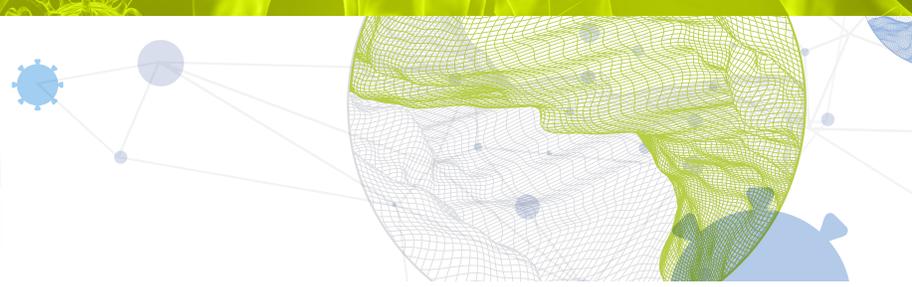




# Global Innovation Index 2021



## GERMANY

**10th**

Germany ranks 10th among the 132 economies featured in the GII 2021.

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 Germany 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 Germany in the GII 2021 is between ranks 7 and 10.

### Rankings for Germany (2019–2021)

	GII	Innovation inputs	Innovation outputs
2021	10	14	8
2020	9	14	7
2019	9	12	9

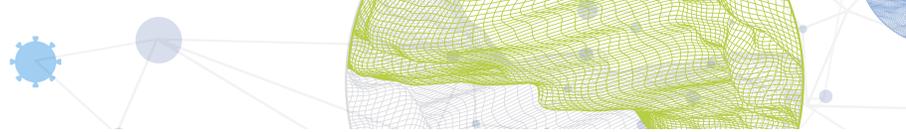
- Germany performs better in innovation outputs than innovation inputs in 2021.
- This year Germany ranks 14th in innovation inputs, the same as last year but lower than 2019.
- As for innovation outputs, Germany ranks 8th. This position is lower than last year but higher than 2019.

**10th**

Germany ranks 10th among the 51 high-income group economies.

**7th**

Germany ranks 7th among the 39 economies in Europe.

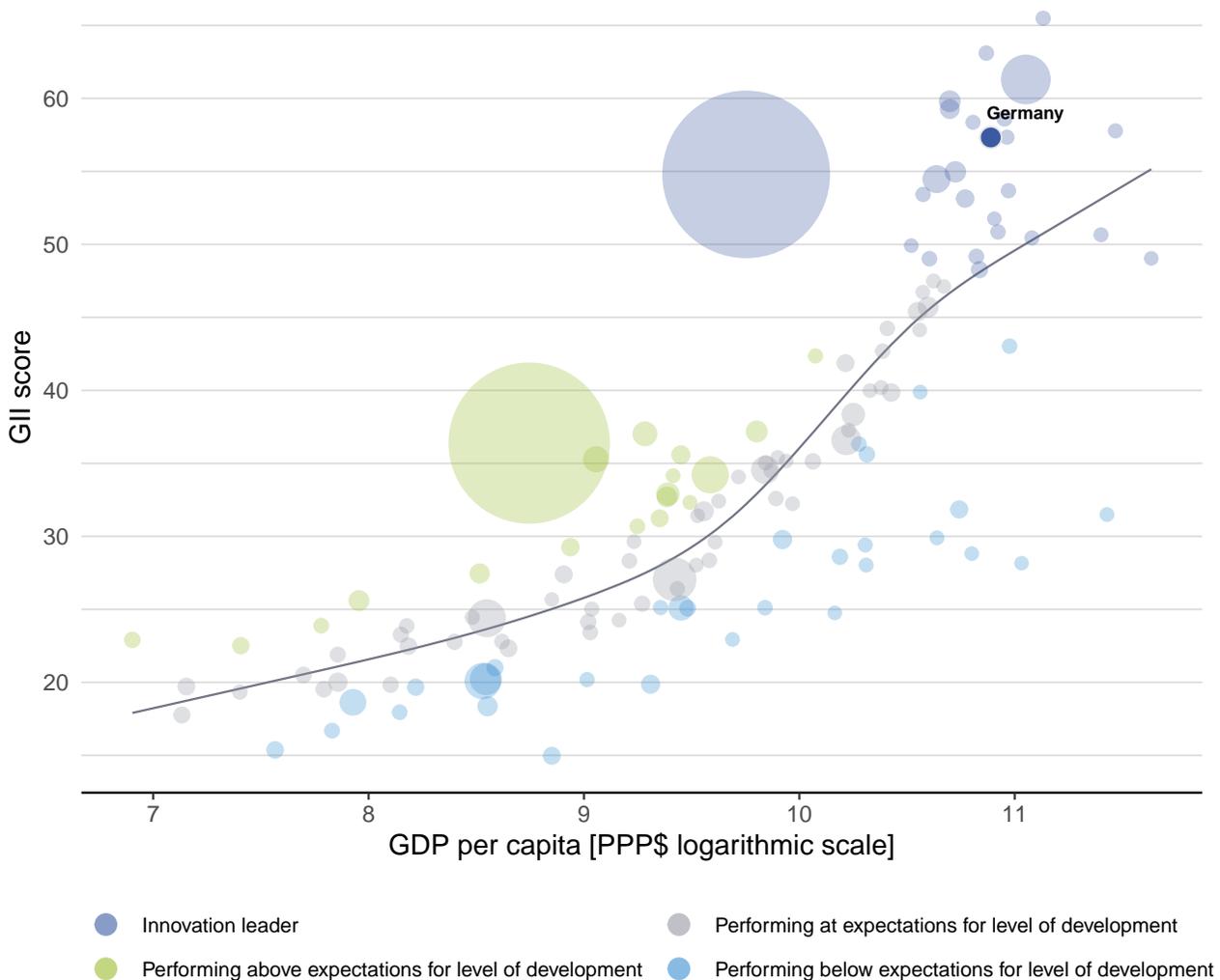


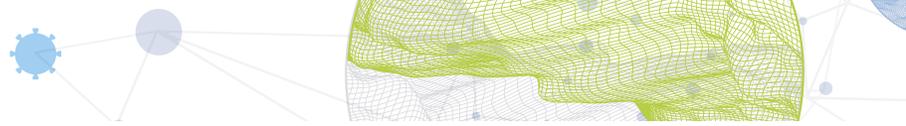
## EXPECTED VS. OBSERVED INNOVATION PERFORMANCE

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, Germany's performance is above expectations for its level of development.

### The positive relationship between innovation and development



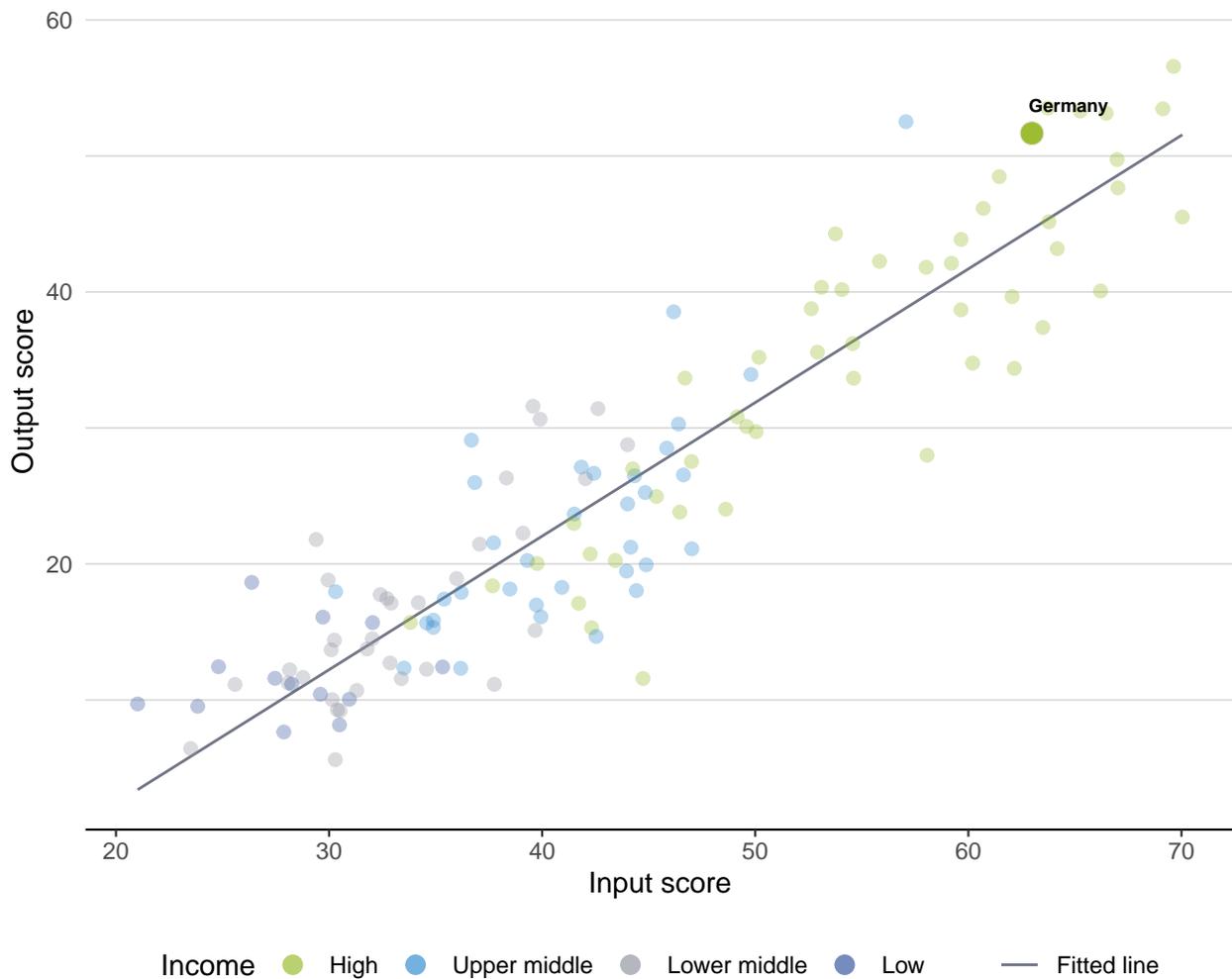


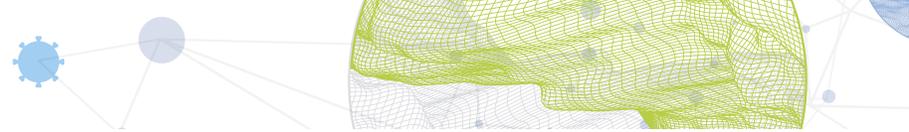
## EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

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

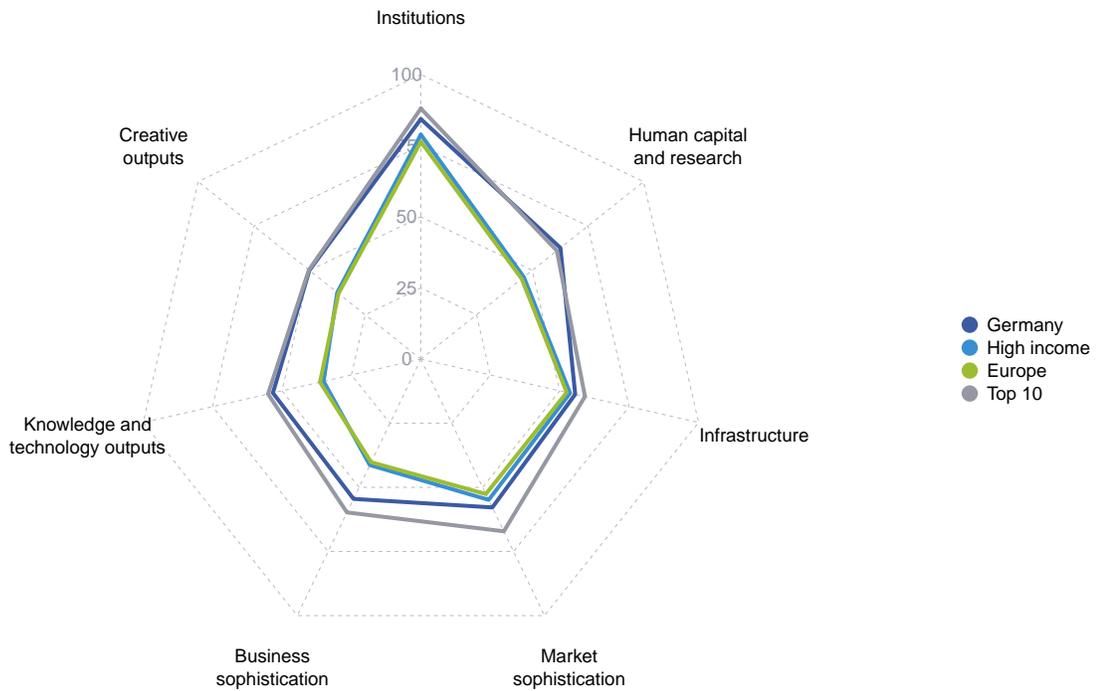
### Innovation input to output performance





# BENCHMARKING AGAINST OTHER HIGH-INCOME GROUP ECONOMIES AND EUROPE

## The seven GII pillar scores for Germany

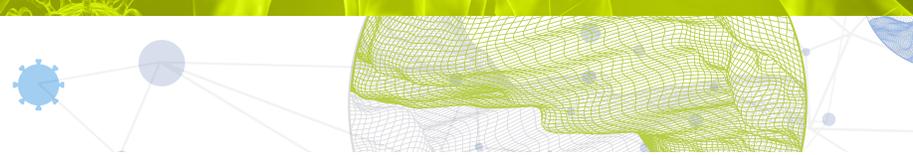


### High-income group economies

Germany performs above the high-income group average in all GII pillars.

### Europe

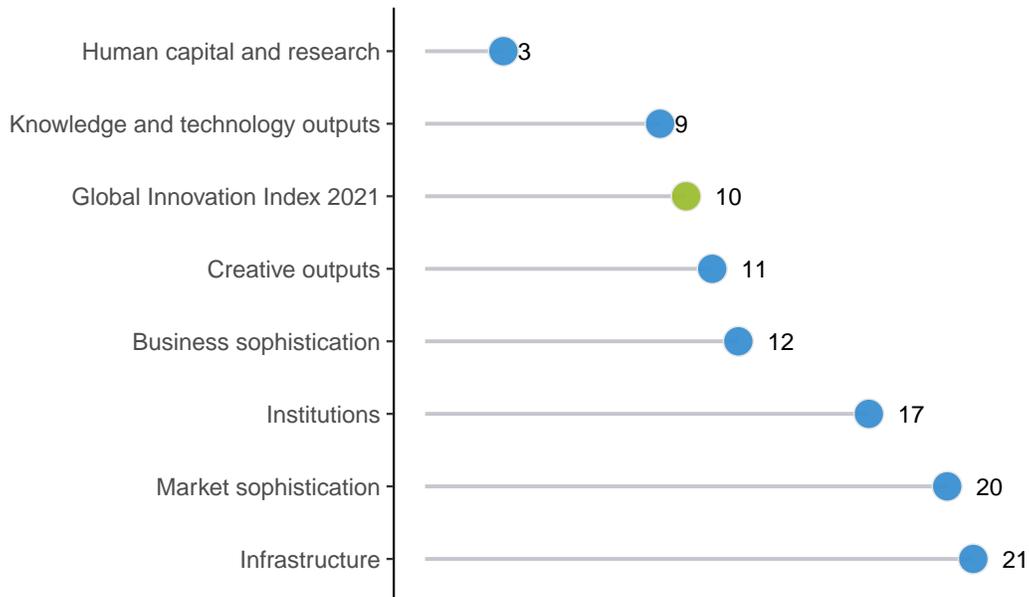
Germany performs above the regional average in all GII pillars.



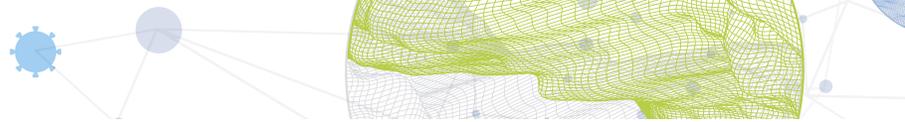
## OVERVIEW OF RANKINGS IN THE SEVEN GII 2021 AREAS

Germany performs best in Human capital and research and its weakest performance is in Infrastructure.

### The seven GII pillar ranks for Germany



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



## INNOVATION STRENGTHS AND WEAKNESSES

The table below gives an overview of the strengths and weaknesses of Germany in the GII 2021.

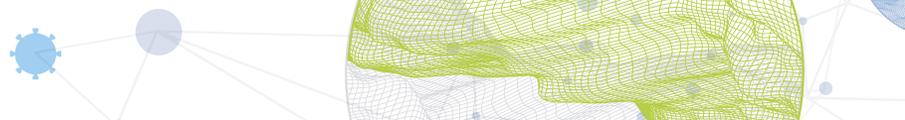
### Strengths and weaknesses for Germany

Strengths			Weaknesses		
Code	Indicator name	Rank	Code	Indicator name	Rank
1.3.2	Ease of resolving insolvency	4	1.2.3	Cost of redundancy dismissal	91
2.2	Tertiary education	5	1.3.1	Ease of starting a business	96
2.3	Research and development (R&D)	6	3.1.4	E-participation	57
2.3.3	Global corporate R&D investors, top 3, mn US\$	2	3.2.3	Gross capital formation, % GDP	76
3.1.1	ICT access	6	4.1.1	Ease of getting credit	44
3.2.2	Logistics performance	1	4.2	Investment	60
4.3	Trade, diversification, and market scale	2	4.2.1	Ease of protecting minority investors	60
4.3.3	Domestic market scale, bn PPP\$	5	6.2.1	Labor productivity growth, %	94
5.2.2	State of cluster development and depth	5	6.2.2	New businesses/th pop. 15–64	73
6.1	Knowledge creation	5	7.2.2	National feature films/mn pop. 15–69	49
6.1.1	Patents by origin/bn PPP\$ GDP	1	7.2.4	Printing and other media, % manufacturing	66
6.1.5	Citable documents H-index	3			
6.3.2	Production and export complexity	4			
7.1	Intangible assets	6			
7.3.2	Country-code TLDs/th pop. 15–69	6			

Output rank	Input rank	Income	Region	Population (mn)	GDP, PPP\$ (bn)	GDP per capita, PPP\$	GII 2020 rank
8	14	High	EUR	83.8	4,454.5	53,571	9

	Score/Value	Rank		Score/Value	Rank	
 <b>Institutions</b>	84.3	17	 <b>Business sophistication</b>	54.5	12	
<b>1.1 Political environment</b>	85.2	14	<b>5.1 Knowledge workers</b>	65.0	12	
1.1.1 Political and operational stability*	83.9	13	5.1.1 Knowledge-intensive employment, %	46.1	16	
1.1.2 Government effectiveness*	85.9	13	5.1.2 Firms offering formal training, %	n/a	n/a	
<b>1.2 Regulatory environment</b>	81.1	29	5.1.3 GERD performed by business, % GDP	2.2	8	
1.2.1 Regulatory quality*	88.5	9	5.1.4 GERD financed by business, %	66.0	7	
1.2.2 Rule of law*	89.4	14	5.1.5 Females employed w/advanced degrees, %	14.0	53	
1.2.3 Cost of redundancy dismissal	21.6	91	◇◇	<b>5.2 Innovation linkages</b>	54.2	12
<b>1.3 Business environment</b>	86.7	14	5.2.1 University-industry R&D collaboration†	68.5	9	
1.3.1 Ease of starting a business*	83.7	96	◇◇	5.2.2 State of cluster development and depth†	69.9	5
1.3.2 Ease of resolving insolvency*	89.8	4	◆◆	5.2.3 GERD financed by abroad, % GDP	0.2	23
 <b>Human capital and research</b>	62.7	3	◆◆	5.2.4 Joint venture/strategic alliance deals/bn PPP\$ GDP	0.1	31
<b>2.1 Education</b>	60.1	27	◆◆	5.2.5 Patent families/bn PPP\$ GDP	5.5	6
2.1.1 Expenditure on education, % GDP	4.9	44	<b>5.3 Knowledge absorption</b>	44.3	21	
2.1.2 Government funding/pupil, secondary, % GDP/cap	23.4	25	5.3.1 Intellectual property payments, % total trade	0.9	41	
2.1.3 School life expectancy, years	16.9	18	5.3.2 High-tech imports, % total trade	10.0	33	
2.1.4 PISA scales in reading, maths and science	500.4	18	5.3.3 ICT services imports, % total trade	2.5	19	
2.1.5 Pupil-teacher ratio, secondary	11.8	49	5.3.4 FDI net inflows, % GDP	3.1	45	
<b>2.2 Tertiary education</b>	54.7	5	◆◆	5.3.5 Research talent, % in businesses	60.7	12
2.2.1 Tertiary enrolment, % gross	70.3	33	 <b>Knowledge and technology outputs</b>	53.3	9	
2.2.2 Graduates in science and engineering, %	35.3	6	◆◆	<b>6.1 Knowledge creation</b>	69.5	5
2.2.3 Tertiary inbound mobility, %	10.0	21	◆◆	6.1.1 Patents by origin/bn PPP\$ GDP	15.7	1
<b>2.3 Research and development (R&amp;D)</b>	73.2	6	◆◆	6.1.2 PCT patents by origin/bn PPP\$ GDP	4.2	9
2.3.1 Researchers, FTE/mn pop.	5,381.7	13	◆◆	6.1.3 Utility models by origin/bn PPP\$ GDP	1.8	12
2.3.2 Gross expenditure on R&D, % GDP	3.2	6	◆◆	6.1.4 Scientific and technical articles/bn PPP\$ GDP	25.9	35
2.3.3 Global corporate R&D investors, top 3, mn US\$	94.1	2	◆◆	6.1.5 Citable documents H-index	87.0	3
2.3.4 QS university ranking, top 3*	70.4	10	◆◆	<b>6.2 Knowledge impact</b>	43.8	15
 <b>Infrastructure</b>	55.6	21	◆◆	6.2.1 Labor productivity growth, %	-1.4	94
<b>3.1 Information and communication technologies (ICTs)</b>	80.2	32	◆◆	6.2.2 New businesses/th pop. 15-64	1.4	73
3.1.1 ICT access*	90.8	6	◆◆	6.2.3 Software spending, % GDP	0.5	19
3.1.2 ICT use*	81.5	19	◆◆	6.2.4 ISO 9001 quality certificates/bn PPP\$ GDP	11.0	26
3.1.3 Government's online service*	73.5	59	◇	6.2.5 High-tech manufacturing, %	57.1	7
3.1.4 E-participation*	75.0	57	◇◇	<b>6.3 Knowledge diffusion</b>	46.5	19
<b>3.2 General infrastructure</b>	44.2	20	◆◆	6.3.1 Intellectual property receipts, % total trade	1.4	16
3.2.1 Electricity output, GWh/mn pop.	7,259.6	28	◆◆	6.3.2 Production and export complexity	92.1	4
3.2.2 Logistics performance*	100.0	1	◆◆	6.3.3 High-tech exports, % total trade	12.3	12
3.2.3 Gross capital formation, % GDP	21.4	76	○	6.3.4 ICT services exports, % total trade	2.5	45
<b>3.3 Ecological sustainability</b>	42.3	32	 <b>Creative outputs</b>	50.0	11	
3.3.1 GDP/unit of energy use	13.8	34	<b>7.1 Intangible assets</b>	58.4	6	
3.3.2 Environmental performance*	77.2	10	◆◆	7.1.1 Trademarks by origin/bn PPP\$ GDP	60.5	34
3.3.3 ISO 14001 environmental certificates/bn PPP\$ GDP	1.9	44	◆◆	7.1.2 Global brand value, top 5,000, % GDP	145.9	12
 <b>Market sophistication</b>	57.8	20	◆◆	7.1.3 Industrial designs by origin/bn PPP\$ GDP	12.0	11
<b>4.1 Credit</b>	51.2	27	◆◆	7.1.4 ICTs and organizational model creation†	78.0	8
4.1.1 Ease of getting credit*	70.0	44	○	<b>7.2 Creative goods and services</b>	25.6	36
4.1.2 Domestic credit to private sector, % GDP	80.2	37	○	7.2.1 Cultural and creative services exports, % total trade	0.9	31
4.1.3 Microfinance gross loans, % GDP	n/a	n/a		7.2.2 National feature films/mn pop. 15-69	4.0	49
<b>4.2 Investment</b>	32.5	60	◇◇	7.2.3 Entertainment and media market/th pop. 15-69	52.8	12
4.2.1 Ease of protecting minority investors*	62.0	60	○	7.2.4 Printing and other media, % manufacturing	0.9	66
4.2.2 Market capitalization, % GDP	53.4	32	○	7.2.5 Creative goods exports, % total trade	2.1	29
4.2.3 Venture capital investors, deals/bn PPP\$ GDP	0.1	25	<b>7.3 Online creativity</b>	57.9	13	
4.2.4 Venture capital recipients, deals/bn PPP\$ GDP	0.1	24	◆◆	7.3.1 Generic top-level domains (TLDs)/th pop. 15-69	52.1	14
<b>4.3 Trade, diversification, and market scale</b>	89.8	2	◆◆	7.3.2 Country-code TLDs/th pop. 15-69	84.8	6
4.3.1 Applied tariff rate, weighted avg., %	1.8	25	◆◆	7.3.3 Wikipedia edits/mn pop. 15-69	77.5	15
4.3.2 Domestic industry diversification	96.5	19	◆◆	7.3.4 Mobile app creation/bn PPP\$ GDP	13.3	41
4.3.3 Domestic market scale, bn PPP\$	4,454.5	5	◆◆			

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 Appendix IV 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

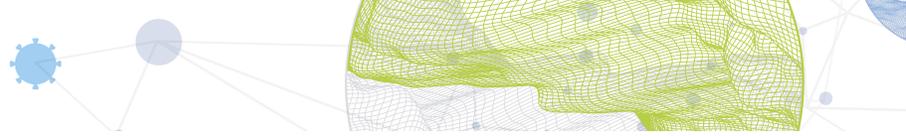
The following tables list data that are either missing or outdated for Germany.

### Missing data for Germany

Code	Indicator name	Economy year	Model year	Source
4.1.3	Microfinance gross loans, % GDP	n/a	2018	Microfinance Information Exchange
5.1.2	Firms offering formal training, %	n/a	2019	World Bank

### Outdated data for Germany

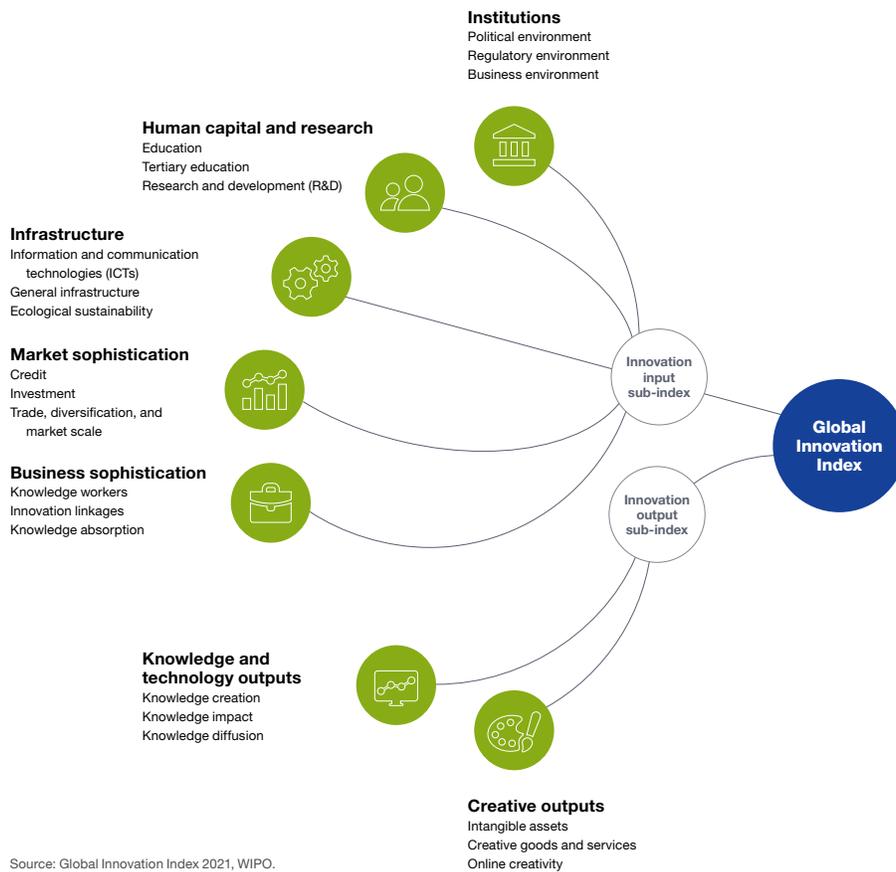
Code	Indicator name	Economy year	Model year	Source
2.1.5	Pupil-teacher ratio, secondary	2018	2019	UNESCO Institute for Statistics



## 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.



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.