
# DENMARK

**10th** Denmark ranks 10th 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 Denmark 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 Denmark in the GII 2022 is between ranks 9 and 11.

## Rankings for Denmark (2020–2022)

| GIIYR | GII | Innovation inputs | Innovation outputs |
|---|---|---|---|
| **2020** | 6 | 5 | 9 |
| **2021** | 9 | 5 | 11 |
| **2022** | 10 | 8 | 10 |

- Denmark performs better in innovation inputs than innovation outputs in 2022.
- This year Denmark ranks 8th in innovation inputs, lower than both 2021 and 2020.
- As for innovation outputs, Denmark ranks 10th. This position is higher than last year but lower than 2020.

**10th** Denmark ranks 10th among the 48 high-income group economies.

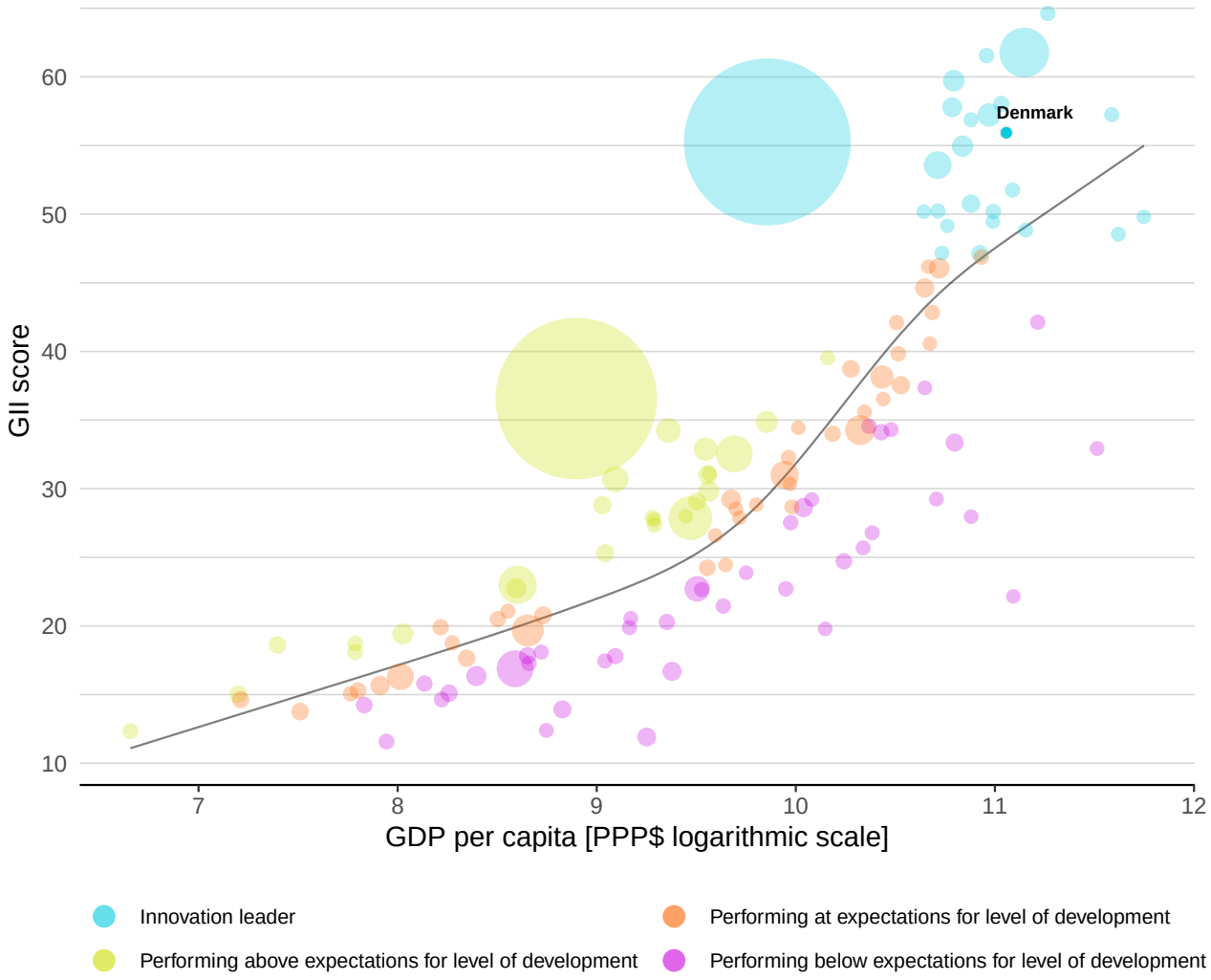
**7th** Denmark ranks 7th among the 39 economies in Europe.

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

## The positive relationship between innovation and development

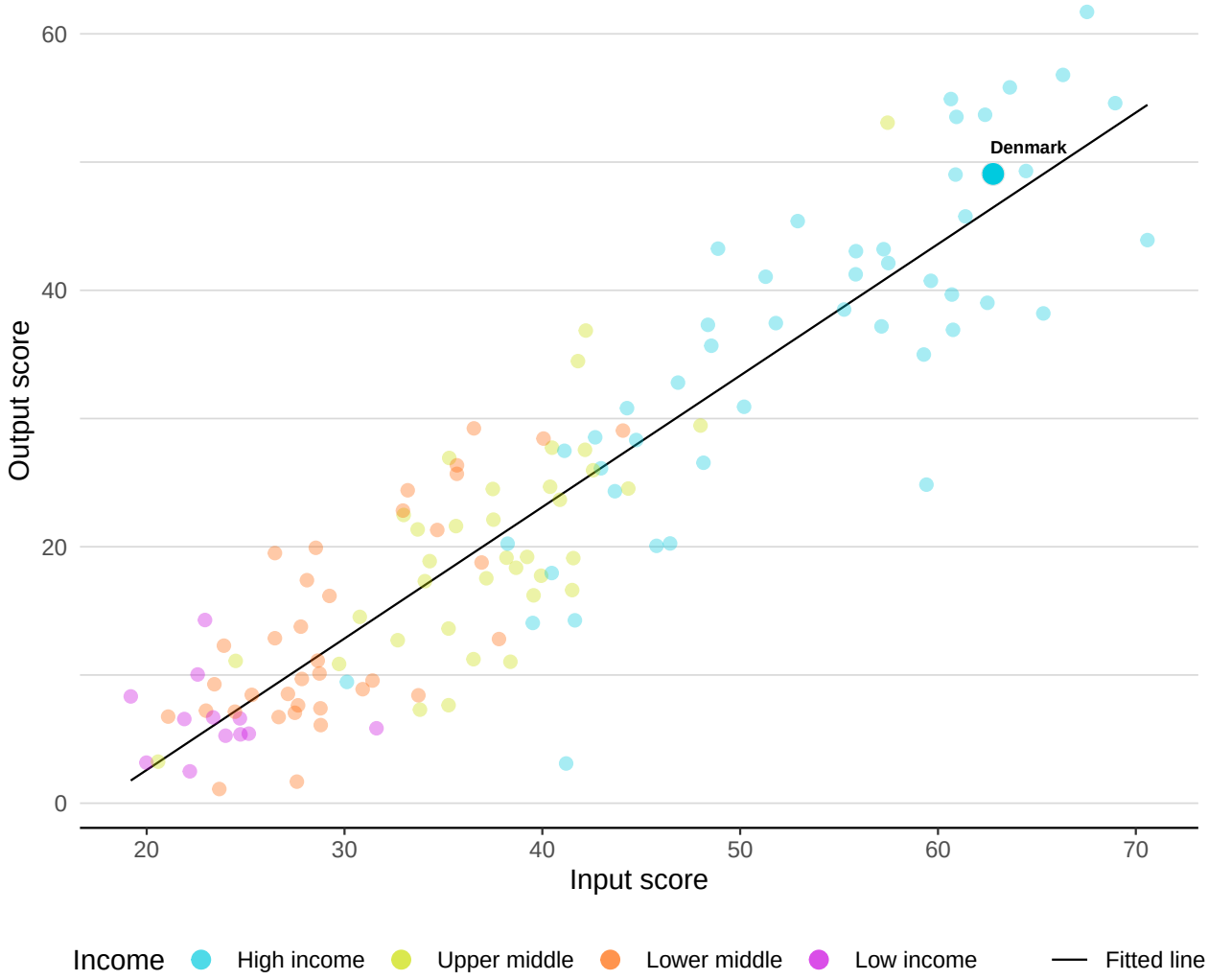


# EFFECTIVELY TRANSLATING INNOVATION INVESTMENTS INTO INNOVATION OUTPUTS

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.

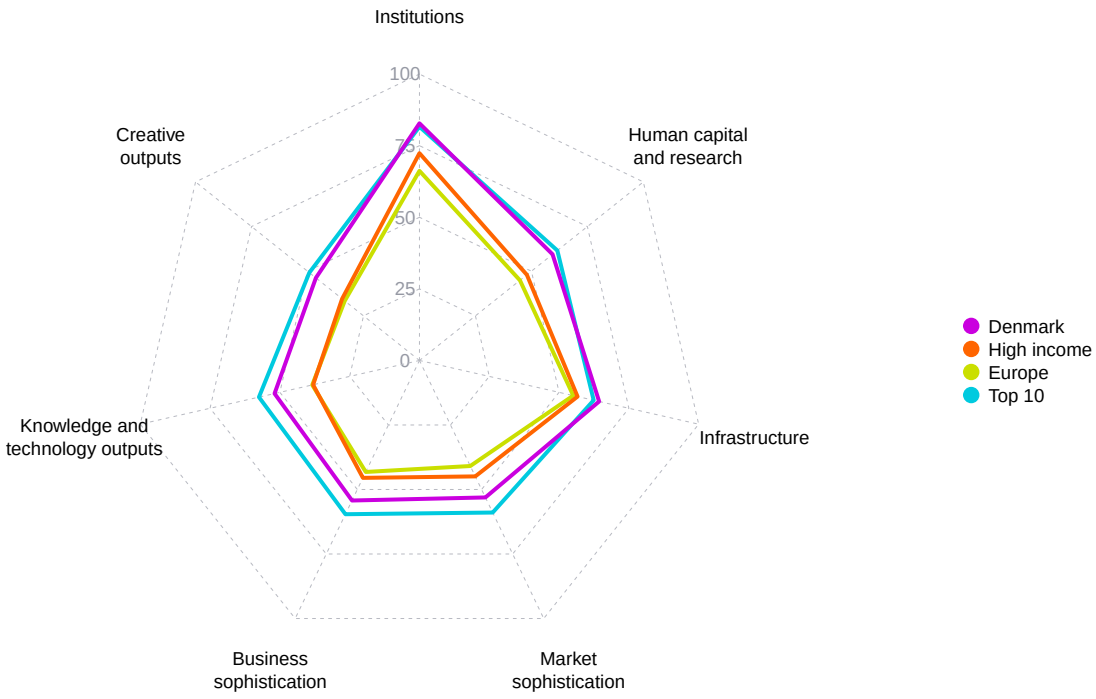
Denmark produces more innovation outputs relative to its level of innovation investments.

## Innovation input to output performance



# BENCHMARKING AGAINST OTHER HIGH-INCOME GROUP ECONOMIES AND EUROPE

## The seven GII pillar scores for Denmark




### High-income group economies

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

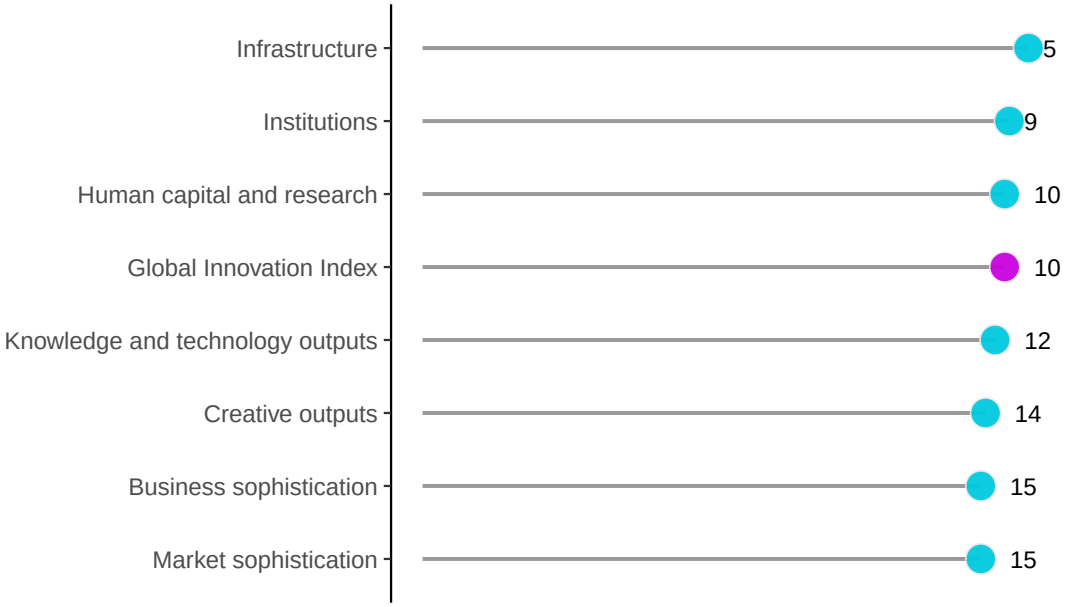
### Europe

Denmark performs above the regional average in all GII pillars.

# OVERVIEW OF RANKINGS IN THE SEVEN GII 2022 AREAS

Denmark performs best in Infrastructure and its weakest performance is in Market sophistication and Business sophistication.

## The seven GII pillar ranks for Denmark




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

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

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

# INNOVATION STRENGTHS AND WEAKNESSES

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

## Strengths and weaknesses for Denmark

| Strengths | | | Weaknesses | | |
|---|---|---|---|---|---|
| **Code** | **Indicator name** | **Rank** | **Code** | **Indicator name** | **Rank** |
| 1.1.1 | Political and operational stability | 4 | 1.2.3 | Cost of redundancy dismissal | 80 |
| 1.1.2 | Government effectiveness | 5 | 2.2.2 | Graduates in science and engineering, % | 50 |
| 1.2.1 | Regulatory quality | 6 | 3.2.3 | Gross capital formation, % GDP | 67 |
| 1.2.2 | Rule of law | 5 | 4.3.2 | Domestic industry diversification | 51 |
| 2.3.1 | Researchers, FTE/mn pop. | 3 | 5.3.2 | High-tech imports, % total trade | 99 |
| 3.1.2 | ICT use | 2 | 5.3.4 | FDI net inflows, % GDP | 113 |
| 3.1.3 | Government's online service | 3 | 6.1.3 | Utility models by origin/bn PPP$ GDP | 41 |
| 3.3.2 | Environmental performance | 1 | 6.2.1 | Labor productivity growth, % | 73 |
| 6.1.4 | Scientific and technical articles/bn PPP$ GDP | 2 | 7.1.2 | Trademarks by origin/bn PPP$ GDP | 73 |
| 7.3.2 | Country-code TLDs/th pop. 15–69 | 1 | 7.2.4 | Printing and other media, % manufacturing | 62 |

GII 2022 rank

# Denmark

**10**

| Output rank | Input rank | Income | Region | Population (mn) | GDP, PPP$ (bn) | GDP per capita, PPP$ |
|---|---|---|---|---|---|---|
| 10 | 8 | High | EUR | 5.8 | 370.3 | 63,405 |

| | | Score/ Value | Rank |
|---|---|---|---|
| **Institutions** | | **82.8** | **9** |
| **1.1** | **Political environment** | 90.7 | 2 ● ◆ |
| 1.1.1 | Political and operational stability* | 90.9 | 4 ● |
| 1.1.2 | Government effectiveness* | 90.4 | 5 ● |
| **1.2** | **Regulatory environment** | 85.3 | 20 |
| 1.2.1 | Regulatory quality* | 89.6 | 6 ● |
| 1.2.2 | Rule of law* | 94.3 | 5 ● |
| 1.2.3 | Cost of redundancy dismissal | 18.8 | 80 ○ |
| **1.3** | **Business environment** | 72.4 | [14] |
| 1.3.1 | Policies for doing business† | 72.4 | 13 |
| 1.3.2 | Entrepreneurship policies and culture* | n/a | n/a |
| **Human capital and research** | | **59.4** | **10** |
| **2.1** | **Education** | 68.9 | 8 ◆ |
| 2.1.1 | Expenditure on education, % GDP 🕘 | 6.8 | 8 ◆ |
| 2.1.2 | Government funding/pupil, secondary, % GDP/cap | 21.0 | 47 |
| 2.1.3 | School life expectancy, years | 18.7 | 9 |
| 2.1.4 | PISA scales in reading, maths and science | 501.1 | 17 |
| 2.1.5 | Pupil-teacher ratio, secondary | 9.7 | 26 |
| **2.2** | **Tertiary education** | 42.5 | 30 |
| 2.2.1 | Tertiary enrolment, % gross | 81.8 | 20 |
| 2.2.2 | Graduates in science and engineering, % | 23.0 | 50 ○ |
| 2.2.3 | Tertiary inbound mobility, % | 10.5 | 23 |
| **2.3** | **Research and development (R&D)** | 67.0 | 11 |
| 2.3.1 | Researchers, FTE/mn pop. | 7,692.2 | 3 ● ◆ |
| 2.3.2 | Gross expenditure on R&D, % GDP | 3.0 | 10 |
| 2.3.3 | Global corporate R&D investors, top 3, mn USD | 70.4 | 14 |
| 2.3.4 | QS university ranking, top 3* | 58.5 | 15 |
| **Infrastructure** | | **64.3** | **5 ● ◆** |
| **3.1** | **Information and communication technologies (ICTs)** | 93.8 | 3 ● ◆ |
| 3.1.1 | ICT access* | 93.2 | 22 |
| 3.1.2 | ICT use* | 88.5 | 2 ● ◆ |
| 3.1.3 | Government's online service* | 97.1 | 3 ● ◆ |
| 3.1.4 | E-participation* | 96.4 | 9 |
| **3.2** | **General infrastructure** | 48.5 | 25 |
| 3.2.1 | Electricity output, GWh/mn pop. | 4,931.4 | 44 |
| 3.2.2 | Logistics performance* | 90.2 | 8 |
| 3.2.3 | Gross capital formation, % GDP | 23.2 | 67 ○ |
| **3.3** | **Ecological sustainability** | 50.7 | 10 ◆ |
| 3.3.1 | GDP/unit of energy use | 19.7 | 8 |
| 3.3.2 | Environmental performance* | 77.9 | 1 ● ◆ |
| 3.3.3 | ISO 14001 environmental certificates/bn PPP$ GDP | 2.8 | 31 |
| **Market sophistication** | | **53.1** | **15** |
| **4.1** | **Credit** | 62.4 | [5] |
| 4.1.1 | Finance for startups and scaleups* | n/a | n/a |
| 4.1.2 | Domestic credit to private sector, % GDP | 163.3 | 8 |
| 4.1.3 | Loans from microfinance institutions, % GDP | n/a | n/a |
| **4.2** | **Investment** | 34.7 | 22 |
| 4.2.1 | Market capitalization, % GDP | n/a | n/a |
| 4.2.2 | Venture capital investors, deals/bn PPP$ GDP | 0.3 | 15 |
| 4.2.3 | Venture capital recipients, deals/bn PPP$ GDP | 0.1 | 14 |
| 4.2.4 | Venture capital received, value, % GDP | 0.0 | 24 |
| **4.3** | **Trade, diversification, and market scale** | 62.2 | 46 |
| 4.3.1 | Applied tariff rate, weighted avg., % | 1.5 | 20 |
| 4.3.2 | Domestic industry diversification 🕘 | 87.9 | 51 ○ |
| 4.3.3 | Domestic market scale, bn PPP$ | 370.3 | 52 |

| | | Score/ Value | Rank |
|---|---|---|---|
| **Business sophistication** | | **54.3** | **15** |
| **5.1** | **Knowledge workers** | 63.1 | 16 |
| 5.1.1 | Knowledge-intensive employment, % | 48.7 | 10 |
| 5.1.2 | Firms offering formal training, % | 40.6 | 31 |
| 5.1.3 | GERD performed by business, % GDP | 1.8 | 11 |
| 5.1.4 | GERD financed by business, % | 59.6 | 14 |
| 5.1.5 | Females employed w/advanced degrees, % | 24.6 | 20 |
| **5.2** | **Innovation linkages** | 53.1 | 12 |
| 5.2.1 | University-industry R&D collaboration† | 65.4 | 15 |
| 5.2.2 | State of cluster development and depth† | 60.3 | 26 |
| 5.2.3 | GERD financed by abroad, % GDP | 0.2 | 25 |
| 5.2.4 | Joint venture/strategic alliance deals/bn PPP$ GDP | 0.2 | 17 |
| 5.2.5 | Patent families/bn PPP$ GDP | 4.7 | 8 |
| **5.3** | **Knowledge absorption** | 46.6 | 23 |
| 5.3.1 | Intellectual property payments, % total trade | 0.8 | 50 |
| 5.3.2 | High-tech imports, % total trade | 6.6 | 99 ○ |
| 5.3.3 | ICT services imports, % total trade | 4.3 | 10 |
| 5.3.4 | FDI net inflows, % GDP | 0.6 | 113 ○ |
| 5.3.5 | Research talent, % in businesses | 58.2 | 17 |
| **Knowledge and technology outputs** | | **51.9** | **12** |
| **6.1** | **Knowledge creation** | 63.3 | 9 |
| 6.1.1 | Patents by origin/bn PPP$ GDP | 10.6 | 9 |
| 6.1.2 | PCT patents by origin/bn PPP$ GDP | 4.2 | 8 |
| 6.1.3 | Utility models by origin/bn PPP$ GDP | 0.3 | 41 ○ |
| 6.1.4 | Scientific and technical articles/bn PPP$ GDP | 65.6 | 2 ● ◆ |
| 6.1.5 | Citable documents H-index | 51.3 | 15 |
| **6.2** | **Knowledge impact** | 44.5 | 12 |
| 6.2.1 | Labor productivity growth, % | 0.6 | 73 ○ |
| 6.2.2 | New businesses/th pop. 15–64 🕘 | 10.0 | 13 |
| 6.2.3 | Software spending, % GDP | 0.5 | 16 |
| 6.2.4 | ISO 9001 quality certificates/bn PPP$ GDP | 6.4 | 41 |
| 6.2.5 | High-tech manufacturing, % 🕘 | 48.3 | 15 |
| **6.3** | **Knowledge diffusion** | 47.9 | 20 |
| 6.3.1 | Intellectual property receipts, % total trade | 2.1 | 12 |
| 6.3.2 | Production and export complexity | 67.4 | 26 |
| 6.3.3 | High-tech exports, % total trade | 5.8 | 34 |
| 6.3.4 | ICT services exports, % total trade | 3.4 | 36 |
| **Creative outputs** | | **46.2** | **14** |
| **7.1** | **Intangible assets** | 50.9 | 20 |
| 7.1.1 | Intangible asset intensity, top 15, % | 85.0 | 7 |
| 7.1.2 | Trademarks by origin/bn PPP$ GDP | 31.4 | 73 ○ ◇ |
| 7.1.3 | Global brand value, top 5,000, % GDP | 128.2 | 14 |
| 7.1.4 | Industrial designs by origin/bn PPP$ GDP | 6.5 | 16 |
| **7.2** | **Creative goods and services** | 32.2 | 21 |
| 7.2.1 | Cultural and creative services exports, % total trade | 1.2 | 23 |
| 7.2.2 | National feature films/mn pop. 15–69 | 5.0 | 24 |
| 7.2.3 | Entertainment and media market/th pop. 15–69 | 72.9 | 4 |
| 7.2.4 | Printing and other media, % manufacturing | 0.8 | 62 ○ |
| 7.2.5 | Creative goods exports, % total trade | 1.6 | 33 |
| **7.3** | **Online creativity** | 50.9 | 6 ● |
| 7.3.1 | Generic top-level domains (TLDs)/th pop. 15–69 | 49.8 | 14 |
| 7.3.2 | Country-code TLDs/th pop. 15–69 | 100.0 | 1 ● ◆ |
| 7.3.3 | GitHub commit pushes received/mn pop. 15–69 | 37.2 | 17 |
| 7.3.4 | Mobile app creation/bn PPP$ GDP | 16.7 | 19 |

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 Denmark.

## Missing data for Denmark

| Code | Indicator name | Economy year | Model year | Source |
|---|---|---|---|---|
| 1.3.2 | Entrepreneurship policies and culture | n/a | 2021 | Global Entrepreneurship Monitor |
| 4.1.1 | Finance for startups and scaleups | n/a | 2021 | Global Entrepreneurship Monitor |
| 4.1.3 | Loans from microfinance institutions, % GDP | n/a | 2020 | International Monetary Fund, Financial Access Survey (FAS) |
| 4.2.1 | Market capitalization, % GDP | n/a | 2020 | World Federation of Exchanges |

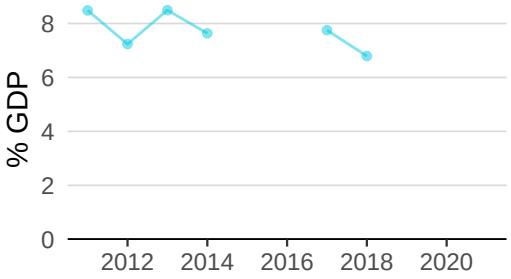
## Outdated data for Denmark

| Code | Indicator name | Economy year | Model year | Source |
|---|---|---|---|---|
| 2.1.1 | Expenditure on education, % GDP | 2018 | 2020 | UNESCO Institute for Statistics |
| 4.3.2 | Domestic industry diversification | 2018 | 2019 | United Nations Industrial Development Organization |
| 6.2.2 | New businesses/th pop. 15–64 | 2018 | 2020 | World Bank, Enterpreneurship Database |
| 6.2.5 | High-tech manufacturing, % | 2018 | 2019 | United Nations Industrial Development Organization |

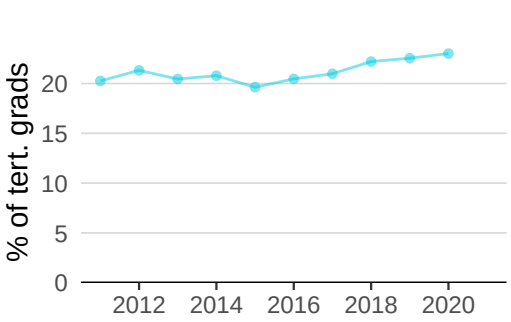
# DENMARK'S INNOVATION SYSTEM

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

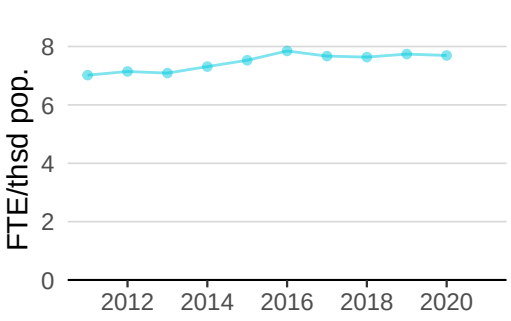
## Innovation inputs



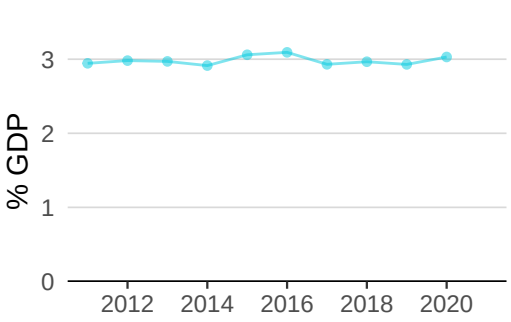

**2.1.1 Expenditure on education** was equal to 6.8% GDP in 2018–down by 12 percentage points from the year prior–and equivalent to an indicator rank of 8.



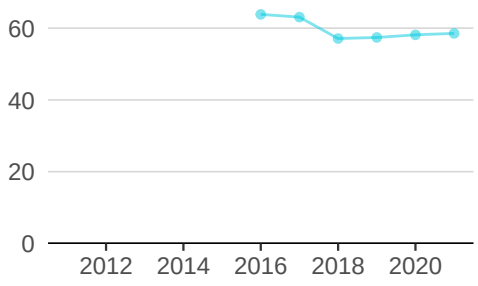

**2.2.2 Graduates in science and engineering** was equal to 23.0% of tert. grads in 2020–up by 2 percentage points from the year prior–and equivalent to an indicator rank of 50.



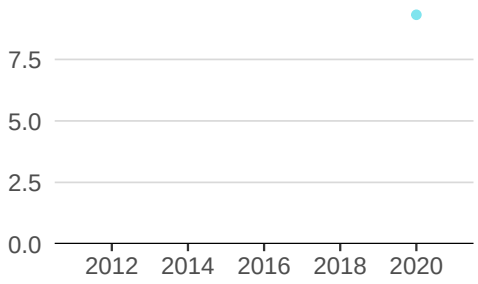

**2.3.1 Researchers** was equal to 7.7 FTE/thsd pop. in 2020–down by 1 percentage point from the year prior–and equivalent to an indicator rank of 3.



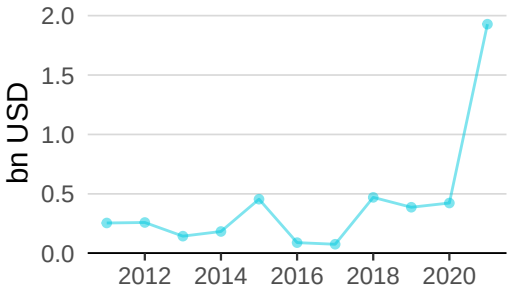

**2.3.2 Gross expenditure on R&D** was equal to 3.0% GDP in 2020–up by 3 percentage points from the year prior–and equivalent to an indicator rank of 10.



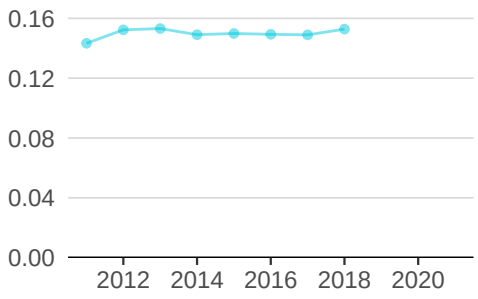

**2.3.4 QS university ranking** was equal to 58.5 in 2021–up by 1 percentage point from the year prior–and equivalent to an indicator rank of 15.



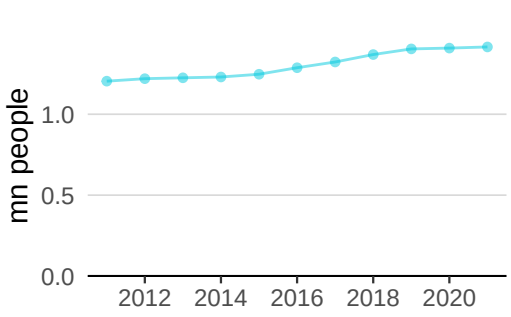

**3.1.1 ICT access** was equal to 9.3 in 2020 and equivalent to an indicator rank of 22.




**4.2.4 Venture capital received** was equal to 1.9 bn USD in 2021–up by 356 percentage points from the year prior–and equivalent to an indicator rank of 24.

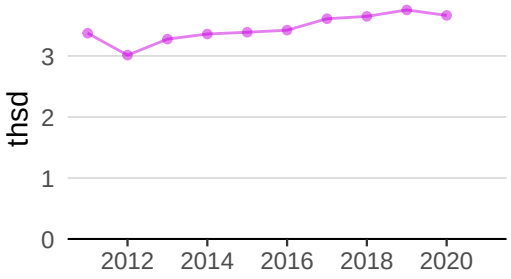



**4.3.2 Domestic industry diversification** was equal to 0.2 in 2018–up by 3 percentage points from the year prior–and equivalent to an indicator rank of 51.

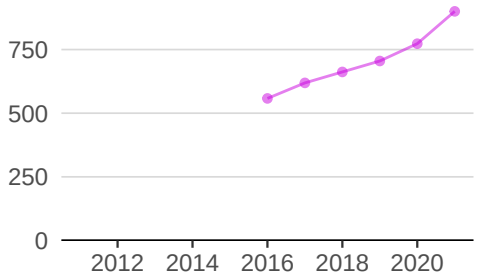



**5.1.1 Knowledge-intensive employment** was equal to 1.4 mn people in 2021–effectively unchanged from the year prior–and equivalent to an indicator rank of 10.

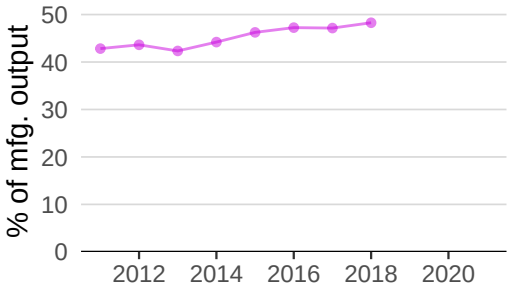
## Innovation outputs



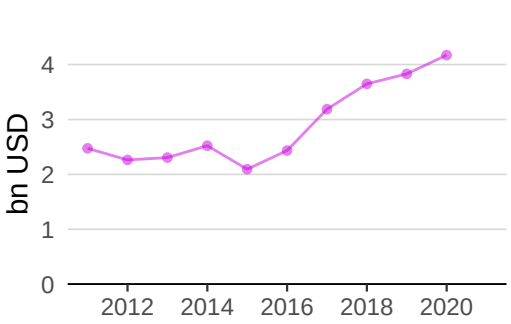

**6.1.1 Patents by origin** was equal to 3.7 thsd in 2020–down by 2 percentage points from the year prior–and equivalent to an indicator rank of 9.



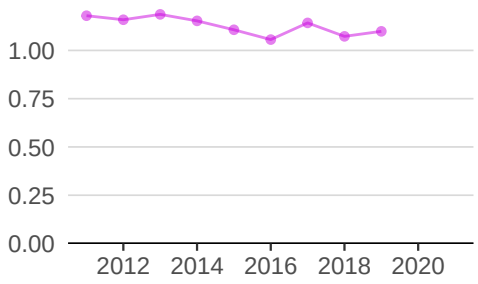

**6.1.5 Citable documents H-index** was equal to 900.0 in 2021–up by 16 percentage points from the year prior–and equivalent to an indicator rank of 15.



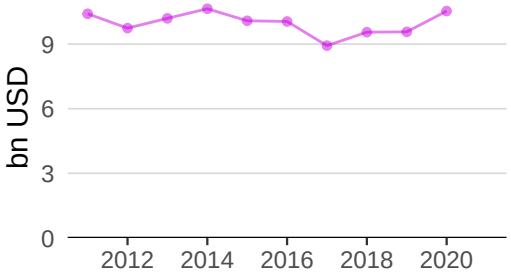

**6.2.5 High-tech manufacturing** was equal to 48.3% of mfg. output in 2018–up by 2 percentage points from the year prior–and equivalent to an indicator rank of 15.



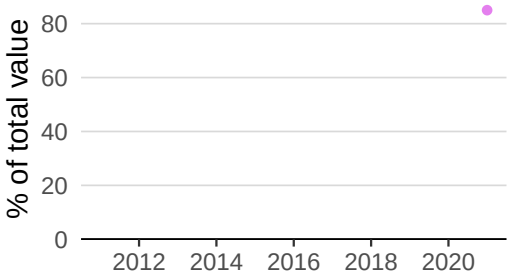

**6.3.1 Intellectual property receipts** was equal to 4.2 bn USD in 2020–up by 9 percentage points from the year prior–and equivalent to an indicator rank of 12.



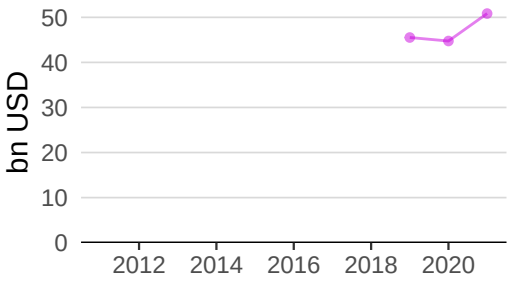

**6.3.2 Production and export complexity** was equal to 1.1 in 2019–up by 2 percentage points from the year prior–and equivalent to an indicator rank of 26.



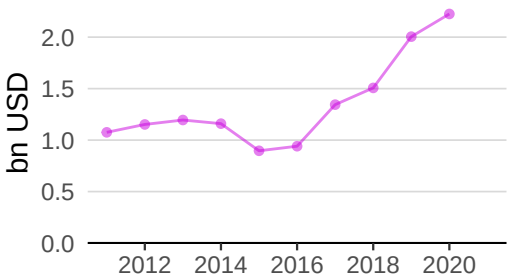

**6.3.3 High-tech exports** was equal to 10.5 bn USD in 2020–up by 10 percentage points from the year prior–and equivalent to an indicator rank of 34.




**7.1.1 Intangible asset intensity** was equal to 85.0% of total value in 2021 and equivalent to an indicator rank of 7.




**7.1.3 Global brand value** was equal to 50.8 bn USD in 2021–up by 14 percentage points from the year prior–and equivalent to an indicator rank of 14.




**7.2.1 Cultural and creative services exports** was equal to 2.2 bn USD in 2020–up by 11 percentage points from the year prior–and equivalent to an indicator rank of 23.

# DENMARK'S INNOVATION TOP PERFORMERS

## 2.3.3 Global corporate R&D investors

| Firm | Industry | R&D | R&D Growth | R&D Intensity | Rank |
|---|---|---|---|---|---|
| | | [mn EUR] | [%] | [%] | |
| NOVO NORDISK | Pharmaceuticals & Biotechnology | 1,845 | 6.2 | 10.8 | 85 |
| DANSKE BANK | Banks | 517 | 33.9 | 8.3 | 293 |
| H LUNDBECK | Pharmaceuticals & Biotechnology | 504 | 23.2 | 21.2 | 301 |

Source: European Commission's Joint Research Centre (https://iri.jrc.ec.europa.eu/scoreboard/2021-eu-industrial-rd-investment-scoreboard).
Note: European Commission's Joint Research Centre ranks the top 2,500 firms by R&D investment annually.

## 2.3.4 QS university ranking

| University | Score | Rank |
|---|---|---|
| AARHUS UNIVERSITY | 50.2 | 155 |
| UNIVERSITY OF COPENHAGEN | 65.5 | 79= |
| TECHNICAL UNIVERSITY OF DENMARK | 59.9 | 99 |

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 |
|---|---|
| NOVO NORDISK | 1 |
| ORSTED | 2 |
| DSV | 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

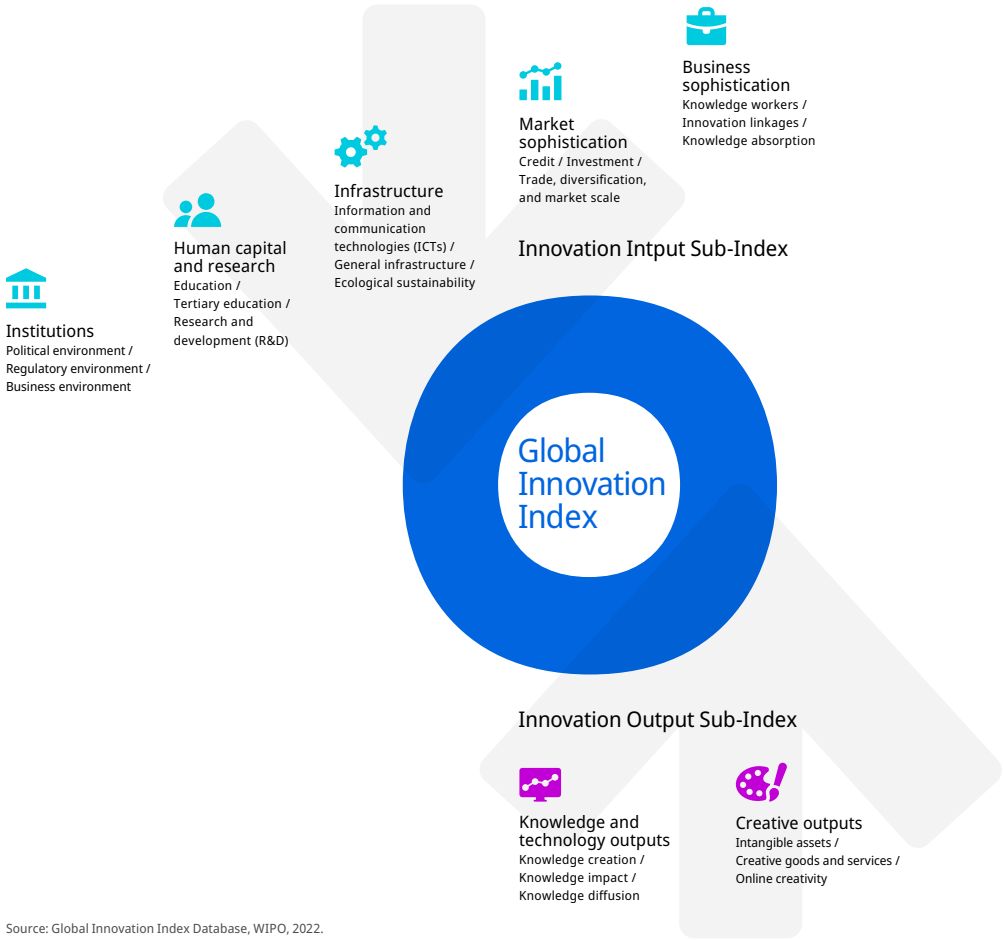
| Brand | Industry | Rank |
|---|---|---|
| LEGO | Toys | 1 |
| MAERSK | Logistics | 2 |
| DSV | Logistics | 3 |

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.