

GLOBAL INNOVATION INDEX 2019

SWEDEN

2nd

Sweden ranks 2nd 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 Sweden 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 Sweden's ranking in the GII 2019 confirms its 2nd rank.

Sweden's Rankings, 2017 - 2019

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

- Sweden performs better in Innovation Outputs than Inputs in 2019.
- This year Sweden ranks 4th in Innovation Inputs, worse than in 2018 and 2017.
- In Innovation Outputs, Sweden ranks 3rd. This position is the same as in 2018 and 2017.

2nd

Sweden ranks 2nd among the 50 high-income economies.

2nd

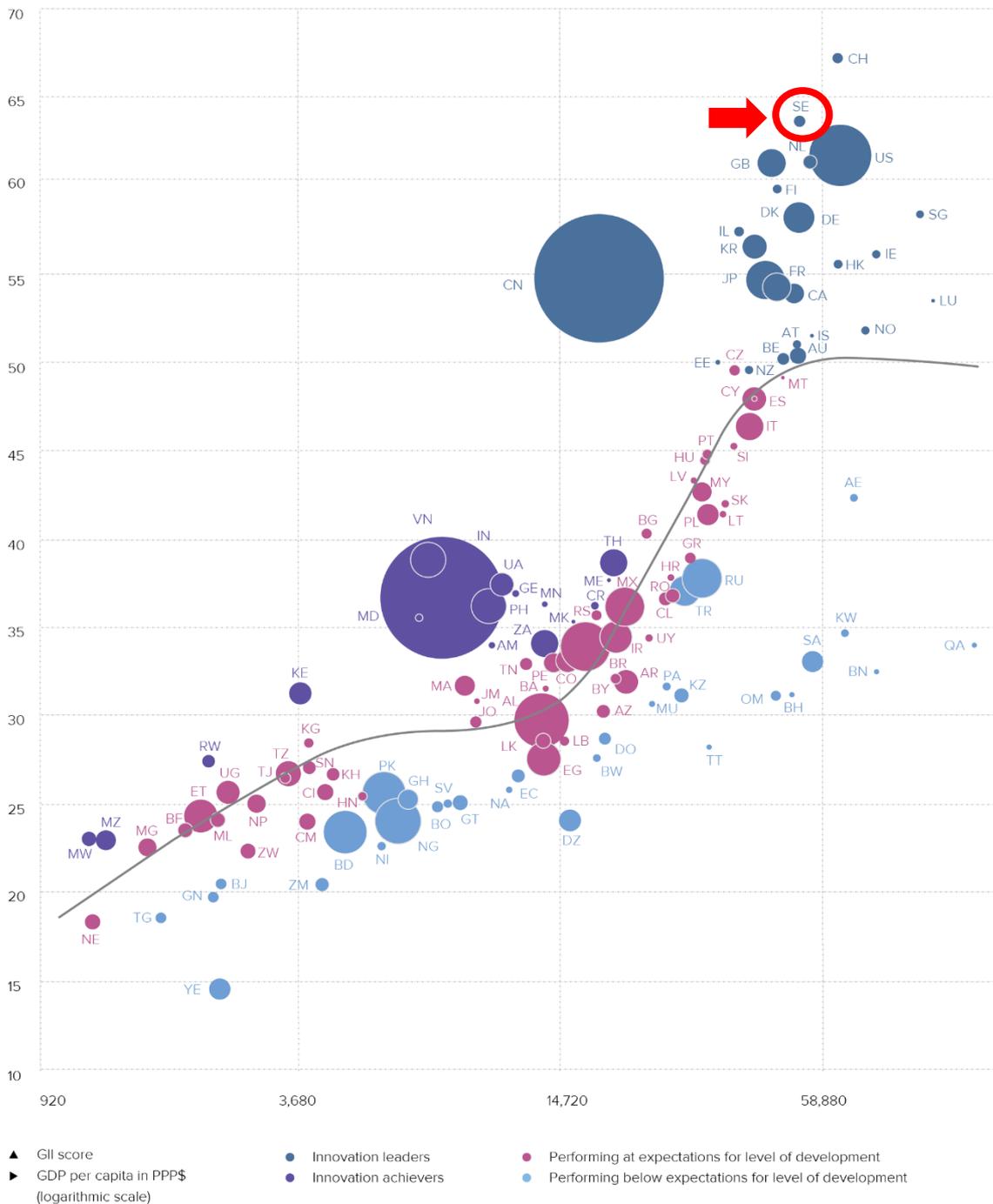
Sweden ranks 2nd among the 39 economies in Europe.

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, Sweden performs well above its expected level of development.

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

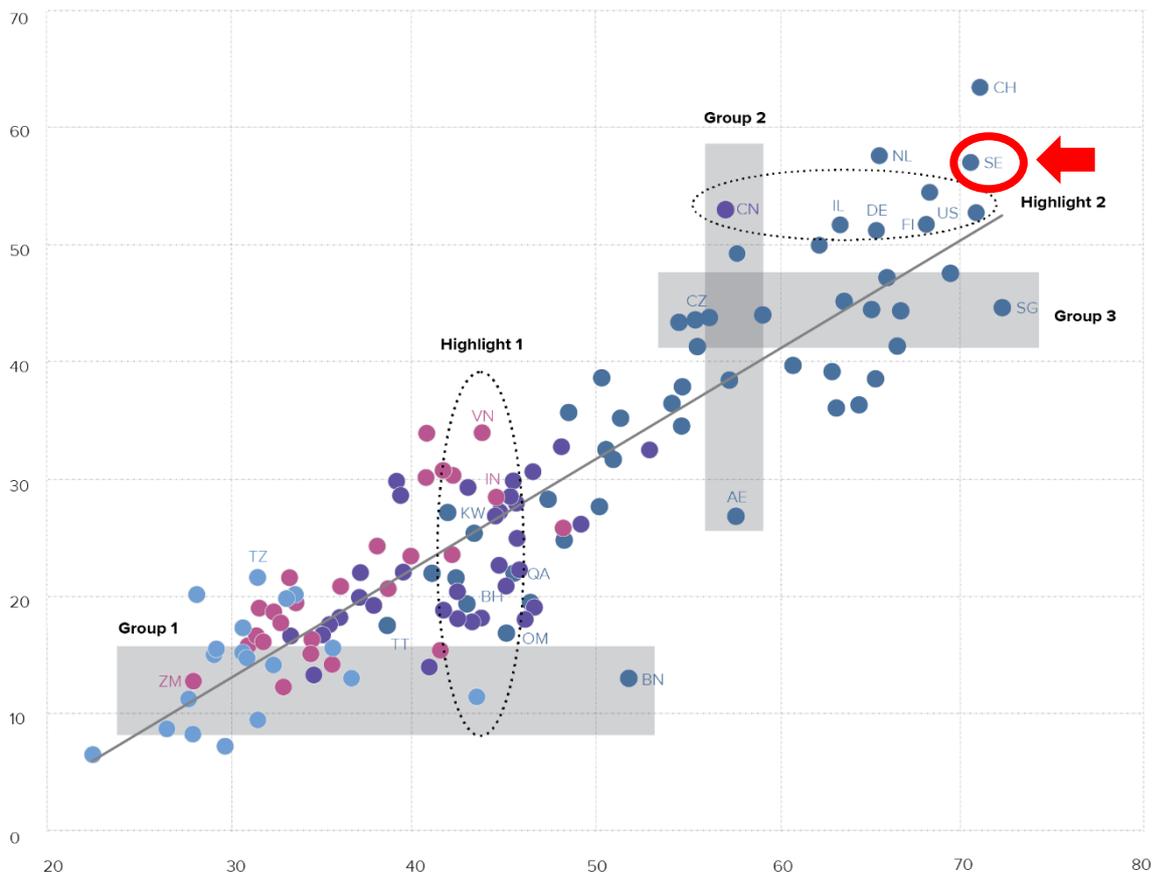


EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

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

Innovation input/output performance by income group, 2019

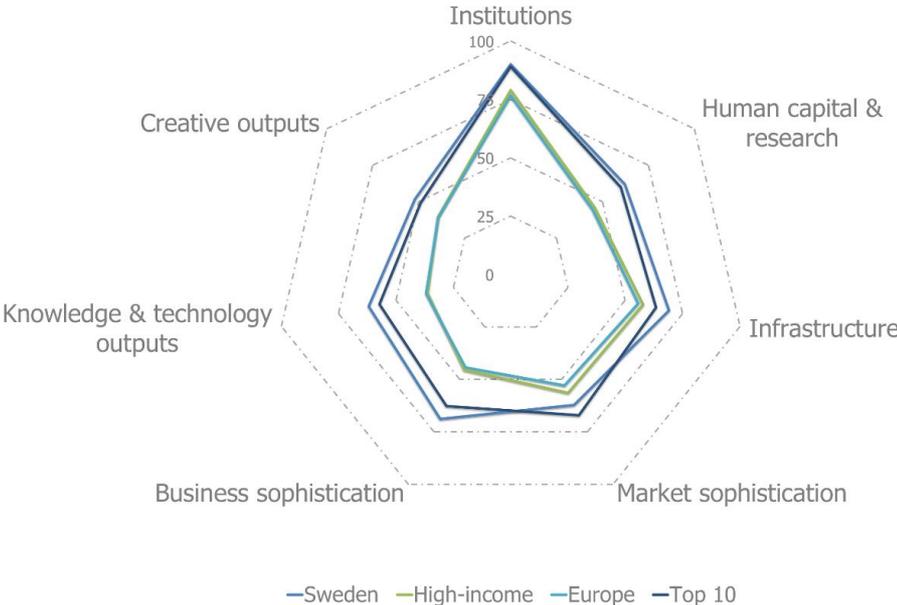


- ▲ Output score
- ▶ Input score
- High income
- Upper-middle income
- Lower-middle income
- Low income
- Fitted values

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 SWEDEN TO OTHER HIGH-INCOME ECONOMIES AND THE EUROPE REGION

Sweden's scores in the seven GII pillars



High-income economies

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

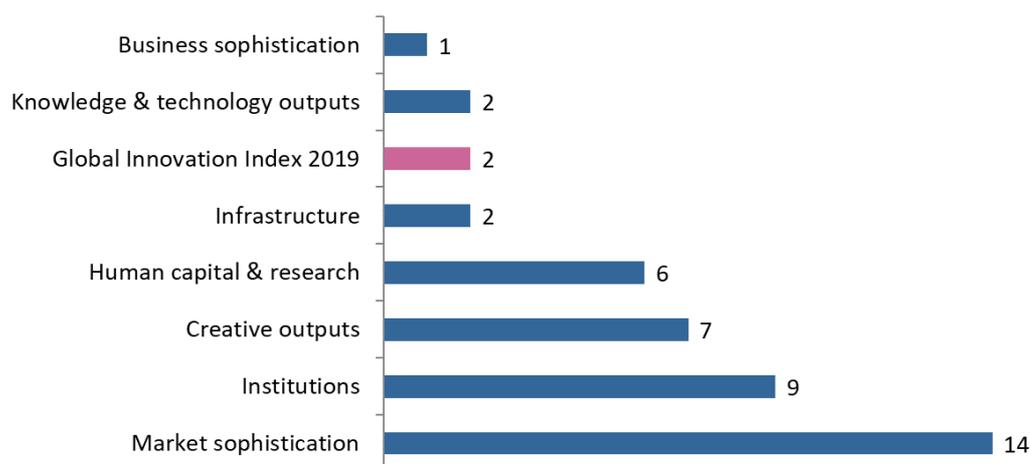
Europe Region

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

Sweden ranks in the top 3 in the following areas: Knowledge workers, Innovation linkages, Knowledge creation, and Online creativity.

OVERVIEW OF SWEDEN'S RANKINGS IN THE 7 GII AREAS

Sweden performs the best in Business sophistication and its weakest performance is in Market sophistication.



*The highest possible ranking in each pillar is 1.

SWEDEN'S INNOVATION STRENGTHS AND WEAKNESSES

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

Strengths			Weaknesses		
Code	Indicator name	Rank	Code	Indicator name	Rank
1.2.2	Rule of law*	3	1.2.3	Cost of redundancy dismissal, salary weeks	57
2.3.1	Researchers, FTE/mn pop.	4	2.1.5	Pupil-teacher ratio, secondary	56
2.3.2	Gross expenditure on R&D, % GDP	3	3.3.1	GDP/unit of energy use	57
3	Infrastructure	2	4.1.1	Ease of getting credit*	77
3.2	General infrastructure	4	4.3.1	Applied tariff rate, weighted mean, %	23
3.2.2	Logistics performance*	2	5.2.3	GERD financed by abroad, %	55
3.3.2	Environmental performance*	5	5.3.2	High-tech imports, % total trade	59
5	Business sophistication	1	5.3.4	FDI net inflows, % GDP, 3-year average	55
5.1	Knowledge workers	2	6.2.1	Growth rate of PPP\$ GDP/worker, %, 3-year average	80
5.1.2	Firms offering formal training, % firms	3	7.2.4	Printing & other media, % manufacturing	47
5.2	Innovation linkages	2			
5.2.5	Patent families 2+ offices/bn PPP\$ GDP	1			
6	Knowledge & technology outputs	2			
6.1	Knowledge creation	2			
6.1.2	PCT patents by origin/bn PPP\$ GDP	1			
6.3.1	Intellectual property receipts, % total trade	1			
7.1.3	ICTs & business model creation†	4			
7.1.4	ICTs & organizational model creation†	2			
7.3	Online creativity	3			
7.3.3	Wikipedia edits/mn pop. 15–69	3			

STRENGTHS

- Sweden has relative strengths in all GII pillars, except for Market sophistication.
- Three GII pillars are relative strengths: Infrastructure (2), Business sophistication (1), and Knowledge & Technology Outputs (2).
- In Infrastructure (2), the country has relative strengths in the sub-pillar General infrastructure (4) and in indicators Logistics performance (2) and Environmental performance (5).
- In Business sophistication, where the country ranks 1st in the world, Sweden exhibits strengths in two of its three sub-pillars - Knowledge workers (2) and Innovation linkages (2); and in indicators Firms offering formal training (3), and Patent families in 2 or more offices (1).
- In Knowledge & technology outputs (2), the sub-pillar Knowledge creation (2), and indicators PCT patents by origin (1) and Intellectual property receipts (1) are also relative strengths.
- In Creative outputs (7), Sweden exhibits strengths in the sub-pillar Online creativity (3) and in indicators ICTs & business model creation (4), ICTs & organizational model creation (2), and Wikipedia edits (3).
- The indicators Rule of law (3), Researchers (4), and R&D expenditures (3) are other relative strengths for Sweden.

WEAKNESSES

- Sweden's relative weaknesses in the GII are scattered across the seven GII pillars, but mostly among innovation inputs.
- In Institutions (9), the indicator Cost of redundancy dismissal (57) is a relative weakness.
- In Human capital & research (6), the indicator Pupil-teacher ratio (56), is also a relative weakness.
- In Infrastructure (2), the indicator GDP per unit of energy use (57) is a relatively weakness.
- In Market sophistication (14), Sweden exhibits relative weaknesses in indicators Ease of getting credit (77) and Applied tariff rate (23).
- In Business sophistication (1), the following indicators are also relative weaknesses: R&D financed by abroad (55), High-tech imports (59), and FDI inflows (55).
- On innovation outputs, only two indicators – Labor productivity growth (80) and Printing & other media (47) - are relative weaknesses.

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$	GDP per capita, PPP\$	GII 2018 rank
3	4	High	EUR	10.0	542.8	52,984.1	3
				Score/Value	Rank		
INSTITUTIONS				90.1	9		
1.1	Political environment		91.1	9			
1.1.1	Political and operational stability*.....		91.2	12			
1.1.2	Government effectiveness*.....		91.1	8			
1.2	Regulatory environment		92.0	13			
1.2.1	Regulatory quality*.....		90.2	10			
1.2.2	Rule of law*.....		97.6	3 ●			
1.2.3	Cost of redundancy dismissal, salary weeks.....		14.4	57 ○			
1.3	Business environment		87.1	14			
1.3.1	Ease of starting a business*.....		94.7	16			
1.3.2	Ease of resolving insolvency*.....		79.5	16			
HUMAN CAPITAL & RESEARCH				62.1	6	◆	
2.1	Education		67.8	6	◆		
2.1.1	Expenditure on education, % GDP.....		7.6	5	◆		
2.1.2	Government funding/pupil, secondary, % GDP/cap... ..		23.6	32			
2.1.3	School life expectancy, years.....		18.8	8			
2.1.4	PISA scales in reading, maths, & science.....		495.8	23			
2.1.5	Pupil-teacher ratio, secondary.....		12.9	56 ○			
2.2	Tertiary education		43.1	28			
2.2.1	Tertiary enrolment, % gross.....		63.5	39			
2.2.2	Graduates in science & engineering, %.....		26.6	23			
2.2.3	Tertiary inbound mobility, %.....		6.6	35			
2.3	Research & development (R&D)		75.3	6	◆		
2.3.1	Researchers, FTE/mn pop.....		7,268.2	4	◆		
2.3.2	Gross expenditure on R&D, % GDP.....		3.4	3	●		
2.3.3	Global R&D companies, avg. exp. top 3, mn US\$.....		80.2	10			
2.3.4	QS university ranking, average score top 3*.....		59.1	14			
INFRASTRUCTURE				69.1	2	◆	
3.1	Information & communication technologies (ICTs)		89.5	12			
3.1.1	ICT access*.....		82.7	17			
3.1.2	ICT use*.....		87.1	6	◆		
3.1.3	Government's online service*.....		94.4	14			
3.1.4	E-participation*.....		93.8	19			
3.2	General infrastructure		59.8	4	◆		
3.2.1	Electricity output, kWh/mn pop.....		15,902.8	7			
3.2.2	Logistics performance*.....		93.1	2	●		
3.2.3	Gross capital formation, % GDP.....		26.4	39			
3.3	Ecological sustainability		58.1	10			
3.3.1	GDP/unit of energy use.....		9.7	57 ○			
3.3.2	Environmental performance*.....		80.5	5	●		
3.3.3	ISO 14001 environmental certificates/bn PPP\$ GDP..		9.3	7	◆		
MARKET SOPHISTICATION				62.1	14		
4.1	Credit		59.4	19			
4.1.1	Ease of getting credit*.....		55.0	77 ○			
4.1.2	Domestic credit to private sector, % GDP.....		132.2	15			
4.1.3	Microfinance gross loans, % GDP.....		n/a	n/a			
4.2	Investment		54.6	30			
4.2.1	Ease of protecting minority investors*.....		68.3	30			
4.2.2	Market capitalization, % GDP.....		n/a	n/a			
4.2.3	Venture capital deals/bn PPP\$ GDP.....		0.1	17			
4.3	Trade, competition, & market scale		72.3	29			
4.3.1	Applied tariff rate, weighted avg., %.....		1.8	23 ○			
4.3.2	Intensity of local competition*.....		75.1	25			
4.3.3	Domestic market scale, bn PPP\$.....		542.8	38			
BUSINESS SOPHISTICATION				68.8	1	◆	
5.1	Knowledge workers		81.8	2	◆		
5.1.1	Knowledge-intensive employment, %.....		52.3	5			
5.1.2	Firms offering formal training, % firms.....		70.3	3	●		
5.1.3	GERD performed by business, % GDP.....		2.4	4			
5.1.4	GERD financed by business, %.....		57.3	14			
5.1.5	Females employed w/advanced degrees, %.....		24.8	12			
5.2	Innovation linkages		66.1	2	◆		
5.2.1	University/industry research collaboration*.....		71.8	9			
5.2.2	State of cluster development*.....		67.6	12			
5.2.3	GERD financed by abroad, %.....		6.7	55 ○			
5.2.4	JV-strategic alliance deals/bn PPP\$ GDP.....		0.2	5	◆		
5.2.5	Patent families 2+ offices/bn PPP\$ GDP.....		7.2	1	◆		
5.3	Knowledge absorption		58.4	6			
5.3.1	Intellectual property payments, % total trade.....		1.7	16			
5.3.2	High-tech imports, % total trade.....		7.8	59 ○			
5.3.3	ICT services imports, % total trade.....		3.3	6	◆		
5.3.4	FDI net inflows, % GDP.....		3.0	55 ○			
5.3.5	Research talent, % in business enterprise.....		72.0	4	◆		
KNOWLEDGE & TECHNOLOGY OUTPUTS				61.8	2	◆	
6.1	Knowledge creation		73.5	2	◆		
6.1.1	Patents by origin/bn PPP\$ GDP.....		11.2	10			
6.1.2	PCT patents by origin/bn PPP\$ GDP.....		7.7	1	◆		
6.1.3	Utility models by origin/bn PPP\$ GDP.....		n/a	n/a			
6.1.4	Scientific & technical articles/bn PPP\$ GDP.....		30.2	7	◆		
6.1.5	Citable documents H-index.....		59.5	11			
6.2	Knowledge impact		48.0	20			
6.2.1	Growth rate of PPP\$ GDP/worker, %.....		0.4	80 ○			
6.2.2	New businesses/th pop. 15-64.....		8.1	19			
6.2.3	Computer software spending, % GDP.....		0.6	11			
6.2.4	ISO 9001 quality certificates/bn PPP\$ GDP.....		7.9	38			
6.2.5	High- & medium-high-tech manufactures, %.....		0.5	14			
6.3	Knowledge diffusion		63.9	6	◆		
6.3.1	Intellectual property receipts, % total trade.....		3.7	1	◆		
6.3.2	High-tech net exports, % total trade.....		7.3	23			
6.3.3	ICT services exports, % total trade.....		6.2	6	◆		
6.3.4	FDI net outflows, % GDP.....		3.9	15			
CREATIVE OUTPUTS				51.9	7		
7.1	Intangible assets		56.7	15			
7.1.1	Trademarks by origin/bn PPP\$ GDP.....		55.6	42			
7.1.2	Industrial designs by origin/bn PPP\$ GDP.....		4.1	30			
7.1.3	ICTs & business model creation*.....		81.9	4	●		
7.1.4	ICTs & organizational model creation*.....		82.7	2	◆		
7.2	Creative goods & services		31.8	23			
7.2.1	Cultural & creative services exports, % total trade.....		1.1	26			
7.2.2	National feature films/mn pop. 15-69.....		10.1	19			
7.2.3	Entertainment & Media market/th pop. 15-69.....		71.8	5			
7.2.4	Printing & other media, % manufacturing.....		1.2	47 ○			
7.2.5	Creative goods exports, % total trade.....		1.8	30			
7.3	Online creativity		62.5	3	◆		
7.3.1	Generic top-level domains (TLDs)/th pop. 15-69.....		43.2	17			
7.3.2	Country-code TLDs/th pop. 15-69.....		70.9	8			
7.3.3	Wikipedia edits/mn pop. 15-69.....		106.6	3	◆		
7.3.4	Mobile app creation/bn PPP\$ GDP.....		64.2	8			

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

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

Missing data

Code	Indicator name	Country year	Model year	Source
4.1.3	Microfinance gross loans, % GDP	n/a	2017	Microfinance Information Exchange
4.2.2	Market capitalization, % GDP	n/a	2017	World Federation of Exchanges
6.1.3	Utility models by origin/bn PPP\$ GDP	n/a	2017	World Intellectual Property Organization

Outdated data

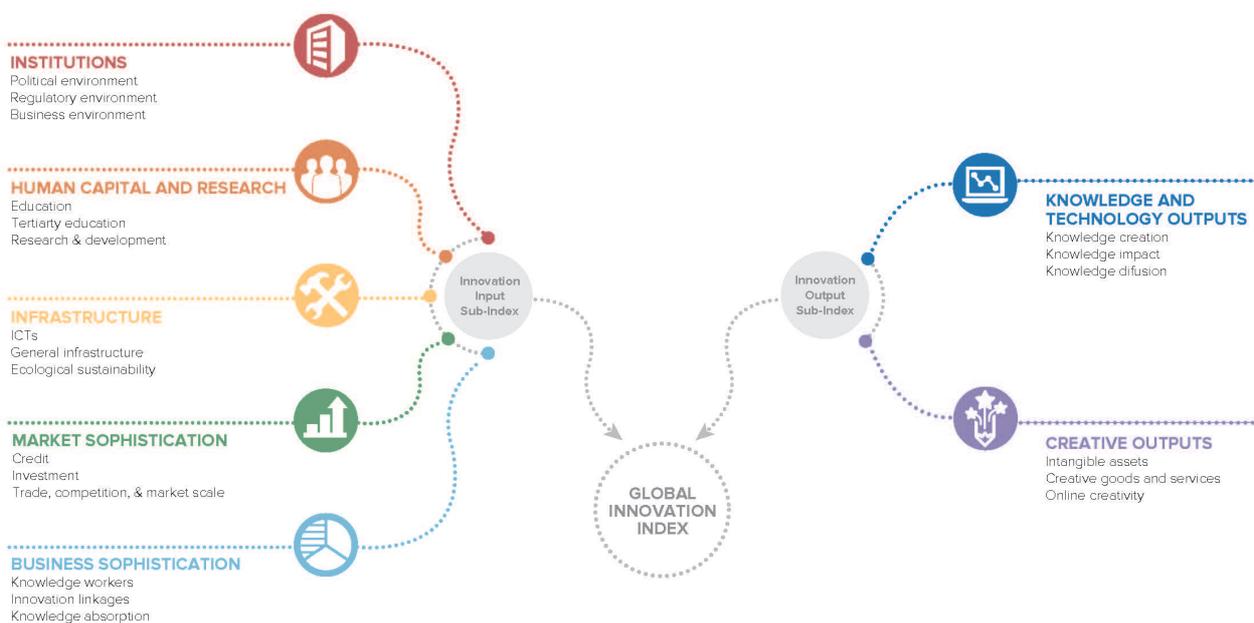
Code	Indicator name	Country year	Model year	Source
2.1.5	Pupil-teacher ratio, secondary	2016	2017	UNESCO Institute for Statistics
2.2.1	Tertiary enrolment, % gross	2016	2017	UNESCO Institute for Statistics
5.1.4	GERD financed by business, %	2015	2016	UNESCO Institute for Statistics; Eurostat; OECD - Main Science and Technology Indicators
5.2.3	GERD financed by abroad, %	2013	2016	UNESCO Institute for Statistics

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.

