



GLOBAL INNOVATION INDEX 2019

AUSTRALIA

22nd

Australia ranks 22nd among the 129 economies featured in the GII 2019.

The Global Innovation Index (GII) is a ranking of world economies based on 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 Australia over the past three years, noting that data availability and the GII model influence year-on-year comparisons of the GII ranks. The confidence interval for Australia's ranking in the GII 2019 is between 22 and 26.

Australia's Rankings, 2017 - 2019

	GII	Innovation Inputs	Innovation Outputs
2019	22	15	31
2018	20	11	31
2017	23	12	30

- Australia performs better in Innovation Inputs than Outputs.
- This year Australia ranks 15th in Innovation Inputs, worse than last year and compared to 2017.
- As for Innovation Outputs, Australia ranks 31st. This position is the same as last year and worse compared to 2017.

21st

Australia ranks 21st among the 50 high-income economies.

6th

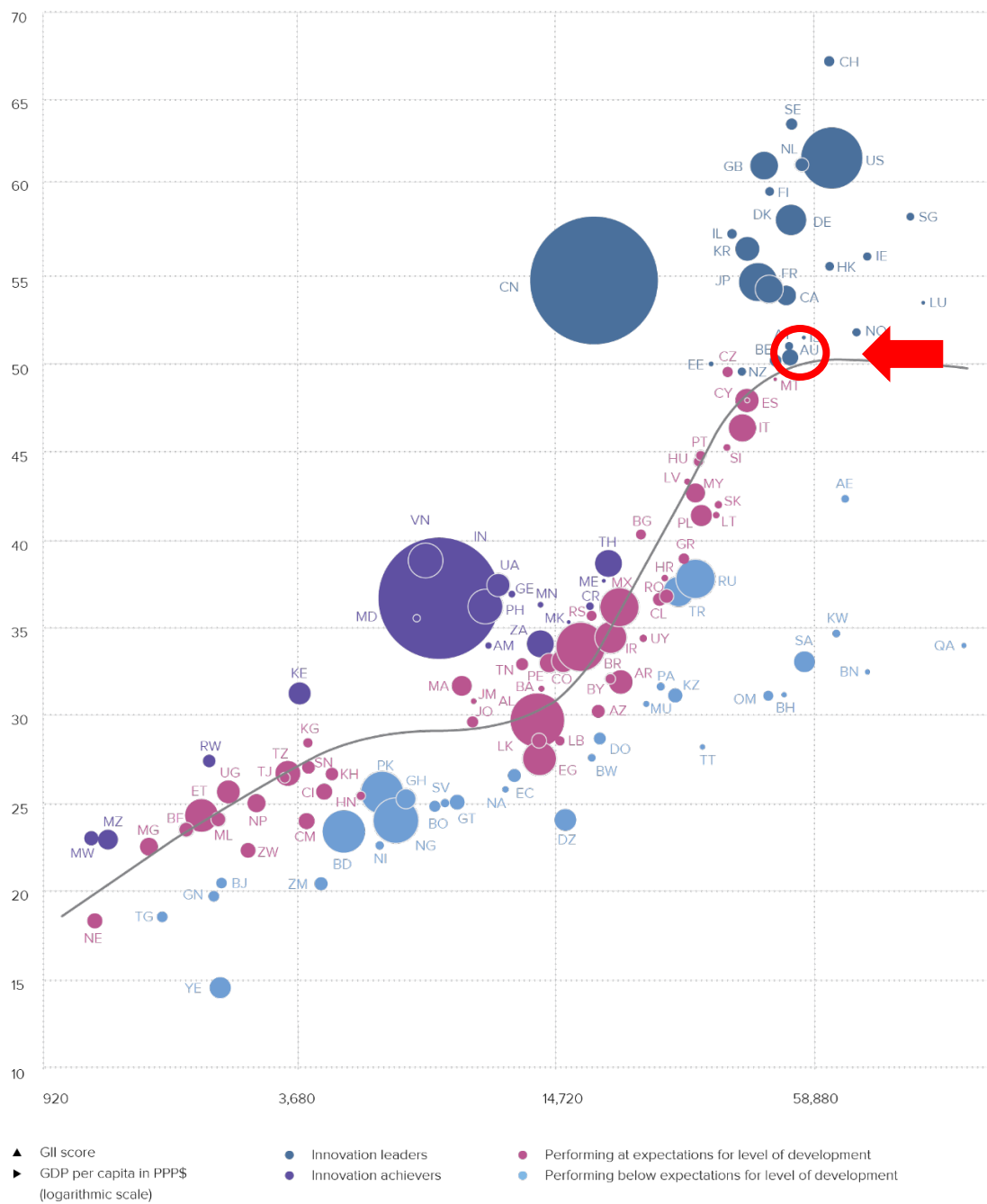
Australia ranks 6th among the 15 economies in South East Asia, East Asia, and Oceania.

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 considered Innovation under-performers relative to GDP.

Relative to GDP, Australia performs above its expected level of development.

GII scores and GDP per capita in PPP US\$
(bubbles sized by population)

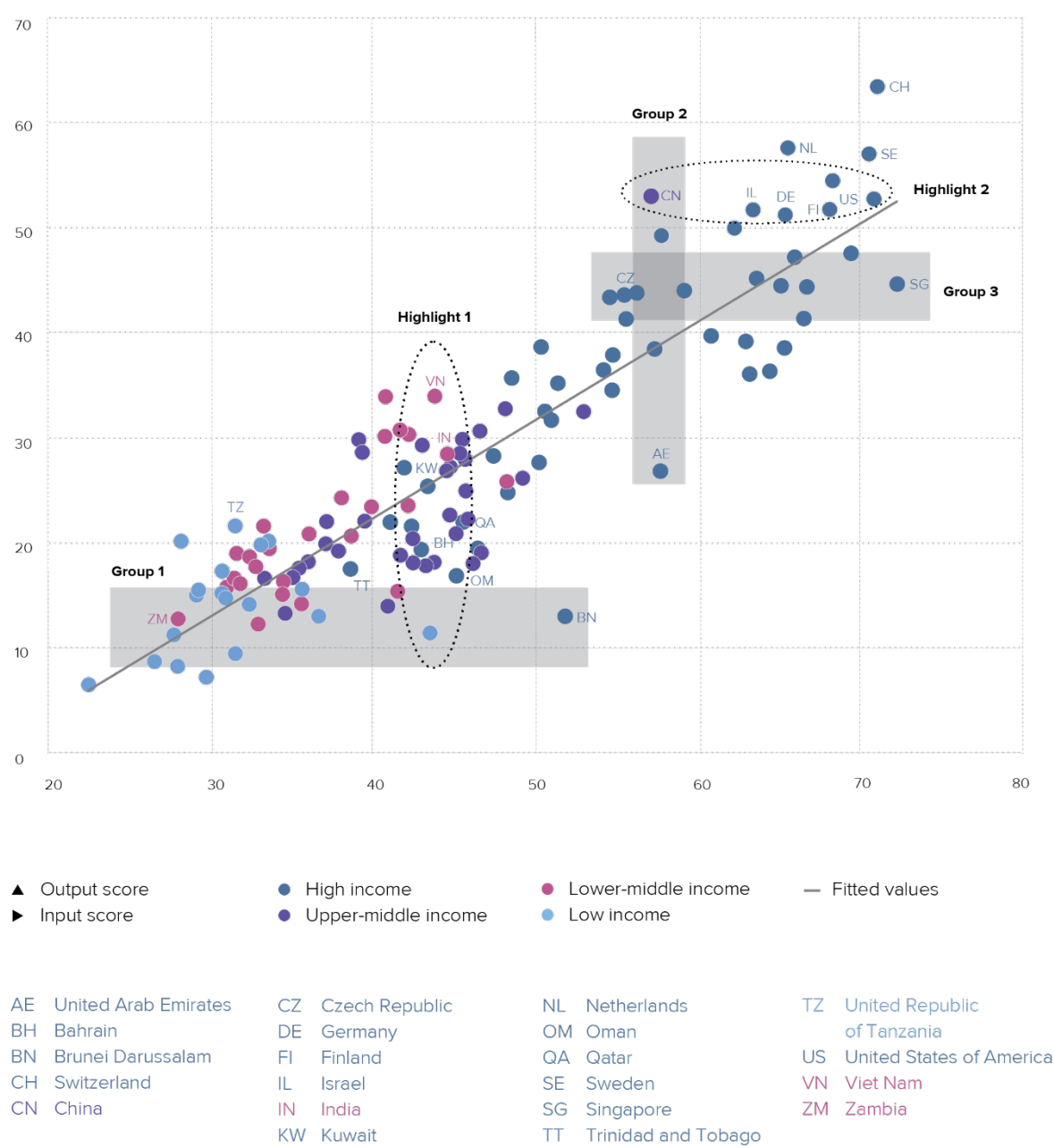


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

The chart below shows the relationship between innovation inputs and innovation outputs, indicating which economies best translate innovation inputs into innovation outputs. Economies appearing above the line are effectively translating their costly innovation investments into more and higher-quality outputs. In contrast, those below the line are not effectively translating innovation inputs into outputs.

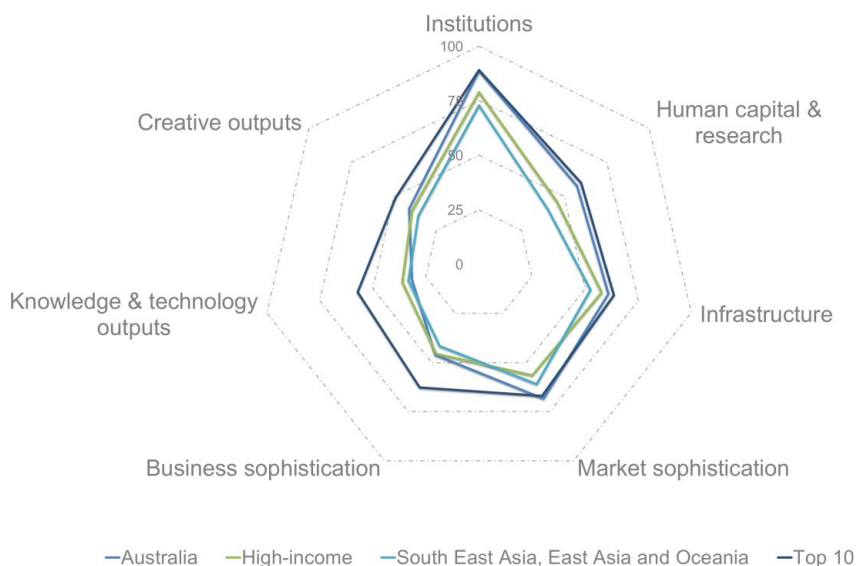
Australia produces less innovation outputs relative to its level of innovation investments.

Innovation input/output performance by income group, 2019



BENCHMARKING AUSTRALIA TO OTHER HIGH-INCOME ECONOMIES AND THE SOUTH EAST ASIA, EAST ASIA, AND OCEANIA REGION

Australia's scores in the seven GII pillars



High-income economies

Australia has high scores in all GII pillars, but in Knowledge & technology outputs, which is below the average of the high-income group.

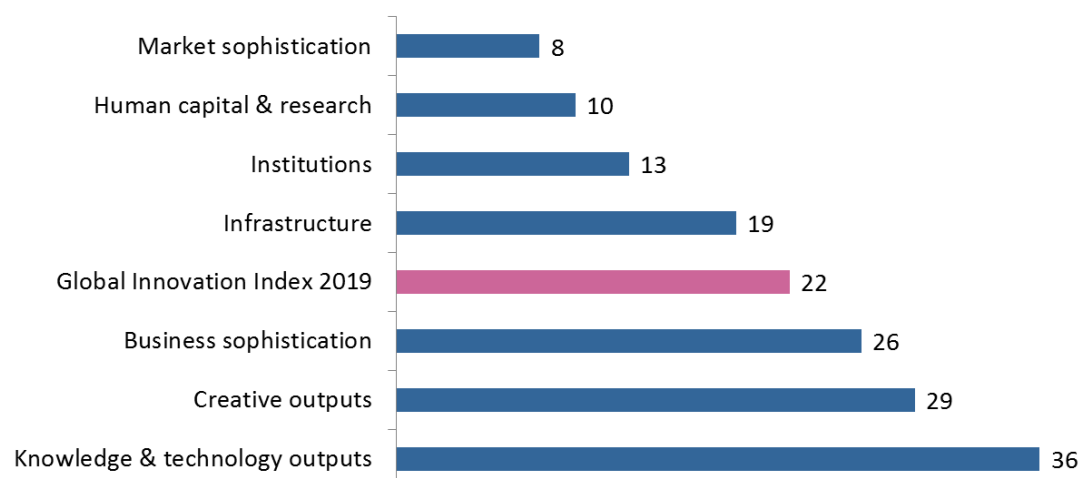
South East Asia, East Asia, and Oceania Region

Compared to other economies in the South East Asia, East Asia, and Oceania region, Australia performs above average in all GII pillars, but in Knowledge & technology outputs.

Top ranks are found in areas such as Credit and Trade, competition, & market scale, where the country ranks in the top 10 worldwide.

OVERVIEW OF AUSTRALIA'S RANKINGS IN THE 7 GII AREAS

Australia performs the best in Market sophistication and its weakest performance is in Knowledge & technology outputs.



*The highest possible ranking in each pillar is 1.

AUSTRALIA'S INNOVATION STRENGTHS AND WEAKNESSES

The table below gives an overview of Australia's strengths and weaknesses in the GII 2019.

Strengths		
Code	Indicator name	Rank
1.2.1	Regulatory quality*	5
1.3.1	Ease of starting a business*	7
2	Human capital & research	10
2.1.3	School life expectancy, years	1
2.2.1	Tertiary enrolment, % gross	2
2.3.4	QS university ranking, average score top 3*	5
3.1.3	Government's online service*	7
3.1.4	E-participation*	5
4	Market sophistication	8
4.1	Credit	5
4.1.1	Ease of getting credit*	7
4.3	Trade, competition, & market scale	10
4.3.1	Applied tariff rate, weighted mean, %	9
5.2.4	JV-strategic alliance deals/bn PPP\$ GDP	7
6.1.4	Scientific & technical articles/bn PPP\$ GDP	10
6.1.5	Citable documents H index	10
6.2.2	New businesses/th pop. 15–64	7
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	10

Weaknesses		
Code	Indicator name	Rank
2.1.2	Government funding/pupil, secondary, % GDP/cap	69
2.2.2	Graduates in science & engineering, %	76
3.3.1	GDP/unit of energy use	67
4.2.1	Ease of protecting minority investors*	61
5.2.3	GERD financed by abroad, %	84
5.3.3	ICT services imports, % total trade	71
6.2.1	Growth rate of PPP\$ GDP/worker, %, 3-year average	77
6.3	Knowledge diffusion	88
6.3.3	ICT services exports, % total trade	83
6.3.4	FDI net outflows, % GDP, 3-year average	97
7.2.2	National feature films/mn pop. 15–69	56

STRENGTHS

- GII strengths for Australia are found in all of the seven GII pillars.
- Pillars Human capital & research (10) and Market sophistication (8) are notable GII strengths for Australia.
- In Human capital & research (10), additional strengths are indicators School life expectancy (1), Tertiary enrolment (2), and Quality of universities (5).
- In Market sophistication (8), other strengths for Australia are sub-pillars Credit (5) and Trade, competition, & market scale (10) and indicators Ease of getting credit (7) and Applied tariff rate (9).
- In Institutions (13), two GII strengths are indicators Regulatory quality (5) and Ease of starting a business (7).
- In Infrastructure (19), Australia's strengths are indicators Government's online service (7) and E-participation (5).
- On the innovation input side, the last GII strengths is indicator Joint Ventures – strategic alliance deals (7) in Business sophistication (26).
- In Knowledge & technology outputs (36), Australia's strengths are indicators Scientific & technical articles (10), Quality of scientific publications (10), and New businesses (7).
- In Creative outputs (29), indicator Generic top-level domains (TLDs) (10) is a GII strength for the country.

WEAKNESSES

- Australia's weaknesses are found in six of the seven GII pillars.
- The highest number of relative weaknesses for Australia is found in Knowledge & technology outputs (36), where sub-pillar Knowledge diffusion (88) and indicators Labor productivity growth (77), ICT services exports (83), and FDI outflows (97) are GII weaknesses for the country.
- In Human capital & research (10), indicators Government funding per pupil (69) and Graduates in science & engineering (76) are weaknesses for Australia.
- In Business sophistication (26), Australia's weaknesses are indicators R&D financed by abroad (84) and ICT services imports (71).
- Other relative weaknesses for Australia are indicators:
 - GDP per unit of energy use (67) in Infrastructure (19);
 - Ease of protecting minority investors (61) in Market sophistication (8), and
 - National feature films (56) in Creative outputs (29).

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$	GDP per capita, PPP\$	GII 2018 rank
31	15	High	SEAO	24.8	1,318.6	52,373.5	20
Score/Value Rank				Score/Value Rank			
INSTITUTIONS..... 88.8 13				BUSINESS SOPHISTICATION..... 46.1 26			
1.1	Political environment.....		85.7	14	5.1	Knowledge workers..... 67.5 11	
1.1.1	Political and operational stability*.....		89.5	15	5.1.1	Knowledge-intensive employment, %..... 46.0 14	
1.1.2	Government effectiveness*.....		83.8	15	5.1.2	Firms offering formal training, % firms..... n/a n/a	
					5.1.3	GERD performed by business, % GDP..... 1.0 21	
					5.1.4	GERD financed by business, %..... 61.9 11	
					5.1.5	Females employed w/advanced degrees, %..... 22.6 17	
1.2	Regulatory environment.....		93.1	12	5.2	Innovation linkages..... 34.6 39	
1.2.1	Regulatory quality*.....		93.7	5	5.2.1	University/industry research collaboration*..... 53.1 35	
1.2.2	Rule of law*.....		90.9	13	5.2.2	State of cluster development*..... 53.8 40	
1.2.3	Cost of redundancy dismissal, salary weeks.....		12.0	38	5.2.3	GERD financed by abroad, %..... 1.6 84	
					5.2.4	JV-strategic alliance deals/bn PPP\$ GDP..... 0.2 7	
					5.2.5	Patent families 2+ offices/bn PPP\$ GDP..... 1.0 28	
1.3	Business environment.....		87.7	11	5.3	Knowledge absorption..... 36.2 50	
1.3.1	Ease of starting a business*.....		96.5	7	5.3.1	Intellectual property payments, % total trade..... 1.3 24	
1.3.2	Ease of resolving insolvency*.....		78.9	19	5.3.2	High-tech imports, % total trade..... 10.5 26	
					5.3.3	ICT services imports, % total trade..... 1.0 71	
					5.3.4	FDI net inflows, % GDP..... 3.3 50	
					5.3.5	Research talent, % in business enterprise..... 27.9 44	
HUMAN CAPITAL & RESEARCH..... 57.7 10				KNOWLEDGE & TECHNOLOGY OUTPUTS.... 31.6 36			
2.1	Education.....		61.0	19	6.1	Knowledge creation..... 38.0 21	
2.1.1	Expenditure on education, % GDP.....		5.3	32	6.1.1	Patents by origin/bn PPP\$ GDP..... 2.0 43	
2.1.2	Government funding/pupil, secondary, % GDP/cap... ..		17.2	69	6.1.2	PCT patents by origin/bn PPP\$ GDP..... 1.4 26	
2.1.3	School life expectancy, years.....		22.1	1	6.1.3	Utility models by origin/bn PPP\$ GDP..... 0.8 29	
2.1.4	PISA scales in reading, maths, & science.....		502.3	19	6.1.4	Scientific & technical articles/bn PPP\$ GDP..... 26.9 10	
2.1.5	Pupil-teacher ratio, secondary.....		n/a	n/a	6.1.5	Citable documents H-index..... 65.2 10	
2.2	Tertiary education.....		50.6	13	6.2	Knowledge impact..... 44.1 30	
2.2.1	Tertiary enrolment, % gross.....		113.8	2	6.2.1	Growth rate of PPP\$ GDP/worker, %..... 0.4 77	
2.2.2	Graduates in science & engineering, %.....		17.6	76	6.2.2	New businesses/th pop. 15-64..... 15.5 7	
2.2.3	Tertiary inbound mobility, %.....		17.5	9	6.2.3	Computer software spending, % GDP..... 0.3 53	
					6.2.4	ISO 9001 quality certificates/bn PPP\$ GDP..... 9.7 32	
					6.2.5	High- & medium-high-tech manufactures, %..... 0.3 39	
2.3	Research & development (R&D).....		61.4	14	6.3	Knowledge diffusion..... 12.6 88	
2.3.1	Researchers, FTE/mn pop.....		4,539.5	16	6.3.1	Intellectual property receipts, % total trade..... 0.3 29	
2.3.2	Gross expenditure on R&D, % GDP.....		1.9	18	6.3.2	High-tech net exports, % total trade..... 1.7 58	
2.3.3	Global R&D companies, avg. exp. top 3, mn US\$.....		68.1	20	6.3.3	ICT services exports, % total trade..... 1.0 83	
2.3.4	QS university ranking, average score top 3*.....		80.9	5	6.3.4	FDI net outflows, % GDP..... 0.1 97	
INFRASTRUCTURE..... 60.9 19				CREATIVE OUTPUTS..... 41.1 29			
3.1	Information & communication technologies (ICTs).....		89.0	13	7.1	Intangible assets..... 48.7 40	
3.1.1	ICT access*.....		80.4	26	7.1.1	Trademarks by origin/bn PPP\$ GDP..... 64.3 33	
3.1.2	ICT use*.....		80.2	15	7.1.2	Industrial designs by origin/bn PPP\$ GDP..... 2.3 48	
3.1.3	Government's online service*.....		97.2	7	7.1.3	ICTs & business model creation*..... 70.7 30	
3.1.4	E-participation*.....		98.3	5	7.1.4	ICTs & organizational model creation*..... 67.3 25	
3.2	General infrastructure.....		49.1	20	7.2	Creative goods & services..... 27.5 35	
3.2.1	Electricity output, kWh/mn pop.....		10,432.2	13	7.2.1	Cultural & creative services exports, % total trade..... 0.4 56	
3.2.2	Logistics performance*.....		79.0	18	7.2.2	National feature films/mn pop. 15-69..... 3.2 56	
3.2.3	Gross capital formation, % GDP.....		24.3	50	7.2.3	Entertainment & Media market/th pop. 15-69..... 67.0 7	
					7.2.4	Printing & other media, % manufacturing..... 2.3 14	
					7.2.5	Creative goods exports, % total trade..... 0.6 54	
3.3	Ecological sustainability.....		44.5	45	7.3	Online creativity..... 39.5 16	
3.3.1	GDP/unit of energy use.....		8.5	67	7.3.1	Generic top-level domains (TLDs)/th pop. 15-69..... 63.1 10	
3.3.2	Environmental performance*.....		74.1	21	7.3.2	Country-code TLDs/th pop. 15-69..... 50.9 14	
3.3.3	ISO 14001 environmental certificates/bn PPP\$ GDP..		3.2	30	7.3.3	Wikipedia edits/mn pop. 15-69..... 47.2 28	
					7.3.4	Mobile app creation/bn PPP\$ GDP..... 12.1 37	
MARKET SOPHISTICATION..... 68.3 8							
4.1	Credit.....		79.5	5			
4.1.1	Ease of getting credit*.....		90.0	7			
4.1.2	Domestic credit to private sector, % GDP.....		142.5	13			
4.1.3	Microfinance gross loans, % GDP.....		n/a	n/a			
4.2	Investment.....		46.4	51			
4.2.1	Ease of protecting minority investors*.....		60.0	61			
4.2.2	Market capitalization, % GDP.....		102.3	11			
4.2.3	Venture capital deals/bn PPP\$ GDP.....		0.1	19			
4.3	Trade, competition, & market scale.....		78.9	10			
4.3.1	Applied tariff rate, weighted avg., %.....		0.9	9			
4.3.2	Intensity of local competition*.....		79.2	11			
4.3.3	Domestic market scale, bn PPP\$.....		1,318.6	20			

NOTES: ● indicates a strength; ○ a weakness; ◆ a strength relative to the other top 25-ranked GII economies; ◇ a weakness relative to the other top 25-ranked GII economies; * 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 AND GII MODEL

The following tables list data that are missing or are outdated for Australia.

Indicator Government funding per pupil, for which data were not available last year, becomes available in the GII 2019.

Missing data

Code	Indicator name	Country year	Model year	Source
2.1.5	Pupil-teacher ratio, secondary	n/a	2017	UNESCO Institute for Statistics
4.1.3	Microfinance gross loans, % GDP	n/a	2017	Microfinance Information Exchange
5.1.2	Firms offering formal training, % firms	n/a	2013	World Bank

Outdated data

Code	Indicator name	Country year	Model year	Source
2.2.2	Graduates in science & engineering, %	2015	2016	UNESCO Institute for Statistics
2.3.1	Researchers, FTE/mn pop.	2010	2017	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
2.3.2	Gross expenditure on R&D, % GDP	2015	2017	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
4.1.2	Domestic credit to private sector, % GDP	2016	2017	International Monetary Fund
5.1.1	Knowledge-intensive employment, %	2016	2017	Source: International Labour Organization
5.1.3	GERD performed by business, % GDP	2015	2017	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
5.1.4	GERD financed by business, %	2008	2016	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
5.1.5	Females employed w/advanced degrees, %	2013	2017	International Labour Organization
5.2.3	GERD financed by abroad, %	2008	2016	UNESCO Institute for Statistics
5.3.5	Research talent, % in business enterprise	2010	2017	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators

Model changes

The table below provides a summary of the adjustments to the GII 2019 framework.

Changes to the GII 2019 framework

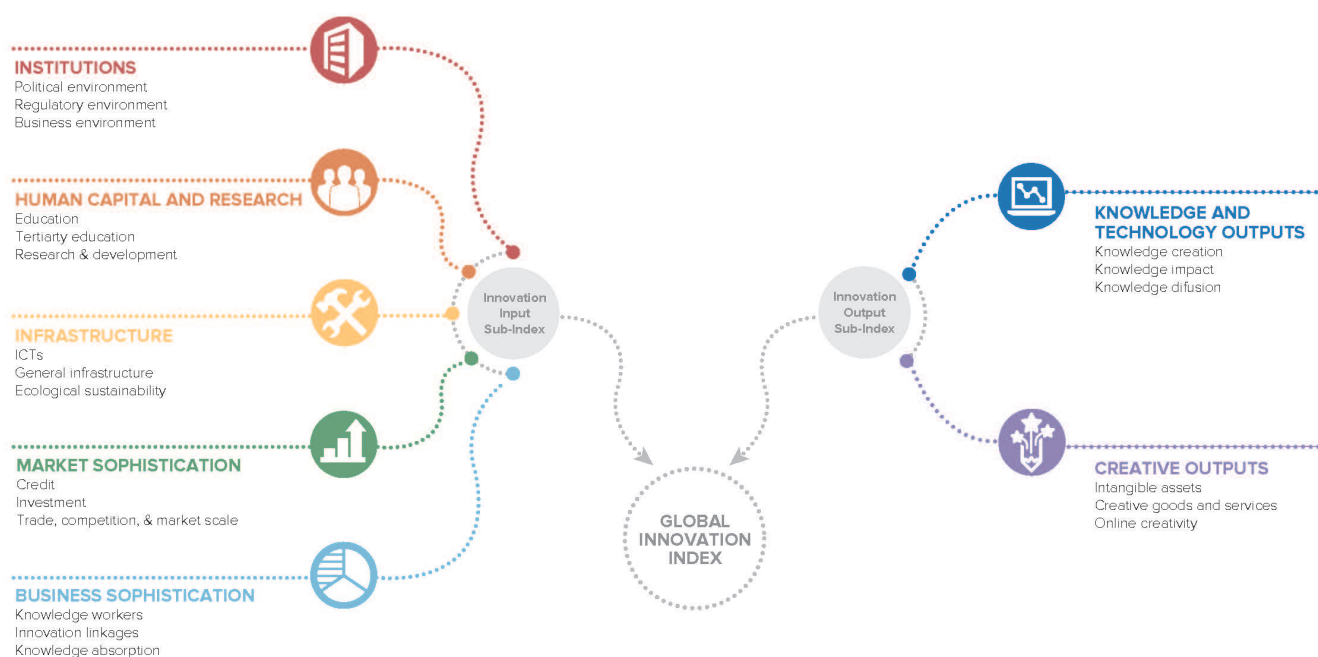
	GII 2018	Adjustment		GII 2019
1.1.1	Political stability & safety	Replaced	1.1.1	Political & operational stability
3.3.2	Environmental performance	Indicator changed at source	3.3.2	Environmental performance
5.3.1	Intellectual property payments, % total trade	Methodology change	5.3.1	Intellectual property payments, % total trade (3 year avg.)
5.3.2	High-tech imports, % total trade	Methodology change	5.3.2	High-tech imports, % total trade
6.2.1	Growth rate of PPP\$ GDP/worker, %	Methodology change	6.2.1	Growth rate of PPP\$ GDP/worker, % (3 year avg.)
6.3.1	Intellectual property receipts, % total trade	Methodology change	6.3.1	Intellectual property receipts, % total trade (3 year avg.)
7.3.4	Mobile app creation/bn PPP\$ GDP	Methodology change	7.3.4	Mobile app creation/bn PPP\$ GDP

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 2019, the GII presents its 12th edition devoted to the theme **Creating Healthy Lives—The Future of Medical Innovation**.

Recognizing that innovation is a key driver of economic development, the GII aims to provide a rich innovation ranking and 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 countries that incorporate the GII into their innovation agendas.

Framework of the Global Innovation Index 2019



The Index is a ranking of the innovation capabilities and results of world economies. It measures innovation based on criteria that includes 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 containing three sub-pillars.



www.globalinnovationindex.org



GII app for iOS



GII app for android