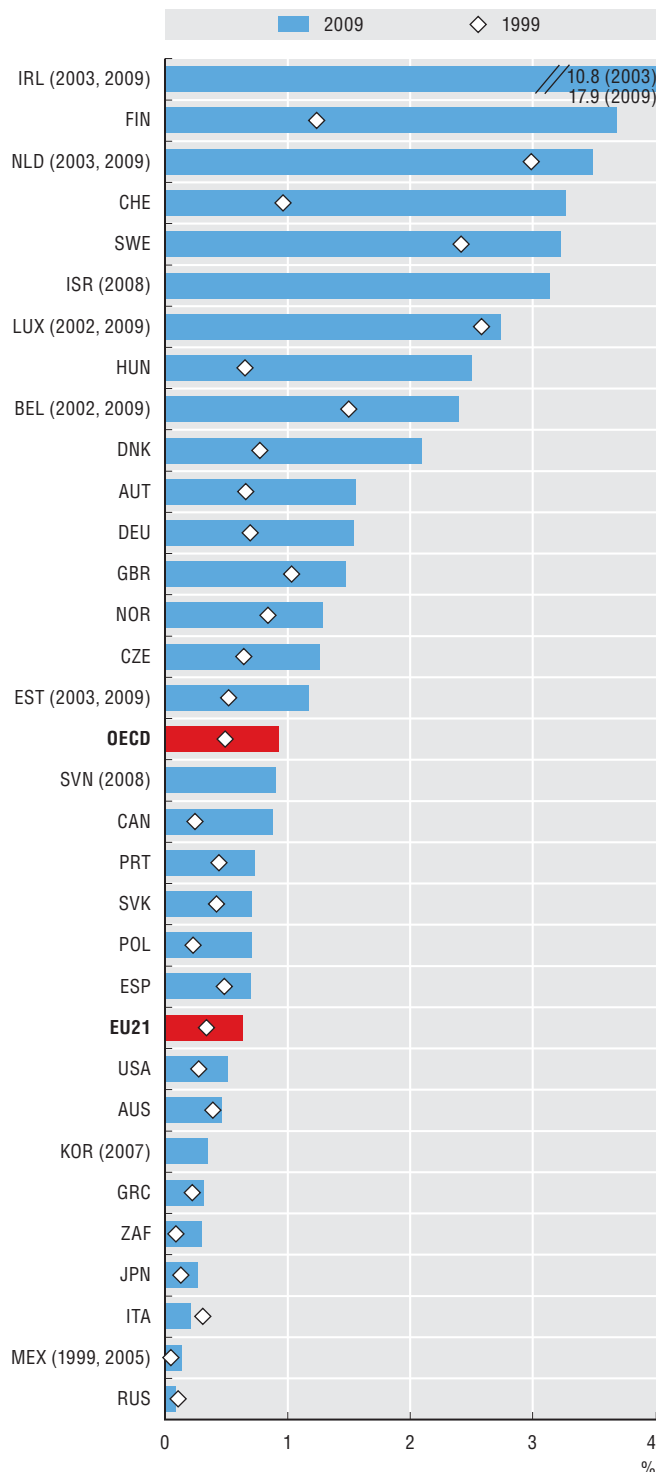


### 3. CONNECTING TO KNOWLEDGE

## 10. Technology flows

International technology flows (average of receipts and payments) as a percentage of GDP, 1999 and 2009



Source: OECD, Technology Balance of Payments Database, May 2011. See chapter notes.

StatLink <http://dx.doi.org/10.1787/888932486602>

Technology receipts from patents and licences and payments for R&D services are the main source of information on disembodied technology diffusion and indicate the internationalisation of technology flows.

These flows reflect to some extent cross-border trade in R&D outcomes. Unlike R&D expenditures, such payments are for production-ready technologies. Over the years, international technology flows have increased, showing that knowledge generated in one country is increasingly used in another. While it is not possible to distinguish between intra- (parents and affiliates) and inter-firms transactions, the figures point to the importance of foreign affiliates' activities. For instance, technology flows to and from Ireland are mainly due to the strong presence of foreign affiliates (particularly US and UK firms). The figures may however be affected by intra-firm transactions and transfer pricing.

Royalties are an important category of international technology flows. In almost all countries for which data are available, transactions involving royalties and licence fees grew on average more than the rate of GDP growth over the last decade. In the Russian Federation, China, Estonia and India, international flows of royalties increased by more than 20% annually between 1997 and 2009.

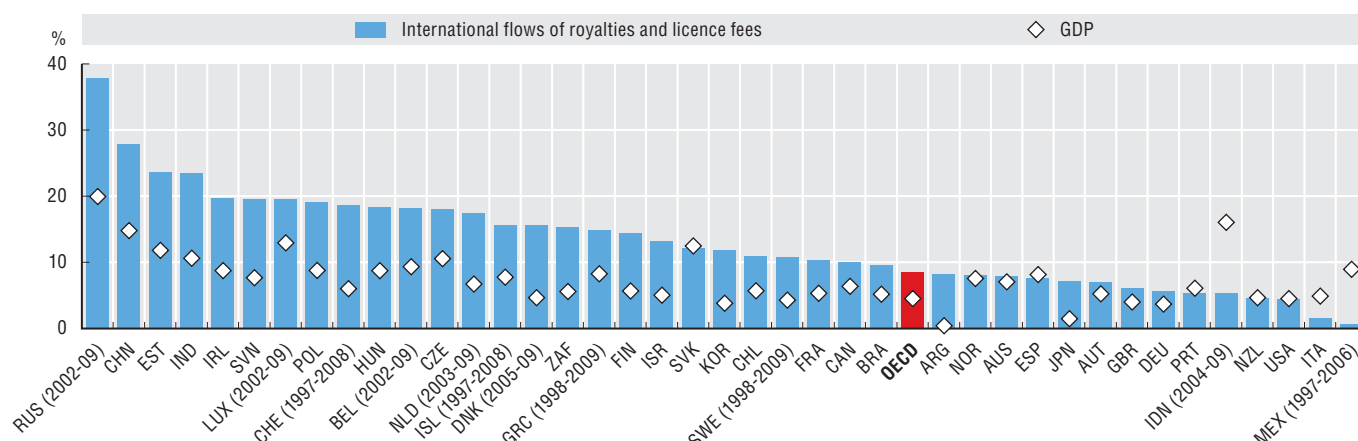
The rise in international technology flows shows that knowledge is increasingly implemented in a different country from the one in which it was developed. Many countries with a high share of patents invented by foreign businesses either have large multinational firms that perform R&D abroad or are low-tax countries with no track record of innovation activities. In this case, the intellectual property (IP) may be located there as a way to minimise taxes.

### Definitions

Technology flows refer to the average of technological payments and receipts. *Trade in technology* comprises four main categories: transfer of techniques (through patents and licences, disclosure of know-how); transfer (sale, licensing, franchising) of designs, trademarks and patterns; services with a technical content, including technical and engineering studies as well as technical assistance; industrial R&D. *Royalties and licence fees* are payments and receipts between residents and non-residents for the authorised use of intangible, non-produced, non-financial assets and proprietary rights (such as patents, copyrights, trademarks, industrial processes and franchises) and for the use, through licensing agreements, of produced originals or prototypes (such as manuscripts, cinematographic works and sound recordings). *Foreign inventions* refer to patents none of whose inventors resides in the country in which a resident owns the patent. Patent applications are filed through the Patent Cooperation Treaty (PCT) at international phase.

### International technology flows through royalties and licence fees, 1997-2009

Average annual growth rate, based on USD, percentage

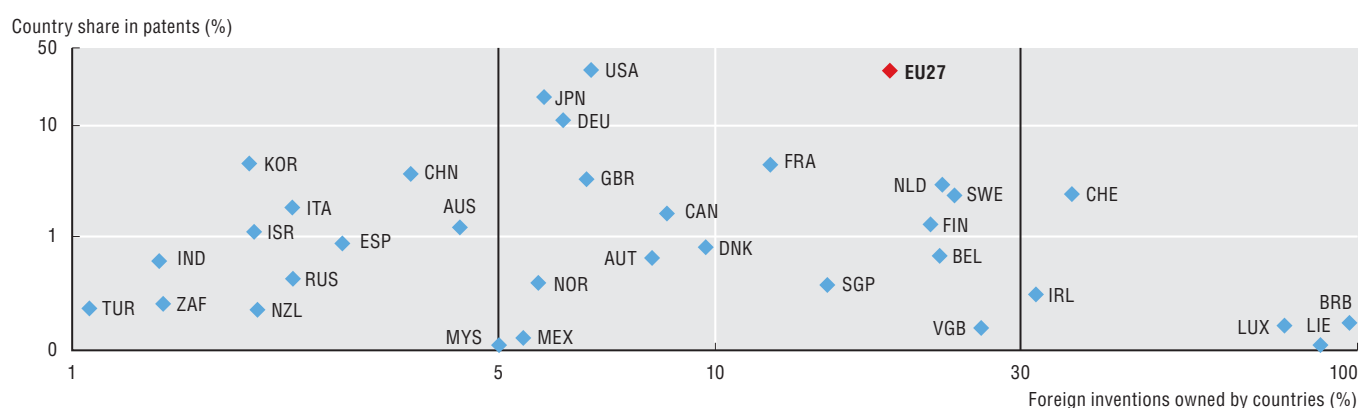


Source: OECD, Technology Balance of Payments Database, May 2011; OECD, Trade in Services Database, May 2011; World Bank, World Development Indicators, May 2011; and OECD, Annual National Accounts Database, May 2011.

StatLink <http://dx.doi.org/10.1787/888932486621>

### Foreign inventions owned by countries, 2006-08

Relative to country share in patent applications, percentages, axis in logarithmic scale



Source: OECD, Patent Database, May 2011. See chapter notes.

StatLink <http://dx.doi.org/10.1787/888932486640>

### Measurability

Technology receipts and payments show a country's ability to sell technology abroad and its use of foreign technologies, respectively. Further qualitative and quantitative information is needed to analyse a country's deficit or surplus since a deficit (surplus) on the technology balance does not necessarily indicate a lack (or presence) of competitiveness.

Measurement errors may lead to underestimation or overestimation of technology transfers. Licensing contracts provide payment channels other than technology payments, and payment/receipt flows may be only part of the total price paid and received. Alternatively, national tax and control regulations on technology payments and receipts may bias data on technology flows, notably for international transfers of multinationals. If royalties are less taxable than profits, royalties may be preferred to other transfer channels and exceed the value of technology transferred. On the contrary if limitations are imposed on royalty remittances, some part of repatriated profits will represent remuneration of technology transfer.

The location of patent ownership may reveal the importance of IP tax shifting and may indirectly reveal attractive tax incentives for IP revenue and tax planning strategies. However, the data currently available do not include revenue generated by patents. This limits the analysis that can be undertaken.



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