

## 4. CONNECTING TO GLOBAL RESEARCH

### 4.2. International research co-operation among regions

International research co-operation is unevenly distributed within countries, with a few regions accounting for most of the patents with foreign inventors. This suggests that a country's innovative capability depends on the ability of a very few of its regions to connect to global research networks.

Analysis of regional patenting helps to identify innovative regions that serve as important nodes of innovation networks. In 2004-06, the regional concentration of inventive activities was highest in large countries such as Australia (with an index of 92) and Canada (94), whereas Ireland (31) and Switzerland (28) showed the least concentration. In almost all countries, international co-invention of patents was slightly more concentrated in some regions than total patenting activity.

In the mid-2000s, among the top 20 collaborative regions in terms of the number of patents with at least one co-inventor located abroad, 11 were in the United States. However, none of the US regions remains in the top 20 when co-operation is measured in relative terms. The regions with the highest shares of patents with foreign co-inventors were mostly located in Europe. The high scores of the French regions (Haut-Rhin and Bas-Rhin) and the Swiss region of Basel-Landschaft can be ascribed to their geographical proximity: inventors from Haut-Rhin co-operate with German and Swiss inventors, mostly in companies located in Switzerland. The Belgian regions of Brussels and Vlaams Brabant tend to act as an innovation hub, with co-inventions between the main European countries and the United States. Outside Europe, the Indian state of Karnataka shows the largest share of international co-operation in its patenting activity (42%), mostly with US co-inventors.

#### Patents by regions

Breaking down patent data by region allows for a broad range of analyses to address issues relating to the regional dimension of inventive activities. The addresses of the inventors and applicants – as provided in the patent document – have been linked to regions at a very detailed level for most OECD countries, plus China and India.

The OECD has classified regions within each member country, based on two territorial levels. The higher level (territorial level 2 – TL2) consists of 335 large regions, while the lower level (territorial level 3 – TL3) is composed of 1 681 small regions.

All regions are defined within national borders and, in most cases, correspond to administrative regions. This classification, which for European countries is largely consistent with the Eurostat's Nomenclature of Territorial Units for Statistics (NUTS), facilitates comparisons between regions at the same territorial level. Indeed the two levels, which are officially established and relatively stable in all member countries, are used as a framework for implementing regional policies in most countries.

The geographic concentration index presented here is defined for the variable  $y$  as:

$$\left[ \sum_{i=1}^N |y_i - a_i| / 2 \right] \times 100$$

where  $y_i$  is the share of region  $i$  in the national total  $y$ ,  $a_i$  is the area of region  $i$  as a percentage of the country area, and  $N$  stands for the number of regions. The index ranges from 0 (no concentration) to 100 (maximum concentration) in all countries. Its value is affected by the size of regions, and differences in geographic concentration among countries may be partially due to differences in the average size of regions in each country.

#### Source

OECD, REGPAT Database, June 2009, [www.oecd.org/sti/ipr-statistics](http://www.oecd.org/sti/ipr-statistics).

#### Going further

Maraut, S., et al. (2008), "The OECD REGPAT Database: A Presentation", *OECD Science, Technology and Industry Working Papers 2008/2*, OECD, Paris, [www.oecd.org/sti/working-papers](http://www.oecd.org/sti/working-papers).

OECD (2009), *OECD Patent Statistics Manual*, OECD, Paris.

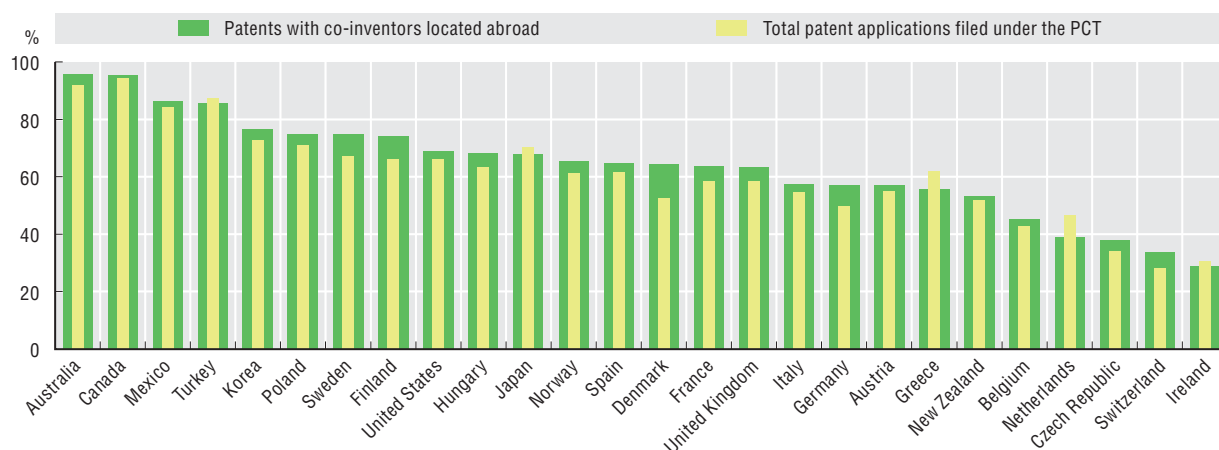
#### Figure notes

Counts are based on patent applications filed under the PCT, by priority date and inventor's region of residence, using simple counts.

The shares of international co-inventions by regions are measured as the share of PCT patent applications with at least one co-inventor located abroad in total patents invented by a given region.

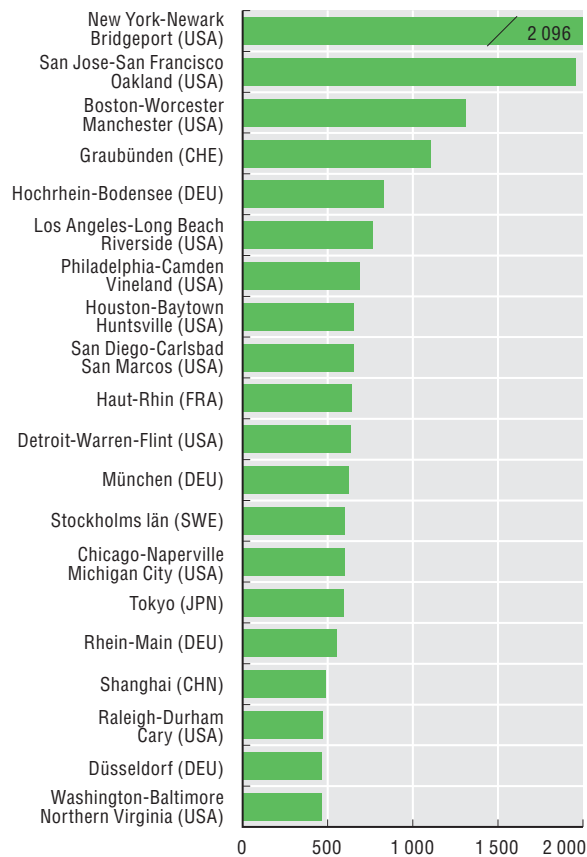
The list of top 20 regions cover regions with more than 250 PCT filings over 2004-06.

**Regional concentration of PCT patent applications with co-inventors located abroad, 2004-06**



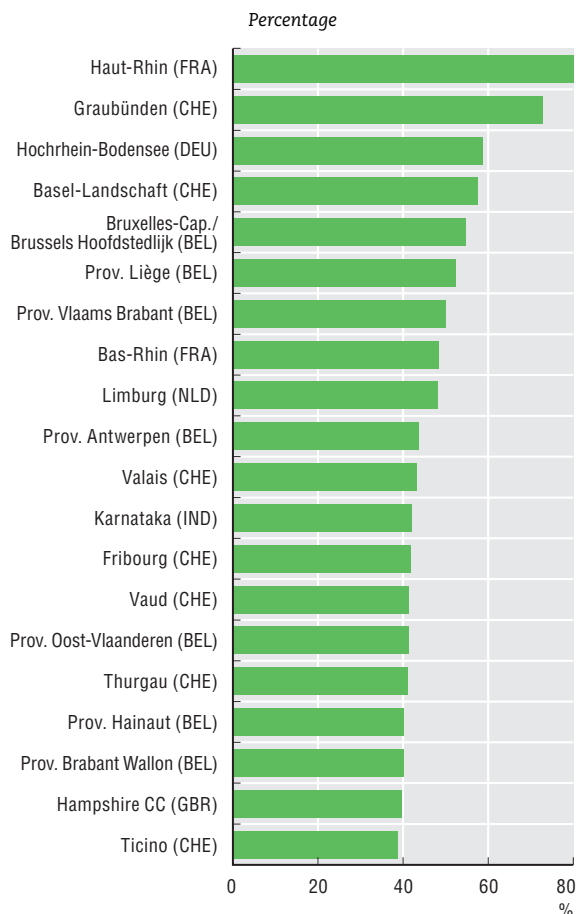
StatLink <http://dx.doi.org/10.1787/745700710022>

**Top 20 regions by number of PCT patents with co-inventors located abroad, 2004-06**

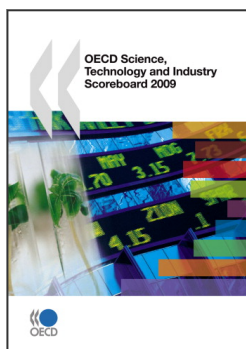


StatLink <http://dx.doi.org/10.1787/745710883872>

**Top 20 regions by share of PCT patents with co-inventors located abroad, 2004-06**



StatLink <http://dx.doi.org/10.1787/745716774063>



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