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The Contribution of Foreign
Affiliates to Productivity
Growth: Evidence from
OECD Countries

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Statistical Analysis of Science, Technology and Industry

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THE CONTRIBUTION OF FOREIGN AFFILIATES TO PRODUCTIVITY GROWTH: EVIDENCE FROM OECD COUNTRIES

Chiara Criscuolo*

ABSTRACT

This study uses new information to determine the role of foreign affiliates in productivity growth. The study has three aims. Firstly, the study quantifies the contribution of foreign affiliates to productivity growth in OECD countries using a growth accounting approach. Secondly, the analysis shows how much of this contribution derives from an increase in the employment share of foreign affiliates in the host country relative to an increase in the productivity of existing foreign affiliates. Thirdly, the study compares the presence of foreign affiliates across OECD countries. The information is derived by matching three OECD data sources: the STAN database for industrial analysis, the AFA (Activities of Foreign Affiliates) and FATS (Foreign Affiliates in Trade and Services) databases. Despite its limitations, this combined database provides longitudinal industry level information on both the presence and the productivity of foreign affiliates in OECD countries. The analysis confirms that foreign affiliates can make an important contribution to productivity growth. The contribution is larger in the manufacturing sector. In the services sector and in low-tech manufacturing sectors, the largest component of the contribution of foreign affiliates is due to the increased employment share of foreign affiliates. In medium- and high-tech sectors, the contribution is mainly driven by stronger productivity growth of existing foreign affiliates. In the United States the contribution is consistently driven by stronger productivity growth of existing foreign affiliates in both the manufacturing and the services sectors.

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LA CONTRIBUTION DES FILIALES ÉTRANGÈRES À LA CROISSANCE DE LA PRODUCTIVITÉ : OBSERVATIONS CONCERNANT LES PAYS DE L'OCDE

Chiara Criscuolo*

RÉSUMÉ

La présente étude utilise de nouvelles informations pour déterminer le rôle joué par les filiales étrangères dans la croissance de la productivité. L'analyse s'articule autour de trois axes. Premièrement, l'étude quantifie la contribution des filiales étrangères aux gains de productivité dans les pays de l'OCDE à partir d'une analyse causale de la croissance. Deuxièmement, l'analyse montre dans quelle mesure cette contribution résulte d'une augmentation du poids relatif des filiales étrangères dans l'emploi du pays hôte, ou de gains de productivité réalisés par les filiales étrangères existantes. Troisièmement, l'étude compare la présence des filiales étrangères dans différents pays de l'OCDE. Les informations utilisées sont obtenues par rapprochement de trois sources de données de l'OCDE : la base de données sur l'analyse structurelle (STAN), la base de données sur les activités des filiales étrangères (AFA) et la base de données sur les échanges de services des filiales étrangères (FATS). Malgré ses limites, l'ensemble de données ainsi constitué offre des informations longitudinales par secteur tant sur la présence que sur la productivité des filiales étrangères dans les pays de l'OCDE. L'analyse confirme que les filiales étrangères peuvent contribuer de manière importante à la croissance de la productivité. Cette contribution est plus forte dans le secteur manufacturier. Dans les services et dans les secteurs manufacturiers de basse technologie, la contribution des filiales étrangères est principalement imputable à l'augmentation de leur poids relatif dans l'emploi. Dans les secteurs de moyenne et haute technologie, cette contribution repose essentiellement sur une croissance plus forte de la productivité des filiales étrangères existantes. Aux États-Unis, cette contribution résulte systématiquement d'une croissance plus forte de la productivité des filiales étrangères existantes, tant dans le secteur manufacturier que dans les services.

* L'auteur souhaite exprimer sa gratitude à Dirk Pilat, Andrew Wyckoff, Paul Conway, Colin Webb, Norihiko Yamano, Nicholas Oulton, Agnes Cimper, et Thomas Hatzichronoglou pour leurs précieux commentaires et suggestions. Un grand merci également à Isabelle Desnoyers-James et Laurent Moussié pour m'avoir fourni les données des bases AFA et FATS ainsi que des précisions sur leurs sources. Toute erreur reste de ma responsabilité. Les opinions exprimées dans ce document sont celles de l'auteur et ne doivent pas être considérées comme celles de l'OCDE ou de ses pays membres.

INTRODUCTION

In recent decades, foreign direct investment (FDI) has steadily increased so that foreign owned multinational enterprises (MNEs) now play an important role in the economy of many developed and developing countries. Countries have competed with each other in attracting FDI because affiliates of foreign MNEs are expected to contribute to the welfare of the host economy through multiple channels. But what precisely is the impact of foreign affiliates on the host country economy?

Economic models of international trade assume that MNEs must have inherent advantages that allow them to compete with domestic firms despite the higher costs of operating in a foreign country with a different culture and legal environment, where they have also less knowledge of demand conditions and of local business networks involving suppliers and customers (see for example Helpman, Melitz and Yeaple, 2004 (and references therein); Hymer, 1976; Helpman 1984; Dunning, 1991 and Markusen, 1995).

The inherent advantages of MNEs derive from firm specific assets, such as better management techniques and better production technology and employees' technical knowledge, which they can share with their affiliates as well as brand names and product innovations from which the affiliates benefit.

Thus, firms that are affiliates of multinational enterprises benefit both from being part of a global group, and from the advantages of vertical (and/or horizontal) integration. They can gain from factor price differentials, global economies of scale, outsourcing and the knowledge transfers from parent companies and flows among subsidiaries. This makes them more productive than firms which are not part of an MNE (see for example Doms and Jensen, 1998 for evidence on the United States; Griffith, 1999 and Criscuolo and Martin, 2004 for evidence on the United Kingdom). Since there is a paucity of data identifying firms which are part of domestic MNEs, and since only a small fraction of all domestic firms are part of domestic multinationals, this MNE advantage is mainly reflected in an advantage of foreign affiliates.

Empirical evidence has shown that foreign affiliates are larger, more capital and skill intensive; they invest more in both physical and knowledge capital and pay higher wages¹ than domestic firms within the same industry. Also, as shown by previous OECD work, they are often concentrated in more capital and skill intensive sectors. Foreign affiliates are also more R&D intensive and more innovative. Therefore, they are likely to grow more rapidly than domestic firms and thus contribute *directly* to the productivity growth of the host economy more than the average domestic firm.

Foreign affiliates may also contribute *indirectly* to the productivity growth of the host economy, by raising the productivity of domestic firms. Host countries hope to benefit from the presence of foreign affiliates by appropriating some of the productivity and knowledge advantages that foreign affiliates cannot fully internalise. These externalities take place through "knowledge spillovers" such as international technology transfers and diffusion of best practices and demonstration effects (see Keller, 2004 for a survey).² The presence of foreign affiliates increases the competitive pressure on domestic firms in the

1. See Lipsey, 2003 for a survey of empirical evidence.

2. Domestic firms can imitate foreign affiliates; workers trained in foreign firms might leave foreign firms and move to domestic firms. In the case of backward and forward linkages, foreign firms are also likely to improve the knowledge of domestic suppliers and/or distributors (see evidence in Smarzynska, 2004).

same industry, thus forcing them to introduce new technology and improve efficiency (see Blomström and Kokko, 1997); however, the entry of foreign firms can result in lower productivity or exit of domestic firms because of lower market shares, through a market stealing effect (Aitken and Harrison, 1999).

This is the first study to quantify the *direct* contribution of foreign affiliates to productivity growth across OECD countries using a growth accounting approach. It investigates how much of the contribution is derived from an increase in the size of foreign affiliates' presence in the host country and how much is derived from their more rapid growth. The data on which the analysis is based comes from matching three sources: the OECD STAN database for industrial analysis, the AFA (Activities of Foreign Affiliates) and FATS (Foreign Affiliates' Trade in Services) databases. Despite its limitations, this combined database provides longitudinal information at the industry level on the productivity of the host country and the presence and the productivity of foreign affiliates. This study does not attempt to assess and quantify spillovers (*i.e.* the *indirect* contribution) from foreign affiliates to domestic firms. This will be the subject of future research.

Only a study by Corrado, Lengermann and Slifman (2003) has previously used a growth accounting approach to quantify the contribution of the (foreign and domestic) multinational sector to labour productivity growth. It focused on the United States for the period from 1977 to 2000, and used industry level data. Relative to their work, this study assesses the contribution of the foreign multinational sector across several OECD countries. Moreover, it extends their analysis, by decomposing the foreign affiliates' contribution in two effects: the *within* effect, *i.e.* the contribution from productivity growth of existing foreign affiliates, and the *between* effect, *i.e.* the contribution from the growth in the share of foreign affiliates' employment in the host economy.

The rest of the paper is organised as follows: Section 2 describes the data, section three outlines the methodology used and section four describes the results. Finally section 5 concludes. The Annex and the Appendices include more details regarding the data and some additional results.

THE DATA

The data used for the analysis contains information from three OECD databases: the STAN productivity database; the AFA (Activity of Foreign Affiliates) database, which contains information on activity of foreign affiliates in the manufacturing sector and the FATS (Foreign Affiliates' Trade in Services) database, which contains information on the activity of foreign affiliates in the services sector. A description of each dataset follows.

The STAN database

The Structural Analysis (STAN) database is provided and maintained by the Economic Analysis and Statistics Division of the OECD. STAN has been widely used and comprehensively documented.³ Thus, this section only briefly describes the variables used and the main issues of interest.

STAN contains information on annual measures of output, measured as gross output and/or value added, labour input, investment, import and exports at the industry level⁴ both in the manufacturing and the services sector for 28 OECD countries. The analysis conducted in the paper only uses measures of output and labour input to construct measures of labour productivity growth.

STAN is mostly based on member countries' annual National Accounts, which is primarily based on data collected at the establishment level, but also uses other sources (*e.g.* national industrial surveys/censuses; short term indicators of industrial activity; labour force surveys; business registers; income surveys and input-output tables) to estimate missing information. In general, the STAN definitions of variables follow SNA93 definitions.

The output measures available in STAN are value added and gross output; they are measured in nominal terms, *i.e.* at current prices, and in real terms, *i.e.* as volumes. The latter are expressed as index numbers with national reference years equal to 100. It is, therefore, possible to calculate the implicit deflators for gross output and for value added.⁵

Gross output is defined as the value of goods and/or services produced in a year whether sold or stocked.

The definition of value added in STAN is at the valuation most commonly presented in national publications; however this definition differs across countries. Indeed, value added is not measured directly, but calculated as the difference between production and intermediate inputs, or as the sum of labour costs, consumption of fixed capital, taxes less subsidies and net operating surplus and mixed income. Table 1 (from Webb, 2005) describes the different definitions. Table 2 describes the difference in definitions across countries used in the current analysis; as the table shows, most countries present value added at basic prices, in line with SNA93 (or in Europe, ESA95) recommendations. Japan and the United States use valuations at producer's prices.

3. See Webb (2005) for a thorough user guide and www.oecd.org/sti/stan for an overview of the sources.

4. The STAN list of industries is based on ISIC Rev. 3.

5. The calculation is the following: $(\text{output at current prices} * 100) / \text{index of output volumes} * \text{output at current prices in the reference year}$; where output can refer to value added and/or gross output.

Table 1. Valuation of value added¹

Value added at Factor costs	1. This table draws on concepts outlined in both the 1968 and 1993 version of a <i>System of National Accounts</i> (SNA68 and SNA93). Until the late 1990s, most countries adhered to recommendations in SNA68 (where the notions of Factor Costs, Producer's Prices and Market Prices were predominant). However, many OECD Member countries have now implemented SNA93 (or the EU equivalent, ESA95) which recommends the use of Basic Prices and Producer's prices (as well as Purchaser's Prices for Input-Output tables).
+ <i>other taxes, less subsidies, on production</i> ²	
= Value added at Basic prices	2. These consist mostly of current taxes (and subsidies) on the labour or capital employed, such as payroll taxes or current taxes on vehicles and buildings.
+ taxes less subsidies, <i>on products</i> ³ (<i>not including imports and VAT</i>)	
= Value added at Producer's prices	3. These consist of taxes (and subsidies) payable per unit of some good or service produced, such as turnover taxes and excise duties.
+ taxes, less subsidies, <i>on imports</i>	
+ Trade and transport costs	4. Market prices are those which purchasers pay for the goods and services they acquire or use, excluding deductible VAT. The term is usually used in the context of aggregates such as GDP, whereas Purchaser Prices refer to the individual transactions.
+ Non-deductible VAT	
= Value added at Market prices ⁴	

Source: Colin Webb, 2005.

Table 2. Differences in valuation of value added across countries¹

Definition	Country
Value added at basic prices	Austria; Belgium; Czech Republic; Germany; Finland; France; Hungary; Italy; Netherlands; Norway; Poland; Portugal; Spain; Sweden
Value added at producer's prices	Japan; United States

Source: OECD, STAN country notes, 2005.

STAN includes information on total employment and on the number of employees. The preferred measure of labour input in this study is employment. For many countries the measure of employment provided is headcounts, *i.e.* the actual number engaged full- and part-time. However, some countries such as Austria, Japan and the United Kingdom provide the number of jobs, as recommended in SNA93, so that those with more than one job are counted more than once. For measuring productivity, a measure of hours worked or comparable measures of full-time equivalent employment would be preferable.⁶ However, hours worked by detailed activity are only available for some countries. Moreover, there are still concerns related to the measurement of hours actually worked and their degree of international comparability (see Chapter 4 of the OECD's Manual "Measuring Productivity"), consequently this study prefers the headcounts measure.

6. A related issue concerns also the composition of labour, which is much more difficult to compare across countries. While some efforts have been made, the statistical basis remains rather limited. The OECD has, therefore, not yet estimated levels of labour input adjusted for its composition in the context of its work on international comparisons of productivity levels.

AFA and FATS databases

Both the Activity of Foreign Affiliates (AFA) and the Foreign Affiliates' Trade in Services (FATS) are survey based data. OECD member countries report on the basis of their own surveys or their own business registers information concerning the outputs, inputs and importing/exporting activity of foreign affiliates at the sectoral level. The data contains 18 variables that describe the activity of foreign affiliates in the host country. For some countries AFA and FATS also contain information on national totals.⁷

The data reports information at the enterprise level, rather than at the establishment level. This means that the statistics on foreign affiliates' activity reported might incorporate secondary activity. This point is particularly relevant in this study because measures of foreign affiliates' activity are calculated relative to national totals using data from STAN which is primarily based on establishment level data. Since the two aggregates are not based on the same statistical unit, this might cause some measurement problems (see also the *OECD Handbook on Economic Globalisation Indicators*, section 3.3.7).

The AFA and FATS databases do not contain information on enterprises' capital stocks. Thus, the only measure of productivity that can be calculated from AFA/FATS is labour productivity, defined as the ratio of output (value added or turnover) to the number of persons employed.

In using these data various issues arise.

Firstly, the definition of "foreign affiliate" in both databases on the activity of foreign affiliates in manufacturing and services sector is based on the concept of controlling interest. The definition of "controlling interest" might differ across countries (as detailed in Box 1). For most countries, controlling interest is defined as direct majority ownership (*i.e.* over 50% of shares held directly by foreign owners). However, for some countries such as Hungary and the United States data on foreign affiliates also includes firms under minority control (between 10% and 50%), based on the assumption that foreign owners can still influence management decisions. Moreover some countries (*e.g.* Germany) include indirectly foreign-owned establishments, *i.e.* owned by foreigners through foreign majority-owned resident enterprises. When making cross-country comparisons these differences need to be outlined.

Secondly, the definition of foreign owned firms within countries has sometimes changed over time. In Germany the data available up to 2001 comprise enterprises directly owned by foreigners, but after 2002 the figures provided also include enterprises indirectly owned by foreigners through foreign majority-owned resident enterprises. In Norway and Finland, data from 1995 include indirectly foreign-owned establishments and are not comparable with those for previous years which only include enterprises directly owned by foreigners.

Thirdly, statistics on foreign presence in some sectors are only available for more recent years (*e.g.* for France, data for the food and beverages and energy sectors were added in 1999) or are missing in the database for some years due to confidentiality issues.

Finally, the coverage of the sources used has sometimes changed over time (*e.g.* in the Czech Republic the Business Register used as a source by the Czech Statistical Office covered units employing at least 20 employees in 1997 and 1998; and all units from 1999; in Norway the data sources used by Statistics Norway covered all establishments with five or more persons up to 1991; those employing more than ten persons for the period 1992-95 and all manufacturing establishments from 1996.).

7. Data for which figures on national totals are missing are the United States. For most countries the figures are only available at an aggregate level and only for some years. For example, data for the manufacturing sector in Japan are only available between 1992 and 1996; in Italy only for 1999 and 2001.

In analysing the longitudinal dimension of the data, we need to take these factors into account to identify spurious changes in the data.

Box 1. Activity of Foreign Affiliates (AFA) and Foreign Affiliates' Trade in Services (FATS) databases

As outlined in Chapter 3 of the OECD *Handbook on Economic Globalisation Indicators* data covering the operations of affiliates and parent companies should be compiled, if possible, "for affiliates in which the direct investor has an unambiguous control and should be attributed to the country of the investor of ultimate control".

The criterion recommended for a firm to be classified as under unambiguous control of a foreign owner is whether a majority (more than 50% of the capital) of ordinary shares or voting power is held by a single foreign investor (or a group of foreign investors acting in concert). Some countries, however, define foreign-controlled affiliates as those firms where a foreign owner holds more than 10% of the capital. As outlined in Tables 3 and 4 this is the case for Hungary and the United States in both AFA and FATS.

To identify the "investor of ultimate control", *i.e.* the parent firm at the end of a chain of domestic and/or foreign directly and indirectly controlled companies, it is necessary to have information not only on the foreign firms that directly control the firm but also on the indirect owners of the firm. However, this information is not available for all countries, as shown in Tables 3 and 4.

Table 3. Definition of foreign-owned companies in AFA

		Ownership	
		Majority (>50%)	Minority (>10%)
CONTROL	Direct	Czech Republic; Finland (until 1995); Germany (until 2001); Ireland; Japan; Netherlands; Poland; Canada; Norway (until 1995); Turkey	Hungary (>10%)
	Indirect	Finland (from 1996); Norway (from 1996); France; Germany (from 2001); Italy; United States (from 1997); Luxembourg	United States (until 1997)

Table 4. Definition of foreign-owned companies in FATS

		Ownership	
		Majority (>50%)	Minority (>10%)
CONTROL	Direct	Austria ; Belgium; Poland; France; Japan; Luxembourg; Germany (until 2001); Portugal; Greece; Netherlands	Hungary (>10%)
	Indirect	Finland; Sweden; Ireland; Italy; Norway; Germany (from 2002); United States from 1997 partially indirect)	United States until 1996 (partially indirect)

Issues in creating a joint AFA–STAN and FATS-STAN database

Level of consolidation

The first issue that arises when combining the AFA/FATS databases with STAN is that the data are not collected at the same level. While the main source for the STAN database is the OECD Annual National Accounts which are primarily based on establishment level data, AFA and FATS are both based on enterprise level information. Thus, in STAN the industry allocation is mostly based on the main activity of each plant that is part of an enterprise. In AFA/FATS, the industry classification is based on the primary activities of the consolidated enterprise. This might cause the relative presence of foreign affiliates in certain sectors to be under- or overestimated, depending on whether the industry concerned is the secondary or primary activity of the foreign enterprise.⁸ Contrary to the study of Corrado, Lengermann and Slifman (2004) who were able to correct for this problem through pseudo establishment estimates from the underlying micro level data, the data underlying this analysis do not provide a straightforward solution to this problem. A similar correction and use of the underlying micro level data, however, should be part of future research.

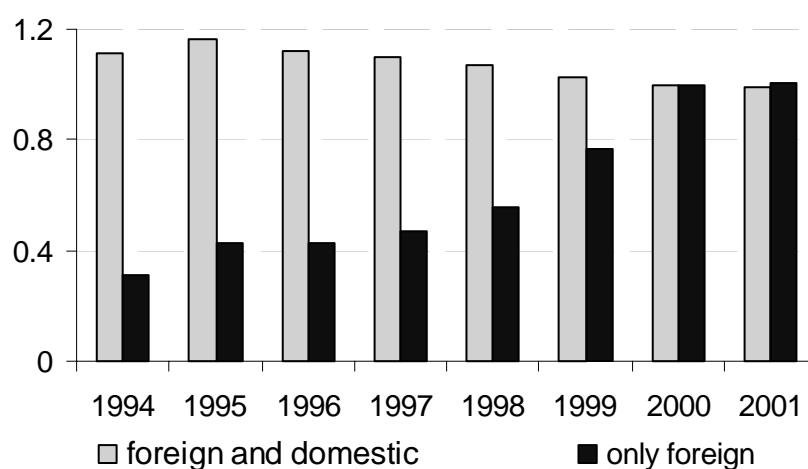
Deflators

To measure productivity growth, value added and turnover need to be deflated. AFA/FATS only contain nominal values, but the STAN database contains measures of output at current and constant prices, so that value added and output deflators can be derived. When comparing productivity growth of foreign owned and domestic firms at the aggregate manufacturing and/or services sector level, the same deflators calculated from STAN are used for both groups. However, the sectoral distribution of foreign affiliates likely differs from the national average. For example, foreign affiliates might be mainly concentrated in high-tech sectors with low inflation, while domestic firms might be more evenly distributed across sectors, including sectors with higher inflation. Applying the same deflators to foreign affiliates and domestic firms means assuming that foreign and domestic firms have the same industry distribution.

For the countries for which the complete sectoral distribution of foreign affiliates across different industries is available, separate deflators for foreign affiliates can be derived. Annex 1 contains the details of this issue. Figure 1 shows the different deflators for Sweden. The limitations of this approach are related to the fact that sudden and/or spurious changes in the presence of foreign affiliates within a particular sector of the economy might affect the deflators for that particular sector, for reasons unrelated to inflation.

8. In 14 cases, the ratio of foreign presence relative to the national total is greater than one. This happens at the 2-digit level for France in sector 30 (Manufacture of office, accounting and computing machinery) from 1994 to 1997 and from 1999 to 2001 (average value for these periods 1.17 (standard deviation 0.07)); for Great Britain in sector 30 (Manufacture of office, accounting and computing machinery) in 1993 (1.16); for Hungary in sector 23 (Manufacture of coke, refined petroleum products and nuclear fuel) from 1998 to 2002 (average value for these periods 2.81 (standard deviation 1.07)); and for the USA (Majority and Minority ownership) in sector 16 (Manufacture of Tobacco products) in 2000 and 2001 (average value for these periods 1.09 (standard deviation 0.002)). In the service sector, the employment share is always within the 0-1 range; but for turnover the ratio is greater than 1 in 30 cases, 27 of which are in the wholesale and retail trade sector. The high turnover ratio for these sectors is easily explained by the difference in definition of output in FATS (sales) and STAN (margins), as discussed in more detail in the paper.

Figure 1. Deflators for the manufacturing sector total and foreign firms only: Sweden



Source: AFA and STAN databases, OECD.

Differences across surveys in terms of variable definition

A third set of issues arises in merging production data from AFA/FATS and STAN. Some of the main variables used are defined differently in the two surveys. Firstly, STAN contains information on total employment. AFA and FATS only contain information on the total number of employees. However, the difference between total number of employees and total employment, which corresponds mostly to the “self-employed”, is likely to be negligible for foreign affiliates. Therefore, the statistics reported should reflect very closely the foreign affiliates’ share of total employment in the host economy.

Secondly, STAN contains gross output information, while AFA and FATS use turnover. Since turnover equals the value of goods and/or services sold in a year, while production is defined as the value of goods or services produced in a year whether sold or stocked, the direction of the biases that may arise from this difference is not always clear. However, in the services sector, sizeable biases, especially in the wholesale and retail sectors, might derive from differences in the definition of output. As noted by Triplett and Bosworth (2004) and Timmer and Inklaar (2005) the system of national accounts, which constitute the basis for STAN, measures trade output as margins rather than sales, where margins are defined as sales minus the value of the goods that would need to be purchased to replace the ones sold.

Issues related to international comparability

To summarise, caution must be taken when comparing foreign affiliates’ presence and contribution to growth across countries and across manufacturing and services sectors, if the latter are derived from different national sources.

There might be discrepancies related to whether countries use direct or indirect control in their definition of foreign controlled affiliates, or whether the countries classify only majority-owned firms as foreign-controlled affiliates or whether they also include minority-controlled firms.

A second source of distortion is the difference in the sources of information on the presence of foreign affiliates. Some countries use business register information, others use specific surveys. In the latter case a related concern relates to sampling issues: *e.g.* if the stratification by size excludes smaller firms below different thresholds, the samples might not be comparable across countries.

A third concern arises because of the conversion of national industrial classifications to international classifications. This issue occurs when the conversion to an international classification is based on aggregated published data. This concern particularly affects data from the United States and Canada.

Finally, differences in the definition of the main variables of interest, *e.g.* employment, gross output and value added must be kept in mind in cross-country comparisons, as discussed in the sections describing the STAN database.

Other data issues

In the following section the study shows that on the whole the performance of foreign affiliates is better than average. However, one might question whether “the average firm” in the host country constitutes a useful reference for comparison.

The group most suitable for comparison with affiliates of foreign MNEs is likely to be the affiliates of domestic MNEs. Domestic MNEs are similar in size; enjoy economies of scale and the benefits of being part of global groups to the same level as foreign affiliates. When such comparisons have been made at the micro level (*e.g.* Doms and Jensen, 1998 for the United States and Criscuolo and Martin, 2004 for the United Kingdom) the results show that in general the nationality of the owner does not bear any weight on the productivity outcome. The exception seems to be the United States, in both studies affiliates of American MNEs are consistently the most productive. However, the data on domestic MNEs are currently only available for very few countries and contain only information on the domestic activity of the consolidated group rather than at the enterprise level, thus hampering the comparison between foreign controlled affiliates and affiliates of domestic multinationals.

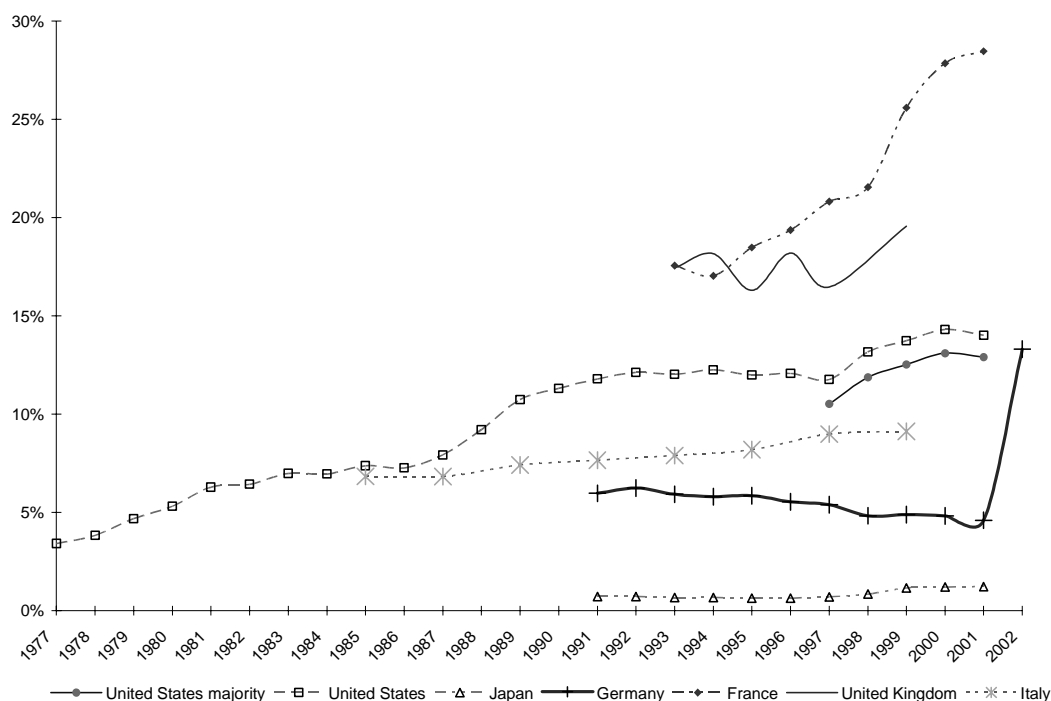
The presence of foreign affiliates in OECD countries

Previous OECD work has shown the presence in several OECD countries of foreign affiliates (OECD, 2001 and Hatzichronoglou, 2004). One of the aims of this work is to show the trends of this presence over time, wherever possible.

Employment

Figure 2 reports the employment share of foreign affiliates in the manufacturing sector in six of the G7 countries.⁹ The employment share of foreign affiliates is the lowest in Japan (going from 0.72% in 1991 to 1.22% in 2001) and is highest in France and the United Kingdom. For all countries the share of employment of foreign affiliates has increased over time. For Germany this share had decreased prior to 2001, then sharply increased between 2001 and 2002. However, as explained below, this is likely to be the consequence of a change in the definition of “foreign-controlled” firms.

9. Excluding Canada for which data on employment in foreign affiliates is not available in the AFA/FATS databases.

Figure 2. **Employment share of foreign affiliates in the manufacturing sector of G7 countries**

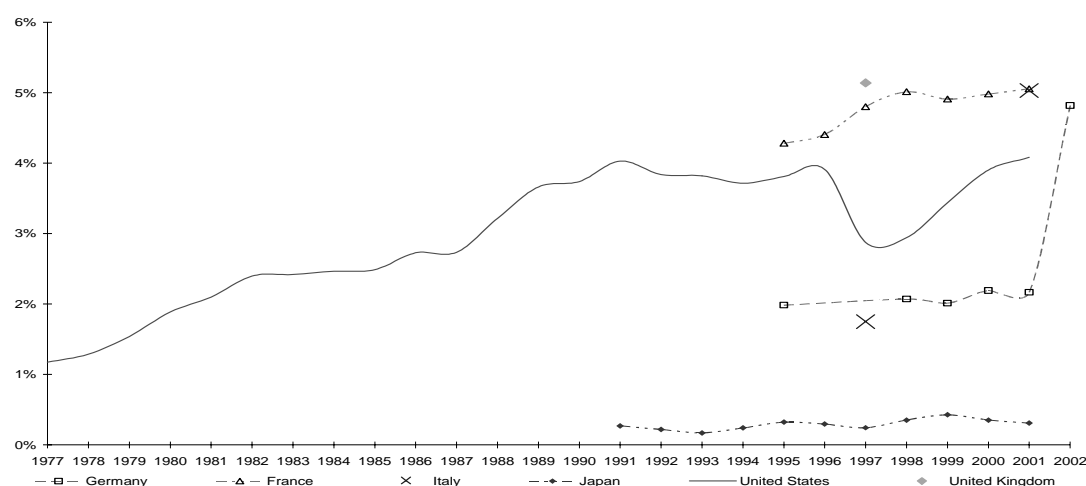
The steep increase in the share of employment of foreign affiliates in Germany between 2001 and 2002 is due to a change in the definition of foreign controlled enterprises. Since 2002, Germany includes both direct and indirect foreign direct investment in the number reported. This means that from 2002 the figures provided also include enterprises indirectly owned by foreigners through foreign majority-owned resident enterprises.

Figure 2 also shows a steep increase in the foreign employment share in France for 1999. This is primarily because in 1999 the food and energy industry sector was included in the survey.

Two series are shown for the United States. The difference between the two series lies once again in the way the group of foreign affiliates is defined. The series (United States) that covers the period 1977 to 2001 covers both majority and minority foreign-owned enterprises. The series (United States majority) defines as foreign affiliates only majority-owned enterprises and covers only a more recent time period (1997-2001). As expected and as evident from the figure, this second group is a subset of the first one and follows very closely the trend outlined in the first series.

Figure 3 looks at the services sector. In services longitudinal data is available for five G7 countries, for the United Kingdom only one data point is available in 1997. As in the manufacturing sector, the data shows a general trend towards the increasing presence of foreign affiliates. The presence of foreign affiliates is lowest in Japan and highest in the United Kingdom and France. However in the interpretation of the graph, some caveats apply.

Figure 3. Employment share of foreign affiliates in the services sector (50 to 74) of G7 countries



Note: Japan: data for the sectors 60 to 64 only available in 1997; data for the sectors 65 to 67 only available in 2000 and data for sectors 70 to 74 only available in 1997, 2000 and 2001. United States: data for sectors 70 to 74 only available from 1987. Data for 65 to 67 and 70 to 74 missing in 1999.

These graphs report the private services sector.¹⁰ Data for the United States include a break in the series, because from 1997 the definition of foreign ownership only includes majority owned foreign affiliates, while up to 1997, all firms where foreigners had an interest of at least 10% were defined as foreign affiliates. Data for Italy are only available in 1997 and 2001, but come from two different sources.¹¹ Germany has a break in the series in 2001 as in manufacturing, because indirectly controlled foreign affiliates are included. Finally, as outlined in the notes to the figure there are changes over time in the sectors that are covered, for example data for Japan for most years only covers the retail and wholesale trade, hotels and restaurants.

Figures 4 and 5 present the share of employment of foreign affiliates in the non-G7 OECD countries in manufacturing and services, respectively.

10. The private services sector is defined as sectors 50 to 74. For those countries for which data on foreign affiliates for the financial services are not available, we report data on 50 to 64 and 70 to 74, as described in the notes to the figures.

11. Information for 1997 comes from the Reprint database developed at the Department of Management, Economics and Industrial Engineering of the "Politecnico di Milano" with the support of the Italian National Council for Economy and Labour (CNEL). Information for 2001 comes from ISTAT.

Figure 4. Employment share of foreign affiliates in the manufacturing sector of non-G7 countries

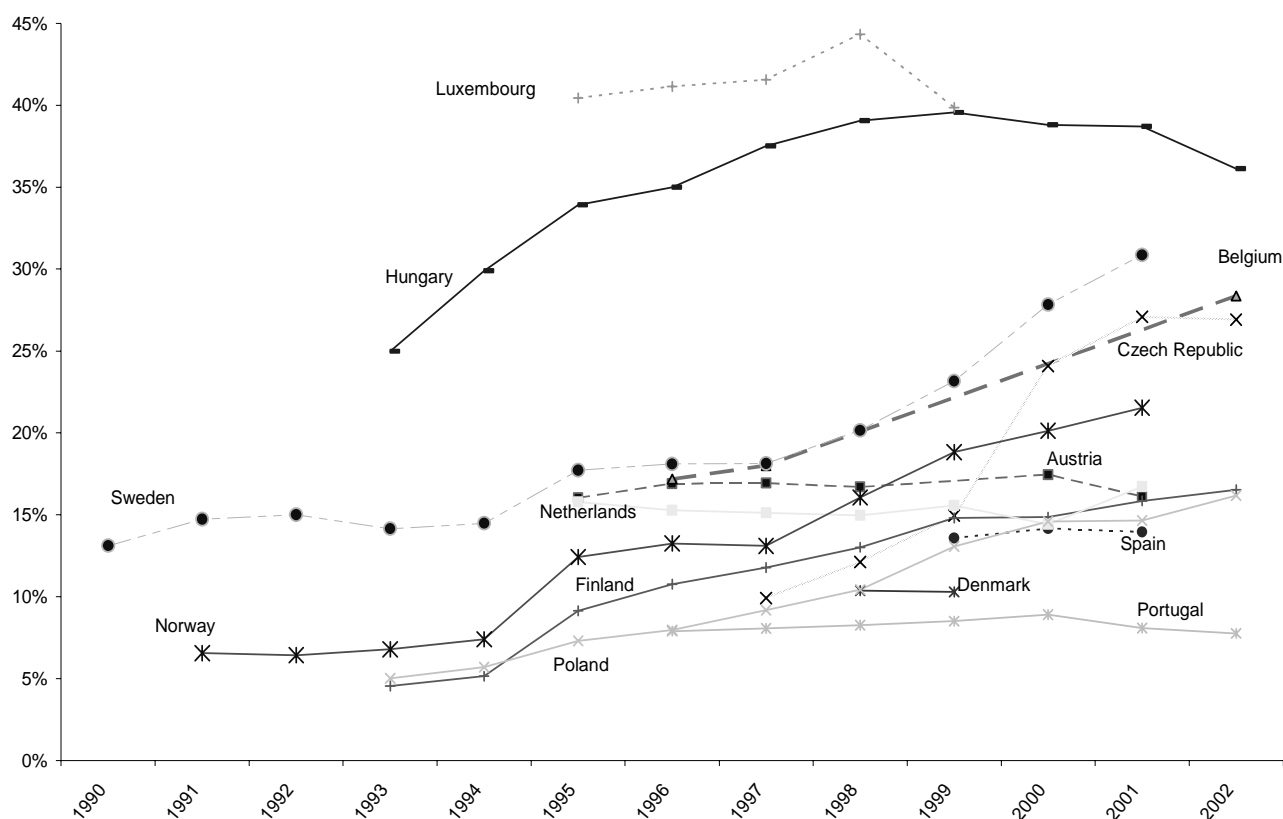


Figure 4 shows that in most of the 13 countries for which we have data, there is an increase in the employment share of foreign affiliates. This reflects a general trend also found in previous studies.

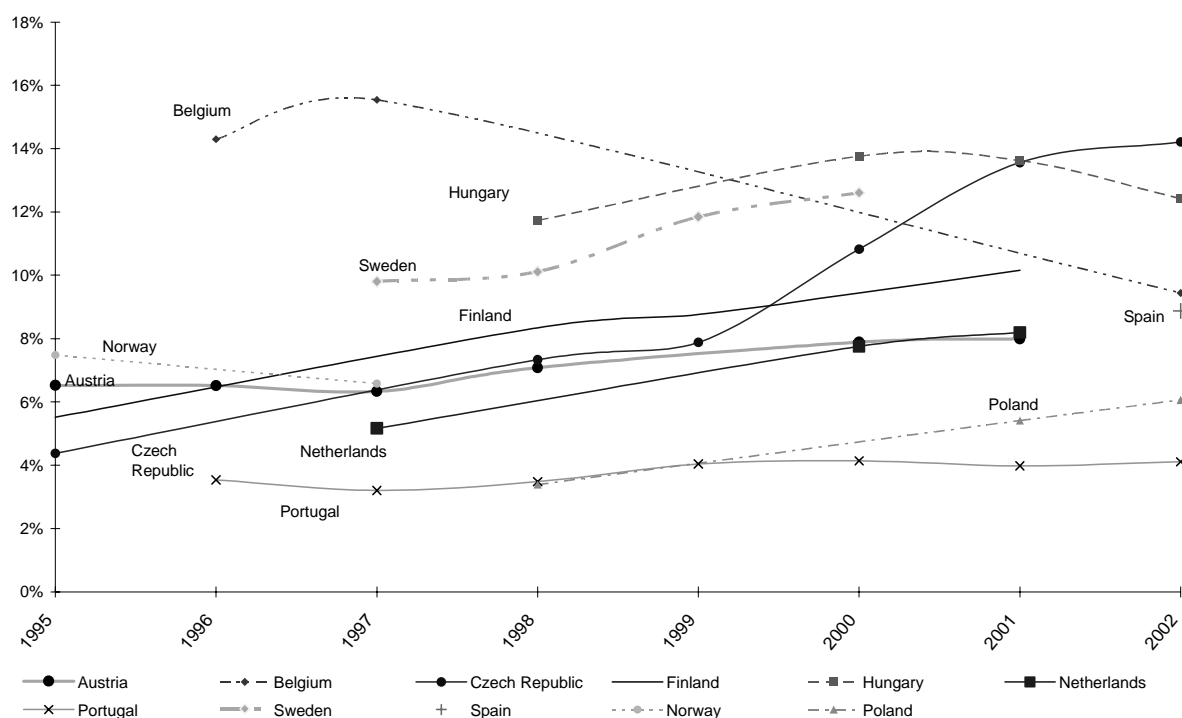
However, some of this observed increase might partly be “spurious”, *i.e.* due to changes in definition of the foreign affiliates’ group or in the coverage of the data. Explanations are provided where possible.

For Sweden, the coverage of the data on foreign affiliates has improved over time, and indeed the increase in the number of employees between 1994 and 1995-1996 can be related to this improvement. However, the steep increase in the following year that we observe in the manufacturing sectors reflects sharp changes in the paper, printing and publishing, pharmaceutical and motor vehicles industries.¹²

In Norway, data from 1995 include indirectly foreign-owned establishments and are not comparable with those for previous years which only include enterprises directly owned by foreigners.

Similarly for Finland data from 1995 include indirectly foreign-owned establishments and are not comparable with those for previous years which only include enterprises directly owned by foreigners.

12. In the 1990s, some major mergers with and acquisitions of foreign firms took place: for example, General Motor's 50% ownership of Saab Automobile (1990); the merger between Asea and Swiss Brown Boveri (1988) (ABB); the merger between Pharmacia and Upjohn (1996); Tetra Pak's acquisition of Alfa Laval (1991) and Dutch Akzo's acquisition of Nobel Industries (1994). In 1999, a year that corresponds to a big increase in foreign presence in the data, Ford acquired the automobile operations of Volvo.

Figure 5. **Employment share of foreign affiliates in the services sector of non-G7 countries**

Note: Czech Republic: data for sectors 65 to 67 missing in 1999. Finland: data for sector 55 missing in 1995. Hungary: data for 65 to 67 missing in 2002.

Figure 5 shows the employment shares of foreign affiliates in services. Data for Spain is only available for one year. Relative to the manufacturing sector data, the time period covered is much shorter and the data is much more sparse over time (*e.g.* for the Netherlands we only have two data points in 1997 and 2001). Data on sectors 65 to 67 are missing in 1999 and 2002 for the Czech Republic and Hungary, respectively. Data for sector 55 (Hotels and restaurants) is missing in 1995 for Finland. The data show a high foreign presence in Eastern European countries, Hungary and the Czech Republic. However, caution is needed when comparing Hungary with other countries because data for Hungary include minority owned foreign enterprises in the foreign affiliates' group. This might partly explain the larger presence of foreign affiliates in terms of employment, and as shown below, in terms of turnover and value added.

As suggested by these first figures, further work is needed to fill in any gaps in the data and to extend the coverage to more OECD countries.

Output: turnover and value added

In the manufacturing sector the share of foreign affiliates' turnover relative to the total is almost always larger than the share of value added (see Table 5). The difference is most pronounced in Japan. A possible explanation of this feature of the data is that affiliates might import finished or semi-finished products from their parent company and resell them on the host country market.

Table 5. Ratio of the turnover share to the value added share in the manufacturing sector

Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	
France				1.08	1.09	1.08	1.09	1.09	1.10	1.12	1.10	1.18		
United Kingdom				1.07	1.05	1.06	1.07	1.09		1.29				
Japan					2.24	1.73	1.76	1.95	1.93	2.26	1.88	1.83		
United States (majority)								1.27	1.31	1.34	1.42	1.47		
United States	1.20	1.19	1.18	1.21	1.24	1.31	1.27	1.28	1.34	1.38	1.49	1.50		
Czech Republic								1.13	1.11	1.15	1.02	0.97	1.05	
Denmark									0.82	1.09				
Spain										1.27	1.27	1.25		
Finland						1.03	1.00	0.98	1.04	1.02	1.04	1.07	1.03	
Hungary		1.10	0.95	1.19				1.21	1.16	1.17	1.21	1.21	1.45	1.47
Netherlands						1.24	1.18	1.22	1.28	1.28	1.13	1.40		
Norway							1.02	1.02	0.93	0.96	0.94	0.97		
Portugal							1.10	1.20	1.23	1.19	1.20	1.46	1.41	
Sweden	1.12	1.14	1.10	1.09	1.08	1.04	1.10	1.01	1.04	1.09	0.98	0.97		

Source: OECD calculations using AFA/STAN database.

For the manufacturing sector in the G7 countries the output trends for both value added and turnover are very similar and also reflect the trend in employment shares (*e.g.* a break in the series for France in 1999 and for Germany in 2001). One thing to note from comparing these two figures is that for Germany, Canada and Italy we only have data on turnover, but not on value added.

For the non-G7 countries data on foreign affiliates in the manufacturing sector reflects again a general increase in the presence of foreign affiliates. The data show a high foreign presence in Eastern European countries, Hungary and the Czech Republic. However, caution is needed when comparing Hungary with other countries because data for Hungary includes minority-owned foreign enterprises in the foreign affiliates' group. This might partly explain the larger presence of foreign affiliates in terms of employment, turnover and value added.

Figure 6. Turnover share of foreign affiliates in the manufacturing sector: G7 countries

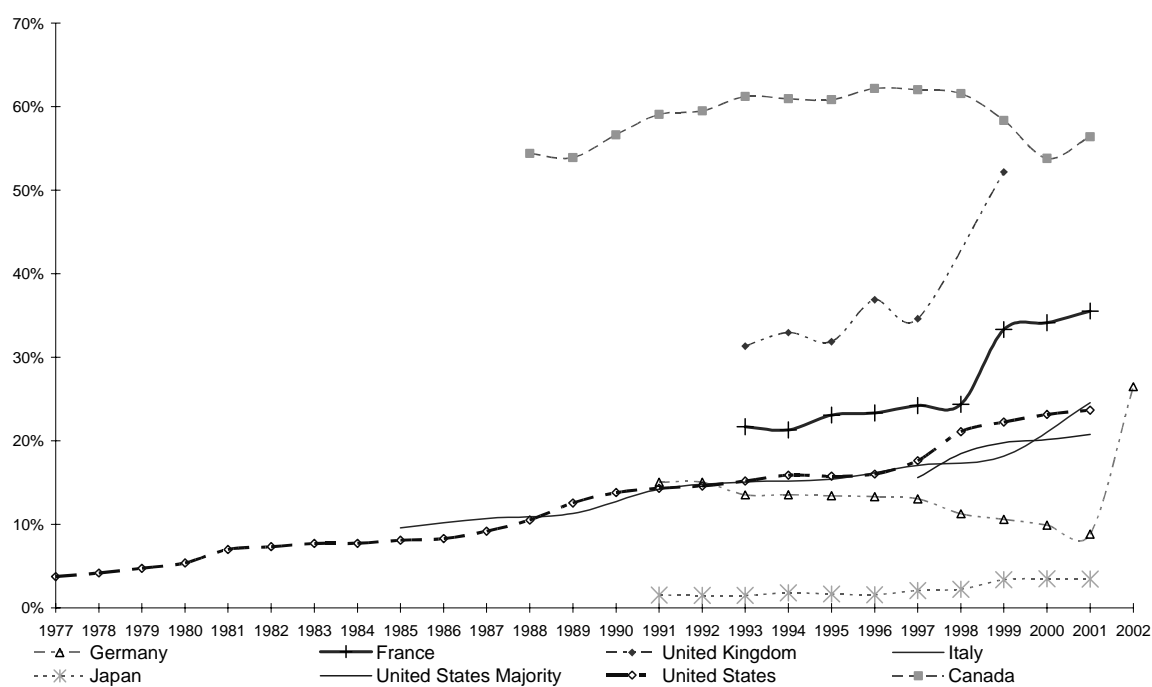
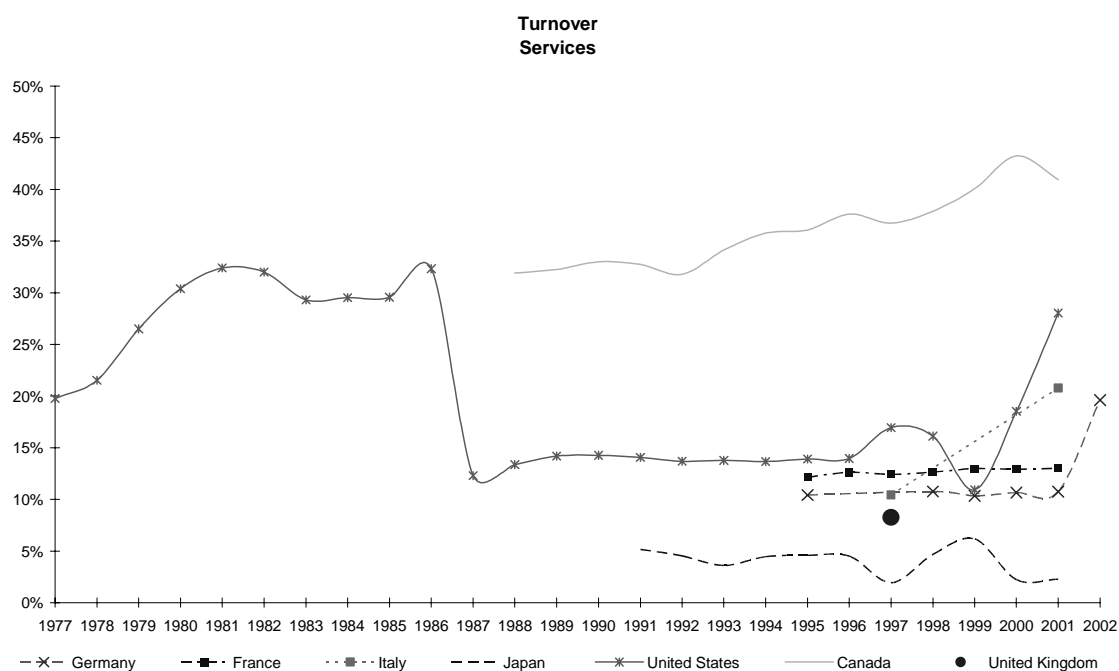


Figure 7. Turnover share of foreign affiliates in the services sector: G7 countries



Note: Japan: data for sectors 60 to 64 and 70 to 74 are only available in 1997; 2000 and 2001. Data for sectors 65 to 67 are only available in 2000. United States: data for sectors 70 to 74 are available for 1987 to 1996 and 1999. Data for 60 to 64 are missing in 2001 and 2002. Data for 65 to 67 are missing in 2001. United Kingdom: data for 65 to 67 are missing in all years. Data on foreign affiliates for Canada come from AFA and cover operating revenues.

Figure 8. Value added share of foreign affiliates in the manufacturing sector: G7 countries

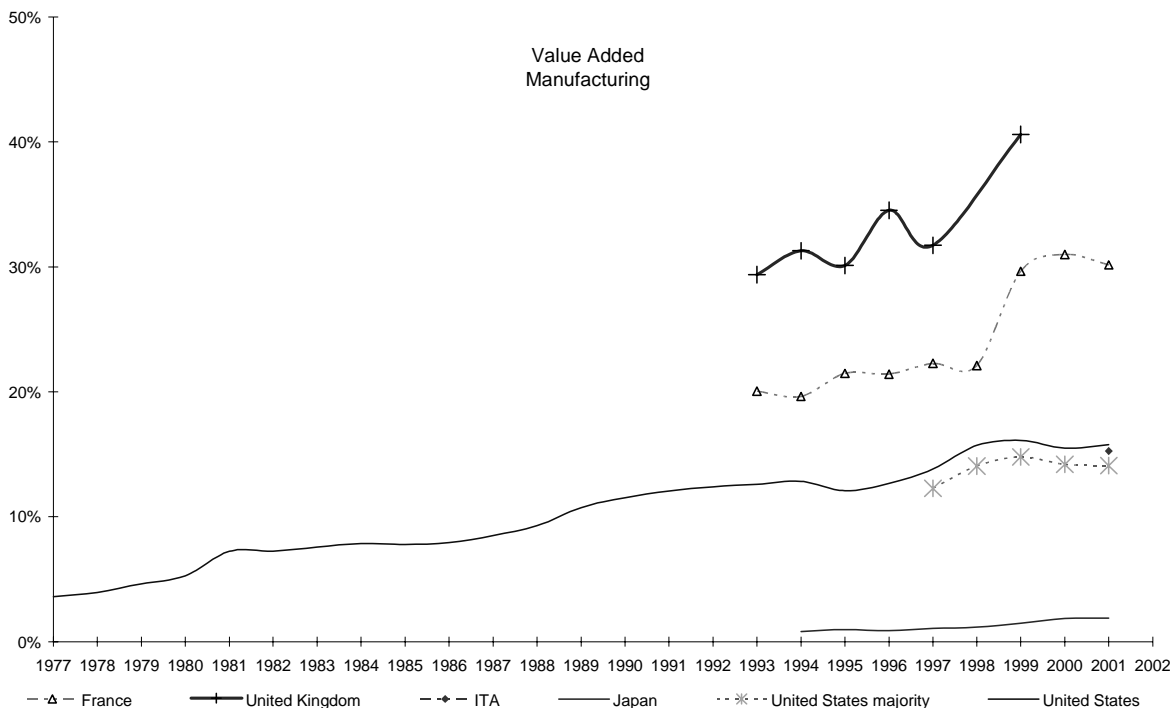
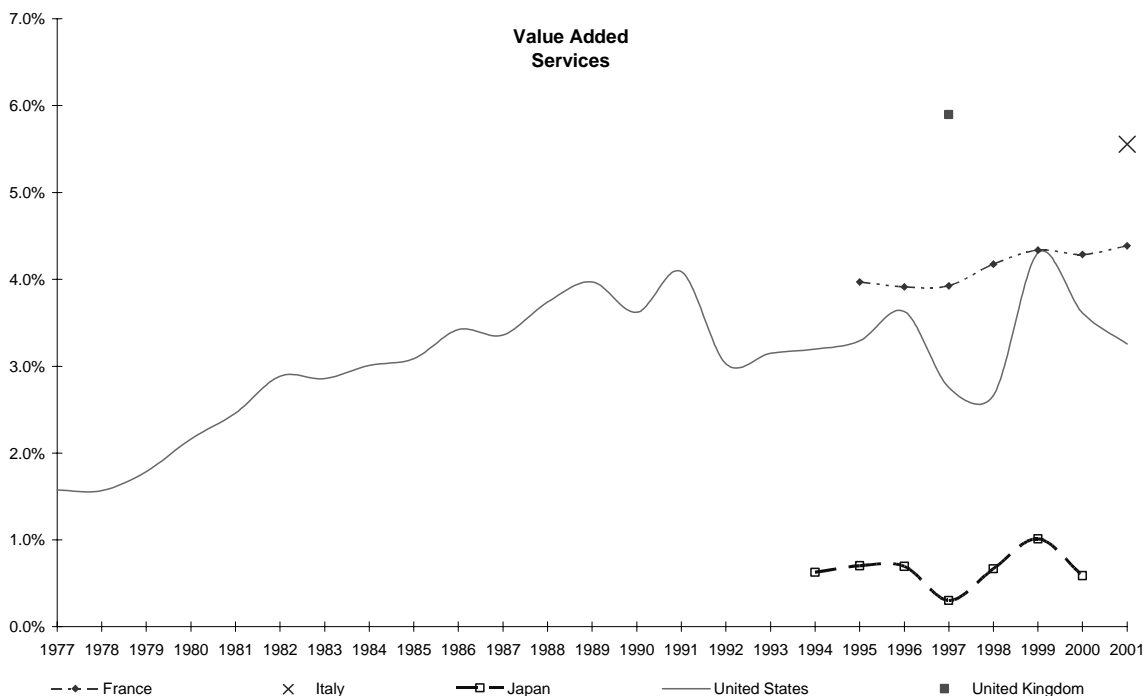


Figure 9. Value added share of foreign affiliates in the service sector: G7 countries



Note: Japan: data for sectors 60 to 64 and 70 to 74 are only available in 1997 and 2000. Data for sectors 65 to 67 are not available in any year. United States: data for sector 55 are only available from 1992; data for 60 to 64 are missing in 1999; data for sectors 70 to 74 are available from 1992 and missing in 1999.

Figure 10. Turnover share of foreign affiliates in the manufacturing sector: non G7 countries

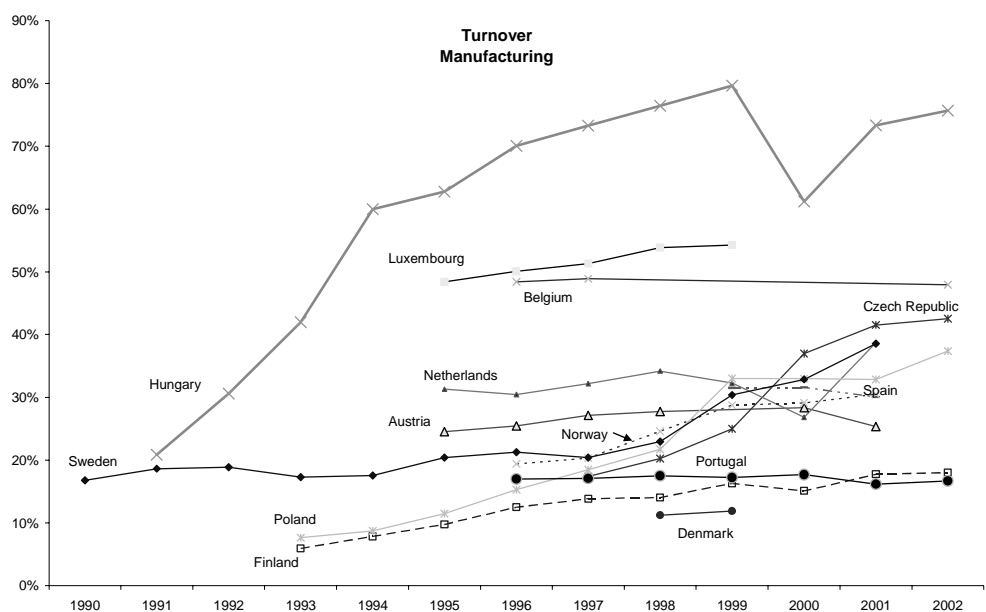
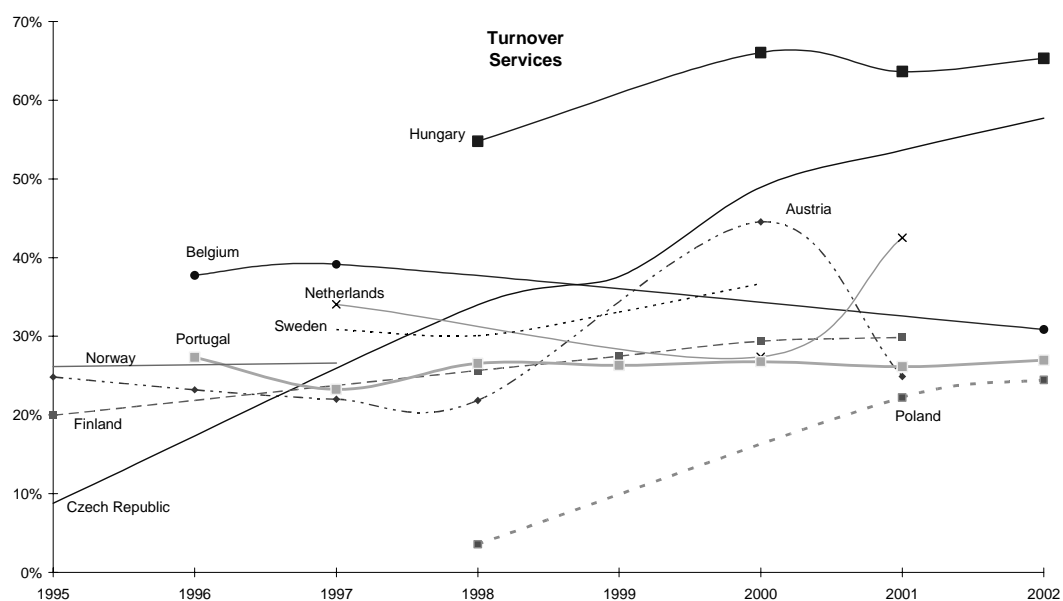


Figure 11. Turnover share of foreign affiliates in the services sector: non G7 countries



Note. Czech Republic: data for sectors 65 to 67 are missing in 1999. Finland: data for sector 55 are missing in 1995. Hungary: data for 65 to 67 are missing in 2002.

Figure 12. Value added share of foreign affiliates in the manufacturing sector: non G7 countries

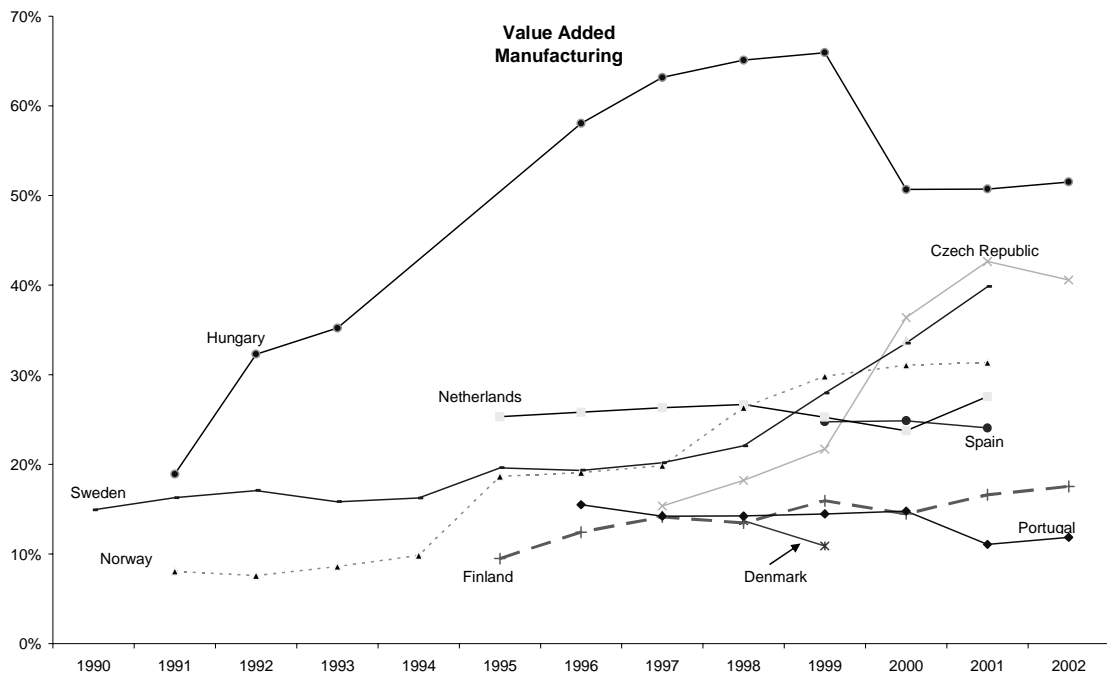
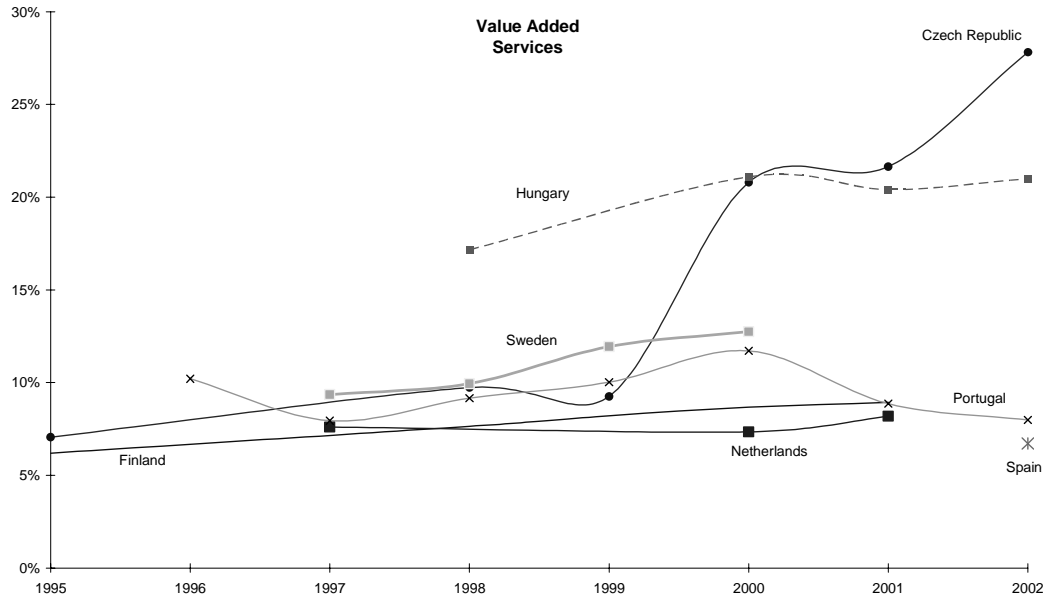


Figure 13. Value added share of foreign affiliates in the services sector: non G7 countries



Note. Czech Republic: data for sectors 65 to 67 are missing in 1999. Finland: data for sector 55 are missing in 1995. Hungary: data for 65 to 67 are missing in 2000, 2001 and 2002.

In the services sector, the data is only available for more recent years and is sparser than in the manufacturing sector. Caution is needed when interpreting the figures: the turnover share of foreign affiliates might be biased for two reasons. Firstly, in the retail and wholesale trade sectors, the measure of output used in STAN, *i.e.* margins, is by definition smaller than the measure of output used in FATS, *i.e.* sales; this might lead to an upward bias. Secondly, FATS is based on enterprise-level information, while STAN is primarily based on establishment-level data. If foreign enterprises are active in the manufacturing and services sectors, but report manufacturing as their primary activity, FATS will not record their activity in the services sector. This might lead to a downward bias in the estimate of the foreign affiliates' presence in the services sector.

Annex 3 Figure 26 reports the share of turnover of foreign affiliates in sectors 50 to 74 using the totals from STAN, and for the countries and where the data is available, the share of turnover using the total from FATS. The figures show that the ratio of foreign affiliates' turnover to the national total from STAN is larger than the one obtained as the ratio of foreign affiliates turnover to the total turnover for sectors 50 to 74 from FATS.

The relative labour productivity of foreign affiliates

Figures 14 to 20 report relative labour productivity of foreign affiliates (measured as the ratio of output per employee of foreign affiliates over the output per employee of national totals) in the manufacturing and services sectors of OECD countries. The figures show that on average foreign affiliates are more productive than the national average. In the manufacturing sector, when labour productivity is measured as turnover per employee the advantage is larger than when labour productivity is measured as value added per employee. A possible explanation for this pattern might be that affiliates are more likely to import finished or semi-finished products from their parent company and resell them within the host country market.

Figure 14. **Relative labour productivity (value added over employment) of foreign affiliates in the manufacturing sector of G7 countries**

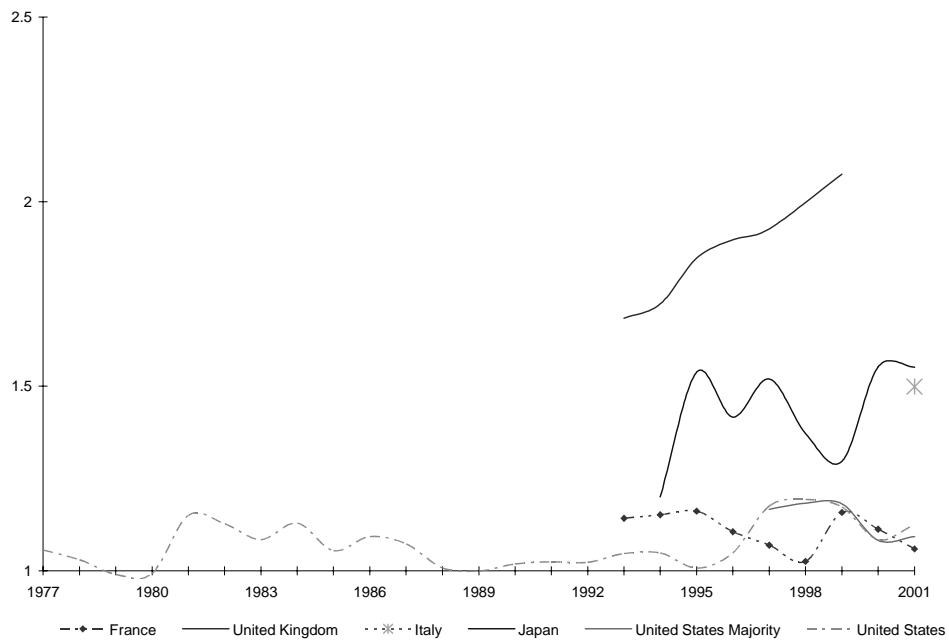
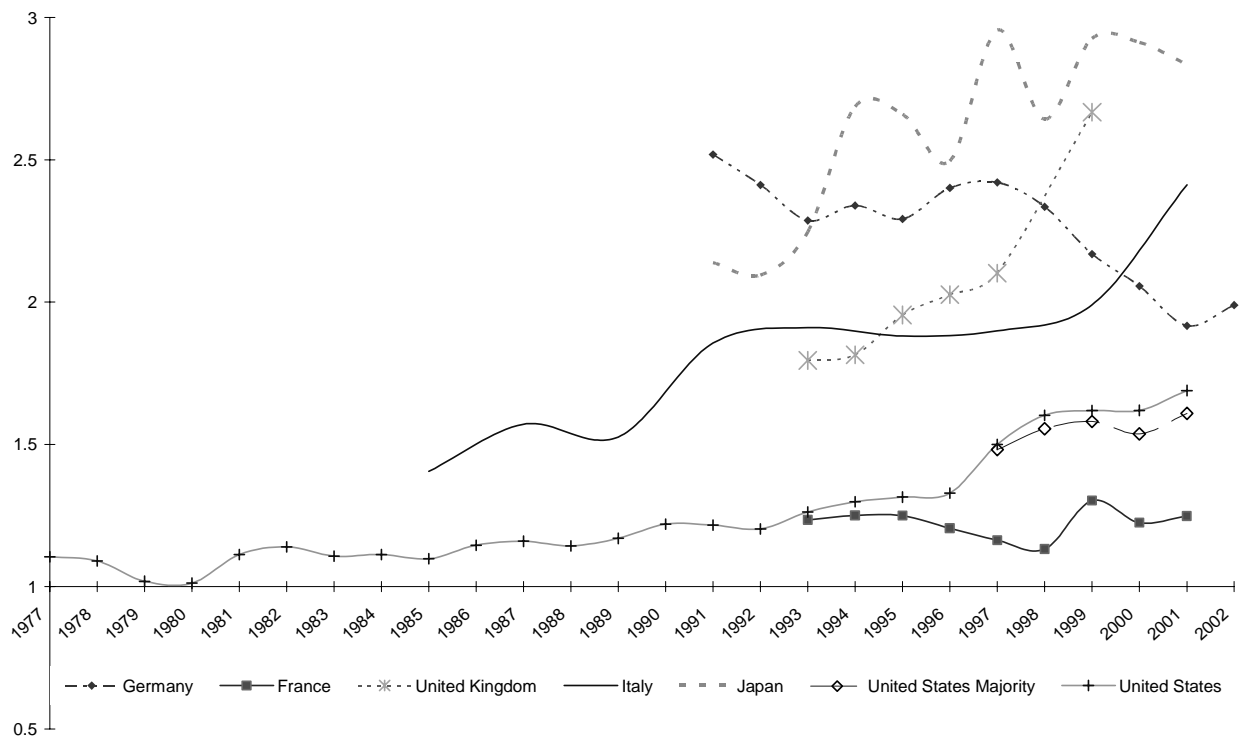


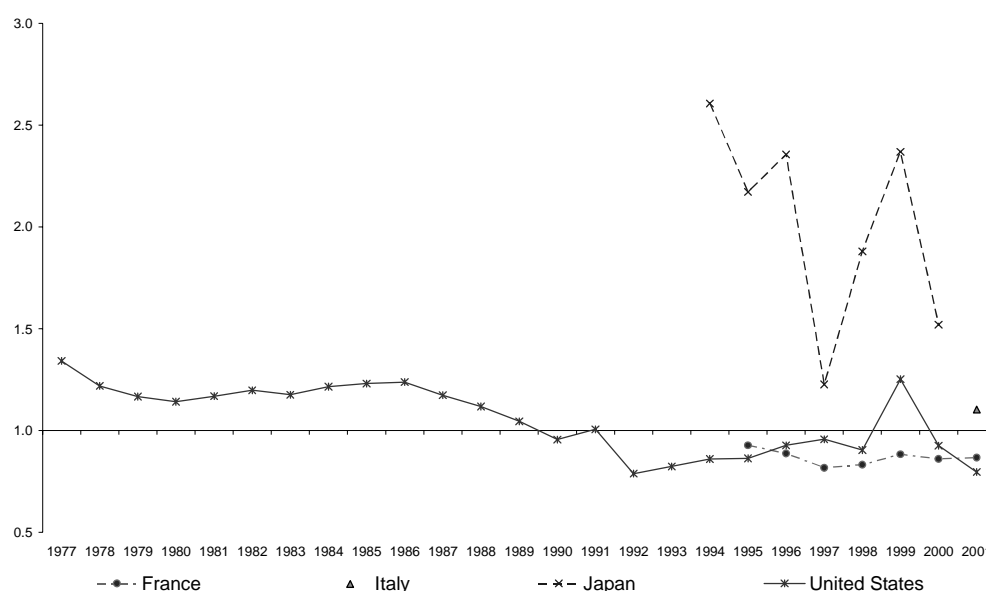
Figure 15. **Relative labour productivity (turnover over employment) of foreign affiliates in the manufacturing sector of G7 countries**



In the United States the labour productivity advantage of foreign affiliates (when we measure labour productivity as value added per employee) is very small and becomes negative in some years. The advantage in labour productivity for foreign firms is also quite small for France, Finland and Sweden and is largest in Portugal, Spain, Hungary and the United Kingdom.

This part of the study does not report labour productivity measured as turnover per employee for foreign affiliates and as gross output per employee in the national sector in the services sector. This choice is mainly driven by the output measurement issues discussed above, since for foreign affiliates labour productivity is measured as sales per employee while for the total national labour productivity is measured as margins per employee. In Annex 3 to the paper we compare foreign affiliates productivity calculated on the basis of turnover with the productivity of national firms calculated on the basis of turnover from FATS. Figure 26 shows that foreign affiliates remain more productive and that the ranking across countries also remains largely confirmed with France, Finland and Sweden being the countries where foreign affiliates have little or no productivity advantage relative to the national average.

Figure 16. **Relative labour productivity (value added over employment) of foreign affiliates in the services sector of G7 countries**



Note: Japan: data for sectors 60 to 64 and 70 to 74 are only available in 1997 and 2000. Data for sectors 65 to 67 are not available in any year. United States: data for sector 55 are only available from 1992; data for 60 to 64 are missing in 1999; data for sectors 70 to 74 are available from 1992 and missing in 1999.

Figure 17. Relative labour productivity (value added over employment) of foreign affiliates in the manufacturing sector of non G7 countries

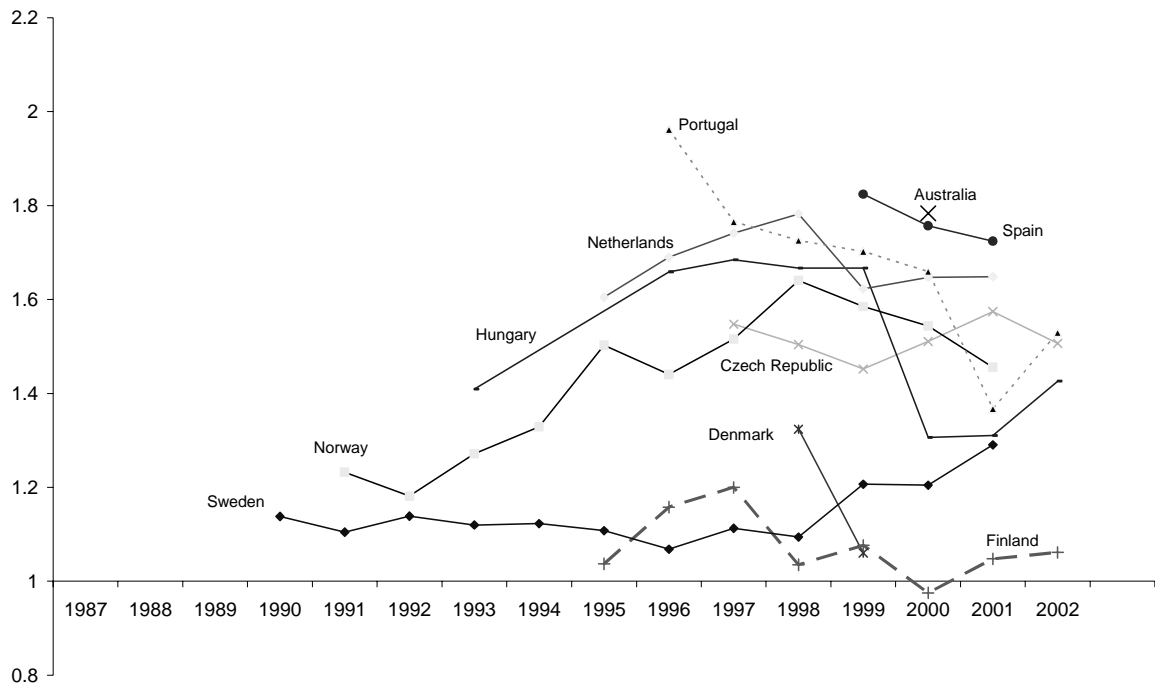


Figure 18. Relative labour productivity (turnover over employment) of foreign affiliates in the manufacturing sector of non G7 countries

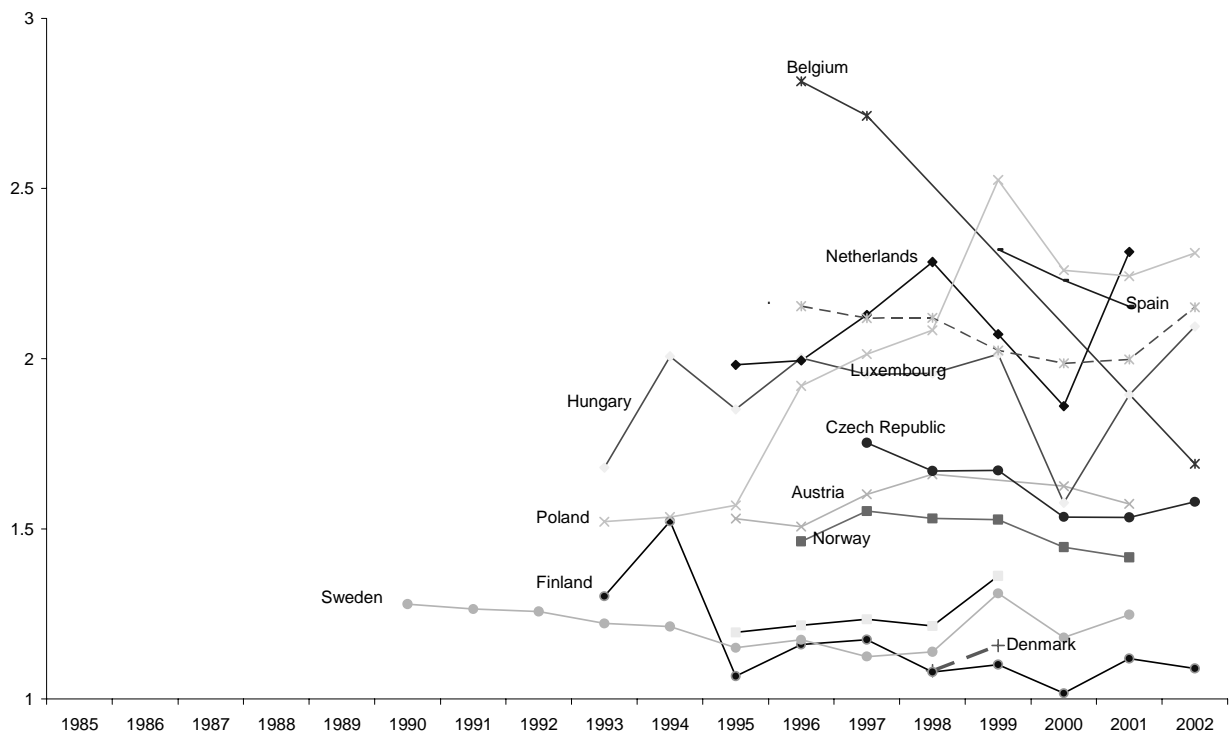
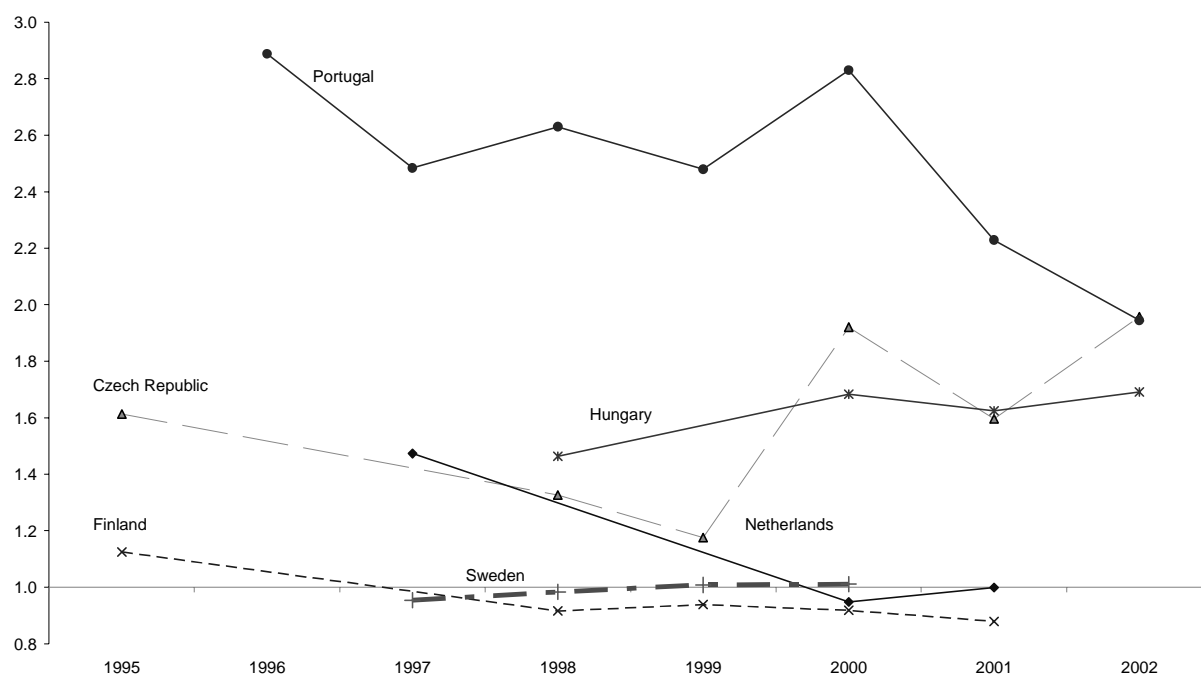


Figure 19. Relative labour productivity (value added over employment) of foreign affiliates in the services sector of non G7 countries



Note. Czech Republic: data for sectors 65 to 67 are missing in 1999. Finland: data for sector 55 are missing in 1995. Hungary: data for 65 to 67 are missing in 2000, 2001 and 2002.

Box 2. Relative labour productivity (value added over employment) productivity by country of origin in the manufacturing sector of 9 OECD countries

AFA and FATS contain some details on the country of origin of foreign affiliates. This information is only available for some countries and mostly at the aggregate level. This Box reports data on the manufacturing sector. The figure shows the ratio of labour productivity of foreign affiliates relative to national labour productivity in the manufacturing sector in the latest available year in 9 OECD countries.

Figures 14 to 20 have shown that the countries where the advantage of foreign affiliates is smallest are the United States, France and Finland and Sweden. How do the multinationals of these countries perform when abroad relative to other countries?

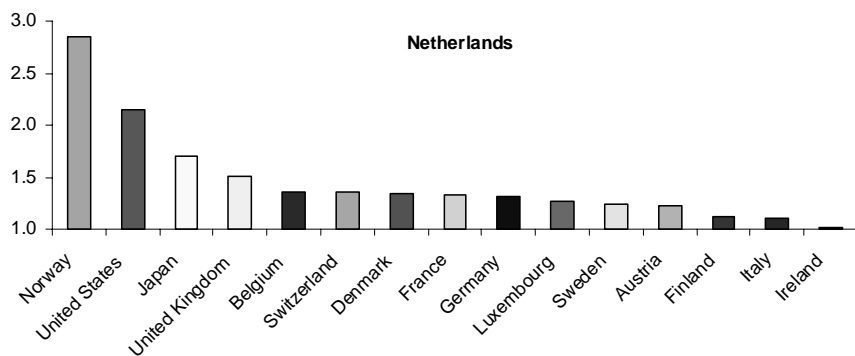
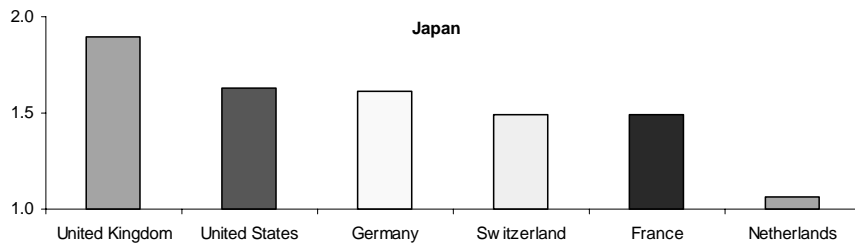
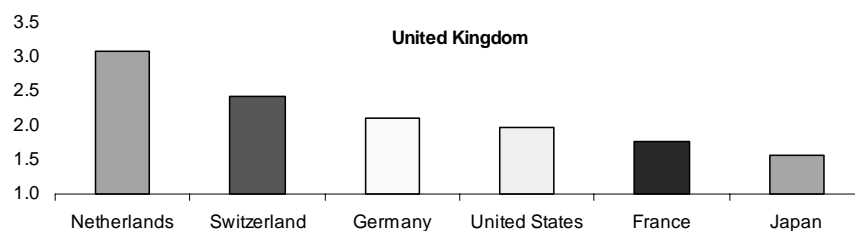
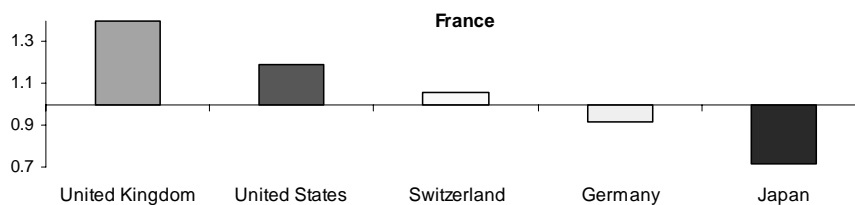
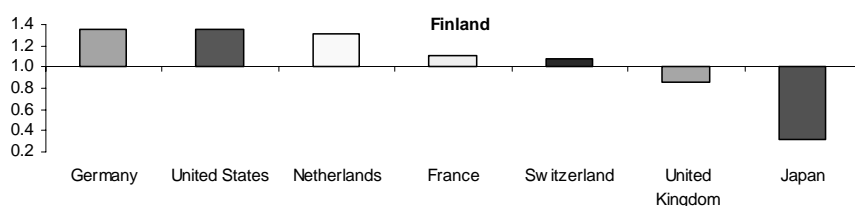
Data on the performance of Finnish multinationals is only available for the Netherlands (where they are the third least-productive group of multinationals) and for the United States, where they are less productive than the average US firm. French multinationals are the third most productive group of multinationals in Norway, and between the 4th and 8th most productive in Finland, Japan, the United Kingdom, Portugal, Sweden and the United States. Data on Swedish multinationals are available for the Netherlands (where they are the 11th most productive group of foreign multinationals), Portugal (where they are the second most productive) and the United States (although this is not reported in the figure) where they are the 20th most productive group of multinationals.

The United Kingdom, which performs badly in terms of foreign affiliates' advantage, appears to have very productive foreign affiliates abroad: affiliates of British multinationals are the most productive in Sweden, Japan and France. Affiliates of Swiss multinationals are also performing well in terms of relative productivity in Norway, United Kingdom and France among other countries.

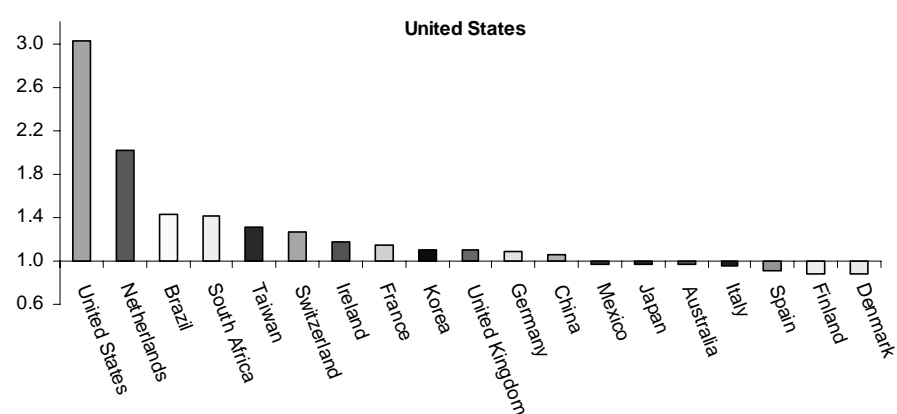
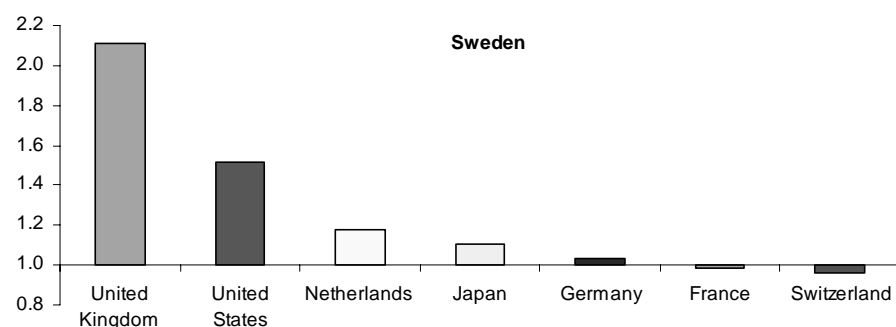
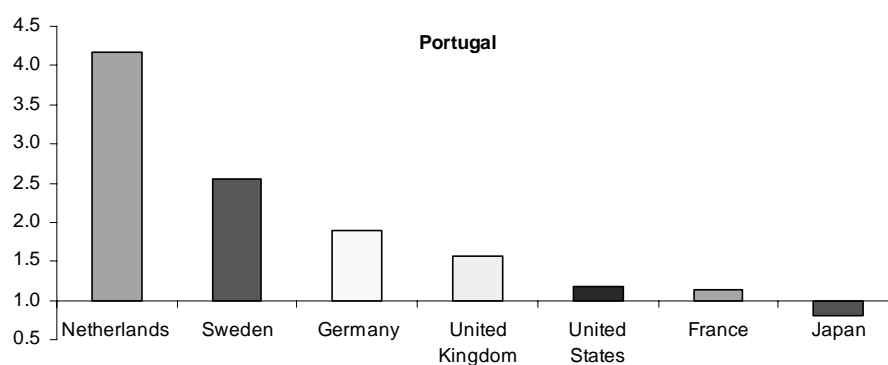
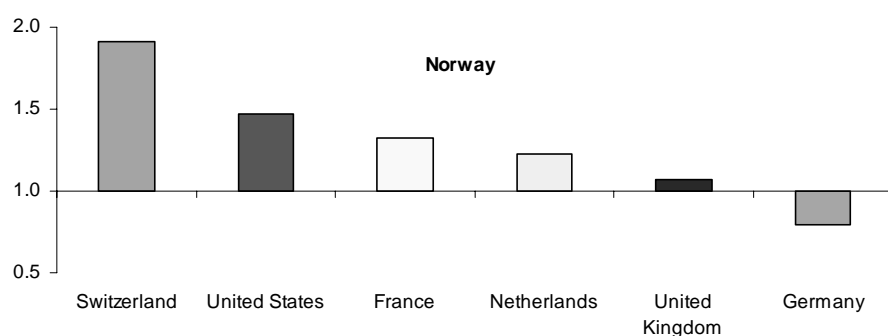
Box 2 (contd.)

US multinationals are the second most productive multinationals in Japan, France, Norway, the Netherlands and Sweden. The data also allows us to identify the performance of US multinationals in the US, the figures show that among all multinationals operating in the US, US multinationals are by large the most productive followed by affiliates of Dutch multinationals. This result confirms previous evidence from firm level data (Doms and Jensen, 1998). This result might reflect both a genuine ownership advantage, but might also stem from a “home advantage” that domestic US multinationals enjoy when operating in their home country (see also Criscuolo and Martin, 2004).

A final point to note is that these rankings might well reflect the industrial composition of the multinationals of different nationality. However, due to lack of detail in the data, we cannot investigate this issue further.



Box 2 (contd.)



Notes: Figures reported are labour productivity of foreign affiliates relative to national labour productivity in the manufacturing sector in 2001, except for Japan (2000), United Kingdom (1999) and Portugal (2002).

Source: AFA database.

Annex 2 reports the relative productivity of foreign affiliates at a more disaggregated level for both the manufacturing and services sector. The Annex reports the relative labour productivity of foreign affiliates at the sectoral level in the 1990s. In the manufacturing sectors, foreign affiliates are in general more productive than domestic firms. The United States, France and Sweden are countries where this advantage is less marked, while in Spain, Portugal and the United Kingdom this advantage is more pronounced. In high tech sectors (such as chemicals and pharmaceuticals and machinery and equipment) the productivity advantage of foreign affiliates is smaller. This might be due to the tougher competition present in these sectors which have already been opened to global competition through imports. In the services sectors, a similar ranking holds. In the retail and wholesale sector, the relative labour productivity of foreign affiliates is always very high. This might be partly due to the difference in definition of output between FATS and STAN (an issue that deserves further investigation). In the business services sector, foreign affiliates are less productive than the national average. The sector in which foreign affiliates are more productive than the national total (except within the United States) is financial intermediation. For hotels and restaurants, transport, storage, communication and business activities, foreign firms are relatively less productive than the national average in France. In the United States, foreign affiliates have a small productivity advantage only in the wholesale and retail trade sectors, while in all other services domestic firms are more productive.

METHODOLOGY

Total annualised labour productivity growth is defined as the weighted sum of the domestic firms' productivity growth and the foreign affiliates' productivity growth, where the weights used are the shares of domestic and foreign affiliates' total employment, as shown in the formula below:

$$\frac{1}{k} * \frac{\Delta LP_t}{LP_{t-k}} = \sum_{i=DOM, FOR} \frac{w_{it} LP_{it} - w_{it-k} LP_{it-k}}{LP_{t-k}} * \frac{1}{k}$$

Where LP is labour productivity calculated as the ratio of output¹³ at constant prices to labour input (EMP), Δ indicates change; k indicates the number of years between observations, so that the left hand side is the aggregate annualised labour productivity growth and $w_{it} = \frac{EMP_{it}}{EMP_t}$, is the employment share.

For each sector therefore the contribution to labour Productivity growth of foreign affiliates can be calculated as: $\frac{1}{k} * \left(\left(\frac{EMP_{FOR,t}}{EMP_t} * LP_{FOR,t} - \frac{EMP_{FOR,t-k}}{EMP_t} * LP_{FOR,t-k} \right) / LP_{t-k} \right)$. This contribution is calculated for the total manufacturing and services sectors, but also at a more detailed sectoral level.

The paper also shows how much of the contribution to productivity growth by foreign affiliates derives from switches in labour resources between domestic and the more productive foreign affiliates, ("between effect") and how much is due to the labour productivity growth within the group of foreign affiliates.

$$\frac{1}{k} * \left(\left(\frac{EMP_{FOR,t}}{EMP_t} * LP_{FOR,t} - \frac{EMP_{FOR,t-k}}{EMP_t} * LP_{FOR,t-k} \right) / LP_{t-k} \right) = \underbrace{\frac{1}{k} * \frac{\Delta LP_{FOR,t}}{LP_{t-k}} * \bar{w}_{FOR}}_{within} + \underbrace{\Delta w_{FOR,t} * \frac{1}{k} * \frac{\bar{LP}_{FOR}}{LP_{t-k}}}_{between}$$

The first term on the right hand side is the "within" or "productivity growth" effect and the second is the "between" or "share" effect term. Thus for example, the contribution of foreign affiliates to labour productivity growth might increase if there is an increase in its productivity growth or its average employment share is higher (from the first term) or if its employment share increase or if its labour productivity level is higher relative to the domestic average. The next section will report the results of this breakdown for the manufacturing and services sector. The breakdown at a more detailed industry level is reported in Annex 2.

13. Output can be turnover or value added. The empirical analysis focuses on value added.

Labour productivity growth and the contribution of foreign affiliates to labour productivity growth

The study has already shown that foreign affiliates are on average more productive than domestic firms, but are they also growing faster? What is their contribution to the growth of the host economy? Figure 20 starts by describing annualised labour productivity growth over the period 1995-2001 for the national average, foreign affiliates and for domestic firms in the manufacturing sectors of 12 OECD countries. The figures show a (sizeable) variation in growth rates across countries and across domestic and foreign firms, and additionally in contributions across countries. In Sweden, Finland, the Czech Republic, the United States, the Netherlands, Japan, the United Kingdom and Norway foreign affiliates have demonstrated a superior growth rate when compared with domestic firms. In France and Hungary, domestic firms have grown more rapidly than foreign affiliates and in Spain and Portugal foreign affiliates have experienced negative labour productivity growth.

The sectoral analysis shows that these results hide great sectoral heterogeneity. For example, in Sweden, domestic firms grew much more rapidly than foreign firms in the basic metal and fabricated mineral products and in the machinery and equipment sectors. Finland's domestic firms outperformed foreign affiliates in the machinery and equipment sectors. Norway's domestic firms grew more rapidly in the chemical, rubber and fuel products and in the basic metals and fabricated mineral products, and in recycling and other manufacturing not elsewhere classified. In the Czech Republic and the Netherlands, domestic firms have grown more than foreign affiliates in the textile, leather, footwear and wood, paper and publishing sectors. Additionally, the Czech domestic firms grew more in the transport and equipment sectors. The Dutch domestic firms grew more rapidly in chemicals, non-metallic mineral products and in recycling and other manufacturing. Japanese domestic firms outperformed foreign affiliates in the machinery and equipment sectors (29 to 33); UK firms did the same in the chemical sectors and in the transport and equipment sectors; as did the United States, which also grew faster in the recycling and not elsewhere classified sectors.

The only sector in which foreign firms have demonstrated superior growth when compared with domestic firms in France is the machinery and equipment sector with a difference of 15.1 percentage points.

The data for Hungary show that the domestic advantage is driven by the very strong growth of domestic firms in the chemicals sector (ISIC 23 to 25), but more significantly by the sizeable growth in the machinery and equipment sector; electrical; optical and transport equipment (ISIC 29 to 35).

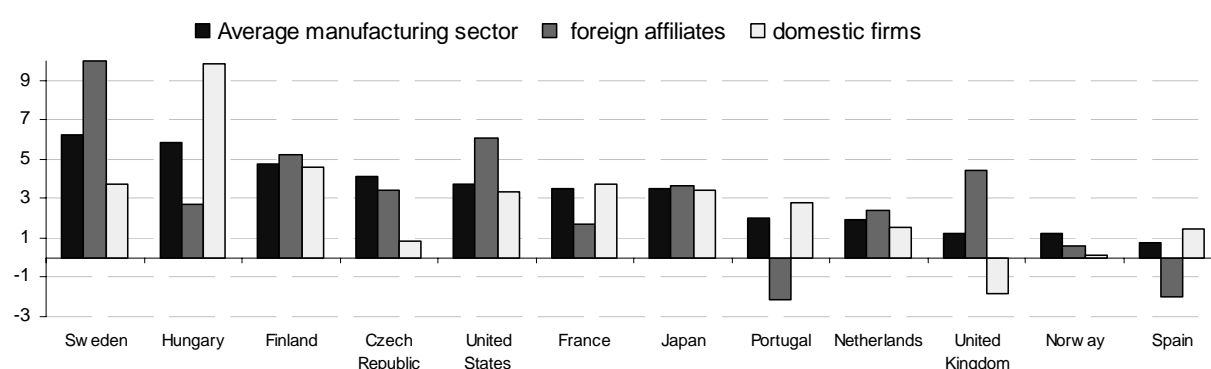
In Spain, foreign affiliates have had positive growth in food, beverages and tobacco products and in non metallic mineral products, where the growth of foreign affiliates is more than double the national average, and in basic metals and fabricated mineral products where the growth of foreign affiliates is positive but relatively small.

In Portugal, the only sectors where foreign affiliates experienced strong positive growth are the medium-high and high-tech sectors: chemical, rubber, plastic and fuel products, where they grew less rapidly than domestic firms; and the sectors of machinery and equipment; electrical and optical equipment and transport equipment, where foreign affiliates have grown much more rapidly than domestic firms.

Box 3. Labour productivity vs Total factor productivity (TFP) (Growth)

This paper uses as a measure of productivity growth the rate of growth of output (ideally value added) per employee. Relative to TFP growth, LP growth is less data intensive, imposes very few theoretical restrictions and does not rely on measures of capital stock that are likely to be affected by measurement error problems. However, labour productivity measures only the efficiency of one of the inputs to production, labour, and thus cannot distinguish whether an increase in productivity is due to an improvement in efficiency or an increase in capital stock. This could be important in this case, since it would be interesting to know where the foreign affiliates' advantage lies: how much is due to higher technical efficiency and how much can be attributed to more capital intensive production, including greater use of information and communications technology (ICT)?

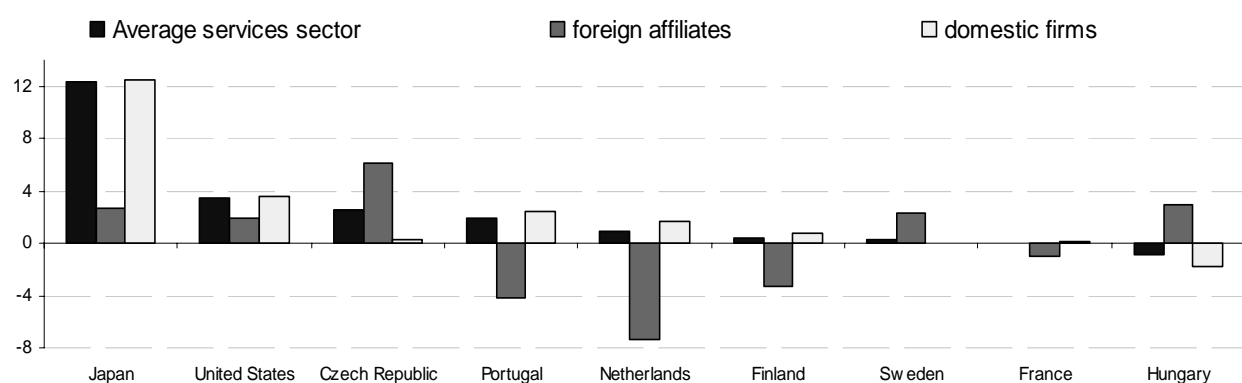
Figure 20. Average annual productivity growth in the manufacturing sector, 1995-2001, percentage points¹



1. Or nearest available year: Czech Republic 1996-2002; United Kingdom 1995-1999; Finland 1995-2002; Hungary 1996-2002; Spain 1999-2001 and Portugal 1996-2002.

Note: Labour productivity is measured as value added in constant prices over employment.

Figure 21. Average annual productivity growth in the services sector, 1995-2001, percentage points



Note. Japan: data for sectors 60 to 64 and 70 to 74 are only available in 1997 and 2000. Data for sectors 65 to 67 are not available in any year. United States: data for sector 55 are only available from 1992; data for 60 to 64 are missing in 1999; data for sectors 70 to 74 are available from 1992 and missing in 1999. Czech Republic: data for sectors 65 to 67 are missing in 1999. Finland: data for sector 55 are missing in 1995. Hungary: data for 65 to 67 are missing in 2000, 2001 and 2002.

Figure 21 illustrates labour productivity growth of the services sectors 50 to 74, labour productivity growth of foreign affiliates, and growth of domestic firms in the services sector for nine OECD countries. The picture here differs from the manufacturing sector: except for the Czech Republic, Sweden and Hungary foreign firms have grown less rapidly than domestic firms and in four countries (Portugal; Finland; France and the Netherlands), they have experienced negative growth.

The analysis of sectoral productivity growth reported in Table 7 (manufacturing) and Table 9 (services), shows that in the United States, foreign affiliates have grown more rapidly than domestic firms only in the retail and wholesale sector. French domestic firms have grown more rapidly than foreign firms in hotels and restaurants and in real estate and business activities, where foreign affiliates experienced negative growth.

The tables also demonstrate the share of foreign affiliates' employment in the sector at the beginning of the period and over the period in question, and they illustrate how this has changed. These figures help explain why, for example, a large growth of foreign affiliates' productivity translates into a small contribution and gives additional evidence to support the breakdown of the foreign affiliates contribution in "within" and "between" effects.

Figure 22 shows the contribution of foreign affiliates and the breakdown in the "within" and "between" effects.

This contribution is negative in Spain and Portugal, where the growth of foreign affiliates was negative and, in line with this result, the negative results are driven by a negative "within" effect.

The contribution is very small and positive in Japan (where it only accounts for 5% of aggregate productivity growth), this is in line with the small share of employment of foreign affiliates. However, two thirds of the contribution reflects the "between effect", *i.e.* an increase in the share of foreign employment.

In the United States, the contribution of foreign affiliates accounts for about 32% of total growth. Across European countries, there is wide variation in the contribution of foreign affiliates to growth, ranging from Hungary (33%); Finland (42%), France (72%), Netherlands (47%) to Sweden (94%).

In the Czech Republic (164%), Great Britain (158%) and Norway (251%), the contribution of foreign affiliates is larger than total national productivity growth. Box 3 explains how this happens by providing an example.

Only in a few cases is the contribution of foreign affiliates driven by the "within" effect (Hungary, the United States and the Netherlands; and in the negative contributions in Spain and Portugal). In all other cases, as shown in figure 22, the "between" effect is the main component of the contribution of foreign affiliates.

At the sectoral level this is also the case, except for the medium-high and high-tech sectors, such as machinery and equipment and chemical, rubber, plastics and fuel products. In these sectors, the "within" effect is as important as the "between" effect and in some cases, is much more sizeable than the "between" effect. This seems to suggest that foreign affiliates grow more rapidly than domestic firms in high-tech sectors. This result is in concordance with previous evidence. In particular, the results for the United States agree with evidence found by Corrado, Lengermann and Slifman (2004). This study finds that foreign affiliates accounted for 14% of the employment in the machinery and equipment sector and contributed 3.2 percentage points to the total productivity growth in the sector (*i.e.* 21%). 2.5 percentage points (*i.e.* 78%) of this contribution is derived from the "within effect", *i.e.* from increased productivity growth.

Figure 22. Contribution of foreign affiliates to average annual productivity growth and break down in “within” and “between effect” in the manufacturing sector, 1995-2001, percentage points

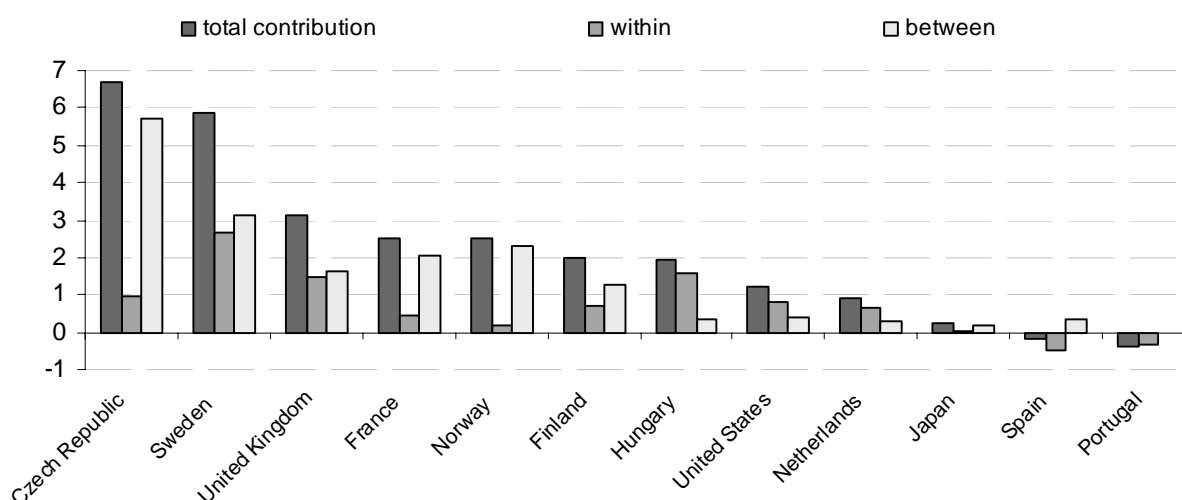


Figure 23. Contribution of foreign affiliates to average annual productivity growth and break down in “within” and “between effect” in the services sector, 1995-2001, percentage points

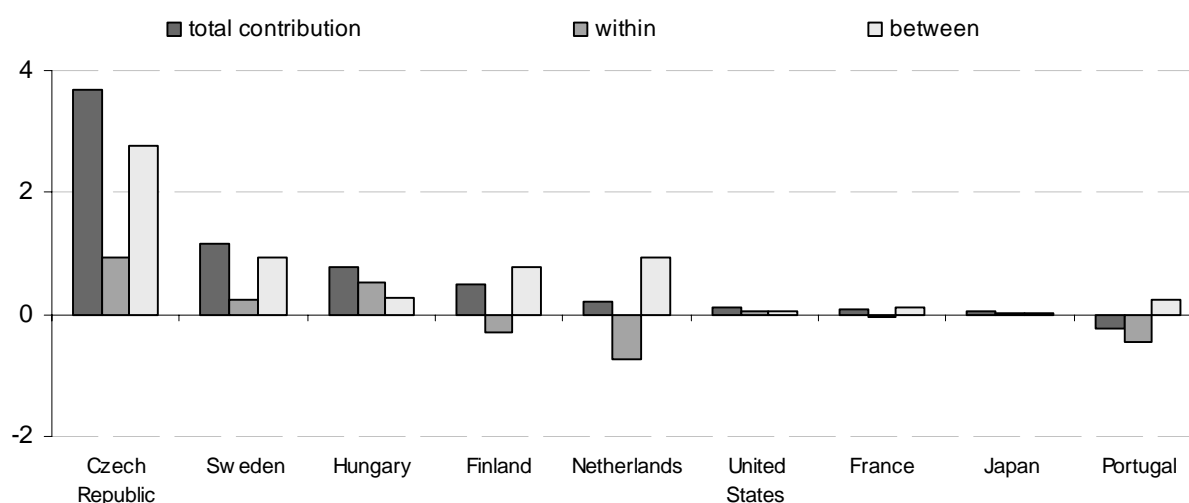


Figure 23 presents the contribution of foreign affiliates and its breakdown for the services sector.

In the services sector, except for the United States, Hungary and Portugal, the “between effect” accounts for most of the contribution of foreign affiliates to productivity growth. For Finland, the Netherlands, France and Portugal the “within effect” represents a negative component of the contribution, in line with the negative productivity growth of foreign affiliates shown in Figure 21.

At the sectoral level, the data shows great heterogeneity. In particular, in the wholesale and retail sectors, the “within” contribution constitutes the largest component of the contribution for France, the United States, Hungary and Portugal. In the transport, storage and communications sectors, the “within” effect is the largest component of the contribution of foreign affiliates for the United States and Hungary.

Box 4. When is the contribution of foreign affiliates likely to be larger than average productivity growth in the host country?

For each sector the contribution to labour productivity growth of foreign affiliates can be calculated as:

$$1/k * \left(\left(\frac{EMP_{FOR,t}}{EMP_t} * LP_{FOR,t} - \frac{EMP_{FOR,t-k}}{EMP_{t-k}} * LP_{FOR,t-k} \right) / LP_{t-k} \right) = \underbrace{\frac{1}{k} * \frac{\Delta LP_{FOR,t}}{LP_{t-k}} * \bar{w}_{FOR}}_{\text{within}} + \underbrace{\Delta w_{FOR,t} * \frac{1}{k} * \frac{\bar{LP}_{FOR}}{LP_{t-k}}}_{\text{between}}$$

The contribution to productivity growth by foreign affiliates derives from switches in labour resources between domestic and more productive foreign affiliates the “between effect” and how much is due to the labour productivity growth within the group of foreign affiliates the “within effect”. The contribution can be negative if either or both terms are negative, or if either of the terms of the right hand side is negative and larger in absolute value than the positive terms. The first term on the right hand side can be negative if productivity growth is negative; the second term can be negative if either there is a negative change in the employment shares of foreign affiliates or if foreign affiliates have, on average, negative productivity levels during the period.

A similar expression can be derived for domestic firms.

For example, the following elements that determine the sign of the contribution can be derived for the contribution of domestic firms to the manufacturing sector of the Czech Republic, Norway and the United Kingdom in the period considered:

	ΔLP	\bar{w}	Δw	\bar{LP}	Sign of the contribution
Czech Republic	0.01	0.82	-0.17	0.32	Negative
Norway	0.03	0.82	-0.09	0.35	Negative
United Kingdom	-0.002	0.83	-0.03	0.026	Negative

where ΔLP is the change in labour productivity between periods (negative for the United Kingdom), \bar{w} is the average share of employment, Δw is the change in the employment share (which is negative in all three cases) and \bar{LP} is the average labour productivity level across the time periods considered.

CONCLUSIONS

This paper represents a first attempt to investigate the contribution of foreign affiliates to labour productivity growth in OECD countries using a growth accounting approach.

The study describes the general trend of increased activity of foreign affiliates in OECD countries. Japan has still a small presence of foreign affiliates in both the manufacturing and services sectors. Most countries in the study have experienced an increase in the aggregate presence of foreign affiliates. Foreign affiliates are found to be on average more labour productive than the national average.

The analysis confirms that foreign affiliates can make an important contribution to productivity growth.

In the manufacturing sector, the average contribution of foreign affiliates to annual productivity growth ranges from 6.7% in the Czech Republic to -0.4% in Portugal. For three countries, the Czech Republic, the United Kingdom and Norway, the contribution of foreign affiliates is larger than labour productivity growth in the total manufacturing sector. This is due to sharp growth in the foreign affiliates' share of employment in the Czech Republic and Norway and to the negative productivity growth of domestic firms in the United Kingdom. In the majority of cases, the contribution of foreign affiliates arises from the "between" effect, *i.e.* the sharp growth of the share of foreign affiliates' employment. However, there is great heterogeneity across sectors and countries. In the medium-high and high technology manufacturing sectors, the contribution reflects mainly "within" effects.

In the services sector, the contribution of foreign affiliates is much smaller than in the manufacturing sector ranging from 1.2% in the Czech Republic to -0.2% in Portugal. As in the manufacturing sector, the "between effect", with the exception of Hungary, accounts for most of the contribution of foreign affiliates to productivity growth in the services sector. At the sectoral level, in retail and wholesale, the "within" effect is largest for the United States, France, Hungary and Portugal. In the sectors of transport, storage and telecommunications, the "within" effect is the most important component of the contribution of foreign affiliates for the United States.

In both the manufacturing and services sectors the contribution is largest in the Czech Republic and Sweden and smallest in Japan and Portugal. For France and the United States the foreign affiliates' contribution to labour productivity is much smaller in the services sector than in the manufacturing sector.

The results for the United States are in line with previous evidence from Corrado, Lengermann and Slifman (2004) that foreign affiliates make a significant contribution to productivity growth and that part of this contribution derives from the larger productivity growth of foreign affiliates, especially in high technology sectors.

The work conducted in this study can be extended along several dimensions. The empirical analysis has highlighted some limitations in the data and future effort should be directed towards improving the data. The analysis focused on labour productivity growth rather than total factor productivity, the main reason is that measures of capital stock are only available for a few countries in STAN and not available at all in AFA/FATS. Efforts aimed at constructing a measure of capital stock would make it possible to

calculate TFP growth. This would allow investigating the sources of the productivity advantage of foreign affiliates, such as higher technical efficiency and greater use of information and communications technology (ICT). Finally, an interesting policy question is the differences in the presence of foreign affiliates in and the contribution to OECD economies. Current research in the OECD Economics Department is studying the role of institutions and regulation on the presence of foreign affiliates in the OECD.

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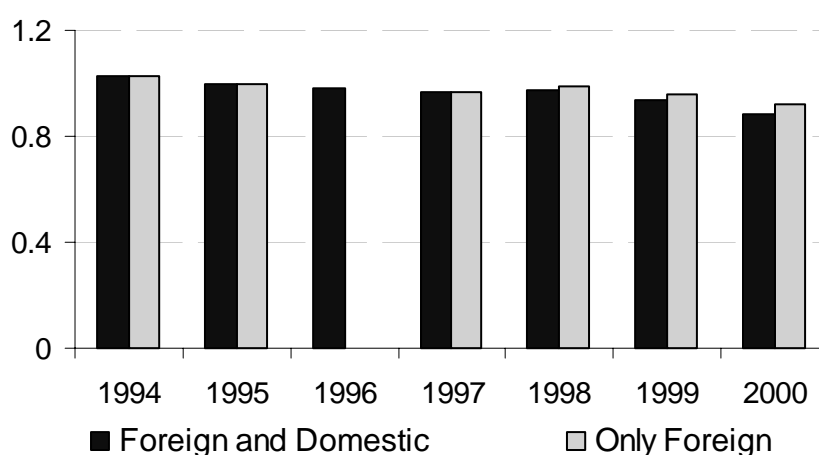
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ANNEX 1: DEFLATION OF FOREIGN AFFILIATES OUTPUT AT THE AGGREGATE LEVEL

For countries for which the complete sectoral distribution of foreign affiliates is available, it is possible to construct a deflator which accounts for the sectoral distribution of foreign affiliates. The first step derives weights that reflect the presence of foreign affiliates in each sector relative to the total manufacturing level, calculated as the share of foreign value added in the sector relative to foreign value added in total manufacturing, and uses these weights to aggregate sectoral-level deflators to the whole manufacturing level. It then compares the figure of real labour productivity and its trend over time using this deflator with the one deflated using the same manufacturing level deflator for both domestic and foreign firms. This is possible for only some countries and for few years.

The formula of the new deflators will differ across countries according to whether the deflators are fixed weight or annually re-weighted chained Laspeyres.

Figure 24. Deflators for the manufacturing sector total and foreign firms only: Japan



Note: In 1996 it was not possible to calculate the deflator for the foreign firms because information for sectors 17 to 19 (textiles, textile products, leather and footwear) is missing in AFA.

ANNEX 2: ANALYSIS AT THE SECTORAL LEVEL

Table 6. Relative labour productivity (value added over employment) in the manufacturing sector

<i>Sectors 15 and 16: Food Products, Beverages and Tobacco</i>													
Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Czech Republic								2.23	2.89	1.83	1.84	2.32	2.46
Spain										1.84	1.96	2.06	
Finland						1.08	1.21	1.37	1.31	1.44	1.08	1.15	
France										1.56	1.36	1.27	
United Kingdom				1.70	1.78	1.89	2.34	2.72		2.06			
Hungary								1.59	1.68	1.56	1.68		
Japan					7.68	7.16	7.30	6.59	6.82	7.77	8.59		
Netherlands								1.58	1.62	1.88	2.01	1.85	1.81
Norway		1.33	1.52	1.54	1.49	2.58	2.60	2.55	3.95	3.68	3.82	3.50	
Portugal								3.25	2.10	1.95	1.94	2.18	0.98
Sweden	1.06	1.10	1.10	1.24	1.17	0.98	1.02	1.31	1.13	1.13	1.14	1.07	1.32
United States	0.73	0.76	0.73	0.84	0.74	0.66	0.77	1.12	0.97	0.94	1.04	1.10	
<i>Sectors 17 to 19: Textiles, Textile Products, Leather and Footwear</i>													
Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Czech Republic								1.35	1.00	1.06	1.26	1.24	1.14
Spain											2.05	1.81	
Finland						1.97	1.89	1.53	1.52	1.52	1.64	1.84	
France				1.09	1.06	1.02	0.99	1.04	1.05	1.04	1.03	0.98	
United Kingdom				1.91	2.11	2.09	1.99	1.97		1.81			
Hungary								1.29	1.46	1.50	1.47		
Japan					1.79	1.62		1.57	1.66	1.90	1.88		
Netherlands							1.82	1.83	1.80	1.76	1.44	1.31	1.54
Norway		1.61	1.52	1.44	0.96	1.30	0.88	1.24	1.34	1.12	1.02	1.32	
Portugal								1.22	0.89	0.88	0.88	0.80	1.00
Sweden	1.45	1.42	1.53	1.59	1.64	1.46	1.62	1.60	1.69	1.53	1.51	1.46	0.99
United States	1.19	1.20	1.22	1.22	1.19	1.24	1.28	1.18	1.23	1.05	1.12	1.26	
<i>Sectors 20 to 22: Wood and Products of Wood and Cork; Pulp, Paper, Paper Products, Printing and Publishing</i>													
Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Czech Republic								1.54	1.19	1.48	1.78	1.84	1.50
Spain											1.82	1.76	
Finland						0.95	1.15	1.14	0.81	0.91	0.76	0.84	
France				1.32	1.38	1.44	1.33	1.32	1.29	1.22	1.18	1.22	
United Kingdom				1.91	1.95	1.98	2.09	2.09		3.12			
Hungary								1.82	1.81	1.99	2.04		
Japan					0.56	1.23	1.17	1.94	1.47	1.15	1.41		
Netherlands							1.97	1.90	1.89	1.87	1.74	1.65	1.80
Norway		1.21	1.46	1.26	1.20	1.40	1.40	1.39	1.37	1.35	1.46	1.52	
Portugal								3.64	2.45	1.75	2.46		1.88
Sweden	1.04	1.11	1.17	1.11	1.09	0.93	1.01	0.97	1.16	1.13	1.17	1.14	1.63
United States	1.10	1.06	1.10	1.14	1.19	1.17	1.25	1.19	1.28	1.18	1.20	1.20	
<i>Sectors 23 to 25: Chemical, Rubber, Plastics and Fuel Products</i>													
Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
France						1.05	1.04	0.96	0.95	0.92	1.23	1.07	1.01
United Kingdom				1.60	1.61	1.70	1.74	1.80		1.67			
Hungary								1.53	1.38	1.43	1.44		
Japan					0.54	0.54	0.42	0.55	0.53	0.53	0.63		
Netherlands							1.28	1.30	1.30	1.33	1.23	1.16	1.13
Norway		1.12	0.89	1.09	1.16	1.16	1.06	1.10	1.15	1.22	1.05	0.97	0.91
Portugal								2.59	3.03	3.20	2.48	2.05	2.12
Sweden	0.94	0.76	0.84	0.88	0.95	1.06	0.96	1.05	1.03	1.16	1.06	1.25	
United States	0.83	0.84	0.87	0.90	0.91	0.85	0.87	1.12	1.12	1.17	0.99	1.03	
<i>Sectors 24 and 25: Chemical, Rubber and Plastics</i>													
Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Czech Republic								1.38	1.22	1.41	1.27	1.31	1.36
Spain										1.44	1.43	1.39	
Finland						1.26	1.23	1.35	1.16	1.29	1.44	1.36	
France					1.10	1.10	1.03	1.03	0.99	0.96	0.93	0.91	
United Kingdom				1.53	1.60	1.70	1.72	1.81		1.57			
Hungary									1.66	1.64			
Japan					0.72	0.76	0.61	0.82	0.83	0.78	0.96		
Netherlands							1.31	1.30	1.26	1.35	1.21	1.17	1.16
Norway													
Portugal								2.56	3.07	3.30	2.57	2.32	2.70
Sweden	1.00	0.82	0.85	0.92	0.95	1.06	0.96	1.08	1.07	1.16	1.11	1.32	
United States	0.94	0.93	0.95	1.00	0.98	0.92	0.94	0.89	0.93	0.93	0.91	0.89	

Table 6 (contd.)

Sector 26: Other non-metallic mineral products													
Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Czech Republic								1.65	1.69	1.63	1.86	2.20	1.79
Spain										2.22	2.22	2.29	
Finland						1.13	1.26	1.37	1.29	1.34	1.31	1.32	
France					1.06	1.15	1.02	0.99	1.02	1.04	1.02	1.03	
United Kingdom				1.39	1.44	1.40	1.43	1.54		1.39			
Hungary							1.23	1.16	1.06	1.28			
Japan					0.70	1.78		0.93	1.12	1.41	1.43		
Netherlands						1.29	1.31	1.38	1.43	1.30	1.20	1.10	
Norway		1.13	1.27	1.33	1.33	1.11	1.30	1.22	1.09	1.01	1.12	1.08	
Portugal								1.37	1.24	1.15	2.00	1.80	1.26
Sweden	1.03	1.02	0.94	0.97	0.97	0.94	1.01	0.98	0.98	1.02	0.96	0.97	
United States	1.06	1.15	1.10	1.20	1.17	1.25	1.35	1.38	1.30	1.24	1.36	1.48	
Sectors 27 and 28: Basic metals and fabricated mineral products													
Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Czech Republic								1.06	1.32	1.53	1.43	1.46	1.24
Spain										2.23	2.37	2.13	
Finland						0.89	0.94	1.09	1.05	1.17	1.25	1.09	
France					0.98	0.92	0.93	0.93	0.84	0.86	0.84	0.87	
United Kingdom				1.79	1.91	1.96	1.79	1.74		2.17			
Hungary							1.06	1.29	1.23	1.37			
Japan					1.02	0.94	1.09	0.67	0.21	0.66	1.10		
Netherlands						1.21	1.26	1.27	1.31	1.26	1.45	1.36	
Norway		1.09	1.00	1.23	1.17	1.02	1.02	1.25	1.17	1.12	1.06	1.00	
Portugal								2.54	1.58	1.84	1.31	2.04	
Sweden	1.01	1.00	1.03	1.10	1.11	1.26	1.01	1.08	1.01	1.19	1.15	1.16	
United States	1.12	1.08	1.06	1.06	1.01	1.09	1.12	1.10	1.14	1.04	1.11	1.22	
Sectors 29 to 33: Machinery and equipment													
Country	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Czech Republic											1.24	1.23	1.22
Spain										1.47			
Finland										0.89	0.83	0.94	0.77
France					1.08	1.09	1.00	0.95	0.91	0.94	0.97	0.97	
United Kingdom				1.39	1.39	1.59	1.62	1.59		2.11			
Hungary									1.46	1.26			
Japan					0.86	1.48	1.47	1.44	1.36	1.48	1.47		
Netherlands						1.22	1.20	1.24	1.35	1.16	1.24	1.34	
Norway		1.10	1.12	1.08	1.02	1.39	1.21	1.26	1.44	1.31	1.21	1.19	
Portugal								1.23	0.87			1.33	1.53
Sweden	1.16	1.15	1.16	1.09	1.08	1.08	0.98	0.93	0.90	0.89	1.00	1.20	
United States			0.85	0.86	0.89	0.82	0.85	0.85	0.86	0.87	0.88	0.93	
Sectors 30 to 33: Electrical and Optical Equipment													
Country	1977	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Czech Republic											1.23	1.28	1.31
Spain										1.40			
Finland										0.71	0.66	0.79	0.57
France					1.12	1.12	1.03	0.95	0.91	0.98	0.98	0.95	
United Kingdom				1.32	1.35	1.65	1.67	1.60		2.01			
Hungary									1.44	1.17			
Japan					0.85	1.54	1.49	1.15	1.13	1.32	0.99		
Netherlands						1.35	1.36	1.40	1.49	1.24	1.27	1.52	
Portugal								1.13	0.75			1.31	1.53
Sweden	1.38	1.34	1.45	1.12	1.08	1.08	0.98	0.90	0.86	0.83	0.98	1.50	
Sectors 34 and 35: Transport Equipment													
Country	1977	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Czech Republic								2.41	1.69	1.43	1.24	1.37	1.23
Spain										1.32	1.31	1.30	
Finland											0.89	1.17	1.23
France					0.92	0.89	0.99	0.80	0.76	0.68	0.83	0.74	
United Kingdom				1.29	1.32	1.55	1.65	1.65		1.53			
Hungary									1.45	1.75			
Japan					0.97	0.58	0.91	1.04	0.68	0.64	1.10		
Netherlands						0.72	1.34	1.23	1.47	1.30	1.38	1.99	
Norway			1.11	1.11	1.14	1.10	1.03	1.18	1.12	1.11	1.25	1.20	
Portugal								1.40	1.99				
Sweden	0.83	0.80	0.92	0.81	0.87	0.79	0.75	0.81	0.91	1.21	1.18	1.22	
United States	0.82	0.88	0.75	0.73	0.76	0.81	0.75	0.83	1.09	1.07	0.81	0.76	
Sectors 36 and 37: Manufacturing NEC; Recycling													
Country	1977	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Czech Republic								1.50	1.58	1.31	1.50	1.69	1.65
Spain											1.92	1.84	
Finland						1.06	1.28	1.19	1.04	1.25	1.31	1.27	
France					0.97	0.89	0.90	0.90	0.91	0.95	0.88	0.80	
United Kingdom				1.54	1.58	1.92	1.71	1.74		2.85			
Hungary								0.98	1.31	1.17	1.38		
Japan					1.87	2.74	1.81	1.49	0.55	0.75	1.63		
Netherlands						2.35	2.49	2.73	2.64	2.33	2.32	2.29	
Norway		0.80	0.92	1.00	1.31	1.35	1.43	1.33	1.32	1.38	1.12	0.93	
Portugal								2.27	1.51	2.89	1.37		
Sweden	2.29	2.53	2.62	2.39	1.49	1.88	2.23	2.14	1.61	2.21	2.11	2.30	
United States	2.45	2.30	2.52	1.94	2.19	2.86	2.77	1.12	1.02	1.00	1.10	1.01	

Table 7. Contribution to LP (VA/EMP) productivity growth in the manufacturing sectors

<i>Total Manufacturing sector (Sectors 15 to 37)</i>								
Country	Average sector LP growth	LP growth domestic firms	LP growth foreign affiliates	Foreign employment share	Change in foreign employment share	Foreign contribution	within effect	between effect
Czech Republic	0.041	0.009	0.035	0.099	0.170	0.067	0.010	0.057
Spain	0.008	0.015	-0.020	0.136	0.004	-0.002	-0.005	0.003
Finland	0.048	0.046	0.052	0.092	0.074	0.020	0.007	0.013
France	0.035	0.038	0.017	0.185	0.100	0.025	0.005	0.020
United Kingdom	0.012	-0.018	0.044	0.163	0.033	0.031	0.015	0.016
Hungary	0.059	0.098	0.027	0.350	0.011	0.019	0.016	0.003
Japan	0.035	0.034	0.036	0.006	0.006	0.002	0.001	0.002
Netherlands	0.019	0.015	0.024	0.158	0.009	0.009	0.006	0.003
Norway	0.012	0.002	0.006	0.124	0.091	0.025	0.002	0.023
Portugal	0.020	0.028	-0.021	0.079	-0.001	-0.004	-0.003	0.000
Sweden	0.062	0.037	0.100	0.177	0.131	0.058	0.027	0.032
United States	0.037	0.033	0.061	0.120	0.020	0.012	0.008	0.004
<i>Sectors 15 and 16: Food Products, Beverages and Tobacco</i>								
Country	Average sector LP growth	LP growth domestic firms	LP growth foreign affiliates	Foreign employment share	Change in foreign employment share	Foreign contribution	within effect	between effect
Czech Republic	-0.040	-0.083	-0.024	0.062	0.122	0.045	-0.006	0.051
Spain	0.008	-0.001	0.069	0.106	-0.008	0.005	0.013	-0.008
Finland	0.035	0.031	0.049	0.061	0.089	0.024	0.006	0.018
France	-0.010	0.010	-0.101	0.131	0.016	-0.011	-0.022	0.011
United Kingdom	-0.010	-0.061	0.013	0.133	0.099	0.052	0.004	0.048
Hungary	-0.044	-0.082	-0.028	0.316	0.034	0.003	-0.015	0.017
Japan	-0.015	-0.016	0.021	0.001	0.000	0.000	0.000	0.000
Netherlands	0.017	0.006	0.042	0.179	0.000	0.012	0.012	0.000
Norway	0.020	-0.021	0.087	0.126	0.012	0.036	0.030	0.006
Portugal	0.012	0.026	-0.094	0.035	-0.002	-0.011	-0.010	-0.001
Sweden	0.014	0.007	0.032	0.204	0.104	0.026	0.008	0.018
United States	-0.049	-0.057	0.028	0.135	-0.024	-0.001	0.002	-0.003
<i>Sectors 17 to 19: Textiles, Textile Products, Leather and Footwear</i>								
Country	Average sector LP growth	LP growth domestic firms	LP growth foreign affiliates	Foreign employment share	Change in foreign employment share	Foreign contribution	within effect	between effect
Czech Republic	0.078	0.079	0.035	0.082	0.095	0.034	0.006	0.028
Spain	0.004	0.014	-0.115	0.027	-0.003	-0.012	-0.006	-0.006
Finland	0.013	0.009	0.001	0.016	0.028	0.009	0.000	0.009
France	0.049	0.050	0.039	0.107	0.023	0.009	0.005	0.004
United Kingdom	0.010	0.001	-0.025	0.044	0.047	0.020	-0.003	0.023
Hungary	-0.035	-0.073	0.007	0.282	0.041	0.021	0.003	0.018
Japan	-0.001	-0.001	0.032	0.001	0.001	0.000	0.000	0.000
Netherlands	0.050	0.061	0.017	0.110	-0.020	-0.003	0.003	-0.006
Norway	0.041	0.038	0.044	0.029	0.039	0.012	0.003	0.010
Portugal	0.004	0.006	-0.028	0.054	-0.022	-0.006	-0.001	-0.004
Sweden	0.013	0.008	0.013	0.140	0.035	0.012	0.003	0.009
United States	0.035	0.035	0.038	0.051	-0.010	0.000	0.002	-0.002
<i>Sectors 20 to 22: Wood and Products of Wood and Cork; Pulp, Paper, Paper Products, Printing and Publishing</i>								
Country	Average sector LP growth	LP growth domestic firms	LP growth foreign affiliates	Foreign employment share	Change in foreign employment share	Foreign contribution	within effect	between effect
Czech Republic	0.063	0.050	0.046	0.082	0.091	0.041	0.009	0.032
Spain	-0.025	-0.023	-0.060	0.054	0.002	-0.002	-0.006	0.004
Finland	0.004	0.004	0.020	0.026	0.011	0.004	0.001	0.003
France	0.019	0.021	-0.001	0.169	0.033	0.011	0.000	0.011
United Kingdom	-0.006	-0.039	0.138	0.094	0.001	0.027	0.026	0.001
Hungary	0.034	0.027	0.079	0.227	-0.030	0.010	0.030	-0.021
Japan	-0.005	-0.005	0.023	0.000	0.000	0.000	0.000	0.000
Netherlands	0.021	0.022	0.012	0.089	0.004	0.004	0.002	0.002
Norway	0.029	0.021	0.046	0.054	0.061	0.022	0.005	0.016
Portugal	0.021	0.032	-0.090	0.024	0.001	-0.007	-0.008	0.001
Sweden	0.032	0.024	0.073	0.063	0.134	0.034	0.009	0.025
United States	-0.004	-0.004	0.008	0.072	-0.021	-0.004	0.001	-0.004

Table 7 (contd.)

Sectors 23 to 25: Chemical, Rubber, Plastics and Fuel Products								
Country	Average sector LP growth	LP growth domestic firms	LP growth foreign affiliates	Foreign employment share	Change in foreign employment share	Foreign contribution	within effect	between effect
France	0.039	0.043	0.033	0.378	0.098	0.034	0.015	0.019
United Kingdom	0.006	0.008	0.002	0.241	0.002	0.002	0.001	0.001
Hungary	-0.020	0.524	-0.038	0.624	-0.022	-0.046	-0.036	-0.010
Japan	0.026	0.027	0.062	0.043	0.016	0.004	0.002	0.002
Netherlands	0.024	0.040	0.002	0.327	0.006	0.002	0.001	0.001
Norway	-0.010	0.004	-0.039	0.207	0.208	0.016	-0.014	0.030
Portugal	0.041	0.051	0.023	0.123	-0.004	0.006	0.007	-0.002
Sweden	0.064	-0.008	0.106	0.387	0.186	0.097	0.054	0.043
United States	0.017	0.007	0.055	0.248	0.015	0.015	0.012	0.003
Sectors 24 and 25: Chemical, Rubber and Plastics								
Country	Average sector LP growth	LP growth domestic firms	LP growth foreign affiliates	Foreign employment share	Change in foreign employment share	Foreign contribution	within effect	between effect
Czech Republic	0.026	-0.013	0.025	0.121	0.283	0.088	0.009	0.079
Spain	-0.003	0.009	-0.021	0.319	0.007	-0.005	-0.010	0.005
Finland	0.018	0.001	0.035	0.105	0.155	0.043	0.008	0.035
France	0.048	0.085	0.011	0.418	0.077	0.020	0.006	0.015
United Kingdom	0.013	0.022	0.0001	0.243	0.001	0.0004	0.00004	0.0003
Hungary	-0.211	-0.131	-0.235	0.469	0.005	-0.185	-0.192	0.007
Japan	0.019	0.017	0.080	0.045	0.016	0.006	0.003	0.003
Netherlands	0.036	0.051	0.013	0.313	0.004	0.006	0.005	0.001
Sweden	0.065	-0.025	0.124	0.375	0.190	0.106	0.061	0.045
United States	0.021	0.023	0.017	0.265	0.001	0.004	0.004	0.0002
Sector 26: Other non-metallic mineral products								
Country	Average sector LP growth	LP growth domestic firms	LP growth foreign affiliates	Foreign employment share	Change in foreign employment share	Foreign contribution	within effect	between effect
Czech Republic	0.027	-0.031	0.046	0.078	0.194	0.085	0.013	0.072
Spain	0.015	0.017	0.029	0.080	-0.006	-0.002	0.005	-0.007
Finland	0.017	0.001	0.048	0.252	0.029	0.021	0.014	0.006
France	0.023	0.029	0.002	0.202	0.042	0.009	0.001	0.008
United Kingdom	0.004	-0.001	0.002	0.097	0.037	0.013	0.0003	0.013
Hungary	0.064	0.007	0.077	0.483	0.062	0.078	0.049	0.029
Japan	0.010	0.010	-0.032	0.000	0.001	0.0003	-0.00005	0.0004
Netherlands	0.031	0.053	0.002	0.344	0.030	0.008	0.001	0.006
Norway	-0.024	-0.025	-0.027	0.301	0.086	0.004	-0.010	0.015
Portugal	0.013	0.014	-0.001	0.049	-0.009	-0.002	-0.0001	-0.002
Sweden	0.021	0.022	0.028	0.335	0.209	0.047	0.012	0.035
United States	-0.003	-0.022	0.028	0.217	0.057	0.021	0.008	0.013
Sectors 27 and 28: Basic metals and fabricated mineral products								
Country	Average sector LP growth	LP growth domestic firms	LP growth foreign affiliates	Foreign employment share	Change in foreign employment share	Foreign contribution	within effect	between effect
Czech Republic	0.009	-0.001	0.045	0.064	0.104	0.030	0.006	0.024
Spain	0.025	0.025	0.001	0.055	0.005	0.006	0.0001	0.006
Finland	-0.003	-0.007	0.033	0.079	0.052	0.012	0.003	0.008
France	0.013	0.020	0.002	0.096	0.159	0.025	0.0003	0.025
United Kingdom	0.013	-0.003	0.040	0.090	0.024	0.021	0.008	0.013
Hungary	-0.006	-0.042	0.091	0.240	0.010	0.028	0.024	0.004
Japan	0.013	0.013	0.048	0.003	-0.002	-0.0003	0.0001	-0.0004
Netherlands	0.011	-0.002	0.033	0.131	0.081	0.025	0.007	0.018
Norway	0.043	0.044	0.038	0.143	0.074	0.021	0.007	0.014
Portugal	0.018	0.030	-0.034	0.051	-0.012	-0.011	-0.004	-0.007
Sweden	0.005	0.007	-0.009	0.136	0.035	0.005	-0.002	0.007
United States	0.010	0.008	0.032	0.111	-0.020	-0.0004	0.004	-0.004

Table 7 (contd.)

Sectors 29 to 33: Machinery and equipment								
Country	Average sector LP growth	LP growth domestic firms	LP growth foreign affiliates	Foreign employment share	Change in foreign employment share	Foreign contribution	within effect	between effect
Czech Republic	0.021	0.004	0.026	0.295	0.043	0.038	0.010	0.027
Finland	0.110	0.128	0.048	0.218	0.018	0.015	0.010	0.006
France	0.082	0.012	0.163	0.329	0.083	0.088	0.066	0.022
United Kingdom	0.027	-0.059	0.118	0.224	0.054	0.074	0.047	0.027
Hungary	0.428	1.036	0.127	0.459	0.078	0.237	0.102	0.135
Japan	0.102	0.103	0.059	0.011	0.004	0.002	0.001	0.001
Netherlands	0.012	0.009	0.031	0.177	-0.022	0.001	0.006	-0.005
Norway	0.006	-0.001	-0.018	0.076	0.184	0.036	-0.004	0.040
Portugal	0.044	-0.018	0.112	0.316	0.053	0.064	0.047	0.017
Sweden	0.198	0.366	0.021	0.269	0.030	0.022	0.011	0.011
United States	0.153	0.149	0.192	0.142	0.034	0.032	0.025	0.007
Sectors 30 to 33: Electrical and Optical Equipment								
Country	Average sector LP growth	LP growth domestic firms	LP growth foreign affiliates	Foreign employment share	Change in foreign employment share	Foreign contribution	within effect	between effect
Czech Republic	0.020	-0.029	0.056	0.403	0.023	0.043	0.029	0.015
Finland	0.176	0.214	0.075	0.256	0.040	0.025	0.015	0.011
France	0.126	0.018	0.249	0.321	0.083	0.129	0.101	0.027
United Kingdom	0.051	-0.048	0.117	0.247	0.072	0.091	0.055	0.037
Hungary	0.568	2.667	0.120	0.523	0.135	0.356	0.117	0.238
Japan	0.164	0.167	0.035	0.015	-0.006	-0.001	0.001	-0.002
Netherlands	0.010	0.007	0.033	0.169	-0.025	0.001	0.007	-0.006
Portugal	0.048	-0.026	0.134	0.356	0.042	0.070	0.057	0.013
Sweden	0.451	0.917	0.045	0.205	0.057	0.061	0.028	0.033
Sectors 34 and 35: Transport Equipment								
Country	Average sector LP growth	LP growth domestic firms	LP growth foreign affiliates	Foreign employment share	Change in foreign employment share	Foreign contribution	within effect	between effect
Czech Republic	0.201	0.442	0.004	0.285	0.287	0.144	0.004	0.140
Spain	-0.040	-0.035	-0.047	0.389	0.004	-0.022	-0.024	0.003
Finland	-0.010	-0.087	0.176	0.333	-0.006	0.048	0.052	-0.003
France	0.059	0.080	0.021	0.208	0.122	0.025	0.005	0.019
United Kingdom	0.029	0.059	0.025	0.368	-0.048	-0.006	0.013	-0.020
Hungary	-0.017	-0.168	0.185	0.625	-0.111	-0.024	0.153	-0.177
Japan	0.034	0.032	0.244	0.001	0.044	0.012	0.003	0.008
Netherlands	0.044	-0.031	0.411	0.231	0.004	0.071	0.070	0.001
Norway	0.005	-0.013	0.021	0.123	0.241	0.053	0.006	0.047
Portugal	0.032	-0.183	0.460	0.156	0.058	0.219	0.119	0.100
Sweden	0.065	0.023	0.187	0.085	0.349	0.111	0.039	0.072
United States	0.023	0.032	0.012	0.079	0.144	0.021	0.001	0.020
Sectors 36 and 37: Manufacturing NEC; Recycling								
Country	Average sector LP growth	LP growth domestic firms	LP growth foreign affiliates	Foreign employment share	Change in foreign employment share	Foreign contribution	within effect	between effect
Czech Republic	0.050	0.029	0.076	0.078	0.079	0.041	0.013	0.028
Spain	0.025	0.022	-0.018	0.032	0.007	0.012	-0.001	0.013
Finland	0.022	0.018	0.060	0.043	0.025	0.009	0.004	0.005
France	0.021	0.026	0.002	0.092	0.074	0.011	0.002	0.011
United Kingdom	0.000	-0.036	0.121	0.044	0.044	0.042	0.015	0.026
Hungary	-0.041	-0.068	0.078	0.211	-0.022	0.007	0.015	-0.008
Japan	0.039	0.040	-0.058	0.002	-0.002	-0.001	-0.002	-0.001
Netherlands	0.006	0.004	0.002	0.013	0.009	0.004	0.0001	0.003
Norway	0.022	0.025	-0.036	0.035	0.061	0.009	-0.003	0.012
Portugal	0.045	0.046	-0.072	0.025	0.050	0.016	-0.008	0.024
Sweden	0.047	0.042	0.094	0.071	-0.009	0.008	0.012	-0.003
United States	0.025	0.037	-0.099	0.031	0.010	-0.007	-0.010	0.003

Note: Czech Republic: 1997 to 2002. Sectors 29 to 33: 2000 to 2002. Spain: 1999 to 2001. Sectors 17 to 19; 20 to 22 and 36 and 37: 2000 to 2001. Finland: Sectors 20 to 22: 1998 to 2001; Sectors 29 to 33: 1999 to 2002; Sectors 34 and 35: 2000 to 2002; total manufacturing (15 to 37): 1995 to 2002. France: Sectors 15 and 16: 1999 to 2001; Sectors 20 to 22: 1997 to 2001. United Kingdom: 1995 to 1999. Hungary: 1996 to 1999; Sectors 24 to 25; 29 to 33; 34 and 35: 1998-99; total manufacturing (15 to 37): 1996 to 2002. Japan: 1995-2000. Netherlands: Sectors 20 to 22: 1997-2001. Norway: Sectors 23 to 25: 1995-2002. Portugal: 1996 to 2002. Sectors 20 to 22: 1996-1999; Sectors 27 and 28 and 36 and 37: 1996-2000; Sectors 29 to 33: 1997-2002; Sectors 34 and 35: 1997-98. Sweden: Sectors 29 to 33: 1995-2000.

Source: STAN and AFA databases, OECD.

Table 8. Relative labour productivity (value added over employment) in the services sector

Sectors 50 to 52: Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods								
country	1995	1996	1997	1998	1999	2000	2001	2002
Czech Republic	2.32			1.69	1.65	1.76	1.84	1.80
Finland	1.92			1.64	1.69	1.72	1.66	
France	1.58	1.66	1.59	1.64	1.85	1.82	1.85	
Hungary				1.71		2.02	1.89	1.96
Italy							1.79	
Netherlands			2.11			1.66	1.90	
Portugal		6.34	6.02	6.40	6.01	6.97	3.24	3.06
Sweden			1.71	1.75	1.86	1.84		
United States	1.33	1.28	1.52	1.54	1.60	1.86	1.81	
Sectors 55: Hotels and restaurants								
country	1995	1996	1997	1998	1999	2000	2001	2002
Czech Republic	0.77			0.83	0.77	1.68	1.54	1.35
Finland				1.17	1.17	1.25	1.15	
France	0.73	0.79	0.71	0.93	0.79	0.80	0.77	
Hungary				1.52		1.75	1.72	1.90
Italy							0.85	
Netherlands			1.84			1.27	1.30	
Portugal		2.86	1.46	1.63	1.17	1.26	1.29	1.33
Sweden			1.56	1.30	1.24	1.26		
United States	0.99	1.16	0.88	0.87	0.83	0.78	0.72	
Sectors 60 to 64: Transport, storage and communications								
country	1995	1996	1997	1998	1999	2000	2001	2002
Czech Republic	2.62			1.00	0.78	1.23	1.41	1.59
Finland	0.90			0.68	0.72	0.53	0.55	
France	0.76	0.77	0.80	0.77	0.62	0.60	0.74	
Hungary				3.19		3.49	3.46	3.34
Italy							1.72	
Japan			1.44			1.61		
Netherlands			0.94			0.68	0.65	
Portugal		2.87	3.61	3.71	2.94	2.73	2.49	2.53
Sweden			0.83	0.87	0.87	0.93		
United States	0.99	1.19	0.59	0.66		0.59	0.24	
Sectors 65 to 67: Financial intermediation								
country	1995	1996	1997	1998	1999	2000	2001	2002
Czech Republic	3.16			1.94		6.30	1.99	2.14
France	1.49	1.23	1.46	1.72	1.66	1.68	1.51	
Hungary				2.71				
Portugal		1.04	1.21	1.20	1.39	1.22	1.31	1.29
United States	0.59	0.91	1.12	0.86	0.79	1.01	0.46	
Sectors 70 to 74: Real estate, renting and business activities								
country	1995	1996	1997	1998	1999	2000	2001	2002
Czech Republic	0.74			0.99	0.93	1.05	0.91	1.26
Finland	0.59			0.47	0.48	0.53	0.50	
France	0.55	0.48	0.41	0.42	0.45	0.45	0.45	
Hungary				0.59		0.79	0.78	0.89
Italy							0.50	
Japan			0.45			0.36		
Netherlands			1.13			0.63	0.59	
Portugal		0.85	0.48	0.57	0.45	0.56	1.54	0.74
Sweden			0.52	0.55	0.59	0.59		
United States	0.48	0.50	0.59	0.53		0.39	0.45	

Table 9. Contribution to LP (VA/EMP) productivity growth in the services sectors

Sectors 50 to 52: Wholesale and retail trade; repair of motor vehicles, motorcycles and personal and household goods

Country	Average sector LP growth	LP growth domestic firms	LP growth foreign affiliates	Foreign employment share	Change in foreign employment share	Foreign contribution	within effect	between effect
Czech Republic	0.077	0.059	0.028	0.059	0.105	0.045	0.007	0.038
Finland	0.020	0.017	-0.006	0.078	0.043	0.013	-0.001	0.014
France	0.005	0.002	0.034	0.051	0.001	0.003	0.003	0.0002
Hungary	0.002	-0.014	0.039	0.147	0.009	0.014	0.010	0.004
Netherlands	0.017	0.021	-0.010	0.069	0.003	0.0001	-0.002	0.002
Portugal	0.000	0.017	-0.086	0.031	0.007	-0.013	-0.019	0.005
Sweden	0.035	0.020	0.063	0.102	0.022	0.026	0.012	0.014
United States	0.063	0.060	0.146	0.038	-0.004	0.006	0.007	-0.001

Sectors 55: Hotels and restaurants

Country	Average sector LP growth	LP growth domestic firms	LP growth foreign affiliates	Foreign employment share	Change in foreign employment share	Foreign contribution	within effect	between effect
Czech Republic	-0.063	-0.067	-0.004	0.045	0.037	0.004	0.000	0.004
Finland	-0.004	-0.001	-0.011	0.097	-0.035	-0.014	-0.001	-0.013
France	0.001	0.0003	0.011	0.026	-0.010	-0.001	0.0002	-0.001
Hungary	-0.023	-0.027	0.034	0.094	-0.021	-0.004	0.004	-0.008
Netherlands	-0.010	-0.008	-0.081	0.046	0.051	0.009	-0.011	0.020
Portugal	-0.011	-0.009	-0.095	0.013	0.019	0.0004	-0.006	0.006
Sweden	0.023	0.030	-0.046	0.073	0.017	0.003	-0.006	0.008
United States	-0.008	-0.0001	-0.051	0.070	0.087	0.006	-0.006	0.012

Sectors 60 to 64: Transport, storage and communications

Country	Average sector LP growth	LP growth domestic firms	LP growth foreign affiliates	Foreign employment share	Change in foreign employment share	Foreign contribution	within effect	between effect
Czech Republic	0.021	0.016	-0.044	0.005	0.056	0.014	-0.004	0.018
Finland	0.052	0.059	-0.034	0.026	0.049	0.005	-0.002	0.007
France	0.041	0.042	0.035	0.016	0.009	0.002	0.001	0.001
Hungary	0.0001	-0.007	0.012	0.081	0.003	0.006	0.003	0.003
Netherlands	0.037	0.047	-0.052	0.046	0.053	0.008	-0.004	0.011
Portugal	0.043	0.039	0.018	0.016	0.013	0.008	0.001	0.007
Sweden	0.013	0.012	0.052	0.065	0.062	0.023	0.004	0.019
United States	0.027	0.033	-0.120	0.054	-0.015	-0.007	-0.006	-0.002

Sectors 65 to 67: Financial intermediation

Country	Average sector LP growth	LP growth domestic firms	LP growth foreign affiliates	Foreign employment share	Change in foreign employment share	Foreign contribution	within effect	between effect
Czech Republic	0.154	-0.649	0.058	0.063	0.621	0.406	0.068	0.337
France	-0.010	-0.010	-0.008	0.023	0.003	0.001	-0.0003	0.001
Portugal	0.202	0.192	0.289	0.051	0.043	0.036	0.022	0.014
United States	0.059	0.061	0.006	0.034	0.008	0.001	0.0001	0.001

Sectors 70 to 74: Real estate, renting and business activities

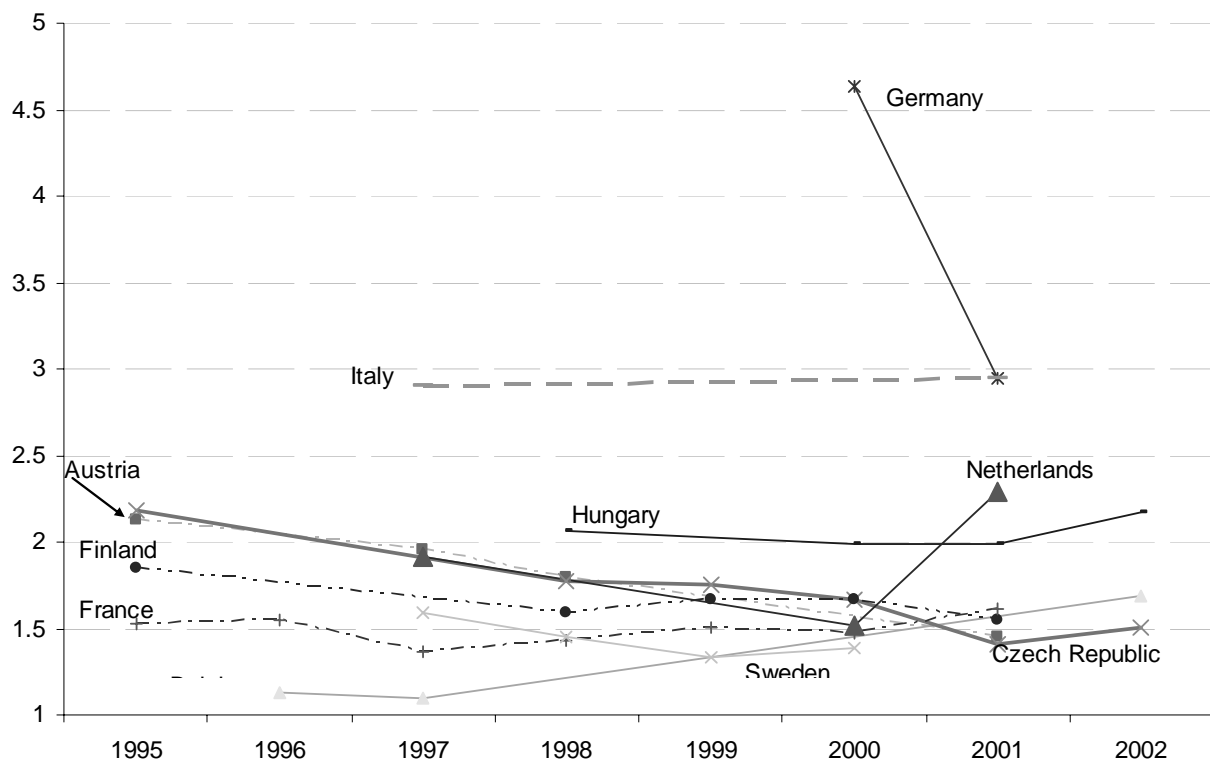
Country	Average sector LP growth	LP growth domestic firms	LP growth foreign affiliates	Foreign employment share	Change in foreign employment share	Foreign contribution	within effect	between effect
Czech Republic	-0.015	-0.020	0.074	0.045	0.062	0.012	0.004	0.008
Finland	-0.019	-0.013	-0.041	0.048	0.061	0.003	-0.002	0.005
France	-0.018	-0.016	-0.044	0.059	0.017	-0.0003	-0.002	0.001
Hungary	-0.034	-0.048	0.076	0.173	-0.040	0.00003	0.007	-0.007
Netherlands	0.006	0.017	-0.116	0.036	0.047	0.002	-0.008	0.010
Portugal	-0.009	-0.009	-0.030	0.067	-0.022	-0.004	-0.001	-0.003
Sweden	-0.040	-0.041	-0.002	0.125	0.012	0.002	-0.0001	0.002
United States	-0.001	0.0001	-0.009	0.029	0.013	0.001	-0.0002	0.001

Note: Czech Republic: 1995-2002. Finland: Sector 55: 1998-2001. Hungary: 1998-2002. Netherlands: 1997-2001. Portugal: 1996-2002. Sweden: 1997-2000.

Source: STAN and FATS databases, OECD.

ANNEX 3: FURTHER ANALYSIS OF PRESENCE AND LABOUR PRODUCTIVITY OF FOREIGN AFFILIATES IN THE SERVICES SECTOR

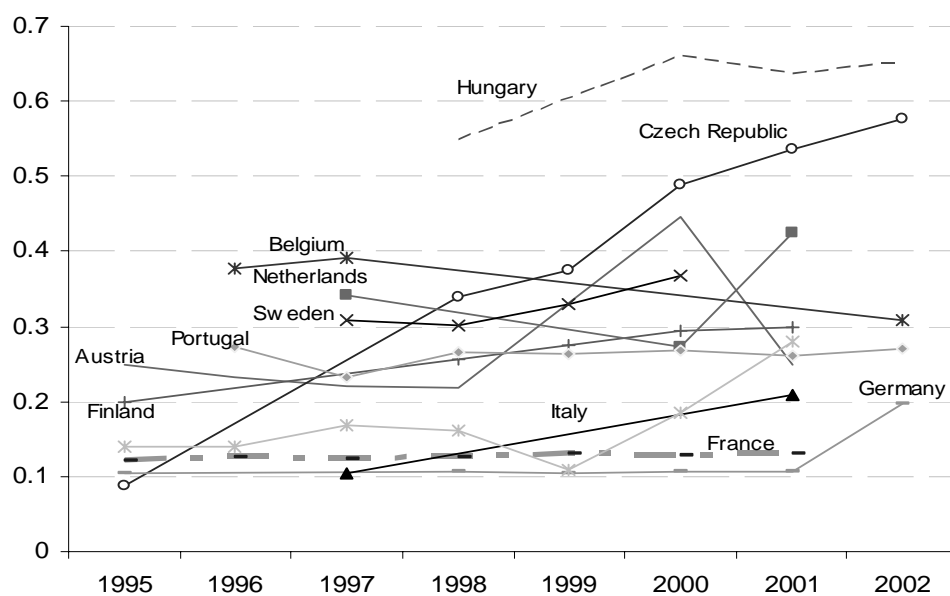
Figure 25. Relative labour productivity (turnover per employee) of foreign affiliates in the services sector (50 to 74) using FATS database for total national figures



Note: Austria: sectors 65 to 67 only included in 2001; Belgium: sectors 65 to 67 only included in 2002; Czech Republic: sectors 65 to 67 not included in 1999; Finland: sector 55 not included in 1995; Germany: sectors 50 to 52 not included in 2000; Hungary: sectors 65 to 67 not included in 1998 and 2002.

Source: FATS database, OECD.

Figure 26. Share of turnover of foreign affiliates in the services sector (50 to 74) using the FATS database for total national figures



Note: Austria: sectors 65 to 67 only included in 2001; Belgium: sectors 65 to 67 only included in 2002; Czech Republic: sectors 65 to 67 not included in 1999; Finland: sector 55 not included in 1995; Germany: sectors 50 to 52 not included in 2000; Hungary: sectors 65 to 67 not included in 1998 and 2002.

Source: FATS database, OECD.