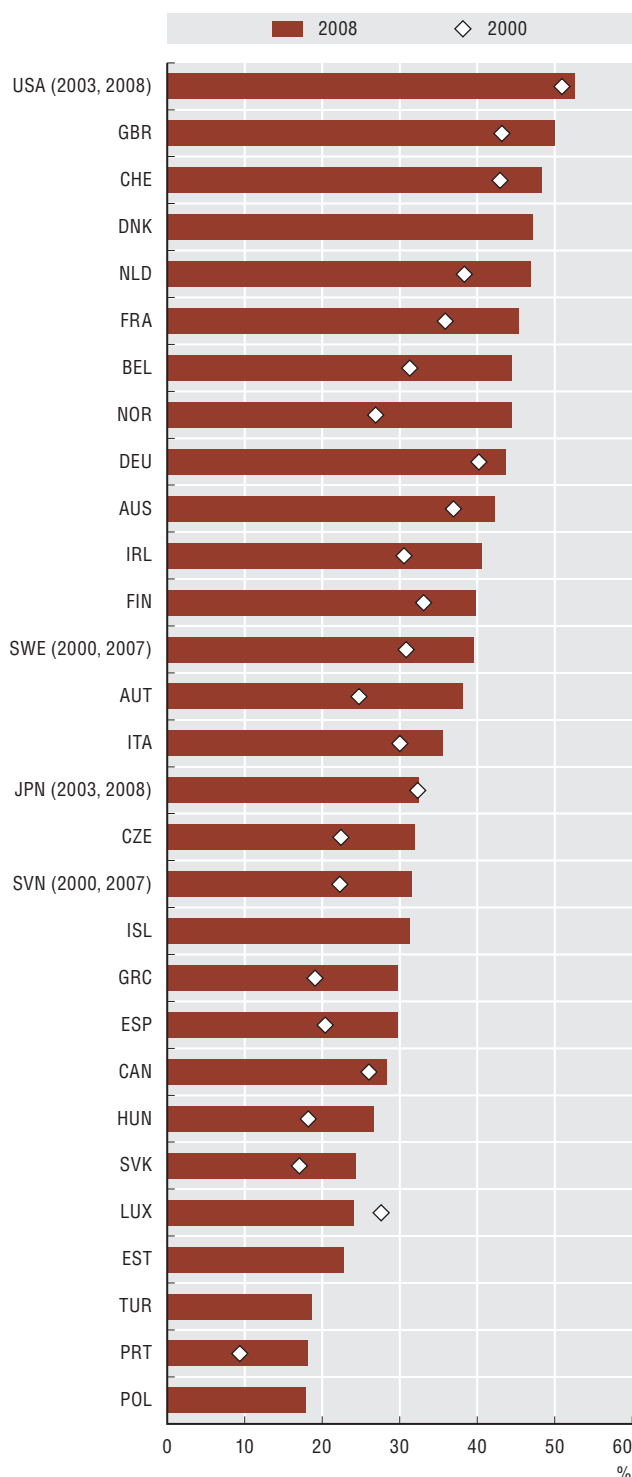


## 2. Services-manufacturing linkages

Services-related occupations in manufacturing,  
2000 and 2008

As a percentage of all employees in manufacturing



Source: OECD, calculations based on EU Labour Force Survey; US Current Population Survey; Australian, Canadian and Japanese Labour Force Surveys, May 2011. See chapter notes.

StatLink <http://dx.doi.org/10.1787/888932487609>

Manufacturing production in many OECD economies has declined in recent decades so that, on average, services now account for about 70% of OECD GDP. In fact, in the United States and the United Kingdom, employment in manufacturing industries is now less than 10% of total employment. As part of this general decline, the scope and nature of manufacturing has changed so that what was once dominated by skilled trades and vocations, machine operators, assembly line workers, etc., now relies increasingly on service occupations and service inputs. This reflects the increasing use of technology in production, international sourcing of more sophisticated intermediate inputs and a range of social factors (such as the changing skill composition of populations).

Measuring trends in the interdependence of services and manufacturing industries is not easy. However, the two indicators presented here suggest that for many countries, the share of service activities necessary for manufacturing production has increased in recent years.

Data on occupations show that in the last decade there has been a steady increase in the share of employees in the manufacturing sector who are employed in occupations that can be considered as services-related, such as management, business, finance and legal professionals. In 2008, on average, the share in the OECD area had reached about 35% although it varied between 18% (Poland) and 52% (United States).

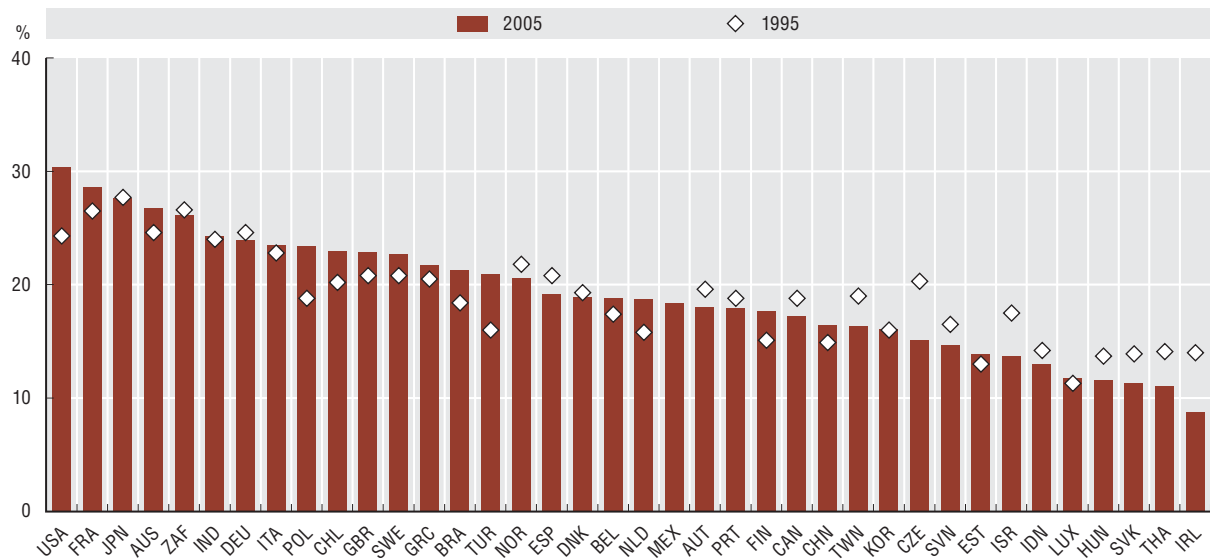
Estimates based on OECD's "harmonised" input-output tables can reveal the amount of services embodied in one unit of final demand for manufactured goods. The contribution of services value added needed to satisfy demand for manufactured products varies between 10 and 30% – again highlighting the symbiotic nature of the two sectors. Between 1995 and 2005, significant increases in total services embodied in manufacturing were evident in Poland, Turkey and the United States. Such changes over time may reflect a shift in industrial structures towards manufacturing products that are more service intensive.

## Definitions


Services related occupations are defined here as ISCO-88 major groups: 1. "Legislators, Senior Officials and Managers"; 2. "Professionals"; 3. "Technicians and Associate Professionals"; 4. "Clerks"; and 5. "Service workers and shop and market sales workers". Manufacturing refers to ISIC Rev. 3 (NACE Rev. 1) Divisions 15 to 37.

## Service sector value-added embodied in manufacturing output, 1995 and 2005

As a percentage of total value added of manufactured goods in final demand



Source: OECD, STAN Input-Output Database, May 2011.

StatLink  <http://dx.doi.org/10.1787/888932487628>**Measurability**

In an input-output framework, domestic services indirectly embodied in manufactured goods produced for final demand can be shown to be equal to:

$$v(I - A)^{-1} y'$$

where  $v$  is a  $1 \times n$  vector with components  $v_j$  (the ratio of value added to output in industry  $j$  for service industries and zero otherwise),  $y'$  is the  $1 \times n$  vector of domestically produced final demand with zero entries for non-manufacturing goods and services, and  $A$  is an input coefficient matrix describing the ratio of the inputs from industry  $i$  used to make the output of industry  $j$ .

Similarly, imported services embodied in manufactured goods is defined as:

$$m(I - A)^{-1} y'$$

where  $m$  is a  $1 \times n$  vector with components of import ratio for service industries and zero otherwise.

Thus, the percentage of final demand in manufactured goods that reflects services sector value added of domestic origin and from imports can be calculated thus:

$$v(I - A)^{-1} y' / \sum y' \text{ and } m(I - A)^{-1} y' / \sum y'.$$

Considering domestically sourced and imported services separately reveals widespread increases in the presence of imported services embodied in domestic manufacturing output, albeit from a low level of about 2%.



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