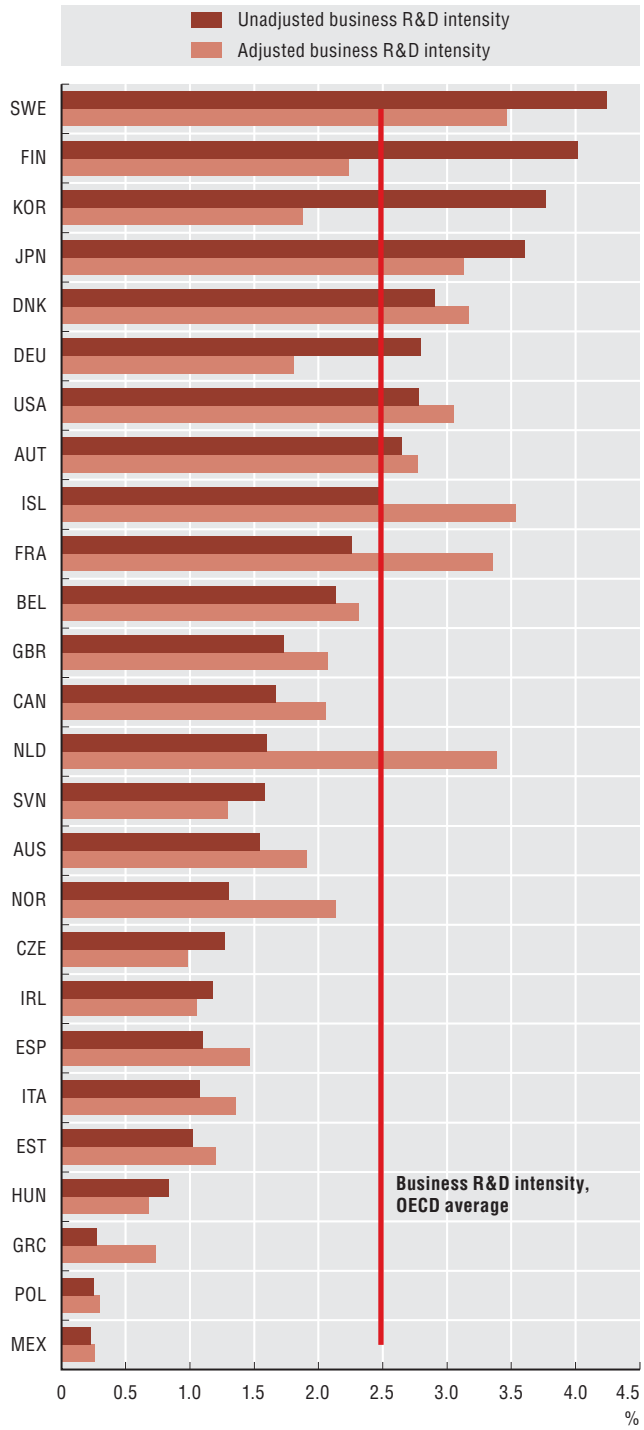
8. R&D specialisation

Business R&D intensity adjusted for industrial structure, 2008

As a percentage of value added in industry



Source: OECD, calculations based on the Structural Analysis (STAN) and ANBERD Databases, July 2011; OECD, Main Science and Technology Indicators Database, June 2011. See chapter notes.

StatLink http://dx.doi.org/10.1787/888932487913

When comparing total business research and development (R&D) intensity (R&D expenditure relative to value added or gross domestic product) across countries it is important to take into account differences in their industrial structure. While there is significant variation in R&D intensity within sectors, some sector-specific patterns make it very difficult for a country to raise its R&D intensity significantly without fundamentally changing its industrial structure. An understanding of the extent to which structural differences can account for observed differences in overall business R&D intensity can be achieved by constructing an indicator that shows what a country's total R&D intensity would be if it had the same industrial structure as the average for OECD countries.

In Finland, Germany and Korea, adjusted business R&D intensity would be below the OECD average of 2.5%: these economies are relatively specialised in high- and medium-high-technology industries such as information and communication technology (ICT) or motor vehicles. If France, Iceland and the Netherlands had an average OECD industry structure, their business R&D intensity would be higher. For countries in southern and eastern Europe and for Mexico, an industry structure closer to the OECD average would not raise their overall R&D intensity. This indicates that their business R&D is lower than average regardless of sectoral specialisation.

High-technology industries in Ireland, Finland, the United States and Iceland perform more than two-thirds of all manufacturing R&D, while medium-high-technology industries account for more than half of manufacturing R&D in the Czech Republic, Turkey, Germany and Austria. In Mexico, Australia, Estonia and Portugal, manufacturing R&D is still mainly concentrated in medium-low- and low-technology industries.

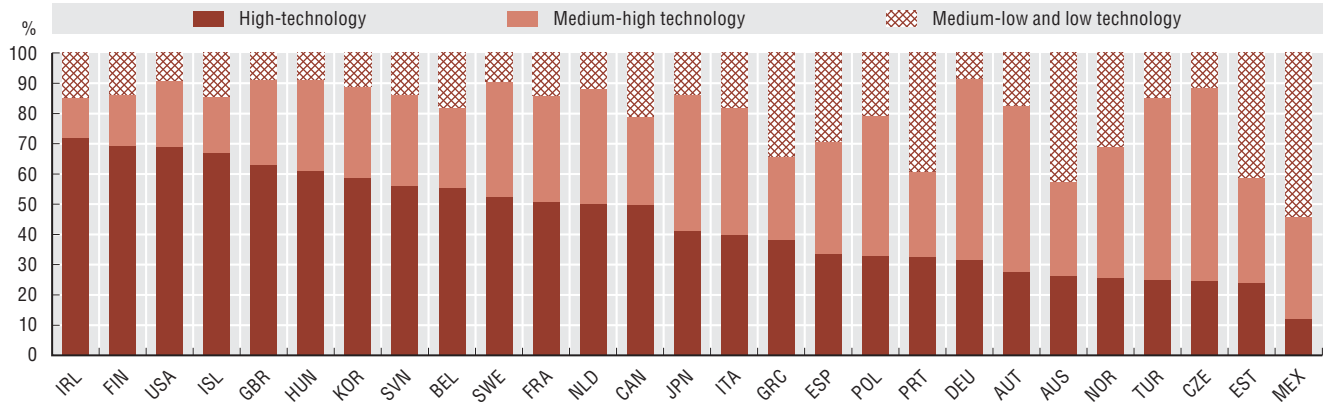
Many service industries are increasingly knowledge-intensive and R&D often plays a significant role. In most OECD countries services account for one-third or more of business R&D expenditure (BERD), a share that has increased over the last decade. Cross-country comparisons of the sectoral distribution of BERD should nonetheless be made with care owing to differences in how countries allocate R&D to various industries.

Definitions

R&D intensity adjusted for industry structure is a weighted average of the R&D intensities of a country's industrial sectors, using the OECD industrial structure's sector value added shares as weights instead of the actual shares used in the calculation of the unadjusted measure of R&D intensity. Manufacturing industries are classified by level of technology (high-, medium-high-, medium-low- and low-technology activities) on the basis of average OECD R&D intensity as revealed by R&D relative to value added and gross output statistics.

Business R&D in the manufacturing sector by technological intensity, 2008

As a percentage of manufacturing business enterprise R&D



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

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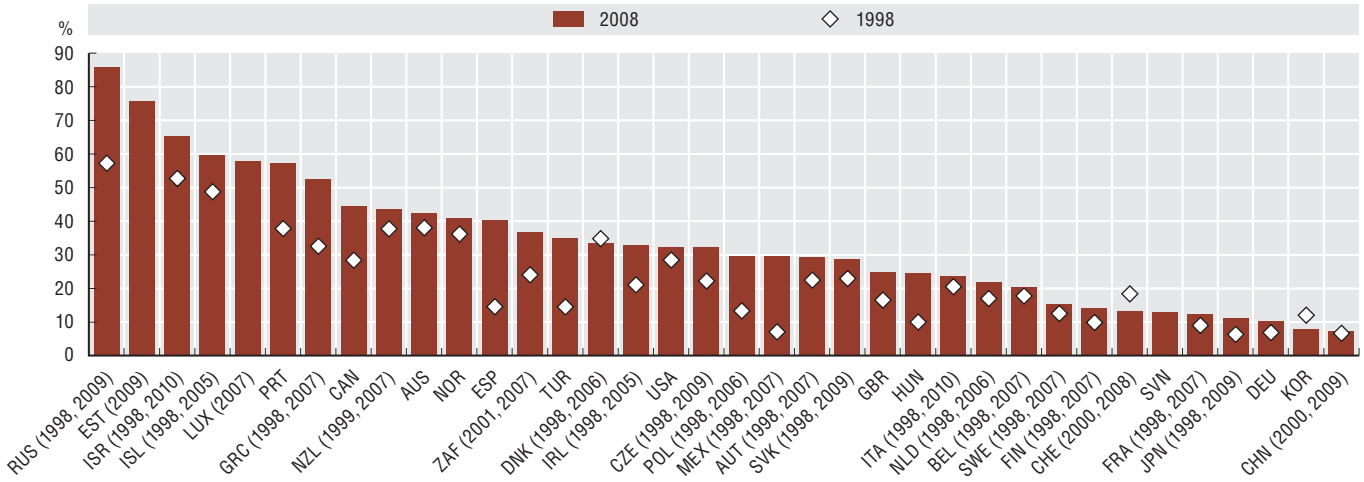
Share of services in business R&D, 1998 and 2008



Source: ANBERD Database, May 2011. See chapter notes.

StatLink http://dx.doi.org/10.1787/888932487951

Measurability

Allocating R&D by industry presents a number of challenges. Some countries adopt a "principal activity" approach whereby a firm's R&D expenditure is assigned to that firm's principal industrial activity code. Other countries collect information on R&D by "product field", so the R&D is assigned to the industries of final use, allowing reporting companies to break down expenditures across product fields when more than one applies. Many countries follow a combination of these approaches, as product breakdowns are often not required in short-form surveys. The *Frascati Manual* (2002) recommends following a main activity approach when classifying statistical units, but for firms carrying out significant R&D for several kinds of activities it recommends subdividing the R&D by units or product fields. This applies to all industry groups and, at a minimum, to the R&D industry (ISIC Rev. 3 Division 73), although not all countries follow this method. The ANBERD Database is based on the product field breakdown whenever countries can provide such information. This may cause comparability problems with countries that only report on the basis of the main activity.