

GLOBAL INNOVATION INDEX 2019

THE NETHERLANDS

4th

The Netherlands ranks 4th 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 the Netherlands 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 the Netherlands's ranking in the GII 2019 is between 3 and 5. Between 2018 and 2019, the rank decrease for the Netherlands is the result of a mix of decreased performance, changes to the underlying GII model, and new data becoming available (page 8).

The Netherlands' GII Rankings, 2017 - 2019

	GII	Innovation Inputs	Innovation Outputs
2019	4	11	2
2018	2	9	2
2017	3	9	2

- The Netherlands performs better in Innovation Outputs than Inputs.
- This year the country ranks 11th in Innovation Inputs, worse than in 2018 and 2017.
- The Netherlands ranks 2nd in Innovation Outputs, the same rank as in 2018 and 2017.

4th

The Netherlands ranks 4th among the 50 high-income economies.

3rd

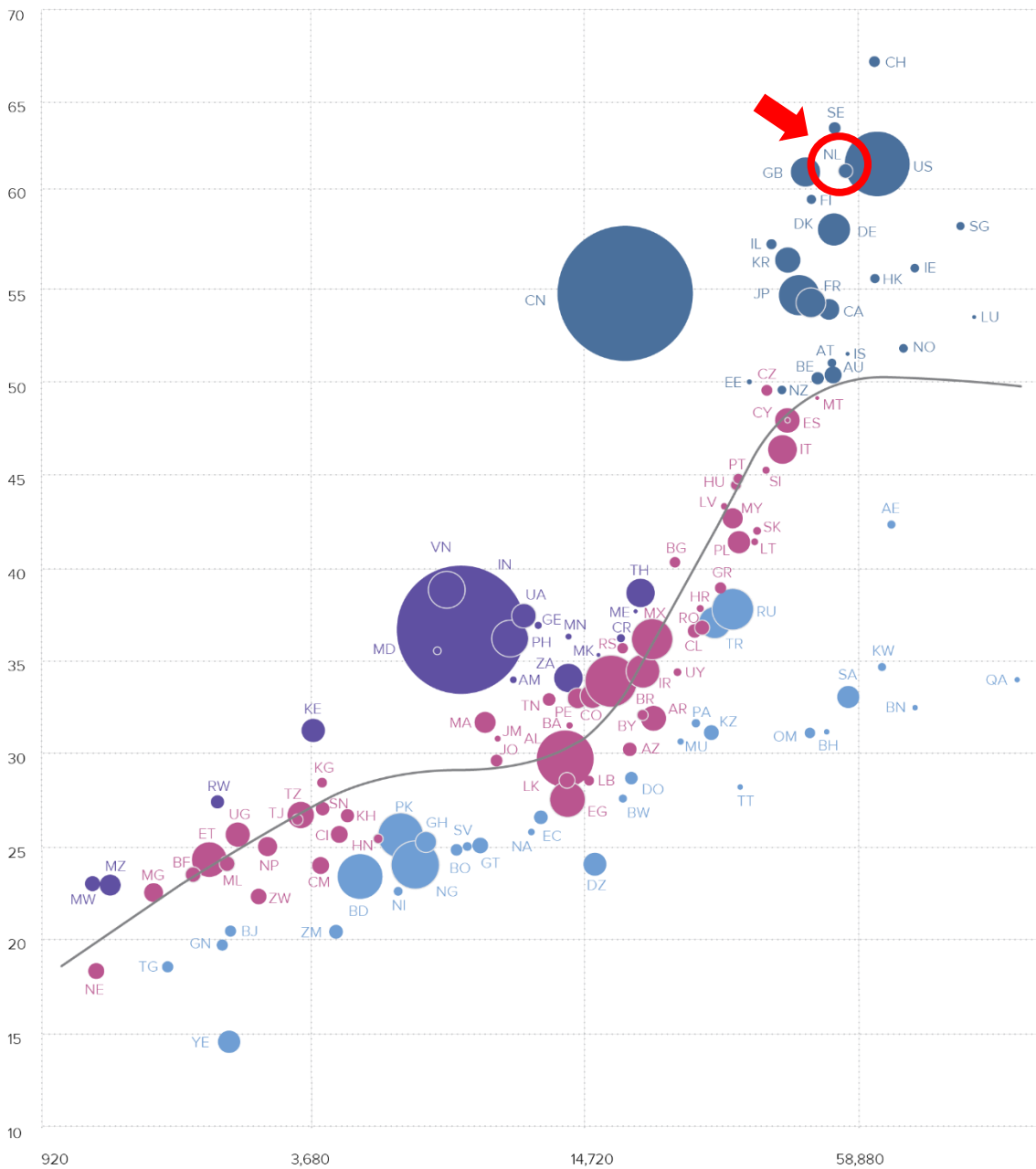
The Netherlands ranks 3rd among the 39 economies in Europe.

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 considered Innovation under-performers relative to GDP.

Relative to GDP, the Netherlands performs well above its expected level of development.

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



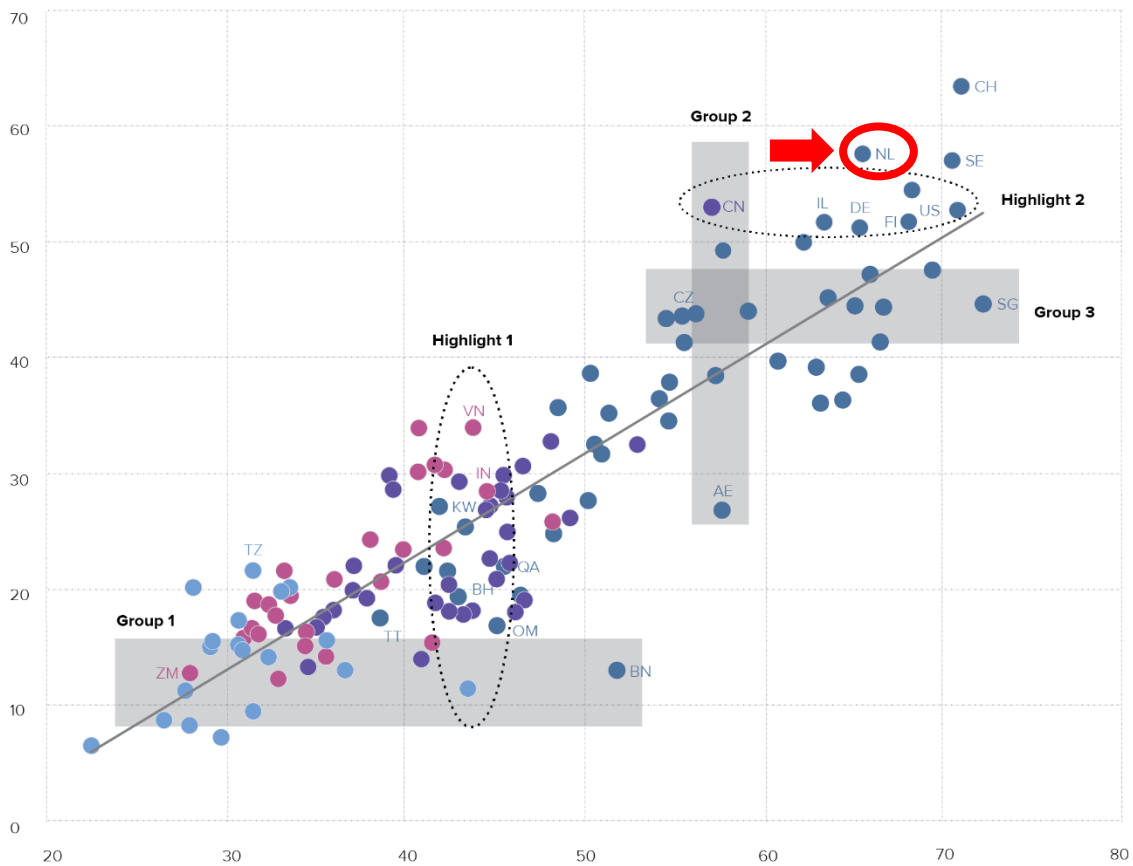
- ▲ GII score
- ▶ GDP per capita in PPP\$ (logarithmic scale)
- Innovation leaders
- Innovation achievers
- Performing at expectations for level of development
- Performing below expectations for level of development

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.

The Netherlands produces more innovation outputs relative to its level of innovation investments.

Innovation input/output performance by income group, 2019

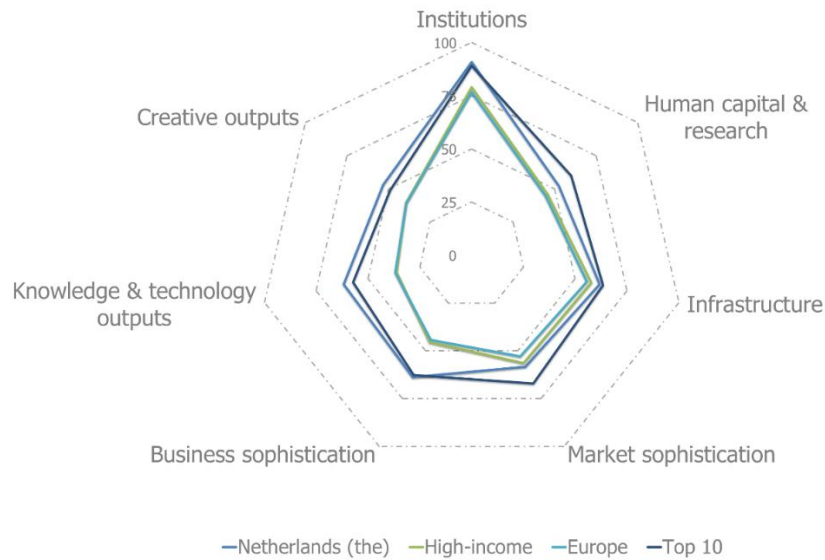


▲ Output score ● High income ● Lower-middle income — Fitted values
 ► Input score ● Upper-middle income ● Low income

AE United Arab Emirates	CZ Czech Republic	NL Netherlands	TZ United Republic of Tanzania
BH Bahrain	DE Germany	OM Oman	US United States of America
BN Brunei Darussalam	FI Finland	QA Qatar	VN Viet Nam
CH Switzerland	IL Israel	SE Sweden	ZM Zambia
CN China	IN India	SG Singapore	
	KW Kuwait	TT Trinidad and Tobago	

BENCHMARKING THE NETHERLANDS TO OTHER HIGH-INCOME ECONOMIES AND THE EUROPE REGION

The Netherlands's scores in the seven GII pillars



High-income economies

The Netherlands has high scores in all seven GII pillars, which are all above the average of the high-income group.

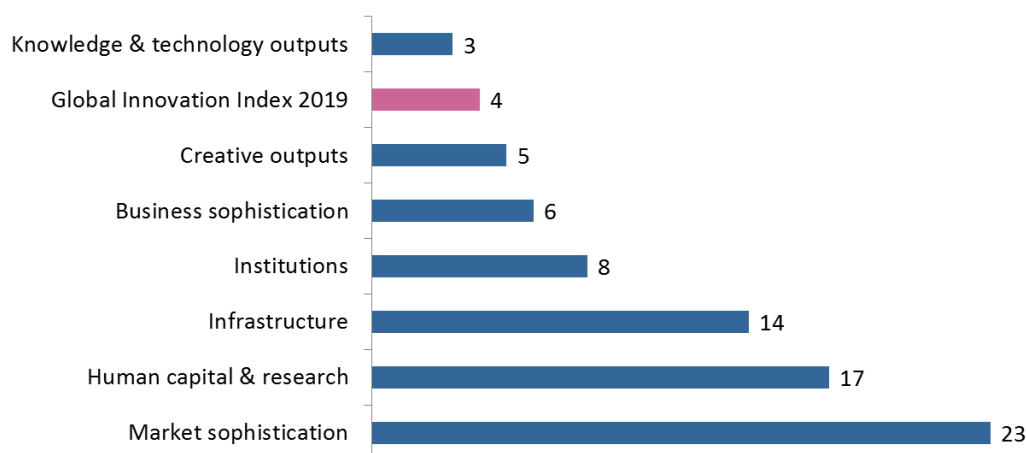
Europe Region

Compared to other economies in the Europe region, the Netherlands performs above average in all seven GII pillars.

Top ranks are found in sub-pillars Knowledge absorption, Knowledge diffusion, and Online creativity where the country ranks in the top 3 worldwide.

OVERVIEW OF THE NETHERLANDS' RANKINGS IN THE 7 GII AREAS

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



*The highest possible ranking in each pillar is 1.

THE NETHERLANDS'S INNOVATION STRENGTHS AND WEAKNESSES

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

Strengths			Weaknesses		
Code	Indicator name	Rank	Code	Indicator name	Rank
1.2.1	Regulatory quality*	4	1.2.3	Cost of redundancy dismissal, salary weeks	65
3.1	Information & communication technologies (ICTs)	4	2.1.5	Pupil-teacher ratio, secondary	64
3.1.4	E-participation*	4	2.2	Tertiary education	59
4.3.2	Intensity of local competition	5	2.2.2	Graduates in science & engineering, %	91
5.2	Innovation linkages	5	3.2.3	Gross capital formation, % GDP	85
5.2.1	University/industry research collaboration	4	4.1.1	Ease of getting credit*	94
5.2.2	State of cluster development	5	4.2.1	Ease of protecting minority investors*	68
5.3	Knowledge absorption	2	4.3.1	Applied tariff rate, weighted mean, %	23
5.3.1	Intellectual property payments, % total trade	1	6.2.1	Growth rate of PPP\$ GDP/worker, %, 3-year average	70
5.3.4	FDI net inflows, % GDP, 3-year average	5	7.1.1	Trademarks by origin/bn PPP\$ GDP	43
6	Knowledge & technology outputs	3	7.2.4	Printing & other media, % manufacturing	51
6.3	Knowledge diffusion	2			
6.3.1	Intellectual property receipts, % total trade	1			
6.3.4	FDI net outflows, % GDP, 3-year average	1			
7	Creative outputs	5			
7.1.3	ICTs & business model creation	3			
7.1.4	ICTs & organizational model creation	4			
7.3	Online creativity	2			
7.3.1	Generic top-level domains (TLDs)/th pop. 15–69	5			
7.3.2	Country-code TLDs/th pop. 15–69	1			

STRENGTHS

- Relative strengths for the Netherlands are in all GII pillars, with the exception of the Human capital & research (17) pillar.
- Both output pillars – Knowledge and Technology outputs (3), and Creative outputs (5) are relative strengths.
- Knowledge & technology outputs (3) is the top ranked area for the Netherlands. In this pillar, the country exhibits strengths in sub-pillar Knowledge diffusion (2) as well as in two of its four indicators – Intellectual property receipts and FDI outflows, both ranked 1st.
- In Creative outputs (5), the sub-pillar Online creativity (2) is identified as a relative strength, together with two of its four indicators - Generic top-level domains (5) and Country-code TLDs (1). Other two indicators in this pillar - ICTs & business model creation (3) and ICTs & organizational model creation (4) - are also strengths.
- On innovation inputs, most strengths for the Netherlands are in the Business sophistication (6) pillar. In this, the Netherlands performs well in two sub-pillars: Innovation linkages (5) and Knowledge absorption (2). At the indicator level, strengths include University-industry research collaboration (4), State of cluster development (5), FDI inflows (5), and Intellectual property payments – where it ranks 1st in the world.
- In Infrastructure (14), the Netherlands has a strength in sub-pillar Information & communication technologies (ICTs) (4) and in its indicator E-participation (4).
- The indicators Regulatory quality (4) and Intensity of local competition (5) are also relative strengths.

WEAKNESSES

- The Netherlands has relative weaknesses in all GII areas, except for Business sophistication (6). Most of them are on innovation inputs.
- In Institutions (8), the Netherlands exhibits a single relative weakness in indicator Cost of redundancy dismissal (65).
- In Human capital & research (17), the country presents a relatively weak performance in sub-pillar Tertiary education (59) as well as in two indicators – Pupil-teacher ratio (64) and Graduates in science & engineering (91).
- In Infrastructure (14), the country shows one relative weakness in indicator Gross capital formation (85).
- In Market sophistication (23), three indicators - Ease of getting credit (94), Ease of protecting minority investors (68), and Applied tariff rate (23) are relative weaknesses.
- In Knowledge & technology outputs (3), the indicator Labor productivity growth (70) is also a relative weakness.
- In Creative outputs (5), indicators Trademarks by origin (43) and Printing & other media (51) are relative weaknesses.

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$	GDP per capita, PPP\$	GII 2018 rank
2	11	High	EUR	17.1	972.5	56,383.2	2
				Score/Value	Rank		
INSTITUTIONS				90.9	8		
1.1	Political environment			91.4	8		
1.1.1	Political and operational stability*.....			91.2	12		
1.1.2	Government effectiveness*.....			91.4	7		
1.2	Regulatory environment			91.9	14		
1.2.1	Regulatory quality*.....			96.9	4 ●		
1.2.2	Rule of law*.....			94.8	7		
1.2.3	Cost of redundancy dismissal, salary weeks.....			15.8	65 ○		
1.3	Business environment			89.3	7		
1.3.1	Ease of starting a business*.....			94.3	19		
1.3.2	Ease of resolving insolvency*.....			84.3	7		
HUMAN CAPITAL & RESEARCH				52.4	17		
2.1	Education			60.1	23		
2.1.1	Expenditure on education, % GDP.....			5.4	29		
2.1.2	Government funding/pupil, secondary, % GDP/cap... ..			22.9	36		
2.1.3	School life expectancy, years.....			18.0	11		
2.1.4	PISA scales in reading, maths, & science.....			507.9	12		
2.1.5	Pupil-teacher ratio, secondary.....			14.4	64 ○		
2.2	Tertiary education			32.8	59 ○		
2.2.1	Tertiary enrolment, % gross.....			80.4	19		
2.2.2	Graduates in science & engineering, %.....			14.1	91 ○ ◇		
2.2.3	Tertiary inbound mobility, %.....			10.7	18		
2.3	Research & development (R&D)			64.4	12		
2.3.1	Researchers, FTE/mn pop.....			5,007.1	13		
2.3.2	Gross expenditure on R&D, % GDP.....			2.0	17		
2.3.3	Global R&D companies, avg. exp. top 3, mn US\$.....			85.4	9		
2.3.4	QS university ranking, average score top 3*.....			68.1	13		
INFRASTRUCTURE				61.8	14		
3.1	Information & communication technologies (ICTs)			91.1	4 ●		
3.1.1	ICT access*.....			87.5	8		
3.1.2	ICT use*.....			84.8	7		
3.1.3	Government's online service*.....			93.1	17		
3.1.4	E-participation*.....			98.9	4 ●		
3.2	General infrastructure			45.7	31		
3.2.1	Electricity output, kWh/mn pop.....			6,805.9	31		
3.2.2	Logistics performance*.....			91.5	6		
3.2.3	Gross capital formation, % GDP.....			21.3	85 ○		
3.3	Ecological sustainability			48.5	36		
3.3.1	GDP/unit of energy use.....			10.9	42		
3.3.2	Environmental performance*.....			75.5	18		
3.3.3	ISO 14001 environmental certificates/bn PPP\$ GDP..			3.0	33		
MARKET SOPHISTICATION				58.2	23		
4.1	Credit			49.3	32		
4.1.1	Ease of getting credit*.....			45.0	94 ○ ◇		
4.1.2	Domestic credit to private sector, % GDP.....			111.9	20		
4.1.3	Microfinance gross loans, % GDP.....			n/a	n/a		
4.2	Investment			48.8	42		
4.2.1	Ease of protecting minority investors*.....			58.3	68 ○		
4.2.2	Market capitalization, % GDP.....			111.0	9		
4.2.3	Venture capital deals/bn PPP\$ GDP.....			0.1	15		
4.3	Trade, competition, & market scale			76.5	18		
4.3.1	Applied tariff rate, weighted avg., %.....			1.8	23 ○		
4.3.2	Intensity of local competition*.....			80.5	5 ●		
4.3.3	Domestic market scale, bn PPP\$.....			972.5	26		
BUSINESS SOPHISTICATION				63.7	6		
5.1	Knowledge workers			64.6	18		
5.1.1	Knowledge-intensive employment, %.....			46.8	12		
5.1.2	Firms offering formal training, % firms.....			n/a	n/a		
5.1.3	GERD performed by business, % GDP.....			1.2	17		
5.1.4	GERD financed by business, %.....			52.0	24		
5.1.5	Females employed w/advanced degrees, %.....			19.7	24		
5.2	Innovation linkages			59.0	5 ●		
5.2.1	University/industry research collaboration*.....			75.5	4 ● ◆		
5.2.2	State of cluster development*.....			72.8	5 ● ◆		
5.2.3	GERD financed by abroad, %.....			13.9	30		
5.2.4	JV-strategic alliance deals/bn PPP\$ GDP.....			0.1	23		
5.2.5	Patent families 2+ offices/bn PPP\$ GDP.....			6.0	8		
5.3	Knowledge absorption			67.6	2 ● ◆		
5.3.1	Intellectual property payments, % total trade.....			8.1	1 ● ◆		
5.3.2	High-tech imports, % total trade.....			11.5	22		
5.3.3	ICT services imports, % total trade.....			2.3	17		
5.3.4	FDI net inflows, % GDP.....			27.7	5 ● ◆		
5.3.5	Research talent, % in business enterprise.....			62.7	7		
KNOWLEDGE & TECHNOLOGY OUTPUTS				61.8	3 ● ◆		
6.1	Knowledge creation			65.0	7		
6.1.1	Patents by origin/bn PPP\$ GDP.....			10.0	12		
6.1.2	PCT patents by origin/bn PPP\$ GDP.....			4.3	10		
6.1.3	Utility models by origin/bn PPP\$ GDP.....			n/a	n/a		
6.1.4	Scientific & technical articles/bn PPP\$ GDP.....			20.8	21		
6.1.5	Citable documents H-index.....			68.8	8		
6.2	Knowledge impact			45.4	27		
6.2.1	Growth rate of PPP\$ GDP/worker, %.....			0.6	70 ○		
6.2.2	New businesses/th pop. 15-64.....			6.1	24		
6.2.3	Computer software spending, % GDP.....			0.6	8		
6.2.4	ISO 9001 quality certificates/bn PPP\$ GDP.....			10.9	28		
6.2.5	High- & medium-high-tech manufactures, %.....			0.3	36		
6.3	Knowledge diffusion			75.0	2 ● ◆		
6.3.1	Intellectual property receipts, % total trade.....			7.0	1 ● ◆		
6.3.2	High-tech net exports, % total trade.....			11.2	15		
6.3.3	ICT services exports, % total trade.....			3.6	23		
6.3.4	FDI net outflows, % GDP.....			36.3	1 ● ◆		
CREATIVE OUTPUTS				53.2	5 ● ◆		
7.1	Intangible assets			56.1	16		
7.1.1	Trademarks by origin/bn PPP\$ GDP.....			53.9	43 ○		
7.1.2	Industrial designs by origin/bn PPP\$ GDP.....			3.8	33		
7.1.3	ICTs & business model creation*.....			84.0	3 ● ◆		
7.1.4	ICTs & organizational model creation*.....			80.2	4 ● ◆		
7.2	Creative goods & services			37.1	12		
7.2.1	Cultural & creative services exports, % total trade.....			1.7	10		
7.2.2	National feature films/mn pop. 15-69.....			7.6	23		
7.2.3	Entertainment & Media market/th pop. 15-69.....			50.4	17		
7.2.4	Printing & other media, % manufacturing.....			1.2	51 ○		
7.2.5	Creative goods exports, % total trade.....			4.1	14		
7.3	Online creativity			63.3	2 ● ◆		
7.3.1	Generic top-level domains (TLDs)/th pop. 15-69.....			78.9	5 ● ◆		
7.3.2	Country-code TLDs/th pop. 15-69.....			100.0	1 ● ◆		
7.3.3	Wikipedia edits/mn pop. 15-69.....			86.3	10		
7.3.4	Mobile app creation/bn PPP\$ GDP.....			16.3	28		

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 the Netherlands.

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
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
6.1.3	Utility models by origin/bn PPP\$ GDP	n/a	2017	World Intellectual Property Organization

Outdated data

Code	Indicator name	Country year	Model year	Source
2.1.5	Pupil-teacher ratio, secondary	2016	2017	UNESCO Institute for Statistics
2.2.1	Tertiary enrolment, % gross	2016	2017	UNESCO Institute for Statistics
2.2.2	Graduates in science & engineering, %	2014	2016	UNESCO Institute for Statistics

Model changes

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

Changes to the GII 2019 framework

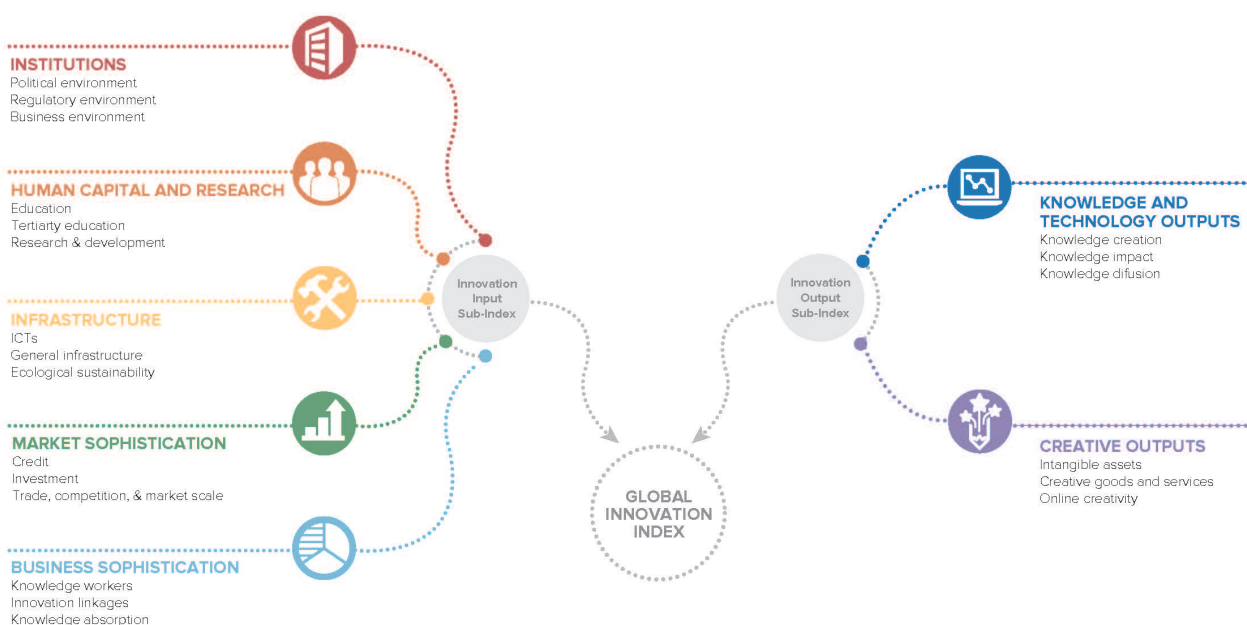
GII 2018		Adjustment	GII 2019	
1.1.1	Political stability & safety	Replaced	1.1.1	Political & operational stability
3.3.2	Environmental performance	Indicator changed at source	3.3.2	Environmental performance
5.3.1	Intellectual property payments, % total trade	Methodology change	5.3.1	Intellectual property 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.

