

F.5. International co-operation in S&T

■ The technological activities of (multinational) firms have become increasingly internationalised. In the search for new technological competences, better adaptation to markets and lower research and development costs, companies are moving research activities overseas more intensively. The information contained in patents makes it possible to trace the internationalisation of technological activities and the circulation of knowledge among countries. In addition, collaboration with foreign partners increasingly plays an important role as firms gain access to a broader pool of resources and knowledge at lower cost and are able to share risks with partners.

■ Cross-border ownership of inventions/patents clearly reflects the internationalisation of science and technology activities. On average, 15% of all inventions were owned or co-owned by a foreign resident in 2005-07, but the differences are substantial across countries. In Argentina, nearly 89% of domestic inventions belong to foreign residents, while Korea and Japan report the lowest shares of foreign ownership in 2005-07 (3.9% and 4%, respectively). The United Kingdom is an exception among large countries, with around 37% of domestic inventions owned by foreign residents, compared to 30% in the mid-1990s.

■ Patents filed under the PCT (Patent Co-operation Treaty) show that domestic ownership of inventions made abroad is particularly high in small open economies. In Luxembourg more than 80% of inventions owned were made with inventors abroad and more than 30% in Switzerland, Chinese Taipei, Ireland, Belgium, the Netherlands, Sweden and Finland. Turkey, Japan, Korea, India, Brazil and South Africa report the lowest share of inventions made abroad (less than 6%).

■ Collaboration on innovation with foreign partners is another important source of knowledge inflows and can take a variety of forms with different levels of interaction ranging from simple one-way information flows to highly interactive and formal arrangements. Collaboration with foreign customers and/or suppliers helps firms develop new products, processes or other innovations.

■ The share of EU firms collaborating on innovation with partners across Europe ranges from less than 2% in Spain and Turkey to over 13% in Finland, Luxembourg and Slovenia. Collaboration with partners outside Europe is much less frequent and concerns between 1% and 5% of firms in most European countries. Overall, innovating firms from the Nordic countries and some small European economies (Belgium, Luxembourg and Slovenia) tend to collaborate more frequently with partners abroad.

Sources

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- OECD (2009), *OECD Science, Technology and Industry Scoreboard 2009*, OECD, Paris.

For further reading

- Guellec, D. and B. Van Pottelsberghe de la Potterie (2001), "The internationalisation of technology analysed with patent data", *Research Policy*, 2001, Vol. 30, Issue 8, pp. 1253-1266.
- OECD and Eurostat (2005), *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data*, 3rd edition, OECD, Paris, www.oecd.org/sti/oslomannual.
- OECD (2009), *OECD Patent Statistics Manual*, OECD, Paris.

Cross-border ownership of inventions

Patent documents report the inventor(s) and the applicant(s) – the owner of the patent at the time of application – along with their addresses and countries of residence. A difference between the owners' and inventors' country of residence points to cross-border ownership of inventions. In most cases, cross-border ownership of inventions is mainly the result of activities of multinationals: the applicant is an international conglomerate and the inventors are employees of a foreign subsidiary.

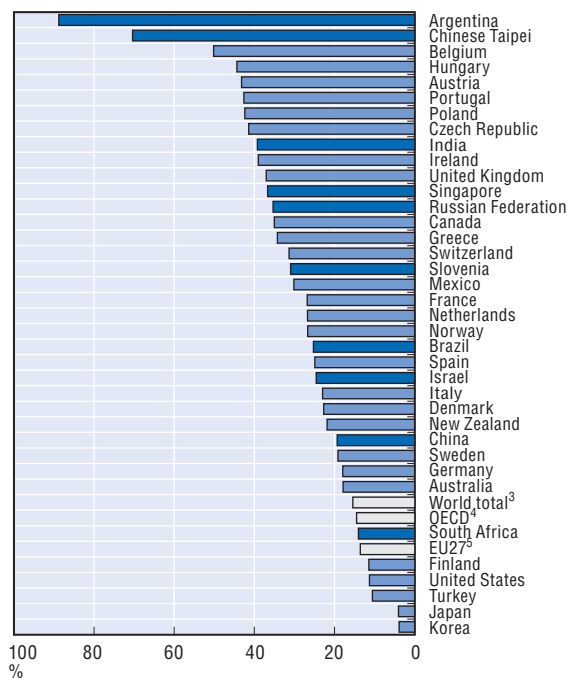
Foreign ownership of domestic inventions is one of the measures of globalisation of technological activities. It refers to the number of patents invented domestically and owned by non-residents in the total number of domestic inventions. It measures the extent to which foreign firms control domestic inventions. Obviously, what is considered foreign ownership in one inventor country implies a domestically owned invention abroad by firms in another country. Foreign ownership includes inventions in which the inventor country shares ownership (co-owned inventions), but this share is frequently a small part of the total of cross-border inventions.

Domestic ownership of inventions made abroad measures the extent to which domestic firms control inventions made by residents of other countries. It refers to patents that are the property of a country, but have at least one inventor located in a foreign country.

The use of patent indicators to measure globalisation of technology is not without shortcomings. Most of the caveats are related to the identification of companies' country of origin. The first concerns the financial context of the cross-border ownership. A patent invented abroad may mean an acquisition or merger rather than the setting up of a R&D laboratory. Patent databases do not register such changes in the ownership of patents. A second problem concerns the origin of subsidiaries. In some cases, the owner country reported may be not the country in which the company's headquarters are located but that of the subsidiary in charge of management of international intellectual property. In other cases, the company owing the invention may be the subsidiary and the address reported that of the host country (and not that of the headquarters).

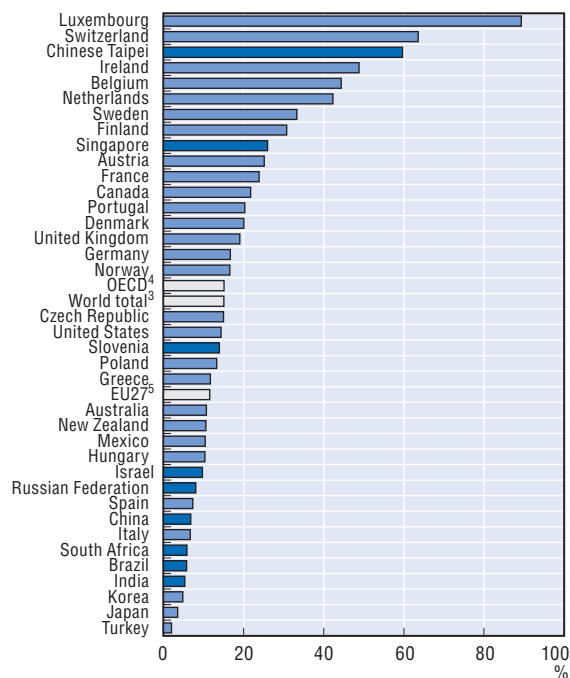
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Figure F.5.1. Foreign ownership of domestic inventions,¹ 2005-07



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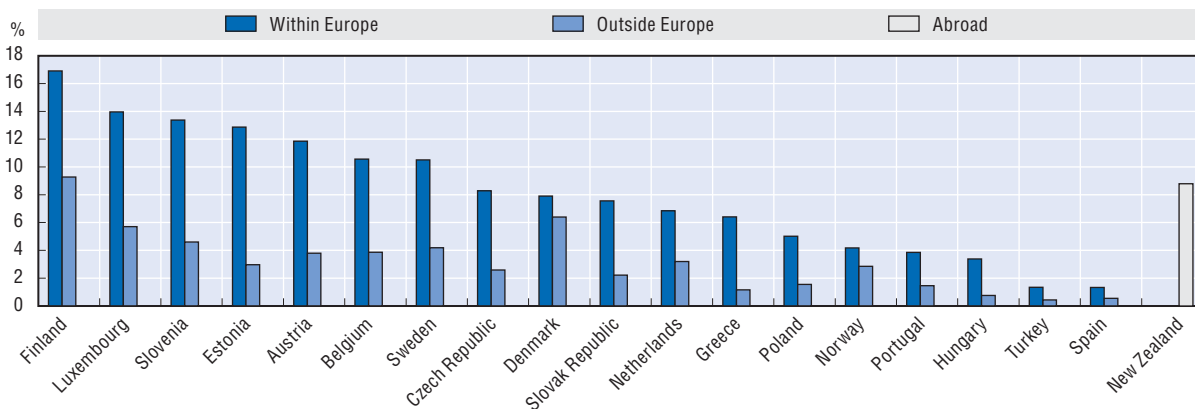
Figure F.5.2. Domestic ownership of inventions made abroad,² 2005-07



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Figure F.5.3. Firms in Europe with foreign collaboration on innovation, 2004-06

As a percentage of all firms

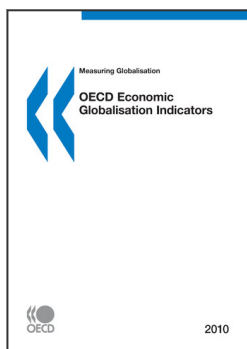


StatLink <http://dx.doi.org/10.1787/843215663712>

Note: Patent counts are based on patent applications filed under the Patent Co-operation Treaty (PCT), at international phase, by the priority date and the inventor's (respectively applicant's) country of residence.

1. Share of PCT patent applications owned by foreign residents in total patents invented domestically. Coverage: countries/economies with more than 200 PCT filings over the period.
2. Share of PCT patent applications invented abroad in total patents owned by country residents. Coverage: countries/economies with more than 200 PCT filings over the period.
3. All patents that involve international co-operation.
4. Patents of OECD residents that involve international co-operation.
5. The EU is treated as one country; intra-EU co-operation is excluded.

Information on data for Israel: <http://dx.doi.org/10.1787/888932315602>.



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