

This PDF is a selection from an out-of-print volume from the National Bureau of Economic Research

Volume Title: Topics in Empirical International Economics: A Festschrift in Honor of Robert E. Lipsey

Volume Author/Editor: Magnus Blomstrom and Linda S. Goldberg, editors

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-06083-7

Volume URL: <http://www.nber.org/books/blom01-1>

Conference Date: December 3-4, 1998

Publication Date: January 2001

Chapter Title: Home-Country Effects of FDI: Foreign Production and Structural Change in Home-Country Operations

Chapter Author: Gunnar Fors, Ari Kokko

Chapter URL: <http://www.nber.org/chapters/c10581>

Chapter pages in book: (p. 137 - 162)

---

# Home-Country Effects of FDI Foreign Production and Structural Change in Home-Country Operations

Gunnar Fors and Ari Kokko

---

## 5.1 Introduction

The home-country effects of foreign direct investment (FDI) have been hotly debated for many years, but the topic has received renewed attention over the past decade. One important reason is the development of the regional integration processes in Europe and the Americas. The reduction of regional trade and investment barriers has created new, large markets and removed restrictions on where plants can be located. The resulting increase in competition and the relocation of industry are expected to improve efficiency and welfare in the integrating region as a whole. However, it is not obvious that the benefits will be distributed equally among the participating countries, or between members of the integration agreement and outsiders. The worry in the home countries of multinational corporations (MNCs)—in particular, those home countries that are large net outward investors—is that investment and production abroad may replace home-country exports, employment, or investment.

The debate on the home-country effects of FDI has a longer history in Sweden than in most other countries, with the exception of the United States. The concern about home-country effects is easy to understand when it is noted that Sweden is a significant outward investor, while inward investment has, until recently, been much more limited. For instance, the outflows of Swedish FDI between 1981 and 1990 were more than five times

Gunnar Fors is head of division at the Swedish National Board of Trade, a government agency under the foreign ministry, Stockholm. Ari Kokko is professor of international business at Abo Akademi University, Turku, Finland, and holds a position at the European Institute of Japanese Studies, Stockholm.

Financial support from the Marianne and Marcus Wallenberg Foundation and HSFR of Sweden is gratefully acknowledged.

larger than the inflows (OECD 1993), and the stock of outward FDI was more than two and one-half times that of inward FDI in the mid-1990s (Braunerhjelm et al. 1996). Moreover, Swedish multinational corporations account for more than half of aggregate Swedish investment and employment in the manufacturing sector, and undertake more than 90 percent of manufacturing R&D. This means that any effects of outward investment are likely to be felt throughout the Swedish economy.

A disproportionately large share of the academic research on home-country effects has also focused on Sweden. Sweden is one of the few countries, besides the United States, where detailed information on the foreign operations of national firms has been collected systematically for a long period of time. The Research Institute of Industrial Economics (IUI) in Stockholm has conducted detailed surveys on the foreign operations of Swedish MNCs about every fourth year since the mid-1960s. These surveys, covering the years 1965, 1970, 1974, 1978, 1986, 1990, and 1994, include all Swedish MNCs in manufacturing with at least fifty employees and at least one majority-owned affiliate abroad. This data set has provided unique opportunities to follow three decades of the internationalization of Swedish industry, both at an aggregate level and at the firm level.

The studies analyzing the impact of FDI on the Swedish economy have, with a few recent exceptions, concluded that the relationship between foreign investment and home-country exports or employment is one of mild complementarity. Similarly, most studies of U.S. investment abroad have suggested a weak positive relationship (or no relationship) between FDI and home-country exports. These findings have reduced the worry that FDI has grown at the expense of investment or job creation in Sweden. However, they do not mean that the impact of FDI on Sweden is negligible. One reason is that investment abroad may be an essential survival strategy for firms in industries with large fixed costs and global competition. Although it is impossible to demonstrate convincingly what would have happened if Swedish firms had not been allowed to engage in FDI, it is safe to assume that many of them would have been smaller and less competitive in sectors where large investments in R&D and marketing are needed. Another reason is that FDI is likely to change the character of home-country production. The studies of the impact of FDI on aggregate home-country employment or exports fail to show that the structure and content of the home country's exports change as firms establish production abroad. Instead of exporting finished products to foreign customers, the MNCs' parent companies will increasingly focus on exporting intermediate inputs to their foreign affiliates.

The purpose of this paper is to add to the existing studies of home-country effects by focusing on the structural changes in home-country production that follow from FDI. Using detailed firm- and plant-level data from a sample of Swedish MNCs for the period 1986–94, we will try to

demonstrate the great degree of change that continuously takes place within each MNC. We will also illustrate the direction of some of the structural changes that are in progress and show that the effects of FDI at the plant level are significantly different from those at more aggregate levels. This paper differs from earlier studies using the IUI database in its emphasis on the changes taking place in the home-country operations of the MNCs. This is possible because the IUI data have been complemented by a detailed plant-level database on the home-country operations of the largest Swedish MNCs, provided by Statistics Sweden.

The remainder of the paper is organized as follows. Section 5.2 summarizes the findings of some earlier studies of the production interactions between the foreign and domestic operations of MNCs. The impact of FDI on home-country exports has been the main issue in the earlier literature, but some studies focusing on home-country employment and domestic production structure are also discussed. Section 5.3 introduces the database and describes the changes in the operations of the sample companies between 1986 and 1994, with special emphasis on the great extent of structural change that has taken place within the MNCs. Section 5.4 looks at the relation between foreign production and domestic employment in a simple regression framework, and section 5.5 concludes the paper.

## 5.2 FDI and Home-Country Exports and Employment

Although the academic research on the home-country effects of FDI has addressed a wide variety of issues—ranging from environment and income distribution to taxation and economic policy (for recent surveys see Caves 1996; Dunning 1993; Industry Commission 1996)—it is clear that questions concerning the impact of outward investment on home-country exports, production, and employment have dominated the agenda. Only a few formal theoretical models of the determinants of foreign and domestic production are available (e.g., Brainard 1993; Markusen 1995), but the number of empirical studies is large. The empirical literature includes both detailed business-oriented analyses and more aggregated econometric studies for several countries at different points in time. This yields a large variation in methodology and results, although some broad generalizations appear to be possible. The more business-oriented authors have typically attempted to examine what would have happened in specific cases if investment abroad had not been possible, whereas econometric studies have tried to detect the overall relationship between FDI and home-country exports in larger samples of firms or industries.

Jordan and Vahlne (1981) provide an example of a Swedish business-oriented analysis of FDI and home-country exports. They aim to compare the domestic employment effects of foreign direct investment with alternative ways to exploit the competitive advantages of a sample of Swedish

firms. The alternatives considered are exports from Sweden, licensing, and minority joint ventures, and the analysis attempts to take into account several factors that may influence Swedish exports and employment in the midterm. These include estimates of the market shares that can be captured under the alternative strategies, differences in the ability to face and solve customer problems in the relevant markets, flows of royalties and license payments (which influence the possibilities to undertake R&D), and differences in related product sales under the alternative strategies.

Jordan and Vahlne's overall conclusion is that foreign direct investment has positive effects on Swedish exports and employment, because the establishment of foreign affiliates typically leads to large increases in the foreign market shares and in exports of intermediate products to affiliates. The driving force is the existence (or fear) of various types of trade barriers that would limit the market shares if export were the only available alternative. Foreign production is judged, by Jordan and Vahlne, to be particularly beneficial for low-technology products with high transportation costs. However, the results rest on very specific assumptions about export survival rates, that is, the fractions of the affiliates' market share that could have been served by home exports. In some cases, for standardized products, the assumed survival rates are as low as 2 to 8 percent. A related government research report (Sweden 1981) examines a larger sample of firms and reaches similar results, with the summary conclusion that FDI has been a necessary strategy for the survival and international competitiveness of Swedish firms. Foreign direct investment has been complementary to Swedish exports and employment, because the alternatives would have resulted in much lower foreign market shares for Swedish firms.

It is obvious that the assumptions about export survival rates are of central importance for the outcome, and it is therefore interesting to compare Jordan and Vahlne's (1981) estimates with other estimates. To begin with, it can be noted that many other business-oriented case studies have also been based on very low survival rates. For instance, Stobaugh and associates (1972), who study nine U.S. firms, assume that their entire foreign markets would have been lost within five years in the absence of FDI. A problem with these studies is that the estimates of survival rates are often based on surveys and interviews with company officials, who naturally are interested in "portraying their foreign activities in as favourable a light as possible vis-à-vis their impact on the domestic economy" (Frank and Freeman 1978, 9).

An alternative is provided by Frank and Freeman (1978), who set up a model for the U.S. economy in which survival rates are explicitly calculated from data on costs and revenues. The model yields estimates of survival rates ranging between 20 and 40 percent, depending on industry. However, they rule out shifts in market size that are "occasioned by the establishment of a foreign subsidiary" (p. 35), which means that their figures are

probably on the high side: The establishment of an affiliate may lead both to shifts in the demand curve and to increases in market shares. They also calculate a short-run “break-even” survival rate for the U.S. economy in 1970, which would lead to equally large export displacement and export stimulus from FDI. This break-even estimate is 11 percent (p. 62): Foreign direct investment will stimulate domestic exports if the surviving market shares are smaller, but will reduce exports if it is larger. Using their own best estimates of survival rates, Frank and Freeman conclude that foreign direct investment has substituted for U.S. exports and that the net employment effect of FDI is an annual loss of between 120,000 and 160,000 jobs (p. 62). It should be noted that the generality of these results is also uncertain, since the period under examination may not be representative—this was the peak of the U.S. firms’ internationalization process.

The problem of assessing survival rates does not usually come up in the econometric studies, which typically employ regression analysis to determine the relation between exports and various firm, industry, and country characteristics. Controlling for as many other determinants as possible, the focus is on the partial effect of foreign direct investment (measured, e.g., as the stock of foreign assets or the value of foreign production). A negative coefficient for FDI implies that foreign production substitutes for exports, whereas a positive sign suggests that complementarity—the stimulus to home exports of intermediate and other related products—is more important in the aggregate. It can be noted that most U.S. studies of this type (e.g., U.S. Tariff Commission 1973; Horst 1974; Bergsten, Horst, and Moran 1978; Kravis and Lipsey 1988; Blomström, Lipsey, and Kulchysky 1988; Lipsey and Weiss 1981, 1984), as well as studies focusing on France, Japan, Canada, and the United Kingdom (e.g., Mucchielli and Saucier 1997; Buigues and Jacquemin 1994; Industry Commission 1996; Reddaway et al. 1968) conclude that the complementarities have tended to outweigh the substitution effects. However, it is also interesting to note that much of the research in both the United States and France was sparked by reports claiming that outward FDI had contributed to significant job losses, amounting to perhaps 900,000 jobs in the United States in the late 1960s (Ruttenberg 1971), and several million jobs in France in the 1990s (Arthuis 1993).

It is likely that there are significant differences between the competitive advantages of Swedish MNCs and multinationals from other home countries, and it may not be possible to generalize results across countries. A number of studies have therefore focused on the Swedish FDI-trade relationship. The most comprehensive of these are presented in Swedenborg (1979, 1982), Blomström, Lipsey, and Kulchysky (1988), and Svensson (1996). The studies are all based on a detailed data set on Swedish multinationals collected by the IUI in Stockholm, but there are significant differences in methodology and results. The major innovation in both of Swe-

denborg's studies is that she bases her analysis on two-stage least squares (2SLS) estimations, in order to avoid the bias that comes about because both foreign production and exports may be affected by the same omitted variables. The first stage estimates the size of foreign production as a function of various firm, industry, and host-country characteristics, and the second stage estimates exports from the Swedish parent company with the first-stage fitted values of foreign production as one of the independent variables. In Swedenborg (1979), the focus is on a sample of some 100 Swedish manufacturing MNCs with more than 300 foreign affiliates in 1974. Her findings suggest that there was no significant overall effect of foreign production on the exports of Swedish parents that year, but that the aggregate results hide two significant, but opposite, effects. Foreign production seems to substitute for some exports to sales affiliates and non-affiliated customers in the host country, but there is a concurrent (larger) positive effect on the exports of goods (both intermediates and finished products) to producing affiliates. Swedenborg (1982) adds observations for three more years (1965, 1970, and 1978), with very similar results. The effect on total export is still not statistically significant, but there is a clear pattern when complementary and substituting exports are examined separately. A one dollar increase in foreign production is found to result in a twelve cent increase in exports to producing affiliates, but only a two cent fall in exports to other customers in the host country—that is, a net export stimulus of ten cents. Birgitta Swedenborg's contribution to this volume, which examines Swedish FDI during the period 1965–94 in a panel data analysis, largely confirms these conclusions.

Blomström, Lipsey, and Kulchycky (1988) argue that Swedenborg's results are uncertain because her first-stage estimations have low explanatory power, so that much of the relevant variation in the affiliates' production is neglected in the second stage. They examine Swedish exports and foreign direct investment for ten aggregate industry groups in 1978, as well as changes between 1970 and 1978, in a conventional ordinary least squares (OLS) framework. By focusing on changes in the variables, they hope to eliminate the impact of the omitted variables that simultaneously affect foreign production and exports, but not those that affect changes in production or exports. Moreover, they look at total Swedish exports in each industry, rather than at only the parent corporations' exports. This means that they may capture some instances in which the affiliates' activities have substituted for other firms' exports, as well as cases in which FDI has facilitated other Swedish firms' exports to the host market. The latter situation may occur if foreign production familiarizes the host country with Swedish products, or if the affiliates transfer information about the host country's business environment back to Sweden.

Yet, the findings in Blomström, Lipsey, and Kulchycky (1988) differ little from those presented by Swedenborg (1979, 1982). They find no signs of

substitution between Swedish exports and foreign production for any of the industries included—if anything, the authors find a larger complementary effect—and no evidence that large foreign production in a country reduces the country's subsequent imports from Sweden. Blomström, Fors, and Lipsey (1997), examining the connection between home employment and foreign production, also find a positive relation, which is interpreted as an indication of complementarity. Swedish MNCs with large foreign production also tend to have large domestic employment, controlling for the size of domestic output. The proposed reason is that MNCs with more foreign activities need additional supervisory, management, marketing, and R&D personnel in the parent company.<sup>1</sup>

A recent study by Svensson (1996), using unpublished data from later surveys of Swedish direct investment abroad, challenges the results of the earlier research. Svensson argues that it is necessary to account for the foreign affiliates' exports to third countries because they are likely to substitute directly for parent exports. Doing this, he finds that there now appears to be substitution between Swedish investment abroad and exports from Sweden. Braunerhjelm and Oxelheim (1998) address the discrepancy between Svensson (1996) and earlier studies by suggesting that the impact of FDI may vary depending on industry characteristics. They argue that FDI and exports should be complements in industries that rely on immobile natural resources (Heckscher-Ohlin industries), but that they may be substitutes in industries relying on technology, brand names, and other intangible assets that are not fixed to the home country (Schumpeter industries)—in particular, if the economic environment in the home country is less attractive than that in the host countries. They also find some empirical support for this hypothesis by examining the relationship between domestic and foreign investment in a regression framework. Their conclusion is that industry differences are likely to be important, and that more studies based on disaggregated data are needed to formulate efficient economic policies.

Although some of the recent studies have found signs of a substitutive relationship between FDI and home-country operations, they all note that the quantitative impact remains relatively small. It is therefore not unfair to summarize the debate on production interactions by noting that, in the aggregate, Swedish FDI does not appear to have any dramatic effect on Swedish investment, production, or exports. However, this assessment neglects the structural changes in the home country that come about because FDI influences the composition of home-country exports. The next section turns to an empirical investigation of these structural changes.

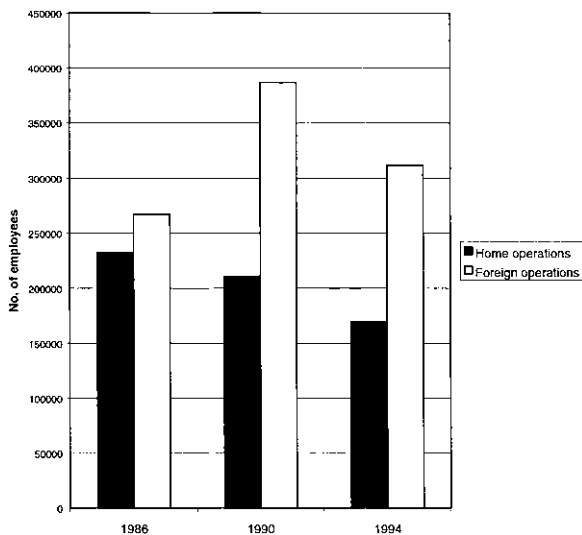
1. However, it should be noted that the same relationship could indicate that the MNCs with large foreign production have decided to concentrate relatively labor intensive production processes in Sweden.



### 5.3 Structural Change in Large Swedish MNCs 1986–1994

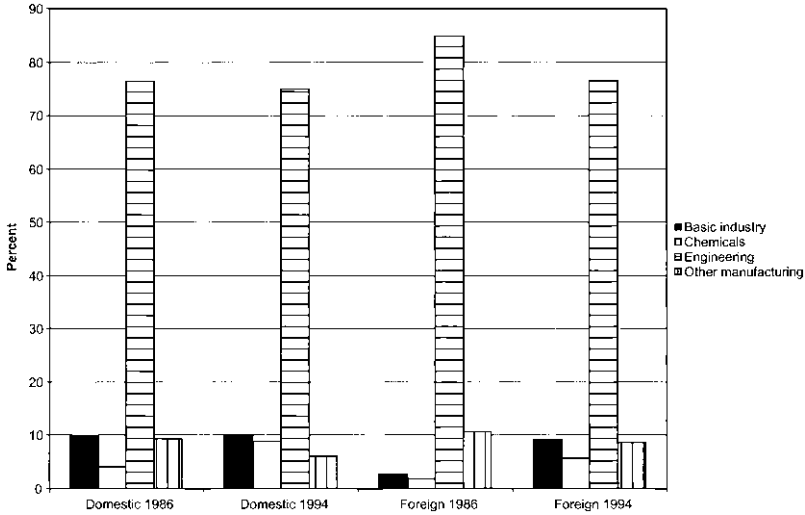
The data used in this paper are drawn from a plant-level database on the home-country operations of the thirty largest Swedish multinational conglomerates from 1986 to 1994, provided by Statistics Sweden, and from the database on the foreign operations of Swedish MNCs collected by the IUI. We were forced to drop several of the thirty firms provided by the Statistics Sweden database because they were not included in the IUI database (which excludes holding companies and firms that are active primarily in services), and the sample used in the subsequent analysis covers seventeen MNCs. Although the number of firms is relatively small, it should be noted that they hold a significant share of Swedish FDI. In 1994, they accounted for 57 percent of the domestic employment and 60 percent of the foreign employment of all the MNCs included in the IUI database.

Figures 5.1–5.3 show how the structure of home and foreign operations in the seventeen MNCs has changed between 1986 and 1994. Figure 5.1 depicts the changes in total employment. While domestic employment declined markedly, from more than 230,000 in 1986 to less than 170,000 in 1994, employment in foreign affiliates increased over the same period, from 267,000 to 312,000. The number of domestic plants fell from 229 to 169, while the number of foreign affiliates grew from 304 to 378. However, there was a marked difference in the development of employment in for-



**Fig. 5.1** Employment in domestic and foreign operations 1986–94, seventeen Swedish MNCs

*Source:* IUI and Statistics Sweden.



**Fig. 5.2** Distribution of employment in domestic and foreign operations across broad industry groups 1986–94, seventeen Swedish MNCs

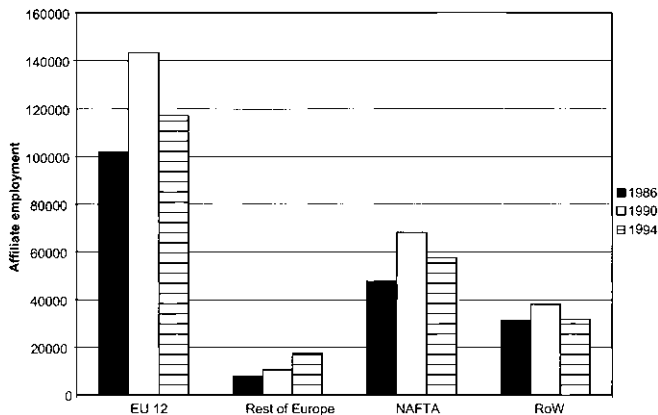
Source: IUI and Statistics Sweden.

eign affiliates between the two subperiods 1986–90 and 1990–94. Foreign employment increased by 44 percent between 1986 and 1990, when the economy was booming and Swedish MNCs were making very large profits, but fell by 20 percent between 1990 and 1994, when a deep financial crisis led to a severe recession.

Apart from the rapid internationalization process, which raised the foreign share of the MNCs' aggregate employment from 54 percent to 65 percent, there were also some important changes in the industry distribution of employment at home and abroad, and in the geographical distribution of foreign employment. Figure 5.2 illustrates the changes in employment across the four broad industry groups: basic industries, chemicals, engineering, and other manufacturing. The changes in the industry structure of domestic operations between 1986 and 1994 appear relatively limited, although the end points hide significant differences between the two subperiods. Engineering industries contracted and basic industries expanded rapidly during the 1986–90 period, but a reversal of the trend between 1990 and 1994 nearly restored the initial employment shares (although total employment had fallen by more than a quarter, as shown in fig. 5.1). The changes in foreign operations were similar, but their development between 1990 and 1994 was not strong enough to neutralize the fall in the share of engineering and the increase in basic industries between 1986 and 1994. However, in absolute terms, engineering employment in foreign operations actually grew during this period.

Figure 5.3 illustrates the changes in the geographical distribution of foreign employment. In absolute terms, employment grew in all four regions, with the largest absolute increases in the twelve European Union (EU) countries. In relative terms, however, the largest increases took place in the rest of Europe, which is dominated by the European Free Trade Agreement (EFTA) countries. Between 1986 and 1994, the share of this region grew from about 4 percent to nearly 8 percent of the foreign employment of the seventeen MNCs in the sample. The share of the twelve EU countries fell from 54 percent to 52 percent over the same period, in spite of a large absolute increase. There were also significant differences between the two subperiods in all regions except for the rest of Europe. Large employment increases between 1986 and 1990, amounting to about 40 percent in North American Free Trade Agreement (NAFTA) countries and the EU, turned into contractions of 16–18 percent between 1990 and 1994.

Table 5.1 adds further statistics to describe the changes that have taken place over the eight-year period. The table compares capital intensity and labor productivity in the domestic and foreign operations of the sample corporations. Physical-capital intensity (measured as the book value of capital per employee, in constant 1990 prices) more than doubled in both domestic and foreign operations between 1986 and 1994. Value added per employee in Swedish operations (in constant 1990 prices) increased by about 64 percent over the same period, while the corresponding increase in foreign operations was about 10 percentage points lower. Consequently, the gap in labor productivity between domestic and foreign operations increased somewhat over this period. The table also highlights the differences among regions regarding capital intensity and labor productivity.



**Fig. 5.3** Geographical distribution of foreign employment 1986–94, seventeen Swedish MNCs

Source: IUI database.

**Table 5.1** Capital Intensity and Labor Productivity at Home and Abroad

	1986	1990	1994
<i>Capital Intensity (K/L, million SEK)</i>			
Home operations	0.246	0.360	0.496
Foreign operations	0.143	0.190	0.318
EU 12	0.157	0.265	0.428
Other Europe	0.184	0.310	0.236
NAFTA	0.189	0.177	0.226
Other	0.085	0.123	0.188
<i>Labor Productivity (VAL, million SEK)</i>			
Home operations	0.310	0.334	0.507
Foreign operations	0.258	0.258	0.397
EU 12	0.242	0.309	0.445
Other Europe	0.232	0.358	0.318
NAFTA	0.274	0.225	0.322
Other	0.159	0.156	0.264

Source: IUI and Statistics Sweden.

The gap between domestic operations and affiliates in Europe is significantly smaller than implied by the aggregate figures for foreign operations. In fact, in 1990, affiliates in other Europe exhibited higher average labor productivity than the MNCs' Swedish plants. The fluctuation in the relative positions of the regions are to some extent related to changes in exchange rates, but changes in the industry distribution of affiliates are presumably also important.

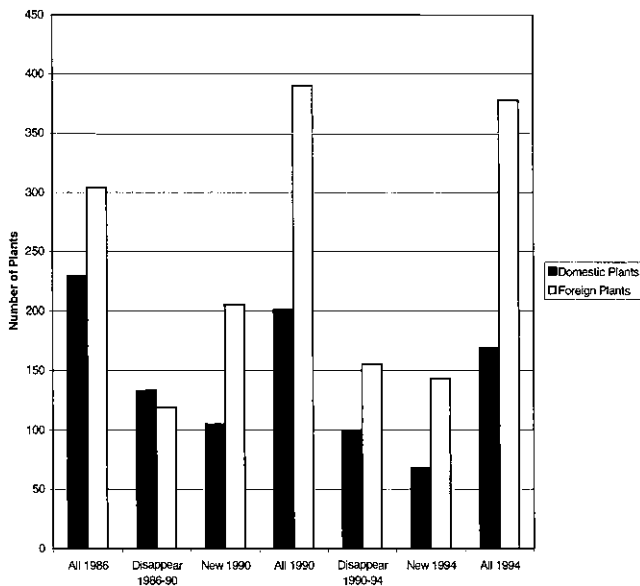
The differences between the two subperiods regarding total employment and the distribution of employment across industries and regions suggest that both the determinants and the consequences of the internationalization of industry may be quite complex. Both country- and industry-specific determinants of investment appear to be important, and it is clear that these may change significantly over time. The resulting changes in the structure of domestic and foreign production can be quite significant, as suggested by the large changes in the amount and industry distribution of employment in this sample of MNCs.

### 5.3.1 Plant and Employment Dynamics

Although the figures presented previously suggest a reasonably large degree of change in the operations of Swedish MNCs, they underestimate the degree of change taking place within the corporations. The reason is that the comparisons of aggregate employment and industry distributions of employment reflect only the net changes that have taken place. For instance, the relatively moderate reduction of aggregate employment in Swedish plants between 1986 and 1990 is the sum of much larger job losses in some firms and industries and job creation in others. Figures 5.4–5.6

summarize some information on the changes that have taken place at the plant level. Figure 5.4 gives a rough picture of the dynamics in the population of plants owned by the seventeen MNCs at home and abroad. The figure shows the number of surviving, disappearing, and new plants for 1986, 1990, and 1994. More than half of the 229 Swedish plants that existed in 1986 had disappeared from the sample by 1990, as a result of closures or sales to other firms. (Unfortunately, we have not been able to determine exactly what has happened to the plants dropping out of the sample.) This corresponds to an average death rate for plants of about 12 percent per year, which is roughly similar to that for small and medium-sized enterprises. Simultaneously, the seventeen MNCs established 105 new plants in Sweden. The changes in the population of foreign plants were almost as large. Of the 304 foreign affiliates existing in 1986, 119 had disappeared by 1990, while 205 new affiliates had been established over the same period. The development between 1990 and 1994 was similar, with the exception that the number of new Swedish plants was much lower than the number of disappearing plants, reflecting the contraction in home operations.

Considering the industry distribution of disappearing and new plants in Sweden, there is no doubt that the largest changes occurred in chemicals and in other manufacturing. The number of Swedish plants in both these



**Fig. 5.4** Plant dynamics: changes in the population of domestic and foreign plants 1986–94, seventeen Swedish MNCs

*Source:* IUI and Statistics Sweden.

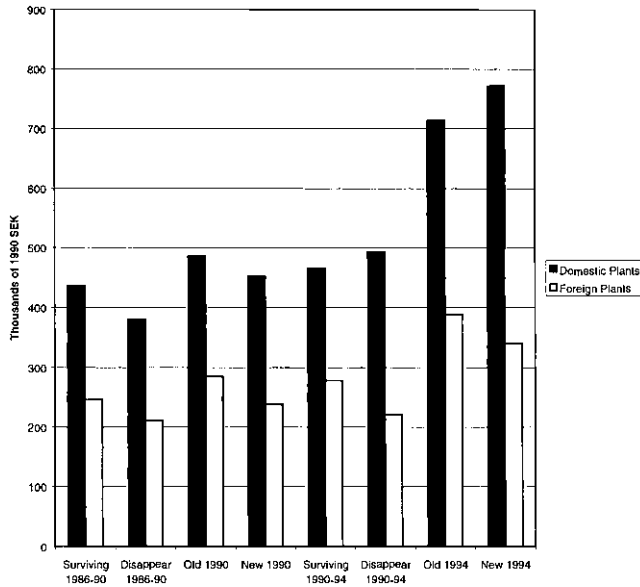
industry groups was reduced by more than half. However, the changes were notable even in basic industry, although the total number of Swedish plants fell by only one (from 26 to 25) between 1986 and 1994. Our sample includes 36 plants that disappeared and 35 that were created during the period. It should be noted that this underestimates the true number of changes, since we do not capture plants that emerged and disappeared between 1986 and 1990 or between 1990 and 1994. The largest changes in foreign operations were found in basic industry and chemicals, where the number of affiliates increased from 11–12 to 28. The dramatic changes in the population of affiliates in the engineering industry are also notable. The total number of affiliates grew by 18 (the difference between 215 new and 197 disappearing plants) for a total increase from 239 to 257.

The changes in number of jobs are not quite as dramatic as the changes in number of plants, reflecting the fact that both disappearing and new plants are small relative to the surviving ones. Yet job losses and job creation in Swedish plants corresponded to one-third to one-fourth of total employment in 1986 and 1990, with somewhat higher numbers for the foreign affiliates.

It is clear that this dramatic dynamism reflects a much larger potential for structural change than the aggregate data indicate. As noted in the previous section, few studies have been able to examine the dynamism within MNCs in detail because of the lack of suitable data. This study is plagued by the same problem, but figures 5.5 and 5.6 roughly illustrate some of the changes.

Figure 5.5 shows the average labor productivity of surviving, disappearing, and new plants. This is an interesting measure, since it may reflect the skill and capital intensity of the underlying production process. The pattern implied by (for example) the product life-cycle theory is one in which technical progress leads to higher skill and capital intensity both at home and abroad, presumably to the benefit of both the home and the host countries. However, various market characteristics, such as government intervention or cost conditions, might lead to other results. For instance, one of the main concerns regarding the effects of FDI in Sweden in recent years is that foreign production may lead to the export of attractive capital- or skill-intensive jobs. The data presented in figure 5.5 generally do not provide any strong support to such worries, although the development between 1990 and 1994 is somewhat confusing. The pattern for the subperiod 1986–90, however, is one that could be expected. A comparison of 1986 productivity between those plants that survived until 1990 and those that had disappeared by 1990 reveal that the former exhibited higher labor productivity. In other words, plant closures contributed to the rise in average productivity in the MNCs.

However, the comparison between those Swedish plants that survived and those that disappeared between 1990 and 1994 suggests a somewhat



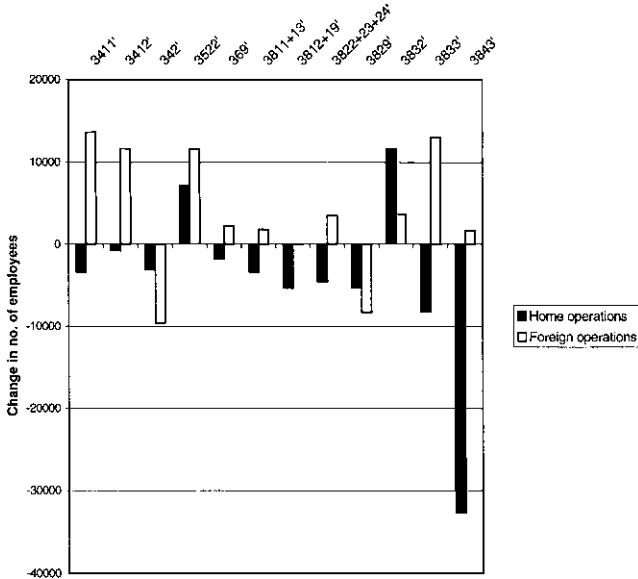
**Fig. 5.5** Average labor productivity (VA/L) of surviving, disappearing, and new plants 1986–94, seventeen Swedish MNCs

Source: IUI and Statistics Sweden.

peculiar pattern. The plants that had disappeared by 1994 had higher labor productivity in 1990 than those that survived until 1994. One possible explanation could be that some operations with relatively high value added per worker were moved from Sweden to foreign affiliates of Swedish MNCs during this period.

Figure 5.6 summarizes changes in employment at home and abroad for the twelve industry categories in which Swedish MNCs had both domestic and foreign activities during the period under study. The industries are chosen at the three- and four-digit levels. The most interesting observation is probably that domestic and foreign employment changed in the opposite directions in most (eight of twelve) of the industry categories.

It is worth noting that the pattern of production relocations illustrated by figure 5.6 does not conform to any simple theoretical prediction. There does not appear to be any strong support for Braunerhjelm and Oxelheim's (1998) hypothesis that FDI and exports should be complements in industries based on Swedish raw materials, but should be substitutes in industries with R&D and technology as the competitive assets. The largest job gains have occurred in telecommunications equipment, whereas the largest job losses are found in the automobile industry. Both are among the most R&D-intensive industries in Sweden, with R&D expenditures exceeding 20 percent of value added in 1989. Paper and pulp, and metal products,



**Fig. 5.6 Changes in domestic and foreign employment, three- and four-digit industries 1986–94, seventeen Swedish MNCs**

Source: IUI and Statistics Sweden.

Note: Industry categories are as follows (n.e.c. = not elsewhere classified):

3411	Pulp, paper, and paperboard
3412	Containers and boxes of paper and paperboard
342	Printing and publishing
3522	Pharmaceuticals
369	Nonmetallic products n.e.c.
3811+13	Fabricated metal products: hand tools and structural metal products
3812+19	Furnitures and other fabricated metal products n.e.c.
3822+23+24	Agricultural, metal, and woodworking, and special industrial machinery
3829	Machinery n.e.c.
3832	Radio, television, and telecommunications equipment
3833	Electrical appliances
3843	Motor vehicles

are among the industries in which foreign employment has increased while domestic employment has fallen. These industries are presumably more dependent on Swedish natural resources than are other sectors. The four industries in which Swedish and foreign employment have changed in the same direction include printing and publishing, which is the least R&D intensive of the sectors, as well as pharmaceuticals, which is the most R&D intensive. This confusing pattern may be related to the short and relatively turbulent time period under study, but it also corroborates the need for future research in this area. It is possible that a richer data set, including disaggregated information on R&D, labor quality, and exports and imports, would have presented a clearer picture. Considering the complex



decision-making process underlying location decisions, it is obvious that research focusing on formal theoretical modeling of the issues at hand will also be valuable. However, the next section will examine the relation between foreign production and domestic employment in a simple regression framework that may allow us to say something more about the character of the structural changes taking place in home operations.

#### 5.4 How Does Foreign Production Affect Parent Employment?

With detailed plant-level data on the domestic and foreign operations of MNCs, it should be possible to examine the relationship between foreign and domestic production in closer detail than most earlier studies have done. In this section, we will therefore present some simple descriptive equations on disaggregated data, following Blomström, Fors, and Lipsey (1997), to examine the relationship between foreign production and domestic employment, given the level of domestic production. For this purpose, we have pooled the observations for 1986, 1990, and 1994, and defined two dependent variables,  $PEMPL_{ij}$  and  $PEMPL_{ijk}$ , to measure employment in Sweden. The subscript  $i$  identifies the MNC, the subscript  $j$  identifies the time period, and the subscript  $k$  denotes the industry. As discussed earlier, each MNC includes several individual firms that are not necessarily involved in the same industry. The explanatory variables measure domestic and foreign production, as proxied by the parent firm's net sales, PNS (sales – imports from the foreign affiliates) and the affiliates' net sales, ANS (sales – imports from the parent's Swedish plants). Subscripts  $i$ ,  $j$ , and  $k$  denote the MNC, time period, and industry. The relationship we will estimate in an OLS framework is

$$(1) \quad PEMPL_{ij} = a + b * PNS_{ij} + c * ANS_{ij} + \text{time dummies} \\ + \text{MNC dummies.}$$

Table 5.2 summarizes the results of some of the regression results. In equation (2a), the dependent variable is aggregate domestic employment for each MNC,  $PEMPL_{ij}$ . The explanatory variables are the parents' net sales ( $PNS_{ij}$ ) and the affiliates' aggregate net sales ( $ANS_{ij}$ ) plus company and time dummies. The negative estimated coefficient for ANS is contrary to that found in Blomström, Fors, and Lipsey (1997), and indicates that the MNCs with the largest production abroad have relatively low employment in Sweden, controlling for the level of Swedish production. In other words, more foreign output means fewer employees at home for a given value of home output. This effect could be a reflection of the structural changes in MNC operations discussed in the previous section. Foreign production would have a negative impact on domestic employment if the more labor-intensive portions of the largest MNCs' operations were relo-

**Table 5.2** Regression Analysis: The Relationship between Domestic Employment and Foreign Production in Swedish MNCs

Dependent Variable	(2a) PEMPL <sub>ij</sub>	(2b) PEMPL <sub>ijk</sub>
Constant	1,262.68	-2,616.79
PNS <sub>ij</sub>	0.46 (3.70)***	
PNS <sub>ijk</sub>		0.0007 (28.39)***
ANS <sub>ij</sub>	-0.39 (-2.65)**	
ANS <sub>ijk</sub>		0.08 (3.58)***
TD 1986	1,782.88 (1.10)	1,543.20 (4.94)***
TD 1990	2,119.57 (1.62)	1,264.37 (3.93)***
Company dummies	Incl.	Incl.
Adjusted R <sup>2</sup>	0.92	0.89
F-value	31.63	91.98
N	51	225

cated to their foreign affiliates, while the more skill- or capital-intensive operations were kept in Sweden. This result can be considered as a rough summary of the unclear picture presented by figure 5.6, which illustrated the changes in domestic and foreign employment in twelve disaggregated industries.<sup>2</sup>

To examine whether the negative coefficient in equation (2a) is related to the industry distribution of the operations of the MNCs, we have identified the domestic employment variable by the relevant industry in equation (2b), so that the dependent variable there is PEMPL<sub>ijk</sub>. The explanatory variables PNS<sub>ijk</sub> and ANS<sub>ijk</sub> are also identified by the industry of operations. In addition, we have included company and time dummies. This raises the number of observations from 51 to 225. Here, results are similar to those in Blomström, Fors, and Lipsey (1997). The positive and significant coefficient of the variable ANS<sub>ijk</sub> indicates that the firms with large foreign operations in a specific industry also tend to have high levels of employment in Sweden in the same industry, taking into account the level of Swedish production. The positive coefficient for ANS in Blomström, Fors, and Lipsey (1997) was interpreted to mean that the largest MNCs needed additional supervisory, marketing, and R&D personnel in Sweden to man-

2. However, it should be noted that this explanation is not perfectly consistent with the findings from figure 5.5, where we noted that the plants surviving between 1990 and 1994 exhibited lower labor productivity than those disappearing from the sample between those two years.

age their foreign operations, and it is possible that the same mechanism works here as well. At this less-aggregated level, there is no evidence of any relocation of more labor-intensive operations to foreign affiliates.

The differences between the results in equations (2a) and (2b) provide an interesting and complementary piece of information to the ongoing debate on the relation between domestic and foreign production. For the MNCs in the sample and the period under study, it appears that larger foreign production is related to lower domestic employment for a given amount of domestic output. This probably reflects structural changes within the MNCs, which involve a relocation of the more labor-intensive operations to foreign affiliates. Once the industry distribution of operations is controlled for, there appears to be a positive relation between foreign production and domestic employment. The positive impact on domestic employment is probably related to the various activities undertaken at home to coordinate and support the operations of foreign affiliates.

### **5.5 Concluding Remarks**

This paper has surveyed some of the literature on the relationship between FDI and the home-country operations of MNCs, and has tried to highlight the effects of outward FDI on economic structure in the home country. Much of the existing literature on production interactions between the domestic and foreign operations of MNCs has examined what happens to home-country exports and employment as a result of outward FDI. Although the results of earlier studies vary somewhat, there appears to be a consensus that the quantitative effects are not dramatic. The reduced exports of finished products from the home country to independent foreign customers are balanced by increases in exports of intermediate products to the foreign affiliates. However, the structural changes—the transformation that occurs when the parent company becomes increasingly specialized in the production of intermediate goods—have not been discussed in great detail. Drawing from a database covering seventeen of the largest Swedish MNCs, we have therefore attempted to provide a rough picture of how internationalization is connected with structural changes in the home-country operations of the MNCs.

The main finding of this study is that the changes taking place within the MNCs are larger than has been recognized in most earlier studies. Looking at the population of plants owned by the MNCs, we found annual turnover rates of about 10 percent for the period 1986–94. In most of the industries in which the seventeen MNCs in our sample had operations both in Sweden and abroad, the domestic and foreign employment changed in opposite directions. However, in this largely exploratory paper, we were not able to identify any simple pattern in these relocations of production, although the regression exercise in section 5.4 suggested that

home-country operations were becoming relatively less labor-intensive as a result of the structural changes. One reason for the weak conclusions is the lack of formal models to explain the determinants of the MNCs' location decisions. The production pattern that can be discerned at any given point in time reflects current conditions as well as past decisions, which means that empirical analysis is not likely to be sufficient for distinguishing the main determinants of MNC behavior. Fortunately, an increasing amount of theoretical work presently focuses on problems where international trade, investment, and location decisions are interconnected.

Another area that has not been discussed in this paper is the welfare consequences of the ongoing structural changes within the MNCs. Since the MNCs' location choices are based on profit maximization, it can be assumed that their decisions reveal that there are private gains to be made from specialization. It is not equally obvious what the net effects are for Sweden. One reason is that there are differences in international market structure, which means that some industries can charge higher prices and generate larger profits than others. Certain types of production may also be connected with positive external effects and spillovers. The aggregate impact of FDI on the home country may be beneficial if production processes with high profits and positive externalities are retained at home, but effects are likely to be less advantageous, or even negative, if these are among the activities that are moved to foreign affiliates. However, there is no generally accepted notion of which industries are most beneficial, which kinds of externalities are relevant, how important they are in quantitative terms, and how they compare with the gains from specialization. If the structural changes within the MNCs turn out to follow some systematic pattern, it is clear that the welfare consequences should also be subject to analysis.

## References

- Arthuis, J. 1993. *Délocalisations hors du territoire national des activités industrielles et de service*. Rapport du Sénat no. 337, Paris.
- Bergsten, F., T. Horst, and T. Moran. 1978. *American multinationals and American interests*. Washington, D.C.: Brookings.
- Blomström, M., G. Fors, and R. E. Lipsey. 1997. Foreign direct investment and employment: Home country experience in the United States and Sweden. *Economic Journal* 107:787-97.
- Blomström, M., R. E. Lipsey, and K. Kulchycky. 1988. U.S. and Swedish direct investment and exports. In *Trade policy issues and empirical analysis*, ed. R. Baldwin, 259-99. Chicago: University of Chicago Press.
- Brainard, L. 1993. A simple theory of multinational corporations and trade with a trade-off between proximity and concentration. NBER Working Paper no. 4269. Cambridge, Mass.: National Bureau of Economic Research.

- Braunerhjelm, P., K. Ekholm, L. Grundberg, and P. Karpaty. 1996. Swedish multinational corporations: Recent trends in foreign activities. IUI Working Paper no. 462. Stockholm: Research Institute of Industrial Economics.
- Braunerhjelm, P., and L. Oxelheim. 1998. Does foreign direct investment replace home country investment? Paper presented at symposium, New Issues in Trade and Location. 28–30 August, Lund, Sweden.
- Buigues, P., and A. Jacquemin. 1994. Foreign direct investment and exports to the European Community. In *Does ownership matter? Japanese multinationals in Europe*, ed. M. Mason and D. Encarnation, 163–99. Oxford: Oxford University Press.
- Caves, R. E. 1996. *Multinational enterprise and economic analysis*. Cambridge, UK: Cambridge University Press.
- Dunning, J. H. 1993. *Multinational enterprises and the global economy*. Wokingham, U.K.: Addison-Wesley.
- Frank, R. H., and R. T. Freeman. 1978. *Distributional consequences of direct foreign investment*. New York: Academic Press.
- Horst, T. 1974. American exports and foreign direct investments. Discussion Paper no. 362. Boston: Harvard Institute of Economic Research.
- Industry Commission. 1996. *Implications for Australia of firms locating offshore*. Belconnen, ACT: Industry Commission.
- Jordan, J. L., and J. E. Vahlne. 1981. Domestic employment effects of direct investment abroad by two Swedish multinationals. Multinational Enterprises Programme. Working Paper no. 13. Geneva: International Labour Office.
- Kravis, I., and R. E. Lipsey. 1988. The effect of multinational firms' foreign operations on their domestic employment. NBER Working Paper no. 2760. Cambridge, Mass.: National Bureau of Economic Research.
- Lipsey, R. E., and M. Y. Weiss. 1981. Foreign production and exports in manufacturing industries. *Review of Economics and Statistics* 63:488–94.
- . 1984. Foreign production and exports of individual firms. *Review of Economics and Statistics* 66:304–8.
- Markusen, J. 1995. The boundaries of multinational enterprises and the theory of international trade. *Journal of Economic Perspectives* 9:169–89.
- Mucchielli, J.-L., and P. Saucier. 1997. European industrial relocations in low-wage countries: Policy and theory debates. In *Multinational firms and international relocation*, ed. P. J. Buckley and J.-L. Mucchielli, 5–33. Cheltenham, UK: Edward Elgar.
- Organization for Economic Cooperation and Development (OECD). 1993. *OECD reviews on foreign direct investment: Sweden*. Paris: OECD.
- Reddaway, W. B., in collaboration with S. J. Potter and C. T. Taylor. 1968. *Effects of U.K. direct investment overseas: Final report*. Cambridge: Cambridge University Press.
- Ruttenberg, S. 1971. *Needed! A constructive foreign trade policy*. Washington, D.C.: AFL-CIO.
- Stobaugh, R. B., and associates. 1972. *U.S. multinational enterprises and the U.S. economy*. Boston: Harvard Graduate School of Business Administration.
- Svensson, R. 1996. Effects of overseas production on home country exports: Evidence based on Swedish multinationals. *Weltwirtschaftliches Archiv* 132 (2): 304–29.
- Sweden. 1981. *Effekter av investeringar utomlands*. SOU 1981:33. Stockholm: Liber Förlag.
- Swedenborg, B. 1979. *The multinational operations of Swedish firms*. Stockholm: Almqvist & Wicksell International.
- . 1982. *Svensk industri i utlandet: En analys av drivkrafter och effekter*. Stockholm: Industrial Institute for Economic and Social Research.

U.S. Tariff Commission. 1973. *Implications of multinational firms for world trade and investment and for U.S. trade and labor*. Report to the U.S. Senate Committee on Finance, February.

## Comment      Guy V. G. Stevens

It is a privilege and a pleasure to participate in this tribute to the career of Robert Lipsey. Bob commented on one of my first published papers back in 1972, and we later collaborated on a study of the interaction between domestic and foreign investments of U.S. multinationals (Stevens and Lipsey 1994). Perhaps more important, over a period now closing in on thirty years, we have participated with a small group of researchers and Department of Commerce officials to improve both the quality and the accessibility of U.S. data on multinational firm operations. No one has contributed more to this effort than Bob.

### Data and Findings

Gunnar Fors and Ari Kokko examine a new source of Swedish micro-economic data, exploring some new questions and showing that some old answers depend on the level at which the data are aggregated. The data in question, covering three cross sections (1986, 1990, and 1994), are plant-level data for both parent-firm operations in Sweden and affiliate operations abroad.

Just looking at histograms and averages (table 5.1 and figs. 5.1–5.6) suggests that there is little evidence for some of the worst fears regarding the effects of direct investment. First, there seemed to be no clear pattern of correlation between employment changes for parent operations in Sweden and those for the foreign affiliates: In the initial period (1986–90), domestic employment fell while that in foreign affiliates rose, whereas in the second (1990–94), both fell. Moreover, the earlier period was a boom time in Sweden, so that any reductions in employment in the sample were probably taken up quickly by the rest of the economy. Second, there was no evidence that good jobs were being exported from Sweden to the foreign affiliates; labor productivity in Sweden rose smartly over time, and, with only one exception (which later evaporated), was consistently higher than that in foreign plants. Of course, not all such comparisons are meant to answer definitively such questions as, “What would have happened in the *absence* of the observed changes in foreign affiliate operations?”

The authors’ regression analysis attempts to address the “what if” question with respect to the question of changes in Swedish employment.

Guy V. G. Stevens is a senior economist in the International Division of the Board of Governors of the Federal Reserve System, Washington, D.C.

Among other things, here they show that empirical answers to such questions seem to depend on the degree of data aggregation. In what are now fairly well-known regressions of home- or parent-firm employment on domestic and foreign-affiliate net sales (or production), when the firm's data are aggregated over all industries, the sign of the foreign-affiliate sales variable is significantly negative ( $-0.39$ ). This degree of aggregation corresponds to that of most previous Swedish work using firm data and, as the authors point out, the results are contrary to at least one influential study (Blomström, Fors, and Lipsey 1997). It would appear, then, that Fors finds himself in the enviable position of being able to produce published results arguing for either a significant positive or a negative effect of foreign-affiliate sales on Swedish employment.

However, when the authors use their new data disaggregated by plant, the significant positive effect of foreign-affiliate sales ( $+0.08$ ) reemerges.<sup>1</sup> I will comment further on these results in the next section.

The authors have just begun to explore their disaggregated data set, but already they are revealing patterns that surprise and intrigue. The turnover in plant ownership shown in figure 5.4 is dramatic—showing, for example, that approximately half of the domestic plants were sold or abandoned in each of the four-year periods studied. This pattern indicates much more flexibility in adjusting the capital stock than I would have imagined. Moreover, there seemed little indication that plants that disappeared were in any way inferior by the measure of labor productivity to those that survived.

### **Further Comments on the Estimates of the Interactions between Foreign-Affiliate Production and Domestic Variables**

Fors and Kokko discuss how the estimated sign of the effect of foreign-affiliate sales or production on domestic employment differs between their two equations, and differs with the results of at least some previous research (e.g., Blomström, Fors, and Lipsey 1997). In their introductory section, they also note the differences of opinion among researchers on the closely related question of the effect of foreign-affiliate production on home-country exports. The resolution of these differences should probably be a priority for future research.

Even if the causes of these different empirical results are identified, I would like to suggest that the best of the resulting equations may not, without something more, be sufficient to throw light on the policy questions they were designed to answer—in this case, the impact of foreign-affiliate production on the demand for domestic (Swedish) labor. Suppose it turns out that the disaggregated equation (2b) is the correct one and that

1. The difference in the size of the estimated coefficients for the affiliate sales and other variables concerns me a bit. Perhaps this is a problem of different units of measurement, but the coefficients are 5 to 500 times larger in the equation using the aggregated data.

the coefficient on affiliate sales ( $ANS_{ijk}$ ) is really 0.08. If we are asked the policy question, “What will be the impact of a one-unit change in ANS on domestic employment (PEMPL)?” we would tend to answer “0.08.” This answer assumes not only that a unit of foreign-affiliate sales can be treated as exogenous for purposes of estimation, but also that it can be varied independently of any other variable in the equation. Given that the two variables on the right-hand sides of their equations (foreign-affiliate production and net domestic production) are most likely coterminous, this assumption seems unlikely. In fact, one of the key research questions in the discipline is the degree to which exports from the parent firm, a component of net domestic production, are affected by changes in foreign-affiliate production. For purposes of illustration, assume that, in addition to equation (2b) (see table 5.2), another equation postulates that finished goods exports from the parent,  $X_S$ , (subscript “S” for substitutes) plus affiliate production ANS equals a time dependent exogenous variable,  $D_t$  (foreign demand). Since  $X_S$  plus domestic sales equals parent net sales (PNS) in equation (2b), an exogenous change in ANS would now induce an equal and opposite change in both  $X_S$  and PNS. The correct estimate of the overall impact of the change on domestic employment would now be 0.08 – 0.0007.<sup>2</sup>

The foregoing illustrates that, even for plant-level data, an omitted equation can make a crucial difference for the answer to the policy questions that originally motivated the research. This problem becomes even more central when we try to calculate overall country effects of changes in multinational firm activity, necessitating calculations (and probably equations) for interactions with host-country producers in foreign markets and with exporters from third countries. To this problem of selecting properly sized models, one can add the pitfalls of being unsure whether an equation that by necessity involves endogenous variables is truly structural, and of finding adequate instruments to estimate consistent coefficients when simultaneous equation problems do appear.

The citation of this litany of problems perhaps explains the comment in my oral presentation in which, after completing a 1974 paper with Michael Adler on trade and investment, I concluded that this area of study was “too difficult.” I am glad that researchers such as the present authors, Bob Lipsey, and others at this conference have continued to labor in this vineyard, despite my timidity at the time. I may have been right that the costs

2. The value of 0.0007 seems implausibly small. This is another reason I suspect that the coefficients in equation (2b) might either be implausible or reflect different units of measurement for the two independent variables.

The previous example, for simplicity, ignores exports of intermediate goods from the parent to foreign affiliates. Taking intermediates into account would change the overall result considerably, but would support the main point that it is important not to ignore the other equations in the model that link the endogenous variables appearing in a given equation.



are high, but so are the benefits. The authors further point out that this vineyard is far from picked clean: The wide range in plausible estimates for such questions as the impact of foreign-affiliate production on trade indicates that important policy questions are still open. A useful enterprise, I would venture, would be a study that takes the various contending estimates for the interaction of trade, foreign-affiliate production, and domestic labor demand and tries to understand their differences.

## References

- Adler, Michael, and Guy V. G. Stevens. 1974. The trade effects of direct investment. *Journal of Finance* 29 (2): 655–76.
- Blomström, Magnus, Gunnar Fors, and Robert E. Lipsey. 1997. Foreign direct investment and employment: Home country experience in the United States and Sweden. *Economic Journal* 107:1787–97.
- Stevens, Guy V. G. 1972. Capital mobility and the international firm. In *The international mobility and movement of capital*, ed. Fritz Machlup et al., 323–53. New York: National Bureau of Economic Research.
- Stevens, Guy V. G., and Robert E. Lipsey. 1994. Interactions between domestic and foreign investment. *Journal of International Money and Finance* 11 (1): 40–62.

---

# III

---

## International Trade and Exchange Rates

