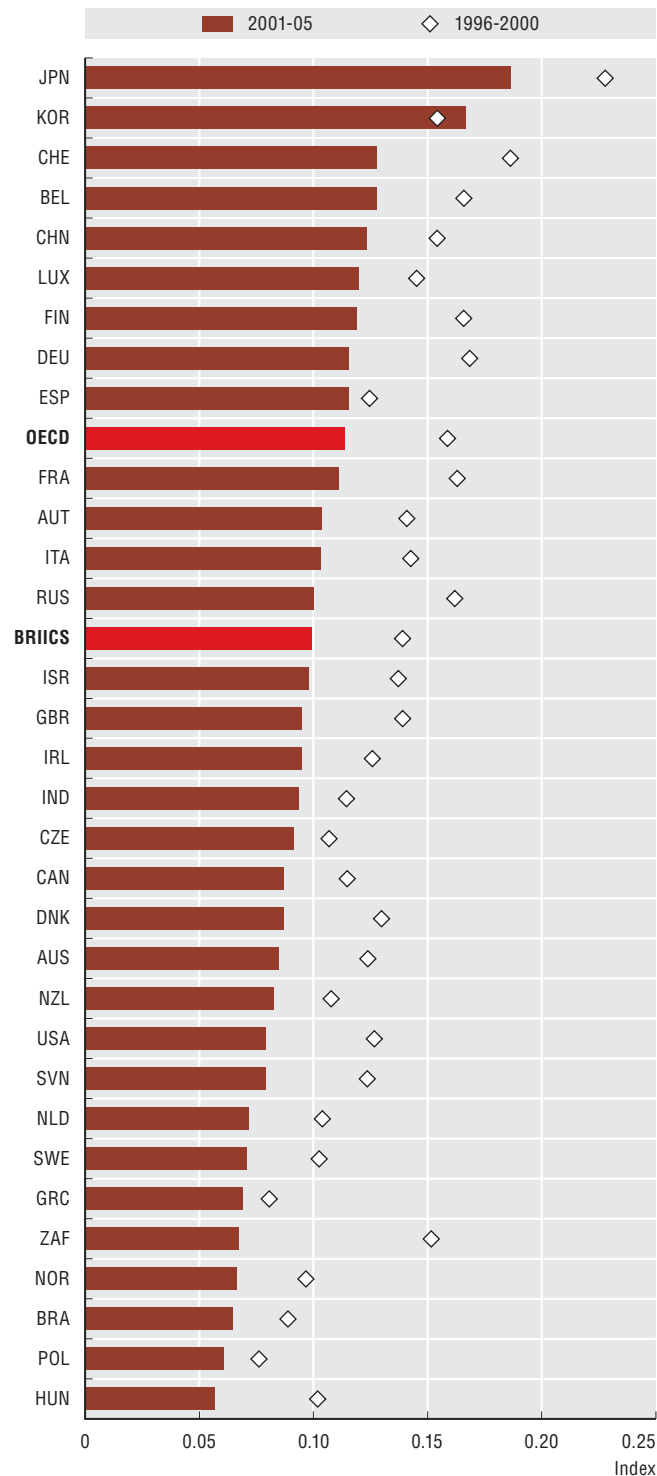


14. Technology performance: impact

Generality of patent applications, 1996-2000 and 2001-05

Average index based on patent applications to the EPO



Source: OECD, calculations based on the Worldwide Patent Statistical Database, EPO, April 2011. See chapter notes.

StatLink <http://dx.doi.org/10.1787/888932488236>

A number of indicators use information on the technological fields of patents based on the International Patent Classification (IPC) system and on the forward citations (citations a patent receives) and backward citations (patents and scientific papers a patent cites).

The “generality index” captures the range of 4-digit IPC technology classes covered by citing patents: the wider the range, the higher the index for the cited patent. Patents associated with a high generality index are relevant to later inventions spanning in several technology areas. Conversely, low index values mean that the citations received are concentrated in a few fields and reflect the technological specialisation of the cited patent.

The index of patent “scope” measures the breadth of the patented invention by counting the number of technology classes assigned to each patent during the patent examination. The larger the number of distinct 4-digit IPC classes, the broader the “scope” index. Finally, a third indicator aims to identify breakthrough inventions, defined as the top 1% of cited patents in each technology field for a given year’s cohort.

On average, patent generality differs across countries and has decreased over time in OECD and BRIICS economies (Brazil, the Russian Federation, India, Indonesia, China, South Africa) by almost 30% and 40%, respectively. In both periods considered, the highest values are more than twice the lowest values. There are also differences among top values: for instance, for patent applications published in 2001-05, Japan and Korea have 46% and 30% higher generality index values, respectively, than the third country, Switzerland.

The “scope” index varies much less and differences across countries are smaller. Except in a few countries, there is a general but moderate increase in patent scope over time.

Many countries generate breakthrough inventions. In both periods considered, the United States, Japan and Germany have a significant proportion of highly cited patents (about 70% in 1996-2000 and 60% in 2001-05). In recent years China and India have emerged and Korea has gained in importance.

Definitions

The generality index follows Hall and Trajtenberg (2004):

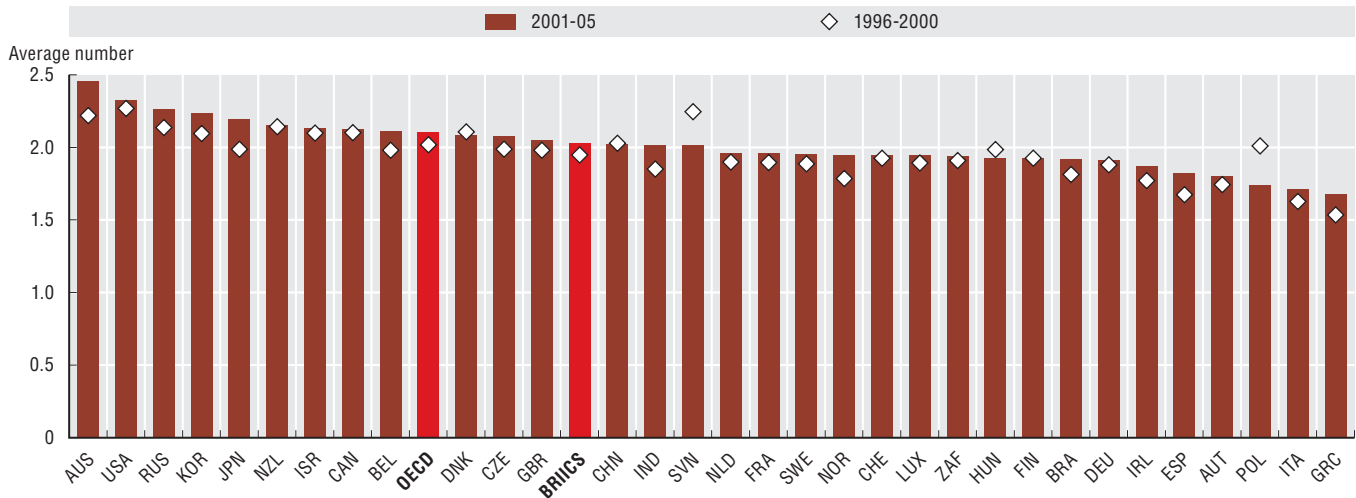
$$\text{Generality} \equiv G_i = 1 - \sum_j^{n_i} s_{ij}^2$$

where s_{ij} is the percentage of citations received by patent i belonging to patent class j out of n_i patent classes.

The scope index is based on Lerner (1994) and is the number of international patent classes to which a European Patent Office (EPO) patent is assigned. Breakthrough inventions are defined following Ahuja and Lampert (2001) as the top 1% of cited patents in each field and year. Technology fields are defined according to Schmoch’s classification (WIPO, 2010) and rely on the International Patent Classification codes in the patent document.

Patent scope by country, 1996-2000 and 2001-05

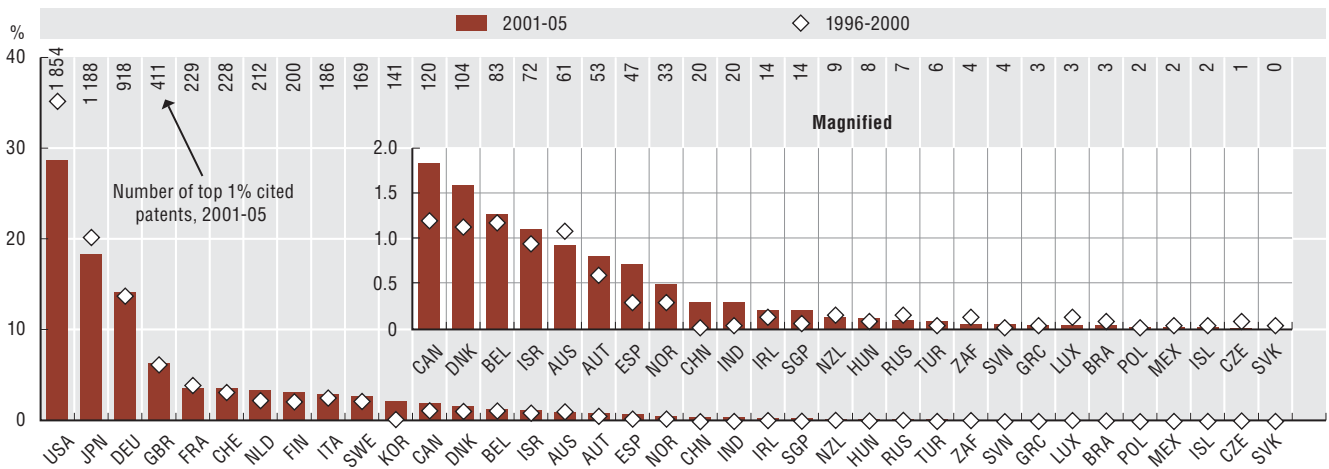
Average number of IPC classes per patent application to the EPO



Source: OECD, calculations based on the Worldwide Patent Statistical Database, EPO, April 2011. See chapter notes.

StatLink <http://dx.doi.org/10.1787/888932488255>**Highly cited patent applications to the EPO (top 1%), 1996-2000 and 2001-05**

As a share of all EPO patent applications in the top 1% in their field



Source: OECD, calculations based on the Worldwide Patent Statistical Database, EPO, April 2011.

StatLink <http://dx.doi.org/10.1787/888932488274>**Measurability**

The generality index is based on the Hirschman-Herfindahl Index (HHI) and relies on information concerning the number and distribution of citations received and the IPC classes of the patents these citations come from. Highly cited patents are computed by grouping all published applications by technology fields and year of publication. Applications belonging to more than one field are assigned to the field of the majority of its 4-digit IPC subclasses. Within each year's cohort, applications are weighted by the number of citations received up to five years after publication. The top 1% of patent applications are considered highly cited. For all three indicators, the values displayed are calculated as averages (shares in the case of breakthrough inventions) of the inventor's country and are based on all applications published in the period.



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