NBER WORKING PAPER SERIES

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Working Paper 5385

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
December 1995

This paper was prepared for the conference on "Geography and Ownership as Bases for Economic Accounting" of the NBER Conference on Research in Income and Wealth, Washington, DC, May 19-20, 1995. We are indebted to Qing Zhang and Ewa Wojas for skillful research assistance and to the National Science Foundation, HSFR of Sweden, and a PSC-CUNY grant from the City University of New York for support. This paper is part of NBER's research program in International Trade and Investment. Any opinions expressed are those of the authors and not those of the National Science Foundation, HSFR, the City University of New York, or the National Bureau of Economic Research.

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ABSTRACT

Internationalized production, that is, production by multinational firms outside their home countries has increased over the last two decades, but it was still, in 1990, only about 7 percent of world output. The share was higher, at 15 percent in "industry," including manufacturing, trade, construction, and public utilities, but it was negligible in "services," which are about 60 percent of world output.

Given all the attention that "globalization" has received from scholars, international organizations, and the press, these numbers are a reminder of how large a proportion of economic activity is confined to single geographical locations and home country ownership. Internationalization of production is clearly growing in importance, but the vast majority of production is still carried out by national producers within their own borders.

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Internationalized Production in World Output

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1. Introduction

Internationalized production, that is, the operations of multinational firms outside their home countries, represents a separation between the geographical location of production and the ownership of production. It represents an extension of the activities and influence of residents of a country outside the geographical borders of the country.

Much of the literature on multinationals is based on the idea that they possess firm-specific assets that are immobile among firms, but mobile across geographical boundaries. To the extent that that is the case, the profitability of R & D and the incentive to invest in it or in other activities that contribute to the accumulation of firm-specific assets, depends on the size of the worldwide market for the firm's output rather than on the size of the firm's home-country markets. Moreover, a judgment about the quality of a firm's management or of the management of a country's firms in general would take into account firms' worldwide operations rather than only those in the firms' home countries.

In this paper, we compare the geographical view and the ownership view of production for several countries and try to assess the overall importance of such production. We make the comparisons in two ways, from the home country side and from the host-country side. The home country view compares the production of a country as a geographical unit with the overseas, and in a few cases, the worldwide production of the firms based in that country. The geographical measure reflects the capabilities of the combination of the

immobile factors of production located in the country with home and other firms' mobile factors while the ownership measure reflects the capabilities of the mobile factors controlled by the country's firms, combined with various countries' immobile factors. The host country view compares the production of the country as a geographical unit with that part of production controlled by foreign firms. Two combinations of factors are involved: in the geographical measure, host country immobile factors are combined with host country and foreign firms' mobile factors and, in the ownership measure, host country immobile factors combined with foreign firms' mobile factors.

Although it is not our focus here, the ownership basis could also be used to compare groups of firms, such as Japanese-, U.S.-, and British-based multinationals, or large and small multinationals, or those based in developed countries with those based in developing countries. In each case, the output of the group of firms would reflect their command over geographically mobile assets, although in a world where access to immobile assets, such as natural resources, is not available on a non-discriminatory basis, such assets may contribute to the capabilities of firms based in a country.

A series of previous papers has compared export market shares and the composition of exports of countries with those of firms based in those countries (Lipsey and Kravis, 1985 and 1987; Blomström and Lipsey, 1989a, 1989b, and 1993; Blomström, 1990; Lipsey, Blomström, and Kravis, 1990; and Kravis and Lipsey, 1992). These export market share comparisons have several advantages over other measures. One is that production for export may be more footloose, less subject to host-government manipulation or control, and therefore more revealing about economic factors than shares in host-country markets. The chief advantage of export market shares is that it is relatively

easy to define the denominators of the share ratios. These might be total world exports or developed-country exports, or exports of manufactured goods of particular products. Quite comprehensive trade data are collected and published by the United Nations, using classifications of commodities fairly comparable from one country to another.

On the other hand, export sales account for a minority of production, and a small minority for some countries' affiliates. They are uninformative about competition in services, many of which cannot be exported and must be produced where they are consumed. Even within manufacturing, usually classified as producing tradables, a concentration on export shares gives a high weight to those products that are most tradable and a low weight to less tradable goods. The effects of skills in advertising and marketing that enable American manufacturers of soft drinks and breakfast cereals to enter many markets would probably not be evident in export market shares.

Another problem with exports as a measure is that exports, unlike value added, for example, can be duplicative. The same product can appear as parents' exports of components to an affiliate and in affiliate exports of a finished product. The same type of duplication characterizes the world trade data that are the denominators for export shares.

The obvious candidates for non-duplicative measures are value added, or gross product originating in a country, a sector of the economy, an industry, or a set of firms. The denominators for such share measures are available for almost all countries for aggregates and major industry groups, although the quality of the data declines as one moves to narrower industry classifications. The numerators present worse problems, especially for measures of the shares of groups of firms spanning national borders. Very few

countries report value added for their own multinationals' worldwide operations or for any operations outside home-country borders. However, on the inward side, a number of countries have coded their industrial censuses to distinguish establishments controlled by foreign firms, thus providing foreign firms' shares of geographically defined host-country production, by industry of establishment. The United States has been a late starter on this type of establishment-based inward investment data, the first example being the results of the BEA-Census match for 1987 (U.S. Department of Commerce, 1992b), although the enterprise-based data described in Appendix Table B-1 go back to 1974. On the outward side, there have been several reports on value added by U.S. affiliates, but the first comprehensive estimates covering a substantial period, with industry and country detail, appeared in Mataloni and Goldberg (1994).

While gross output shares are informative about the control of production, they do not measure market shares. A firm or group of firms could have control over a market by supplying it through exports, or through control of downstream activities such as wholesaling or retailing, where the share in production would be much smaller than the share in final sales. Information on market shares is rarely available on any national or world basis for consumption in general, although there are some data for individual industries. It is possible, for example, to learn what portion of world sales of passenger automobiles is accounted for by American companies or Japanese companies around the world. The data on pharmaceutical sales collected by IMS could presumably be used to measure the degree of control of these markets by each company or group of companies. The share of each major producer in sales of transport aircraft is also known. What is not readily available is such

data for all industries and data on the size of markets for groups of products, needed to calculate market shares.

The broadest summary of our conclusions is that the share of internationalized production (i.e. production by multinational firms outside their home countries) in world output was only about 7 per cent of world output in 1990, but growing somewhat over the last two decades. However, there was a great variety of experience among individual countries. Most notable in our home country data was the big decline in the share of U.S. internationalized production. That decline almost offset the increases in internationalized production in other countries. Similarly, our host country data showed a mixed picture for the individual countries, with an increasing importance of foreign owned multinationals' production in some countries and a decreasing importance in others.

The remainder of the paper proceeds as follows. Section 2 examines the internationalization of production from the home country side. It compares the production of four countries, viz. the United States, Japan, Germany, and Sweden, with the internationalized, and in some cases, the worldwide production of firms based in those countries. In Section 3, internationalized production is examined through host country reports on production by foreign owned firms. Host country data are available for seven developed and twelve developing countries. Section 4 estimates the aggregate importance of internationalized production in world output and Section 5 summarizes our findings.

2. Production Viewed From the Home Country Side

The United States

Some hints of the role of U.S.-based multinationals in world output can be derived from the recently published data on the gross product of U.S. multinationals (Mataloni and Goldberg, 1994). Changes in the share of nonbank majority-owned affiliates of U.S. firms in world output outside the United States and in their importance relative to U.S. output are described in Table 1. Nonbank American affiliates in foreign countries accounted for about 3 per cent of output in the world outside the United States at what was probably their peak share, and that share fell by about a third between 1977 and 1993, after rising during the previous decade. The extent of internationalization of U.S.-owned production (the ratio of affiliate production overseas to output in the U.S.) jumped from less than 5 per cent in 1966 to over 8 per cent in 1977 before a long decline that brought the ratio back down to less than 6 per cent in 1993.

Within the United States there was a similar decline in the importance of parent companies in total output. The share of U.S. nonbank parents in U.S. business output outside banking[1] fell from 32 per cent in 1977 to 26 per cent in 1989 and the share in total output, from 25 to 20 per cent (Table 2). However, the decline in the U.S. multinationals' share within the U.S. came later than in the share outside, 1982 being the peak year among the three,[2] and was not quite as sharp as the decline outside the U.S. Thus, the role of U.S. multinational firms in production was declining both at home and abroad,

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[1] Business output excludes output produced in the government and household sectors.

[2] Parent gross output estimates are available only for benchmark years beginning in 1977.

a little more rapidly abroad.

A rough picture of the worldwide role of these firms shows a much larger share in world production for U.S. multinationals (parents and affiliates combined) than in production outside the U.S. for their affiliates alone.

Table 1

Share of U.S. Affiliates[a] in Gross Product of the World Outside the U.S.

	U.S. Affiliate Gross Product		GDP		U.S. Affiliate Gross Product as Per Cent of	
	Total	1970 Sample[b]	U.S.[d]	World GDP Excluding U.S.[d]	U.S. GDP	GDP Outside U.S.
	($ million)			($ billion)		
1966	36,752	25,838	752.3	1,375.7	4.89	2.67
1970	(54,720)[c]	38,470	795.4	2,226.8	6.88	2.46
1977	161,136		1,975.4	5,150.5	8.16	3.13
1982	223,717		3,152.5	7,977.7	7.10	2.80
1989	319,994		5,204.5	13,868.4	6.15	2.31
1990	356,033		5,489.6	15,530.9	6.49	2.29
1991	356,069		5,656.4	16,193.6	6.29	2.20
1992	361,524		5,937.3	17,272.3	6.09	2.11
1993	357,972		6,259.9	17,318.1	5.72	2.07

[a]Nonbank majority-owned foreign affiliates of nonbank parents

[b]Data for 298 firms sampled in 1970 survey

[c]Estimated by assuming 1970 sample firms accounted for the same share of affiliate gross product in 1970 as in 1966.

[d]World Tables for 1977 on, extrapolated back to 1966 by UN estimates.

Source: Howenstine (1977), Table 1, Mataloni and Goldberg (1994), Table 6, Mataloni (1995), Table 6, United Nations (1993), and World Bank (1995).

Table 2

Gross Product of Nonbank Parents and Foreign Affiliates
of U.S. Firms, 1977, 1982, and 1989
Value and Share in Nominal U.S. and World GDP

	Gross Product		GDP			U.S. Parent Share (%)		U.S. MNC Share (%)
	Parents	Parents and Affiliates	U.S. Nonbank Business[a]	U.S.	World	U.S. Nonbank Business	U.S.	World
	($ U.S. Million)		($ U.S. Billion)					
1977	490,529	651,665	1,520.3	1,975.4	7,125.8	32.3	24.8	9.15
1982	796,017	1,019,734	2,412.0	3,152.5	11,130.2	33.0	25.3	9.16
1989	1,044,884	1,364,878	4,028.8	5,204.5	19,072.9	25.9	20.1	7.16

[a]Excluding banks, government and government enterprises, private households, imputed rental income on housing, rental income of persons, business transfer payments, subsidies, and the statistical discrepancy.

Source: Mataloni and Goldberg (1994), Tables 1 and 3, and World Bank (1995)

Their share was much greater in U.S. production than in foreign production and U.S. production was still, in 1989, over a quarter of world output.

The trend in the share of the United States as a geographical area in world output is shown, for a somewhat longer period, in Table 3. The U.S. share in world output declined substantially from 1960 and 1966 to 1970, but during the period for which we can compare the U.S. as a country with U.S. firms, starting in 1977, there was virtually no further change in the U.S. role. Thus, this history includes two very different periods for the U.S. and for U.S. firms. From the first half of the 1960s to the mid-1970s, the U.S. as a geographical entity had a declining share of world output, while U.S. firms' production outside the U.S. had a rising share of world output and a large rise relative to domestic U.S. output. After the mid-1970s the United

States as a country held on to a quite steady share of world production, while U.S. multinationals' shares of world output were falling, U.S. affiliate output was declining relative to geographical U.S. output and their own parents' domestic output, and the parents' shares of domestic U.S. output were falling.

One reason why the share of U.S. multinationals in production outside the United States is so low is that much of the world's production takes place in industries in which multinationals do not operate, such as government and households, or from which foreign firms are often barred or limited, such as transportation, communication, public utilities, and certain services. Even within the private business sector in the United States, the role of U.S. parents varies greatly across industries, as can be seen in the 1989 parent

Table 3

U.S. GDP as Per Cent of World GDP

	Nominal[a]	In 1985 World Prices
1960	36.5	26.9
1966	35.4	26.7
1970	26.3	24.0
1977	27.7	22.2
1982	28.3	20.6
1985	32.6	21.1
1989	27.3	20.7
1990	26.1	20.4
1991	25.9	19.8
1992	25.6	19.8
1993	26.5	

[a] Converted to $US by current exchange rates.

Sources: World Bank (1995) and Penn World Tables (5.6).

shares of business GNP (excluding production in the banking, government, and household sectors):

U.S. Parent Share of U.S. Business GDP, 1989

	Per cent
All Industries	26
Petroleum extraction and refining	88
Manufacturing[a]	61
Services	6
All other[b]	16

[a]Excluding petroleum and coal product manufacturing

[b]Including agriculture, mining, except petroleum, construction, wholesale and retail trade, transportation and public utilities, and finance

Source: Mataloni and Goldberg (1994), Table 3

The multinationals' home, or parent, operations account for a majority of U.S. production in the petroleum and manufacturing sectors, but for only a small part of production in the rest of the economy.

For the internationalized production of U.S. firms (production by affiliates in foreign countries) we can make comparisons to world totals by industry only for "industry" as contrasted with "services," the latter including agriculture and finance, and the former including mining, manufacturing, transportation, communication, and other public utilities, construction, and wholesale and retail trade. This crude industrial origin breakdown is shown in Table 4. The share of U.S. affiliates in service output outside the United States was negligible, but stable, while the share in this very broadly defined "industry" category declined by almost 20 per cent.

Table 4

Gross Product of Nonbank Majority-Owned Foreign Affiliates
of U.S. Firms and Shares in "Industry" and "Service" Output,
Outside the U.S., 1977, 1982, and 1989
(Unit: Millions of $US and Per Cent)

	U.S. Affiliate Gross Product		GDP Originating Outside the U.S.		U.S. Affiliate Share in Non-US GDP	
	Industry[a]	Services[b]	Industry[a]	Services[b]	Industry[a]	Services[b]
1977	155,259	5,877	1,924,662	3,744,095	8.07	0.16
1982	214,528	9,189	2,798,156	5,858,840	7.67	0.16
1989	302,045	17,948	4,527,113	10,648,247	6.67	0.17

[a]Mining, Manufacturing, Transportation, communication, and public utilities, Construction, and Wholesale and retail trade

[b]Agriculture, Finance (except banking), insurance and real estate, and Other services

Source: Mataloni and Goldberg (1994), Table 8, and United Nations (1993)

Japan

The next largest home country for which some production-related indicators are available is Japan. However, the Ministry of International Trade and Industry's (MITI's) surveys of multinational firms, from which these indicators are taken, have coverage rates that are low, vary over time, and differ from variable to variable even within the same year. Three indicators, sales, production (a concept similar to sales in that it includes intermediate expenditures), and intermediate expenditures are available, and it is possible to estimate value added as the difference between sales or production and intermediate expenditures. Here value added is estimated as the difference between sales and intermediate expenditures because production samples are relatively small.[3]

There are pronounced fluctuations in reported value added estimates. Because a large portion of the fluctuations in unadjusted series is caused by changes in survey coverage, a rough attempt has been made here to adjust the data for changes in coverage. The adjustments are detailed in Appendix A and made in two steps: (1) adjusting sales numbers to account for changing coverage rates over time and (2) constraining value added-sales ratios to a narrower band of variation as suggested by other data sources, to account for the fact that coverage rates were lower for intermediate expenditures than for sales.[4] The resulting adjusted estimates reveal more stable growth in value

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[3]For parents, ratios of production samples to sales samples were 88 per cent in 1983, 49 per cent in 1986, and 62 per cent in 1992, with corresponding ratios for affiliates at 37 per cent, 19 per cent, and 27 per cent, respectively (Japan, Ministry of International Trade and Industry, various years a, various years b).

[4]These other sources are the corporation statistics used to estimate corporate value added in Japan (Appendix Table A-5), U.S. estimates of value added-sales ratios for Japanese affiliates in the United States (Appendix

added of both parents and affiliates (Table 5a). Accordingly, multinationals' shares of Japan's corporate value are also much more stable if the adjusted figures are used. However, after adjustment, the downward trend in parents' shares of all industries is also more pronounced, from 30-33 per cent in 1980, 1983, and 1986, to 24-25 per cent in 1988-1991, and 21 per cent in 1992. Declines are observed in both manufacturing and trade. In contrast, ratios of affiliates' value added to Japan's corporate value added were remarkably stable at 6 per cent in most years. In manufacturing, these ratios rose markedly in 1990-1992 compared to previous years. For trade affiliates, ratios of affiliate value added to Japan's corporate value showed a downward trend from 12-14 per cent in 1980, 1983, and 1986 to 7-10 per cent in 1986-1992.

Multinationals' shares of Japanese GDP are smaller than shares of corporate value added, but the two series display a similar trend (Table 5b), with higher shares in 1980-1986 than thereafter. While Japanese multinationals' shares of Japanese GDP have tended to fall in recent years, Japan's shares of world GDP continued to increase through 1988 and have remained relatively stable in most years thereafter. As a result, Japanese multinationals' shares of world GDP rose from 2.6 per cent in 1980 to 4.1 per cent in 1986, and fluctuated in the 3.6-4.1 per cent range in 1990-1992. There was a rather continuous rise in shares of affiliates in world GDP outside of Japan, from 0.45 per cent in 1980 to 0.80 per cent in 1986, and to 0.92-0.95 per cent in 1991-1992. These data suggest that Japanese multinationals' shares of world production rose much more rapidly in 1980-1986 than in 1986-1992, in marked contrast to the pattern suggested by data on

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Table A-2), and recently initiated business structure surveys.

Table 5a

Japanese Multinationals' Value Added and
Ratios to Corporate Value Added in Japan
(Unit: Value Added in US $ Millions, Ratios in Per Cent)

Fiscal Year[a]	Parents			Affiliates		
	All industries	Manufacturing	Trade	All industries	Manufacturing	Trade
ADJUSTED VALUE ADDED[b]						
1980	241,693	192,607	24,809	45,450	13,516	26,341
1983	293,608	225,400	29,433	57,547	14,187	34,264
1986	495,035	381,200	46,151	99,618	35,262	57,189
1987	NA	NA	NA	88,627	34,561	45,457
1988	542,116	438,504	45,432	95,734	43,791	44,018
1989	473,534	346,479	47,286	119,497	50,267	56,368
1990	601,583	451,925	56,059	151,879	68,886	68,889
1991	716,941	485,841	95,740	176,302	79,554	84,530
1992	661,076	537,301	56,542	180,918	88,760	82,786
RATIOS OF ADJUSTED VALUE ADDED TO CORPORATE VALUE ADDED IN JAPAN						
1980	31.11	58.43	11.02	5.85	4.10	11.70
1983	32.80	61.40	11.67	6.43	3.86	13.58
1986	29.53	60.54	9.53	5.94	5.60	11.81
1987	NA	NA	NA	4.09	4.21	7.23
1988	23.92	51.56	7.10	4.22	5.15	6.88
1989	23.70	44.64	8.93	5.98	6.48	10.65
1990	24.06	48.37	8.16	6.07	7.37	10.03
1991	24.96	47.15	11.85	6.14	7.72	10.46
1992	21.27	50.52	6.35	5.82	8.35	9.29

[a]Fiscal years ending 31 March of the following calendar year.

[b]See Appendix A for an explanation of how adjusted estimates are calculated.

Source: Appendix Tables A-3, A-4, and A-5.

Table 5b

Japanese Multinationals' Shares of World GDP, World GDP Excluding Japan, and Japanese GDP[a]
(Unit: Per Cent)

Year	Parents & Affiliates Relative to World GDP	Affiliates Relative to World GDP Excluding Japan	Parents & Affiliates Relative to Japan's GDP	Parents & Affiliates Relative to Corporate Japan	ADDENDUM Japan's GDP Relative to World GDP
MULTINATIONALS' SHARES BASED ON ADJUSTED VALUE ADDED					
1980	2.58	0.45	27.11	36.97	9.53
1983	3.04	0.55	29.60	39.23	10.26
1986	4.10	0.80	29.95	35.48	13.68
1987	NA	0.64	NA	NA	14.72
1988	3.50	0.62	22.01	28.14	15.88
1989	3.11	0.74	20.65	29.68	15.05
1990	3.56	0.83	25.70	30.14	13.87
1991	4.06	0.95	26.69	31.10	15.22
1992	3.61	0.92	22.94	27.09	15.73

[a]World GDP and Japanese GDP as estimated by the World Bank.

Source: Table 5a and World Bank (1995) and earlier issues.

stocks of foreign direct investment.[5] These divergent trends may indicate that adjustment for the fall-off in the coverage rates of the MITI surveys in recent years is not sufficient or that the adjustment in 1986 (a year of particular poor coverage) was too large. On the other hand, it also may reflect a loose correlation between changes in FDI stocks and changes in production of Japanese multinationals.

Germany

For other home countries we have no information on affiliate production, and only for a few countries do we have data even on affiliate sales. German affiliate sales approximately doubled relative to German GDP and world GDP outside Germany, eventually reaching over 30 per cent of German GDP and about 2 per cent of world GDP outside Germany (Table 6). However, sales are substantially larger than production. If the difference between sales and production is as large for Germany as for the United States, German firms' internationalized output may have reached over 12 per cent of German home output, up from 6 per cent, and the German affiliate share of world production outside Germany might have risen from about 0.4 per cent to about 0.8 per cent.

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[5]Measured on a balance of payments basis, stocks rose 21 per cent annually in 1980-1986, but 27 per cent annually in 1986-1992 (Japan, Bank of Japan, various years). The corresponding growth rates of value added were 13 per cent and 5 per cent, respectively, for parents and 14 per cent and 10 per cent, respectively, for affiliates (Table 5a).

Table 6

Sales of German Firms' Foreign Affiliates
Relative to World GDP Outside Germany
($ U.S. Billion)

		GDP		Sales of German Affiliates Relative to	
	Sales	Germany	World Excl. Germany	Germany	World GDP Excl. Germany
1976	68.71	445	5,908	15.4	1.16
1977	81.56	515	6,611	15.8	1.23
1978	110.33	639	7,837	17.3	1.41
1979	150.20	757	9,067	19.8	1.66
1980	178.96	810	10,020	22.1	1.79
1981	177.21	679	10,575	26.1	1.68
1982	172.83	654	10,476	26.4	1.65
1983	170.80	653	10,735	26.2	1.59
1984	183.74	615	11,280	29.9	1.63
1985	191.58	619	11,715	30.9	1.64
1986	236.93	887	13,433	26.7	1.76
1987	290.42	1,107	15,065	26.2	1.93
1988	348.94	1,193	16,966	29.2	2.06
1989	372.18	1,183	17,890	31.5	2.08
1990		1,502	19,519		
1991		1,720	20,130		
1992		1,969	21,240		
1993		1,909	21,669		

Source: Germany, Deutsche Bundesbank (1991) and earlier issues, Lipsey (1989), and World Bank (1980), (1993), and (1995).

Sweden

For Sweden we have data on sales for both parents and foreign affiliates, shown in Table 7. There is no clear trend in the world production share of Swedish MNCs as a whole during the period for which we have data, but a large rise from 1965 to 1970 and then a decline. There was a very strong upward trend in the internationalized production share (the production share of Swedish affiliates), especially in the last few years. The Swedish geographical output share shows little trend over the whole period and seems to have held up somewhat better than the Swedish MNC share, at least up to 1978.

Table 7

Sales of Swedish Parent Firms and Their Foreign Affiliates
Relative to World GDP

	Sales					Per Cent of					
	Swedish Parents		Swedish Affiliates			World GDP			Swedish GDP		
	All Parents	Parents with Foreign Production Affiliates ($ Million)	Sales Minus Imports Net Sales	Nominal GDP ($ Billion) World	Sweden	Sales of Swedish MNCs	Swedish Affiliate Net Sales	Swedish GDP	Affiliate Net Sales	Parent Sales	Swedish MNC Sales Affiliate Net Sales
1965	(10,817)[a]	7,997	1,426	1,966	21.9	.48	.07	1.12	6.5	36.5	15.1
1970	24,102	17,818	2,598	3,022	25.8	.68	.09	.85	10.0	69.1	12.7
1974	(30,817)[b]	24,736	5,849	5,286	58.3	.58	.11	1.10	10.0	42.4	19.1
1978	46,959	39,220	10,535	8,475	92.3	.59	.12	1.09	11.4	42.5	21.2
1986			22,097	14,319	133.0		.15	.93	16.6		
1990			45,370	21,020	229.8		.22	1.09	19.7		

[a]Estimated by assuming same ratio to sales of parents with only foreign production affiliates as in 1970.

[b]Estimated by assuming same ratio to sales of parents with only foreign production affiliates as in average of 1970 and 1978.

Source: Swedenborg, Johansson-Grahn, and Kinwall (1988), Tables 2.4, C.4A, and C.4B, Andersson, Fredriksson, and Svensson (forthcoming), and World Bank (1980), (1993), and (1995).

The four countries for which we have some home-country data on internationalized production present quite different histories. Internationalized production by U.S. MNCs, the pioneers of internationalization, reached its peak relative to aggregate output outside the United States in the middle or late 1970s and now accounts for a smaller share than in 1966. It has also declined substantially relative to U.S. GDP since 1977. U.S. MNCs and U.S. MNC parents have declined in importance relative to world output and U.S. output, respectively, after a peak in the early 1980s. Within U.S. MNCs, affiliate output declined relative to parent output after 1977, but regained most of their share during the 1980s, with little overall change over a dozen years.

Internationalized production by Japanese MNCs, as far as can be gathered from the incomplete data available, has doubled relative to total world output outside Japan, but remains much smaller than that of American firms. Relative to all Japanese corporate output, internationalized production has changed little, but internationalized production in manufacturing has roughly doubled in comparison to Japanese manufacturing output. Japanese MNC parents have lost ground within Japan, in manufacturing and in all industries, and Japanese MNCs have declined in importance relative to total corporate output and total Japanese GDP.

For Germany and Sweden we have information only on sales from internationalized production. If output followed the trend of sales, German internationalized production has risen substantially since the mid-1970s. Swedish internationalized production, to judge by sales, has grown the fastest, tripling since 1965 and almost doubling since 1978 relative to world output.

Internationalized production has apparently increased in three of the four countries, relative to world output, but the decline for U.S. firms, because of the much larger initial importance of U.S. internationalized production, pretty well offset the increases in the other countries over the last decade and a half.

3. Production Viewed From the Host-Country Side

A different view of the trends reported in the home country data would be to examine host-country reports on production owned by foreign firms. The great advantage of the host-country view is that the data for production by foreign-owned firms is usually from the same sources as, and comparable to, data for production in general and production by domestically-owned firms. Thus, we should be able to calculate production shares, with numerators and denominators that are comparable, for at least some countries.

Host-country data do present additional adding-up problems, since they are usually calculated in each host-country's own currency. A possible solution to that problem is to calculate foreign-owned production shares in each country's home currency and then to apply these shares to measures of real GDP in each country such as those calculated by Summers and Heston (1991). That is not a perfect solution, because the purchasing power parities used in constructing the Summers-Heston GDP data are not necessarily those that would be appropriate for converting individual industry production data, but it may be the best solution available.

One advantage of home-country data is that outward direct investment is more concentrated among countries than is inward investment, so that we could cover roughly half of internationalized production with data from only three

countries. The drawback is that no other countries collect such data on their companies' activities overseas. While inward direct investment is much less concentrated, many more countries collect data on the activities of inward direct investors.

We can stretch the host country data somewhat by combining it with home country data on activities in particular host countries, especially in cases where the United States is the dominant investor in a host country. The disadvantage of that procedure is that we lose the comparability between foreign-owned and domestically-owned operations in a host country, and we therefore use this combination only sparingly here.

There are several comparisons we can make between foreign owned and total production in a country. One is to compare foreign-owned production with GDP, as a measure of the importance of such production in a country's total output. Since GDP is the only denominator for which we have an appropriate translation to a common currency for aggregation across countries, we calculate these ratios of foreign-owned to total production for all countries.

Many sectors are essentially closed to production by foreign firms, including various types of governmental and household production. One can therefore also think of measuring foreign shares in "eligible" sectors, such as the business or corporate sector of each economy.

Since the importance of internationalized production varies greatly among sectors of the economy, it is also of interest to examine shares in individual sectors. We try, where possible, to calculate shares in the goods or "industry" sectors or in manufacturing. In most countries, manufacturing is the only sector for which data are available. That, and the petroleum

sector, are probably the most internationalized of all.

3.1 Developed Host Countries

The United States

The trend within the United States has been, since 1974, that the share of production accounted for by foreign-owned firms has increased steadily, almost tripling over that period. By 1992, the foreign-owned firms' share had reached almost 4 1/2 per cent of total output and almost 6 per cent of output in the nonbank business sector, excluding not only banks, but also government and household production, not open to foreign firms (Table 8)

The foreign presence has always been much larger in petroleum and manufacturing than in other sectors of the U.S. economy. From less than 5 per cent in 1974, the foreign-owned share grew to something in the neighborhood of 14 per cent in 1993, a little faster growth than in other sectors. Foreign-owned manufacturing by itself tripled in importance relative to U.S. total and nonbank business output, reaching 3 per cent of the latter in 1993.

The growth in the foreign firms' share in U.S. output has taken place during a period after the rapid growth in the U.S. multinationals' share of world output described earlier. Thus, while U.S. domestic output was growing relative to U.S. multinationals' worldwide output, foreign firms' U.S. output was growing faster than that of U.S.-owned firms.

The United Kingdom

The United Kingdom is a major recipient of direct investment and is one of the countries that has distinguished foreign-owned manufacturing enterprises in its Census of Production for a fairly long period. The share of foreign-owned firms in U.K. manufacturing production has hovered in the

Table 8

Foreign Firms' Share in U.S. Output, 1974-1993

	Per Cent of				Per Cent of U.S. Manufacturing GDP			
	Total GDP		Nonbank Business GDP		Including petroleum & coal prod.			Excl. petrol. and coal prod.
					Foreign-Owned U.S. Manufacturing			
	Total Foreign-Owned Output	Foreign-Owned Mfg. Output	Total Foreign-Owned Output	Foreign-Owned Mfg. Output	Incl. petrol. & coal prod.	Excl. petrol. & coal prod.	Plus all petroleum	Excl. petrol. & coal prod.
1974	1.64	.76	2.17	1.01		3.13	4.79	
1977	1.78	.84	2.27	1.07	4.97	3.57	5.21	3.68
1978	1.92	.91	2.48	1.18		3.91	5.68	4.02
1979	2.23	1.06	2.89	1.38		4.59	6.65	4.81
1980	2.62	1.14	3.43	1.50		5.27	8.15	5.49
1981	3.26	1.55	4.18	1.99	10.28	7.22	10.48	7.54
1982	3.29	1.50	4.29	1.96		7.29	10.45	7.59
1983	3.27	1.54	4.33	2.04		7.57	10.44	7.86
1984	3.41	1.63	4.38	2.09		7.94	10.62	8.16
1985	3.34	1.55	4.31	2.00		7.85	10.51	8.07
1986	3.33	1.54	4.34	2.01		7.93	10.00	8.19
1987	3.48	1.66	4.54	2.17	10.49	8.60	10.73	8.86
1988	3.89	1.85	5.04	2.41	11.44	9.46	11.69	9.87
1989	4.25	2.08	5.56	2.72	12.98	10.87	13.28	11.30
1990	4.31	2.16	5.67	2.84	13.82	11.70	14.30	12.17
1991	4.50	2.20	5.96	2.91	14.17	12.20	14.59	12.74
1992	4.42	2.23	5.90	2.97	14.40	12.62	15.02	13.15
1993	4.58	2.26	6.10	3.02	14.54	12.84	15.18	13.41

Source: Appendix Table B-1

neighborhood of 20 per cent since 1977, with the latest years' shares a little above the earliest ones, but without a clear trend (Table 9). The lowest foreign share, 17 to 18 per cent, was reached in 1986 and there was a substantial rise after that to 22 to 23 per cent in 1990 and 1991.

Since manufacturing has been declining relative to other industries in the U.K., the stable foreign share in manufacturing meant a decline in the share of foreign-owned manufacturing in the economy as a whole. That share fell by about a third from 1979 to 1986 and then recovered somewhat, but never reached more than 80 per cent of the share in 1977 and 1979. We do not have data to tell whether information for all industries would show that same stability as in manufacturing or the declining share.

Canada

Canada, another important host country for multinationals, also provides long series of information on the operation of foreign firms. From the 1960s through the mid-1980s, foreign firms accounted for about a third of total sales in all industries and all non-financial industries, and more than half in manufacturing (see Table 10). The peak shares seem to have been reached around 1970, but there was little change until the late 1980s. The share of foreign owned firms had dropped substantially by 1988, but it then increased slightly. Taken together, these figures suggest a declining importance of foreign owned firms' sales in Canada since the 1960s and 1970s.

The comparison of our crudely estimated value added in foreign-owned operations with total Canadian GDP gives a somewhat different picture. The share in total national output of foreign-owned production, in manufacturing, and in all industries, reached a peak in the mid-1970s. Then it declined, to

Table 9

United Kingdom: Share of Foreign-Owned Manufacturing Enterprises in Manufacturing and Total Output, 1977 - 1991

	Share (Per Cent) of Foreign-Owned Enterprises in		
	Manufacturing		
	Net Output	Gross Value Added at Factor Cost	Aggregate GDP[a]
1977	19.87	19.76	6.62
1979	21.29	21.41	6.79
1981	18.55	18.30	5.15
1983	18.97	18.61	5.05
1984	20.30	20.15	5.27
1985	18.84	18.67	4.85
1986	17.71	17.31	4.53
1987	19.05	18.79	4.81
1988	18.52	18.23	4.76
1989	21.48	21.06	5.53
1990	22.39	21.77	5.67
1991	22.54	21.71	5.32

[a]Share of net output of foreign-owned manufacturing firms.

Source: Appendix Table B-2.

Table 10

Canada: Share of Foreign-owned Firms in Sales or Operating Revenue and of Value Added in Foreign-Owned Firms in Total GDP, 1963-1992

	Shares of Foreign-Owned Firms in Sales or Operating Revenue			
			Manufacturing	
	All Industries	Non-Financial Industries	Enterprise Basis	Establishment Basis
1967	32.3	33.6	53.1	
1968	33.5	35.0	54.5	
1969	33.9	35.7	55.7	
1970	33.6	35.4	55.0	52.0
1972	33.2	35.4	56.1	51.7
1974	33.1	35.4	56.3	
1978	NA	33.5	NA	
1983	27.5	29.9	50.4	
1988	25.5	26.9	48.1	
1990	26.8	26.5	NA	
1992	27.6	28.3	NA	
1993	28.1	28.5	NA	

	Estimated Shares of Foreign-Owned Firms' Value Added in Total GDP: Foreign-Owned Firms in			
			Manufacturing[b]	
	All Industries[a]	Non-Financial Industries[a]	Enterprise Basis	Establishment Basis
1967	16.5	16.1	14.1	
1968	17.0	16.7	14.3	
1969	16.6	16.3	14.1	
1970	16.3	15.9	13.2	10.5
1972	16.6	16.3	13.6	10.8[c]
1974	18.0	17.6	14.5	
1978	NA	17.1	NA	
1983	16.2	14.7	11.5	
1988	15.6	13.9	11.1	
1990	14.8	13.2	NA	
1992	14.3	12.8	NA	
1993	15.1	13.5	NA	

Notes to Table 10

[a]Sales or operating revenue multiplied by .3, using approximation to ratios for U.S. majority-owned affiliates in Canada, which were as follows (%), from Mataloni and Goldberg (1994):

1997	32.8
1982	31.5
1989	30.1
1991	26.6

[b]Sales or operating revenue multiplied by .4, using approximation to 1972 Canadian ratios (%) for foreign-owned manufacturing establishments, as follows (Appendix Table B-3):

Foreign-Owned Establishments, All Activities	38.6
Foreign-Owned Establishments, Manufacturing Activity	41.7

[c]The actual ratio for 1972 is 11.3

Source: Appendix Table B-3.

the point that over the whole period from 1964 to 1992 there was some decline in the foreign-owned share of total Canadian output.

Norway

By all the available measures, the foreign-owned share in Norway's output has declined over the last fifteen years after an earlier increase, and particularly during the 1980s (Table 11). Within manufacturing there was a rise in the foreign share in 1973 and another large one in 1979, followed by a sharp drop, by over a half, to the low point in 1985. Since then there has not been any strong trend.

The dates of the major changes in the foreign shares, coinciding with large increases in oil prices, suggest that relative price changes may have played a major role in these fluctuations. That could be the case if there was substantial foreign ownership in petroleum refining and large changes in refining margins or margins in other downstream petroleum-related output, since these would enter manufacturing value added.

Whatever the source of these fluctuations, they seem to have been associated also with corresponding fluctuations in the importance of the manufacturing sector in aggregate national output. That relationship is shown by the fact that the fluctuations in the foreign share of GDP were wider than those in the share of manufacturing output. For example, when the foreign share of manufacturing output rose by a quarter from 1972 to 1974, the foreign share in GDP rose by a third. And when the foreign share in manufacturing fell by 54 per cent from 1979 to 1986, the share in GDP fell by 65 per cent.

The trend in foreign ownership of Norwegian production seems quite clear. Foreign-owned production has been declining in importance both within manufacturing and for the economy as a whole, ever since the peak share

Table 11

Norway: Share of Foreign-Owned Manufacturing Establishments in Manufacturing and Total Output, 1972-1990

	Manufacturing Value Added at Factor Prices: Foreign-Owned as Per Cent of		Manufacturing Value Added at Purchasers' Prices: Foreign-Owned as Per Cent of Aggregate GDP[a]
	Total Mfg. Value Added at Factor Prices (1)	Aggregate GDP (2)	(3)
	Foreign Ownership ≥ 50%, Four Industries		
1952	40.27		1.60
1957	36.62		1.38
1961	29.04		1.19
	Foreign Ownership ≥ 50%, All Manufacturing		
1962	6.43		1.59
1962	6.35	1.51	
	Foreign Ownership ≥ 20%, All Manufacturing		
1962	11.59		2.87
1962	11.79	2.80	
1972	14.69	3.10	2.91[b]
1973	18.46	4.01	3.77[b]
1974	18.22	4.11	3.86[b]
1975	17.21	3.79	3.56
1976	16.64	3.48	3.18
1977	17.23	3.43	3.08
1978	17.80	3.32	2.99
1979	20.50	3.97	3.59
1980	14.36	2.40	2.20
1981	14.31	2.18	2.04
1982	13.29	1.93	1.82
1983	10.61	1.50	1.42
1984	10.25	1.45	1.39
1985	9.41	1.28	1.24
1986	11.27	1.60	1.54
1987	10.74	1.53	1.47[c]
1988	NA	NA	NA
1989	13.58	1.87	1.80[c]
1990	11.18	1.43	1.38[c]

[a]Estimated by multiplying Col. 2 by the ratio of Col. 3 to Col. 2 of Appendix Table B-4.
[b]Extrapolated from 1975 by Col. 2
[c]Extrapolated from 1986 by Col. 2

Source: Appendix Table B-4

reached in 1973 or 1974. In addition, there is evidence of a decline in the foreign share during the 1950s in the four industries for which foreign ownership data are available, industries that were growing relative to the average within the declining manufacturing sector.

Sweden

The trajectory of foreign ownership of Swedish industry appears to have been quite different from that for Norway, although the severe reduction in availability of data after 1978 makes inferences rather uncertain. Most of the measures show little change in the share of foreign-owned enterprises in manufacturing or total production from 1971 through 1976 or 1977, but if there was any change, it was toward an increase in foreign shares, especially after 1978 (Table 12). That impression is reinforced by the foreign shares in employment (Appendix Table B-6). After 1979 very little is available on value added, but the one series that does continue shows more than a doubling of the foreign share by 1986 and 1990. The employment share of foreign-owned enterprises (Appendix Table B-6) rose similarly, a little faster in manufacturing–6Xthafior all industries, but both confirming the impression of rapid growth in the foreign share of Swedish production during the 1980s.

Table 12

Sweden: Share of Foreign Owned Firms
in Manufacturing and Total Production, 1971-1990

	Value Added in Foreign-Owned Production Relative to Value Added in All Corresponding Enterprises				GDP	
	Manufacturing Establishments in Enterprises with Foreign Ownership		Enterprises with Foreign Ownership		Manufacturing Establishments in Enterprises with Foreign Ownership	
	>50%	≥20%	>50%	≥20%	>50%	≥20%
1971	6.2	NA	5.3	8.1	1.65	NA
1972	6.3	10.9	5.3	8.3	1.68	2.91
1973	6.4	10.7	5.9	9.7	1.80	3.00
1974	6.7	11.0	5.8	9.0	2.05	3.38
1975	6.4	10.2	5.3	7.8	1.84	2.93
1976	6.9	11.0	5.2	7.8	1.90	3.04
1977	7.0	11.7	5.4	8.5	1.84	3.09
1978	7.5	12.5	5.3	8.5	1.89	3.13
1979			6.1	9.5		
1986			13.5			
1990			17.0			

Source: Appendix Tables B-5 and B-6.

Japan

The data on production by foreign firms in Japan suffer from many of the same defects as the data on Japan-based multinationals. In particular, they are based on voluntary surveys with low and fluctuating degrees of coverage. Response rates have varied between a high of 59 per cent and a low of 31 per cent, but fell between 45 and 55 per cent in 11 out of the fifteen years for which coverage is known. The definition of foreign ownership has also changed over time: 25 per cent equity ownership in 1977-81; 50 per cent in 1982 to 1991; and 33 per cent in 1991-92. While those changes of definition might not have a major effect on measures of production in most host countries, minority-owned operations are of much greater importance in Japan than elsewhere. For example, in the data for U.S. affiliates operating in Japan in 1982, minority-owned affiliates (10 per cent to 50 per cent U.S. ownership) were larger, measured by employee compensation than majority-owned affiliates overall, and in manufacturing, as can be seen below:

Employee Compensation in Japan in Nonbank U.S. Affiliates of Nonbank Parents, 1982 ($million)

	All Industries	Manufacturing	Trade
All affiliates	6,029	4,472	823
Majority-owned Affiliates	1,874	1,122	485
Minority-owned Affiliates	4,155	3,350	338
Ratio: All/Majority	3.2	4.0	1.7

Source: U.S. Dept. of Commerce (1985a), Tables II.F4 and II.F6

If we were to apply the U.S. ratios of total relative to majority-owned affiliates net sales to the Japanese data for affiliates owned 50 per cent or more, we would raise the ratios in 1982 through 1991 substantially, to three or four times the level in Table 13, a level that seems improbable. Even if

we made the more modest assumption that there was no change in a consistent ratio between 1981 and 1982, adding about 65 per cent to the total ratio and almost 85 per cent to the ratio in manufacturing, our picture of the trend would be altered.

The data point to an important characteristic of value added as a production measure: its sensitivity to cyclical and exchange rate fluctuations. The sharp decline in foreign firms' shares in 1982 probably was a reflection of the cyclical downturn at that time. The fall in foreign firms' value added from 1983 to 1985 probably represents the effects of the sharp rise in the exchange value of the US dollar, as U.S. affiliates, especially those in trade, cut margins to preserve their markets in Japan.

Japan's policies toward inward FDI were extremely restrictive until the early 1970s. Despite the fact that government restrictions on inward FDI were largely eliminated in 1980, foreign firms' shares of Japanese production are still very low and actually displayed a weak downward trend during the 1980s and early 1990s (Table 13), leading some (e.g. Encarnacion, 1992) to suggest that private barriers to FDI have replaced public barriers. On the other hand, others (e.g. Ramstetter and James, 1993) argue that these trends are a result of general entry barriers (e.g., high land costs) and the low priority accorded the Japanese market by many Western multinationals in this period.

Table 13

Japan: Share of Foreign-owned Firms in Corporate Value Added and in GDP, 1977-1992
(Unit: Per Cent)

Year	Shares of Corporate Value Added in Japan			Shares of Japan's GDP, all industries
	All industries	Manufac-turing	Trade	
FOREIGN OWNERSHIP SHARES=25 PER CENT OR MORE				
1977	2.89	5.13	1.66	1.81
1978	2.67	5.14	1.27	1.64
1979	2.23	4.21	1.18	1.48
1980	2.25	4.20	1.38	1.54
1981	2.51	4.99	1.14	1.74
FOREIGN OWNERSHIP SHARES=50 PER CENT OR MORE				
1982	1.53	2.83	1.11	1.05
1983	1.90	3.88	0.94	1.35
1984	1.54	3.07	0.69	1.09
1985	1.11	2.27	0.36	0.80
1986	1.66	3.69	0.77	1.22
1987	1.51	3.33	0.76	1.19
1988	1.53	3.27	0.94	1.25
1989	1.51	3.14	0.97	1.20
1990	1.35	2.78	0.82	1.13
1991	1.34	2.83	0.94	1.14
FOREIGN OWNERSHIP SHARES=33 PER CENT OR MORE				
1991	1.50	2.94	1.33	1.27
1992	1.30	2.71	1.08	1.08

Source: Appendix Table B-7

Australia

Time series for foreign firms' shares in Australian output appear to be confined to mining and manufacturing, and even these cover only the period from the early 1970s to the mid-1980s. The mining sector is the one for which the longer span of years can be observed, and it is also the sector most dominated by foreign firms. Within that sector, the foreign share of production rose until the mid-1970s and then declined, the latest ratio, for 1984-85 being the lowest of the period (Table 14). However, there was no real indication of a trend before that. The share of GDP originating in foreign-owned mining production did appear to have an upward trend, however, because the mining sector, though quite small, increased in importance during these years.

The foreign share in the much larger, but relatively shrinking, manufacturing sector declined somewhat over the period for which we have data, but the share of foreign owned manufacturing production in total output declined substantially. Thus, there is little doubt that the foreign share in Australian production as a whole declined, given that foreign production in these two major industries fell from about 9½ per cent to about 7¼ per cent of GDP.

Table 14

Australia: Share of Foreign-Owned and Foreign-Controlled Establishments in Mining, Manufacturing, and Total Output, 1971-72 to 1986-87

	Share (%) of Sector Value Added and GDP, by Control								
	Total		Foreign and Joint Australian and Foreign				Naturalized and Naturalizing	Share (%) of Sector Value Added and GDP, by Ownership	
			Total		Foreign	Joint		Foreign	
	Sector	GDP	Sector	GDP	Sector	Sector	Sector	Sector	GDP
Mining									
1971-72	55.0	1.87							
1972-73	57.7	1.88							
1973-74	60.2	2.03							
1974-75	60.1	2.27						51.8	1.96
1976-77	59.0	2.29							
1981-82	57.9	2.36	52.3	2.13	29.9	22.4	5.6	51.2	2.09
1982-83	56.6	2.51	47.5	2.11	27.6	19.9	9.1	50.4	2.24
1984-85	51.5	2.39	40.0	1.86	15.2	24.8	11.5	44.7	2.08
Manufacturing: Largest 200 Enterprise Groups in Manufacturing									
1972-73	NA	NA	23.2	5.01	21.9	1.2	NA		
1975-76	NA	NA	21.9	4.52	20.7	1.2	NA		
Manufacturing									
1972-73	NA	NA	34.3	7.50	32.0	2.3	NA	31.2	6.82
1982-83	34.6	5.87	33.3	5.65	32.1	1.2	1.3	32.9	5.57
1986-87	33.3	5.38	32.1	5.20	30.8	1.4	1.2	30.9	5.00

Source: Appendix Tables B-8 and B-9

Of the seven developed host countries for which we have data from national sources on production by inward investors, only two, the United States and Sweden, have undergone a substantial growth in foreign-owned shares in their production, mainly during the 1980s. The growth was particularly large in manufacturing for the U.S., although the shares have not reached high levels compared with those in other countries. For Sweden, we do not have data by industry for the period of high growth in the foreign share.

The opposite trend, for manufacturing at least, characterized Norway and Canada. In Norway, the foreign share in manufacturing was cut substantially after rising in the 1970s, and the contribution of foreign-owned manufacturing to GDP fell far more steeply, as manufacturing declined in importance in the whole economy. In Canada, the foreign share of production, which reached a peak in the mid-1970s, fell substantially until 1988, and then recovered a bit by 1993, but the final shares were below the levels of the 1960s. Japan, the United Kingdom and Australia are harder to characterize by any particular trends. Thus, among these seven countries, there is no strong consensus regarding the direction of changes in the importance of foreign-owned production. The strongest case for a trend is that of the United States, which absorbed an unprecedented share of the world's direct investment during the 1980s, but that may have been a temporary episode not likely to be repeated.

3.2. Developing Host Countries

Our data for developing countries are less complete. Table 15 presents the data we have assembled on foreign firms' shares of value added in Asia's

developing economies.[6] Across countries these shares vary in a wide range, from very close to zero in India and in China's industrial sector for a number of years, to well over 50 per cent for some years in Malaysia and all years in Singapore. In the three countries for which data covering all industries are available for a reasonably long period of time (India, Malaysia, and Taiwan), there is a pronounced downward trend in Malaysia, due in large part to the declines of foreign shares in agriculture and mining (Ramstetter, 1995, p. 123). There are no such strong trends in India and Taiwan, but in Taiwan, foreign shares were high relative to the past in the late 1980s.[7] In India and Korea, foreign firms' shares were much larger in manufacturing than in all industries. Foreign shares in Malaysia and Taiwan generally followed a U-shaped pattern, being relatively high in the mid- to late-1970s, then bottoming out in the early- to mid-1980s, and rising again in the late 1980s and early 1990s.

For the remaining countries (China, Hong Kong, Indonesia, Singapore, and Thailand), data are available only for industry or manufacturing. A very strong upward trend is observable in China, though the figures here represent only an upper limit on foreign joint ventures' shares, and the data for

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[6]The data for China refer to gross value of output for industry, including intermediate expenditures. Figures on sales and gross output, including intermediate expenditures, are also available for a large number of other countries and are provided in the Appendix Tables.

[7]Ratios of foreign firm sales to Taiwanese total output indicate that high foreign shares continued into 1991 (see Appendix Table C-8). The two value added estimates for foreign firms in 1990 and 1991 are inconsistent and seem inconsistent also with the sales data.

Table 15

Foreign Firms' Percentage Shares of Value Added in Selected Asian Developing Economies

	All industries					Manufacturing					
				Taiwan				Malaysia		Taiwan	
Year	India b	Korea b,c	Malaysia 1 a,c,e	1 b,f	2 b,f,f	India b,d	Korea b,c	1 a,c,e	2 a,e	1 b,f	2 b,c,f
1968	NA	NA	NA	NA	NA	NA	NA	NA	48.2	NA	NA
1969	NA	NA	63.5	NA	NA	NA	NA	57.6	55.1	NA	NA
1970	NA	NA	60.2	NA	NA	NA	NA	68.5	53.1	NA	NA
1971	NA	NA	56.6	NA	NA	NA	NA	60.8	58.1	NA	NA
1972	NA	NA	54.2	NA	NA	NA	NA	58.3	56.4	NA	NA
1973	NA	NA	55.5	NA	NA	NA	NA	53.8	53.0	NA	NA
1974	NA	2.44	57.1	6.1	NA	NA	9.5	57.4	53.5	18.0	NA
1975	1.75	3.83	50.0	6.4	NA	7.6	13.6	52.1	48.4	19.3	NA
1976	1.95	4.66	46.2	6.5	NA	NA	16.0	47.1	51.7	17.8	NA
1977	1.82	5.54	43.0	7.1	NA	NA	18.4	43.8	44.7	19.3	NA
1978	1.86	5.32	41.0	8.0	NA	NA	17.0	44.4	44.2	21.1	NA
1979	1.89	NA	40.3	8.4	10.4	7.0	NA	51.0	42.0	22.1	30.7
1980	1.71	NA	39.4	6.7	8.9	7.0	NA	49.7	NA	17.9	25.8
1981	NA	NA	39.6	6.1	8.5	NA	NA	48.6	NA	16.0	24.9
1982	1.26	NA	37.4	5.7	6.6	5.2	NA	47.4	NA	14.9	18.6
1983	1.23	NA	36.9	6.8	6.3	5.1	NA	44.2	36.0	16.2	17.2
1984	1.68	NA	34.0	8.8	11.3	5.8	10.7	38.2	32.9	21.9	29.0
1985	1.75	NA	31.4	5.7	7.8	6.1	11.6	34.3	32.2	13.4	18.7
1986	1.79	NA	31.3	7.1	6.9	6.4	12.0	36.3	33.4	15.6	16.0
1987	1.78	NA	32.9	8.0	7.8	6.3	NA	39.5	35.0	16.7	17.8
1988	NA	NA	32.0	11.4	10.5	NA	NA	40.6	36.8	22.9	22.4
1989	NA	NA	30.9	12.6	12.2	NA	NA	40.4	40.1	22.8	23.8
1990	NA	NA	30.1	14.0	7.8	NA	NA	40.5	42.0	20.4	28.9
1991	NA	NA	30.1	7.8	11.0	NA	NA	43.1	43.4	10.0	23.7
1992	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 15 (continued)

Year	Industry: China, upper limit, -g	Industry: Guangdong upper limit, -g	Industry: Guangdong Guang-dong, -g	Manufacturing: Hong Kong, -a	Manufacturing: Total Indonesia -b	Manufacturing: Nonoil Indonesia -b	Manufacturing: Singapore 1 -a,h	Manufacturing: Singapore 2 -a,h	Manufacturing: Thailand -b,i
1974	NA	NA	NA	NA	NA	NA	NA	NA	15.5
1975	NA	NA	NA	NA	19	21	62.7	NA	NA
1976	NA	NA	NA	NA	25	28	64.1	NA	NA
1977	NA	NA	NA	NA	26	29	65.2	NA	NA
1978	NA	NA	NA	NA	23	26	63.4	NA	NA
1979	NA	NA	NA	NA	21	25	67.3	NA	NA
1980	0.48	1.9	NA	NA	22	28	67.4	65.4	NA
1981	0.58	NA	NA	NA	22	28	67.7	66.0	NA
1982	0.68	NA	NA	NA	20	26	66.6	65.8	NA
1983	0.78	NA	NA	12.8	19	24	63.2	66.4	NA
1984	1.01	NA	NA	13.0	14	19	63.1	67.9	NA
1985	1.21	4.6	NA	10.7	13	18	64.8	67.0	NA
1986	1.46	NA	NA	12.8	14	18	65.9	73.5	13.3
1987	2.02	NA	NA	13.5	15	18	72.4	74.0	NA
1988	2.72	NA	NA	14.3	14	17	71.7	72.4	NA
1989	3.44	NA	NA	14.6	16	19	73.6	74.4	NA
1990	4.38	24.3	8.34	16.2	15	19	72.7	74.2	14.8
1991	5.66	29.1	27.0	17.3	NA	NA	72.2	72.9	NA
1992	7.11	33.6	31.8	17.1	NA	NA	70.2	69.5	NA
1993	10.16	43.8	33.2	NA	NA	NA	NA	NA	NA

[a]Foreign firms defined as firms with 50% or higher foreign ownership shares.
[b]Foreign firms defined to include firms with minority foreign ownership shares.
[c]Value added estimated as total sales less expenditures for raw materials and parts.
[d]For India, foreign firm manufacturing data refer to the sum of textiles, chemicals, and engineering (metals and machinery) only.
[e]Malaysia 1: data from surveys of limited companies. Malaysia 2: data from industrial surveys.
[f]Taiwan 1 data are estimates given by the original source equal to total income less expenditures for raw materials and parts, electricity, and other intermediate consumption. Taiwan 2 are estimates calculated as total sales less expenditures for raw materials and parts only. For manufacturing, Taiwan 1 data refer to all manufacturing, but Taiwan 2 data exclude paper and printing, precision machinery, and miscellaneous manufacturing.
[g]Figures for China and Guangdong refer to the gross value of output, including intermediate expenditures.
[h]Singapore 1 data refers to gross value added, Singapore 2 data refers to net value added.
[i]Ratios to national accounts measures of value added. Data refer only to firms promoted by the Board of Investment; including non-promoted foreign firms, the foreign share was 30.6 per cent in 1990. Many non-promoted firms had been promoted firms earlier.

Source: Appendix Tables C-1 through C-11.

Guangdong Province indicate that there are substantial differences between the upper limit and the actual share in some years. Nonetheless, there is no doubt that foreign shares in China have increased dramatically in recent years and have reached moderately high levels in Guangdong Province, mainly in firms owned by Overseas Chinese.[8] Upward trends are present in Hong Kong and Singapore, and a downward trend in Indonesia. In Thailand, shares of foreign firms promoted and surveyed by the Thai Board of Investment have not changed much over time, but it is also clear that these firms accounted for only about one-half of all foreign firm production in Thailand in 1990.

On balance, it appears that foreign firms' shares of manufacturing production have increased somewhat in Asia's developing economies. The fact that Asian manufacturing has grown extremely rapidly in the last two decades, combined with constant or rising shares of foreign firms in these industries, means that the share of Asian manufacturing operations of foreign multinationals in world production has been increasing. Moreover, if one could account for the production of the growing number of Asian manufacturing multinationals in their home markets, something we have been unable to do here, the increase in the share of Asian manufacturing's internationalized production in world production would likely be even more pronounced. As the Malaysian data indicate, it is also true that internationalized production has long played an important role in Asian primary industries as well, though this role has become smaller in recent years in Malaysia. In services, the scope of internationalized production is probably still relatively limited in Asia

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[8]In 1992, 23 per cent of the gross value of industrial production in Guangdong occurred in Overseas Chinese firms (China, State Statistical Bureau, various issues).

compared to developed economies, as most Asian economies still restrict the activities of foreign multinationals in services.

We also have some information on the activities of multinationals in Latin America (Table 16). In the two largest economies, Brazil and Mexico, as well as in Uruguay, one of the smallest countries in the region, foreign owned firms play an important role in manufacturing production. In Brazil, foreign-owned production accounted for about 29 per cent of manufacturing gross output in 1980, the only year for which data on all foreign affiliates are available. Little change has taken place in the share of U.S. affiliates (dominated by majority-owned affiliates), which accounted for approximately half of all foreign affiliates' manufacturing output in Brazil in the beginning of the 1980s. If the growth of other foreign firms was like that of U.S. majority-owned foreign affiliates, there have been only small changes in the foreign manufacturing share in Brazil since the mid-1970s.

In Mexico, we find no significant change in the role of multinationals during the 1970s, and if U.S. MOFAs can represent all foreign affiliates in Mexico as we assumed they did in Brazil, the role of the multinationals remained unchanged in Mexican manufacturing also in the 1980s. In 1970, 28.7 per cent of Mexican manufacturing value added was produced by foreign owned firms. In 1980, the last year for which figures for total foreign-owned production are available, that share was almost unchanged (27.2 per cent). Looking only at U.S. majority-owned foreign affiliates in Mexican manufacturing, we see a downward trend until 1982, but then it shifted dramatically. Between 1982 and 1990, these affiliates' share of Mexican manufacturing value added increased by 53 per cent (from 8.5 to 13.0 per cent). However, this seems to be a result of policy changes in Mexico after

Table 16

Foreign-owned Production as Per Cent of Manufacturing Output:

Three Latin American Countries

	Brazil		Mexico			Uruguay
	Total Foreign	U.S. MOFAs[a]	Total Foreign A	Total Foreign B	U.S. MOFAs[a]	
1970		NA	34	28.7		NA
1975		NA	31			NA
1977		10.5			9.2	NA
1978		NA			NA	18.0
1980	28.5			27.2		NA
1982		12.3			8.5	NA
1988		NA			NA	28.0
1989		12.9			13.0	NA
1990		10.3			13.0	29.0
1991		9.2			NA	NA

[a]In 1982, U.S. majority-owned foreign affiliates (MOFAs) accounted for 85 per cent of manufacturing employment in all U.S. affiliates in Brazil and 60 per cent in Mexico.

Source: Appendix Tables C-12 through C-14.

the debt crisis in 1982. Mexico abandoned the strict FDI rules from the 1970s which, among other things, prevented majority-ownership in new investments, and American firms seem to have responded to that change. In 1982, U.S. majority-owned foreign affiliates accounted for 60 (55) per cent of the employment (sales) in all U.S. affiliates in Mexican manufacturing, and in 1990, this share had increased to 71 (66) per cent.

The foreign share in Uruguay has also increased steadily since the 1970s. Almost 30 per cent of the country's manufacturing output was produced by foreign firms in 1990. Given that Uruguay is a financial center for the

Southern Cone, one would expect the foreign share of the service industry production to be even higher.

In sum, it seems safe to guess that approximately 30 per cent of our three Latin American countries' manufacturing output today is produced by foreign owned multinationals. The foreign share has been essentially unchanged in Mexico since 1970, It increased somewhat in Brazil during the 1970s, but fell back again during the 1980s. In Uruguay, the trend has been upward since 1978, but the economy is small compared to the others. Thus, taking the three countries together, there has been little change in the foreign manufacturing share since the beginning or the mid-1970s. During this period, however, these Latin American countries' manufacturing sectors have been growing more slowly than those of the Asian countries discussed above, but still faster than the world average. This suggests that the share of internationalized production in world output have been increasing somewhat for these developing countries as well.

4. Measuring World Internationalized Production

4.1 From Home Country Data

Home-country data on affiliate production were available for four countries, viz. the United States, Japan, Germany, and Sweden. Judging from data on stocks of direct investment, it appears that these four countries have accounted for about half or more of all outward investment stocks since 1960. That share jumped from 1960 to 1975, mainly through the growth of U.S. investment, and has declined ever since, as follows:

Share (per cent) of Four Countries in World Stock of Outward Direct Investment

1960	49.6
1975	57.1
1980	56.5
1985	54.2
1990	50.7
1992	50.2

Source: Lipsey (1995), Table E-7

We can use that information to roughly estimate the MNC affiliate, or internationalized share in world production:

Share (per cent) of Affiliate Output in World GDP, Estimated from Home-Country Data

	Four Home Countries	World[a]
1970	2.5	4.5
1977	3.1	5.4
1982	3.2	5.7
1988	3.3	6.6
1990	3.4	6.8

[a]Including four home countries
Source: Roughly estimated from country tables

The share of the four home countries reporting affiliate sales or output has changed little since 1977. However, these countries' share of the stock of total world outward direct investment has declined since then. If we assume that the four countries' affiliates' share in production follows their share in the stock of direct investment, we can roughly estimate that the share of internationalized, or affiliate production has risen from about 4½ per cent to between 6½ and 7 per cent of world output since 1970.

Of course, the share of production accounted for by the multinationals from these countries, including parent (non-internationalized) as well as affiliate (internationalized) production, is much larger. In the U.S., Japan,

and Sweden, it was probably about 12½ per cent in 1980 and a little over 11 per cent at the end of the 1980s.

We have no information as to what part of the population of MNCs' production is represented by these four countries' firms. If we assumed, with no justification, that the parents account for the same share of world output as their affiliates do of the stock of foreign direct investment, we would estimate that MNCs accounted for about 22 per cent of world output at the beginning of the 1980s and the same share at the end.

4.2 From Host-Country Data

One way of estimating how typical are the six developed host countries (other than the U.S.) for which we have data is to compare U.S.-owned production and total output there with U.S.-owned output and total output in developed countries as a group. We can make this comparison for selected years since 1977. However, we lose the advantage of comparing U.S.-owned output and total output in each country drawn form the same sources, and compiled by the same methods. The results of this comparison are shown in Table 17.

The six countries accounted for around half of U.S. MNCs' production in developed countries outside the U.S. (dominated by the U.K. and Canada), first growing in importance and then declining to a little less than half. Their share in aggregate output in developed countries other than the U.S.(dominated by Japan), was considerably smaller, growing substantially from 1977 to 1989 but never reaching much more than a third.

The shares of U.S.-owned internationalized (affiliate) production in total output in these six countries and in developed countries as a group both

Table 17

U.S.-Owned Output and Total Output in Six Developed Countries and All Developed Countries, 1977, 1982, and 1989-91

	1977	1982	1989	1990	1991	1992	1993
Gross Output of Majority-Owned U.S. Nonbank Affiliates ($ Million)							
U.K.	16,861	38,465	52,703	60,123	59,494	55,343	52,824
Canada	27,783	34,017	52,114	50,820	47,126	44,938	45,034
Norway	1,655	4,440	4,164	5,120	4,939	4,870	4,236
Sweden	1,103	1,889	2,229	2,128	2,432	2,265	1,868
Japan	3,065	4,587	14,940	14,565	16,517	15,947	17,958
Australia	5,578	10,069	13,902	14,178	12,295	13,148	12,614
Total	58,045	93,467	140,052	146,934	142,803	136,311	134,534
All Developed Countries	107,487	164,198	262,400	294,594	296,469	294,182	283,747
Share (%) of Six Counties	52.1	56.9	53.4	49.9	48.2	46.3	47.4
GDP ($US Billions)							
U.K.	254.2	487.1	843.2	980.5	1,014.9	1,050.9	942.8
Canada	203.2	301.4	544.9	569.1	582.5	563.7	546.3
Norway	36.0	56.1	90.0	105.5	105.9	113.1	103.4
Sweden	83.5	101.2	191.2	228.8	239.3	247.6	185.0
Japan	691.3	1,086.4	2,871.7	2,932.0	3,350.2	3,662.4	4,214.2
Australia	105.8	174.8	293.4	296.3	301.8	297.0	289.4
Total	1,374.0	2,207.1	4,834.5	5,112.2	5,594.6	5,934.6	6,281.2
All Developed Countries	4,940.7	7,719.6	14,484.0	15,975.6	16,804.8	17,980.5	18,128.9
Share (%) of Six Countries	27.8	28.6	33.4	32.0	33.3	33.0	34.6
U.S. Affiliate Share of Output							
Six Countries	4.22	4.23	2.90	2.87	2.55	2.30	2.14
All Developed Countries	2.17	2.13	1.81	1.84	1.76	1.64	1.56
Ratio: Six Countries /All Developed	1.94	1.98	1.60	1.56	1.45	1.40	1.37

Source: MOFA Output: Mataloni and Goldberg (1994) and Mataloni (1995)
GDP: World Bank (1995)

were lower in 1993 than in 1977 and 1982, but the decline was much greater in the six countries. By this standard we might guess that these six countries provide a somewhat downward-biased picture of the path of internationalized production.

We make a crude attempt to aggregate the internationalized output in the seven developed countries we cover, adding the United States to these six countries. That aggregation is performed by taking ratios of foreign-owned (internationalized) production to aggregate GDP in each country, calculated in national currencies at current prices, and applying these ratios to GDP in current year international prices for each country. The results are shown in Table 18.

The addition of the United States to the list of countries included, with a large weight in aggregate world output, changes the picture of the trend. Foreign-owned production increased its share of total output in the countries surveyed by almost 30 per cent between 1977 and 1990. The increase was not continuous, to judge from the five countries with data for the most years, but included a rapid rise in the late 1970s, a decline to the mid-1980s, and then another rapid increase. The share in world real aggregate output of that same foreign-owned production in these countries rose with similar timing, but a little more slowly, reflecting the fact that growth in these countries was below the world average.

Since most, but not all, host countries report foreign-owned shares only in manufacturing, it is difficult to judge the implications of Table 18 for the share of total internationalized production in world output. Table 19 is a more consistent version of Table 18, limited to manufacturing output, where possible, and, as a consequence, more of an understatement of the share of

Table 18

Share of Foreign-Owned Production in Seven Developed Countries[a] in Their Real Output[b] and in Real World Output[b], 1977 to 1991
(Per cent)

	Share of Foreign-Owned Production in Real Output of			Share in Real World Output: Foreign-Owned Production in		
	Seven Countries	Six Countries[c]	Five Countries[d]	Seven Countries	Six Countries[c]	Five Countries[d]
1977	3.40	3.23	3.25	1.27	1.17	1.16
1978[e]		3.18	3.21	1.16	1.16	1.15
1979[f]		3.50	3.53		1.26	1.25
1980[g]			3.68			1.26
1981			3.91			1.35
1982[h]			3.67			1.25
1983			3.72			1.28
1984			3.82			1.33
1985			3.64			1.25
1986	3.76	3.64	3.64	1.37	1.29	1.27
1987[i]		3.76	3.77		1.33	1.31
1988[j]			4.00			1.40
1989		4.23	4.23		1.50	1.48
1990		4.20	4.20		1.47	1.45
1991[k]		4.21	4.21		1.45	1.43

[a]Australia, Japan, Norway, Sweden, the U.K., the U.S., and Canada
[b]Real GDP in current international prices
[c]Excluding Australia
[d]Excluding Australia & Sweden
[e]For UK, 1977
[f]For Sweden, 1978
[g]For UK, 1979
[h]For UK, 1981
[i]For Sweden, 1986
[j]For Norway, 1987
[k]For Norway and Sweden, 1990

Source: Text tables and Penn World Tables (5.6)

Table 19

Share of Foreign-Owned Manufacturing Production in Seven Developed Countries[a] in Their Real Output[b] and in Real World Output,[b] 1977 to 1991
(Per cent)

	Share of Foreign-Owned Production In Real Output of			Share in Real World Output: Foreign-Owned Production in		
	Seven Countries	Six Countries[c]	Five Countries[d]	Seven Countries	Six Countries[c]	Five Countries[d]
1977[e]	2.53	2.53	2.54	0.99	0.92	0.90
1978[f]		2.36	2.37		0.86	0.85
1979[g]		2.62	2.64		0.95	0.93
1980[h]		2.52	2.53		0.88	0.87
1981			2.64			0.91
1982[i]			2.36			0.80
1983			2.47			0.85
1984			2.53			0.88
1985			2.36			0.81
1986	2.50	2.42	2.40	0.91	0.86	0.84
1987[j]			2.49		0.89	0.87
1988			2.60			0.91
1989			2.90			1.01
1990		2.89	2.87		1.01	0.99
1991			2.81			0.95

[a]Australia, Japan, Norway, Sweden, The U.K., USA and Canada
[b]Real GDP in current international prices
[c]Excluding Australia
[d]Excluding Australia and Sweden
[e]Average of 1974 and 1979 for Canada
[f]For U.K., 1977 and for Canada, Average of 1974 and 1979
[g]For Sweden, 1978 and for Canada, 1980
[h]For UK, 1979
[i]For UK, 1981
[j]For Sweden, 1986
[k]For Norway, 1987

Source: Text tables and Penn World Tables (5.6)

internationalized production in world output.

Internationalized manufacturing production in these developed countries rose in importance relative to aggregate output in the same countries and to world output. In both cases the increase was slower than for the mixed sectors of production shown in Table 18, about 15 per cent overall relative to the countries' total output and only about 4 or 5 per cent relative to world output. The slower growth in importance for internationalized manufacturing output reflects the declining share of manufacturing in developed countries' total production as well as the declining share of these seven countries in world output.

Thus, from this calculation, we can gather that there has been some long-term growth in the importance of internationalized production in the developed countries relative to their total output and to world output.

We have also aggregated the internationalized output in the nine developing countries we cover, using the same method as for developed countries. There appears to have been a fall in the share of internationalized production in the developing countries' own output from 1977 to 1983, following an earlier rise (Table 20). Then there was a large growth in the share after 1983. Relative to aggregate world output there was little change from 1977 to 1983, after an earlier increase, but a very large rise after that, suggesting a growth of over 50 per cent relative to world output up to 1990. The growth was probably even faster after that, because foreign investment in China accelerated in the 1990s. The increase in foreign-owned production was much larger relative to world output than relative to these countries' own output because these countries were growing faster than the rest of the world.

Table 20

Share of Foreign-Owned Production in Nine Developing Countries[a] in Their Real Output[b] and in Real World Output[b], 19757 to 1990
(Per cent)

	Share of Foreign-Owned Production in Real Output of			Share in Real World Output: Foreign-Owned Production in		
	Seven Countries A	Nine Countries A	Nine Countries B	Seven Countries[c]	Nine Countries A	Nine Countries B
1975	1.79			0.22		
1976						
1977	2.17		3.38	0.26		0.59
1978						
1979						
1980[c]	1.73		3.11	0.24		0.55
1981						
1982						
1983[d]	1.83	2.99	3.03	0.27	0.46	0.56
1984						
1985						
1986						
1987						
1988						
1989[e]	2.38	3.29		0.38	0.59	
1990[e]	2.79	3.41		0.46	0.64	

[a]Seven countries: China, India, Indonesia, Malaysia, Mexico, Singapore, and Taiwan
Nine countries A also include: Brazil and Hong Kong
Nine countries B also include: Brazil and Korea

[b]Real GDP in current international prices

[c]For Malaysia, 1979, and for Korea, 1978

[d]For Brazil and Mexico, 1982, and for Korea, 1978

[e]For India, 1987

Source: Text tables and Penn World Tables (5.6)

Even more than for the developed host countries' data, the data for foreign-owned production in developing countries are limited to the manufacturing sector. The same ratios, confined as far as possible, to the manufacturing sector, are shown in Table 21. The time pattern for manufacturing alone relative to the countries' output is similar to that for the hybrid values in Table 20, with a rise to 1977, a decline to the early 1980s, and then another increase. However, there is no clear trend over the whole period. In contrast, the shares of world output do show an upward trend. The difference between the trends in shares of country output and in shares of world output results from the fact that the ratios are dominated by Asian countries that were growing much faster than the rest of the world.

Table 21

Share of Foreign-Owned Manufacturing Production in Nine Developing Countries in their Real Output[a] and in Real World Output[a]

	Share (%) of Foreign-Owned MFG Production in Real Output of			Share (%) in Real World Output of Foreign-Owned Manufacturing Production in		
	7 Countries[b]	9 Countries[c]	9 Countries[d]	7 Countries[b]	9 Countries[c]	9 Countries[d]
1974						
1975	1.65			0.21		
1976						
1977[e]	2.00		3.25	0.24		0.52
1978						
1979						
1980[f]	1.60		3.01	0.22		0.53
1981						
1982						
1983[g]	1.71	2.89	2.93	0.25	0.52	0.54
1984						
1985						
1986						
1987						
1988						
1989[h]	2.04	3.01		0.33	0.58	
1990[h]	2.34	3.03		0.38	0.59	

[a]Real GDP in current international prices
[b]India, Malaysia, Singapore, Mexico, Taiwan, Indonesia and China
[c]7 countries plus Hong Kong and Brazil
[d]7 countries plus Korea and Brazil
[e]For India, average of 1975 and 1979
[f]For Malaysia, 1979 and for Korea, 1978
[g]For Brazil, 1982 and for Korea, 1984
[h]For India, 1987

If we add the foreign-owned manufacturing production in developed and developing host countries, we find that there was some rise over the period since 1977 in the share of world output, as indicated by Table 22.

Table 22

Internationalized Manufacturing Output
in Thirteen Host Countries
as Per Cent of World GDP

1977	1.16
1980	1.10
1985[a]	1.11
1990	1.39

[a]1986 for developed countries and 1983 for developing countries

Source: Tables 19 and 20

Only two countries, the United States and Japan, give a breakdown of their overseas production between manufacturing and other industries. The share of manufacturing in the total for these two countries combined is shown in Table 23.

Table 23

Share of Manufacturing in Total Overseas Output of MNCs

	U.S.	U.S. and Japan
1977	44.4	41.2[a]
1980		42.1
1982	44.6	
1983		40.5[c]
1989		50.9
1991		49.1

[a]1977 for U.S. and 1980 for Japan

[b]1982 for U.S. and 1980 for Japan

[c]1982 for U.S. and 1983 for Japan

Source: Table 5A; Mataloni and Goldberg (1994) and Mataloni (1995)

If we take 40 per cent as a rough estimate of the manufacturing share in total internationalized output for 1977 through 1985 and 50 per cent as the share in 1990, we could estimate that total internationalized output in these thirteen host countries accounted for the following proportions of world GDP:

Table 24

Estimated Total Internationalized Output in Thirteen Host Countries as Per Cent of World GDP (Estimate A)

1977	2.9
1980	2.8
1985	2.8
1990	2.8

Source: Table 22

These thirteen host countries accounted for roughly half of all the inward stock of foreign direct investment, with some fluctuations (Table 25):

Table 25

Approximate Share of Thirteen Host Countries in World Stock of Inward Direct Investment (Per cent)

1980	53.8
1985	56.3
1990	52.8

Source: United Nations (1994b), Annex Table 3

If we assume that the share of world internationalized production of these thirteen countries was equal to their share of the inward direct investment stock, we can make an estimate of the share of internationalized production in the whole world, as in Table 26:

Table 26

Share of Internationalized Production in World GDP
(Estimate A)

1977	5.4
1980	5.2
1985	5.0
1990	5.3

Source: Tables 24 and 25

An alternative estimate could be based on the share of manufacturing in total internationalized output measured from the host country side rather than from the home country side. Although the coverage of affiliate output is smaller this way, it may be more appropriate for the particular host countries in our sample. The shares of manufacturing in affiliate output in the five host countries for which we have the data, are shown in Table 27.

Table 27

Foreign-Owned Manufacturing Output as Per Cent of
Total Foreign-Owned Output:
Five Host Countries[a]

1977	65.4
1979	63.9
1980	60.1
1982	57.8
1985	57.7
1989	60.7
1990	59.6
1991	58.3

[a]U.S., Australia, Canada, Taiwan, and India

Applying these ratios to the manufacturing output measures of Table 22, we would estimate shares of World GDP for total internationalized output of the thirteen host countries as follows (Table 28):

Table 28

Estimated Total Internationalized Output in Thirteen Host Countries as Per cent of World GDP (Estimate B)

1977	1.77
1980	1.83
1985	1.92
1990	2.33

Source: Tables 22 and 26

The corresponding estimate for the share of internationalized production in the output of all host countries would be the following (Table 29):

Table 29

Share of Internationalized Production in World GDP (Estimate B, From Host-Country Data)

1977	3.3
1980	3.4
1985	3.4
1990	4.4

Source: Tables 25 and 27

This estimate (B) of the share of internationalized output is smaller than the one derived in Table 26, but probably a better one, since the relationship of manufacturing to total affiliate output is derived from countries similar to those represented in the affiliate production data. This calculation implies a substantial growth in the share of internationalized production in world output, as does the calculation from the home country side, but here almost all the growth is after 1985. The shares estimated from host-country data are considerably smaller, but the growth is faster, about a third from 1977 to 1990 as compared with about a quarter in the estimates from home country data.

5. Summary and Conclusions

The difference between a geographical and an ownership view of production is measured by the amount of internationalized production: that is, production in enterprises owned by non-residents of the country where the production is located. That internationalized production is also one aspect of the much talked about "globalization" of production, for any one country and for the world as a whole.

The internationalization of production can be measured from two sides: that of the home country and that of the host country. Viewed from the home country, the question is "how much of production owned or controlled by home country residents takes place outside the geographical boundaries of the home country?" Viewed from the host country, the question is "how much of production located in the host country is owned or controlled by residents of other countries?" For the world as a whole, the two views, if measured perfectly, are identical.

Using host country data, mostly limited to manufacturing, we made two crude estimates of the share of affiliate output in world production. One suggested a rough stability, at 5 per cent or a little more, and the other, a substantial increase from 3.3 per cent in 1977 to 4.4 per cent in 1990, with most of the gain taking place in the late 1980s. The affiliate share of world production estimated from the home-country data rose from 4 1/2 per cent in 1970 to 5.4 per cent in 1977 and almost 7 per cent in 1990. Since the home country data require fewer assumptions to move from the sample to a world total, we would be inclined to accept them as the best estimates and treat those from the host country side as mainly a check on the orders of magnitude involved.

The general impression of a much greater importance of internationalized output stems from the contrast between shares of such production in goods industries, particularly manufacturing, and in services. Internationalized output in "Industry" by U.S. and Japanese firms was almost 6 per cent of world output in 1989, but less than 0.2 per cent of the output of "Services." "Industry" is defined here to include manufacturing, mining, transportation, communication, public utilities, construction, and trade, and accounted for about 35 per cent of world output in 1989, down from 41 per cent in 1970. Services accounted for 58 per cent, as compared with 49 per cent in 1970. Since the United States and Japan account for about three quarters of the outward direct investment stock of the four countries, we might guess that the four countries combined account for about 7½ per cent of world output of "Industry" and that all internationalized production amounted to something in the neighborhood of 15 per cent of world "Industry" output.

In the "Services" sector, which covers all except agriculture and industry, the internationalized share of production for these four countries' firms was negligible, somewhere between a quarter of one per cent and a half, but closer to a quarter, with no strong trend.

Another reason for the impression of a much greater role of internationalization or "globalization" is that our calculations do not include the total output of MNCs, but only the part that is outside their home countries. A very rough calculation suggests that the MNCs (parents and affiliates) accounted for about 22 per cent of world output both at the beginning and at the end of the 1980s.

Given all the attention that "globalization" has received from scholars, international organizations, and the press, these numbers are a reminder of

how large a proportion of economic activity is confined to single geographical locations and home country ownership. Internationalization of production is clearly growing in importance, but the vast majority of production is still carried out by national producers within their own borders.

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Appendix A

Outward Investment Production Data for Japan

Appendix A: Adjusting the MITI Survey Data on Japanese Multinationals

Estimates for Japanese parents and their foreign affiliates are based on data obtained from the Ministry of International Trade and Industry's (MITI's) surveys of parents and affiliates, the only source that provides estimates of production-related activities of Japanese multinationals for more than one year. The coverage of these surveys is incomplete and varies from year to year as well as from variable to variable. This appendix explains the methods used in this paper to compensate for these variations in coverage.

The coverage problems can be most clearly seen by comparing the MITI surveys (Columns 1 to 4, 6 to 8, and 10 of Appendix Table A-1), with generally more comprehensive surveys by a private publishing company, Toyo Keizai (Columns 5, 9, and 11). The numbers of parents identified by MITI are usually slightly larger than the number surveyed by Toyo Keizai but, because reply rates were low (varying from 33 to 51 per cent in 1980 and 1983-1992), the number of replying parents is far lower. Moreover, the number of firms reporting even such a basic indicator as sales is smaller than the number of replies for several years. Since we wish to calculate value added, the fact that the number of firms reporting intermediate expenditures is smaller in many years than the number reporting sales is a concern.

For affiliates, reply rates are generally much higher than for parents (64-79 per cent in 1986-1992), but here again the number of firms reporting sales is often lower than the number of replying firms and the number of firms reporting intermediate expenditures is still smaller in most years (Appendix Table A-1, note c). Moreover, although the number of affiliates to which MITI has sent out questionnaires and the number of affiliates included in the Toyo

Keizai surveys were roughly equal in 1988, in subsequent years, the number of affiliates to which MITI sent out questionnaires increased much more slowly than the number of affiliates in the Toyo Keizai surveys. Thus, by 1992, the number of affiliates in the Toyo Keizai surveys was 31 per cent larger than the number of affiliates receiving MITI questionnaires and 2.3 times larger than the number of affiliates reporting sales to MITI. If comparisons are made in terms of affiliate employment, the Toyo Keizai estimates are far larger than MITI estimates in the years for which comparisons are possible. One reason the Toyo Keizai estimates are higher is that they apparently cover a large number of smaller affiliates that may be excluded from the MITI surveys.[9] Nonetheless, the relatively stable growth rates of affiliate employment implied by the Toyo Keizai surveys, 8 per cent in 1987-1988, 16 per cent in 1988-1989, an annual average of 8 per cent in 1989-1991, and 6 per cent in 1991-1992, are much more believable than the wild gyrations in corresponding growth rates implied by the MITI surveys, 14 per cent, -13 per cent, 18 per cent, and -13 per cent, respectively.

Unfortunately, the Toyo Keizai publications do not attempt to compile sales (the only production-related indicators included in these surveys), perhaps because the number of firms reporting sales to Toyo Keizai is much smaller than the number reporting employment. One important comparison that can be made, however, is between the MITI data and U.S. Bureau of Economic Analysis (BEA) data on Japanese affiliates operating in the United States. The BEA data should not be subject to the same coverage problems as the MITI

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[9]For example in 1992, 6,383 affiliates reported employment to MITI for an average of 220 per affiliate (Japan, Ministry of International Trade and Industry, various years a) while figures in Appendix Table A-1 indicate an average of 170 per affiliate in the Toyo Keizai sample.

surveys because the BEA surveys are legally mandatory and data are adjusted to compensate for known variations in coverage. Moreover, this comparison covers a substantial portion of Japanese affiliates abroad, 22-27 per cent of the number of affiliates reporting sales and 40-55 per cent of affiliate sales in 1983-1992 (Appendix Tables A-1, A-2 and A-4).

For sales, the variable for which coverage is among the best in the MITI surveys, MITI estimates were larger than BEA totals in 1983-1984 and 1986-1988, and BEA estimates were larger in other years (Appendix Table A-2). Moreover, for most years, the differences between the two estimates were under 10 per cent, the exceptions being 1987 and 1990-1992, with the MITI estimate being conspicuously much lower in 1992. BEA numbers of affiliates were smaller than MITI's sales samples in 1983 and 1986-1988, but the BEA numbers grew much faster thereafter. In contrast, BEA estimates of Japanese affiliate employment were generally far larger than corresponding MITI estimates. Thus, it appears than estimates of sales are much closer in the two sources than estimates of the number of affiliates or affiliate employment.

MITI estimates of value added in Japanese affiliates in the United States are much larger than corresponding U.S. estimates of gross product originating in them, 8.4 fold in 1983, 6.4 fold in 1986, and 2.1-3.4 fold in 1987-1992, implying that MITI estimates of intermediate purchases are much lower. Moreover, although value added to sales ratios calculated from U.S. data are relatively stable, rising slowly from 6 per cent in 1980 to 13 per cent in 1992, corresponding ratios calculated from MITI data varied from 15 per cent to 58 per cent. MITI's recently initiated business structure surveys indicate that corresponding ratios for majority owned affiliates worldwide in 1991 (the only year available as yet) were close to the low end of the MITI

estimates but slightly higher than U.S. estimates, 20 per cent in all industries, 35 per cent in manufacturing, and 15 per cent in trade (Japan, Ministry of International Trade and Industry, 1994). Thus, if the coverage of affiliates in the United States is representative of the MITI multinationals' survey coverage in general, estimates of sales appear to have been reasonably reliable in the 1980s, but poor coverage appears to have had a particularly adverse effect on more recent sales estimates, on estimates of intermediate purchases, and therefore on calculated value added.

Adjustments to the MITI estimates of sales and value added presented in Appendix Tables A-3 and A-4 attempt to compensate for: (1) fluctuations in coverage over time and (2) the particularly low and variable coverage of intermediate expenditures. The first step involves adjusting the sales series to compensate for changes in coverage from year to year. To estimate the marginal effect of changes in coverage rates, worldwide affiliate sales and parent sales were estimated as functions of sales by affiliates in the United States taken from BEA data and the applicable coverage rate. The idea here use the strong correlations between parent sales, affiliate sales, and sales of affiliates in the United States, to remove trend effects independent of variance in reply rates, and then measure the effect of changing reply rates. The resulting ordinary least squares regressions for 1980, 1983-1992 are as follows:

$$SP_t = \underset{(0.69)}{-29736} + \underset{(5.60)}{4.1794}(SAU_t) + \underset{(3.34)}{442766}(NPS_t/NP_t) \qquad \bar{R}^2 = 0.920 \quad DW = 0.83$$

$$SA_t = \underset{(2.07)}{-19945} + \underset{(15.7)}{2.1625}(SAU_t) + \underset{(2.19)}{28653}(NAS_t/NA_t) \qquad \bar{R}^2 = 0.961 \quad DW = 1.10$$

where NA=number of affiliates in Toyo Keizai surveys, NAS=number of affiliates reporting sales to MITI, NP=number of parents sent MITI questionnaires, NPS =

number of parents reporting sales, SA=worldwide affiliate sales, SAU=BEA estimates of sales of Japanese affiliates in the United States, SP=parent sales, t=a subscript indicating year t, and figures in parentheses are t-statistics. Durbin-Watson statistics are uncomfortably low, especially in the parent equation where first autocorrelation is definitely indicated, but the small samples involved make it difficult to correct this problem with any degree of confidence and these estimates are used as is.

Aggregate adjusted sales (SAADJ and SPADJ, respectively) are then calculated as the sum of reported sales and the product of the coefficient on the reply rate from the above equations and the difference between the maximum observed reply rate and the actual reply rate.

$$SAADJ_t = SA_t + (0.765 - NAS_t/NA_t)(442766)$$

$$SPADJ_t = SP_t + (0.484 - NPS_t/NP_t)(28653)$$

The use of the maximum observed reply rate as opposed to 1 (implying 100 per cent coverage) reflects a primary concern compensating for variations in coverage rates as opposed to compensating for the levels of coverage rates. To obtain estimates for the manufacturing and trade sectors (a sector being indicated by subscript i), sectoral shares from reported sales data are multiplied by adjusted sales estimates.

$$SAADJ_{it} = (SAADJ_t)(SA_{it}/SA_t)$$

$$SPADJ_{it} = (SPADJ_t)(SP_{it}/SP_t)$$

The second step is then to calculate value added from the adjusted sales

figures. Since the levels and volatility of value added-sales ratios in the MITI data seem clearly unrealistic, adjusted value added estimates are derived by first adjusting the value added-sales ratios downwards somewhat and reducing their volatility, and then multiplying these adjusted ratios and corresponding adjusted sales estimates. Because the average of MITI estimates for the years 1988-1990 are relatively low and closer to other corresponding estimates this average is taken as a base, and adjusted value added-sales ratios are calculated as an 80-20 weighted average of this base and reported ratios. The resulting calculations are as follows:

$$VSADJ_{it} = 0.8(VSB_i) + 0.2(VS_{it})$$

$$VADJ_{it} = (VSAADJ_{it})(SPADJ_{it})$$

where VSB=base (average 1988-1990) value added-sales ratio (for affiliates, 0.19 in all industries, 0.34 in manufacturing, and 0.13 in trade; for parents, 0.22 in all industries, 0.40 in manufacturing, and 0.05 in trade), VADJ=adjusted value added, VS=reported value added-sales ratio, VSADJ=adjusted value added-sales ratio.

The resulting adjusted estimates for sales and value added are thought to be more realistic than the unadjusted figures in that fluctuations due to changes in the coverage of MITI surveys are somewhat compensated for. The resulting adjusted figures are correspondingly subject to far less variation than the unadjusted values. However, this is by no means the only possible way of adjusting the MITI numbers and further exploration of this problem is definitely warranted.

Finally, there is also a problem encountered when trying to calculate

multinationals' shares of Japanese value added or sales (or total output including intermediate expenditures) at the sector level. Namely, if one calculates the ratio of parent sales to total output on a national accounts basis for the trade sector, the resulting ratios are 1.68 to 2.25 (Appendix Tables A-3 and A-5). If one uses the MOF's corporations statistics to calculate parent shares of sales, these ratios fall to the 0.29-0.40 range. In other words, either the differences between the definition of total sales and total output (i.e., inventory changes) or differences in accounting by establishments (national accounts data) or enterprises (corporation and multinational firm statistics) are extremely large. Due to the control of a large number of non-trade establishments by large trading firms in Japan, the latter is probably by far the larger factor. This makes the use of the corporation statistics preferable for sectoral level analysis but use of these data may lead to overestimation of multinationals' shares because corporation statistics-based estimates of value added are below national accounts estimates of GDP.

Appendix Table A-1

Japan: Comparisons of MITI's and Toyo Keizai's Surveys
(Units: Samples in Number of Firms, Employment in Thousands)

	Parent samples					Affiliate samples				Affiliate employment	
	MITI surveys[b]					MITI surveys[c]					
Fiscal year-end[a]	Sent out (1)	Replies (2)	Sales (3)	Intermediate expenditures (4)	Toyo Keizai surveys (5)	Sent out (6)	Replies (7)	Sales (8)	Toyo Keizai surveys (9)[d]	MITI surveys (10)[c]	Toyo Keizai surveys (11)[d]
1980	3,247	1,401	1,256	1,180	NA	NA	3,853	3,288	6,270	739	NA
1983	3,331	1,271	1,161	1,153	NA	NA	4,383	3,705	7,351	709	NA
1984	3,301	1,617	1,488	NA	NA	NA	4,962	4,962	7,684	926	NA
1985	3,385	1,413	1,293	NA	NA	NA	5,343	5,343	8,187	1,057	NA
1986	3,425	1,144	1,031	832	NA	7,112	4,579	4,519	8,146	962	NA
1987	3,708	1,718	1,511	NA	2,329	8,367	6,647	6,647	8,933	1,168	1,544
1988	3,525	1,771	1,606	1,441	3,165	9,576	7,544	7,544	9,859	1,326	1,672
1989	3,331	1,563	1,360	1,359	3,191	8,804	6,362	6,362	11,484	1,157	1,941
1990	3,529	1,776	1,616	1,553	3,284	10,210	7,986	7,986	12,522	1,550	NA
1991	3,368	1,789	1,630	1,325	3,331	10,835	8,505	7,620	13,522	1,621	2,277
1992	3,378	1,594	1,439	1,296	3,290	10,844	7,108	6,243	14,238	1,404	2,416

[a]Fiscal years ending 31 March of the following calendar year. MITI estimates refer to the end of the fiscal year. Toyo Keizai estimates refer the same calendar year (June/July for 1983-1989, December for 1990-1991 and October for 1992); figure for 1980 estimated as number of firms in June 1981 minus firms established from 1980 forward.

[b]Data refer to parent firms owning at least 10% of a foreign affiliate.

[c]Data refer to directly owned affiliates with 10% or larger Japanese ownership shares and indirectly owned affiliates that are majority owned by directly owned affiliates. Data for 1982 and 1984-1985 exclude indirectly owned affiliates; indirectly owned affiliates accounted for 7% of the number of replying affiliates and 3% of affiliate employment in 1980, 9% and 5%, respectively, in 1983, and 8% and 4%, respectively, in 1986. Sample sizes for intermediate expenditures are not calculable for affiliates but, as in the case of parents, are thought to be much smaller than for sales in some years. For example, for directly owned affiliates in 1983, the sales sample was 3,368 but the intermediate expenditure sample was only 2,704.

[d]Since 1990 Toyo Keizai surveys have covered affiliates with Japanese ownership shares of 10 per cent or more; before 1990 the cutoff is unclear.

Source: Japan, Ministry of International Trade and Industry (various years), and Toyo Keizai (various years).

Appendix Table A-2

Japan: Sales and Value Added of Japanese Affiliates in the United States

(Unit: Billions of Yen, Number of Firms)

Year	Sales			Value added			Value added/Sales			No. of Affiliates, all industries[c]
	All industries	Manufacturing	Trade	All industries	Manufacturing	Trade	All industries	Manufacturing	Trade	
MITI SURVEYS[a]										
1983	27,414	2,358	24,700	8,872	1,168	7,424	0.32	0.50	0.30	833
1984	36,781	5,660	30,136	NA	NA	NA	NA	NA	NA	NA
1985	25,199	3,862	20,654	NA	NA	NA	NA	NA	NA	NA
1986	25,969	4,845	20,600	15,060	2,989	11,691	0.58	0.62	0.57	1,107
1987	27,278	5,600	21,000	5,731	1,597	3,926	0.21	0.29	0.19	1,717
1988	31,222	7,249	22,659	4,657	2,020	2,362	0.15	0.28	0.10	1,957
1989	41,491	11,706	28,672	7,109	3,282	3,448	0.17	0.28	0.12	1,720
1990	40,071	11,196	27,459	10,516	4,539	5,024	0.26	0.41	0.18	2,070
1991	37,654	10,072	26,342	16,810	5,965	10,025	0.45	0.59	0.38	1,935
1992	31,576	9,313	20,474	15,540	5,518	8,828	0.49	0.59	0.43	1,602
U.S. BEA SURVEYS[b]										
1980	17,822	844	15,918	1,050	NA	NA	0.06	NA	NA	709
1983	25,318	1,526	22,502	1,866	NA	NA	0.07	NA	NA	799
1984	34,280	2,485	29,920	2,938	NA	NA	0.09	NA	NA	833
1985	27,198	1,994	23,781	2,422	NA	NA	0.09	NA	NA	870
1986	24,462	1,754	21,620	2,014	NA	NA	0.08	NA	NA	953
1987	23,604	1,958	19,160	2,212	550	1,068	0.09	0.28	0.06	1,159
1988	30,891	3,603	23,752	3,223	1,031	1,199	0.10	0.29	0.05	1,378
1989	42,903	6,722	30,585	4,966	1,698	1,701	0.12	0.25	0.06	1,817
1990	45,114	8,656	31,504	5,001	2,127	1,531	0.11	0.25	0.05	2,233
1991	42,989	8,630	28,952	5,325	2,002	2,208	0.12	0.23	0.08	2,472
1992	41,769	8,517	27,971	5,382	2,104	2,349	0.13	0.25	0.08	3,124

[a]For definitional notes, see Appendix Table A-1.

[b]Data refer to nonbank affiliates with 10 per cent or more foreign ownership and their largest ultimate beneficial owners in Japan. Value added data refer to gross product estimates by the source. Original US$ figures converted to Japanese yen using exchange rates in the MITI multinational firms' surveys.

[c]For MITI multinational firms' surveys, number of firms reporting sales.

Source: Japan, Ministry of International Trade and Industry (various years a), (various years b), Lowe (1990), U.S. Department of Commerce (1985b), (1990), (1992b), (1994), and (various issues), and Zeile (1994).

Appendix Table A-3

Japan: Sales and Value Added Estimates for Japanese Parents[a]
(Unit: Billions of Yen)

Year	Sales			Value Added[b]			Value Added/Sales		
	All industries	Manufacturing	Trade	All industries	Manufacturing	Trade	All industries	Manufacturing	Trade
UNADJUSTED									
1980	184,591	79,864	94,551	42,898	37,116	4,213	0.23	0.46	0.04
1983	219,431	91,489	111,945	62,678	51,422	5,669	0.29	0.56	0.05
1984	321,584	172,747	121,143	NA	NA	NA	NA	NA	NA
1985	272,219	114,664	126,028	NA	NA	NA	NA	NA	NA
1986	217,855	91,544	104,722	70,778	57,098	5,785	0.32	0.62	0.06
1987	267,807	119,331	120,473	NA	NA	NA	NA	NA	NA
1988	304,582	138,219	128,843	75,266	58,627	5,786	0.25	0.42	0.04
1989	315,548	125,004	159,502	56,922	46,803	4,958	0.18	0.37	0.03
1990	364,494	154,233	160,167	87,828	62,488	9,527	0.24	0.41	0.06
1991	363,258	151,615	158,758	152,800	79,611	34,965	0.42	0.53	0.22
1992	327,024	144,363	143,852	90,908	79,087	6,721	0.28	0.55	0.05
ADJUSTED[c]									
1980	227,620	98,480	116,591	51,154	40,765	5,251	0.22	0.41	0.05
1983	279,407	116,495	142,542	65,768	50,490	6,593	0.24	0.43	0.05
1984	336,296	180,650	126,685	NA	NA	NA	NA	NA	NA
1985	317,390	133,692	146,940	NA	NA	NA	NA	NA	NA
1986	298,872	125,587	143,666	72,696	55,979	6,777	0.24	0.45	0.05
1987	301,680	134,424	135,711	NA	NA	NA	NA	NA	NA
1988	317,155	143,925	134,161	72,210	58,409	6,052	0.23	0.41	0.05
1989	349,072	138,284	176,448	74,818	54,744	7,471	0.21	0.40	0.04
1990	376,041	159,119	165,241	85,154	63,970	7,935	0.23	0.40	0.05
1991	363,273	151,622	158,765	95,317	64,593	12,729	0.26	0.43	0.08
1992	352,708	155,701	155,150	82,482	67,039	7,055	0.23	0.43	0.05

[a]See Appendix Table A-1 for definitional details.
[b]Value added estimated as sales less intermediate expenditures. For 1988 and 1990-1991, intermediate expenditures are estimated as (IV/IR) where IT=value of imports and IR=ratio of imports to intermediate expenditures. Due to apparent differences in sample sizes across these variables and rounding errors, this induces errors in the value added calculations not present for other years.
[c]See Appendix text for details on the calculation of adjusted values.

Source: See Appendix Tables A-1 and A-2.

Appendix Table A-4

Japan: Sales and Value Added Estimates for Japanese Affiliates
(Unit: Billions of Yen)

Year	Sales			Value added			Value added/Sales		
	All industries	Manufacturing	Trade	All industries	Manufacturing	Trade	All industries	Manufacturing	Trade
UNADJUSTED[a]									
1980	37,940	6,510	30,979	11,136	3,205	7,706	0.29	0.49	0.25
1983	49,914	7,218	41,345	17,157	3,953	12,179	0.34	0.55	0.29
1984	68,933	13,442	52,564	NA	NA	NA	NA	NA	NA
1985	50,953	9,949	38,151	NA	NA	NA	NA	NA	NA
1986	48,166	11,362	35,510	27,478	7,483	19,118	0.57	0.66	0.54
1987	54,809	13,060	39,877	12,673	3,747	7,963	0.23	0.29	0.20
1988	68,427	17,621	48,128	10,440	5,082	4,644	0.15	0.29	0.10
1989	93,178	22,267	66,044	16,038	6,856	7,957	0.17	0.31	0.12
1990	99,806	26,195	69,149	25,926	11,233	11,586	0.26	0.43	0.17
1991	88,737	25,365	58,337	40,887	14,984	22,851	0.46	0.59	0.39
1992	79,007	25,114	48,785	39,347	15,185	21,166	0.50	0.60	0.43
ADJUSTED[b]									
1980	44,834	7,693	36,608	9,619	2,861	5,575	0.21	0.37	0.15
1983	57,392	8,300	47,539	12,891	3,178	7,675	0.22	0.38	0.16
1984	72,350	14,108	55,169	NA	NA	NA	NA	NA	NA
1985	54,173	10,578	40,562	NA	NA	NA	NA	NA	NA
1986	54,190	12,783	39,951	14,629	5,178	8,398	0.27	0.41	0.21
1987	55,408	13,203	40,313	11,198	4,367	5,743	0.20	0.33	0.14
1988	68,422	17,620	48,124	12,752	5,833	5,863	0.19	0.33	0.12
1989	99,224	23,712	70,330	18,881	7,942	8,906	0.19	0.33	0.13
1990	103,452	27,152	71,675	21,498	9,751	9,751	0.21	0.36	0.14
1991	94,510	27,015	62,132	23,439	10,577	11,238	0.25	0.39	0.18
1992	88,363	28,087	54,561	22,573	11,075	10,329	0.26	0.39	0.19

[a]See Appendix Table A-1 for definitional notes regarding the multinational firms' surveys. Note also that data for 1984 and 1985 exclude indirectly-owned affiliates that accounted for 7% of all affiliate sales in 1983 and 8% in 1986.

[b]For details on calculation of adjusted figures see appendix text.

Source: See Appendix Tables A-1 and A-2.

Appendix Table A-5

Japan: Sales or Total Output and Value Added for Japan
(Unit: Billions of Yen)

Year	Sales or Total Output			Value Added			Value Added/Sales		
	All industries	Manufacturing	Trade	All industries	Manufacturing	Trade	All industries	Manufacturing	Trade
ALL CORPORATIONS IN JAPAN[a]									
1980	662,415	229,489	313,737	164,405	69,773	47,667	0.25	0.30	0.15
1983	766,836	260,240	360,230	200,482	82,230	56,508	0.26	0.32	0.16
1984	811,901	283,075	378,607	211,635	89,955	60,201	0.26	0.32	0.16
1985	857,031	295,821	392,407	231,619	95,000	62,497	0.27	0.32	0.16
1986	860,670	272,667	404,049	246,152	92,463	71,117	0.29	0.34	0.18
1987	953,937	300,878	448,820	273,814	103,733	79,388	0.29	0.34	0.18
1988	1,035,465	326,172	471,390	301,925	113,274	85,200	0.29	0.35	0.18
1989	1,093,531	345,425	484,382	315,698	122,623	83,630	0.29	0.35	0.17
1990	1,200,607	375,069	529,832	353,891	132,240	97,218	0.29	0.35	0.18
1991	1,256,101	387,860	550,597	381,881	137,005	107,446	0.30	0.35	0.20
1992	1,230,330	368,516	535,788	387,752	132,702	111,163	0.32	0.36	0.21
NATIONAL ACCOUNTS ESTIMATES (ESTABLISHMENTS)[b]									
1980	544,284	242,496	55,396	239,951	70,232	36,792	0.44	0.29	0.66
1983	614,674	264,895	61,900	279,169	81,416	41,774	0.45	0.31	0.67
1984	647,176	279,496	64,698	300,429	89,245	41,977	0.46	0.32	0.65
1985	674,321	287,810	65,896	320,258	94,673	42,836	0.47	0.33	0.65
1986	675,725	275,271	67,189	334,450	96,262	43,567	0.49	0.35	0.65
1987	696,821	274,715	70,158	349,516	99,297	45,540	0.50	0.36	0.65
1988	746,587	296,560	74,306	373,137	106,649	48,010	0.50	0.36	0.65
1989	810,513	322,246	78,391	398,238	114,455	50,377	0.49	0.36	0.64
1990	877,125	348,072	84,913	426,559	123,443	54,501	0.49	0.35	0.64
1991	924,561	366,078	90,286	451,873	131,336	57,830	0.49	0.36	0.64
1992	926,688	351,620	92,326	461,334	129,570	59,273	0.50	0.37	0.64

[a]Data refer to fiscal years ending March 31 of following calendar year. Data in "sales or total output" columns refer to sales. Value added is estimated as sales less cost of sales plus labor costs.
[b]Data refer to calendar years. Data in "sales or total output" columns refer to total output, including intermediate expenditures. Value added is evaluated at producer prices.

Source: Japan, Economic Planning Agency (various years), and Japan, Ministry of Finance (various years).

Appendix B

Host Country Production Data for Foreign-Owned Firms: Developed Countries

Appendix Table B-1

Gross Product of Foreign-Owned Nonbank Affiliates in the U.S. and U.S. Aggregate Gross Product

	Affiliate Gross Product				Aggregate U.S. GDP			
		Manufacturing					Manufacturing	
	Total[a]	Excl. Petrol. & Coal Products	Incl. Petrol. & Coal Products	Manufacturing and Petroleum[b]	Total	Nonbank U.S. Business[c]	Incl. Petrol. & Coal Products	Excl. Petrol. & Coal Products
	$ Million				$ Billion			
1974	23,900[d]	11,121		17,007	1,458.6	1,100.4[d]	355.3[b]	
1977	35,222	16,672	23,053	24,326	1,974.1	1,555.0	466.8	452.9
1978	42,920	20,403		29,666	2,232.7	1,733.7	521.9	507.0
1979	55,424	26,429		38,298	2,488.6	1,921.0	575.7	549.7
1980	70,906	30,981		47,969	2,708.0	2,069.9	588.3	564.0
1981	98,828	47,117	65,886	68,453	3,030.6	2,364.5	653.0	624.6
1982	103,489	47,189		67,642	3,149.6	2,412.0	647.5	622.0
1983	111,490	52,461		72,362	3,405.0	2,576.1	693.3	667.2
1984	128,761	61,423		82,205	3,777.2	2,937.6	773.9	752.3
1985	134.852	62,536		83,698	4,038.7	3,128.4	796.5	775.0
1986	142,120	65,794		82,959	4,268.6	3,275.5	829.3	803.5
1987[f]	157,869						878.4	852.5
1987[g]	157,869	75,503	91,271	94,153	4,539.9	3,479.9	877.8	851.9
1988	190,384	90,877		112,325	4,900.4	3,775.8	961.0	920.3
1989	223,420	109,198		133,414	5,250.8	4,016.8	1,004.6	966.1
1990	239,279	119,849		146,527	5,546.1	4,222.8	1,024.7	984.6
1991	257,634	125,934	144,116	150,639	5,724.8	4,321.7	1,032.5	988.2
1992	266,333[e]	134,127	153,094	159,680	6,020.2	4,514.1	1,063.0	1,019.6
1993	290,427	143,587	162,654	169,769	6,343.3	4,761.1	1,118.3	1,070.6

[a]Nonbank foreign affiliates
[b]Including all petroleum affiliate activities, such as crude production refining, transport, wholesale trade, and retail trade.
[c]Excludes GDP of depository institutions, government and government enterprises, and private households, imputed GDP of owner-occupied housing, rental income of persons, business transfer payments, subsidies, and the statistical discrepancy.
[d]Excluding banking.
[e]Excludes savings institutions and credit unions.
[f]Based on 1972 SIC
[g]Based on 1987 SIC

Source: Howenstine (1979), Lowe (1990), Parker (1993), U.S. Department of Commerce (1992a), (1992b), and (1994), Yuskavage (1994)and (1995), Zeile (1994) and Zeile (1995), and unpublished data of the Bureau of Economic Analysis, U.S. Department of Commerce.

Appendix Table B-2

United Kingdom: Output of Foreign-Owned and All Private Manufacturing Enterprises and Aggregate GDP, 1977-1991
(Unit: £ million)

	Net Output		Gross Value Added at Factor Cost		
	Foreign Enterprises	All Enterprises	Foreign Enterprises	All Enterprises	Aggregate GDP
1977	9,651	48,578	8,298	42,002	145,660
1979	13,436	63,349	11,531	53,849	197,830
1981	13,099	70,614	10,602	57,935	254,270
1983	15,332	80,804	12,235	65,753	303,520
1984	17,120	84,321	13,724	68,096	324,840
1985	17,279	91,706	13,866	74,255	356,170
1986	17,392	98,184	13,727	79,307	383,630
1987	20,298	106,544	16,086	85,624	421,890
1988	22,386	120,864	17,753	97,389	469,760
1989	28,430	132,355	22,301	105,913	514,240
1990	31,116	138,984	24,064	110,525	549,390
1991	30,475	135,208	22,818	105,094	573,560

Source: United Kingdom (1994) and earlier issues of the same report, United Nations (1992) and (1994), and World Bank (1995).

Appendix Table B-3

Canada: Sales or Operating Revenue of Foreign-Owned and All Canadian Firms and Canadian GDP (Million Canadian Dollars)

	Sales or Operating Revenue						
	All Industries		Non-Financial Industries		Manufacturing Industries		GDP At Cur. Market Prices
	Foreign-Owned	Total	Foreign-Owned	Total	Foreign-Owned	Total[b]	
1963	24,355		23,767		15,715		46,542
1964	26,305		25,877		17,334	30,856	50,884
1965	30,073		29,478		10,561	33,889	56,040
1966	33,967		33,307		21,904	37,303	62,597
1967	36,730		35,958		23,535	38,955	67,258
1968	41,301		40,380		25,912	41,997	73,325
1969						45,938	83,030
1970					23,456[b]	45,992	89,120
1971						49,183	96,550
1972					29,072[b]	55,489	107,790
1973							126,420
1974							150,960
1975							170,110
1976							196,290
1977			123,005	353,791	73,757[c]	130,201	216,090
1978			136,014	402,843	83,477[c]	149,828	239,580
1979							274,090
1980							307,730
1981							353,450
1982							371,820
1983							402,230
1984							441,310
1985							474,340
1986							501,430
1987							546,780
1988	299,538	1,177,141	269,973	1,055,028	194,078	574,972	600,840
1989	318,936	1,250,876	284,964	1,106,196	205,900	589,670	645,150
1990	327,452	1,256,193	290,825	1,097,379	204,618	573,215	662,810
1991	321,847	1,201,935	285,535	1,043,962	203,135	544,791	667,410
1992	325,186	1,176,202	290,741	1,026,759	207,204	543,874	681,340

Source:

GDP from World Bank (1976), (1980), (1991), (1993), (1995)
Sales from: Canada, Dept. of Trade and Industry (1974a), pp. 90-92 and (1974b), pp. 58-59
Canada, Statistics Canada (1972), (1980), and (1992).

Notes to Appendix Table B-3

[a]In 1964-1972, firms with assets of $5 million or more and more than 50 per cent ownership by a single foreign owner.

[b]Shipments by manufacturing establishments.

[c]Assets greater than $250,000 or sales greater than $500,000 and foreign ownership of 50 per cent or more.

[d]On an establishment basis, the value of shipments and value added were as follows: (Canada, Statistics Canada, 1972)

	1972	1970
Value of shipments		
Foreign-Owned firms, all activities	34,597	
Foreign-Owned firms, manufacturing activity	29,072	23,456
All firms, all activities	64,360	
All firms, manufacturing activity	56,191	46,381
Value added		
Foreign-Owned firms, all activities	13,363	
Foreign-Owned firms, manufacturing activity	12,131	
All firms, all activities	25,981	
All firms, manufacturing activity	24,265	

Appendix B-4

Norway: Output of Foreign-Owned and All Establishments in Manufacturing and Aggregate GDP, 1972-1990
(Unit: million Norwegian Kronor)

	Manufacturing			
	Value Added at Factor Prices		Value Added at Market Prices	Aggregate
	Foreign-owned	Total	Total	GDP
	(1)	(2)	(3)	(4)
	Foreign Ownership ≥ 50%, Four Industries[a]			
1952[b]	304.9	757.1	5,681	19,037
1957[b]	400.8	1,094.6	7,500	29,148
1961[b]	423.3	1,457.6	9,525	35,632
	Foreign Ownership ≥ 50%, All Mfg. Industries			
1962[b]	611.6	9,513.3		38,442
1962[c]	580.8	9,139.3		38,442
	Foreign Ownership ≥ 20%, All Mfg. Industries			
1962[b]	1,103.0	9,513.3		38,442
1962[c]	1,077.3	9,139.3		38,442
1972	3,053.2	20,781.9		98,400
1973	4,482.4	24,277.3		111,850
1974	5,336.1	29,293.7		129,730
1975	5,629.8	32,719.7	30,762	148,700
1976	5,936.8	35,687.7	32,655	170,710
1977	6,568.8	38,131.2	34,189	191,530
1978	7,074.0	39,748.0	35,791	213,080
1979	9,486.2	46,269.3	41,748	238,670
1980	6,845.2	47,654.0	43,712	285,050
1981	7,155.4	49,997.2	46,682	327,670
1982	6,988.4	52,567.7	49,580	362,270
1983	6,028.8	56,815.3	53,777	402,199
1984	6,547.4	63,873.6	61,143	452,512
1985	6,381.2	67,808.6	65,845	500,199
1986	8,195.0	72,744.1	70,406	513,718
1987	8,585.2	79,951.4		561,480
1988	NA	NA		583,277
1989	11,621.2	85,575.7		621,383
1990	9,443.5	84,440.8		660,551

[a]Electrochemical, Other chemical, exc. oil refining, Basic metals, exc. iron & steel, and electrotechnical
[b]VA at market prices
[c]VA at factor prices

Source: Stonehill (1965); Norway, Statistisk Sentralbyrå (1968), (1978), and (1988) and earlier issues, and unpublished data from Statistisk Sentralbyrå, Oslo; United Nations (1994); and World Bank (1995).

Appendix Table B-5

Sweden: Measures of Output and Employment in Foreign-Owned Establishments in Manufacturing, 1971-1990

	Establishments in Enterprises with Majority Foreign Ownership		Establishments in Enterprises with 20% or More Foreign Ownership	
	Value Added	Employment	Value-Added	Employment
	Foreign-Owned and % of Total (MKr.)	Foreign-Owned and % of Total	Foreign-Owned and % of Total (MKr.)	Foreign-Owned and % of Total
1971	3,097.8(6.2)	40,916(4.6)		
1972	3,447.2(6.3)	43,565(5.0)	5,966.7(10.9)	80,387(9.2)
1973	4,122.9(6.4)	46,594(5.2)	6,878.1(10.7)	83,677(9.4)
1974	5,323.3(6.7)	51,314(5.6)	8,762.0(11.0)	85,919(9.4)
1975	5,592.0(6.4)	52,677(5.7)	8,909.4(10.2)	85,468(9.2)
1976	6,553.7(6.9)	52,450(5.7)	10,462.1(11.0)	85,621(9.3)
1977	6,905.1(7.0)	51,232(5.8)	11,559.1(11.7)	86,067(9.7)
1978	7,900.8(7.5)	51,378(6.0)	13,079.3(12.5)	86,061(10.0)
1986	30,659.5(13.5)[a]			
1990	54,026.1(17.0)[a]			

[a]Manufacturing only

Source: Sweden, Statistiska Centralbyrån, 1993 and earlier issues in the same series.

Appendix Table B-6

Sweden: Measures of Employment and Value Added
in Foreign-Owned Enterprises and GDP, 1970-1992

	Enterprises with majority foreign ownership			Enterprises with 20 per cent or more foreign ownership			
	Manufact.	All Industries		Manufact.	All Industries		GDP
	Empl.(000) % of Total	Empl.(000) % of Total	VA % of Total	Empl.(000) % of Total	Empl.(000) % of Total	VA % of Total	(Billion Kr.)
1970	42.1(4.5)	82.0(4.1)		73.1(7.9)	130.4(6.6)		
1971	43.8(4.7)	90.0(4.5)	5.3	79.0(8.5)	144.4(7.1)	8.1	187.3
1972	44.3(4.9)	89.8(4.6)	5.3	79.6(8.8)	143.2(7.3)	8.3	205.0
1973	49.5(5.3)	96.8(4.7)	5.9	87.5(9.3)	153.4(7.5)	9.7	229.3
1974	52.7(5.6)	99.0(4.9)	5.8	91.9(9.8)	162.0(8.0)	9.0	259.0
1975	53.3(5.7)	99.5(4.9)	5.3	84.0(8.9)	154.8(7.6)	7.8	304.2
1976	53.8(5.7)	102.5(4.9)	5.2	84.9(9.1)	161.6(7.8)	7.8	344.1
1977	48.9(5.4)	104.2(4.4)	5.4	82.1(9.0)	171.1(7.2)	8.5	374.2
1978			5.3			8.5	417.1
1979	53.9(5.8)	105.6(4.4)	6.1	86.3(9.4)	171.3(7.2)	9.5	467.5
1980	56.1(6)	114.2(6)					531.1
1985	75.7(9)	139.7(7)					866.6
1986							947.3
1987	90.9(11)	154.2(7)					1,023.6
1988							1,114.5
1989	121.1(14)	202.0(9)					1,232.6
1990	123.9(14)	206.0(9)					1,359.9
1991	133.6(16)	229.6(10)					1,447.3
1992	128.0(17)	223.7(10)					1,441.7

Source: Enterprise data from Sweden, Statistiska Centralbyrån (1993) and earlier issues in the same series.

GDP from World Bank (1995) and earlier issues.

Appendix Table B-7

Japan: Value Added Estimates for Foreign-owned Firms in Japan, Corporations in Japan, and Japan's GDP
(Unit: Billions of Yen)

Year	Value Added in Foreign Owned Firms: All industries	Manufacturing	Trade	Corporate Value Added in Japan: All industries	Manufacturing	Trade	Japan's GDP, all industries
FOREIGN EQUITY SHARES ≥ 25%							
1977	3,365	2,732	526	116,623	53,226	31,715	185,622
1978	3,358	2,831	442	125,960	55,064	34,913	204,404
1979	3,271	2,732	487	147,021	64,893	41,222	221,546
1980	3,693	2,934	659	164,405	69,773	47,667	240,177
1981	4,483	3,843	582	178,506	77,064	51,075	257,963
FOREIGN EQUITY SHARES ≥ 50%							
1982	2,843	2,183	584	186,214	77,244	52,623	270,602
1983	3,812	3,188	533	200,482	82,230	56,508	281,767
1984	3,262	2,762	413	211,635	89,955	60,201	300,543
1985	2,572	2,159	225	231,619	95,000	62,497	320,419
1986	4,075	3,414	547	246,152	92,463	71,117	334,609
1987	4,136	3,455	604	273,814	103,733	79,388	348,425
1988	4,627	3,701	800	301,925	113,274	85,200	371,428
1989	4,757	3,852	813	315,698	122,623	83,630	396,197
1990	4,778	3,674	800	353,891	132,240	97,218	424,538
1991	5,131	3,882	1,011	381,881	137,005	107,446	450,795
FOREIGN EQUITY SHARES ≥ 33%							
1991	5,732	4,029	1,433	381,881	137,005	107,446	450,795
1992	5,024	3,594	1,204	387,752	132,702	111,163	464,933

Source: Japan, Ministry of International Trade and Industry (various years c), Japan, Ministry of Finance (various years), and World Bank (1995) and earlier issues.

Appendix Table B-8

Australia: Value Added in Foreign-Owned or Foreign-Controlled Manufacturing Establishments, 1972-73 to 1986-87
(Unit: $ A Million)

	1972-73	1975-76	1982-83	1986-87
Manufacturing Industry, by Control				
Foreign (excluding joint) control	3,437.1		9,976.2	13,998.2
Joint Foreign and Australian Control	249.5		371.8	619.5
Naturalized or Naturalizing	NA		405.3	527.0
Total Foreign Control	NA		10,753.3	15,144.7
TOTAL FOREIGN & DOMESTIC	10,746.0		31,059.1	45,508.8
Largest 200 Enterprise Groups in Manufacturing industry, by Control				
Foreign (excluding joint) control	2,334.4	3,508.6		
Joint Foreign-Australian Control	132.2	201.8		
Total Foreign & Joint Control	2,466.6	3,710.3		
Total Largest 200 Enterprise Groups	5,428.8	8,533.9		
Total Manufacturing Industry	10,640.1[a]	16,921.0		
Manufacturing Industry, by Ownership				
Foreign Ownership				
Direct Foreign Ownership	2,976.8		8,820.5	11,741.9
Other Identified Foreign Ownership	379.2		1,382.7	2,333.8
Total Foreign Ownership	3,356.0		10,203.1	14,075.7
TOTAL FOREIGN & DOMESTIC	10,746.0		31,059.1	45,508.8
GDP[b]	49,185	82,250	183,365	281,745

[a]Adjusted to a basis comparable with 1975-76 by excluding establishments in single establishment enterprises with fewer than four employees.

[b]Averages of pair of years.

Source: Australian Bureau of Statistics (1978b), "Foreign Ownership and Control of the Manufacturing Industry, Australia," various years, United Nations (1994), and World Bank (1995) and earlier issues.

Appendix Table B-9

Australia: Value Added in Foreign-Controlled, or Foreign-Owned, and All Mining Establishments, 1971-72 to 1984-85
(Unit: $ A Million)

	Foreign or Joint Control						
	Total	Foreign Control[a]	Joint Foreign & Australian Control[b]	Naturalized or Naturalizing	Foreign Ownership	All Mining	GDP
1971-72	785.3					1,428.5	42,040
1972-73	922.3					1,597.3	49,185
1973-74	1,202.2					1,996.1	59,200
1974-75	1,604.7				1,381.5	2,669.1	70,785
1976-77	2,099.8					3,561.8	91,555
1981-82	3,887.2	2,007.1	1,501.2	378.9	3,441.9	6,716.1	165,055
1982-83	4,609.1	2,245.8	1,625.1	738.2	4,104.1	8,146.6	183,365
1984-85	5,464.3	1,613.1	2,636.3	1,214.9	4,741.1	10,609.9	228,115

[a]A single foreign resident investor or foreign-controlled enterprise held at least 25% of the paid-up value of voting shares in the enterprise, provided that there was no larger holding by an Australian controlled enterprise or Australian resident individual.

[b]Equal holding by foreign and Australian controlled enterprises or individuals.

Source: Australian Bureau of Statistics (1978) and other issues, and World Bank (1995) and earlier issues.

Appendix C

Host Country Production Data for Foreign-Owned Firms: Developing Countries

Appendix Table C-1

China: Gross Value of Output for Industry
(Unit: Millions of Yuan)

	China, total		Guangdong Province		
	All firms	Firms other than state-, collective- and individually-owned	All firms	Firms other than state-, collective- and individually-owned	Foreign firms
1980	515,426	2,449	23,435	450	NA
1981	539,978	3,140	NA	NA	NA
1982	581,122	3,940	NA	NA	NA
1983	646,044	5,040	NA	NA	NA
1984	761,730	7,670	NA	NA	NA
1985	971,647	11,741	50,508	2,325	NA
1986	1,119,426	16,306	NA	NA	NA
1987	1,381,299	27,877	NA	NA	NA
1988	1,822,458	49,532	NA	NA	NA
1989	2,201,706	75,844	NA	NA	NA
1990	2,392,436	104,756	160,932	39,161	13,440
1991	2,824,801	159,958	207,178	60,334	55,938
1992	3,706,571	263,358	276,915	93,120	88,208
1993	NA	NA	371,564	162,757	123,380

Source: China, State Statistical Bureau (1993), (1994), and (various years).

Appendix Table C-2

Hong Kong: Production-related Indicators for Manufacturing Establishments
(Unit: HK$ Millions)

Year	Total sales		Gross value of output		Value added	
	All establishments	Foreign establishments[a]	All establishments	Foreign establishments[a]	All establishments	Foreign establishments[a]
1983	168,807	22,588	170,681	23,049	44,140	5,631
1984	205,115	30,234	283,340	38,189	52,741	6,849
1985	191,314	25,006	177,006	21,091	50,287	5,365
1986	245,183	35,800	227,225	30,265	62,779	8,016
1987	312,811	45,682	283,340	38,189	75,761	10,196
1988	349,720	57,303	315,940	47,317	83,182	11,890
1989	369,712	62,424	325,411	49,153	89,645	13,100
1990	377,565	74,385	322,180	55,101	92,241	14,920
1991	377,111	70,410	324,218	54,146	92,693	15,996
1992	385,844	72,881	331,243	56,405	97,445	16,627

[a]Establishments with foreign-ownership shares of 50% or more.

Source: Hong Kong, Census and Statistics Department (1993a) and earlier years.

Appendix Table C-3

Malaysia: Production-related Indicators for Manufacturing Establishments
(Unit: M$ Millions)

Year	Gross Output		Value Added	
	All establishments	Foreign establishments[a]	All establishments	Foreign establishments[a]
1968	3,079	1,449	874	422
1969	3,280	1,717	992	547
1970	3,930	2,001	1,182	628
1971	4,164	2,276	1,266	735
1972	5,120	2,653	1,525	860
1973	7,678	3,804	2,327	1,234
1974	10,113	5,293	2,759	1,477
1975	10,733	5,386	3,024	1,462
1976	13,625	6,790	3,681	1,904
1977	15,726	7,178	4,437	1,987
1978	18,549	8,611	5,302	2,344
1979	24,671	10,839	6,742	2,834
1980	NA	NA	NA	NA
1981	38,278	15,504	NA	NA
1982	37,627	15,039	NA	NA
1983	41,474	17,494	10,587	3,817
1984	46,256	17,842	12,301	4,058
1985	45,586	16,377	12,115	3,903
1986	42,427	15,561	12,154	4,062
1987	50,700	20,273	13,317	4,665
1988	65,197	26,545	16,259	5,997
1989	80,802	35,336	20,592	8,259
1990	95,814	43,660	24,530	10,308
1991	120,298	57,890	31,140	13,539

[a]Majority foreign owned, including 50-50 joint ventures.

Source: Malaysia, Department of Statistics (no date a), (no date b), (various years a), (various years b), (various years c), (various years d), and (various years e).

Appendix Table C-4

Malaysia: Production-related Indicators for Limited Companies
(unit: M$ millions)

	All industries			
	Total sales		Value added[a]	
Year	All firms	Foreign firms[b]	All firms	Foreign firms[b]
1969	13,008	7,402	2,969	1,886
1970	14,079	7,828	3,106	1,871
1971	14,910	7,897	3,662	2,073
1972	16,805	8,795	4,459	2,416
1973	21,689	11,258	6,674	3,702
1974	30,191	15,626	8,762	5,007
1975	31,855	14,452	8,770	4,382
1976	43,318	19,057	12,119	5,595
1977	50,033	19,315	14,089	6,056
1978	59,504	21,841	16,708	6,849
1979	61,201	25,097	19,856	7,993
1980	80,657	31,897	23,912	9,421
1981	88,716	35,753	26,772	10,616
1982	94,987	35,507	28,770	10,772
1983	107,876	38,576	35,025	12,935
1984	121,734	40,611	40,903	13,920
1985	124,658	37,639	39,036	12,275
1986	109,220	31,761	34,365	10,743
1987	117,038	36,236	38,127	12,538
1988	140,963	44,243	43,188	13,820
1989	175,070	56,078	54,784	16,942
1990	235,530	71,173	68,962	20,782
1991	279,365	87,277	83,246	25,079

[a]Value added estimated as total sales less purchases of raw materials and parts.

[b]Foreign controlled limited companies incorporated in Malaysia and Malaysian branches of companies incorporated abroad.

Source: Malaysia, Department of Statistics (various years f).

Appendix Table C-5

Malaysia: Production-related Indicators for Limited Companies
(unit: M$ millions)

	Manufacturing			
	Total sales		Value added[a]	
Year	All firms	Foreign firms[b]	All firms	Foreign firms[b]
1969	4,789	3,026	916	528
1970	4,754	2,998	989	677
1971	5,026	3,127	1,138	692
1972	5,718	3,472	1,352	788
1973	7,637	4,359	2,095	1,127
1974	10,856	6,468	2,619	1,504
1975	11,330	5,667	2,588	1,347
1976	15,344	7,258	3,471	1,634
1977	18,038	8,003	4,036	1,767
1978	20,712	9,348	4,857	2,154
1979	21,803	11,209	4,934	2,513
1980	27,528	13,765	6,019	2,991
1981	31,345	15,385	6,560	3,186
1982	31,955	15,358	6,850	3,246
1983	36,055	16,701	8,449	3,730
1984	42,922	17,764	10,786	4,124
1985	40,998	15,508	10,670	3,655
1986	37,814	15,331	10,855	3,936
1987	43,538	19,164	12,228	4,830
1988	55,305	24,783	14,370	5,837
1989	69,366	32,983	18,115	7,314
1990	87,938	42,227	23,289	9,436
1991	108,478	54,556	28,524	12,288

[a]Value added estimated as total sales less purchases of raw materials and parts.

[b]Foreign controlled limited companies incorporated in Malaysia and Malaysian branches of companies incorporated abroad.

Source: Malaysia, Department of Statistics (various years f).

Appendix Table C-6

Korea: Production-related Indicators for Foreign Firms and for the Korean Economy
(Unit: Billion Won)

	Foreign firms[a]				Korea[b]			
	Total sales		Value Added[c]		Gross Value of Output		Value Added	
Year	All industries	Manufacturing	All industries	Manufacturing	All industries	Manufacturing	All industries	Manufacturing
1974	1,168	1,141	210	189	16,730	8,604	7,669	1,992
1975	1,714	1,675	395	366	21,949	11,236	10,302	2,687
1976	2,471	2,424	657	623	29,232	15,461	14,101	3,889
1977	3,166	3,054	1,002	914	36,912	19,494	18,074	4,973
1978	4,177	4,023	1,293	1,169	49,649	26,284	24,327	6,831
1984	NA	11,809	NA	2,385	159,580	88,560	72,644	22,375
1985	NA	13,129	NA	2,851	174,638	95,598	80,847	24,530
1986	NA	16,549	NA	3,538	199,529	112,258	93,426	29,579

[a]The definition of foreign firms is unclear from the original sources, but minority-foreign firms are known to be included in estimates for 1984-1986.
[b]National accounts estimates.
[c]Estimated as total sales less purchases of raw materials.

Source: Koo (1982), Korea, Ministry of Finance (1987), and Bank of Korea (1991).

Appendix Table C-7

Singapore: Production-related Indicators for Manufacturing Establishments
(Unit: S $ Millions)

	Majority-foreign establishments				All establishments			
Year	Total sales	Gross output	Gross value added	Net value added	Total sales	Gross output	Gross Value added	Net value added
1975	8,899	8,987	2,138	NA	12,401	12,610	3,411	NA
1976	11,421	11,196	2,539	NA	15,557	15,317	3,962	NA
1977	12,692	12,852	2,917	NA	17,391	17,518	4,475	NA
1978	14,050	14,069	3,276	NA	19,556	19,667	5,163	NA
1979	18,608	18,658	4,514	NA	25,173	25,297	6,703	NA
1980	22,873	23,329	5,744	4,514	30,947	31,658	8,522	6,898
1981	27,747	27,962	6,580	5,118	36,543	36,787	9,721	7,752
1982	26,661	26,886	6,228	4,732	36,437	36,467	9,356	7,198
1983	26,647	26,620	6,209	4,819	37,411	37,222	9,822	7,254
1984	28,685	29,109	7,005	5,516	40,911	41,078	11,106	8,119
1985	26,968	27,083	6,926	5,226	38,385	38,506	10,687	7,805
1986	26,083	25,815	7,843	6,673	37,578	37,259	11,900	9,075
1987	34,467	34,420	10,448	8,134	45,889	45,943	14,433	10,995
1988	42,352	42,364	12,846	9,886	56,286	56,470	17,918	13,660
1989	48,468	48,516	14,476	11,190	63,306	63,626	19,676	15,039
1990	54,330	54,118	15,710	12,252	71,648	71,333	21,607	16,502
1991	56,260	56,140	16,937	12,949	74,699	74,575	23,450	17,765
1992	57,709	57,340	17,481	12,565	77,767	77,276	24,911	18,090

Notes: Gross value added is gross output less materials, work given out, utilities, fuel, and transportation charges. Net value added is gross value added less other (unspecified) operating costs.

Source: Singapore, Department of Statistics (various years).
Singapore, Economic Development Board (various years a) and (various years b).

Appendix Table C-8

Taiwan: Production-related Indicators for Foreign Firms and the Taiwanese Economy
(Unit: NT $ Billions)

	Foreign Firms[a]						Taiwan[b]					
	Total Sales		Value Added 1[c]		Value Added 2[c]		Total Value of Output			Value Added		
Year	All industries	Selected manufacturing[d]	All industries	All manufacturing	All industries	Selected manufacturing[d]	All industries	All manufacturing	Selected manufacturing[d]	All industries	All manufacturing	Selected manufacturing[d]
1974	105	97	34	32	NA	NA	1,226	675	629	550	180	160
1975	106	100	38	35	NA	NA	1,281	680	639	590	182	164
1976	144	135	46	43	NA	NA	1,575	861	809	708	239	212
1977	169	158	59	55	NA	NA	1,844	1,000	941	829	284	244
1978	227	214	80	75	NA	NA	2,338	1,404	1,281	992	353	307
1979	302	287	101	95	124	116	2,859	1,729	1,582	1,196	429	376
1980	353	337	100	96	133	123	3,642	2,178	2,001	1,491	537	475
1981	391	372	109	101	151	139	4,226	2,455	2,251	1,774	632	560
1982	372	348	108	99	125	111	4,411	2,521	2,311	1,900	670	595
1983	332	308	142	122	132	116	4,924	2,874	2,623	2,100	755	673
1984	552	505	205	192	264	228	5,560	3,337	3,037	2,343	880	784
1985	421	375	141	125	194	155	5,735	3,401	3,096	2,474	930	829
1986	500	458	203	176	198	162	6,441	3,883	3,511	2,855	1,133	1,012
1987	601	536	257	213	252	202	7,336	4,148	3,743	3,223	1,272	1,139
1988	699	582	397	299	366	265	8,099	4,396	3,981	3,497	1,322	1,182
1989	881	668	488	316	474	291	8,826	4,539	4,109	3,879	1,380	1,233
1990	985	797	589	296	328	374	9,361	4,553	4,123	4,222	1,450	1,294
1991	1,191	916	368	161	516	345	10,246	4,900	4,443	4,704	1,619	1,449

[a]Foreign firms are defined as all firms with foreign equity participation.
[b]National accounts estimates
[c]Value added 1 are estimates given by the original source equal to total income less expenditures for raw materials and parts, electricity and energy, and other intermediate consumption. Value added 2 are estimates calculated as total sales less expenditures for raw materials and parts only. There are unusually large differences between these two measures in 1990 and 1991. In addition, the ratio of value added to sales is exceptionally low in 1991 for Value Added 1 and in 1990 for Value Added 2. For both reasons, the estimates for these two years should not be given much credence.
[d]Selected manufacturing is total manufacturing less paper and printing, precision machinery, and miscellaneous manufacturing.

Source: Republic of China, Investment Commission (various years a) and Republic of China, Directorate General of Budget, Accounting and Statistics (various years b)

Appendix Table C-9

India: Value Added in Foreign-controlled Rupee Companies and Indian GDP[a]
(Unit: Millions of Rupees)

	Foreign-controlled Companies		Indian GDP	
Year	All industries	Manufacturing[b]	All industries	Manufacturing
1975	12,481	9,053	712,100	118,600
1976	14,932	NA	765,400	131,200
1977	15,905	NA	873,500	147,000
1978	17,495	NA	938,800	169,200
1979	19,333	13,533	1,024,400	193,800
1980	20,947	15,143	1,224,300	216,400
1981	NA	NA	NA	NA
1982	20,008	14,591	1,594,000	280,700
1983	22,911	16,708	1,867,200	330,400
1984	35,117	21,736	2,085,300	372,400
1985	40,950	25,326	2,338,000	417,800
1986	46,603	29,704	2,600,300	461,700
1987	52,587	33,243	2,948,500	528,700

[a]All data refer to fiscal years ending March 31 of the following calendar year (national accounts and foreign firm data).

[b]Data refer to the sum of 3 manufacturing categories: textiles (including apparel), chemicals, and engineering (metal products and machinery).

Source:
Reserve Bank of India Bulletin,
Finances of Foreign-Controlled Rupee Companies and Branches of Foreign Companies, 1975-76 to 1980-81, August 1984, pp. 291-360. (1975-80 data)
Finances of Foreign-Controlled Rupee Companies, 1982-83 to 1984-85, June 1988, pp. 419-503 (1982-83 data).
Finances of Foreign-Controlled Rupee Companies, 1984-85 to 1985-87, August 1991, pp. 701-748 (1984 data).
Finances of Foreign-Controlled Rupee Companies, 1985-86 to 1987-88, April 1992, pp. 417-464 (1985-87 data).
India, Central Statistical Organization as reported in Asian Development Bank, various years, Key indicators of Developing Asian and Pacific Countries, Vol. 24-25 (1993-1994 issues). Manila: Oxford University Press

Appendix Table C-10

Indonesia: Foreign Shares of Total Value Added in Indonesian Manufacturing
(Units: Shares in Per Cent, Value Added in Billions of Rupiah)

Year	Foreign shares,[a] based on industrial census data: All manufacturing	Foreign shares,[a] based on industrial census data: Nonoil manufacturing	Value added, national accounts estimates, All manufacturing	Value added, industrial census estimates, nonoil manufacturing
1975	19	21	1,124	483
1976	25	28	1,453	646
1977	26	29	1,817	775
1978	23	26	2,420	1,006
1979	21	25	3,311	1,288
1980	22	28	5,288	2,128
1981	22	28	7,067	2,713
1982	20	26	7,482	2,970
1983	19	24	9,896	3,379
1984	14	19	13,113	4,474
1985	13	18	15,503	7,204
1986	14	18	17,185	8,343
1987	15	18	21,150	10,238
1988	14	17	26,252	12,646
1989	16	19	30,323	16,919
1990	15	19	38,910	22,830

[a]Foreign firms are establishments of wholly foreign and foreign-private joint ventures. Industrial census data refer to establishments with 20 or more workers.

Source: Foreign Shares from Indonesia, Biro Pusat Statistik tapes as processed by Aswicahyono, et al. (1994). Nonoil Manufacturing Value Added from United Nations Statistical Division (1993) and Indonesia, Biro Pusat Statistik (1992). National Accounts estimates from Bank Indonesia and Biro Pusat Statistik as cited in Asian Development Bank (various years).

Appendix Table C-11

Thailand: Production-related Indicators for Foreign Firms in Nonoil Manufacturing and Corresponding Estimates for the Total Thai Economy (Unit: Millions of Baht)

	Foreign Firms		Thailand					
Year	Total sales	Value added[a]	Total income, national accounts estimates	Gross output, industrial statistics estimates	Gross output, UNIDO estimates	Value added, national accounts estimates	Value added, industrial statistics estimates	Value added, UNIDO estimates
FOREIGN FIRMS PROMOTED BY THE BOARD OF INVESTMENT								
1974	20,437	8,230	NA	NA	209,452	52,994	NA	70,093
1986	58,383	33,139	698,392	552,068	870,961	248,791	203,528	291,524
1990	254,633	87,383	1,590,185	2,154,248	NA	592,025	738,040	NA
PROMOTED AND NON-PROMOTED FOREIGN FIRMS								
1990	499,735	181,255	1,590,185	2,154,248	NA	592,025	738,040	NA

[a]Value added calculated as total sales minus raw materials and parts for 1974 and 1986; for 1990, expenses on electricity, fuel, water, and parts also deducted.

Source: Foreign firms' estimates for 1974 and 1986 Tambunlertchai and Ramstetter (1991). Foreign firms' estimates for 1990 from compilations of firm level data; for details on this data set see Ramstetter (1994, Appendix A). National accounts estimates from Thailand, National Economic and Social Development Board (various years). Industrial statistics estimates from Thailand, National Statistical Office (various years). UNIDO estimates from UNIDO (1988).

Appendix Table C-12

Brazil: Output in Foreign-Owned and All Manufacturing Firms, Various Years
(Million U.S. $)

	1977	1980	1982	1989	1990	1991
Gross Output						
Foreign-owned firms	NA	52,250	NA	NA	NA	NA
All firms	122,772	183,340	NA	NA	NA	NA
Value-Added						
U.S. MOFA's	5,169	NA	9,572	14,167	12,938	9,887
All firms	49,385	74,250	77,539	110,240	125,148	107,656

Source: Gross output for 1980 from Willmore (1986). Other data from Industrial Statistic Yearbook and Mataloni and Goldberg (1994).

Appendix Table C-13

Mexico: Output in Foreign-Owned and All Manufacturing Firms, Various Years
(Million U.S. $)

	1970	1975	1977	1982	1989	1990
Value Added						
Foreign-owned firms	2,235	4,687	NA	NA	NA	NA
U.S. MOFA's	NA	NA	1,646	2,879	4,123	4,984
All firms	6,650	15,098	17,973	33,829	31,806	38,196

Source: For 1970 and 1975: Unpublished data from the Mexican Census of Manufactures.
For other years: Industrial Statistic Yearbook and Mataloni and Goldberg (1994).

Appendix Table C-14

Uruguay: Output in Foreign-Owned and All Manufacturing Firms, Various Years
(Billion New Pesos)

	1978	1988	1990
Value Added			
Foreign-owned firms	1.41	175.0	955.0
All firms	7.68	627.0	3,347.1

Source: Unpublished data from the Uruguayan Census of Manufactures