# C 8 Production, Value Added and Employment[351]

The specialization pattern of a country in foreign trade can be measured with the help of the RCA indicator.[352] It records the export/import ratio of a product group in relation to the export/import ratio of processed industrial goods in total. As in previous years, Germany had a comparative advantage in trade in R&D-intensive goods in 2019 (C 8-1). R&D-intensive goods consist of high-value technology goods and cutting-edge technology goods. However, a more detailed analysis of these two groups of goods shows that Germany's comparative advantage was only positive for trade in high-value technology goods, while it was negative for trade in cutting-edge goods, albeit with a slightly positive trend. France, the UK, Switzerland, South Korea, and the USA recorded positive values of the RCA indicator in cutting-edge technology; China and Japan showed a negative RCA indicator here over the entire period under review. Sweden has been recording negative values since 2010.

The share of research-intensive and knowledge-intensive industries in a country's value added allows conclusions to be drawn about its technological performance in an international comparison (C 8-2). In the area of high-value technology, Germany had the highest share of value added relative to the countries considered, amounting to 9.2 percent in 2018. In the area of cutting-edge technology, Germany was well behind the leaders South Korea (9.9 percent) and Switzerland (9.4 percent) at 2.8 percent. Knowledge-intensive services contributed significantly more to national value added than research-intensive industries in all countries considered. Yet with a value added share of 25.2 percent, they played a smaller role in Germany in 2018 compared to the other countries considered (exception: South Korea).

After the decline in gross value added in the various commercial business sectors in the crisis year 2009, value added in Germany has increased steadily again since 2010 (C 8-3). However, at 3.2 percent, growth in knowledge-intensive services in 2018 was lower than in the previous year (4.1 percent). There was also a lower increase in value added in non-knowledge-intensive services (4 percent versus 4.5 percent). While the increase in value added was also higher in the knowledge-intensive manufacturing sector in 2017 (4.9 percent) than in 2018 (1.1 percent), it was higher in the non-knowledge-intensive manufacturing sector in 2018 (4 percent) than in the previous year (2.5 percent).

The increase in employment subject to social security contributions in various commercial sectors of the economy in Germany between 2009 and 2019 is mainly due to the service sector (C 8-4). In the non-knowledge-intensive services, employment subject to social security contributions increased by 23.7 percent during this period, in the knowledge-intensive services by 27.7 percent. In the non-knowledge-intensive manufacturing sector, employment subject to social security contributions increased by 10.3 percent, in the knowledge-intensive manufacturing sector by 13 percent.

## Revealed comparative advantage (RCA) of selected countries in foreign trade in R&D-intensive goods 2005–2019 (index values)

Tab. C 8-1

Download data

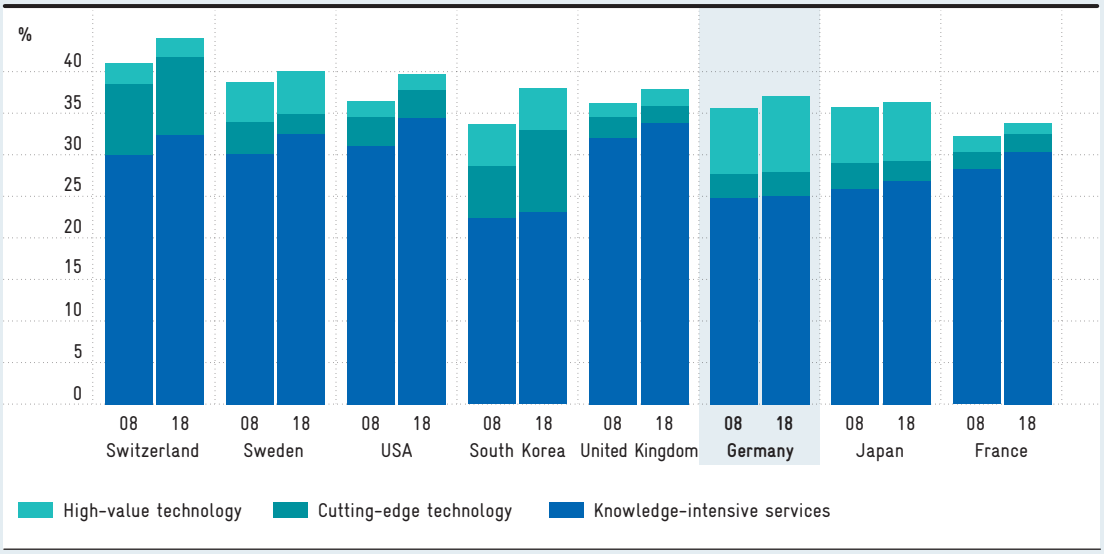
| Year | China* | France | Germany | Japan | South Korea | Sweden | Switzerland | United Kingdom | USA |
|---|---|---|---|---|---|---|---|---|---|
| | | | | R&D-intensive goods | | | | | |
| 2005 | -29 | 7 | 10 | 42 | 17 | -1 | 18 | 14 | 17 |
| 2010 | -27 | 6 | 12 | 33 | 19 | -6 | 22 | 11 | 1 |
| 2015 | -27 | 5 | 13 | 31 | 13 | -5 | 28 | 3 | 2 |
| 2019 | -29 | 6 | 10 | 28 | 12 | 0 | 30 | 17 | -1 |
| | | | | High-value technology goods | | | | | |
| 2005 | 0 | 6 | 27 | 75 | 11 | -2 | 24 | 4 | -5 |
| 2010 | -16 | -2 | 30 | 61 | 7 | -3 | 21 | 15 | -10 |
| 2015 | -3 | -6 | 27 | 63 | 13 | 1 | 21 | 1 | -14 |
| 2019 | -1 | -11 | 19 | 64 | 13 | 7 | 23 | 11 | -17 |
| | | | | Cutting-edge technology goods | | | | | |
| 2005 | -53 | 8 | -34 | -14 | 24 | 1 | 4 | 33 | 55 |
| 2010 | -35 | 20 | -35 | -22 | 33 | -11 | 25 | 1 | 22 |
| 2015 | -46 | 21 | -23 | -35 | 12 | -22 | 41 | 8 | 27 |
| 2019 | -51 | 33 | -15 | -48 | 10 | -25 | 44 | 27 | 23 |

R&D-intensive goods comprise high-value technology goods and cutting-edge technology goods.
A positive RCA value means that the exp./imp. ratio for this product group is higher than for manufactured industrial goods as a whole.
* incl. Hong Kong.
Source: UN COMTRADE database, research November 2020. Calculations and estimates by CWS in Gehrke and Schiersch (2021).


## R&D-intensive industries and knowledge-intensive services in selected countries as a percentage of value added in 2008 and 2018

Fig. C 8-2

Download data

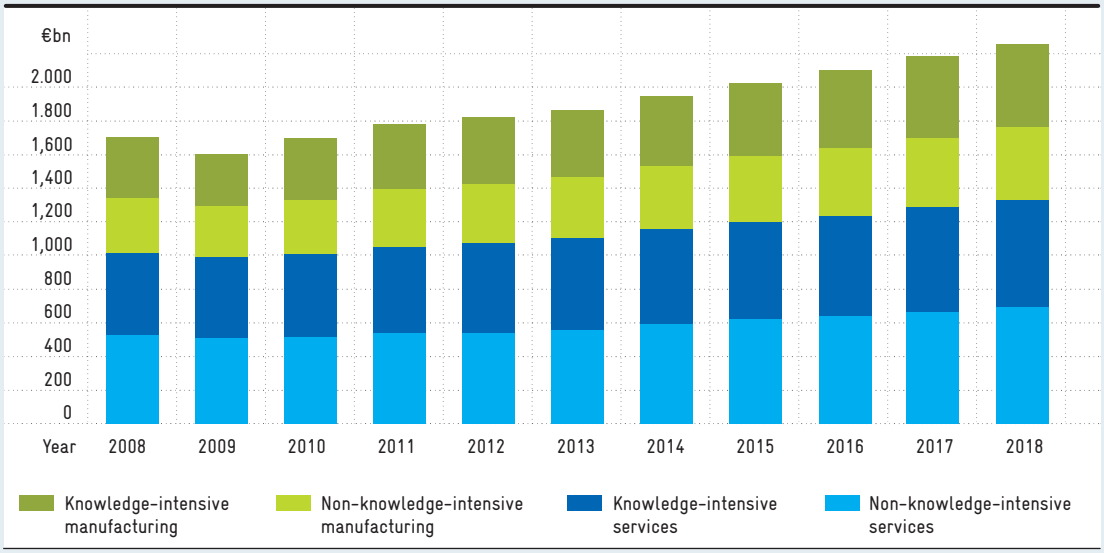



R&D-intensive industries (high-value technology and cutting-edge technology) have an above-average R&D intensity. Knowledge-intensive services are characterized by an above-average proportion of employees with tertiary education qualifications.
Source: OECD-NA, OECD-STAN, OECD-SBS, Eurostat-NA, Eurostat-SBS, EU KLEMS. Calculations and estimates by DIW Berlin in Gehrke and Schiersch (2021).

Fig. C 8-3

Download data

## Gross value added in different industrial business sectors in Germany 2008–2018 in billion euros




Gross value added is the difference between the total value of all goods and services produced and the intermediate inputs for their production. Not including agriculture, forestry, fisheries, public administration and services, real estate and housing, education, private households, social insurance, religious and other organizations, associations, and trade unions. Data for 2015 partly revised.
Source: Federal Statistical Office, Fachserie 18, Reihe 1.4, calculation status August 2020. Calculations by CWS in Gehrke and Schiersch (2021).


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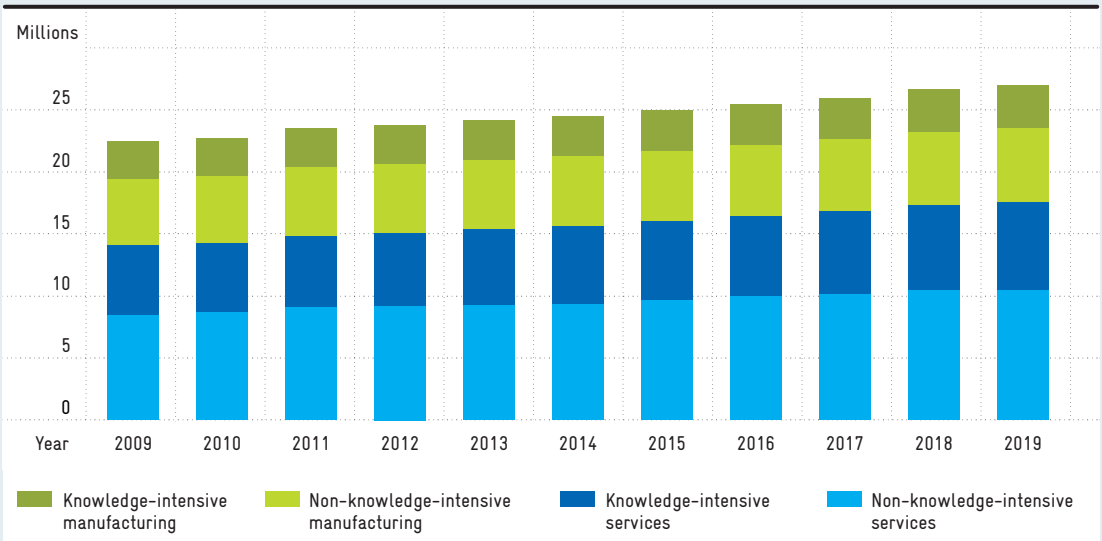
Fig. C 8-4

Download data

## Number of employees subject to social security contributions in different industrial business sectors in Germany 2009–2019 in millions




Not including agriculture, forestry, fisheries, public administration and services, real estate and housing, education, private households, social insurance, religious and other organizations, associations, and trade unions.
Source: Federal Employment Agency. Calculations by CWS in Gehrke and Schiersch (2021).