Volume Title: The Effects of Taxation on Multinational Corporations

Volume Author/Editor: Martin Feldstein, James R. Hines Jr., R. Glenn Hubbard

Volume Publisher: University of Chicago Press

Volume ISBN: 0-226-24095-9

Volume URL: http://www.nber.org/books/feld95-2

Conference Date: January 13-15, 1994

Publication Date: January 1995

Chapter Title: Outward Direct Investment and the U.S. Economy

Chapter Author: Robert E. Lipsey

Chapter URL: http://www.nber.org/chapters/c7738

Chapter pages in book: (p. 7 - 42)

1 Outward Direct Investment and the U.S. Economy

Robert E. Lipsey

Any judgment about the wisdom of tax changes that raise or lower the profitability of American firms' foreign operations must involve some judgment as to the desirability of increasing or decreasing the extent of these operations. The purpose of this paper is to review past research on the effects of U.S. firms' overseas activities on the U.S. economy and to report some further analysis with more recent data.

The first question to be answered is what we mean by the U.S. economy. The ambiguity of the term troubles appraisals of many policies. One way of looking at it is to ask whether the object is to maximize gross national product or gross domestic product. The former is an ownership-based concept that includes the profits from overseas operations of U.S. firms and other income earned overseas by U.S. residents, but excludes profits earned in the United States by foreign residents. The latter is a geographically based concept that covers production that takes place in the United States, regardless of ownership. It thus excludes profits and other income earned overseas (from overseas production), but includes all income earned in the United States (from production in the United States) by both U.S. and foreign residents. One way in which the distinction surfaces in policy discussions is over whether various types of assistance or preferences are to be applied to U.S.-controlled firms, regardless of where they operate, or to firms producing in the United States, whether domestically or foreign owned.

I will try to construe the issue broadly. That means I will consider effects of outward foreign direct investment on the labor employed in the United States by the investing companies and also those on the companies themselves, in-

Robert E. Lipsey is professor of economics at Queens College and the Graduate Center, City University of New York, and a research associate of the National Bureau of Economic Research.

cluding their stockholders, and more generally on the trade and other aspects of the U.S. economy.

Various studies of the behavior of multinational firms, including some of my own, view the firms as facing fixed, or relatively fixed, worldwide markets for their products and making decisions mainly about how to supply that demand most profitably. The firm is pictured as choosing whether to supply the demand by exporting from the United States, by producing abroad, or by licensing technology, patents, or other assets owned by the firm to foreign licensees who would produce outside the United States.

The assumption of a fixed market for a firm tends to bias conclusions toward finding that foreign production by U.S. firms substitutes for production in the United States. An alternative view is that production abroad is often mainly a way of enlarging a firm's share of foreign markets, or of preventing or slowing a decline in that share. The inadequacy of the fixed-market assumption is obvious in any attempt to examine the impact of direct investment in service industries since the nature of most of these industries precludes substantial exporting from one country to another and market share is almost completely contingent on production at the site of consumption. While this is most obvious for service industries, it applies equally to the service component of manufacturing industries, a major part of the final value of sales of manufactured products.

1.1 The Growth of Internationalized Production

The establishment of foreign operations by American firms—and the establishment by any country's firms of production, including sales and service activities, outside the home country—is often referred to as the internationalization of production. In order to understand the process, and the reasons behind it, it is useful to ask whether it is uniquely or mainly an American phenomenon or is, under some circumstances, common to foreign firms as well.

The studies of Cleona Lewis (1938) and Mira Wilkins (1989) on foreign investment in the United States make it clear that direct investment and internationalized production were not an American invention. When the United States lagged technologically in many fields, foreign firms found it profitable to develop marketing and production facilities in the United States to exploit their superior sophistication. The industrial distributions of these operations from different countries clearly reflected some specific technological advantages, such as those of Great Britain in various aspects of the textile industry and of Germany in chemicals.

What has been unique about the United States is that direct investment has been the characteristic form of U.S. foreign investment as far back as data exist, even when the United States was still, on balance, importing capital (Lipsey 1988). That fact, and the lists of early U.S. investors (Lewis 1938; Southard 1931; Wilkins 1970) concentrated among the leading firms in various U.S. industries, emphasize the association of direct foreign investment not with

large aggregate supplies of financial or physical capital but with the possession of firm-specific assets, knowledge, and techniques, sometimes reflected in patents or brand names, that are mobile within firms, even across national borders, but not among firms.

Not only was direct investment the dominant form of U.S. outward investment, but the United States was the dominant source of the world's direct investment for a long period. The U.S. share of the world's stock of outward direct investment was over half around 1970, with the United Kingdom, the next most important investor, far behind at about 15–17 percent and no other single country the source of more than 6 percent. The share of the developed countries' outward direct investment flows originating in the United States was well over half in the 1960s and still over 40 percent in the 1970s. In the late 1980s, however, less than 20 percent of the world's outward flows originated in the United States, and in a reversal of roles, the United States absorbed over 40 percent of the flows from other countries (Lipsey 1993). In the early 1990s, Japan's role as a source of direct investment flows and the U.S. role as a recipient both declined sharply. In 1992, the United States was again the largest supplier, at about a quarter of the OECD total, and was not a significant net recipient, withdrawals and losses equaling or exceeding gross inflows (OECD 1993, table I).

The heyday of outward U.S. direct investment outflows, in the 1960s and at least part of the 1970s, involved a considerable internationalization of U.S. firms' production, in the sense that higher and higher proportions of the production they controlled took place abroad, larger proportions of their employees were outside the United States, and larger shares of their assets came to be located abroad. Since then, however, the degree of internationalization of U.S. companies has stabilized or declined, as if the firms had overshot some desirable level and found it desirable to retreat somewhat.

The peak in the extent of internationalization in this sense for the U.S. economy as a whole was reached some time in the late 1970s (we cannot date it more closely because comprehensive data exist only for occasional foreign investment census years). For example, employment in all overseas affiliates of U.S. firms was almost 11 percent of total U.S. nonagricultural employment in 1977, but only 7.5 percent in 1989. Plant and equipment expenditures by majority-owned foreign affiliates were over 15 percent of domestic U.S. plant and equipment expenditures in U.S. dollars in 1974–76 but fell below 10 percent from 1984 to 1988 and have not recovered their earlier levels. Since the exchange value of the U.S. dollar was low in the late 1980s, the decline in real terms was even larger.

U.S. manufacturing firms have long been much more internationalized than firms in other industries, with their overseas employment reaching about a quarter of domestic manufacturing employment in 1977 (from only 10 percent in 1957) and then declining only slightly to about 22 percent in the late 1980s. Overseas plant and equipment expenditures in manufacturing reached over 20

percent of domestic expenditure in dollar terms for a few years in the 1970s. It fell almost to 10 percent when the exchange value of the dollar was near its peak, and then recovered, but so far not to earlier peak levels.

Within those U.S. firms that are multinational, the changes have not been so sharp, partly because of the importance of manufacturing firms in the universe of multinationals. However, the time pattern has been similar since 1977 (there is little parent firm information available before that).

Within manufacturing multinationals, foreign affiliate net sales, a crude measure of production, were larger in the late 1980s relative to parent sales than in 1977, and affiliate employment was close to the earlier levels relative to parent employment. Thus, this group of firms has not exhibited the shift away from internationalized production that has characterized U.S. multinationals in general or the U.S. manufacturing sector as a whole. The affiliate share of production may even have increased (though it is too volatile to provide a quick judgment that there is an upward trend), and the affiliate share of employment has not changed much since 1977.

The strongest case for increased internationalization in U.S. manufacturing is in exports. Affiliates accounted for less than a third of U.S. multinationals' worldwide exports in 1966, but for more than half in the second half of the 1980s and the early 1990s. Their importance relative to total manufactured exports from the United States also more than doubled over this period.

The contrast between the changes in internationalization within U.S. parents and those for the U.S. economy as a whole reflects the declining role of multinational parents within the U.S. economy. Parent employment in the United States fell from 28 percent of U.S. nonagricultural employment in 1977 to barely over 20 percent in the late 1980s, not because employment was moved overseas, where affiliate employment was also declining, but because these multinationals were declining in importance as part of the U.S. economy. This decline was not simply a reflection of the decline of manufacturing's share of U.S. employment, but took place within manufacturing as well, where manufacturing parent firms' share of total domestic manufacturing employment fell from over 60 percent in 1977 to a little over 50 percent in 1988–90. Thus, the shrinking of many large, established U.S. manufacturing firms affected both their domestic and their foreign employment. The many anecdotes about the shifting of domestic employment abroad do not seem to add up to much in the aggregate, especially for the U.S. economy as a whole.

There is one reason why it is as yet difficult to judge whether the apparent retreat of U.S. firms from foreign operations during the 1980s is a long-term trend. The enormous shift in direct investment toward the United States by foreign firms, to the point where the United States absorbed an unprecedented share of the rest of the world's outflow of direct investment, suggests that the United States was an exceptionally attractive location for investment during this period. If that was the case, it might have been particularly attractive, relative to locations in other countries, to American firms as well as to foreign

firms, and that attractiveness would show up as a retreat from internationalization for U.S. firms while it tended to increase the degree of internationalization of foreign firms.

One reason for this apparent retreat of American firms from overseas activity may have been the growth of efficient and aggressive foreign competitors. The levels of internationalization of the German and Japanese economies were much lower than that of the United States in the 1970s. Since then, the internationalization pioneered on a large scale by American firms has been copied by European and Japanese firms, and now even by firms from developing countries.

How widespread is internationalized production in the sense of firms producing outside their home countries? And is it expanding in the world economy as a whole? Two opposite influences are at work. Internationalization is most prevalent in manufacturing and least common in services. The rising powers in manufacturing, such as Japan and some of the developing countries of Southeast Asia, are increasing the degree to which their companies carry out their manufacturing outside the home countries. At the same time, the share of manufacturing in most of the world's economies is declining, and that of services is increasing. The net result of these two forces, and of the opposite directions of changes in the United States and in other countries, is that the share of internationalized production in world output, after increasing greatly in the 20 years after 1957, perhaps tripling, has grown little since then. The share of Japanese, German, and Swedish firms' internationalized production has been rising, but that rise has been offset by the fall in the much larger U.S. share. Internationalized production by firms from other countries has almost certainly been rising, but it is starting from too low a level to have much impact on the total. The share of such production in worldwide GDP may have been in the range of 10–15 percent in 1990. The U.S. companies accounted for half or more of this total, and if the rise from the recent low point in 1988 continues, internationalized production will again be of growing importance.

A less equivocal story can be told about the share of production outside home countries in world trade in manufactured goods. That share is clearly over 10 percent and seems to have risen even since 1977, mainly because of the growth of Japanese affiliate exports, but also because U.S. affiliates have held on to or even increased their shares since 1977. Thus, world trade in manufactures, if not necessarily aggregate world production or employment, is increasingly made up of exports from internationalized production.

What can we conclude from these trends in the extent of internationalized production? The practice of producing outside the home country is well entrenched, especially in manufacturing, not only for U.S.-based companies but, increasingly, for firms based in other countries. It is increasingly common for firms in at least the more successful developing countries, such as Korea and Taiwan. Presumably, it is an avenue for increasing profitability, probably through increasing market shares that provide economies of scale in the exploi-

tation of the firm's assets, such as patents, other technological assets, reputation, and more generally, skills in production and marketing.

1.2 Overseas Production and Export Market Shares in Manufacturing

The share of the United States, as a country, in world export markets for manufactured goods has been declining over most of the last quarter century. In the early 1990s, after some recovery from the low point in 1987 that resulted partly from the earlier period of high exchange values for the dollar, the share was about 12 percent, 25–30 percent below the level in 1966 (table 1.1). U.S. multinational firms, exporting from the United States and from their overseas production, held on much more successfully. By 1985, when the United States had already lost more than 20 percent of its share of 20 years earlier, U.S. multinationals had increased their share of world exports (table 1.2). They then lost some of that in the next two years, but in the early 1990s retained a share a little above that of 1966. How was this relative stability achieved? Performance was very different for the parent firms, exporting from the United States, and the affiliates, exporting from other countries.

Until at least 1985, the parent firms lost less of their world export shares than did nonmultinational U.S. firms (table 1.3). Then the parent share fell sharply, more rapidly than that of other U.S. firms. In the meantime, more and more of multinational exports were supplied by their overseas affiliates, more than half since 1986, and a record high proportion in 1990–92. Thus, one way the U.S. multinationals kept their export markets, as the United States lost

Table 1.1 **U.S. Share of World[a] Exports of Manufactured[b] Exports (%)**

Year	Share
1966	17.1
1977	13.2
1982	14.6
1985	13.4
1986	11.9
1987	11.3
1988	12.1
1989	12.8
1990	12.1
1991	12.6
1992	12.4

Source: United Nations trade tapes, extended to 1991 and 1992 by estimates derived from data in United Nations (1993, 1994).

[a]Market economy.

[b]As defined in Bureau of Economic Analysis (BEA) investment data, including manufactured foods, but excluding petroleum and coal products.

Table 1.2 **Exports by U.S. Manufacturing Multinationals[a] as a Share of World Manufactured Exports (%)**

Year	Share
1966	15.8
1977	15.5
1982	17.4
1985	18.1
1986	16.6
1987	15.6
1988	16.1
1989	16.4
1990	16.1
1991	16.4
1992	16.0

Source: United Nations trade tapes and Lipsey (1995).
Note: For other definitions, see table 1.1.
[a]Parents and majority-owned affiliates.

Table 1.3 **Parent and Affiliate Export Shares (%)**

	Share of World Manufactured Exports		
Year	U.S. Parents	Majority-Owned Affiliates	Affiliate Share of Multinational Exports
1966	11.0	4.8	30.4
1977	9.1	6.4	41.2
1982	9.3	8.1	46.4
1985	9.4	8.7	48.2
1986	8.2	8.4	50.9
1987	7.5	8.2	52.2
1988	7.7	8.3	52.0
1989	8.0	8.4	51.4
1990	7.3	8.8	54.4
1991	7.6	8.8	53.8
1992	7.2	8.8	54.8

Source: United Nations trade tapes and Lipsey (1995).
Note: For definitions, see tables 1.1 and 1.2.

competitiveness in their industries, was by supplying these markets increasingly from overseas operations, a strategy obviously not available to nonmultinational U.S. firms. (The affiliate shares included in this calculation are only shares of export trade and exclude the much more important affiliate sales in their host-country markets.)

This rise in the importance of exporting from foreign affiliates was not

unique to the United States. Even in Japan, an extremely successful exporter from home-country production, exports by overseas affiliates rose from 8 percent of exports from Japan in 1974 to 14 percent or more in 1986–89. Japan's share of world manufactured exports reached a peak in 1986, shortly after the high point in the exchange value of the dollar, and the declined from 1986 to 1990 before recovering slightly (table 1.4). As the country's export share declined, the share of overseas manufacturing affiliates in their firms' total exports grew from 1986 to 1989, and almost certainly after that as well. Thus, in Japan, as in the United States, foreign operations seemed to play a defensive role in retaining export markets for firms under adverse conditions for parent exporting (table 1.5).

Sweden underwent large losses in trade shares similar to those of the United

Table 1.4 **Japanese Share of World Manufactured Exports (%)**

Year	Share
1965	6.8
1970	8.7
1974	10.5
1977	11.1
1982	12.1
1986	13.7
1987	12.5
1988	12.4
1989	12.0
1990	10.9
1991	11.5
1992	11.4

Source: United Nations trade tapes.

Note: For definitions, see tables 1.1 and 1.2.

Table 1.5 **Affiliate Share of Japanese Multinational Worldwide Exports (%)**

Year	Share
1974	7.2
1977	7.1
1980	8.0
1983	13.4
1986	10.7
1988	12.2
1989	12.3

Source: Lipsey (1995).

Note: For definitions, see tables 1.1 and 1.2.

States, although not quite as large. Swedish multinational firms, over the same period, retained or increased their shares, though the increase was concentrated in 1965–70 (table 1.6). This stability in the share of Swedish multinationals was accompanied by, or possibly accomplished by, a large shift in the sources of export production, with the portion of exports sold by foreign affiliates rising from a tenth of total multinational exports in 1965 to over a third in 1990 (table 1.7).

These three countries are the only ones that collect fairly comprehensive information on the trade of their multinationals' overseas affiliates. The data suggest that one major role for overseas production has been that of retaining market shares when home-country economic conditions and exchange rate changes made the home countries less suitable locations for export production.

An alternative interpretation of the data, discussed below, might be that it was the growth of affiliate production and exports that caused the reduction in home-country exports. However, home-country shares can be explained to a large extent by home-country price and exchange rate movements, not a likely path for influences stemming from decisions to produce abroad.

Table 1.6 **Swedish Share of World Manufactured Exports and Exports by Swedish Multinationals as a Share of World Manufactured Exports (%)**

Year	Sweden	Swedish Multinationals
1965	3.0	1.6
1970	2.9	2.0
1974	2.9	2.0
1978	2.4	1.8
1986	2.3	1.8
1990	2.1	1.7

Source: United Nations trade tapes; Swedenborg et al. (1988); data from the Industriens Utredningsinstitut of Stockholm.

Table 1.7 **Affiliate Share of Swedish Multinational Worldwide Exports (%)**

Year	Share
1965	10.4
1970	12.5
1974	15.9
1978	19.3
1986	24.3
1990	34.6

Source: Swedenborg et al. (1988); data from the Industriens Utredningsinstitut of Stockholm.

1.3 Does Foreign Production Substitute for Home-Country Exports?

Most antagonism against foreign direct investment has historically been toward inward investment, on the ground that it displaced home-country firms in home markets. However, there has also been opposition to outward investment, often led by labor organizations, on the ground that outward investment "exports jobs," partly by producing products to be imported to the home-country market but mostly by replacing home-country exports by overseas production. In the United States, the campaign against outward direct investment reached a peak with the effort to pass the Burke-Hartke bill in the 1960s, the Voluntary Program of Capital Restraints from 1965 through 1967, and then with the compulsory Office of Foreign Direct Investment (OFDI) regulations. These came into effect in 1968 as an effort to "improve" the U.S. balance of payments and were specifically directed against the outflow of capital for foreign direct investment. The government restrictions were ceilings on the export of funds for foreign direct investment, particularly to Western Europe, but were not aimed at the expansion of U.S. firms' foreign operations if the expansion was financed from foreign sources (Fiero 1969). With the defeat of Burke-Hartke and the demise of the OFDI in 1974, the campaign has faded, although the AFL-CIO continues to take a dim view of outward investment in its annual statements on economic policy.

Attempts to measure the effects of overseas production on home-country exports face the problem of defining substitution and of defining a believable counterfactual case. Exports from Japan's recently established or recently enlarged operations in Southeast Asia may "replace" exports that formerly came from Japan, but few would claim, after the rise in the exchange value of the yen, that they are replacing exports that could now be made from Japan. A cross-sectional analysis does not necessarily escape the problem; it may be precisely those more labor-intensive industries that can no longer export from the home country that establish production abroad.

A long line of studies has attempted to find evidence of a relationship between overseas production and home-country exports. One of the earliest U.S. studies, by Gary Hufbauer and F. M. Adler (1968), identified the crucial importance of the assumptions used to the interpretation of any relationships found, and a similar wide range of possible effects was reported in a major U.S. Tariff Commission (1973) study a few years later. The Reddaway reports (1967, 1968) explicitly assumed that in the absence of British foreign affiliates, their markets would have been supplied not by British exports but by local or other foreign suppliers.

The preponderance of evidence from empirical studies points to either no effect or a positive effect of overseas production in a host-country market on home-country exports to that market. Lipsey and Weiss (1981), in a cross-sectional analysis examining exports in 14 manufacturing industries by the United States and by 13 other developed countries, to many destinations, found

that the level of production by U.S.-owned affiliates in a country was positively related to U.S. exports in that industry to that country and, in some markets, negatively related to exports by other developed countries. On the other hand, the presence of affiliates from countries other than the United States was positively related to those countries' exports to that host country and, where there was any significant relationship, negatively related to U.S. exports to the country. In other words, the presence of, and production by, a home country's affiliates in a host country tended to attract exports from that home country and to discourage exports to that host country from other countries. Thus, the main substitution that seemed to take place was of country A's host-country production in country C for country B's exports to country C, and of country B's host-country production in country C for country A's exports to country C. In these calculations, the variables for U.S.-owned and foreign-owned affiliate activity were superimposed on a set of standard gravity equations including host-country income or aggregate imports, distance from home to host country, and trade bloc membership. The estimated trade position in the absence of direct investment is represented by the value of exports when the home-country affiliate activity variable is set at zero while the other variables, including foreign country affiliate variables, are at their actual levels. Since the dependent variables in these equations are total U.S. and other country exports, rather than the exports by parents, they take account of any displacements of one firm's exports to a country by the production in that country by affiliates of another firm from the same home country.

Each dollar of overseas production by U.S. affiliates in these cross-sectional equations added, on average across the statistically significant coefficients, about $0.16 to U.S. exports. Most of the coefficients were below $0.20. The coefficients for displacements of other countries' exports were not so consistently significant and varied widely, but whenever coefficients for both U.S. and other countries' exports were significant, the displacement of other countries' exports was larger than the addition to U.S. exports. That is a reasonable result since the addition to U.S. exports to a host country is the net balance of positive and negative effects of U.S.-owned production there, while the effect on other countries' exports to that host country are generally only negative, with no offsetting gains. One exception to this negative relation to foreign countries' exports would be the case in which the U.S. parent has affiliates in the other countries that are potential suppliers to the host country. Thus a U.S.-owned auto assembly plant in, say, the Netherlands might give rise to exports of auto components from the same company's German affiliate rather than, or in addition to, exports from the parent in the United States.

If a U.S.-owned affiliate in one country exported to other countries, it could displace U.S. exports to those countries without the offsetting effect of exports of components and other inputs to the manufacturing process. That displacement would be missed in the equations just described, and Lipsey and Weiss (1984) therefore examined the effects of aggregate affiliate production abroad

on the total exports to all destinations of the cross section of parent firms. The results were that the displacement of U.S. exports to third countries, if it existed, was not large enough to offset the positive effects on parent exports to host countries; that is, in each industry, firms that produced more abroad also exported more in the aggregate.

It is natural to think that exports by affiliates to third countries would necessarily displace parent exports to them, but that is not necessarily the case. A plane, truck, or car assembled or even produced completely by a U.S. affiliate in country A and exported to country B could later give rise to the export of parts, accessories, and related products from the United States to country B.

An examination of the same question for a later period (Blomström, Lipsey, and Kulchycky 1988), using the direct investment census for 1982 (U.S. Department of Commerce 1985), produced more ambiguous results. The later study lacked the information on affiliates of non-U.S. firms that had been part of the earlier study, but did distinguish between affiliate production for export and affiliate production for local sale in the host country, and also included some equations for production by minority-owned U.S. affiliates not available earlier.

When there was any statistically significant relation at all (a minority of industries), affiliate export sales, or production for export from the affiliate's host country, were consistently associated with higher U.S. exports to that host country. That is to be expected, since substitution of affiliate production for U.S. exports, if there was any, would take place outside the host country, in the third country, and would be unobserved. For sales within the host country, most coefficients were positive, but there were more negative (5 out of 30 industries) than positive coefficients among those that were statistically significant at the 5 percent level.

When data for minority-owned affiliates in the host countries, including those 50 percent owned, were added to the U.S. export equations, these affiliate operations were found to be associated with higher levels of U.S. exports to the host countries. In addition, the inclusion of these affiliate operations had a strong effect on the coefficients for production by majority-owned affiliates, moving many from showing negative effects on U.S. exports to positive effects.

The role of minority-owned affiliates is puzzling, and we can only speculate on the explanation. One factor is their very uneven distribution across countries. They are, for example, almost the only form of direct investment in Japan and quite important there. We have speculated that minority ownership has this strong positive relationship to U.S. exports because it may be a last resort in countries or industries where the U.S. parent would otherwise be barred from a market. These may be markets with more stringent barriers to imports, or where barriers to imports are associated with barriers to majority ownership of affiliates. Minority-owned affiliates may, in such cases, be a price for market entry more often than in the case of majority ownership.

Sweden is the only country outside the United States for which individual firm data are available that permit an analysis similar to those carried out for the United States. A series of Swedish outward direct investment surveys was carried out by the Industriens Utredningsinstitut (IUI), of Stockholm, and analyzed in Swedenborg (1973, 1979, 1982, 1985) and, for the 1986 survey, in Swedenborg, Johansson-Grahn, and Kinnwall (1988). They examined the effects of overseas production by Swedish firms on Swedish parent exports. Because of the small number of Swedish parent firms, it was not possible to run separate equations for individual industries, particularly industries as narrowly defined as in the U.S. studies. However, the Swedish calculations included many firm characteristics that, in effect, incorporated industry characteristics, and also separated companies based on Swedish resource industries.

The Swedish studies included an effort to solve the problem of the possible simultaneity of direct investment production decisions and home-country export decisions by a 2SLS approach in which the first stage estimated the level of production by Swedish affiliates in each host country. The second-stage equation used the estimated production levels from the first stage, among other variables, in the explanation of parent exports to each host country. These equations were applied to each of the survey years and in a pooled time-series–cross-sectional analysis. Swedenborg concluded (1985, 235) that OLS estimations, such as those reported above for the United States, overstated the positive effects of affiliate production on parent exports. Her own estimate, from the 2SLS equations, was that each dollar of Swedish affiliate production added about $0.10 to Swedish parent exports, not very far from the U.S. results mentioned above. From a breakdown of parent exports by type she concluded that only 2 percent of the sales provided by foreign production would be replaced by parent exports if foreign production were abandoned.

A somewhat different analysis was performed by Blomström et al. (1988) for 1978, using the same data source as for Swedenborg's studies but in more aggregated form and with each industry's total manufactured exports from Sweden, rather than only parent exports, as the dependent variable. All the coefficients on affiliate sales were positive and, in fact, larger in a 2SLS analysis than in the OLS equations. There was no evidence in the comparison with Swedenborg's estimates for parent exports that the positive effect on Swedish parent exports came at the expense of exports by other Swedish firms. It seems more likely, although the equations are too different from Swedenborg's to produce a definitive conclusion, that affiliate production encouraged not only parent exports to the affiliates' host countries, but also exports to the same countries by other Swedish firms.

An examination of changes over 1970–78, from the same source of data, showed similar results: the greater the increase in Swedish affiliate production in a country, the greater the growth of exports of manufactures from Sweden to that host country. A single exception was metal manufacturing, where both a high 1970 level of Swedish-controlled production and high growth in that production in 1970–78 were associated with reductions in Swedish exports.

A recent IUI report (Svensson 1993) challenges the earlier findings for Sweden using some of the same data along with the latest, still unpublished, survey for 1990. The report concludes that an increase of $1 in affiliate production for local host-country sale reduces parent exports by $0.14 and that affiliate production for export to third countries reduces parent exports by over $0.40 for each dollar of such affiliate production.

The apparent contradiction of earlier results is attributed by the author to his accounting for the effect of affiliate production for export on parent sales to third countries. However, such effects were included in the analysis of total parent exports by U.S. firms in Lipsey and Weiss (1984) without producing any similar negative effects. The major source of the difference from earlier results seems to be the formulation of the equations, which normalizes across firms by the total worldwide sales of the multinational firm rather than by parent sales, as in Swedenborg's earlier studies. The difference is never pointed out and this normalization is described as a way of eliminating heteroskedasticity. In fact, the result is that what is being tested is the relationship between the share of worldwide sales provided by production carried out in a host country and the share of home-country (parent) exports to that country in the firm's worldwide sales. It is virtually a certainty that these coefficients for host-country production shares will be negative, but those negative coefficients can be interpreted as a negative influence on the absolute value of home-country exports only under an odd implied assumption that is never discussed. The assumption is that in the absence of foreign production the total size of the multinational firm's worldwide sales or production would be the same as with foreign production—if Electrolux did not produce in many countries, it would have the same worldwide sales as it has with foreign production. That assumption would seem to guarantee a negative coefficient for foreign production on home-country exports, but it is not a plausible assumption on which to rest a study.

On the whole, then, it would seem reasonable to conclude that production outside the United States by U.S.-based firms has little effect on exports from the United States by parent firms or by U.S. firms as a whole, and that to the extent there is an effect, it is more likely to be positive than negative. This relationship is probably a characteristic of other countries' multinationals as well. One reason this is true is that foreign production is undertaken to expand or retain a parent firm's foreign markets and parent exports are incidental to these decisions. As foreign affiliates mature, their imports from their parents become marginal to their total activity and fluctuate with exchange rate changes and other developments, but there is no indication that the absolute level of imports from the home country declines over long periods.

1.4 Foreign Production and Home-Country Labor

Aside from the relation of overseas production to exports from the United States, such production could affect the overall demand for labor within the

United States by parent firms, and the demand for labor of different types, even if total production in the United States were not affected. For example, the demand for labor by parent firms might be reduced if more labor-intensive products were allocated to multinationals' foreign operations, while more capital-intensive operations were allocated to U.S. operations. Similarly, the demand for unskilled labor by parents might decline if parts of the production process or products requiring highly skilled labor were allocated to the United States, while processes or products requiring relatively low skills were allocated to overseas affiliates.

The opportunity for multinational firms to engage in such geographical allocation of their production presumably requires that the product be tradable. If a firm's output must be consumed where it is produced, as in many service industries, production will take place where the goods and services are sold and will respond to host-country demand and to host-country costs. There could still be differences among production locations in capital intensity and skill intensity. These might reflect the elasticity of substitution between capital and labor or between labor of different skills if there are significant differences in factor prices, but these should affect the affiliate operations rather than those of the parents. More important, there could still be effects of affiliate operations on parent capital or skill intensity if the needs for certain typically central functions, such as coordination, management, and research and development, were affected by affiliate operations.

In this analysis, the level of home-country (parent) production is taken as given, and the question is whether, within this fixed level of home-country production, the composition of parent production is affected by the parent firm's foreign production activity in such a way as to alter the parent firm's demand for labor and for more-skilled, as compared with less-skilled, labor.

One sign that more labor-intensive activities were being allocated to foreign affiliates or that production methods were being changed in response to differences in factor prices would be a lower capital intensity in affiliate production than in parent production and a lower capital intensity in low-income countries than in high-income countries. The data on net property, plant, and equipment per worker from the latest U.S. outward investment census indicate that in manufacturing as a whole, the physical capital intensity of production in developed countries by all affiliates of manufacturing parents was about 80 percent of that of parents in the United States. The capital intensity of manufacturing affiliates in developing countries was only 42 percent of that in developed countries. In contrast, in a broadly defined services group—including all industries except manufacturing, petroleum, agriculture, mining, and transportation, communication, and public utilities—the physical capital intensity of affiliates was higher than that of their parents in the United States. And for affiliates in developing countries outside of those in manufacturing and petroleum, physical capital intensity was higher than for affiliates in the developed countries (U.S. Department of Commerce 1993, tables II.B8, II.B13, II.G4, II.G11, II.L1, and II.P1). Of course, some of the difference in these aggregate

comparisons may rest on differences in industry composition not related to responses to factor price differences at all. However, it is hard to avoid the impression that manufacturing firms adapt affiliate production to differences in factor prices to a much larger extent than service industry firms do.

A much more thorough investigation of whether multinational firms adapted their factor proportions to relative factor prices (Lipsey, Kravis, and Roldan 1982) concluded that these firms did use more labor-intensive methods of production, as measured by property, plant, and equipment per worker, in low-wage countries. The form that the adaptation took could have been selecting labor-intensive subindustries for production in low-wage countries, selecting labor-intensive production processes for such production, selecting small-scale operations for which only labor-intensive methods of production were available, or operating in a labor-intensive way, whatever technologies were selected. These relationships were visible not only within industries but also within individual firms, and for Swedish as well as American multinationals.

Judging from these aggregate data, manufacturing firms were more responsive to factor price differences in allocating their direct investment activity than were service industry firms. The reason could be simply a higher elasticity of substitution between capital and labor in manufacturing than in services, or it could be that the tradability of manufactured products makes them more suitable for the allocation of, for example, labor-intensive activities to labor-abundant, cheap-labor countries. In the former case, of higher elasticity of substitution in manufacturing, there should not be any effect of overseas production on parent labor intensity. In the latter case, of allocation of activities in response to factor prices, larger overseas operations should produce less employment in the United States relative to sales (lower labor intensity of production).

The predominance of evidence for individual manufacturing firms and their affiliates in six industry groups in the 1982 investment census was that higher overseas production was associated with lower employment at home, given the level of parent production (Kravis and Lipsey 1988). That was the case for all manufacturing firms as a group and within most of the six major industry groups. The only exceptions were that sales by majority-owned affiliates in electrical machinery and by minority-owned affiliates in nonelectrical machinery were positively related to parent employment, for any level of parent production.

Some calculations from the latest outward investment census, for 1989, suggest a similar relationship, as in equation (1):

$$\text{(1)} \qquad \underset{}{\text{PEMP}} = \underset{}{1{,}234} + \underset{(58.1)}{6.14\ \text{PNS}} - \underset{(5.9)}{.77\ \text{ANS}}, \qquad \bar{R}^2 = .867,$$
$$\qquad\qquad\qquad\qquad\quad (5.0)$$

where

PEMP = parent employment;
PNS = parent net sales (sales less imports from affiliates), in million dollars; and
ANS = affiliate net sales (sales less imports from the United States), in million dollars.

Each million dollars of affiliate production (as proxied by affiliate net sales) gave rise to a loss of almost one parent employee, given the level of parent firm production.

If we separate net sales of affiliates into those of manufacturing and of nonmanufacturing affiliates, we find that the negative relationship comes from the manufacturing production; each million dollars of manufacturing affiliate production subtracts about 1.4 workers from parent employment, while each million dollars of nonmanufacturing affiliate production adds 1.2 parent employees:

$$\text{PEMP} = \underset{}{1{,}160} + \underset{(4.7)}{6.16}\,\text{PNS} - \underset{(7.6)}{1.38}\,\text{MANS} + \underset{(2.8)}{1.21}\,\text{NMANS}, \quad \bar{R}^2 = .870; \tag{2}$$

where

MANS = manufacturing affiliate net sales; and
NMANS = nonmanufacturing affiliate net sales.

These equations assume that the impact on parent employment is related to the absolute value of affiliate production: an addition of a million dollars of affiliate production has the same impact on parent employment whether the affiliates are one-tenth the parent's size, in the aggregate, or twice the parent's size.

The same calculations can be performed within the major manufacturing industry groups, reducing the influence of interindustry differences. Across industries, any relation between parent labor intensity and foreign operations is more likely to represent an effect of labor intensity on the tendency to produce abroad than of foreign production on domestic labor intensity.

The parent employment level equations for major industry groups are summarized in table 1.8. Within the major industry groups, the relationships are mixed. In transportation equipment, the group with the largest affiliate sales, the relation is negative; each million dollars of affiliate net sales is associated with parent firms' having five fewer employees.[1] In the next largest industry in

1. There may be an interindustry effect here; the group includes two very different industries, motor vehicles and equipment and other transportation equipment, mainly aircraft. The motor vehicle industry accounts for almost all the foreign affiliate sales, while the other transportation equipment industry accounts for more than half the parent employment.

Table 1.8 **Equations for Parent Employment as a Function of Parent and Foreign Affiliate Production, 1989 (six major industry groups)**

Industry	Constant Term	Coefficients for: Parent Net Sales	Affiliate Net Sales: Total	Affiliate Net Sales: Manufacturing	Affiliate Net Sales: Non-manufacturing	$\bar{R}^2$
Food and kindred products	4,125	4.87	−.58			.453
		(5.7)	(.4)			
	4,125	4.86		−.28	−.18	.443
		(5.7)		(.8)	(.9)	
Chemicals	840	4.93	−.20			.864
		(18.0)	(.6)			
	1,033	4.82		−.67	.81	.867
	(2.5)	(17.5)		(1.6)	(1.3)	
Metals	611	6.04	−.90			.866
	(2.5)	(26.8)	(1.9)			
	629	5.98		−.40	−1.82	.867
	(2.6)	(26.1)		(.7)	(2.1)	
Machinery, except electrical	480	6.47	.77			.968
	(2.4)	(28.2)	(5.8)			
	475	6.54		.83	.52	.968
	(2.4)	(26.9)		(5.7)	(1.6)	
Electrical and electronic machinery	1,642	4.87	3.34			.967
	(5.1)	(30.6)	(4.9)			
	1,618			4.03	−5.33	.970
	(5.4)			(6.1)	(2.6)	
Transportation equipment	−257	9.10	−4.73			.986
	(.3)	(47.2)	(20.2)			
	−250	9.18		−7.53	7.89	.995
	(.4)	(77.5)		(26.5)	(7.1)	

Notes: Parent employment in number of employees. Parent and affiliate sales in million dollars. Numbers in parentheses are *t*-statistics.

terms of affiliate sales, machinery, except electrical, each million dollars of affiliate sales adds one employee to the parent rolls (the story is similar in the other, much smaller, electrical and electronic machinery group). And in the other major investing industry group, chemicals, there is no relation to parent employment.

If we separate the affiliates into manufacturing and sales, we see that the total affiliate sales coefficients are dominated by those for manufacturing affiliates, again positive in the two machinery groups and negative in transportation equipment.

On the whole, these equations for absolute levels of parent employment are inconclusive, with a mixture of positive and negative relations. We would not conclude from these results that there is any clear effect of affiliate production on aggregate parent employment, given the level of parent production.

A different view of the effect of overseas production on parent labor intensity is provided by relating employment per dollar of net parent sales—a measure of labor intensity—to the ratio of overseas (affiliate) to domestic (parent) production, as in equation (3). Virtually none of the variation in parent employment per dollar of output is explained by the following:

$$(3) \qquad \frac{\text{PEMP}}{\text{PNS}} = \underset{(6.3)}{9.45} + \underset{(1.1)}{1.53}\,\frac{\text{ANS}}{\text{PNS}}, \qquad \bar{R}^2 = .000.$$

The statistically insignificant coefficient suggests a positive relationship, with a 1 percentage point increase in the ratio of overseas production to home production associated with a 1.5 percentage point increase in the ratio of parent employment to sales. Such a positive relation might occur if affiliate production gave rise to needs for supervisory, research, or other types of auxiliary employment in headquarters operations. The addition of parent net sales as a variable, on the theory that larger parent firms might be either more efficient or more bureaucratic than smaller ones, did not reveal any effect of parent size.

A distinction between manufacturing and nonmanufacturing affiliates pointed to the former as having no impact on parent labor intensity and the latter as being close to statistical significance at the 5 percent level but still a negligible degree of explanation of the variance in parent employment per dollar of production:

$$(4) \qquad \frac{\text{PEMP}}{\text{PNS}} = \underset{(8.1)}{9.53} - \underset{(1.0)}{.0003\ \text{PNS}} + \underset{(.4)}{.66\ \text{MANS}} + \underset{(1.8)}{6.48\ \text{NMANS}}, \qquad \bar{R}^2 = .001.$$

Within the six major industry groups, the evidence points to a positive impact of foreign affiliate production, and particularly foreign manufacturing affiliate production, on parent employment per dollar of production (table 1.9). The only statistically significant coefficients are in the two machinery groups, and also for manufacturing production in the food industry. Thus, from these calculations, we see no evidence of more capital-intensive activities at home from an allocation of labor-intensive activities to affiliates. More foreign affiliate production, particularly more manufacturing production, seems to lead to more parent employment in the United States relative to U.S. production. Most likely this is supervisory or other headquarters employment, but we have no evidence for this conjecture.

The corresponding equation for parent employment in all service industries combined, from the 1982 data, showed much larger coefficients than for manufacturing, negative for majority-owned affiliate sales and positive for minority-owned affiliate sales. However, the equations for individual service industries

Table 1.9 **Equations for Parent Employment per Dollar of Production as a Function of Parent Size and Ratio of Foreign Affiliate to Parent Production, 1989 (six major industry groups)**

		Coefficients for				
		Ratio between Parent Net Sales and Net Sales of				
Industry	Constant Term	All Affiliates	Manufacturing Affiliates	Nonmanufacturing Affiliates	Parent Net Sales	$\bar{R}^2$
Food and kindred products	6.50	2.04				.024
	(5.6)	(1.6)				
	7.01	2.01			−.165	.018
	(5.2)	(1.6)			(.8)	
	7.29		2.61	−7.87	−.124	.038
	(5.5)		(2.0)	(1.2)	(.6)	
Chemicals	5.92	.37				−.002
	(17.7)	(.9)				
	6.11	.41			−.153	.006
	(17.1)	(.9)			(1.5)	
	6.13		.29	.68	−.155	.000
	(16.9)		(.5)	(.6)	(1.5)	
Metals	8.49	−.059				−.006
	(28.4)	(.2)				
	8.96	−.065			−.745	.048
	(27.5)	(.3)			(3.2)	
	8.98		−.046	−.63	−.739	.043
	(27.0)		(.2)	(.4)	(3.2)	
Machinery, except electrical	8.22	1.84				.093
	(26.8)	(5.2)				
	8.33	1.97			−.285	.109
	(27.1)	(5.5)			(2.4)	
	8.48		2.46	−.09	−.241	.135
	(27.6)		(6.3)	(.1)	(2.0)	
Electrical and electronic machinery	9.11	6.34				.284
	(13.7)	(6.0)				
	9.32	6.28			−.206	.288
	(13.7)	(8.0)			(1.4)	
	10.15		8.06	−9.02	−.207	.421
	(16.1)		(10.5)	(3.5)	(1.5)	
Transportation equipment	9.74	−1.88				−.001
	(16.3)	(1.0)				
	9.71	−.09			−.080	.027
	(16.4)	(.0)			(1.8)	
	9.81		.637	−12.66	−.061	.032
	(16.5)		(.3)	(1.2)	(1.3)	

Notes: Parent employment in number of employees. Parent sales in billion dollars. Affiliate sales in million dollars. Numbers in parentheses are *t*-statistics.

produced mixed results: half the significant coefficients for majority-owned affiliate sales were positive and half negative. For most industries, no effect was visible, and only one coefficient for minority-owned affiliates was statistically significant. Durable goods wholesale trade and insurance were the two service industries in which foreign affiliate sales were positively related to parent employment per dollar of parent sales, and nondurable goods wholesaling and engineering were the two with negative relationships (Kravis and Lipsey 1988).

One problem with interpreting the data for some service industries, particularly those in finance, is that the location of production is hard to define. Part of the sales attributed to a foreign affiliate on the books of the company for tax or related reasons may involve activity actually carried out in the United States. However, banking and insurance activities for host-country customers, in contrast to those for international customers such as U.S. multinationals, are likely to require both host-country employment, without any substitution for domestic U.S. employment, and also some supervisory or service employment in the U.S. parent firm. It is this likely effect, and the impact on multinational firm profits, that is the motivation behind the insistence of the United States on including service industry entry rules in the Uruguay round of GATT negotiations.

A rough estimate can be made of the effect of changes in rules for entry into the insurance industry in various countries. Cross-country regressions of U.S. insurance affiliate sales (premium values) in various countries against income and various country characteristics, including the severity of restrictions on entry by foreign firms, suggested that a shift by all host countries to the most liberal regulation regimes would double the sales (premium values) of life insurance by U.S.-owned affiliates and increase the sales of nonlife insurance by as much as a third. From the equation for the relation of insurance parent employment to affiliate sales in Kravis and Lipsey (1988), it can then be estimated that parent employment in the United States would increase by something in the neighborhood of 10 percent.

Aside from effects on the parent firms' level of employment, the extent of foreign operations might also affect the composition of parent employment in the United States and the demand and wages for different skills. To the extent that parent firms in manufacturing can allocate activities at different skill levels to different locations to serve worldwide markets, we might expect that operations intensive in low-skilled labor would be allocated to foreign affiliates, especially those in countries where low-skilled labor is cheap, and that high-skill functions would tend to be concentrated in the United States or, possibly, in other highly developed countries.

Two types of evidence might shed light on this possibility. One is simply the allocation of activities within U.S. multinationals. Another is the degree to which a larger share of production carried out abroad is associated with a higher level of skill in a firm's U.S. labor force.

The data collected on employment include very little on the characteristics of the parent or affiliate labor forces. One of the few bits of information is the proportion of employees engaged in R&D activities, and another is the average compensation of employees, as a rough indicator of skill levels.

The data on R&D employment emphasize the concentration of R&D activity in parent companies (table 1.10).

The share of parent employment in R&D is more than twice that in affiliates in almost every major industry group. It would be more appropriate to compare parents with their own affiliates, but those data are not published. Thus, many of the affiliates in wholesale trade are subsidiaries of manufacturing parents, and including them in the manufacturing sector would heighten the contrast between parents and affiliates in both manufacturing and wholesale trade. Judging by the data on R&D expenditures, there is a further allocation of R&D activities between affiliates in developed and developing countries, with much higher R&D intensity in the former group (Lipsey, Blomström, and Kravis 1990).

An indication of responses to the price of skilled relative to unskilled labor was provided by data for a cross section of Swedish firms and their affiliates. Although the definition of skilled and unskilled labor was a crude one (salaried vs. wage workers) and only a small portion of the variation in skill composition was explained, there did seem to be a consistent relationship in which more skill-intensive activities were allocated to countries where the price of skilled labor was lower relative to that of unskilled labor.

Within U.S. multinational firms, the average level of compensation per worker, as a crude indicator of average skill levels, can be related to the extent of production in majority-owned affiliates (Kravis and Lipsey 1988). In manufacturing, the association is weak. The $\bar{R}^2$s are low and are significant at the 5 percent level only for total manufacturing and for the food industry. In both cases, the share of assets overseas explained more of parent compensation levels than the share of production. The only coefficients that are statistically significant at the 5 percent level are positive ones for affiliate production shares in the same industries (Kravis and Lipsey 1988, appendix table 5). If parent

Table 1.10 **Employment in R&D as a Share of Total Employment, 1989 (%)**

Industry	Parents[a]	Affiliates[b]
Manufacturing	5.46	2.42
Petroleum and coal products	3.74	.66
Wholesale trade	1.82	1.15
Computer and data processing services	8.94	1.05
Communication and public utilities	2.52	1.01

Source: U.S. Department of Commerce (1993, tables II.P1 and III.G2).

[a]All nonbank parents of nonbank affiliates.

[b]Majority-owned affiliates, by industry of affiliate.

output and sales by minority-owned and majority-owned affiliates in absolute terms are used to explain parent compensation, a little better explanation is reached, but only parent output and minority affiliate output are ever statistically significant, and the coefficients are always positive (Kravis and Lipsey 1988, table 1). Thus the general impression is that if there is any influence of foreign operations it is a tendency toward high skill levels at home.

Among service industries, the share of majority-owned affiliates in production produced significant $\bar{R}^2$s only for wholesale trade in nondurable goods, for all services, and for business services (Kravis and Lipsey 1988, appendix table 5). Adding the other variables produced little improvement in the degree of explanation, but the few significant coefficients for affiliate production were positive.

On the whole, we can say that in both manufacturing and service industries the effect of foreign operations on the average skill levels in parent companies, if any, was to raise them, but the effect was not strong and not universal across industries.

1.5 Foreign and Domestic Investment as Competitors for Funds

One channel by which a decision by a firm to invest in foreign production could affect investment in domestic production is the financial one. The mechanism that would explain such an interdependence or interaction would presumably imply an upward-sloping supply function for the firm's external finance, so that investments in different locations compete for investment funds. It is a channel that would escape the notice of most analyses that take the level of production in each location as given, or as determined only by demand and costs of production in each location.

Studies of this question by Herring and Willett (1973)—and, to some extent, by Severn (1972) and Noorzoy (1980)—found mostly positive relationships over time between domestic and foreign investment. Such relationships, derived mainly from aggregate data, could reflect common fluctuations or trends in demand rather than any interdependence.

A study by Stevens and Lipsey (1992), based on individual firm plant and equipment expenditure data running for 15–20-year periods between the 1950s and the 1970s, attempted to disentangle these effects. Although only seven firms had data complete enough to be analyzed, the results were fairly consistent in suggesting that there was such interdependence. A 1 percent exogenous rise in foreign demand or in a firm's overseas output was estimated to reduce the parent firm's U.S. fixed investment by amounts ranging from 0.3 to 0.8 percent in most of the firms.

This is a tentative finding based on a small number of firms in a period of expanding foreign production by U.S. firms. It would be interesting to test the same model over the period of contracting or stagnant overseas production by U.S. firms and also on larger numbers of firms or on industry aggregates.

In any case, the possibility of this type of competition between foreign and domestic fixed investment is worth further investigation.

1.6 Conclusions

Many of the analyses of the effects of outward direct investment reviewed here implicitly assume that differences among firms and industries in various characteristics can be at least partly explained by differences in the degree to which they operate abroad. These same characteristics are also used to explain the propensity of firms and industries to operate abroad. The explanation of the existence of direct investment and foreign production is centered on the idea that firms possess individual firm-specific assets, such as technologies, or patents, or skills in advertising or marketing, that can be exploited most profitably by producing in many markets. These assets are mobile across international borders but not among firms, and firms cannot realize their value by selling them to other firms or by licensing them to other firms.

The opportunity to exploit these firm-specific assets via direct investment adds to the incentive to acquire them. If R&D intensity and human capital intensity are the strongest explanations of the worldwide trade shares of U.S. multinationals (Kravis and Lipsey 1992), and possibly of their shares in world production as well, a restriction on direct investment would reduce the value of investment in such assets and therefore reduce firms' investment in them. If much of foreign direct investment is defensive, as suggested earlier, it may make investment in firm-specific assets more profitable by extending the length of time over which they can be exploited, a suggestion made many years ago by Vernon (1966).

While firms from different countries tend to possess different comparative advantages, the leading firms in each country tend to internationalize their production. With the long-term decline in costs of international travel and communication, the costs of controlling widespread production must be declining, and firms from most of the countries in the world are increasing the extent to which they produce outside their home countries. With that fact as background, it seems unlikely that the decline in internationalization of American firms' production will go much further and seems more likely that it will be reversed.

The availability of foreign production locations appears to have contributed a great deal to the ability of American multinational firms to retain their market shares in the face of declines in the market share of the United States as a country. The same seems to be true for the trade shares of firms from other countries, and this flexibility applies to softening not only the effects of long-term national declines in export shares and in comparative advantage in individual industries, but also those of short-term events such as large changes in exchange rates.

The frequently expressed fear that American multinationals have been, in some sense, "exporting jobs" by substituting foreign production for American

production has very little empirical support. For one thing, overseas employment and fixed investment have been, for the most part, declining relative to domestic employment and fixed investment for 10 or 15 years. And U.S. firms that produce more abroad than others tend also to export more in general and to the countries where the foreign production takes place. The same relationship is evident for firms based in Sweden, the only other country collecting similar data on multinational parents and affiliates. Overseas production has much more to do with contesting market shares than with finding low-cost production locations, although the latter is also a motivation.

Within multinational firms, the higher the share of overseas operations in the total production of the multinational, the higher the ratio of home employment to home production, more often than not. A possible explanation is that a larger share of foreign production requires a larger number of headquarters employees, such as R&D staff and supervisory personnel, whose contribution to output is not confined to the firm's domestic production. The relationship is not unambiguous, since higher absolute (rather than relative) production abroad is more often associated with lower home employment, given the level of home production, a finding we at one time interpreted as implying an allocation of more capital-intensive parts of total production to the United States and of more labor-intensive parts to affiliates, especially those in developing countries. The interpretation that it is technical activities and management that are allocated to home operations is reinforced by the fact that higher proportions of foreign activity are associated with higher average compensation at home.

On the whole, the evidence suggests that the effect of overseas production on the home-country labor market involves the composition of a firm's home employment rather than the total amount. That change in composition is mainly a shift toward more managerial and technical employment, much like the effects of increasing trade and other aspects of the evolution of the American economy.

References

Blomström, Magnus, Robert E. Lipsey, and Ksenia Kulchycky. 1988. U.S. and Swedish direct investment and exports. In *Trade policy issues and empirical analysis*, ed. Robert E. Baldwin, 259–97. Chicago: University of Chicago Press.

Fiero, Charles E. 1969. Statement by Charles E. Fiero, Director, Office of Foreign Direct Investments, U.S. Department of Commerce, before the Subcommittee on International Exchange and Payments of the Joint Economic Committee, January 15.

Herring, Richard, and Thomas D. Willett. 1973. The relationship between U.S. investment at home and abroad. *Rivista Internazionale di Scienze Economiche e Commerciali* 20:72–80.

Hufbauer, Gary C., and F. M. Adler. 1968. *Overseas manufacturing investment and the*

balance of payments. Tax Policy Research Study no. 1. Washington, D.C.: Department of the Treasury.

Kravis, Irving B., and Robert 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, November.

———. 1992. Sources of competitiveness of the United States and of its multinational firms. *Review of Economics and Statistics* 74, no. 2 (May): 193–201.

Lewis, Cleona. 1938. *America's stake in international investments.* Washington, D.C.: Brookings Institution.

Lipsey, Robert E. 1988. Changing patterns of international investment in and by the United States. In *The United States in the world economy,* ed. Martin Feldstein, 475–545. Chicago: University of Chicago Press.

———. 1993. Foreign direct investment in the United States: Changes over three decades. In *Foreign direct investment,* ed. Kenneth M. Froot, 113–70. Chicago: University of Chicago Press.

———. 1995. The transnationalization of economic activity. Report to the Division on Transnational Corporations and Investment. Geneva: UNCTAD.

Lipsey, Robert E., Magnus Blomström, and Irving B. Kravis. 1990. R&D by multinational firms and host country exports. In *Science and technology: Lessons for development policy,* ed. Robert E. Evenson and Gustav Ranis, 271–300. Boulder and San Francisco: Westview.

Lipsey, Robert E., Irving B. Kravis, and Romualdo A. Roldan. 1982. Do multinational firms adapt factor proportions to relative factor prices? In *Trade and employment in developing countries: Factor supply and substitution,* ed. Anne O. Krueger, 215–55. Chicago: University of Chicago Press.

Lipsey, Robert E., and Merle Yahr Weiss. 1981. Foreign production and exports in manufacturing industries. *Review of Economics and Statistics* 63, no. 4 (November): 488–94.

———. 1984. Foreign production and exports of individual firms. *Review of Economics and Statistics* 66, no. 2 (May): 304–8.

Noorzoy, M. S. 1980. Flows of direct investment and their effects on U.S. domestic investment. *Economic Letters* 5:311–17.

OECD (Organisation for Economic Co-operation and Development). 1993. *International direct investment statistics yearbook: 1993.* Paris: OECD.

Reddaway, W. B., in collaboration with J. O. N. Perkins, S. J. Potter, and C. T. Taylor. 1967. *Effects of U.K. direct investment overseas: An interim report.* Occasional Paper 12, Department of Applied Economics, Cambridge University.

Reddaway, W. B., in collaboration with S. J. Potter and C. T. Taylor. 1968. *Effects of U.K. direct investment overseas: Final report.* Occasional Paper 15, Department of Applied Economics, Cambridge University.

Severn, Alan. 1972. Investment and financial behavior of American direct investors in manufacturing. In *The international mobility and movement of capital,* ed. Fritz Machlup, Walter Salant, and Lorie Tarshis, 367–96. New York: National Bureau of Economic Research.

Southard, Frank A., Jr. 1931. *American industry in Europe.* Boston and New York: Houghton Mifflin.

Stevens, Guy V. G., and Robert E. Lipsey. 1992. Interactions between domestic and foreign investment. *Journal of International Money and Finance* 11, no. 1 (March): 40–62.

Svensson, Roger. 1993. *Production in foreign affiliates: Effects on home country exports and modes of entry.* Stockholm: Industriens Utredningsinstitut.

Swedenborg, Birgitta. 1973. *Den svenska industrins investeringar i utlandet.* Stockholm: Industriens Utredningsinstitut.

———. 1979. *The multinational operations of Swedish firms: An Analysis of determinants and effects.* Stockholm: Industriens Utredningsinstitut.
———. 1982. *Svensk Industri i Utlandet: En Analys av Drivkrafter och Effekter.* Stockholm: Industriens Utredningsinstitut.
———. 1985. Sweden. In *Multinational enterprises, economic structure, and international competitiveness,* ed. John Dunning, 217–48. London: Wiley.
Swedenborg, Birgitta, Goran Johansson-Grahn, and Mats Kinnwall. 1988. *Den Svenska Industrins Utlandsinvesteringar, 1960–1986.* Stockholm: Industriens Utredningsinstitut.
United Nations. 1993. *Yearbook of international trade statistics, 1992.* New York: United Nations.
United Nations. 1994. *Monthly Bulletin of Statistics.* May. New York: United Nations.
U.S. Department of Commerce. Bureau of Economic Analysis. 1985. *U.S. direct investment abroad: 1982 Benchmark Survey data.* Washington, D.C.: Government Printing Office.
———. 1993. *U.S. direct investment abroad: 1989 Benchmark Survey, final results.* Washington, D.C.: Government Printing Office.
U.S. Tariff Commission. 1973. *Implications of multinational firms for world trade and investment and for U.S. trade and labor,* Report to the Senate Committee on Finance (93-1). Washington, D.C., February.
Vernon, Raymond. 1966. International investment and international trade in the product cycle. *Quarterly Journal of Economics* 80 (May): 190–207.
Wilkins, Mira. 1970. *The emergence of multinational enterprise.* Cambridge: Harvard University Press.
———. 1989. *The history of foreign investment in the United States to 1914.* Cambridge: Harvard University Press.

Comment

S. Lael Brainard

Introduction

Bob Lipsey is certainly the person best qualified to synthesize what we know about the relationship between overseas affiliate activity and U.S. domestic activity, since most of what we know comes from his careful analyses of BEA data over the years. In this paper he draws on findings from a multitude of his own papers along with work by a variety of other authors and data from the most recent Bureau of Economic Analysis (BEA) Benchmark Survey of U.S. Direct Investment Abroad to characterize this relationship along a variety of dimensions. His careful perusal leads him to draw several conclusions:

1. The internationalization of production by U.S. firms on aggregate has declined relative to its peak in the 1970s, but this is less true for the manufacturing sector, and untrue for U.S. multinationals. At the same time, the internationalization of production by foreign firms has increased substantially.

S. Lael Brainard is the Mitsubishi Career Development Assistant Professor of Applied Economics at the Sloan School of the Massachusetts Institute of Technology and a faculty research fellow of the National Bureau of Economic Research.

2. Overseas affiliate sales do not appear to substitute for U.S. exports. Indeed, the two are positively correlated in aggregate. On the other hand, they do compete with exports from other countries.

3. Domestic employment by U.S. parents is negatively correlated with sales by overseas manufacturing affiliates and positively with sales by overseas sales affiliates. Further, the R&D intensity of parent employment is positively correlated with overseas affiliate sales. In addition, labor/capital ratios in overseas affiliate production are negatively correlated with wages in the destination market, and are on average higher than that of U.S. parents.

4. There is some evidence of a negative relationship between increases in foreign affiliate sales and fixed investment by the parent at home. I will not say much about this since it will be addressed further in Martin Feldstein's paper (chap. 2 in this volume).

These conclusions come from a careful reading of the data and empirical research over the past 10 years and are carefully and conservatively stated.

Lipsey's research has touched on most of the interesting issues involving outward direct investment and its effect at home. Luckily for researchers such as myself, there is enough ambiguity in some of the results to leave scope for alternative ways of addressing these questions, so we are not compelled simply to wait for additional years of survey data. I will go into greater depth in some of the areas to amplify certain findings and highlight ambiguities, and then suggest areas that warrant additional research.

Exports and Affiliate Sales

The relationship between exports and affiliate sales is interesting and important because it goes to the heart of the question whether increased overseas activity by U.S. firms stimulates or substitutes for activity in the United States.

Most of the research in this area has focused on interesting questions but has estimated them in equations that are tenuously related to economic theory. For instance, many of the regressions use exports as the dependent variable and include affiliate sales as an independent variable (Swedenborg 1979; Blomström, Lipsey, & Kulchycky 1988; Lipsey and Weiss 1981). Yet I have not seen any models which generate this type of reduced-form equation. For instance, neither of the two broad frameworks that have been developed in recent years by trade theorists to analyze multinationals' location decisions would be consistent with such a specification.

Factor proportions models of vertical expansion across borders—the dominant view of multinational enterprises (MNEs) in trade theory—make a complicated set of predictions regarding the relationship between exports and affiliate sales (Helpman 1984; Markusen 1984; Ethier and Horn 1990). When cross-border investment is motivated solely by factor price differentials, multinational activities arise only in a single direction within an industry between economies with strong factor proportions differences. The creation of multinationals may give rise to increased exports of intermediates in the same direction

and of final goods in the reverse direction, in both cases diminishing the share of intraindustry trade. However, the model's implications for the effect of multinational activity on the total volume of trade are ambiguous.

Proximity-concentration models explain horizontal expansion across borders motivated by advantages of proximity to consumers or specialized suppliers at the expense of concentration advantages such as scale economies (Krugman 1983; Horstmann and Markusen 1992; Brainard 1992). These models predict that multinationals arise in industries characterized by high transport costs and trade barriers and low investment barriers and plant scale economies, even between countries with similar factor proportions. Such circumstances give rise to two-way penetration by multinationals. These models predict that affiliate sales substitute for exports of final goods but may generate intraindustry exports of intermediate goods, so again the predictions for the total volume of trade are ambiguous.

Indeed, I know of only one model that posits a causal linkage between affiliate sales and exports, as is implied by the specification. In markets where the local presence of U.S. multinationals enhances the quality reputation of all U.S. firms due to reputational spillovers, increased multinational activity expands demand for both locally produced and imported varieties of U.S. products (Raff 1992).

Of course, it is also possible that both the exports of U.S. parents to their affiliates and the affiliates' sales are counted in the same industry category due to the high level of industry aggregation at which BEA data are available (between 2- and 3-digit SIC) or to the misclassification of manufacturing affiliates as sales affiliates. Some evidence for this is suggested simply by netting out exports to affiliates, which significantly reduces the positive correlation, as shown in table 1C.1.

In any case, both the factor proportions and proximity-concentration models suggest that the positive correlation between affiliate sales and exports is likely to be attributable to determinants that affect both similarly rather than to a causal relationship. And indeed, there is evidence to support this. Grubert and Mutti (1991) find that an instrumental variables approach to estimating exports

Table 1C.1 Correlations

Trade	Affiliate Sales	Net Affiliate Sales
Inward		
Imports	.20	–
Net imports	–	.10
Outward		
Exports	.64	–
Net exports	–	.20

Source: Estimates from Brainard (1993b) using data from U.S. Department of Commerce (1990a, 1990b).

yields negative insignificant coefficients on affiliate sales, controlling for policy variables and income. Unfortunately, however, there are very few if any instruments that are truly independent.

Alternatively, instead of using either affiliate sales or exports as an independent variable and the other as a dependent variable, the proximity-concentration model suggests estimating the extent to which exogenous variables such as trade and investment policies and transport cost differences affect the share of total sales accounted for by affiliate sales as opposed to exports. In research along these lines, I find quite different results, which are shown in table 1C.2 and summarized below (Brainard 1993b):

Factors that raise both exports and affiliate sales:
- Destination market income
- Home market income

Factors that raise affiliate sales relative to exports:
- Transport costs
- Trade barriers and nontariff barriers
- Per capita income similarities
- Sustained depreciation of destination market currency

Factors that reduce affiliate sales relative to exports:
- Plant scale economies
- FDI barriers

Ambiguous factors:
- Average corporate tax rate

An alternative approach is to estimate the levels of affiliate sales and exports netting out exports mediated by affiliates; as is shown in table 1C.2, this yields surprisingly similar results with the exception of transport costs.

Despite disagreement about the specification, this evidence has in common with the papers cited by Lipsey that it provides little support for the factor proportions hypothesis. Indeed, related work (Brainard 1993a) suggests that the same empirical relationships that cast doubt on the importance of factor proportions differences for explaining trade flows hold equally strongly for affiliate sales. The evidence shows that intraindustry affiliate sales (the share of two-way flows within an industry relative to total flows) are increasing in factor proportion similarities, and the total volume of affiliate sales is increasing in relative income similarities. Of course, in some industries and in some countries, factor substitution seems to be the key driver. This is particularly evident in markets where foreign affiliates export a large share of production back to the United States (e.g., the share exceeds 30 percent for Singapore, Taiwan, Hong Kong, and Canada). However, on aggregate it is only 13 percent.

Foreign Affiliate Employment and Domestic Employment

The obvious implication of casting doubt on the factor proportions hypothesis is to cast doubt on the degree to which multinationals substitute between

Table 1C.2 **Determinants of Affiliate Sales**

	Outward Affiliate Sales		Inward Affiliate Sales	
Variable	SUR: Share (1)	OLS: Net Level (2)	SUR: Share (3)	OLS: Net Level (4)
Transport cost	0.2123**	−0.4024**	0.4440**	−0.0856
	(4.81)	(−5.42)	(6.24)	(−0.81)
Tariffs	0.1629**	0.4490**	0.0271	0.4757**
	(3.10)	(5.34)	(0.27)	(3.84)
GDP		0.6710**		0.4898**
		(9.13)		(5.49)
Per capita GDP	0.7602**	0.9343**	0.6335**	0.3949†
	(5.81)	(3.94)	(4.02)	(1.56)
$ Depreciation	−0.2685**	−0.2699*	−0.0548	0.4135**
	(−3.98)	(−2.15)	(−0.50)	(2.75)
Tax rate	0.8868**	0.7913	1.2941**	0.7887
	(2.86)	(1.39)	(3.67)	(1.38)
Trade openness	−0.2735	−0.2552		
	(−0.73)	(−0.35)		
FDI openness	2.0570**	3.2336**		
	(6.64)	(5.61)		
Plant scale	−0.1510**		−0.1862	
	(−4.37)		(−3.13)	
Constant	−6.0239**	−27.1645**	−0.6366	−8.1360**
	(−3.67)	(−7.62)	(−0.33)	(−3.24)
Observations	771	815	513	584
Adjusted R^2	0.2018	0.2226	0.1843	0.1539

Source: Estimates from Brainard (1993b) using data from the 1989 Bureau of Economic Analysis survey.

Note: Col. (1) reports estimates (using seemingly unrelated regression [SUR]) of the log of the share of sales by U.S. affiliates overseas in total U.S. sales to foreign markets (outward affiliate sales plus exports) and col. (2) reports estimates (using OLS) of the log of the level of U.S. affiliate sales in foreign markets net of U.S. exports to the affiliates, where the independent variables are in logs. Similarly, col. (3) reports estimates of the log of the share of sales by foreign affiliates in the U.S. over total foreign sales in the U.S. market, and col. (4) reports estimates of the log of the level of foreign affiliate sales into the U.S. market net of U.S. imports by foreign affiliates. *T*-statistics are in parentheses.

**1 percent significance level.

*5 percent significance level.

†10 percent significance level.

foreign and domestic factors of production. I think the question of how employment overseas affects parent employment at home is a very interesting one.

In Lipsey, Kravis, and Roldan (1982) using data from 1966 and 1970, Lipsey et al. show that the labor intensity of affiliate production exceeds that of parent production and is greatest for affiliates in developing countries. They also show that the labor intensity of production is negatively correlated with the destina-

tion market wage. In both cases, they provide evidence that these factor intensity differentials are attributable to within-industry and possibly within-firm differences rather than to industry selection, suggesting that firms vary their choice of production techniques to exploit factor price differences, or that different activities are undertaken in different locations. This would be consistent with a factor proportions account.

In the current paper, Lipsey examines regressions of parent employment on parent sales and sales by overseas affiliates, using 1989 data. He finds that the relationship between parent employment and affiliate employment is generally negative, and more so for manufacturing affiliates. Here again, however, the regression is a bit problematic since there is likely to be correlation of the errors associated with parent employment and parent sales. Indeed, in similar equations normalizing by the level of parent sales, Lipsey finds that a greater ratio of parent employees to sales is associated with increases in affiliate sales of both manufacturing and nonmanufacturing affiliates, which is inconsistent with a factor proportions account.

There is also substantial interest in determining whether increases in overseas affiliate employment abroad affects industry employment or wages in the United States. Obviously, this is only an interesting issue if there are rigidities in interindustry labor adjustment or industry wage premia apart from compensating differentials. Substantial empirical evidence suggests there are.[1]

In recent research, Slaughter (1993) provides some evidence that suggests that domestic employment and foreign affiliate employment are weakly complementary at a highly aggregated level. Table 1C.3 shows that total U.S. manufacturing employment shrank 10 percent between 1979 and 1989, and that total overseas affiliate employment shrank 14 percent between 1977 and 1989. Southeast Asia is the only region to have experienced substantial growth.

Lipsey's paper also distinguishes the employment effect for R&D employees, and I agree that the heart of the matter may lie in shifts between different types of labor. Unfortunately, the BEA distinguishes production from nonproduction employees only in the benchmark surveys for the affiliates and does not distinguish at all in the parent data. Even so, it is interesting to note that foreign affiliates expanded their nonproduction labor abroad relative to their production labor between 1977 and 1989, a period in which demand for production labor in the manufacturing sector in the United States was stagnant and the relative demand for nonproduction labor grew. Table 1C.3 shows that while employment of production workers shrank 15 percent between 1979 and 1989 in the United States, overseas affiliate production employment shrank 21 percent between 1977 and 1989; it even contracted in Southeast Asia. During the same periods, employment of nonproduction workers grew by 5 percent in the United States while falling slightly overseas overall; in Southeast Asia it grew by 50 percent. These numbers yield little to no support to the claim that

1. See Katz and Summers (1989) for a survey of the literature.

Table 1C.3 **Manufacturing Employment in U.S. and Overseas Affiliates, 1977–89 (thousands)**

Region	Production 1989	Non-production 1989	Total 1989	Production Change 1977–89	Non-production Change 1977–89	Total Change 1977–89	Nonproduction/ Production Ratio 1989
World	1,875	1,369	3,244	−0.21	−0.02	−0.14	0.73
Europe	831	673	1,504	−0.31	−0.10	−0.23	0.81
Canada	271	179	450	−0.24	−0.12	−0.20	0.66
Latin America	453	289	742	0.01	0.09	0.04	0.64
Southeast Asia	197	106	303	−0.03	0.54	0.11	0.54
United States[a]	12,356	5,437	17,793	−0.15	0.04	−0.10	0.44
World/U.S.	0.15	0.25	0.18	0.23	−0.14	0.27	1.66

Sources: 1977 and 1987 BEA benchmark surveys; U.S. Bureau of the Census (1979, 1989).
[a]U.S. data is from 1979 rather than 1977.

expansion by U.S. multinationals overseas was an important cause of reduced demand for production workers at home over the 1980s. Obviously, these numbers are only rough indicators, and more systematic analysis is called for.

Tax

Lipsey's paper focuses on the real effects of overseas production. Most of the other papers in this volume focus on taxation. There is an interesting set of issues at the intersection of the two that are not generally addressed because of the separation between research in international trade theory and public finance: namely, how do tax factors distort the location of real economic activity? Of course, there has been a fair amount of research investigating the effects of taxes on FDI using both state and international data; here I am referring to overseas production rather than investment.

The results in Grubert and Mutti (1991) suggest that U.S. exports and overseas affiliate sales are both decreasing in destination market tax rates. The analysis in Brainard (1993b) of the factors influencing location decisions also included a tax variable, with puzzling results. The ratio of foreign affiliate sales in the United States to imports is increasing in the source market tax rate, as expected. However, it appears that the ratio of U.S. affiliate sales to exports is also increasing in the tax rate in the destination market. This may be due to correlation with other macro-variables, or perhaps to the use of the wrong tax rate. In any case, it warrants further investigation.

Conclusion

The issues that Lipsey raises are important because of the central role of multinationals in cross-border competition. Overseas affiliate sales by U.S.

multinationals are more than double the level of U.S. exports in manufactures, and the ratio exceeds one on the inward side. Moreover, multinationals are major conduits for international trade, mediating as much as half of U.S. manufacturing trade.

These issues are also important because multinationals are a lightning rod for domestic politics. Organized labor has long resisted outward FDI on the grounds that it reduces demand for labor at home. On the inward side, some critics are equally vehement in resisting control of U.S. assets by foreigners.

For both of these reasons, it is important that we develop a better understanding of the actual effects on the U.S. economy of overseas production by U.S. multinationals as well as inward penetration by foreign multinationals. Lipsey's synthesis of the existing empirical literature addresses important questions and interprets the findings in an appropriately cautious and relevant way.

The additional findings I have cited above are consistent with his in suggesting that the majority of overseas activity is not motivated primarily by access to lower factor costs, but rather by market access considerations. This in turn suggests that labor employed by U.S. firms abroad may not substitute for domestic employment in the same industry.

There are many areas with potential for future research. Given the nature of this audience, I will emphasize one. I would encourage more integration of public finance models with trade and investment models so that real and financial factors can be considered simultaneously. Such integration has occurred in the investigation of FDI, but not of overseas production and sales.

References

Blomström, Magnus, Robert Lipsey, and Ksenia Kulchycky. 1988. U.S. and Swedish direct investment and exports. In *Trade policy issues and empirical analysis*, ed. Robert Baldwin, 259–97. Chicago: University of Chicago Press.

Brainard, S. Lael. 1992. A simple theory of multinational corporations and trade with a tradeoff between proximity and concentration. MIT Sloan Working Paper no. 3492-92-EFA, Massachusetts Institute of Technology.

———. 1993a. An empirical assessment of the factor proportions explanation of multinational sales. MIT Sloan Working Paper no. 3624-93-EFA, Massachusetts Institute of Technology.

———. 1993b. An empirical assessment of the proximity-concentration tradeoff between multinational sales and trade. MIT Sloan Working Paper no. 3625-93-EFA, Massachusetts Institute of Technology.

Ethier, Wilfred, and Henrik Horn. 1990. Managerial control of international firms and patterns of direct investment. *Journal of International Economics* 28 (1–2): 25–45.

Grubert, Harry, and John Mutti. 1991. Taxes, tariffs, and transfer pricing in multinational corporate decision making. *Review of Economics and Statistics* 73:285–93.

Helpman, Elhanan. 1984. A simple theory of international trade with multinational corporations. *Journal of Political Economy* 92, no. 3 (June):451–71.

Horstmann, Ignatius, and James Markusen. 1987. Licensing vs. direct investment: A model of internalisation by the multinational enterprise. *Canadian Journal of Economics* 20:464–81.

———. 1992. Endogenous market structures in international trade. *Journal of International Economy* 32:109–29.

Katz, Lawrence F., and Lawrence H. Summers. 1989. Industry rents: Evidence and implications. *Brookings Papers on Economic Activity: Microeconomics* 209–75.

Krugman, Paul. 1983. The "new theories" of international trade and the multinational enterprise. In *The multinational corporation in the 1980s,* ed. D. B. Audretsch and Charles Kindleberger, 57–73. Cambridge: MIT Press.

Lipsey, Robert, Irving Kravis, and Romualdo Roldan. 1982. Do multinational firms adapt factor proportions to relative factor prices? In *Trade and employment in developing countries: Factor supply and substitution,* ed. Anne Krueger, 215–55. Chicago: University of Chicago Press.

Lipsey, Robert, and Merle Yahr Weiss. 1981. Foreign production and exports in manufacturing industries. *Review of Economics and Statistics* 63:488–94.

Markusen, James. 1984. Multinationals, multi-plant economies, and the gains from trade. *Journal of International Economics* 16:205–26.

Raff, Horst. 1992. Foreign direct investment versus exporting when product quality is unknown. Mimeograph, Université Laval.

Slaughter, Matt. 1993. International Trade, multinationals, and American wages. Mimeograph, Massachusetts Institute of Technology.

Swedenborg, Birgitta. 1979. *The multinational operations of Swedish firms.* Stockholm: Industriens Utredningsinstitut.

U.S. Bureau of the Census. 1979, 1989. *Annual survey of manufactures: Statistics for industry groups and industries.* Washington, D.C.: Government Printing Office.

U.S. Department of Commerce. Bureau of Economic Analysis. 1990a. *Foreign direct investment in the United States: Operations of U.S. affiliates, revised 1989 estimates.* Washington, D.C.: Government Printing Office.

———. 1990b. *U.S. direct investment abroad, revised 1989 estimates.* Washington, D.C.: Government Printing Office.

This Page Intentionally Left Blank