UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

Inclusive and Sustainable Industrial Development Working Paper Series
WP 11 | 2016

INCREASING FRAGMENTATION AND GLOBALIZATION OF MANUFACTURING PRODUCTION PROCESSES AND THE IMPACT ON INDUSTRIAL STATISTICS - THE EUROPEAN CONTEXT

DEPARTMENT OF POLICY, RESEARCH AND STATISTICS

WORKING PAPER 11/2016

Increasing fragmentation and globalization of manufacturing production processes and the impact on industrial statistics
The European context

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Vienna, 2016

Acknowledgements

The authors would like to express their sincere gratitude to Steven Landefeld for his review of the paper, and to Ludovico Alcorta for his valuable feedback. Their comments helped improve the paper significantly. Final technical editing was carried out by Shohreh Mirzaei Yeganeh. The paper was edited and formatted by Niki Rodousakis.

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List of Acronyms and abbreviations

BRIC	Brazil, Russian Federation, India, China
CPA	Classification of Products by Activity
CPC	Central Product Classification
ERM	European Restructuring Monitor
EU	European Union
GDP	Gross Domestic Product
HMT	High- and medium high-technology
ICT	Information and communications technologies
IS	International Sourcing
ISIC	International Standard Industrial Classification of all economic activities
ISID	Inclusive and Sustainable Industrial Development
IT	Information Technology
KIS	Knowledge intensive services
LMT	Low- and medium-low-technology
MNEs	Multinational Enterprises
MVA	Manufacturing Value Added
NACE	Statistical classification of economic activities in the European Community
NOS	National Organizations Survey
OECD	Organisation for Economic Co-operation and Development
R&D	Research and Development
UNIDO	United Nations Industrial Development Organization
WIOD	World Input-Output Database

Introduction

Since the economic crisis in 2008, the trend of de-industrialization in industrialized economies has been of major concern for policymakers, especially in Europe. Europe has faced a consistently declining trend of manufacturing with respect to its contribution to the overall economy. But has the role of manufacturing really diminished in industrialized economies? Or is the trend attributable to more fundamental developments related to globalization and underlying problems of economic accounting?

The decline of manufacturing in industrialized economies is apparent at first glance. Several factors have accelerated this trend. With the rise in household income in developed countries, domestic demand for services has grown significantly. Due to the decrease in transaction costs, manufacturing activities gradually shifted to developing economies where low labour costs provide an additional advantage. Another factor driving this development is increasing demand for capital investment as developing countries seek to catch up to the level of industrialization achieved by developed countries. Some economists argue that the manufacturing sector—under present circumstances—is more relevant in developing economies in terms of economic growth than in industrialized countries. The recent global financial crisis, however, has proven this argument to be incorrect. Economies whose share of the services sector, especially financial sectors, in total economy was excessive in pre-crisis period showing the dependency of manufacturing for sustainable economic growth and job creation in industrialized countries.

Policymakers in Europe and North America have again turned their attention to manufacturing to stimulate economic growth and generate employment on the path to recovery from the economic crisis. The European Industrial Policy aims to reverse the declining trend of manufacturing and increase its share in GDP. The United States has introduced the White House Office of Manufacturing Policy with an emphasis on supporting the manufacturing sector to innovate at home and compete globally. Renewed interest in manufacturing has raised the expectation of many nations to change their course towards inclusive and sustainable industrial development (ISID). Many developing countries are aligning their industrial policy to ISID with technical assistance from UNIDO. While governments are again focusing on industrial policy and have put manufacturing on top of their agenda, the problem of measurement remains unresolved. In this paper, we discuss the origin and impact of unbundling of manufacturing into various business functions and argue that traditional business statistics do not adequately cover service activities that support and facilitate core production activities. This has led to an underestimation of the contribution of manufacturing to GDP as well as to total employment.

The unbundling of manufacturing started more than a century ago with the development of cross-country transportation via ships and railways. The major impact of unbundling at that stage was spatial separation of production and consumption, which considerably increased the prospects of international trade. However, the unbundling of manufacturing at the current ratio is driven by the digital revolution. ICT and the increased digitalization of services has made it possible for the core production unit and the service providers to be established at different spatial locations. Essentially, a fragmentation of production processes has taken place. The impact of fragmentation on business statistics is further complicated by the fact that production units and service providers may even be located in different economic territories. In current practice, GDP comprises the gross value added of all activity units located within the economic boundaries of a given country. Accordingly, the value of services produced to support the production function of the respective entity may be accounted in the GDP of another country. A precise estimate of the contribution from various business functions can only be obtained on the basis of a cross-country industrial survey of entities that have outsourced different business functions abroad.

Given its overall mandate of promoting global industrialization, UNIDO has been closely monitoring recent developments in world manufacturing. According to the Industrial Development Report 2013, the loss of manufacturing jobs in core production activities in industrialized economies has been compensated by gains in employment in activities serving the manufacturing sector. Since the 2008 financial crisis, the general perception of the role and significance of manufacturing has changed. Manufacturing is widely recognized as the engine of economic growth and industrial policy is thus back at the top of the agenda. These developments require an adequate response from statisticians to improve the economic measures of industrial activities. This paper addresses some of the gaps in current business statistics and describes possible ways forward to overcome these gaps. It proposes a long-term strategy for developing statistical methods and producing up-to-date statistics that reflect the ways manufacturing enterprises organize their production processes domestically as well as globally.

1. Development of manufacturing and business-related services

The rapid diffusion of information and communication technologies (ICT) has considerably accelerated the spatial fragmentation of production processes globally since the mid-1990s. Other notable factors of fragmentation are decreasing transaction costs, especially transportation costs, and the opening of new markets in emerging industrial economies, especially China, India and other Asian countries. This process has been driven by an externalization of support

functions to dedicated services companies or affiliates and a delocalization of the core functions of manufacturing enterprises in Europe and North America. Due to ICT and the increased digitalization of services, service providers do not necessarily need to be located close to the manufacturing company utilizing the service in question, but can be located spatially independent from the user. The increased international sourcing of services and support functions from European and American manufacturing companies to companies in developing countries is an illustration of this development, which has accelerated in the last decades, in particular.

The business statistics produced by national statistical offices take a traditional focus of the manufacturing industry, but the increased use and integration of services in manufacturing production processes, on the one hand, and increased fragmentation of the production processes, on the other, partially necessitate the expansion of the statistical coverage of business statistics to also include manufacturing-related services, i.e. service activities supporting and facilitating the production process, but also to establish statistical coverage of cross-border activities and relations other than traditional arm's length transactions. This expansion in scope is necessary in order to develop the evidence base for future policymaking, as the economic performance and competitiveness of manufacturing enterprises are closely related to the input and use of services in the different stages of the value chain. Many of these manufacturing-related services are provided by independent service providers, but many services are also provided by internal service divisions of (multinational) manufacturing companies.

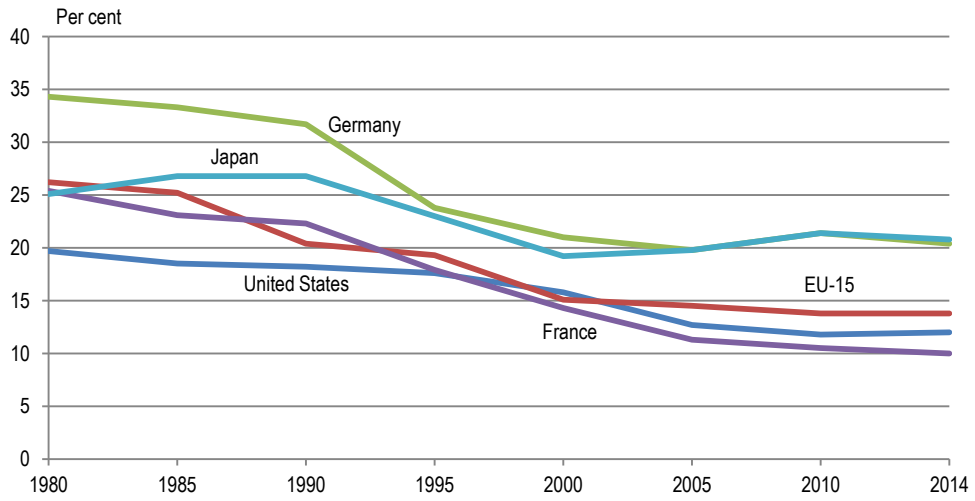
We analyse the decrease in employment and value added generation in the manufacturing sector in Europe and the U.S. by evaluating the factors driving this development, including the externalization of service support functions from manufacturing enterprises to dedicated service enterprises, either domestic or foreign, as well as the spatial externalization in terms of either the movement of functions, such as the core production function currently being performed domestically in Europe or the U.S. to low cost destinations in developing economies such as China or India, or by expanding manufacturing activities in existing affiliates located abroad.

Due to the mentioned data gaps, this development will be mainly analysed from a European perspective by reason of the availability of official statistics on international sourcing, which provide detailed insights into the process of global fragmentation of manufacturing enterprises' value chains.

1.1 Declining share of manufacturing output in industrialized economies

An ongoing discourse in industrialized economies, especially in the U.S. and the European Union, has focused on the continuous deindustrialization of these economies for several decades. Since the 1980s, the share of MVA has consistently fallen in industrialized economies. In the 1980s, manufacturing accounted for one-fifth of GDP in the U.S. and a quarter of GDP in Japan and the European Union (see Figure 1). Prior to reunification, MVA contributed one-third of the GDP of the Federal Republic of Germany. While Germany and Japan still maintain a relatively higher level of manufacturing output, its share in other industrialized countries has dropped below 15 per cent. Most of this decline occurred between 1985 and 2005. This was the period when the outsourcing of manufacturing production accelerated in the U.S. Around the same time, the countries of Central and Eastern Europe moved away from central planning and embraced the market economy, paving the way for massive foreign investment. These changes prompted manufacturing companies in industrialized countries to shift their core production activities from previous locations.

Figure 1 **Share of MVA in GDP of the EU-15 and major industrialized economies, at constant prices 2005, 1980-2014**



Source: International Yearbook of Industrial Statistics; UNIDO Database

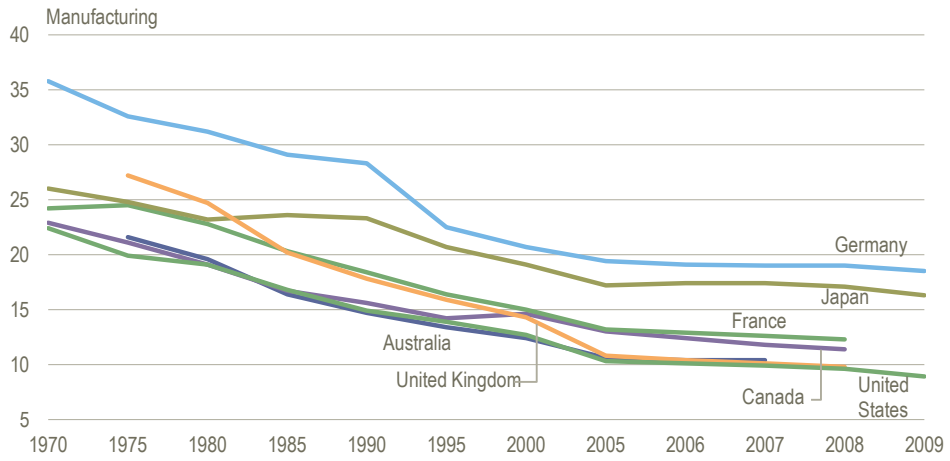
While the production function shifted to the countries of outsource, several support functions remained in the countries of origin, at least in the beginning. This swiftly altered the position of the production and service sectors relative to GDP. In combination with other services that were already increasing due to growing household income, the service sector in general assumed a higher position.

1.2 Job losses in manufacturing

The decline in production has had a heavy toll on employment. In 1970, the manufacturing sector comprised close to one-fourth of total employment in the largest industrialized economies. Germany was an exception, with a manufacturing share of nearly 36 per cent of total employment (see Figure 2). In the 1980s in particular, the manufacturing sector lost significance as a major job creating sector. This development has since continued and in 2008, shortly before the outbreak of the global financial crisis, the manufacturing sector's share had dropped to 9.6 per cent of total employment in the U.S. followed by 9.8 per cent in the United Kingdom. Only in Germany (19.0 per cent) and Japan (17.1 per cent) did manufacturing hold its position and continues to account for a relatively large share of total employment.

The manufacturing sector employed 39.8 million persons in the currently 28 member states of the European Union[1] or 20 per cent of total employment in 1995 (see Figure 2). Employment in manufacturing continuously decreased during the 2000s, down to 36.8 million persons employed in the manufacturing sector in 2008. The decline was further accelerated by the financial crisis and dropped to 33.7 million in 2010 – or a decrease of 3.1 million persons (or 8.4 per cent) employed in the manufacturing sector within only two years. Moreover, the relative importance of the manufacturing sector within the EU decreased to 16.2 per cent in 2008 and even further to 15.1 per cent by 2010.

Figure 2 Employment in manufacturing as a share of the total economy, 1970-2009



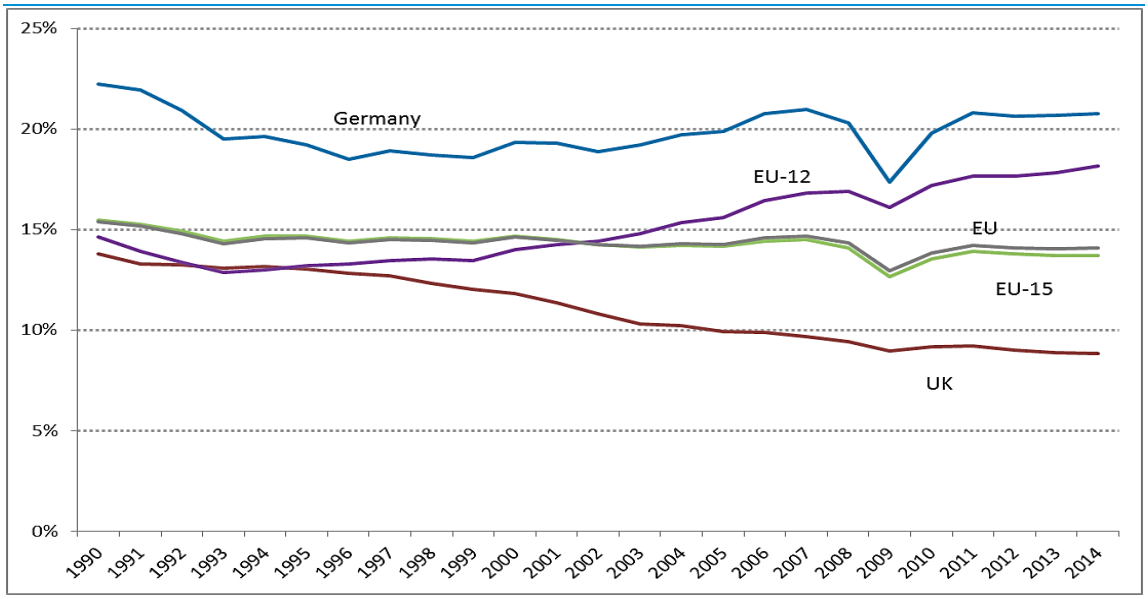
Source: OECD STAN indicators

[1] The following 28 countries are member of the European Union: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, United Kingdom.

1.3 European scenario

The manufacturing sector in the 28 member states of the European Union recorded a value added of US$ 1,618 billion in 1990, which was more than one-third of global MVA. This share decreased continuously during the 2000s and dropped below one-quarter of global MVA after the financial crisis of 2008. Recent estimates show that the European Union currently accounts for 23.0 per cent of world MVA, down from 34.0 per cent in 1990.

Figure 3 Share of MVA in GDP of major European economies at constant prices 2005, 1990-2014

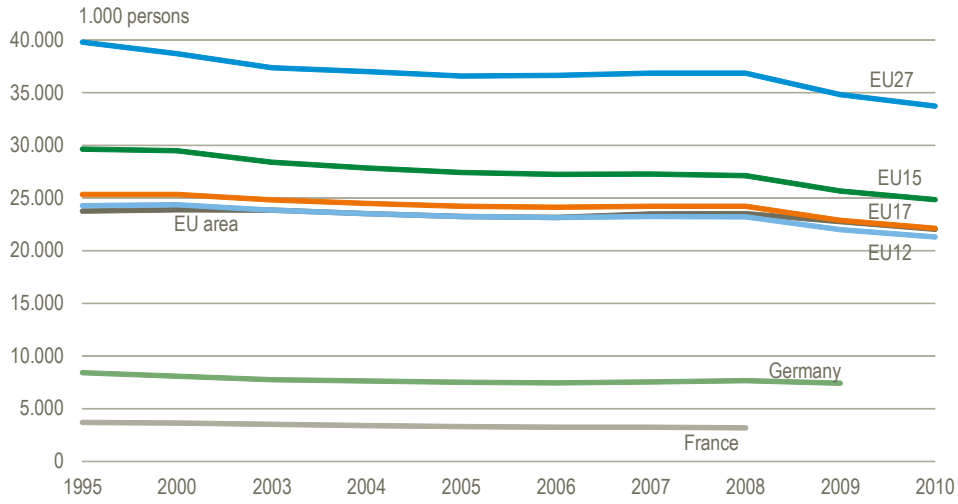


Source: UNIDO database

Since 1990, the share of MVA in the EU-15, which accounts for 90 per cent of MVA of all European Union member states, has consistently fallen. In 2014, the contribution of manufacturing to GDP was 13.8 per cent. Germany, which contributes 30 per cent of MVA of the European Union's total, was an exception to the general declining trend. It recorded a more than 20 per cent share of MVA in GDP between 1995 and 2008. However, after the financial crisis, Germany's MVA share sharply dropped to 17.1 per cent, which in the meantime has been largely recovered and remains stable at 20 per cent. The other large European economies such as France, Italy and the United Kingdom also registered a declining share of MVA in GDP. The EU member states of Central and Eastern Europe, which have benefitted from the outsourcing of the production function of manufacturing enterprises from the EU-15, have maintained a higher level of MVA share in GDP. The share of manufacturing is more than 20 per cent in the economies of the Czech Republic, Hungary, Poland and Slovenia.

The development has been particularly noticeable in the EU-15[2], with employment in manufacturing dropping from 29.6 million persons in 1995 to 24.9 million persons in 2010 – or a decrease of 4.7 million out of a total employment loss of 6.1 million persons in the European manufacturing sector in the period 1995 to 2010. Germany, the EU's manufacturing centre, lost 1 million manufacturing jobs – or more than 16 per cent of all manufacturing jobs lost in the EU in the period 1995 to 2009. In the same period, France lost 0.5 million jobs, a decrease of 13.5 per cent compared to an 11.9 per cent decrease for Germany's manufacturing sector (see Figure 4).

Figure 4 Employment in manufacturing in the EU, 1995-2010



Source: Eurostat: National Accounts

As the value chains of manufacturing are increasingly being bundled with services, the development of manufacturing cannot be analysed on its own, i.e. the analytical scope must be broadened to include business-related services[3] as well. The most essential feature of business-related services is that they are present in—and integrated into—every stage of the value chain. They are a fundamental necessity for the performance of any enterprise activity, whether in manufacturing or services, micro or large enterprises. All enterprises need services to produce, sell or distribute their outputs and to stay competitive. A large variety of services are consumed

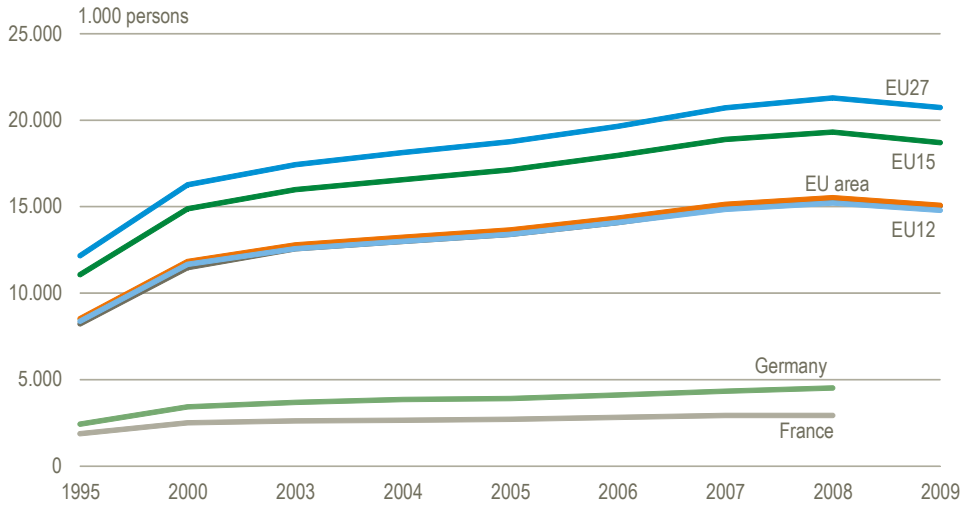
[2] The EU-15 refers to the group of countries that were members prior to EU enlargement in May 2004: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

[3] Business-related services covers the following industries, defined by ISIC Rev. 4/NACE Rev.2: IT and other information services (Divisions 62 +63), Legal, accounting, management, architecture, engineering, technical testing and analysis activities (Divisions 69 to 71), Scientific research and development (Division 72), Other professional, scientific and technical activities (Divisions 73 to 75) and Administrative and support service activities (Divisions 77 to 82).

throughout the different phases of the supply chain, e.g. R&D and design services in the pre-production phase, ICT services in the production phase and marketing in the post-production phase.

Employment in business-related services within the EU increased from 14.8 million persons in 1995 to 25.5 million persons in 2009 – or an increase of 10.7 million persons (see Figure 5). Consequently, the share of business-related services rose from 7.4 per cent of total employment in the 28 EU member states to 11.5 per cent in 2009. In the manufacturing stronghold Germany, business-related services grew by 2.1 million persons in the period 1995 to 2008 – or an increase of nearly 90 per cent compared to an 11.9 per cent decrease of manufacturing. The growth of business-related services can partly be explained by an externalization of support services functions previously carried out within manufacturing enterprises, and partly by the rising demand for such services and the development of new services, especially ICT enabled services.

Figure 5 Employment in business-related services in the EU, 1995-2009



Source: Eurostat: National Accounts

Unfortunately, no statistical evidence on the magnitude of externalization of support services from manufacturing enterprises is available, but an indication can be found in the European ad hoc survey on domestic and international sourcing. Of the approximately 15,000 manufacturing enterprises with more than 100 employees in the 15 countries participating in the survey, 14 per cent sourced their service support functions domestically in the period 2009 to 2011. This was the case in particular for manufacturing enterprises in Ireland (63 per cent of all manufacturing enterprises), Latvia (42 per cent) and Finland (38 per cent) – countries which were hit relatively

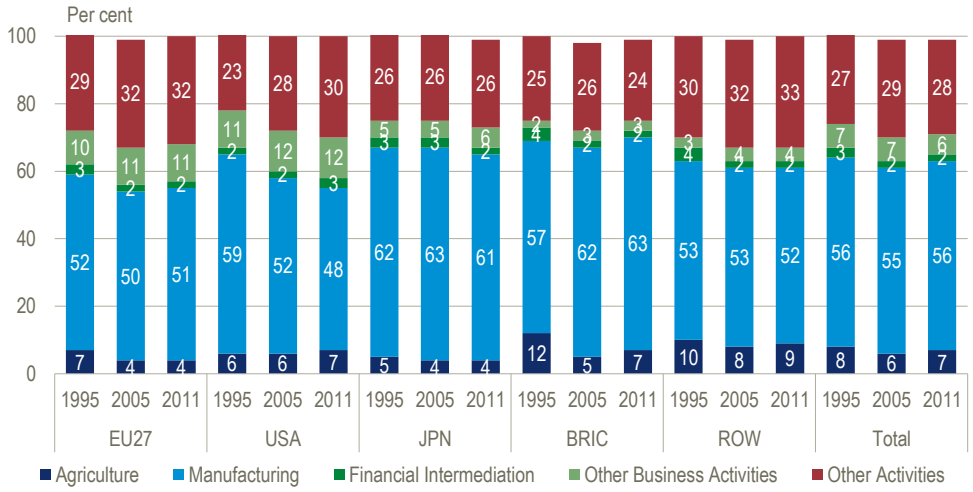
hard by the financial crisis of 2008. An externalization of service support functions from manufacturing enterprises is clearly taking place, although the full magnitude in terms of the number of jobs cannot be determined, as this process is not captured by official statistics.

2. Interaction between manufacturing and business-related services

The manufacturing sector's inputs derive from the sector itself, with 56 per cent of total inputs being used for global production in 2011. There are huge geographical differences in manufacturing input. The most industrialized economies such as the U.S. (48 per cent) and the EU (51 per cent), in particular, show relatively smaller shares of manufacturing inputs to their manufacturing sector in contrast to the emerging manufacturing sector in the BRIC countries (63 per cent), which recorded the largest share of manufacturing inputs (see Figure 6).

Business services comprise 11 per cent to 12 per cent of all inputs to manufacturing in the EU and the U.S., while they only make up 3 per cent of total inputs to manufacturing in BRIC. In general, the share of business services of the total input to manufacturing remained stable during the period 1995 to 2011.

Figure 6 Inputs to manufacturing sector, 1995-2011. Selected countries or groups of countries

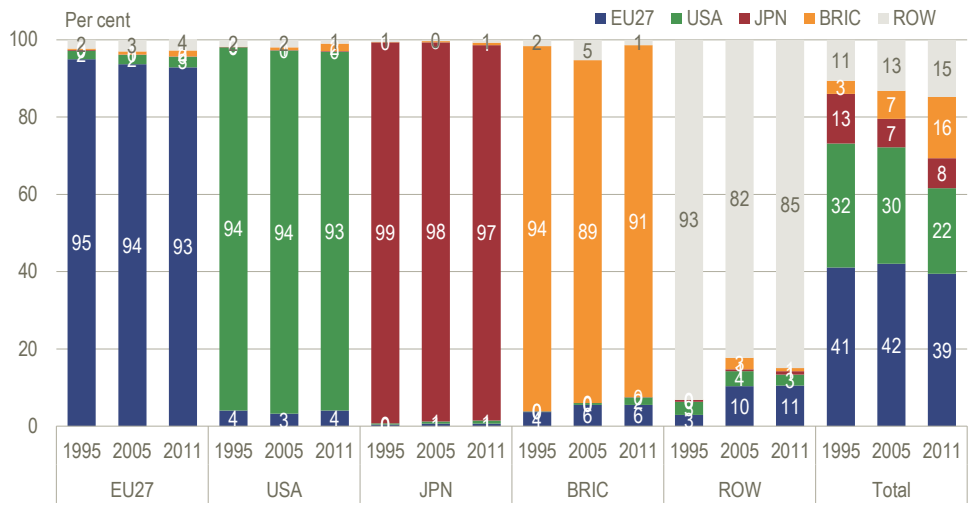


Source: World Input-Output Database (WIOD)

Developments in the geographical origin of the total input of business services to global manufacturing in the period 1995 to 2011 shows that while nearly 75 per cent of all business services consumed by the manufacturing sector in 1995 were produced by the most developed countries (U.S. and EU), this share fell to 61 per cent in 2011 (see Figure 7). The opposite development took place in the BRIC countries, where the share of business services produced in

these countries grew from 3 per cent to 16 per cent, reflecting mainly the increasing share of global manufacturing production located in these countries and but also the increased offshoring of service functions from developed economies to developing economies.

Figure 7 **Business service inputs to manufacturing, 1995-2011. Broken down by geographical origin**



Source: World Input-Output Database (WIOD)

3. The concept of business functions

Business functions can be defined as an aggregation of specific tasks/ products carried out by the enterprise. They are equally applicable to goods-producing and services-producing enterprises. The concept is similar to the concept of occupations, but focuses on business activities rather than the activities of individual workers (a specific business function will typically involve a range of job categories and tasks). For the purpose of statistical surveys, business functions can be defined in terms of international product classifications such as Central Product Classification (CPC) or Classification of Products by Activity (CPA).

The concept of business functions is based on the work of Michael Porter, who identified a list of nine generic business functions: R&D, design, production, marketing and sales, distribution, customer service, firm infrastructure, human resources, and technology development.

An enterprise's core business function represents its revenue-producing activity and in most cases equals the main activity of the enterprise. It includes the production of goods or services intended for the market. The core function may also include other (secondary) revenue generating activities if the enterprise considers these to be part of its core business function.

Support business functions (ancillary activities) are carried out to enable or facilitate the production of goods or services, but are not themselves sold directly to the market or third parties. They do not generate revenues, only costs. However, the cost and quality of support functions can make important contributions to the competitiveness of enterprises (e.g. R&D).

The 2007 European Union Survey on International Sourcing was the first large scale, economy-wide survey to use the concept of business functions. The survey was conducted in 13 European countries, using seven business functions and a residual "other" category (see Box 1). The survey was repeated in 15 countries in 2012, with six business functions (R&D, engineering and related technical services were combined, see second column of Box 2).

The National Organizations Survey (NOS) was carried out in the U.S. in 2011 and used a similar business function list as that of the European Union Survey.

Box 1 Business functions used in the 2007 European Union Survey on International Sourcing

Core business function

This function is the primary activity of the enterprise and will in most cases equal the main activity of the enterprise. It includes the production of goods or services intended for the market/ third parties, and is carried out by the enterprise and yields income. The core business function in most cases equals the enterprise's primary activity. It may also include other (secondary) activities if the enterprise considers these to comprise part of its core functions.

Support business function

Support business functions (ancillary activities) are carried out to enable or facilitate the production of goods or services intended for the market/ third parties. The outputs of support business functions are not directly intended for the market/ third parties. In the survey, support business functions are divided into:

Distribution and logistics

This support function consists of transportation activities, warehousing and order processing functions. In figures and tables, "Distribution" is used as an abbreviation for this function.

Marketing, sales and after sales services, including help desks and call centres

This support function consists of market research, advertising, direct marketing services (telemarketing), exhibitions, fairs and other marketing or sales services. It also include call-centre services and after sales services such as help-desks and other customer support services. In figures and tables, "Marketing, sales" is used as an abbreviation for this function.

ICT services

This support function includes IT services and telecommunication. IT services consist of hardware and software consultancy, customized software data processing and database services, maintenance and repair, web-hosting, other computer-related and information services. Packaged software and hardware are excluded. In figures and tables, "ICT services" is used as an abbreviation for this function.

Administrative and management functions

This support function includes legal services, accounting, book-keeping and auditing, business management and consultancy, HR management (e.g. training and education, staff recruitment, provision of temporary personnel, payroll management, health and medical services), corporate financial and insurance services. Procurement functions are included as well. In figures and tables, "Administration" is used as an abbreviation for this function.

Engineering and related technical services

This support function includes engineering and related technical consultancy, technical testing, analysis and certification. Design services are included here as well.

Research & Development

This support function includes research and experimental development. In the second survey on International Organisation and Sourcing of Business Functions (2012), this function was integrated with the support function 'Engineering and related technical services'. "R&D" is used as an abbreviation for this function.

Other business functions

Facility management.

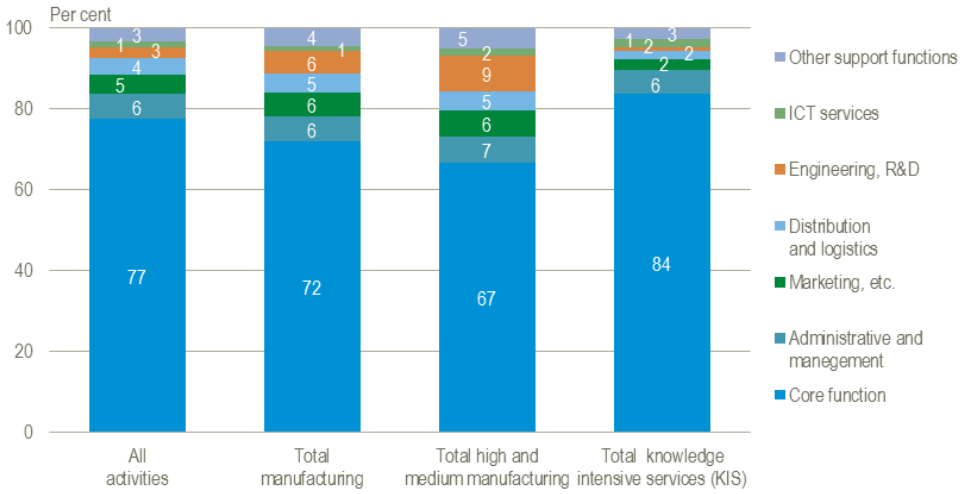
Source: Nielsen (ed.): *International sourcing: Moving business functions abroad* (Statistics Denmark, 2008); available at www.dst.dk/globalisation and http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/International_sourcing_statistics

4. Employment by business function

The 2012 European Survey on International Organization and Sourcing of Business Functions indicated that on average, more than 75 per cent of all persons employed were engaged in the core function of the enterprise. Only about one-quarter of employees worked in support services functions (see Figure 8). The survey also revealed the heterogeneity across business sectors, as the employment share in core functions was only two-thirds in high- and medium-tech manufacturing enterprises. This suggests that support business functions such as engineering and R&D services are more deeply entwined with manufacturing in knowledge intensive manufacturing enterprises. On the other hand, knowledge intensive services (KIS) are characterized by the largest share of persons employed in the enterprise's core function,

reflecting the labour intensity of knowledge intensive services and, possibly, a lesser need for certain support functions such as distribution and logistics whereas administrative and management functions, for example, are of the same relative size as in manufacturing.

Figure 8 **Share of total number of persons employed, broken down in detailed business functions, enterprises with 100 or more persons employed, selected activities, 2011**



Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012

In the U.S., the National Organizations Survey (NOS) also uses the business function approach, and shows a relatively similar pattern to Europe, with 61 per cent of total employees in the surveyed manufacturing enterprises engaged in the enterprise's core function compared to a larger share (67 per cent) of employees who are engaged in services other than trade. According to the NOS figures, Management (10 per cent), Sales and Marketing (8 per cent) and R&D (6 per cent) employ the highest number of persons in U.S. manufacturing enterprises.

The two surveys provide evidence of the significance of support services for manufacturing (also performed in-house) and that service enterprises focus to a large extent on their core function(s), most likely due to the role tacit knowledge of employees plays in many service activities.

4.1 The importance of international outsourcing

The division of labour and accompanying specialization have been key drivers of economic growth throughout history. Where international trade was involved, gains from comparative advantage as described by David Ricardo were reaped. Traditionally, this was linked to vertically organized supply chains within a domestic economy and the international exchange of final goods (international trade in services has only recently gained in significance). However,

since the mid-eighties, supply chains have increasingly been split up, with transaction costs falling as a result of plummeting ICT costs, allowing market transactions to substitute internal hierarchical organization. Lower trade and investment barriers, liberalized domestic markets, cheaper transportation and communication and lower costs of information has allowed the unbundling of value chains to become international in nature, with the concept of "trade in tasks" entering trade theory. Indeed, the geographic and organizational unbundling of the value chain has taken place across core goods- and services-producing activities, as well as for support services such as ICT, back-office functions and even R&D. Well-known examples of production dispersion are the production of aircraft or mobile phones, where the value chains are globally organized.

To stay competitive, enterprises are increasingly organizing their production globally, breaking up their value chains into smaller parts which are supplied by a growing number of providers located worldwide. International sourcing of business functions is a key feature as enterprises in industrialized economies increasingly globalize their production processes.

Box 2 Definition of international sourcing

The total or partial movement of business functions (core or support business functions) currently performed in-house or domestically outsourced by the resident enterprise to either non-affiliated (external suppliers) or affiliated enterprises located abroad.

Source: Nielsen (ed.): *International sourcing: Moving business functions abroad* (Statistics Denmark, 2008); available at www.dst.dk/globalisation and http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/International_sourcing_statistics

The definition used for international sourcing is narrow in terms of location, as it is limited to the replacement of domestic production with foreign production. On the other hand, it is less restrictive as regard control, as it includes all types of relocation of the production of goods or services, irrespective of whether functions are sourced to an affiliated enterprise abroad or contracted out to an unaffiliated supplier abroad. The definition also includes all types of affiliated enterprises and does not distinguish between greenfield establishments and existing affiliates.

It should be emphasized that the expansion of resident enterprises abroad can be carried out in forms other than international sourcing, e.g. expanding existing foreign affiliates or acquisitions of foreign enterprises, without moving currently performed business functions abroad. These types of activities are—by definition—not included in our analysis, even if the boundary between international sourcing and other types of expansion abroad is blurred.

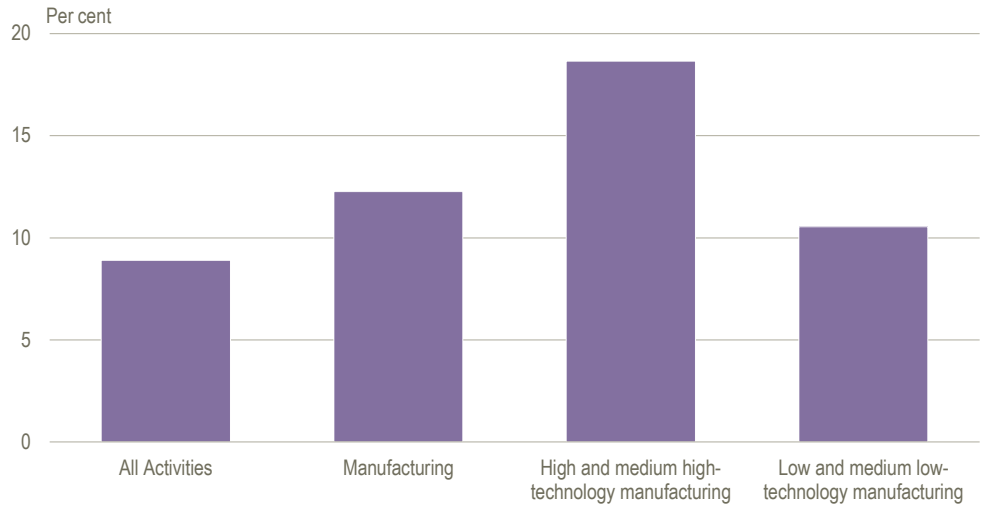
Box 3 Definition of insourcing and outsourcing

CONTROL	LOCATION	
External production outside the enterprise or enterprise group	Domestic Sourcing (Outsourcing) *Production outside the enterprise or group by non-affiliated enterprises but within the compiling country*	International Sourcing (Outsourcing) *Production outside the enterprise or group and outside the compiling country by non-affiliated enterprises. This involves foreign subcontracting*
Internal production within the enterprise group	Domestic Sourcing (Insourcing) *Production within the enterprise group to which the enterprise belongs and within the compiling country*	International Sourcing (Insourcing) *Production within the group to which the enterprise belongs but abroad (by affiliated enterprises)*

Source: Nielsen (ed): *International sourcing: Moving business functions abroad* (Copenhagen, Statistics Denmark, 2008); and http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/International_sourcing_statistics

As already mentioned, the issue of relocation of production and the possible loss of jobs to emerging economies is of major concern for policymakers and citizens in industrialized economies. But only few analyses based on representative statistics are available, as only few large scale statistical surveys on international sourcing or offshoring have been carried out to date.

Figure 9 Share of enterprises sourcing internationally, 2009-2011 (core and/or support functions). Average for 15 European countries



Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions, 2012

The business model of internationally sourcing core or support functions fully or partly is mainly driven by manufacturing enterprises. This is also reflected in the results of the second European survey on International Organisation and Sourcing of Business Functions (2012), which shows that 1,885 manufacturing enterprises (12 per cent of all manufacturing enterprises with 100 or more employees in the 15 participating countries had sourced internationally in the period 2009-2011 compared to 9 per cent of all enterprises within the non-financial business sector (3,584 enterprises) (see Figure 9). Furthermore, the results show that manufacturing enterprises in high- or medium-high-technology industries, in particular, source most frequently with 19 per cent of all enterprises (817 enterprises) compared to 11 per cent for low- and medium-low technology enterprises (1,017 enterprises).

Box 4 **Definition of high- and medium-high-technology manufacturing and low- and medium-low-technology manufacturing**

High- and Medium-High-Technology Manufacturing (HMT) consists of the following activities (ISIC Rev. 3):

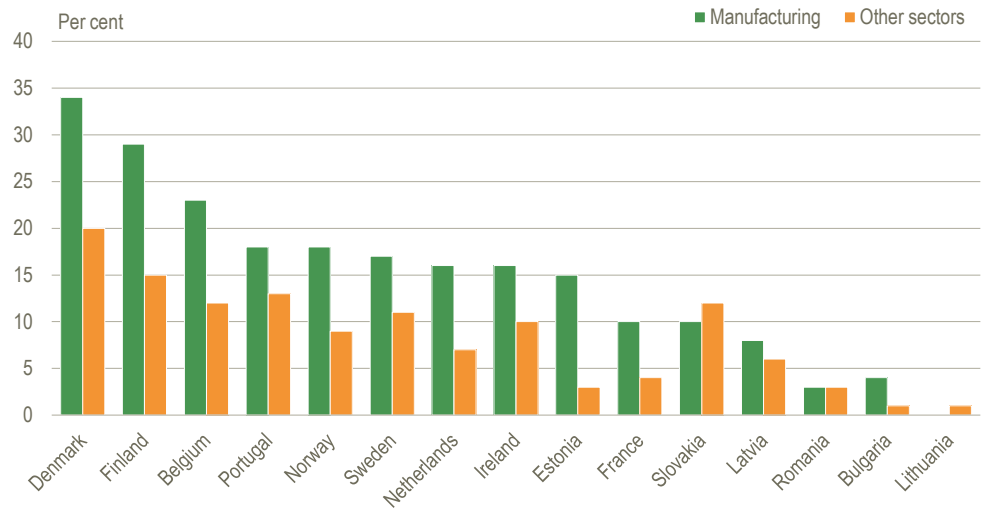
Division 24	Manufacture of chemicals and chemical products
Division 29	Machinery and equipment n.e.c.
Division 30	Office, accounting and computing machinery
Division 31	Electrical machinery and apparatus n.e.c.
Division 32	Radio, television and communication equipment
Division 33	Medical, precision and optical instruments
Division 34	Manufacture of motor vehicles, trailers and semi-trailers
Division 35	Other transport equipment

Low- and Medium-Low-Technology Manufacturing (LMT) consists of the following activities (NACE Rev. 2):

Division 15	Food products and beverages
Division 16	Tobacco products
Division 17	Manufacture of textiles
Division 18	Wearing apparel; dressing and dyeing of
Division 19	Tanning and dressing of leather; manufacture of leather products
Division 20	Manufacture of wood and of products
Division 21	Manufacture of paper and paper products
Division 22	Publishing, printing and reproduction of recorded media
Division 23	Manufacture of coke, refined petroleum products and nuclear fuel
Division 25	Manufacture of rubber and plastics products
Division 26	Manufacture of other non-metallic mineral products
Division 27	Manufacture of basic metals
Division 28	Fabricated metal products, except machinery and equipment
Division 36	Manufacture of furniture; manufacturing n.e.c.
Division 37	Recycling

Huge differences are evident across Europe, with more than 20 per cent of all manufacturing enterprises in high wage countries such as Denmark having sourced internationally (34 per cent of all manufacturing enterprises with 100 or more employees), followed by Finland (29 per cent) and Belgium (22 per cent) (see Figure 10). It should be noted that a relatively lower share of manufacturing enterprises is sourcing internationally in France compared to any of the other "old" EU member states. In the "new" EU member states, only a few manufacturing enterprises engage in international sourcing, with the exception of Estonia.

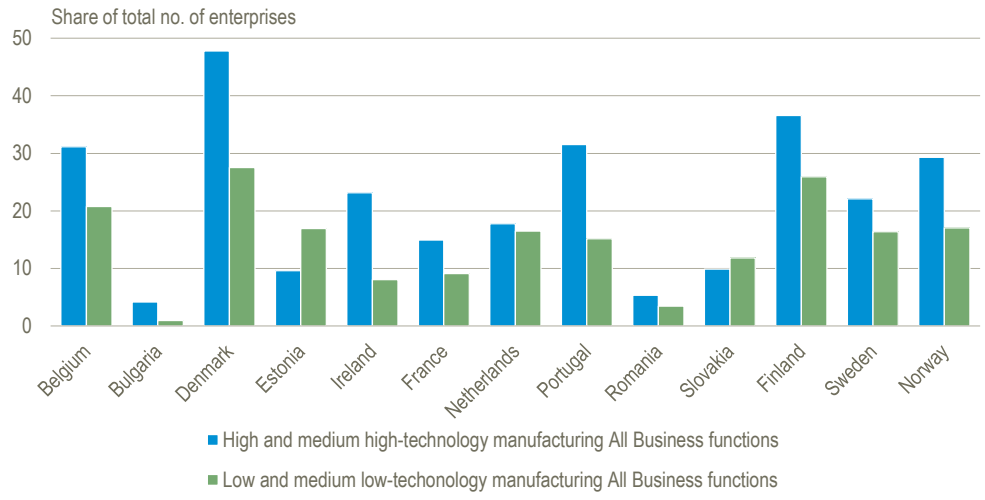
Figure 10 **Enterprises sourcing internationally by industry, 2009-2011 (% of total number of enterprises by industry)**



Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012

The overall pattern for manufacturing is also visible when disaggregating the results further, with nearly 50 per cent of all HMT enterprises in Denmark sourcing internationally), followed by Finland (37 per cent), Belgium and Portugal (both 31 per cent) (see Figure 11). The same country pattern emerges for LMT enterprises, with 28 per cent of all LMT enterprises in Denmark sourcing internationally, followed by Finland (26 per cent) and Belgium (21 per cent).

Figure 11 **High- and medium-high-technology and low- and medium-low-technology enterprises sourcing internationally, 2009-2011 (% of total number of enterprises)**



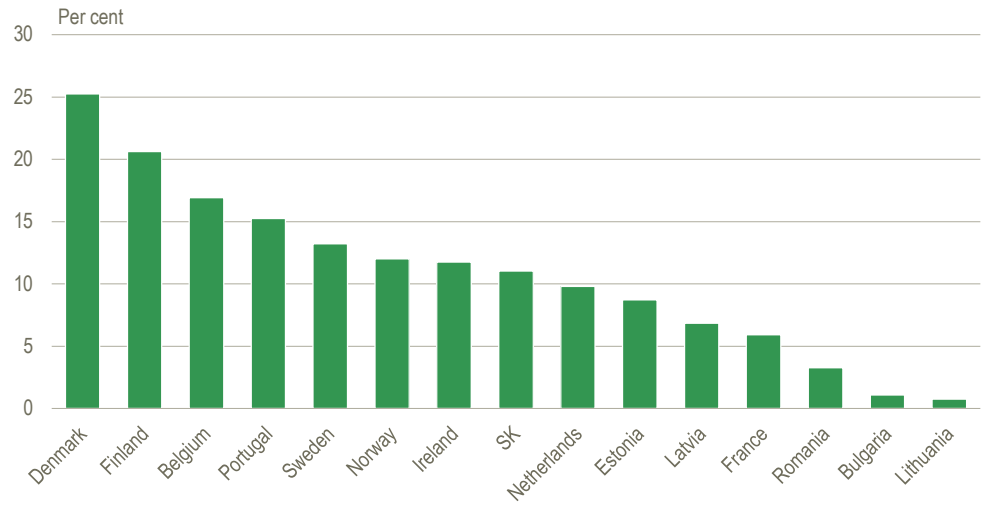
Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012

The European Restructuring Monitor (ERM)[4] data for the period 2003-2013 supports the finding that the manufacturing sector is the driving force of international sourcing in Europe, as job losses in manufacturing constitute more than 70 per cent of all recorded job losses in the EU-27. Only in the UK did job losses in manufacturing constitute less than half of all job losses due to offshoring.

The highest share of enterprises sourcing internationally is generally found in small, open economies with high labour costs, from 25 per cent of all enterprises with 100 or more employees in Denmark to 10 per cent in the Netherlands (see Figure 12). Cost efficiency gains is the main driver for most Northern European enterprises sourcing internationally. The relative high share of Portuguese enterprises sourcing internationally can probably be explained by the traditionally close links with the Brazilian economy rather than for cost saving reasons.

[4] The European Restructuring Monitor (ERM) database is the largest European database capturing employment impacts of restructuring. ERM includes more than 16,000 cases for the period 2003-2013 based on media information and is managed by the European Monitoring Centre for Change (EMCC).

Figure 12 Enterprises sourcing internationally, 2009-2011 (% of total number of enterprises)

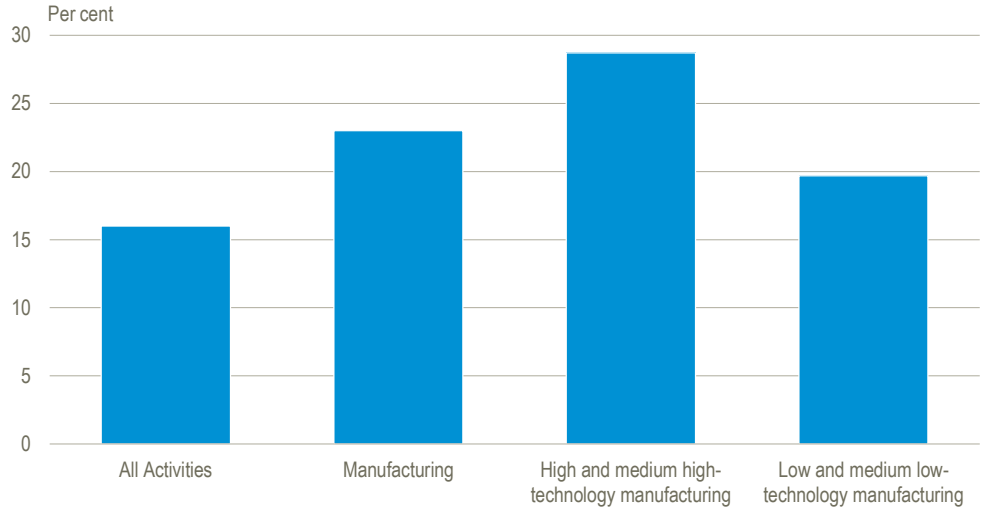


Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012

In the first European survey on international sourcing covering the period 2001 to 2006, 16 per cent of enterprises with 100 or more employees in the 12 countries participating have sourced core or support functions internationally (see Figure 13). During this period, 23 per cent of manufacturing enterprises sourced internationally. This high share was mainly attributable to HMT manufacturing enterprises, of which 29 per cent in the participating European enterprises reported international sourcing compared to 20 per cent of all LMT manufacturing enterprises. This is the same pattern as registered for the period 2009 to 2011. For both periods (2001 to 2011), European manufacturing enterprises—and especially HMT manufacturing enterprises—have been driving international sourcing.

It is being discussed whether the global financial crisis starting in 2008 has slowed down international sourcing due to financial constraints, which limit the setting up of new production plants, or whether the crisis accelerated the movement of business functions abroad for cost reduction purposes. The ERM covering larger cases of job cuts—and consequently the more frequent movement of total production plants requiring investments—records a considerable slowdown in international sourcing after 2008.

Figure 13 **Share of enterprises sourcing internationally, 2001-2006 (core and/or support function). Average for 13 European countries**

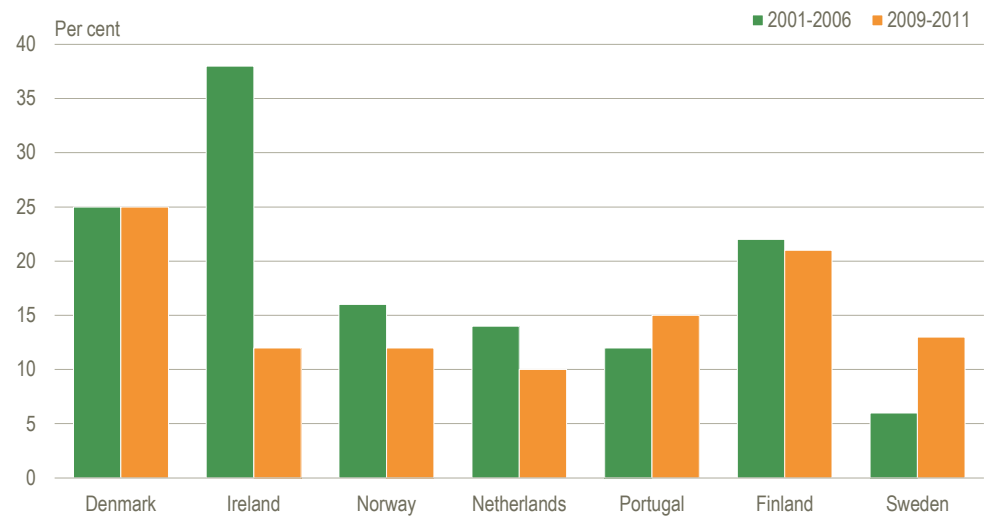


Source: Eurostat: Survey on International Sourcing 2007

As the two surveys on international sourcing cover different European countries and different periods of years, it is difficult to measure the impact of the economic crisis on international sourcing. As an indicator, the annual sourcing average can be used, which indicates that 950 manufacturing enterprises annually sourced internationally in the pre-crisis period 2001–2006 compared to 623 manufacturing enterprises annually in the period 2009–2011. This supports the argument that the economic crisis slowed down international sourcing, but since the first survey included major economies such as Germany, UK and Italy, this is difficult to conclusively determine.

If we only look at the countries participating in both surveys, the results reveal that the economic and financial crisis seems to have influenced the patterns of sourcing behaviour in different ways (see Figure 14). Enterprises in the Netherlands and Ireland, for example, reduced international sourcing, while the level remained consistent in Denmark and Finland, though the new survey only covers three years, while the previous one covered six. In Sweden and Portugal, a rise in the share of businesses opting for international sourcing was registered, even in the years 2009-2011 compared to the previous six-year period.

Figure 14 **Enterprises sourcing internationally, 2001-2006 and 2009-2011 (% of total number of enterprises)**



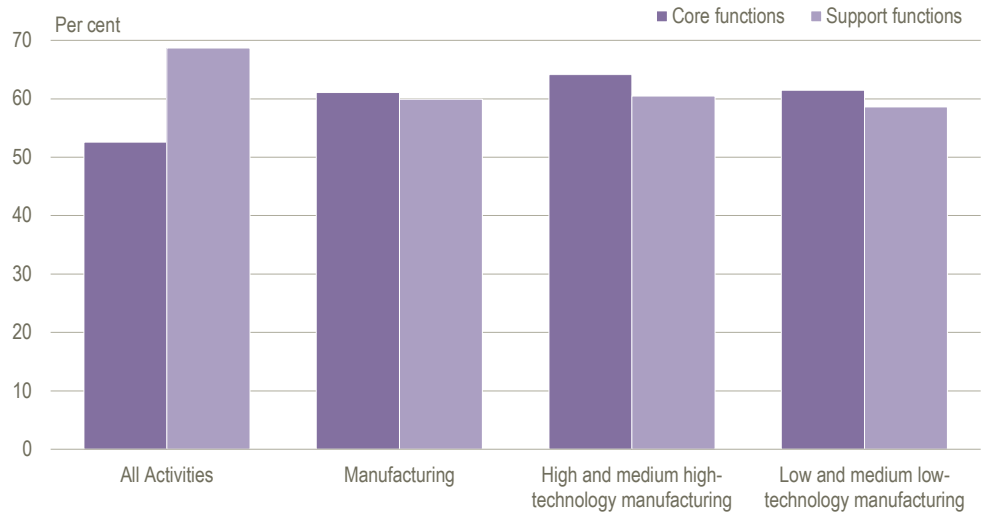
Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012 and survey on International Sourcing 2007

5.1 Types of function sourced internationally

International sourcing was initially a model used by manufacturing enterprises to move production abroad, but with the advance of digitalization and the codification of services, the sourcing model has expanded to include service functions and service enterprises as well. In general, European enterprises more frequently sourced support functions over core functions. Close to 70 per cent of all enterprises sourcing internationally—or 2,461 enterprises—had sourced support functions in the period 2009 to 2011; only slightly more than half of the enterprises sourcing internationally—or 1,884 enterprises—sourced core functions (see Figure 15).

Manufacturing enterprises display different patterns, as a slightly larger share source core functions over support functions. HMT manufacturing enterprises in particular source more core functions (63 per cent or 521 enterprises) compared to LMT manufacturing enterprises (61 per cent or 625 enterprises). The same pattern is found for support functions, i.e. HMT enterprises source more support functions internationally than LMT enterprises.

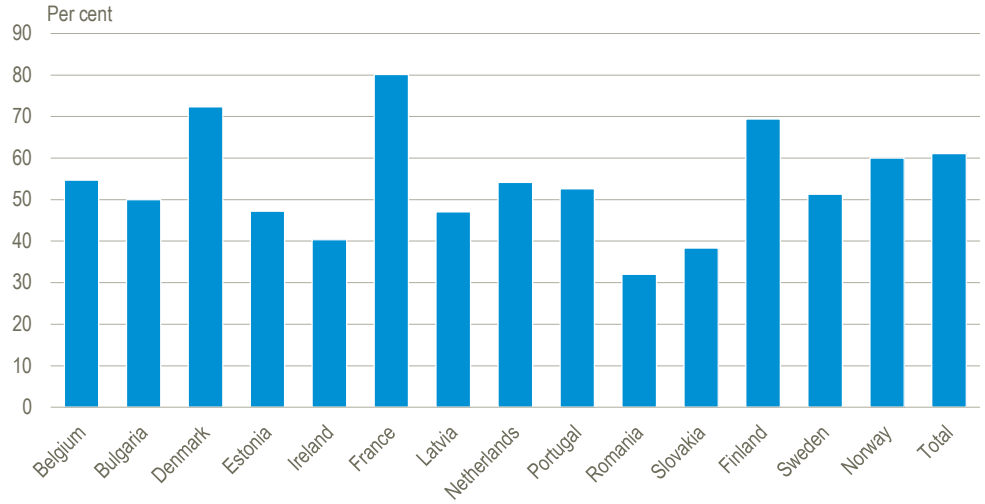
Figure 15 **Enterprises sourcing core and support functions, 2009-2011. Share of all enterprises sourcing internationally. Average for 15 European countries**



Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012.

France has the largest share of manufacturing enterprises that source core functions (80 per cent of all manufacturing enterprises sourcing internationally), followed by the Nordic countries, namely Denmark, Finland and Norway (Figure 16). Denmark and Norway have the largest share of HMT manufacturing enterprises that source core functions, while France and Finland have the largest share of LMT manufacturing enterprises sourcing their core functions. The differences are, however, modest (see Annex, Tables 1-2).

Figure 16 **Manufacturing enterprises sourcing core functions, 2009-2011. Share of all manufacturing enterprises sourcing internationally**

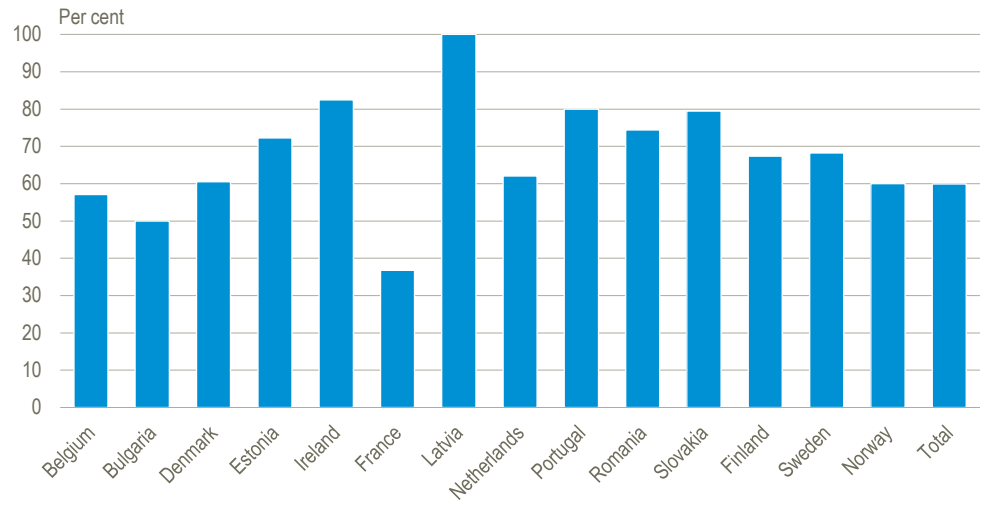


Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012.

Interestingly, a relatively large share of manufacturing enterprises in the new member states has reported international sourcing of their support functions, e.g. Latvia, Slovakia and Romania (see Figure 17). This can probably be explained by the fact that the larger manufacturing enterprises in these countries that source internationally are often affiliates of foreign multinational enterprises (MNEs), which have set up production in these low wage countries to reduce costs and later decide to move the service support functions to headquarters. It should also be noted that only a very small share of manufacturing enterprises in France source support functions internationally.

No clear pattern can be identified when breaking down the manufacturing sector. A high number of LMT manufacturing enterprises (around 80 per cent) in Slovakia and Romania, in particular, source support functions.

Figure 17 **Manufacturing enterprises sourcing support functions, 2009-2011. Share of all manufacturing enterprises sourcing internationally**



Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012.

5.2 Types of support functions sourced internationally

As mentioned above, several types of functions that support an enterprise's core business function exist. These include distribution and logistics, marketing and sales, administration and management, ICT services, R&D and engineering.

When disaggregating the support functions into the six different categories identified, clear differences are found. Overall, 38 per cent of the 1,129 European manufacturing enterprises that have sourced a support function also sourced administrative functions abroad (see Table 1). The

same share has also sourced ICT support functions internationally. These two functions are also those most frequently sourced by all enterprises within the non-financial market sector (46 per cent of all enterprises have sourced support functions and administrative functions, while 41 per cent have sourced ICT support services).

The importance of international sourcing of ICT enabled service functions such as administrative or ICT support services should be considered in the context of the survey's other results, such as the dominance of multinational enterprises as actors in international sourcing, and the fact that such sourcing is often based on strategic decisions taken by the group head. ICT support functions can be carried out relatively easy from any location due to the digital character of many of the services involved.

Manufacturing enterprises source support functions more than service enterprises, such as distribution (30 per cent compared to 25 per cent) and R&D and engineering (27 per cent compared to 22 per cent), which are functions closely related to the production process which might have been moved abroad at an earlier stage.

Within the manufacturing sector, fairly large differences can be observed depending on technology level. One-third of the nearly 500 HMT manufacturing enterprises that have sourced support functions internationally sourced R&D and engineering functions. The share of LMT manufacturing enterprises that sourced support functions was only 18 per cent of the nearly 600 enterprises.

Table 1 International sourcing of specific support functions 2009-2011. Share of enterprises sourcing support functions. Average for 15 European countries

	Distribution	Marketing	ICT services	Administration	R&D engineering	Other
	per cent					
All activities	25	29	41	46	22	21
Manufacturing	30	32	38	38	27	20
High- and medium-high-technology manufacturing	30	30	32	38	33	22
Low- and medium-low-technology manufacturing	28	33	42	40	18	14

Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012

In a first wave, many manufacturing enterprises in the 'old' member states of the EU moved their core production functions to new member states for cost reduction purposes. Interestingly, knowledge intensive but high wage economies such as Denmark and Sweden sourced relatively high shares of R&D and engineering functions abroad in a second wave of international sourcing following the shift of production in the first wave. It should be noted that this development was not observed for all countries; the Netherland and France, for example, sourced knowledge intensive support functions abroad less frequently (see Annex, Figure 1).

5.3 Multinational enterprises are key actors in international sourcing

Multinational enterprises (MNEs) are the drivers of globalization. This also applies to international sourcing. It is important to distinguish international sourcing by MNEs' foreign affiliates within the enterprise group—so-called insourcing—from sourcing to external providers—called outsourcing—as the MNEs in the case of insourcing still control the process and employ the workforce involved.

Evidence for the key role of multinational enterprises in international sourcing is supported by the survey results for 15 European countries[5], which reveal that insourcing—involving MNEs by definition—is the form of sourcing used by nearly 70 per cent of enterprises that source their core function internationally. The same pattern is found for both HMT and LMT manufacturing enterprises (see Figure 18).

Sourcing of core functions to independent producers clearly occurs less frequently, with only 36 per cent of all enterprises sourcing their core functions to an external partner (outsourcing). The same pattern is evident across all manufacturing subgroups (see Figure 19).

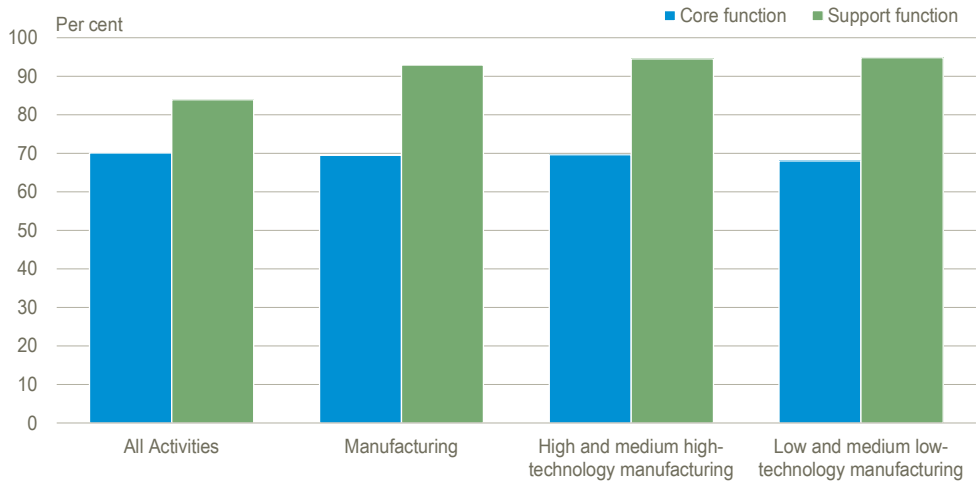
The role of MNEs in the international sourcing of support functions is even more prominent. Eighty-four per cent of all enterprises sourcing support functions internationally belong to an MNE group (see Figure 18). Within manufacturing, the share is even higher, with nearly 95 per cent of all manufacturing enterprises belonging to a multinational group. International sourcing of support functions clearly reflects the competitiveness of MNEs' business model of splitting up and moving different elements of the value chain to global locations which are most efficient.

Enterprises outsource to external partners equally as sourcing core functions, with 36 per cent of all enterprises that source support functions having outsourced to an external provider. The

[5] Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden, United Kingdom.

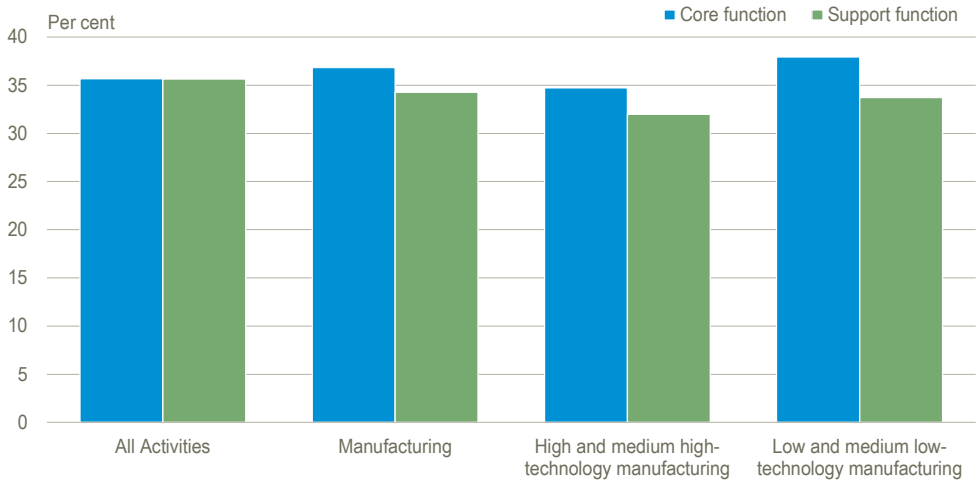
same amount—around one-third—can be found within manufacturing enterprises (see Figure 19).

Figure 18 **Share of enterprises having sourced internationally within an enterprise group (insourcing), 2009-2011. Average for 15 European countries**



Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012

Figure 19 **Share of enterprises having sourced internationally to external partners (outsourcing), 2009-2011. Average for 15 European countries**



Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012

The same number can be found in most countries, 70 per cent to 80 per cent of sourcing enterprises are engaged in insourcing, while only 30 per cent to 40 per cent outsource their business functions abroad (see Annex, Tables 3-10). Outsourcing was only used by a majority of enterprises in some of the new member states, which sourced internationally. This can

probably to a large extent be explained by the fact that few domestic enterprises in these countries are multinationals, and thus have fewer opportunities to insource internationally.

The ERM data also confirm the importance of MNEs for international sourcing, with 53 per cent of all jobs offshored by the EU-27 in the period 2003-2013 being moved abroad from a foreign affiliate. This was especially the case for foreign affiliates located in new member states. The importance of MNEs accelerated as the share of jobs moved abroad increased from 47 per cent in the period 2003-07 to 67 per cent in the period 2008-13.

5.4 Drivers of international sourcing

The most important reason for manufacturing enterprises to engage in international sourcing is cost efficiency, i.e. the reduction of labour costs. Thirty-six per cent of all manufacturing enterprises sourcing internationally stated that this factor was of high importance (see Table 2). Other cost reductions were also of major importance, according to 23 per cent of the enterprises included in the survey.

Multinational enterprises also drive the globalization process in terms of moving business functions abroad. How they organize their global value chains is crucial for achieving competitiveness, hence strategic decisions on international sourcing are often made by the heads of global groups and implemented by their foreign affiliates. This is also reflected in the results, with 34 per cent of respondents claiming that strategic decisions taken by the group head is a very important reason.

The main reasons mentioned for sourcing internationally can be found when splitting manufacturing into HMT and LMT manufacturing. They are relevant for all enterprises, even if more service than manufacturing enterprises emphasize the importance of decisions taken by the group head.

The main reason for enterprises to move functions abroad was to reduce labour and other costs (see Annex, Figure 3). This was the case in particular for enterprises in countries with high labour costs, such as in the Nordic countries. Finland, Denmark and Sweden topped the list of enterprises citing cost reductions as the primary reason for international sourcing. These results confirm the pattern emerging in the survey covering the period 2001-2006, but interestingly, the reduction of labour costs played less of a role for the enterprises in many countries in the survey covering the period 2008-13 (Portugal, Norway, the Netherlands, Denmark and Ireland).

Table 2 **Motivation factors for international sourcing. Share of all enterprises carrying out international sourcing, 2009-2011. Average for 15 European countries**

	All activities	Manu-facturing	High- and medium-high-technology manufacturing	Low- and medium-low-technology manufacturing
			per cent	
Access to new markets	15	16	15	16
Reduction of labour costs	37	36	37	36
Reduction of costs other than labour costs	22	23	21	24
Improved quality or introduction of new products	8	8	4	8
Strategic decisions taken by group head	40	34	36	33
Focus on core business	12	12	12	11
Access to specialized knowledge/technologies	8	6	6	6
Lack of qualified labour	6	4	2	4
Reduced delivery times	8	8	7	7
Less regulation affecting the enterprise, e.g. less environmental regulation	4	4	3	4

Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012

In contrast, enterprises in Romania, Estonia, Portugal and Latvia, which have low labour costs, attached much less importance to cutting labour costs in their decision to move business functions abroad. For these enterprises, reducing other costs appeared to be a more important driver for international sourcing.

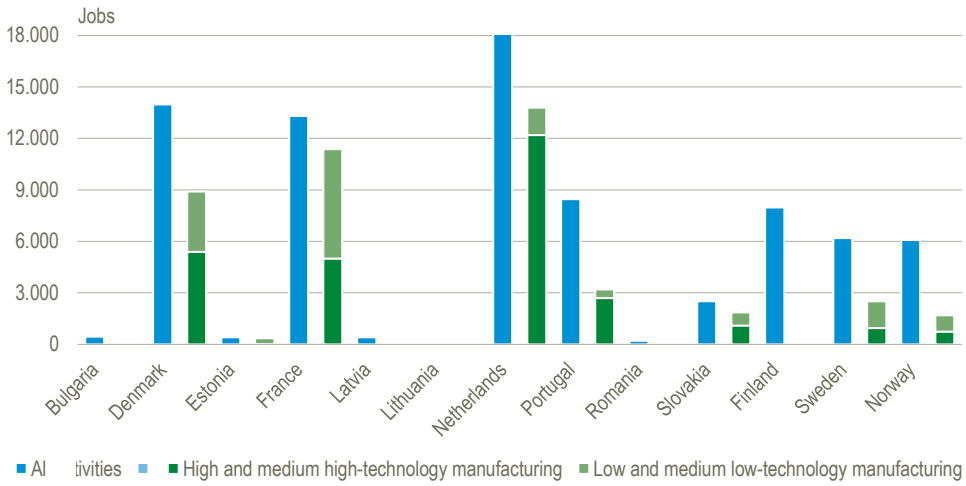
5.5 Employment impact of international sourcing

By definition, international sourcing implies job losses in the domestic economy of the enterprises moving their business functions abroad. This reality is cause for concern among policymakers in industrialized economies, especially if the creation of new jobs occurs at a very small scale as is currently the case in Europe.

European manufacturing enterprises reported job losses due to the international sourcing of over 46,000 jobs or nearly 60 per cent of all reported job losses. The job losses primarily occurred in enterprises in HMT manufacturing (nearly 28,200 jobs – or 61 per cent) followed by enterprises in LMT manufacturing (nearly 15,900 jobs).

The pattern of job losses in manufacturing is similar in most European countries with the exception of Bulgaria, Latvia, and Portugal, where international sourcing was to a large extent attributable to decisions taken by MNEs to move support functions abroad (see Figure 20).

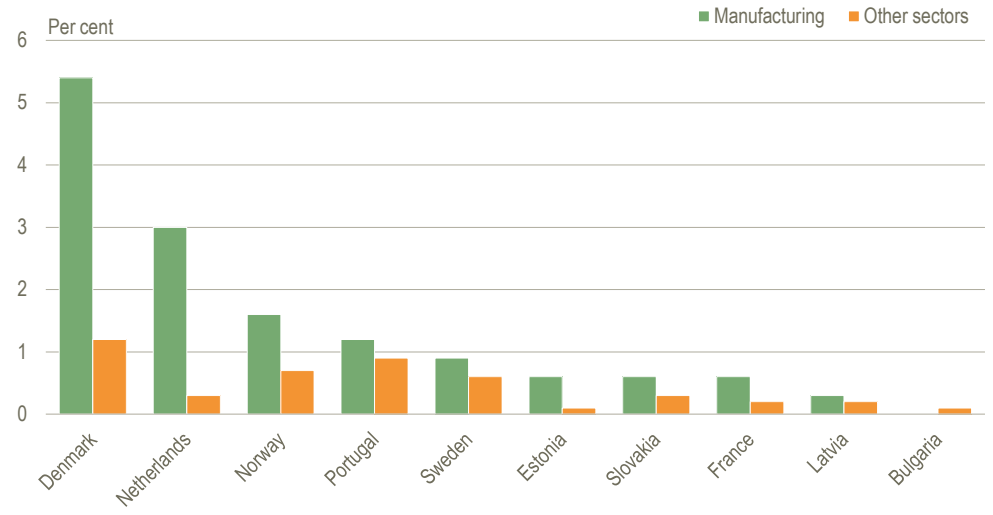
Figure 20 Job losses due to international sourcing, 2009-2011, in selected countries



Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012

In comparison to the total number of employees, job losses due to international sourcing in enterprises with 100 or more employees were relatively low in the period 2009-2011 (see Figure 21). Denmark reported the biggest job losses by far in relative terms, especially in manufacturing. More than 5 per cent of jobs in Danish manufacturing enterprises were moved abroad. The Netherlands was the only other European country that experienced significant job losses in relative terms due to international sourcing. International sourcing is a minor factor in explaining the tremendous rise in unemployment Europe has experienced since the outbreak of the economic crisis.

Figure 21 **Job losses due to international sourcing, 2009-2011. Percentage of employees in all enterprises by sector in 2008**



Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012

However, the flow of jobs abroad is continuous, and the cumulative and indirect effects of this trend should not be underestimated. To illustrate the cumulative process of job losses due to international sourcing, the European survey covering the period prior to 2001 to 2006 revealed that nearly 243,500 jobs in manufacturing were lost in the 12 countries participating in the survey. Germany lost 136,700 jobs—or 54 per cent—followed by the United Kingdom (41,650 job losses). Nearly two-thirds of the job losses in European manufacturing enterprises in this period was observed in HMT manufacturing enterprises, which was the same pattern as for the period 2009-2011 (see Table 3).

The results for the countries participating in both surveys indicate a total loss of 24,050 manufacturing jobs in the Netherlands, 21,463 jobs in Denmark and 6,506 jobs in Portugal due to international sourcing.

The ERM, which monitors large cases of restructuring, reports slightly over 266,000 job losses due to offshoring in the period 2003-2013 – or around 25,000 annually. Nearly 70 per cent of all job losses were reported in manufacturing, confirming the IS survey results. The loss of jobs due to offshoring represents around 6 per cent of all job losses in the EU registered by the ERM.

Table 3 **Job losses linked to international sourcing, 2001-2006. Broken down by country and industry**

	Job losses			
	All activities	Manufacturing	High- and medium-high-technology	Low- and medium-low-technology
EU	332,000	253,472	163,429	90,043
Czech Republic	4,360	4,102	2,162	1,940
Denmark	19,886	12,165	7,960	4,205
Germany	188,634	136,748	91,499	45,250
Ireland	:	:	:	:
Italy	:	:	:	:
Netherlands	14,782	10,205	6,559	3,646
Portugal	3,861	3,269	655	2,614
Slovenia	1,567	1,533	273	1,260
Finland	5,886	4,539	2,965	1,573
Sweden	11,680	10,836	7,309	3,528
United Kingdom	49,405	41,651	32,242	9,409
Norway	3,895	2,724	833	1,891

Source: Eurostat: Survey on International Sourcing 2007

Despite the differences in data sources, both sources indicate that international sourcing only plays a minor role in the job losses observed in Europe's manufacturing sector and other reasons such as the externalization of service support functions domestically, mergers and acquisitions, bankruptcies or contractions generally associated with the business environment have caused more job losses in manufacturing since 2000.

International sourcing—as previously mentioned—is most often associated with job losses that occur when business functions are moved abroad. However, what is often neglected is the fact that the impacts of international sourcing have several dimensions; first, the direct and usually immediate and visible impact, i.e. domestic job losses described above. Secondly, the more indirect, often long-term and less visible impact of improved competitiveness of the enterprise, including the protection of existing jobs, the prevention of shutdowns or bankruptcies due to declining competitiveness and the generation of new and higher value added jobs in the countries sourcing jobs internationally.

The European survey covering the period 2001 to 2006 includes data on job creation linked directly to international sourcing. As already mentioned, this is very difficult to measure and the

results should be interpreted with caution. According to the data, 93,700 jobs were created in the manufacturing sector in the 12 participating countries. Consequently, indicative net job losses due to international sourcing amount to around 150,000 jobs in the period 2001-2006.

Table 4 Job creation linked to international sourcing, 2001-2006. Broken down by country and industry

	Creation			
	All activities	Manufacturing	High- and medium-high-technology manufacturing	Low- and medium-low-technology manufacturing
EU	166,142	93,722	60,353	33,368
Czech Republic	1,146	1,057	483	574
Denmark	5,937	4,031	2,798	1,233
Germany	105,493	69,041	46,537	22,504
Netherlands	5,602	1,437	960	477
Portugal	958	688	93	595
Slovenia	1,741	1,071	264	807
Finland	1,880	1,412	1,030	382
Sweden	1,225	593	416	176
United Kingdom	23,868	2,074	1,392	682
Norway	3,650	2,817	1,255	1,562

Source: Eurostat: Survey on International Sourcing 2007

Of the total number of jobs created, 43,800 jobs—or close to 50 per cent of jobs created in manufacturing enterprises—were high-skilled jobs (see Table 4). In comparison, manufacturing enterprises reported close to 57,200 high skilled job losses – or less than 25 per cent of all jobs lost due to international sourcing; indicating that international sourcing also has an impact on the future employment structure in domestic enterprises sourcing internationally by requiring more high skilled employment in support service functions such as administration, R&D and engineering.

5.6. Sourcing destinations

The survey on International Organisation and Sourcing of Business Functions showed that 44 per cent of European manufacturing enterprises sourced to enterprises located in the EU-15 (the so-called ‘old’ member states) in the period 2009-2011, making this destination the most frequent destination for international sourcing (see Table 5). This was followed by EU-12 (the so-called ‘new’ member states) as the second most frequent destination. The same pattern can

be found both within HMT and LMT manufacturing as for the total non-financial market sector. In other words, even if each EU member state reported job losses, the net effect of international sourcing was far less dramatic for the EU as a whole.

China was the third most important international destination for European manufacturing enterprises, as 17 per cent of manufacturing enterprises sourcing internationally sourced to China. China was an important destination for HMT manufacturing enterprises, nearly as important as European destinations. For LTM manufacturing enterprises China was a far less important destination, with only 13 per cent sourcing to this destination.

India was an important destination for not only service enterprises but also for HMT manufacturing enterprises, with 15 per cent of all European HMT enterprises sourcing to India. When looking at Asia as one sourcing destination—including China and India—nearly half of all European HMT enterprises sourcing internationally had sourced there. In comparison, only around one-fourth of LMT enterprises sourcing internationally had sourced to Asia.

Finally, the U.S. is a relatively important destination for HMT manufacturing enterprises, with 10 per cent having sourced to this destination compared with only 3 per cent of European LMT manufacturing enterprises.

Table 5 Main sourcing destinations, 2009-2011. Share of all enterprises sourcing internationally. Average for 15 European countries

	EU-15	EU-12	China	India	Rest Asia	USA	Brazil
				per cent			
All activities	44	28	12	16	9	7	2
Manufacturing	41	30	17	12	8	6	1
High- and medium-high-technology manufacturing	34	31	25	15	8	10	1
Low- and medium-low-technology manufacturing	45	30	13	9	5	3	1

Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012

Manufacturing enterprises sourcing to EU-15 countries tend to source their core functions more frequently than their support functions to enterprises in these countries, but compared with other destinations, sourcing of core functions plays a minor role due to the fact that many foreign affiliates in other European countries have been sourcing support functions such as

administrative or ICT support functions to their headquarters in the old member states (see Figure 22).

Table 6 Main sourcing destinations, 2001-2006. Share of all enterprises sourcing internationally. Average for 15 European countries

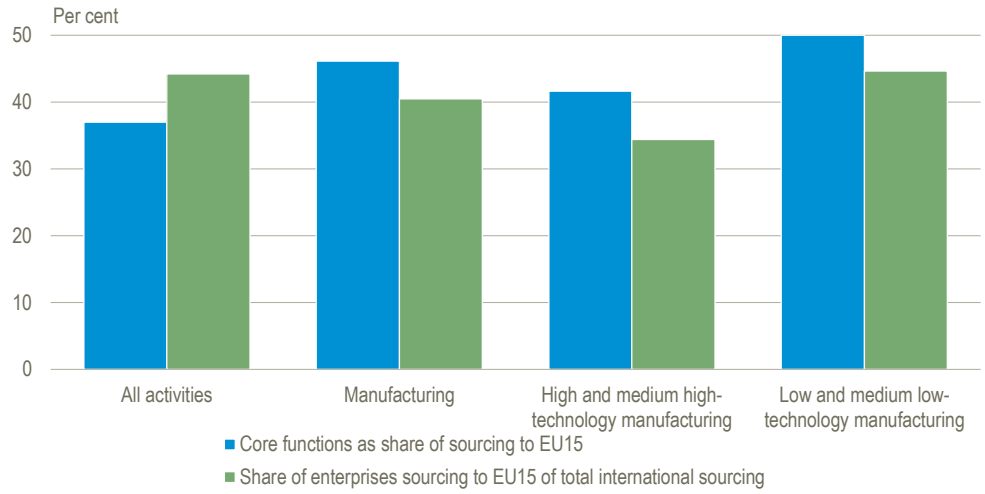
	EU-15	EU-12	China	India	Rest Asia	USA
				per cent		
All activities	37	32	17	10	12	16
Manufacturing	34	34	N/A	N/A	N/A	15
High- and medium-high-technology manufacturing	29	34	25	11	11	N/A
Low- and medium-low-technology manufacturing	39	33	N/A	5	8	N/A

Source: Eurostat: Survey on International Sourcing 2007

The same destination pattern emerges in the first European survey on international souring covering the period 2001-2006. It shows that the EU-15 was the most frequent sourcing destination for manufacturing enterprises (34 per cent of all manufacturing enterprises sourcing internationally), followed closely by the new member states (34 per cent) (see Table 6). Sourcing to the new member states was of relatively higher significance in the period prior to the financial crisis (and partly prior to the EU enlargement in 2004). China was of equal importance for HMT manufacturing enterprises in the two periods while the U.S. lost in importance as a destination for business functions from European manufacturing enterprises, as their share more than halved.

According to ERM data, the actual number of jobs moved to different destinations demonstrates that international sourcing by European companies is primarily an intra-EU exercise (i.e. moving jobs to low wage EU-12 countries, which constitutes one-third of all job losses due to international sourcing between 2003 and 2013), and a relocation to the old EU member states (13 per cent) – a total of 46 per cent of all job losses due to international sourcing to other EU member states. The ERM data also supports the importance of India as a destination for international sourcing from Europe (15 per cent of all job losses are due to sourcing to India) and China (10 per cent) compared to only 4 per cent of all job losses attributable to sourcing to the U.S.

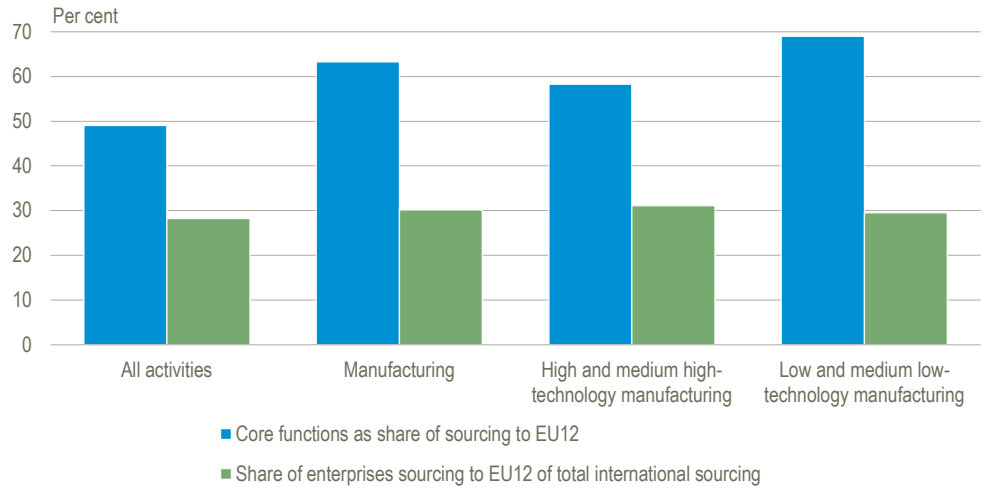
Figure 22 **International sourcing to EU-15 member states, 2009-2011. Average for 15 European countries**



Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012

Sourcing by European manufacturing enterprises to new EU member states (EU-12) is characterized by a much larger focus on sourcing core functions, with more than 60 per cent of enterprises sourcing core functions to new member states. This pattern was very distinct among LMT manufacturing enterprises, in particular, with nearly 70 per cent of all LMT enterprises sourcing core functions to the EU-12 (see Figure 23).

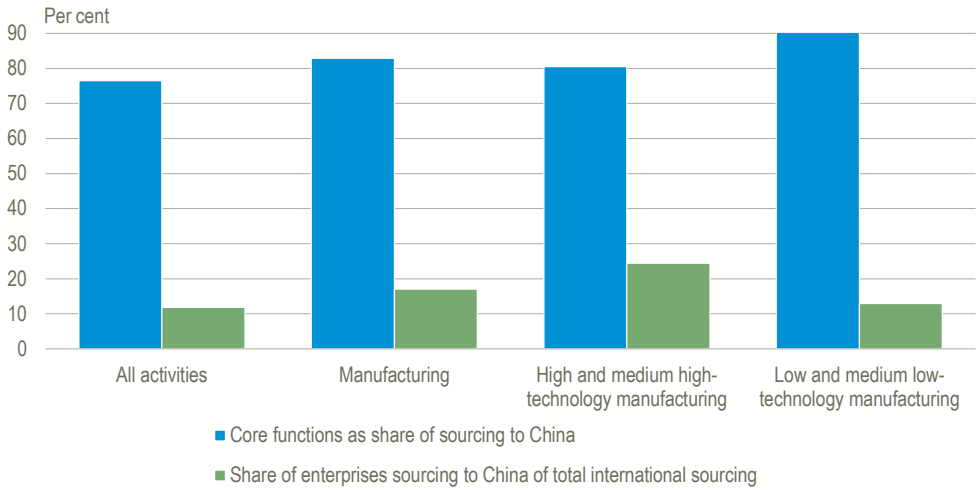
Figure 23 **Sourcing to EU-12 member states, 2009-2011. Average for 15 European countries**



Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012

Sourcing of core functions by manufacturing enterprises to China is widespread, with China being the third most important destination for European manufacturing enterprises. LMT manufacturing enterprises primarily source core functions to China (90 per cent of all LMT enterprises sourcing to China, see Figure 24). In general, 82 per cent of all European manufacturing enterprises sourcing to China sourced their core functions.

Figure 24 Sourcing to China, 2009-2011. Average for 15 European countries

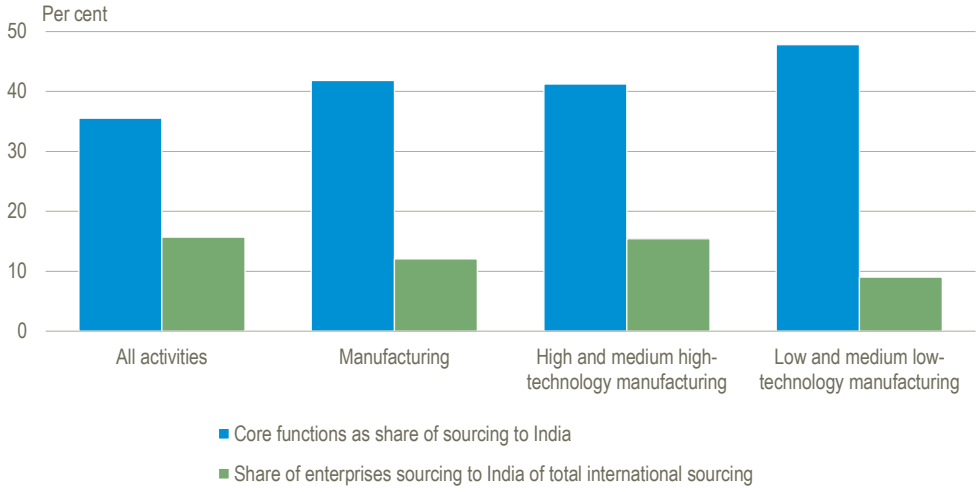


Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012

International sourcing to India, which is a stronghold for ICT services as well as for other types of ICT enabled back office functions, is characterized by a relatively small share of manufacturing companies sourcing core functions to the country (42 per cent of all manufacturing enterprises sourcing to India, see Figure 25). Again, a larger share of LMT manufacturing enterprises source core functions to India than HMT manufacturing enterprises.

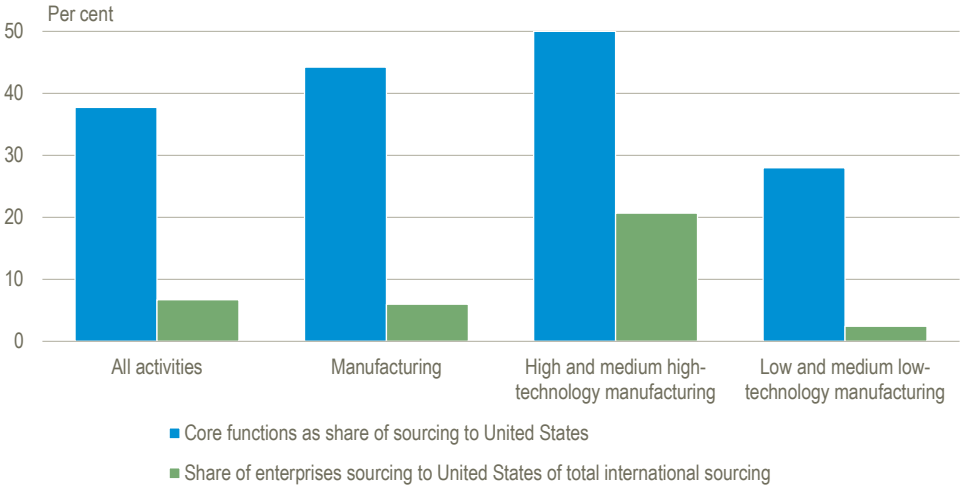
Finally, sourcing from European manufacturing enterprises to the U.S. is very similar to the sourcing to the EU-15, as the share of sourcing of core functions is relatively small (44 per cent of all manufacturing enterprises sourcing to the U.S., see Figure 26). It should be noted that half of all HMT manufacturing enterprises sourcing to the U.S. source their core functions.

Figure 25 Sourcing to India, 2009-2011. Average for 15 European countries



Source: Eurostat: Survey on International Organization and Sourcing of Business Functions 2012

Figure 26 Sourcing to the United States, 2009-2011. Average for 15 European countries



Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012.

6. Manufacturing affiliates of European and U.S. owned MNEs

In the previous chapters, a special form of geographical externalization, namely international sourcing, has been described. Yet this is not the only way enterprises from industrialized economies can increase their production in other parts of the world. They can also expand already existing activities or acquire manufacturing enterprises abroad.

In 2011, European owned manufacturing companies employed nearly 5.5 million persons. The most important geographical areas were the U.S., where European owned companies employed 1.1 million persons (21 per cent of all persons employed in European owned companies outside the EU-12), followed by China with nearly 804,000 employees (15 per cent), Brazil with 525,000 employees (10 per cent) and India with 334,000 employees (6 per cent, see Table 7).

In general, employment in manufacturing affiliates accounts for 40 per cent of total employment in European owned affiliates outside the EU. The share of manufacturing employees is significant especially in China, where 60 per cent of all employees in European affiliates in China work in manufacturing. The lowest share of manufacturing employees among the largest destinations is found in the U.S., where employment in manufacturing affiliates only constitutes 36 per cent of total employment in European owned affiliates in the U.S.

Table 7 Number of persons employed by European owned MNEs outside the EU-27. Main destinations

	2009		2011			
	Manu-facturing	All activities	Manu-facturing	Share of total employment	All activities	Manufacturing as share of total
	No. of persons employed			Per cent	Number	Per cent
Total	N/A	12,733,080	5,364,043	100	13,537,490	39.6
USA	1,040,783	3,348,021	1,145,932	21	3,186,230	36.0
China	657,582	1,139,481	803,173	15	1,343,855	59.8
Brazil	N/A	N/A	525,664	10	1,203,353	43.7
India	257,323	557,447	333,957	6	750,413	44.5
Russia	N/A	N/A	199,157	4		
Malaysia	151,535	151,535	70,489	1	139,995	50.4

Source: Eurostat: Foreign affiliates statistics

Unfortunately, the data does not allow an analysis of the development of employment in foreign affiliates, but the major destinations, namely the U.S., China and India, all reveal an increase of 327,000 employees in manufacturing affiliates in total (or 17 per cent) in the period 2009 to 2011. It is not possible to estimate to what extent these jobs could have been located within the EU, but these figures underpin the trend of manufacturing enterprises to increasingly organize their value chains globally.

The pattern for U.S. owned foreign affiliates is very similar to the European one, with nearly 40 per cent of the total number of employees in U.S. owned foreign affiliates employed in

manufacturing affiliates in 2012 (see Table 8). In total, U.S. owned manufacturing affiliates employed close to 4.8 million employees compared to nearly 5.4 million persons in European owned affiliates. One-third of all employees in manufacturing affiliates were engaged in the EU, followed by 12 per cent in China and 11 per cent in Mexico. Compared to the EU, the major differences are the lower importance of China and Brazil for U.S. owned manufacturing affiliates and the importance of Mexico for U.S. owned manufacturing affiliates.

Employment in U.S. owned manufacturing affiliates grew by 5.6 per cent in the period 2009 to 2012. Growth was recorded in affiliates in China (15 per cent), Mexico (14 per cent) and India (29 per cent), while the affiliates in high wage countries such as the EU and Canada fell by 4 per cent and 5 per cent, respectively.

The U.S. figures also include information about value added generation, showing that industrialized economies, i.e. the EU and Canada, play a very important role in terms of value added creation, with 47 per cent and 10 per cent, respectively, being generated in these affiliates compared to 8 per cent in China and only 4 per cent in Mexico (see Table 9). The share from European affiliates fell by 5 per cent between 2009 and 2012, while the share from affiliates in China more than doubled from 3 per cent to more than 8 per cent. In absolute figures, the value creation in manufacturing affiliates grew from 478 billion US dollars in 2009 to 563 billion US dollars in 2012.

The global fragmentation of the value chains of manufacturing enterprises implies an increasing relocation of manufacturing production from industrialized countries to emerging industrial economies, and especially China. This process is illustrated by the development in manufacturing value added (MVA) since 2000, with industrialized countries accounting for more than 78 per cent of total world MVA and the share declining to just above 67 per cent in 2010 (see Table 10). Not surprisingly, the growth is mainly concentrated in China which increased its share from nearly 7 per cent in 2000 to more than 15 per cent of MVA in 2010.

Table 8 **Number of employees in U.S. owned foreign affiliates, 2009-2012. Main destinations**

	2009				2012			
	Manufacturing	Country share of total employment manufacturing	All activities	Manufacturing share of total	Manufacturing	Country share of total employment manufacturing	All activities	Manufacturing share of total
	No. of employees (1,000)	Per cent	No. of employees (1,000)	Per cent	No. of employees (1,000)	Per cent	No. of employees (1,000)	Per cent
All countries	**4,538,9**	**100**	**10,793,9**	**42.1**	**4,794,7**	**100**	**12,115,8**	**39.6**
EU	1,662,6	36.6	3,820,9	43.5	1,601,5	33.4	3,810,6	42.0
China	510,9	11.3	941,0	54.3	588,0	12.3	1,338,7	43.9
Mexico	481,0	10.6	969,1	49.6	546,5	11.4	1,106,7	49.4
Canada	297,6	6.6	1,082,7	27.5	283,3	5.9	1,133,3	25.0
Brazil	293,3	6.5	522,4	56.1	319,5	6.7	598,5	53.4
India	120,4	2.7	518,0	23.2	155,4	3.2	838,4	18.5
Thailand	94,6	2.1	151,8	62.3	105,1	2.2	169,1	62.2
Malaysia	92,4	2.0	136,7	67.6	112,0	2.3	157,9	70.9
Russia	51,2	1.1	106,1	48.3	69,9	1.5	153,8	45.4

Source: Bureau of Economic Analysis: Activities of U.S. Multinational Enterprises

Table 9 **Value creation by U.S. owned foreign affiliates, 2009-2012. Main destinations**

	2009				2012			
	Manufacturing	Country share of total value creation manufacturing	All activities	Manufacturing share of total	Manufacturing	Country share of total value creation manufacturing	All activities	Manufacturing share of total
	Value added (millions of dollars)	Per cent	Value added (millions of dollars)	Per cent	Value added (millions of dollars)	Per cent	Value added (millions of dollars)	Per cent
All countries	**478,164,0**	**100**	**1,144,957.0**	**41.8**	**563,149,0**	**100**	**1,420,679,0**	**39.6**
EU	250,058,0	52.3	511,547,0	48.9	263,159,0	46.7	559,327,0	47.0
China	12,982,0	2.7	44,880,0	28.9	27,145,0	8.3	46,491,0	58.4
Mexico	16,777,0	3.5	30,990,0	54.1	21,340,0	3.8	43,274,0	49.3
Canada	41,013,0	8.6	113,675,0	36.1	56,563,0	10.0	140,073,0	40.4
Brazil	24,085,0	5.0	37,427,0	64.4	27,978,0	5.0	44,327,0	63.1
India	3,910,0	0.8	14,575,0	26.8	5,243,0	0.9	21,007,0	25.0
Thailand	5,487,0	1.1	10,647,0	51.5	6,826,0	1.2	15,106,0	45.2
Malaysia	4,662,0	1.0	10,059,0	46.3	6,160,0	1.1	14,337,0	43.0
Russia	3,496,0	0.7	7,373,0	47.4	6,286,0	1.1	13,368,0	47.0

Source: Eurostat: Survey on International Organisation and Sourcing of Business Functions 2012

Table 10 Percentage distribution of world MVA by country group (at constant 2005 prices)

	2000	2005	2010
		per cent	
World	**100**	**100**	**100**
By revised country groups			
Industrialized economies	78,4	74,8	67.6
Developing and emerging industrial economies	21,6	25,2	32.4
Emerging industrial economies	12,2	12,7	13.8
China	6,9	9,7	15.3
Other developing economies	2,3	2,5	2.8
Least developed countries	0,3	0,4	0.5

Source: UNIDO

The decrease of manufacturing in industrialized economies is not only attributable to a factual relocation of production from these countries to developing and emerging industrial economies, in particular, caused by either a previous movement of production by industrialized countries (international sourcing) or an increase of already existing production in these countries.

Conclusion

Fragmentation of manufacturing production processes is driven by globalization and the digital revolution, and makes it possible for business functions of an enterprise to be carried out in different economic territories. Our analysis shows that over 20.0 per cent of European manufacturing enterprises have sourced one or more business functions internationally. Of all functions sourced, more than half are core production functions. A separation of services from the core production function has a direct impact on the measurement of the volume of manufacturing output in two ways: first, output of a manufacturing enterprise may be measured excluding the contribution of manufacturing-related services; second, service affiliates may be classified as separate entities in the country of origin when core production function is sourced internationally. In either case, the actual contribution of manufacturing to the economy may be grossly underestimated.

In order to establish better evidence for industrial policymaking, it is necessary to build statistical measures for both manufacturing and the services sector. Although the European Statistical System has established new tools with the purpose of capturing elements of the globalization process in terms of measuring international organization and sourcing of business

functions, these initiatives are still of an ad hoc nature. There are considerable gaps in the statistical coverage of international surveys. There is also the need to establish the evidence base to analyse the reasons for the observed loss of employment in manufacturing. We cannot yet precisely measure whether the loss of jobs is attributable to local recruitment for internationally outsourced production plants, an externalization of the service support function or any other factors. These questions indicate a departure point for discussions on a new survey methodology to capture manufacturing-related services in official statistics.

Finally, this analysis was carried out from the perspective of industrialized economies on the de-location of their manufacturing production to emerging industrial economies. There are currently no available data to study the impact on emerging industrial economies, especially on job creation, exports, imports and overall economic performance. Only by comparing the data of emerging industrial economies (as recipients) with industrialized economies (as donors), we established statistical evidence for horizontal analyses of the impacts of global fragmentation of production processes. It may also require a cross-country industrial survey to cover all business functions outsourced to companies abroad. Such an initiative could be taken by an organization like UNIDO, which has a global mandate on industrial development in general and in industrial statistics in particular.

References

Andreoni, A. Upadhyaya, S (2014); *Growth and Distribution Pattern of the World Manufacturing output: A Statistical Profile, UNIDO Working Paper 2/2014*

Baldwin, R. (2011) *Trade and industrialisation after globalisation's 2nd unbundling: How building and joining a supply chain are different and why it matters*, NBER Working Paper No. 17716

Brown, Clair; Sturgeon, Timothy; and Cole, Connor. (2013), *The 2010 National Organizations Survey: Examining the Relationships Between Job Quality and the Domestic and International Sourcing of Business Functions by United States Organizations*, IRLE Working Paper, UC Berkeley, Berkeley, CA. http://www.irle.berkeley.edu/workingpapers/

Eurofound (2013): *Monitoring and managing restructuring in the 21st century, Publications Office of the European Union, Luxembourg*

European Commission: For a European Industrial Renaissance COM(2014) 014

Eurostat (2011), *Global Value Chains – international sourcing to China and India* http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Global_value_chains_-_international_sourcing_to_China_and_India

Eurostat (2013), *International Sourcing of Business Functions*

http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/International_sourcing_of_business_functions

Eurostat (2014), *Foreign affiliates statistics – employment by business functions*

http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Foreign_affiliates_statistics_-_employment_by_business_function

Gereffi, G., John Humphrey and Timothy Sturgeon. (2005), *The Governance of Global Value Chains.* Review of International Political Economy 12 (1)

Grossman, G. M. and E. Rossi-Hansberg (2006), *Trading Tasks: A Simple Theory of Offshoring,* NBER Working Paper, No. 12721.

Huws, U. and S. Dahlmann (2004). *Outsourcing of ICT and related services in the EU: a status report*. European Foundation for the Improvement of Living and Working Conditions. Luxembourg: Office for Official Publications of the European Communities. www.eurofound.europa.eu/emcc/publications/2004/ef04137en.pdf

Industry Canada, (2011). *Business Innovation and Strategy: A Canadian Perspective.* Report based on the results of the survey of innovation and business strategy. Cat. No . lu

Lanz, R., S. Miroudot and H. K. Nordås (2011), *Trade in Tasks*, OECD Trade Policy Working Papers, No. 117. http://dx.doi.org/10.1787/5kg6v2hkvmmw-en

Nielsen, Peter Bøegh (ed). (2008), *International Sourcing – Moving Business Functions abroad, Statistics Denmark*

Nielsen, Peter Bøegh and Tilewska, Zuzanna. (2011), *Micro Data Linking – Creating new Evidence by Utilising existing Statistical Registers* in International Statistical Institute (ISI): Proceedings of the 2011 World Statistics Congress of the (2011)

Nielsen, Peter Bøegh and Sturgeon, Timothy J. (2014). *Using Business Functions to Measure International Trade and Economic Globalization*

Porter, Michael. (1985), *Competitive Advantage.* New York: Free Press

Ricardo, David. (1817), *On the Principles of Political Economy and Taxation*

Sturgeon, Timothy. (2013) *Global Value Chains and Economic Globalization – Towards a New Measurement Frame-work.* http://epp.eurostat.ec.europa.eu/portal/page/portal/european_business/documents/Sturgeon_report_Eurostat.pdf

Sturgeon, Timothy with Peter Bøegh Nielsen, Greg Linden, Gary Gereffi, and Clair Brown. (2012), *Direct Measurement of Global Value Chains: Collecting Product- and Firm-Level Statistics on Value Added and Business Function Outsourcing and Offshoring.* Chapter 11 in Mattoo, Aaditya; Wang, Zhi and Wei, Shang-Jin (eds.): *Trade in value added: developing new measures of cross-border trade*. Washington, DC; The International Bank for Reconstruction and Development/The World Bank.

Williamson, Oliver. (1985), *The Economic Institutions of Capitalism: Firms, Markets, and Relational Contracting*

United Nations. Economic Commission for Europe. (2014), *Guide to measuring global production*

UNIDO: Industrial Development Report 2011, Vienna

Annex

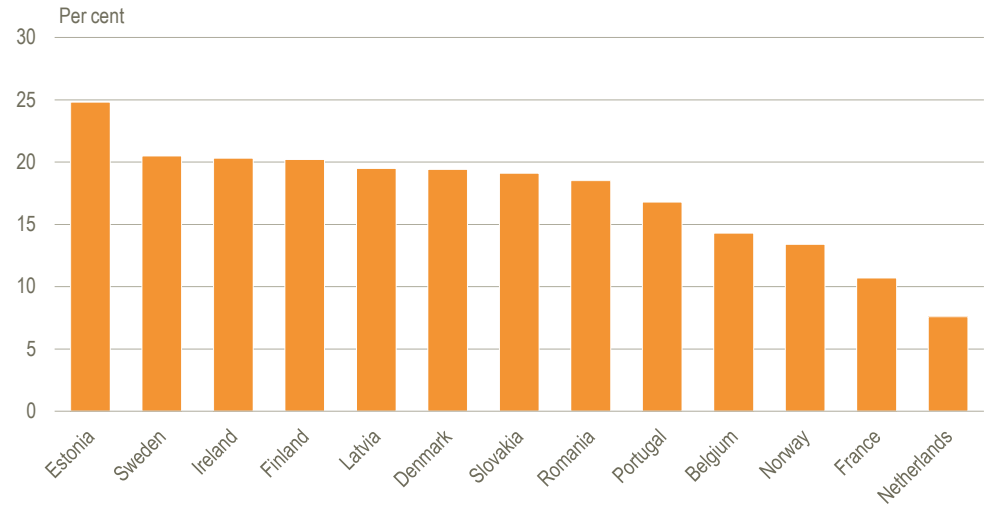
Annex Table 1 **Enterprises sourcing core functions internationally within high- and medium-high-technology manufacturing and low- and medium-low-technology, 2009-2011 (share of number of enterprises sourcing internationally)**

	Share of total no. of enterprises sourcing internationally	
	High- and medium-high-technology	Low- and medium-low-technology
	per cent	
Belgium	51.6	60.0
Bulgaria	62.5	37.5
Denmark	73.6	71.4
Estonia	60.0	48.3
Ireland	43.9	30.8
France	78.5	82.1
Netherlands	62.2	50.4
Portugal	53.6	54.5
Romania	50.0	25.0
Slovakia	56.5	30.0
Finland	68.8	72.7
Sweden	45.5	57.1
Norway	69.0	62.8

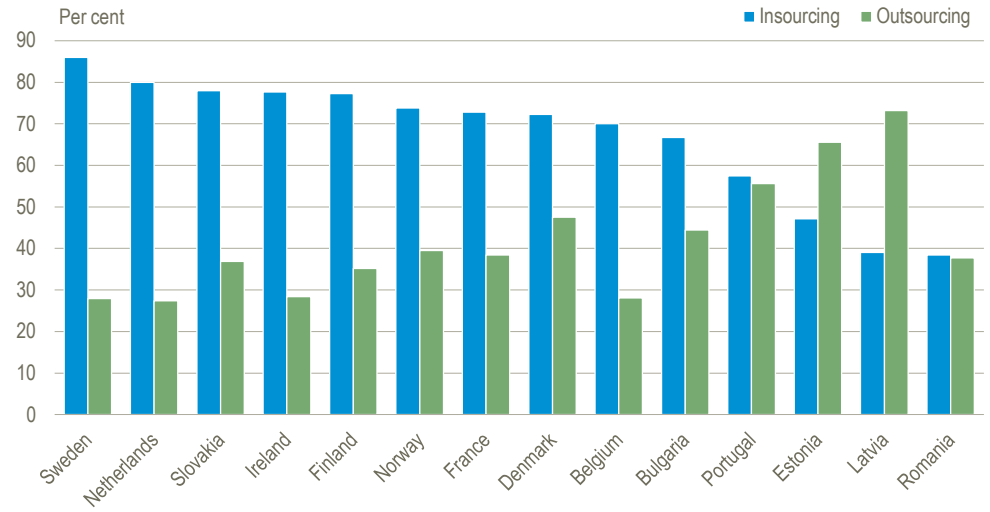
Annex Table 2 **Enterprises sourcing support functions internationally within high- and medium-high-technology manufacturing and low- and medium-low-technology, 2009-2011 (share of total number of enterprises sourcing)**

	Share of total no. of enterprises sourcing internationally	
	High- and medium-high-technology	Low- and medium-low-technology
	per cent	
Belgium	63.7	50.0
Bulgaria	37.5	62.5
Denmark	63.2	55.6
Estonia	40.0	75.9
Ireland	80.5	84.6
France	46.6	27.4
Netherlands	53.7	65.8
Portugal	79.7	79.5
Romania	59.1	78.6
Slovakia	73.9	82.0
Finland	75.0	59.7
Sweden	54.5	80.5
Norway	62.1	51.2

Annex Figure 1 **Enterprises sourcing R&D and engineering support functions internationally, 2009-2011 (share of total number of enterprises sourcing internationally)**



Annex Figure 2 **Share of enterprises having sourced internationally within an enterprise group (insourcing), 2009-2011 or having sourced internationally to external partners (outsourcing), 2009-2011 (% of total number of enterprises sourcing internationally)**



Annex Table 3 **Share of enterprises having sourced internationally within an enterprise group (insourcing), 2009-2011. All activities**

	Core function	Support function
	per cent	
Total	**70.1**	**83.9**
Belgium	59.2	77.7
Bulgaria	57.1	78.6
Denmark	73.7	72.1
Estonia	30.0	54.3
Ireland	67.1	80.0
France	79.3	132.8
Latvia	54.5	40.5
Lithuania	75.0	100.0
Netherlands	81.5	78.3
Portugal	55.6	60.6
Romania	20.5	45.0
Slovakia	64.7	82.8
Finland	70.9	79.9
Sweden	77.4	91.1
Norway	74.4	75.2

Annex Table 4 **Share of enterprises having sourced internationally within an enterprise group (insourcing), 2009-2011. Manufacturing**

	Core function	Support function
	per cent	
Total	**69.5**	**92.9**
Belgium	62.1	76.9
Bulgaria	37.5	62.5
Denmark	74.5	76.1
Estonia	29.4	57.7
Ireland	52.2	76.6
France	77.3	200.6
Latvia	…	23.5
Netherlands	80.0	85.7
Portugal	53.0	53.9
Romania	24.0	50.0
Slovakia	60.7	86.2
Finland	69.0	78.4
Sweden	82.3	92.4
Norway	72.9	72.9

Annex Table 5 **Share of enterprises having sourced internationally within an enterprise group (insourcing) 2009-2011. High- and medium-high-technology manufacturing**

	Core function	Support function
	per cent	
Total	**69.7**	**94.5**
Belgium	48.9	82.8
Bulgaria	0.0	0.0
Denmark	71.9	76.4
Estonia	66.7	50.0
Ireland	44.4	75.8
France	77.3	159.8
Netherlands	96.1	93.2
Portugal	70.3	67.3
Romania	…	46.2
Slovakia	53.8	82.4
Finland	70.5	75.0
Sweden	71.4	92.9
Norway	75.0	83.3

Annex Table 6 **Share of enterprises having sourced internationally within an enterprise group (insourcing), 2009-2011. Low- and medium-low-technology manufacturing**

	Core function	Support function
	per cent	
Total	**68.0**	**94.8**
Belgium	69.4	71.7
Bulgaria	100.0	100.0
Denmark	77.8	74.3
Estonia	21.4	59.1
Ireland	100.0	100.0
France	77.3	269.6
Netherlands	64.4	85.7
Portugal	41.0	50.6
Romania	…	52.3
Slovakia	66.7	87.8
Finland	67.9	82.6
Sweden	90.9	95.2
Norway	70.4	63.6

Annex Table 7 **Share of enterprises having sourced internationally to external partners (outsourcing), 2009-2011. All activities**

	Core function	Support function
	per cent	
Total	**35.7**	**35.6**
Belgium	33.5	21.1
Bulgaria	57.1	35.7
Denmark	39.7	45.0
Estonia	80.0	54.3
Ireland	26.0	22.4
France	30.1	42.7
Latvia	59.1	70.3
Lithuania	25.0	16.7
Netherlands	25.4	29.3
Portugal	54.2	52.7
Romania	52.3	31.2
Slovakia	52.9	31.0
Finland	33.8	29.6
Sweden	24.8	24.4
Norway	32.2	36.0

Annex Table 8 **Share of enterprises having sourced internationally to external partners (outsourcing), 2009-2011. Manufacturing**

	Core function	Support function
	per cent	
Total	**36,8**	**34.3**
Belgium	31,9	19.0
Bulgaria	62,5	37.5
Denmark	42,7	43.5
Estonia	82,4	53.8
Ireland	34,8	23.4
France	29,8	33.3
Latvia	75,0	88.2
Netherlands	30,9	23.8
Portugal	64,0	59.9
Romania	36,0	39.7
Slovakia	50,0	24.1
Finland	35,0	27.8
Sweden	26,6	21.0
Norway	35,4	33.3

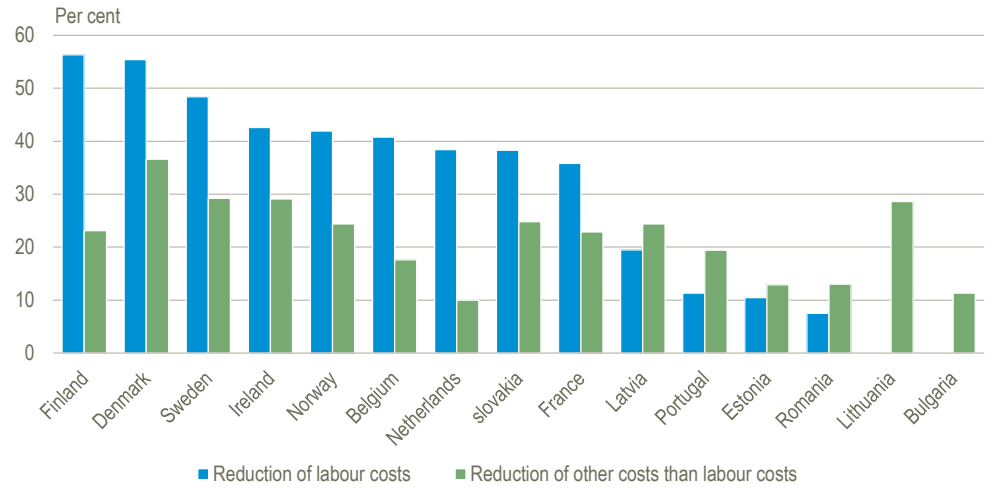
Annex Table 9 **Share of enterprises having sourced internationally to external partners (outsourcing), 2009-2011. High- and medium-high-technology manufacturing**

	Core function	Support function
	per cent	
Total	**34.7**	**32.0**
Belgium	38.3	22.4
Bulgaria	100.0	100.0
Denmark	51.6	45.5
Estonia	33.3	50.0
Ireland	44.4	27.3
France	27.9	29.4
Latvia	…	100.0
Netherlands	3.9	13.6
Portugal	64.9	61.8
Slovakia	61.5	29.4
Finland	34.1	39.6
Sweden	40.0	9.5
Norway	30.0	27.8

Annex Table 10 **Share of enterprises having sourced internationally to external partners (outsourcing), 2009-2011. Low- and medium-low-technology manufacturing**

	Core function	Support function
	per cent	
Total	37.9	33.7
Belgium	27.8	16.7
Denmark	31.1	40.0
Estonia	92.9	54.5
France	31.4	39.1
Latvia	…	84.6
Netherlands	55.9	26.0
Portugal	65.6	55.1
Romania	64.3	38.6
Slovakia	40.0	22.0
Finland	33.9	15.2
Sweden	15.9	29.0
Norway	40.7	31.8

Annex Figure 3 **Selected motivation factors for enterprises sourcing internationally, 2009-2011 (% of total number of enterprises sourcing internationally). Answering very important**



Annex Table 11 **International sourcing, 2009-2011, broken down by destination. Sourcing to other EU-15 member states, all activities**

	Core functions as a share of total sourcing to EU-15	Share of enterprises sourcing to EU-15 of total international sourcing
	per cent	
Total	**37.0**	**44.2**
Bulgaria	60.0	20.8
Denmark	40.9	40.4
Estonia	21.4	62.2
Ireland	41.3	73.6
France	53.5	44.6
Latvia	60.0	61.0
Lithuania	33.3	42.9
Netherlands	…	42.5
Portugal	49.8	69.6
Romania	26.2	57.5
Slovakia	31.9	51.1
Finland	30.9	44.5
Sweden	25.2	39.9
Norway	35.6	50.6

Annex Table 12 **International sourcing, 2009-2011, broken down by destination. Sourcing to other EU-15 member states, manufacturing**

	Core functions as share of total sourcing to EU-15	Share of enterprises sourcing to EU-15 of total international sourcing
	per cent	
Total	**46.1**	**40.5**
Belgium	48.6	34.0
Bulgaria	60.0	31.3
Denmark	51.9	34.2
Estonia	21.7	63.9
Ireland	36.1	63.2
France	69.0	39.5
Latvia	44.4	52.9
Portugal	46.3	77.4
Romania	19.6	65.4
Slovakia	26.3	52.1
Finland	36.2	40.3
Sweden	29.4	33.1
Norway	35.3	42.5

Annex Table 13 **International sourcing, 2009-2011, broken down by destination. Sourcing to other EU-15 member states, high- and medium-high-technology manufacturing**

	Core functions as share of total sourcing to EU-15	Share of enterprises sourcing to EU-15 of total international sourcing
	per cent	
Total	**41.6**	**34.4**
Belgium	30.8	28.6
Denmark	41.4	33.3
Estonia	50.0	80.0
Ireland	44.8	70.7
France	52.2	30.6
Portugal	52.0	72.5
Romania	0.0	40.9
Slovakia	35.7	60.9
Finland	33.3	32.8
Sweden	22.2	23.4
Norway	35.7	48.3

Annex Table 14 **International sourcing, 2009-2011, broken down by destination. Sourcing to other EU-15 member states, low- and medium-low-technology manufacturing**

	Core functions as share of total sourcing to EU-15	Share of enterprises sourcing to EU-15 of total international sourcing
	per cent	
Total	**50.0**	**44.6**
Belgium	60.0	37.5
Bulgaria	60.0	62.5
Denmark	63.6	34.9
Estonia	16.7	62.1
Ireland	0.0	53.8
France	78.3	47.6
Portugal	44.8	77.7
Romania	23.8	75.0
Slovakia	20.8	48.0
Finland	40.0	45.5
Sweden	33.3	42.9
Norway	43.8	37.2

Annex Table 15 **International sourcing, 2009-2011, broken down by destination. Sourcing to other EU-12 member states, all activities**

	Core functions as share of total sourcing to EU-12	Share of enterprises sourcing to EU-12 of total international sourcing
	per cent	
Total	**49.1**	**28.3**
Bulgaria	62.5	33.3
Denmark	65.4	42.4
Estonia	64.7	37.8
Ireland	46.3	27.7
France	58.9	23.8
Latvia	57.9	46.3
Lithuania	33.3	85.7
Netherlands	…	25.3
Portugal	57.1	20.2
Romania	…	17.1
Slovakia	39.5	61.0
Finland	61.8	49.8
Sweden	47.1	38.6
Norway	71.4	32.6

Annex Table 16 **International sourcing, 2009-2011, broken down by destination. Sourcing to other EU-12 member states, manufacturing**

	Core functions as share of total sourcing to EU-12	Share of enterprises sourcing to EU-12 of total international sourcing
	per cent	
Total	**63.3**	**30.2**
Belgium	54.5	36.3
Bulgaria	0.0	18.8
Denmark	75.9	52.0
Estonia	69.2	36.1
Ireland	0.0	21.1
France	77.6	24.5
Latvia	45.5	64.7
Portugal	59.5	22.1
Romania	…	17.9
Slovakia	45.9	50.7
Finland	70.8	50.0
Sweden	61.5	42.2
Norway	75.0	35.0

Annex Table 17 **International sourcing, 2009-2011, broken down by destination. Sourcing to other EU-12 member states, high- and medium-high-technology manufacturing**

	Core functions as share of total sourcing to EU-12	Share of enterprises sourcing to EU-12 of total international sourcing
	per cent	
Total	**58.3**	**31.1**
Belgium	21.7	25.3
Bulgaria	0.0	37.5
Denmark	76.2	48.3
Ireland	0.0	29.3
France	70.4	32.4
Portugal	62.1	42.0
Romania	…	18.2
Slovakia	80.0	43.5
Finland	70.0	46.9
Sweden	33.3	27.3
Norway	77.8	31.0

Annex Table 18 **International sourcing, 2009-2011, broken down by destination. Sourcing to other EU-12 member states, low- and medium-low-technology manufacturing**

	Core functions as share of total sourcing to EU-12	Share of enterprises sourcing to EU-12 of total international sourcing
	per cent	
Total	**69.0**	**29.5**
Belgium	67.3	45.8
Denmark	77.8	57.1
Estonia	69.2	44.8
France	88.9	17.9
Portugal	53.8	11.6
Romania	…	17.9
Slovakia	33.3	54.0
Finland	73.2	53.2
Sweden	75.0	57.1
Norway	87.5	37.2

Annex Table 19 **International sourcing, 2009-2011, broken down by destination. Sourcing to United States, all activities**

	Core functions as share of total sourcing to United States	Share of enterprises sourcing to United States of total international sourcing
	per cent	
Total	**37.8**	**6.7**
Bulgaria	100.0	12.5
Denmark	41.2	5.4
Estonia	0.0	22
Ireland	38.5	26.4
France	31.6	7.1
Netherlands	…	3.6
Portugal	64.7	13.4
Romania	0.0	6.2
Slovakia	100.0	3.5
Finland	…	4.9
Sweden	20.0	6.5
Norway	54.5	6.4

Annex Table 20 **International sourcing, 2009-2011, broken down by destination. Sourcing to United States, manufacturing**

	Core functions as share of total sourcing to United States	Share of enterprises sourcing to United States of total international sourcing
	per cent	
Total	**44.2**	**6.0**
Belgium	50.0	4.7
Denmark	40.0	6.6
Estonia	0.0	2.8
Ireland	33.3	31.6
France	33.3	4.4
Portugal	69.7	17.4
Slovakia	100.0	1.4
Finland	…	5.6
Sweden	36.4	7.1

Annex Table 20 **International sourcing, 2009-2011, broken down by destination. Sourcing to United States, high- and medium-high-technology manufacturing**

	Core functions as share of total sourcing to United States	Share of enterprises sourcing to United States of total international sourcing
	per cent	
Total	47.1	10.4
Belgium	50.0	11.0
Denmark	37.5	9.2
Ireland	…	34.1
France	20.0	6.8
Portugal	87.5	34.8
Slovakia	100.0	4.3
Sweden	57.1	9.1
Norway	50.0	20.7

Annex Table 21 **International sourcing, 2009-2011, broken down by destination. Sourcing to United States, low- and medium-low-technology manufacturing**

	Core functions as share of total sourcing to United States	Share of enterprises sourcing to United States of total international sourcing
	per cent	
Total	**28.0**	**2.5**
Denmark	50.0	3.2
Estonia	0.0	3.4
Ireland	…	30.8
France	80.0	2.0
Portugal	22.2	8.0
Sweden	0.0	5.2

Annex Table 22 **International sourcing, 2009-2011, broken down by destination. Sourcing to China, all activities**

	Core functions as share of total sourcing to China	Share of enterprises sourcing to China of total international sourcing
	per cent	
Total	**76.5**	**11.9**
Bulgaria	100.0	12.5
Denmark	88.9	20.1
Estonia	100.0	2.2
Ireland	68.2	14.9
France	81.6	17.0
Latvia	…	9.8
Netherlands	…	7.6
Portugal	84.4	11.8
Slovakia	87.5	5.7
Finland	89.5	23.1
Sweden	78.1	10.4
Norway	90.0	11.6

Annex Table 23 **International sourcing, 2009-2011, broken down by destination. Sourcing to China, manufacturing**

	Core functions as share of total sourcing to China	Share of enterprises sourcing to China of total international sourcing
	per cent	
Total	**82.9**	**17.0**
Belgium	90.0	14.2
Bulgaria	100.0	18.8
Denmark	91.7	31.6
Estonia	100.0	2.8
Ireland	60.0	17.5
France	86.0	25.6
Portugal	89.2	19.5
Slovakia	75.0	5.5
Finland	91.8	34.0
Sweden	…	11.7

Annex Table 24 **International sourcing, 2009-2011, broken down by destination. Sourcing to China, high- and medium-high-technology manufacturing**

	Core functions as share of total sourcing to China	Share of enterprises sourcing to China of total international sourcing
	per cent	
Total	**80.5**	**24.5**
Belgium	88.9	19.8
Bulgaria	100.0	37.5
Denmark	91.4	40.2
Ireland	60.0	24.4
France	84.2	34.7
Portugal	100.0	23.2
Slovakia	66.7	13.0
Finland	88.0	39.1
Sweden	…	18.2

Annex Table 25 **International sourcing, 2009-2011, broken down by destination. Sourcing to China, low- and medium-low-technology manufacturing**

	Core functions as share of total sourcing to China	Share of enterprises sourcing to China of total international sourcing
	per cent	
Total	**91.7**	**13.0**
Belgium	100.0	10.0
Denmark	92.3	20.6
Estonia	100.0	3.4
France	88.9	17.9
Portugal	81.0	18.8
Slovakia	100.0	2.0
Finland	95.8	31.2
Sweden	100.0	5.2
Norway	100.0	25.6

Annex Table 26 **International sourcing, 2009-2011, broken down by destination. Sourcing to India, all activities**

	Core functions as share of total sourcing to India	Share of enterprises sourcing to India of total international sourcing
	per cent	
Total	**35.5**	**15.7**
Bulgaria	100.0	12.5
Denmark	44.3	22.3
Estonia	100.0	2.2
Ireland	26.8	27.7
France	37.2	21.5
Lithuania	100.0	14.3
Netherlands	…	13.9
Portugal	58.3	9.4
Romania	0.0	3.4
Slovakia	33.3	4.3
Finland	55.0	24.3
Sweden	28.0	24.4
Norway	38.7	18.0

Annex Table 27 **International sourcing, 2009-2011, broken down by destination. Sourcing to India, manufacturing**

	Core functions as share of total sourcing to India	Share of enterprises sourcing to India of total international sourcing
	er cent	
Total	41.9	12.0
Belgium	31.3	15.1
Denmark	52.6	12.5
Estonia	100.0	2.8
Ireland	0.0	22.8
France	50.7	14.6
Portugal	78.3	12.1
Slovakia	100.0	1.4
Finland	55.2	20.1
Sweden	12.5	20.8
Norway	…	10.0

Annex Table 28 **International sourcing, 2009-2011, broken down by destination. Sourcing to India, high- and medium-high-technology manufacturing**

	Core functions as share of total sourcing to India	Share of enterprises sourcing to India of total international sourcing
	per cent	
Total	**41.3**	**15.4**
Belgium	27.8	19.8
Denmark	61.5	14.9
Estonia	100.0	20.0
Ireland	0.0	24.4
France	40.5	16.9
Portugal	84.6	18.8
Finland	50.0	25.0
Sweden	22.2	23.4

Annex Table 29 **International sourcing, 2009-2011, broken down by destination. Sourcing to India, low- and medium-low-technology manufacturing**

	Core functions as share of total sourcing to India	Share of enterprises sourcing to India of total international sourcing
	per cent	
Total	**47.8**	**9.0**
Belgium	33.3	12.5
Denmark	33.3	9.5
France	62.5	12.7
Portugal	80.0	8.9
Slovakia	100.0	2.0
Finland	61.5	16.9
Sweden	0.0	19.5

Annex Table 30 **International sourcing, 2009-2011, broken down by destination. Sourcing to Asia*, all activities**

	Core functions as share of total sourcing to Asia	Share of enterprises sourcing to Asia of total international sourcing
	per cent	
Total	**49.2**	**8.6**
Denmark	54.2	15.3
Estonia	100.0	2.2
Ireland	58.6	19.6
France	58.3	14.4
Netherlands	…	8.7
Portugal	80.8	6.8
Slovakia	37.5	5.7
Finland	43.8	6.5
Sweden	…	2.3
Norway	50.0	11.6

* Except China and India

Annex Table 31 **International sourcing, 2009-2011, broken down by destination. Sourcing to Asia*, manufacturing**

	Core functions as share of total sourcing to Asia	Share of enterprises sourcing to Asia of total international sourcing
	per cent	
Total	**62.7**	**7.5**
Belgium	41.7	5.7
Denmark	66.7	15.8
Estonia	100.0	2.8
Ireland	0.0	7.0
France	76.9	11.0
Portugal	81.8	11.6
Slovakia	0.0	4.1
Finland	62.5	5.6
Sweden	…	4.5
Norway	44.4	11.3

* Except China and India

Annex Table 32 **International sourcing, 2009-2011, broken down by destination. Sourcing to Asia*, high- and medium-high-technology manufacturing**

	Core functions as share of total sourcing to Asia	Share of enterprises sourcing to Asia of total international sourcing
	per cent	
Total	**71.0**	**8.4**
Belgium	37.5	8.8
Denmark	75.0	13.8
Ireland	0.0	9.8
France	80.8	11.9
Portugal	88.9	26.1
Slovakia	0.0	4.3

* Except China and India

Annex Table 33 **International sourcing, 2009-2011, broken down by destination. Sourcing to Asia*, low- and medium-low-technology manufacturing**

	Core functions as share of total sourcing to Asia	Share of enterprises sourcing to Asia of total international sourcing
	per cent	
Total	**64.6**	**4.7**
Belgium	40.0	4.2
Denmark	70.0	15.9
Estonia	100.0	3.4
France	73.1	10.3
Portugal	50.0	3.6
Slovakia	0.0	4.0

* Except China and India

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