C 7 PRODUCTION, VALUE ADDED AND EMPLOYMENT

The advance of globalisation enables an international division of labour, which means that each country can use its comparative advantages in the production of goods. This has lead to a shift in the production of labour-intensive goods and production processes to developing and emerging countries with low labour costs. Thus the global market share of gross value added in the manufacturing sector has shifted over the last decade, with a significant increase in China's share (C 7–3). In the field of labour-intensive goods, industrialised countries such as Germany are unable to compete internationally and have to specialise in the development and production of high-value and cutting-edge technology. Yet, it should be pointed out that developing and emerging countries do not solely specialise in the production of simple goods, but increasingly focus on the production of R&D-intensive goods as well.

The development of value added in Germany has been hampered by the economic crisis. Thus, in the course of two years, value added in Germany has decreased in the manufacturing sector and in non-knowledge-intensive services, reaching a level similar to that of 2005. Only knowledge-intensive services managed to defy the trend and reported an increase in added value, even during the crisis (C 7–1). A similar trend can be observed in the number of employees subjected to social insurance: while employment in the manufacturing sector has declined in recent years, the services sector reported an increase (C 7–2).

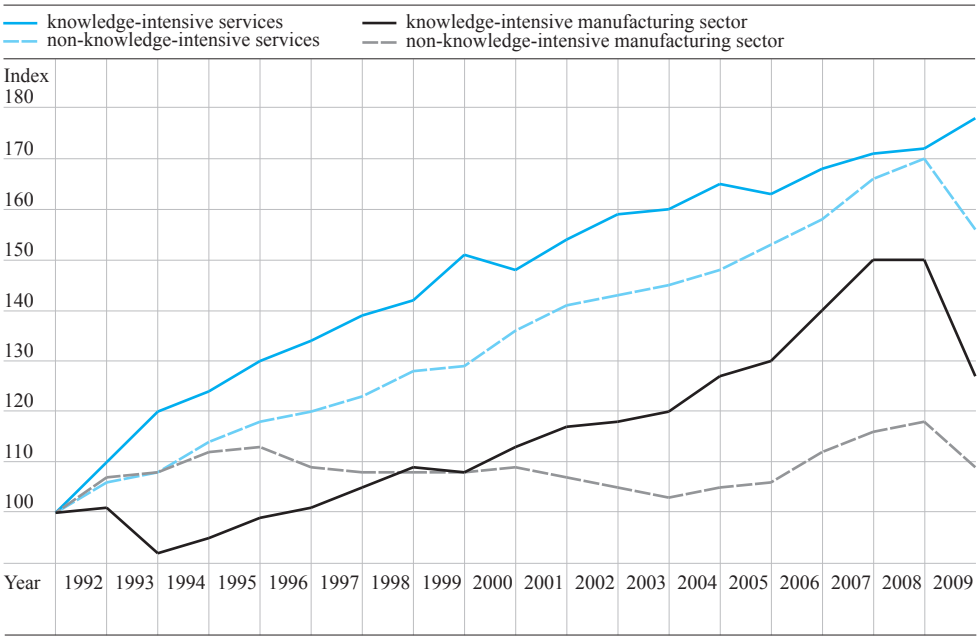
The share of labour input and value added in a country's R&D- and knowledge-intensive industries reflects the relevance of these industries in the respective country. While labour input in R&D-intensive industries has stagnated or declined slightly, labour input increased in knowledge-intensive services in the countries surveyed. A similar trend can be observed in terms of value added: the share of knowledge-intensive services in value added has increased over the past decade. In the R&D-intensive industries, however, these countries do not present a uniform picture (C 7–4 and C 7–5).

But also trade in R&D-intensive goods is no longer solely in the hands of the industrial nations. Emerging economies and developing countries have succeeded in gaining shares in this field as well. While Germany has managed to maintain its global market share over the past 15 years, the United States, Canada and Japan have recorded significant losses in shares. China and Korea, however, have increased their shares in world trade in the field of R&D-intensive goods. Especially noteworthy here is that China – unlike Germany – has built up a positive export specialisation in cutting-edge technologies for several years (C 7–6 and C 7–7).

Development of gross value added in different business sectors in Germany

C 7–1

Shares of gross value added in 2009: knowledge-intensive manufacturing sector, 19 percent; non-knowledge-intensive manufacturing sector, 20 percent; knowledge-intensive services, 30 percent; non-knowledge-intensive services, 31 percent.



Index: 1991 = 100. Not including agriculture and forestry, fisheries, public administration and services, real estate and housing, education, private households, etc.
Source: Federal Statistical Office *(Statistisches Bundesamt, Fachserie 18, Reihe 1.4.)* Calculations by NIW.

Development of employment covered by social security in the business sector in Germany

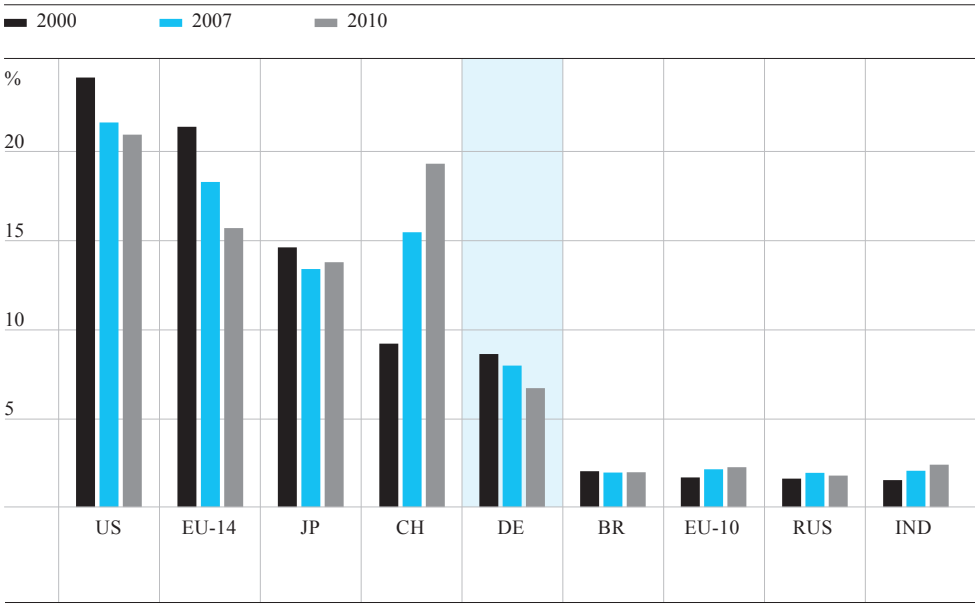
C 7–2

Shares of employment in the business sector in 2010: knowledge-intensive manufacturing sector, 13 percent; non-knowledge-intensive manufacturing sector, 24 percent; knowledge-intensive services, 25 percent; non-knowledge-intensive services, 38 percent.

	2008	2009	2010	2008–2009	2009–2010	2008–2010
	in 1,000			annual average changes in %		
Manufacturing sector	**8,625**	**8,472**	**8,394**	**–1.77**	**–0.93**	**–1.35**
Knowledge-intensive sectors	3,083	3,045	2,999	–1.21	–1.51	–1.36
Non-knowledge-intensive sectors	5,543	5,427	5,395	–2.09	–0.60	–1.34
Services	**14,157**	**14,077**	**14,361**	**–0.57**	**2.02**	**0.72**
Knowledge-intensive sectors	5,522	5,569	5,621	0.86	0.93	0.90
Non-knowledge-intensive sectors	8,635	8,507	8,739	–1.48	2.73	0.60
Industry	**22,782**	**22,549**	**22,755**	**–1.02**	**0.91**	**–0.06**
Knowledge-intensive sectors	8,604	8,615	8,620	0.12	0.07	0.09
Non-knowledge-intensive sectors	14,178	13,934	14,134	–1.72	1.43	–0.15

Source: Federal Employment Agency *(Bundesagentur für Arbeit)*. Calculations by NIW.

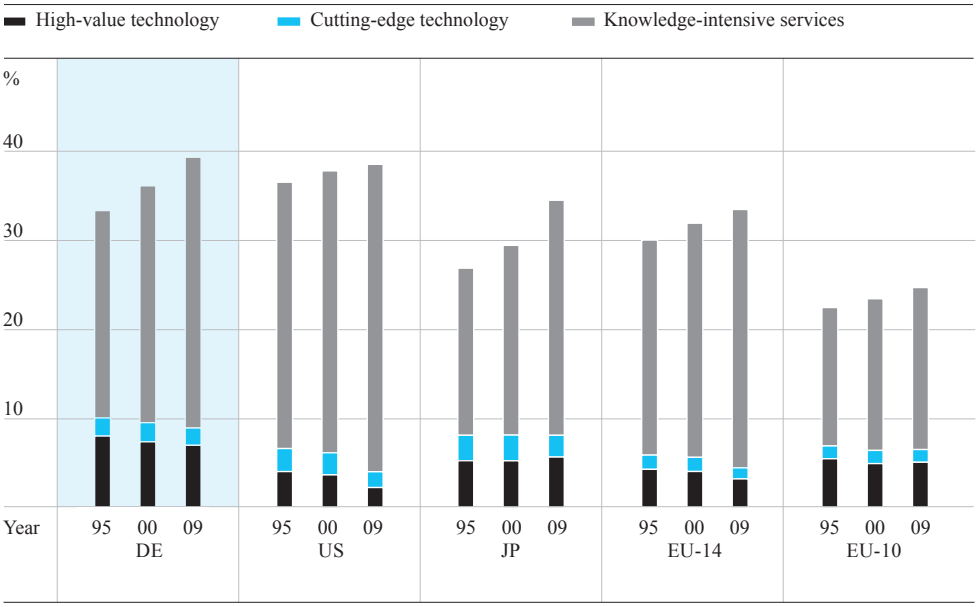
C 7–3 **Countries' and country groups' shares in global value added in the manufacturing sector**
(figures in percent)



Source: United Nations Statistics Division (UNSD 2011). IMF WEO Database (2011). OECD STAN (2011).
Calculations by DIW Berlin.

Global market shares in gross value added of the manufacturing sector have shifted in recent years. China's share in particular has increased significantly.

C 7–4 **Labour input shares of R&D-intensive industries and knowledge-intensive services**
(figures in percent)



EU-14 refers to the old EU member states, excluding Germany. EU-10 refers to the new EU countries, excluding Romania and Bulgaria.
Source: EUKLEMS database (2011). OECD STAN (2011). Eurostat (2011).
Calculations and estimates by DIW Berlin.

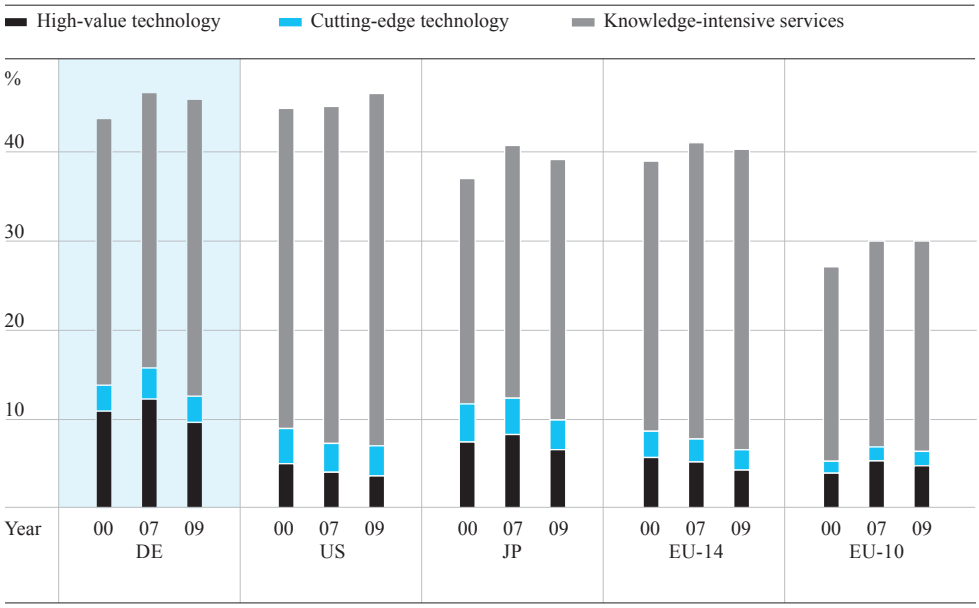
While labour input in R&D-intensive industries has stagnated or decreased slightly, labour input in knowledge-intensive services has increased in the countries surveyed.

Shares of R&D-intensive industries and knowledge-intensive services in value added

C 7–5

(figures in percent)

The share of knowledge-intensive services in value creation has increased over the last decade in the countries surveyed, while the R&D-intensive industries do not present a uniform picture.



EU-14 refers to the old EU member states, excluding Germany. EU-10 refers to the new EU countries, excluding Romania and Bulgaria.
Source: EUKLEMS database (2011). OECD STAN (2011). Eurostat (2011).
Calculations and estimates by DIW Berlin.

Export specialisation (Relative Export Advantage, RXA) of selected countries, for R&D-intensive goods

C 7–6

A positive RXA value means that the share of the world market supply for this product group is higher than it is for processed industrial goods as a whole.

Year	*DE*	FR	GB	IT	DK	SE	FI	EU-14	CH	CA	US	JP	KR	CN
							R&D-intensive goods							
1995	*13*	–3	12	–32	–49	–5	–42	–11	5	1	24	37	2	–85
2000	*12*	2	17	–37	–36	1	–20	–7	1	1	21	33	8	–54
2005	*11*	0	10	–40	–29	–8	–20	–6	6	–9	18	28	18	–19
2010	*14*	9	11	–34	–32	–16	–41	–5	13	–12	10	27	–	–13
							High-value technology							
1995	*32*	0	2	–10	–39	–5	–55	–3	27	20	4	43	–15	–88
2000	*33*	6	7	–8	–27	–1	–63	1	27	19	2	47	–19	–73
2005	*30*	8	9	–13	–24	1	–51	5	20	10	5	42	–5	–73
2010	*34*	5	25	–5	–26	2	–27	10	20	3	16	47	–	–53
							Cutting-edge technology							
1995	*–46*	–9	24	–97	–71	–4	–20	–27	–59	–49	55	27	28	–78
2000	*–35*	–10	25	–113	–55	–1	18	–20	–61	–39	39	1	34	–30
2005	*–36*	–15	13	–122	–40	–28	19	–30	36	–58	37	–3	49	36
2010	*–38*	15	–22	–130	–43	–60	–73	–38	–2	–49	–3	–24	–	34

World exports 2010 based on estimates. EU-14 refers to the old EU member states, excluding Germany; 2010 based on estimates.
Source: OECD, ITCS – International Trade By Commodity Statistics, Rev. 3 (various years).
COMTRADE database. Calculations and estimates by NIW.

C 7–7 **Comparative advantages (Revealed Comparative Advantage, RCA) of selected countries, for foreign trade in research-intensive goods**

A positive RCA value means that the export-import relation for this product group is higher than it is for processed industrial goods as a whole.

Year	*DE*	FR	GB	IT	DK	SE	FI	EU-14	CH	CA	US	JP	KR	CN
R&D-intensive goods														
1995	*22*	3	8	–22	–28	–10	–45	–8	14	–18	13	63	1	–80
2000	*13*	6	14	–24	–11	–1	–22	–1	11	–11	16	50	0	–58
2005	*10*	8	16	–28	–6	–1	–16	3	17	–13	21	47	19	–37
2010	*13*	10	17	–23	–3	–11	–21	3	21	–16	5	42	–	–39
High-value technology														
1995	*36*	0	2	–14	–26	–13	–60	–5	29	–12	–2	91	–10	–92
2000	*32*	4	14	–14	–9	–9	–64	3	29	–11	–3	96	0	–72
2005	*28*	9	8	–19	–2	–3	–49	7	23	–12	4	88	12	–54
2010	*30*	4	20	–10	–10	–4	–24	8	18	–18	10	75	–	–56
Cutting-edge technology														
1995	*–23*	11	13	–53	–32	–6	–20	–16	–32	–39	33	20	18	–54
2000	*–27*	8	15	–57	–15	10	19	–8	–32	–12	39	–10	0	–43
2005	*–36*	6	31	–66	–15	4	26	–6	3	–17	48	–18	27	–29
2010	*–33*	21	10	–83	–14	–30	–11	–9	30	–10	–4	–31	–	–23

EU-14 refers to the old EU member states excluding Germany; only EU-external foreign trade is considered.
1995 excluding Luxemburg.
Source: OECD, ITCS – International Trade By Commodity Statistics, Rev. 3 (various years). COMTRADE database. Calculations and estimates by NIW.