Patents[409]

C 6

Since the mid-2000s, transnational patent applications have been stagnating both in Germany and in other major European economies like the UK, Sweden and Switzerland (cf. C 6-1). By contrast, particularly China, South Korea and Japan have recorded high growth rates. China has overtaken Germany in the meantime and is now one of the leading nations in transnational patent applications together with Germany, the USA and Japan.

While the USA is in the lead in terms of the absolute number of applications in 2015, it is not among the frontrunners with regard to patent intensity (i.e. patent applications per million of the working population (C 6-2)). Here the leaders are Switzerland, Sweden and Japan, followed by Finland, Germany and South Korea. Patents are an important tool for securing market shares in the context of the international technology trade. A high patent intensity therefore reflects both a strong international orientation and a pronounced export focus on the part of the respective economy.

Further conclusions on a country's technological performance can be drawn from patent activities in the field of R&D-intensive technologies. This sector is made up of industries that invest more than 3 percent of their turnover in R&D (R&D intensity). R&D-intensive technology comprises the areas of high-value technology (R&D intensity between 3 and 9 percent) and cutting-edge technology (R&D intensity over 9 percent).

International comparisons show that Germany is highly specialized in high-value technology (C 6-3) as a result of its traditional strengths in the automotive, mechanical-engineering and chemical industries. Only Japan is slightly more specialized in this field.

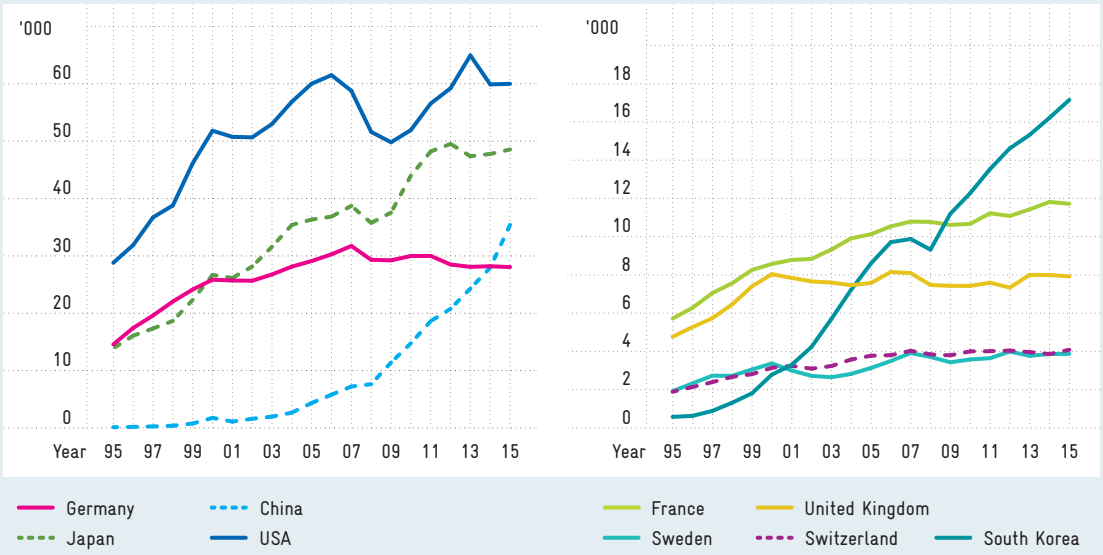
By contrast, China, Sweden, South Korea and the USA are particularly specialized in cutting-edge technology (C 6-4).

Fig. C 6-1

Download data

Development of the number of transnational patent applications in selected countries over time

Transnational patent applications comprise applications in the form of patent families that include at least one application filed with the World Intellectual Property Organization (WIPO) via the Patent Cooperation Treaty (PCT) procedure, or one application filed with the European Patent Office.



Source: EPO (PATSTAT). Calculations by Fraunhofer ISI in Neuhäusler et al. (2018)

Tab. C 6-2

Download data

Absolute number, intensity and growth rates of transnational patent applications in the field of R&D-intensive technology in 2015

The R&D-intensive technology sector comprises industries that invest more than three percent of their turnover in research and development. Intensity is calculated as the number of patents per million gainfully employed persons.

	absolute [1]	intensities [1]	intensities in R&D-intensive technology	growth (2005 = 100) [1]	growth in R&D-intensive technology (2005 = 100)
Total	**260,467**	-	-	**131**	**133**
China	35,394	46	34	812	830
Germany	**28,042**	**701**	**401**	**96**	**98**
EU-28	75,623	342	195	107	108
Finland	1,800	741	436	103	89
France	11,719	439	260	116	117
United Kingdom	7,922	257	150	105	104
Italy	5,644	254	124	96	96
Japan	48,529	761	467	134	128
Canada	3,433	191	121	90	84
Netherlands	4,573	550	293	109	102
Sweden	3,873	801	559	124	138
Switzerland	4,086	823	450	108	109
South Korea	17,151	661	430	199	190
USA	59,975	403	267	100	100

[1] Figures refer to all industries.

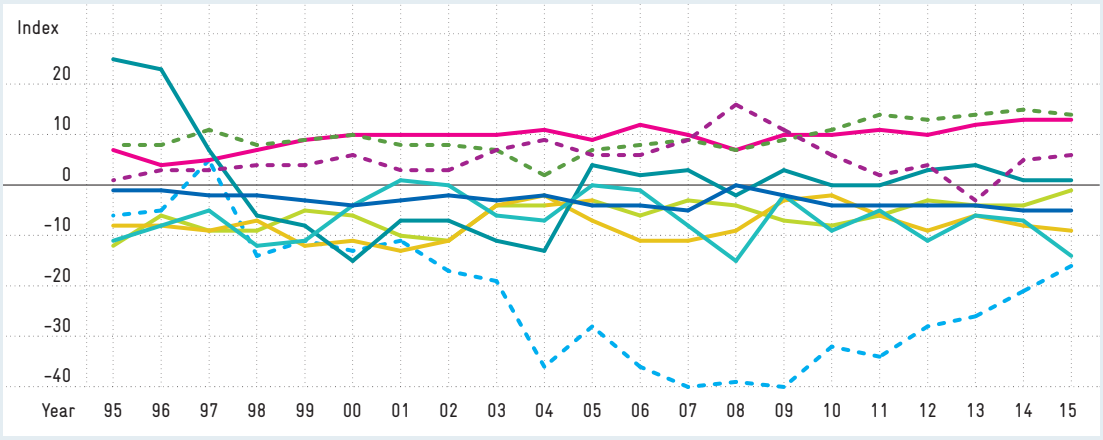
Source: EPO (PATSTAT), OECD (MSTI), World Bank, calculations by Fraunhofer ISI in Neuhäusler et al. (2018).

Fig. C 6-3

Download data

Development of the specialization index in selected countries over time in the field of high-value technology

The specialization index is calculated on the basis of all transnational patent applications worldwide.
Positive or negative values indicate whether the surveyed country's level of activity in a given field is disproportionately high or disproportionately low compared to the global average.



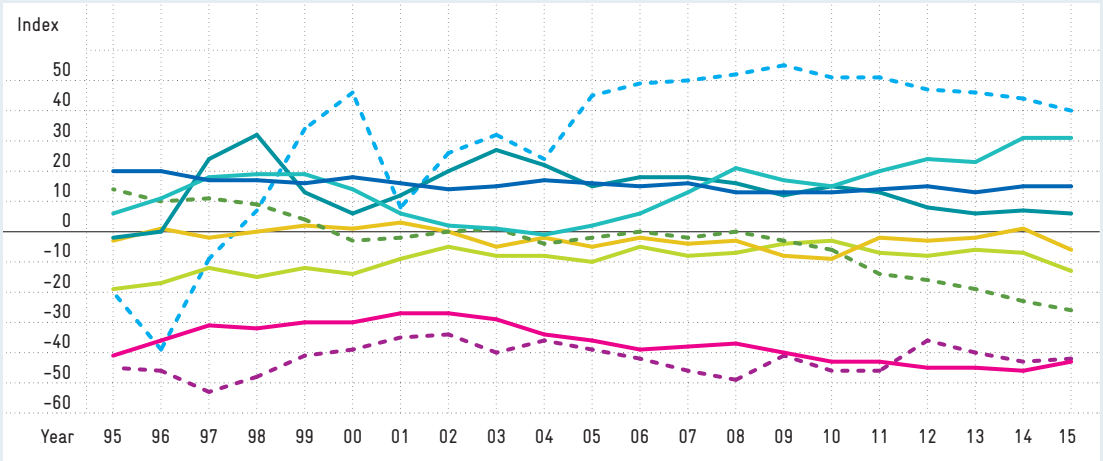
Source: EPO (PATSTAT). Calculations by Fraunhofer ISI in Neuhäusler et al. (2018)

Fig. C 6-4

Download data

Development of the specialization index in selected countries over time in the field of cutting-edge technology

The specialization index is calculated on the basis of all transnational patent applications worldwide. Positive or negative values indicate whether the surveyed country's level of activity in a given field is disproportionately high or disproportionately low compared to the global average.



Source: EPO (PATSTAT). Calculations by Fraunhofer ISI in Neuhäusler et al. (2018)