C 2 Research and development

In 2015, R&D intensity (C 2-1) in Germany increased again and amounted to 2.99 percent of gross domestic product. The three-percent target was thus reached. R&D intensity also increased in the UK and Sweden: Sweden from 3.15 to 3.26 percent and the UK slightly from 1.68 to 1.70 percent. By contrast, R&D intensity in France decreased minimally from 2.24 to 2.23 percent, continuing the stagnation of R&D intensity that has been observed for several years. There are no current data for China, Switzerland, South Korea or the USA. However, South Korea has by far the highest R&D intensity figures of all the reference countries for 2014 with 4.29 percent.

In Germany, the budget estimate for civil R&D (C 2-2) rose again last year. In 2015, the budgetary estimate, i.e. the financial resources set aside in the state budget, was thus 71 percent above the initial level in 2005. The budget estimates rose much more in Switzerland and South Korea, although the data for 2015 are not yet available.

The distribution of gross domestic expenditure on R&D by performing sector (C 2-3) shows that the corporate share in Germany fell from 69.3 percent in 2005 to 67.7 percent in 2015. The tertiary education institutions' share of R&D expenditure rose in the same period from 16.5 to 17.4 percent, public R&D expenditure from 14.1 to 14.9 percent.

No new data are available for the indicators on the R&D intensity of Germany's Länder (C 2-4) or on R&D expenditure by companies (C 2-5). The tables have been taken over without comment from the 2016 Report.

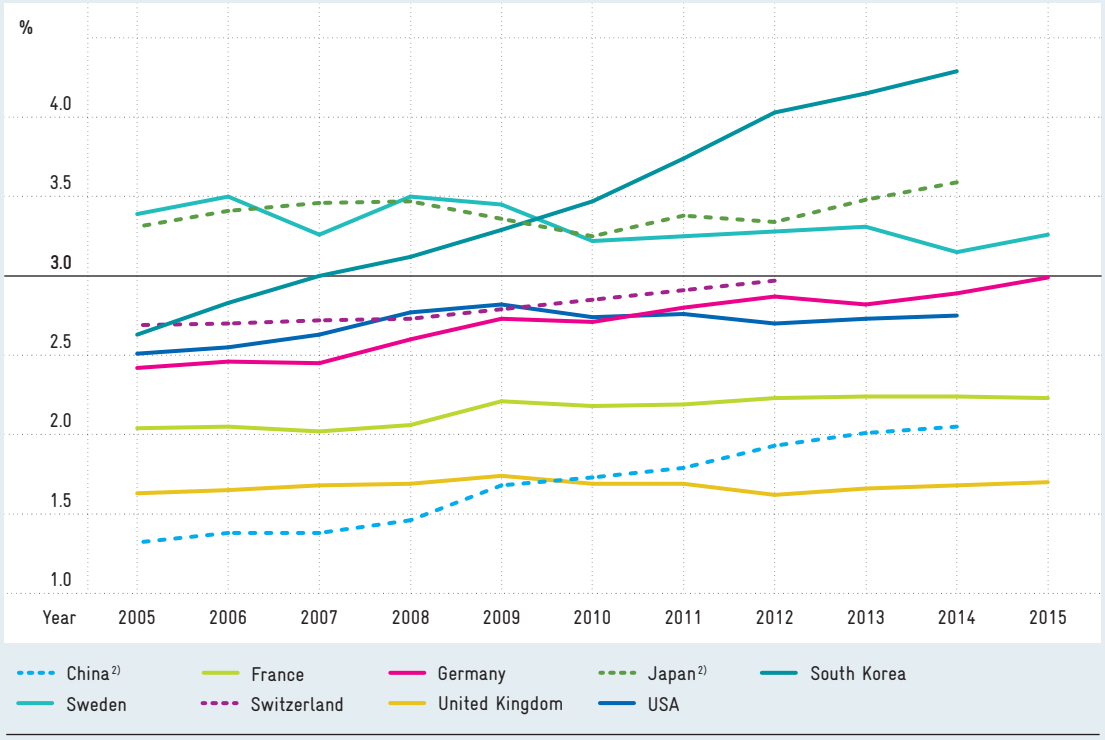
The indicator 'internal corporate R&D expenditure as a percentage of turnover from the company's own products' (C 2-6) again documents an increase in the average R&D intensity in the manufacturing sector for 2015. This development is borne primarily by the automotive engineering industry, the pharmaceutical and chemical industries, and electrical equipment. By contrast, R&D intensities have been declining since 2013 in the sectors IT equipment, electrical engineering, optics and aerospace.[450]

Fig. C 2-1

Download data

R&D intensity in selected OECD countries and China, 2005 to 2015 (as percentage)

R&D intensity: percentage of an economy's gross domestic product (GDP) spent on research and development.[1)]



[1)] Gross domestic product based on the methodology of the European System of National and Regional Accounts (ESA 2010).
[2)] Gross domestic product based on the methodology of the ESA 2005. Some of the data for Switzerland were estimated. Japan 2008, France 2010, South Korea 2007, break in the series in China in 2009.
Source: OECD, EUROSTAT. Calculations and estimates by CWS in Schasse (2017).

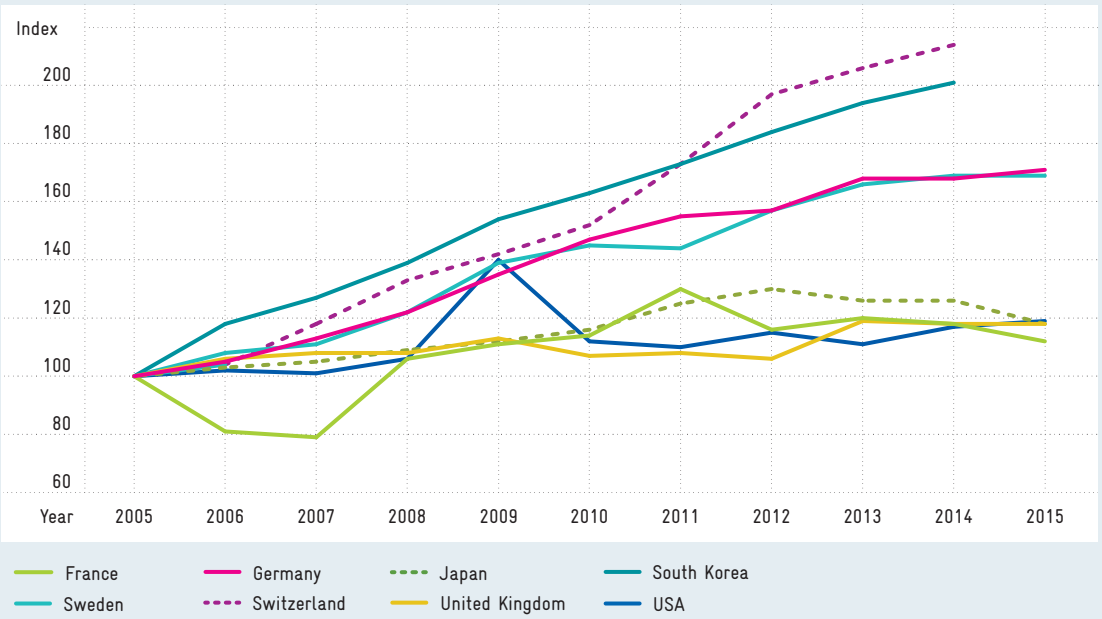
C

Fig. C 2-2

Download data

State budget estimates for civil R&D

R&D budget estimates: the chart shows the amounts set aside in the budget to finance R&D.



Index: 2005 = 100, data partially based on estimates.
Source: OECD, EUROSTAT. Calculations and estimates by CWS in Schasse (2017).

C

Tab. C 2-3

Download data

Distribution of gross domestic expenditure on R&D (GERD) by performing sector, 2005 and 2015

Gross domestic expenditure on research and development (GERD) in industry, the higher education sector and the public sector.

	2005					2015				
		of which by ... (in percent)					of which by ... (in percent)			
Countries	GERD in USD m	private sector	higher edcation sector	public sector	private non-profit*	GERD in USD m	private sector	higher edcation sector	public sector	private non-profit*
France	39,236	62.1	18.8	17.8	1.3	59,341	65.1	20.3	13.1	1.5
Germany	**64,299**	**69.3**	**16.5**	**14.1**	**-**	**111,180**	**67.7**	**17.4**	**14.9**	**-**
Japan[1)]	128,695	76.4	13.4	8.3	1.9	166,861	77.8	12.6	8.3	1.3
South Korea[1)]	30,618	76.9	9.9	11.9	1.4	72,267	78.2	9.0	11.2	1.5
Sweden	10,500	72.8	22.0	4.9	0.3	15,109	69.5	26.9	3.4	0.2
Switzerland[2)]	7,470	73.7	22.9	1.1	2.3	13,571	69.3	28.1	0.8	1.8
United Kingdom	34,081	61.4	25.7	10.6	2.3	45,476	65.7	25.6	6.8	1.9
USA[3)]	328,128	68.9	14.3	12.3	4.4	499,299	72.0	13.3	10.6	4.0
China[1)]	86,828	68.3	9.9	21.8	-	368,732	77.3	6.9	15.8	-

[1)] 2014 instead of 2015 [2)] 2004 instead of 2005 [3)] 2015 provisional.
Private non-profit organisations are included under the 'public sector' in some countries (e.g. Germany).
Source: OECD, EUROSTAT. Calculations by CWS in Schasse (2017).

Tab. C 2-4

Download data

R&D intensity of Germany's Länder, 2003 and 2013 (as percentage)

R&D intensity: Länder expenditure on research and development as a percentage of their gross domestic product, broken down by sectors.

	2003				2013			
Länder	Total	private sector	public sector	higher education sector	Total	private sector	public sector	higher education sector
Baden-Württemberg	3.76	2.97	0.37	0.41	4.80	3.87	0.42	0.52
Bavaria	3.00	2.41	0.24	0.36	3.16	2.41	0.32	0.43
Berlin	3.65	1.85	1.01	0.78	3.57	1.50	1.23	0.84
Brandenburg	1.18	0.34	0.55	0.29	1.55	0.45	0.74	0.36
Bremen	2.63	1.35	0.61	0.67	2.67	1.01	0.97	0.70
Hamburg	1.71	1.03	0.33	0.35	2.32	1.33	0.47	0.51
Hesse	2.46	2.01	0.16	0.29	2.83	2.18	0.23	0.42
Lower Saxony	2.80	2.05	0.31	0.44	2.84	1.92	0.39	0.52
Mecklenburg-West Pomerania	1.30	0.27	0.53	0.50	1.83	0.48	0.71	0.64
North Rhine-Westphalia	1.74	1.06	0.26	0.42	1.94	1.11	0.33	0.49
Rhineland-Palatinate	1.73	1.24	0.15	0.34	2.13	1.54	0.17	0.43
Saarland	1.06	0.39	0.24	0.43	1.42	0.55	0.41	0.46
Saxony	2.23	1.03	0.60	0.60	2.74	1.11	0.81	0.82
Saxony-Anhalt	1.18	0.29	0.38	0.51	1.42	0.42	0.50	0.50
Schleswig-Holstein	1.10	0.49	0.31	0.31	1.47	0.75	0.37	0.35
Thuringia	1.89	1.01	0.39	0.50	2.20	1.05	0.52	0.63
Germany	**2.46**	**1.72**	**0.33**	**0.42**	**2.83**	**1.91**	**0.42**	**0.50**

Source: SV Wissenschaftsstatistik in Schasse et al. (2016).

C

Tab. C 2-5

Download data

Internal R&D spending by companies: origin of funds, economic sector, company size and technology category, 2013

Internal corporate R&D: R&D that is conducted within the company, either for the company's own purposes or commissioned by a third party.

	Internal R&D expenditure				
	Total	of which financed by			
		industry	state	other domestic residents	other countries
	in €'000	as percentage			
All companies active in research	**53,296,234**	**91.7**	**3.0**	**0.2**	**5.0**
Manufacturing industries	46,048,715	92.8	2.0	0.2	5.0
Chemical industry	3,346,601	93.8	1.6	0.0	4.6
Pharmaceutical industry	4,074,886	86.8	0.5	0.0	12.7
Plastics, glass and ceramics	1,261,748	92.2	2.6	0.7	4.6
Metal production and processing	1,273,337	80.7	8.5	0.2	10.7
Electrical engineering/electronics	9,472,033	94.6	2.8	0.1	2.4
Mechanical engineering	5,388,201	95.8	2.0	0.5	1.7
Vehicle equipment	19,204,835	93.1	1.3	0.2	5.4
Other manufacturing industries	2,027,074	91.0	3.7	0.1	5.2
Remaining sectors	7,247,519	85.1	9.7	0.2	5.0
fewer than 100 employees	2,859,712	78.4	16.8	0.4	4.5
100–499 employees	4,708,916	88.2	6.4	0.3	5.1
500–999 employees	3,214,604	90.9	4.6	0.1	4.4
1,000 employees and more	42,513,002	93.1	1.6	0.2	5.1
Technology categories in industry					
Cutting-edge technology (› 9 percent of turnover spent on R&D)	13,404,548	90.4	3.2	0.0	6.3
High-value technology (3–9 percent of turnover spent on R&D)	27,113,163	94.4	1.1	0.2	4.3

Source: SV Wissenschaftsstatistik. In: Schasse et al. (2016).

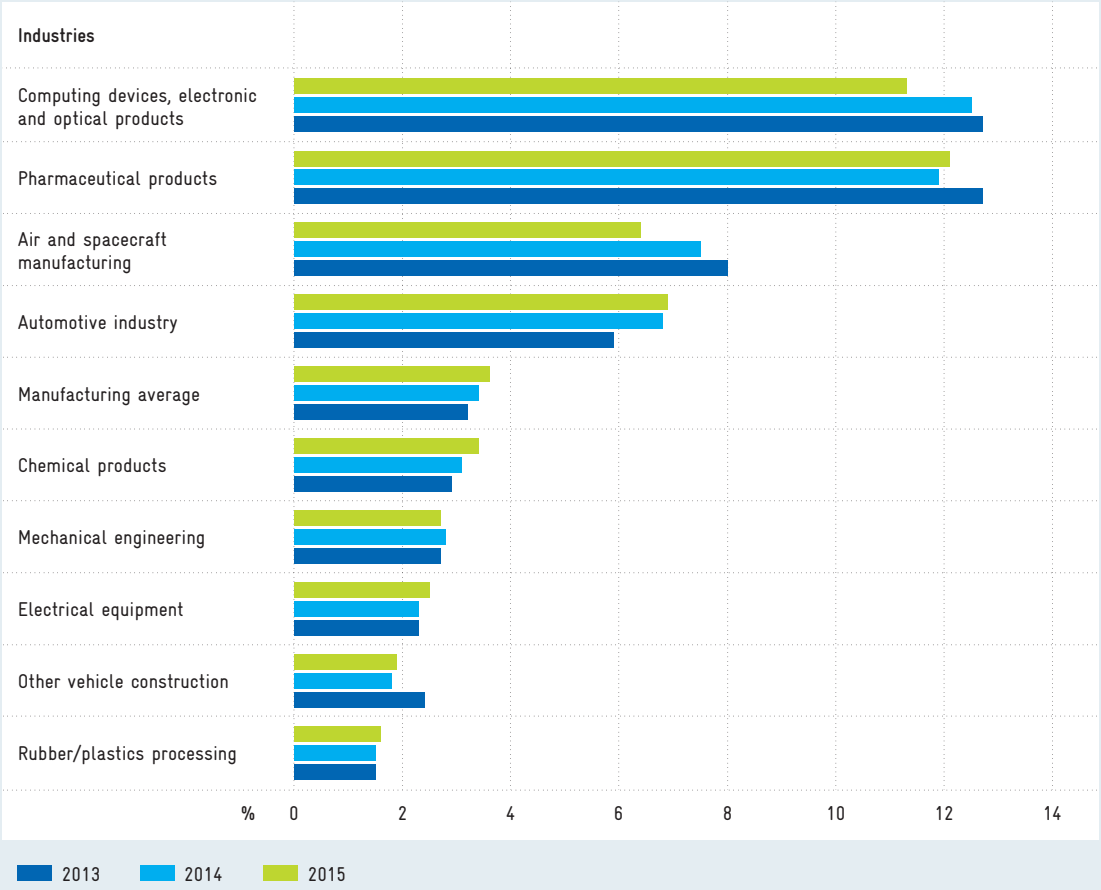
C

Fig. C 2-6

Download data

Internal corporate R&D expenditure as a percentage of turnover from the company's own products, 2013, 2014 and 2015

Internal corporate R&D: R&D that is conducted within the company, either for the company's own purposes or commissioned by a third party.



Figures net, without input tax. 2013: break in series.
Source: SV Wissenschaftsstatistik, Statistisches Bundesamt (Federal Statistical Office), corporate results for Germany. Calculations by CWS in Schasse (2017).

C