP$ GDP	55
7.2.1	Cultural and creative services exports, % total trade	11	6.2.3	Software spending, % GDP	98
7.2.4	Printing and other media, % manufacturing	5	7.1.1	Intangible asset intensity, top 15, %	54
7.3.3	GitHub commit pushes received/mn pop. 15–69	26	7.1.3	Global brand value, top 5,000, % GDP	75

GII 2022 rank

Croatia

42

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP$ (bn)	GDP per capita, PPP$
40	45	High	EUR	4.1	124.8	31,112

		Score/ Value	Rank	
Institutions		**52.6**	**77**	◇
1.1	**Political environment**	69.6	42	
1.1.1	Political and operational stability*	80.0	30	
1.1.2	Government effectiveness*	59.1	45	◇
1.2	**Regulatory environment**	70.3	50	
1.2.1	Regulatory quality*	55.8	52	◇
1.2.2	Rule of law*	53.7	51	◇
1.2.3	Cost of redundancy dismissal	15.1	61	
1.3	**Business environment**	17.9	127 ○	◇
1.3.1	Policies for doing business†	32.1	115 ○	◇
1.3.2	Entrepreneurship policies and culture*	3.6	72 ○	◇
Human capital and research		**36.9**	**46**	◇
2.1	**Education**	61.7	28	
2.1.1	Expenditure on education, % GDP 🕘	3.9	79	
2.1.2	Government funding/pupil, secondary, % GDP/cap	n/a	n/a	
2.1.3	School life expectancy, years	15.1	50	
2.1.4	PISA scales in reading, maths and science	471.9	37	
2.1.5	Pupil-teacher ratio, secondary	6.2	1 ● ◆	
2.2	**Tertiary education**	39.2	38	
2.2.1	Tertiary enrolment, % gross	67.7	40	
2.2.2	Graduates in science and engineering, %	28.5	24	
2.2.3	Tertiary inbound mobility, %	3.5	64	
2.3	**Research and development (R&D)**	9.7	58	◇
2.3.1	Researchers, FTE/mn pop.	2,220.0	37	
2.3.2	Gross expenditure on R&D, % GDP	1.2	32	
2.3.3	Global corporate R&D investors, top 3, mn USD	0.0	38 ○	◇
2.3.4	QS university ranking, top 3*	5.0	68	◇
Infrastructure		**56.2**	**31**	
3.1	**Information and communication technologies (ICTs)**	82.6	35	
3.1.1	ICT access*	90.0	46	
3.1.2	ICT use*	75.8	37	
3.1.3	Government's online service*	75.3	52	
3.1.4	E-participation*	89.3	23 ●	
3.2	**General infrastructure**	33.6	53	◇
3.2.1	Electricity output, GWh/mn pop.	3,269.1	59	◇
3.2.2	Logistics performance*	48.8	48	
3.2.3	Gross capital formation, % GDP	25.7	46	
3.3	**Ecological sustainability**	52.4	5 ● ◆	
3.3.1	GDP/unit of energy use	12.7	41	
3.3.2	Environmental performance*	60.2	16 ●	
3.3.3	ISO 14001 environmental certificates/bn PPP$ GDP	10.1	8 ● ◆	
Market sophistication		**35.1**	**56**	
4.1	**Credit**	29.3	56	
4.1.1	Finance for startups and scaleups*	37.1	46	◇
4.1.2	Domestic credit to private sector, % GDP	59.8	59	
4.1.3	Loans from microfinance institutions, % GDP	n/a	n/a	
4.2	**Investment**	13.2	46	
4.2.1	Market capitalization, % GDP	36.0	44	
4.2.2	Venture capital investors, deals/bn PPP$ GDP	0.0	81 ○	
4.2.3	Venture capital recipients, deals/bn PPP$ GDP	0.0	41	
4.2.4	Venture capital received, value, % GDP	0.0	28	
4.3	**Trade, diversification, and market scale**	62.7	38	
4.3.1	Applied tariff rate, weighted avg., %	1.5	20	
4.3.2	Domestic industry diversification	95.2	24	
4.3.3	Domestic market scale, bn PPP$	124.8	80	

		Score/ Value	Rank	
Business sophistication		**32.6**	**46**	
5.1	**Knowledge workers**	40.0	47	
5.1.1	Knowledge-intensive employment, %	36.4	41	
5.1.2	Firms offering formal training, %	26.2	63	◇
5.1.3	GERD performed by business, % GDP	0.6	37	
5.1.4	GERD financed by business, %	37.6	49	
5.1.5	Females employed w/advanced degrees, %	17.6	41	
5.2	**Innovation linkages**	24.7	57	◇
5.2.1	University-industry R&D collaboration†	33.2	108 ○	◇
5.2.2	State of cluster development and depth†	32.6	122 ○	◇
5.2.3	GERD financed by abroad, % GDP	0.3	11 ●	
5.2.4	Joint venture/strategic alliance deals/bn PPP$ GDP	0.0	60	
5.2.5	Patent families/bn PPP$ GDP	0.1	60	◇
5.3	**Knowledge absorption**	33.2	54	
5.3.1	Intellectual property payments, % total trade	1.1	35	
5.3.2	High-tech imports, % total trade	8.1	69	
5.3.3	ICT services imports, % total trade	2.0	40	
5.3.4	FDI net inflows, % GDP	3.5	36	
5.3.5	Research talent, % in businesses	24.6	49	
Knowledge and technology outputs		**29.0**	**45**	
6.1	**Knowledge creation**	18.7	49	
6.1.1	Patents by origin/bn PPP$ GDP	1.2	59	
6.1.2	PCT patents by origin/bn PPP$ GDP	0.3	39	
6.1.3	Utility models by origin/bn PPP$ GDP	0.2	55 ○	
6.1.4	Scientific and technical articles/bn PPP$ GDP	40.5	23 ●	
6.1.5	Citable documents H-index	17.3	49	
6.2	**Knowledge impact**	33.0	45	
6.2.1	Labor productivity growth, %	0.8	68	
6.2.2	New businesses/th pop. 15–64	4.4	33	
6.2.3	Software spending, % GDP	0.1	98 ○	◇
6.2.4	ISO 9001 quality certificates/bn PPP$ GDP	22.4	8 ● ◆	
6.2.5	High-tech manufacturing, %	24.5	50	
6.3	**Knowledge diffusion**	35.3	43	
6.3.1	Intellectual property receipts, % total trade	0.2	41	
6.3.2	Production and export complexity	62.0	30	
6.3.3	High-tech exports, % total trade	4.2	42	
6.3.4	ICT services exports, % total trade	3.9	28	
Creative outputs		**28.0**	**39**	
7.1	**Intangible assets**	30.2	60	
7.1.1	Intangible asset intensity, top 15, %	47.5	54 ○	
7.1.2	Trademarks by origin/bn PPP$ GDP	48.3	49	
7.1.3	Global brand value, top 5,000, % GDP	2.5	75 ○	◇
7.1.4	Industrial designs by origin/bn PPP$ GDP	3.1	36	
7.2	**Creative goods and services**	36.4	14 ●	
7.2.1	Cultural and creative services exports, % total trade	2.0	11 ●	
7.2.2	National feature films/mn pop. 15–69	2.4	45	
7.2.3	Entertainment and media market/th pop. 15–69	n/a	n/a	
7.2.4	Printing and other media, % manufacturing	3.0	5 ● ◆	
7.2.5	Creative goods exports, % total trade	1.0	42	
7.3	**Online creativity**	15.3	36	
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	14.9	32	
7.3.2	Country-code TLDs/th pop. 15–69	11.8	38	
7.3.3	GitHub commit pushes received/mn pop. 15–69	26.5	26 ●	
7.3.4	Mobile app creation/bn PPP$ GDP	8.2	45	

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/global_innovation_index/en/2022. 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 indicators that are either missing or outdated for Croatia.

Missing data for Croatia

Code	Indicator name	Economy year	Model year	Source
2.1.2	Government funding/pupil, secondary, % GDP/cap	n/a	2018	UNESCO Institute for Statistics
4.1.3	Loans from microfinance institutions, % GDP	n/a	2020	International Monetary Fund, Financial Access Survey (FAS)
7.2.3	Entertainment and media market/th pop. 15–69	n/a	2021	PwC, GEMO

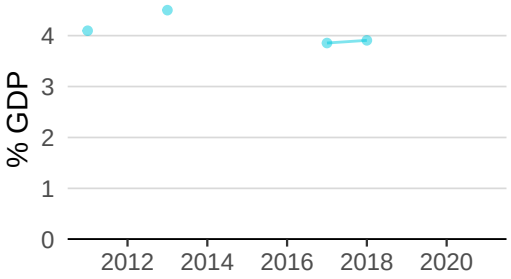
Outdated data for Croatia

Code	Indicator name	Economy year	Model year	Source
2.1.1	Expenditure on education, % GDP	2018	2020	UNESCO Institute for Statistics

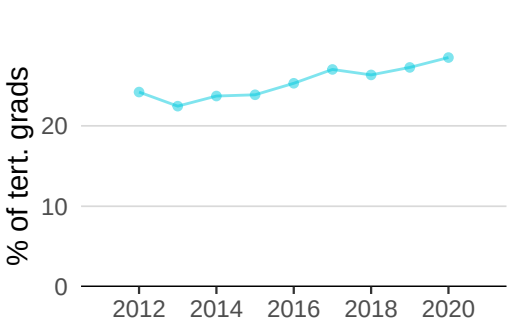
CROATIA'S INNOVATION SYSTEM

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

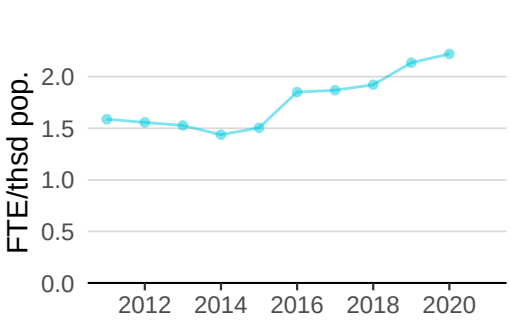
Innovation inputs



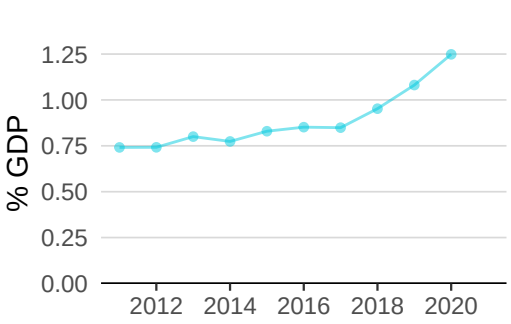
2.1.1 Expenditure on education was equal to 3.9% GDP in 2018–up by 1 percentage point from the year prior–and equivalent to an indicator rank of 79.



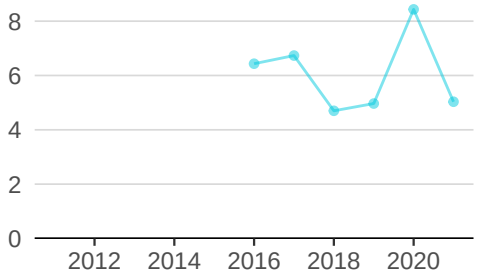
2.2.2 Graduates in science and engineering was equal to 28.5% of tert. grads in 2020–up by 4 percentage points from the year prior–and equivalent to an indicator rank of 24.



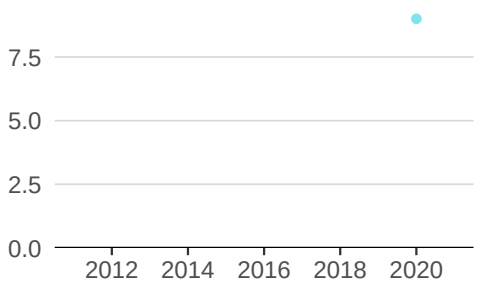
2.3.1 Researchers was equal to 2.2 FTE/thsd pop. in 2020–up by 4 percentage points from the year prior–and equivalent to an indicator rank of 37.



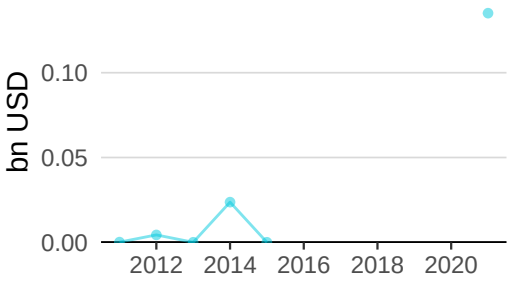
2.3.2 Gross expenditure on R&D was equal to 1.2% GDP in 2020–up by 15 percentage points from the year prior–and equivalent to an indicator rank of 32.



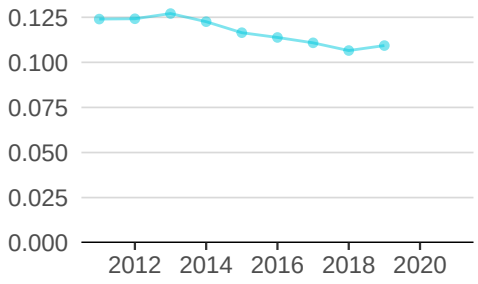
2.3.4 QS university ranking was equal to 5.0 in 2021–down by 40 percentage points from the year prior–and equivalent to an indicator rank of 68.



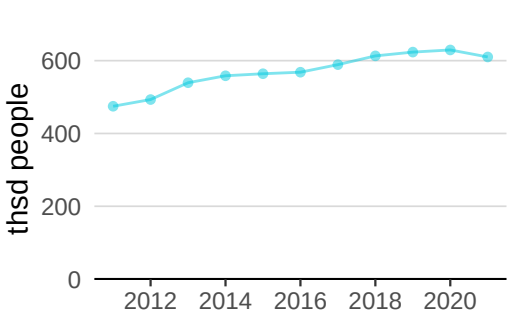
3.1.1 ICT access was equal to 9.0 in 2020 and equivalent to an indicator rank of 46.



4.2.4 Venture capital received was equal to 0.1 bn USD in 2021 and equivalent to an indicator rank of 28.

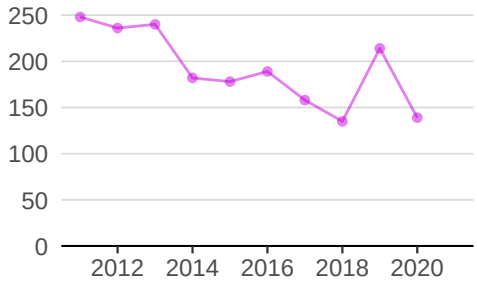


4.3.2 Domestic industry diversification was equal to 0.1 in 2019–up by 3 percentage points from the year prior–and equivalent to an indicator rank of 24.

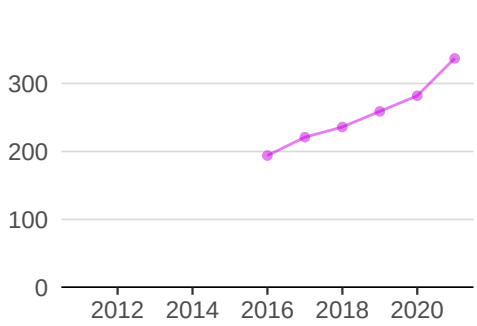


5.1.1 Knowledge-intensive employment was equal to 610.2 thsd people in 2021–down by 3 percentage points from the year prior–and equivalent to an indicator rank of 41.

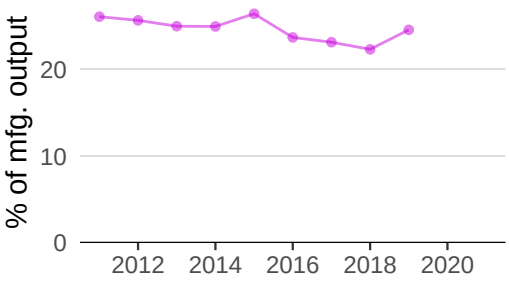
Innovation outputs



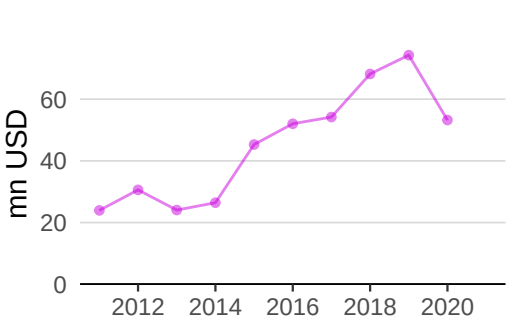
6.1.1 Patents by origin was equal to 139.0 in 2020–down by 35 percentage points from the year prior–and equivalent to an indicator rank of 59.



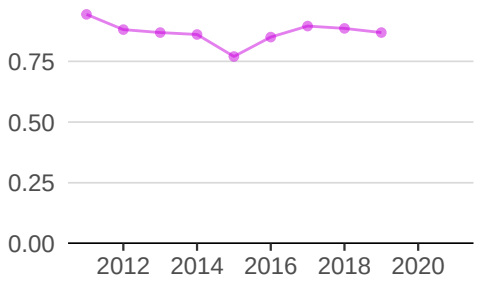
6.1.5 Citable documents H-index was equal to 337.0 in 2021–up by 20 percentage points from the year prior–and equivalent to an indicator rank of 49.



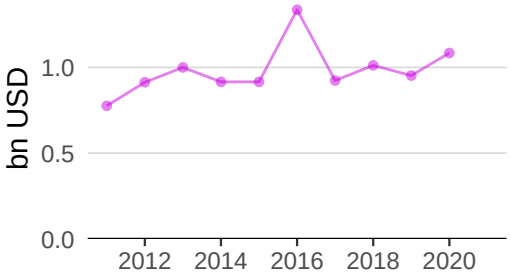
6.2.5 High-tech manufacturing was equal to 24.5% of mfg. output in 2019–up by 10 percentage points from the year prior–and equivalent to an indicator rank of 50.



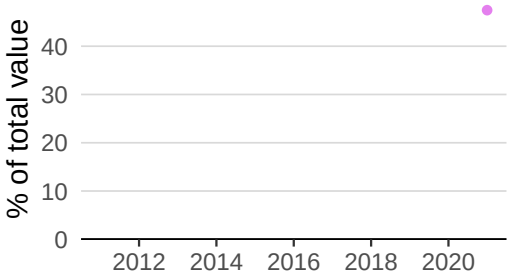
6.3.1 Intellectual property receipts was equal to 53.2 mn USD in 2020–down by 28 percentage points from the year prior–and equivalent to an indicator rank of 41.



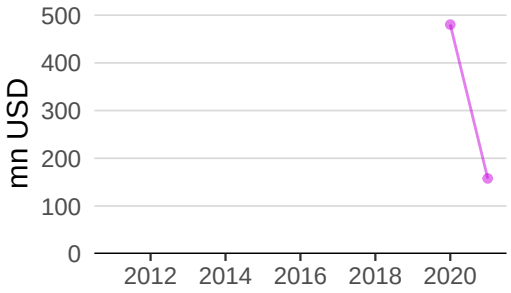
6.3.2 Production and export complexity was equal to 0.9 in 2019–down by 2 percentage points from the year prior–and equivalent to an indicator rank of 30.



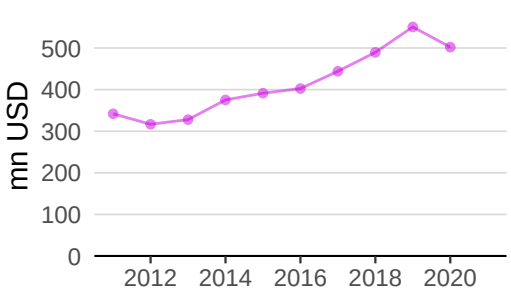
6.3.3 High-tech exports was equal to 1.1 bn USD in 2020–up by 14 percentage points from the year prior–and equivalent to an indicator rank of 42.



7.1.1 Intangible asset intensity was equal to 47.5% of total value in 2021 and equivalent to an indicator rank of 54.



7.1.3 Global brand value was equal to 157.7 mn USD in 2021–down by 67 percentage points from the year prior–and equivalent to an indicator rank of 75.



7.2.1 Cultural and creative services exports was equal to 502.1 mn USD in 2020–down by 9 percentage points from the year prior–and equivalent to an indicator rank of 11.

CROATIA'S INNOVATION TOP PERFORMERS

2.3.3 Global corporate R&D investors

Firm	Industry	R&D	R&D Growth	R&D Intensity	Rank

No observations

Source: European Commission's Joint Research Centre (https://iri.jrc.ec.europa.eu/scoreboard/2021-eu-industrial-rd-investment-scoreboard).

2.3.4 QS university ranking

University	Score	Rank
UNIVERSITY OF ZAGREB	15.1	751-800

Source: QS Quacquarelli Symonds Ltd (https://www.topuniversities.com/university-rankings/world-university-rankings/2022).
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".

7.1.1 Intangible asset intensity, top 15

Firm	Rank
INA INDUSTRIJA NAFTE	1
ATLANTIC GRUPA	2
PETROKEMIJA	3

Source: Brand Finance (https://brandirectory.com/reports/gift-2021).
Note: Brand Finance only provides within economy ranks.

7.1.3 Global brand value, top 5,000

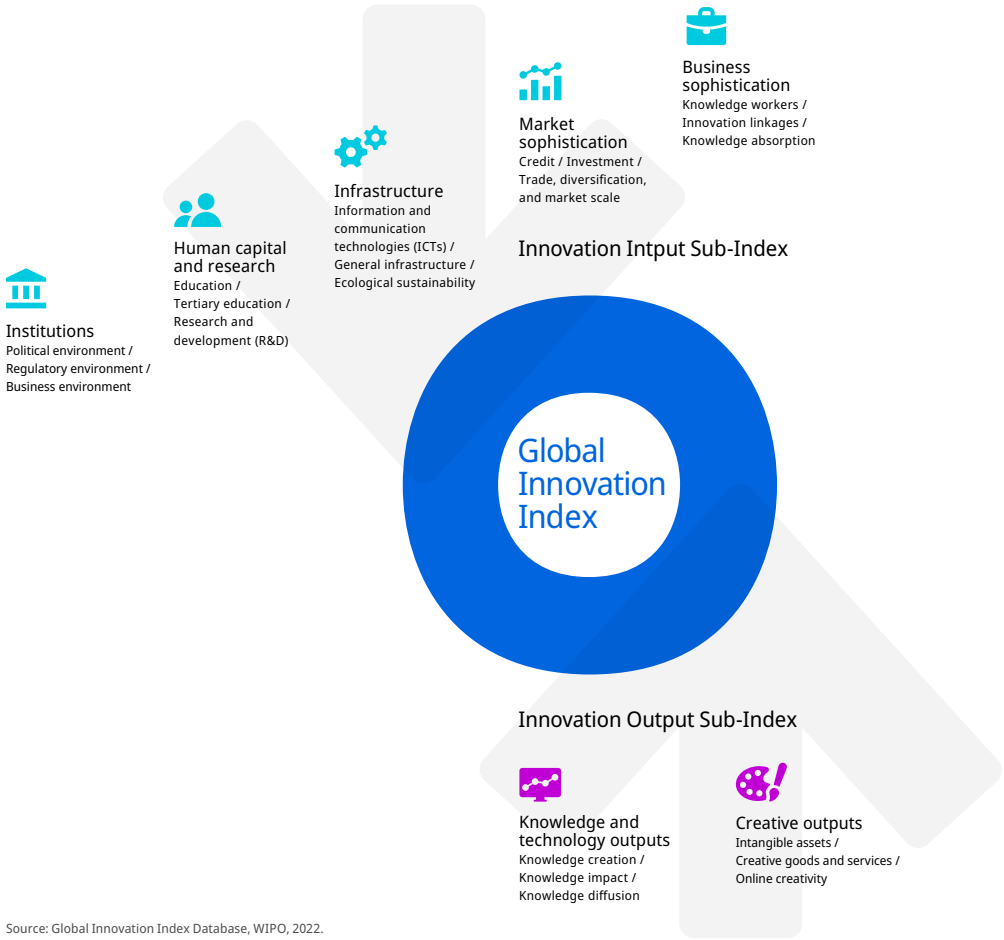
Brand	Industry	Rank
ZAGREBACKA BANKA	Banking	1

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

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, 2022.

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.