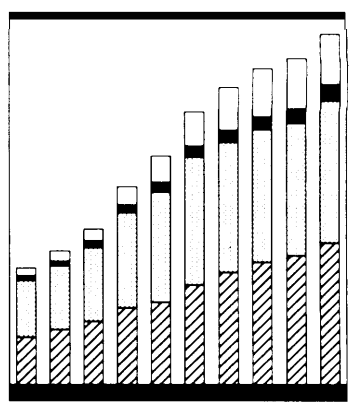
Multinational Firms and International Trade

6

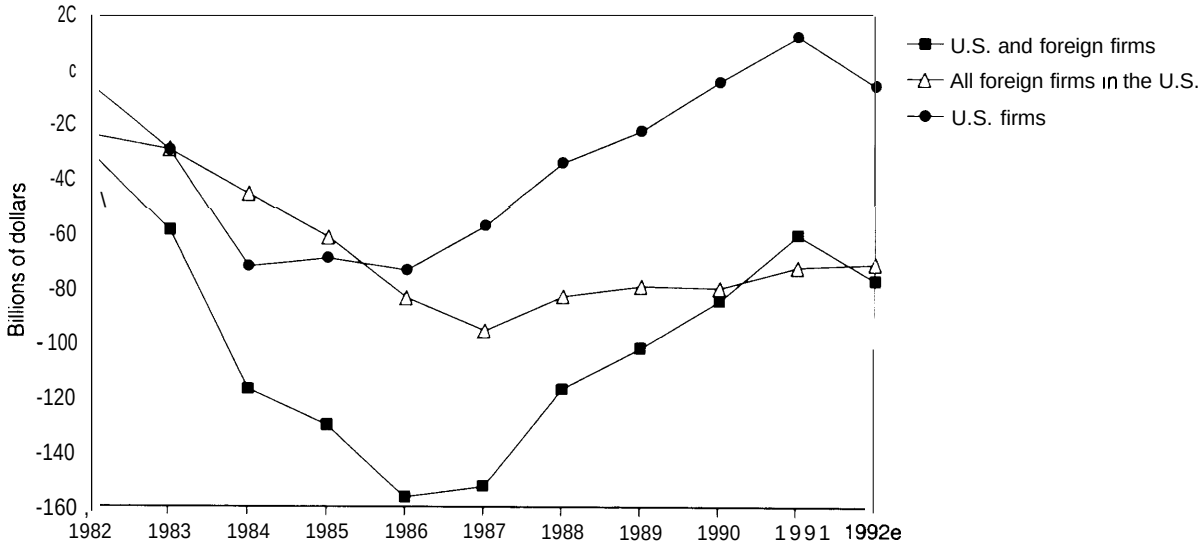
When multinational businesses first gained broad public attention in the late 1960s, many analysts believed that foreign direct investment (FDI) would effectively displace trade because foreign affiliates would supply local markets not with exports but with locally produced goods. Multinational enterprises (MNEs) were expected to replicate the production process globally, producing and selling in local markets instead of exporting from the domestic market. Historically, this form of FDI has been most commonly associated with U.S. firms investing abroad. Ford's investment in integrated production plants in Europe is a classic example of what one analyst has called "trade-destroying" FDI. [1]

However, the expectation that FDI would supplant trade has not always been borne out. Instead of investing in fully integrated manufacturing facilities and producing goods abroad, many MNEs have established foreign manufacturing operations that import a high percentage of intermediate components; others have set up wholesaling and service facilities that import both intermediate goods and finished products. Rather than replacing trade, these investments encourage trade—that is, they are trade-creating. To the extent that FDI promotes trade, aggregate trade flows will tend to mirror aggregate investment flows.



[1] For a discussion of this view of FDI see: R. Gilpin, citing the work of Koyoshi Kojima, in 'Where Does Japan Fit In'?', *Millennium: Journal of International Studies*, 18(3). 337, 1989. on Ford's style of FDI, see M. Wilkins and F.E. Hill, *American Business Abroad: Ford On Six Con/] ents* (Detroit, MI: Wayne State University Press, 1964).

FIGURE 6-1: U.S. Merchandise Trade Balance, 1982-1992 (constant 1987 dollars)



NOTE: 1992 data are preliminary

SOURCE: OTA, based on data in U S Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business* 73(1 O) 54, table 1, October 1993, 73(3) 90-91, table 2, March 1993, and 74(3) 68-69, table 2, March 1994 (hereafter cited as BEA, SCB), U S Department of Commerce, Bureau of Economic Analysis, *Foreign Direct Investment* in *the United States Operations of U S Affiliates of Foreign Companies* revised 1983-1991 estimates and preliminary 1992 estimates, (Washington, DC U S Government Printing Off Ice, 1986-1994), table G-3 (1982-1 986) and table G-1 (1987-1 992) (hereafter cited as BEA, *FDIUS)*

THE TRADE AND INVESTMENT NEXUS

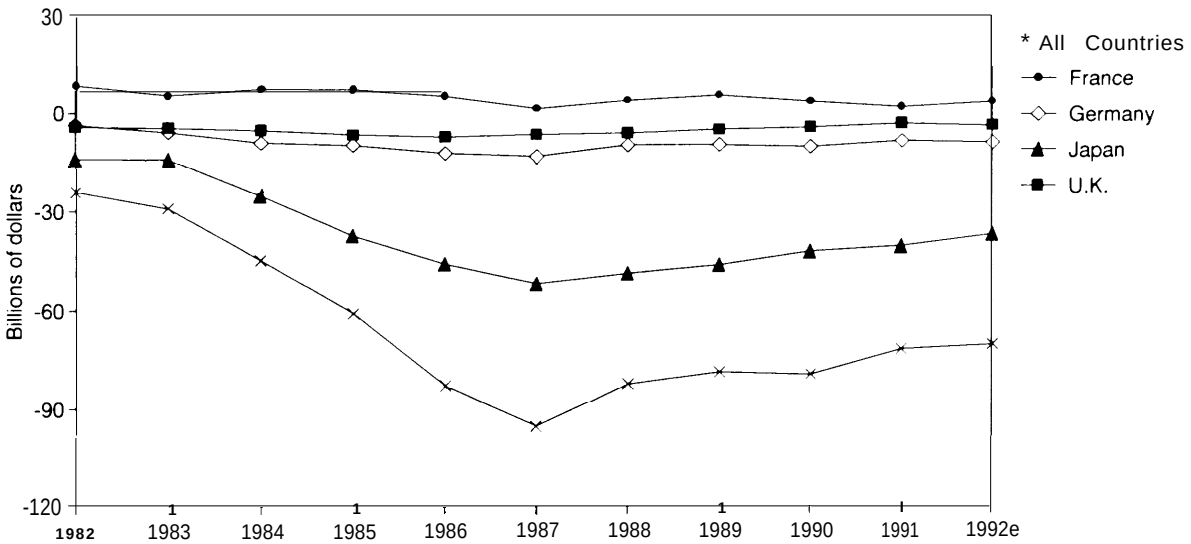
In the United States, foreign affiliates consistently have imported far more than they have exported. In 1991 their ratio of imports to exports was 1.83: 1, after having peaked at 2.98:1 in 1987.[2] Except for 1984 and 1985, in each year between 1977 and 1992 the trade deficit run by foreign affiliates has amounted to more than half of the entire U.S. merchandise trade deficit. As U.S. businesses improved their trade performance after the post- 1985 depreciation of the dollar, foreign affiliates in the United States accounted for an increasing share of the total trade deficit. In 1987, the trade deficit of all foreign affiliates in the United States was equivalent to 53 percent of the total trade deficit; that level rose steadily to peak at 120 percent in 1991. In 1992, foreign affiliates ran a trade deficit of $70.7 billion in real terms, compared to a deficit of $6.1 billion run by U.S. firms (see figure **6-1).**

This pattern does not mean that foreign affiliates in the United States are wholly responsible for the trade deficit. That deficit is affected by a broad range of factors, including exchange rates, variations in national growth and productivity rates, and different rates of domestic savings and investment. In addition, some of what foreign affiliates import is used to produce goods that might otherwise have been produced entirely abroad. Even if foreign affiliates were not present, much of what they import would be brought into the United States through other channels.

Nevertheless, the trading activity of foreign affiliates clearly represents an important component of foreign direct investment in the United States.

[2] U.S. Department of Commerce, BEA, Survey *of Current Business* (Washington, DC: October 1993), table 1, p. 54.

FIGURE 6-2: Trade Balances of Foreign Subsidiaries in the United States by Nationality of Ownership, 1982-1992 (constant 1987 dollars)



NOTE: 1992 data are preliminary.

SOURCE: BEA, SCB 73(10) 57, table 3, October 1993, BEA,*FDIUS,* table G-2 (1991 -1 992)

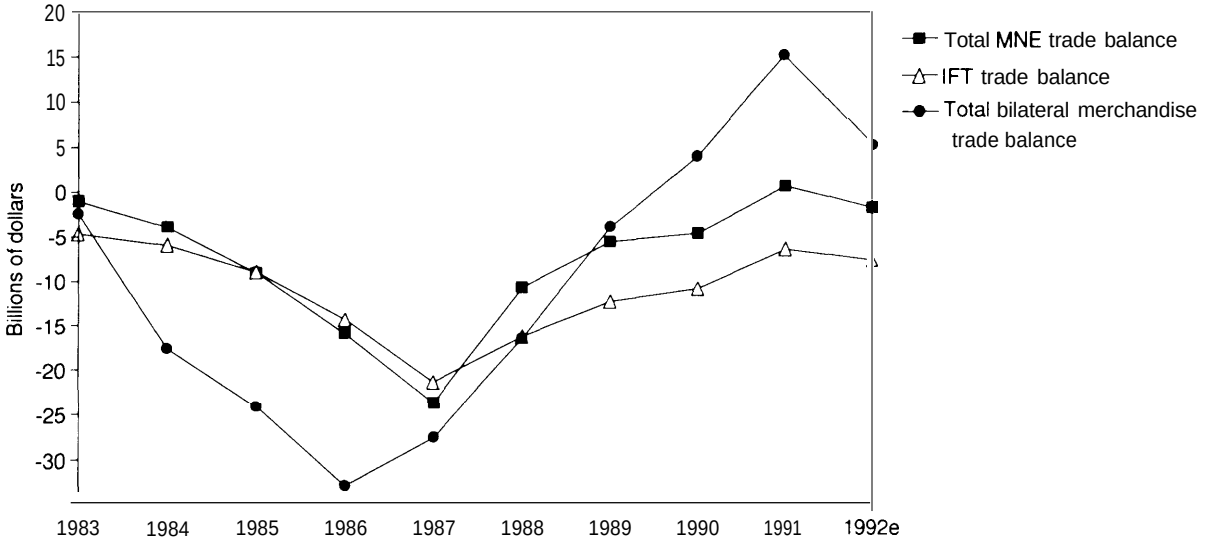
Moreover, the trading behavior of foreign affiliates varies by national origin. Japanese affiliates in the United States consistent y have run the largest trade deficit-$37.4 billion in 1992, equivalent to 49 percent of the total merchandise trade deficit that year. German and U.K. affiliates also have run deficits, although considerably smaller at $9.6 and $4.1 billion, respectively, in 1992. French affiliates tend to run small trade surpluses, amounting to $3.1 billion in 1992 (see figure **6-2).**

The following analysis demonstrates that variances in the trading tendencies of foreign affiliates, including variances in the trading relationship between affiliates and their parent firms, are closely associated with the distribution and composition of FDI. They may also be associated with the timing of FDI.

Merchandise Trade and the Distribution of FDI

The last section of chapter five described the large asymmetry in two-way investment flows between the United States and Japan, compared to investment between the United States and Europe (see figure **5-9).** The difference between these two bilateral investment relationships is reflected in merchandise trade flows. As figure **6-3** illustrates, trade balances between the United States and Europe follow the same pattern as the bilateral investment relationship, which shifted from a balanced position in the early 1980s into a U.S. deficit in the mid- 1980s, and then returned to a relative balance by the early 1990s. Figure 6-4 illustrates the progression of the U.S. trade deficit with Japan, which also reflects the bilateral investment relationship. In 1980 investment was relatively balanced at about $5 billion in each direction, but since then Japanese investment in the United States has grown to reach $96 billion by 1993-over three times that of U.S. investment in Japan. In short, the U.S. trade balance with Europe tends to mirror the balance in direct investment, while the U.S. trade deficit with Japan tends to reflect the investment deficit.

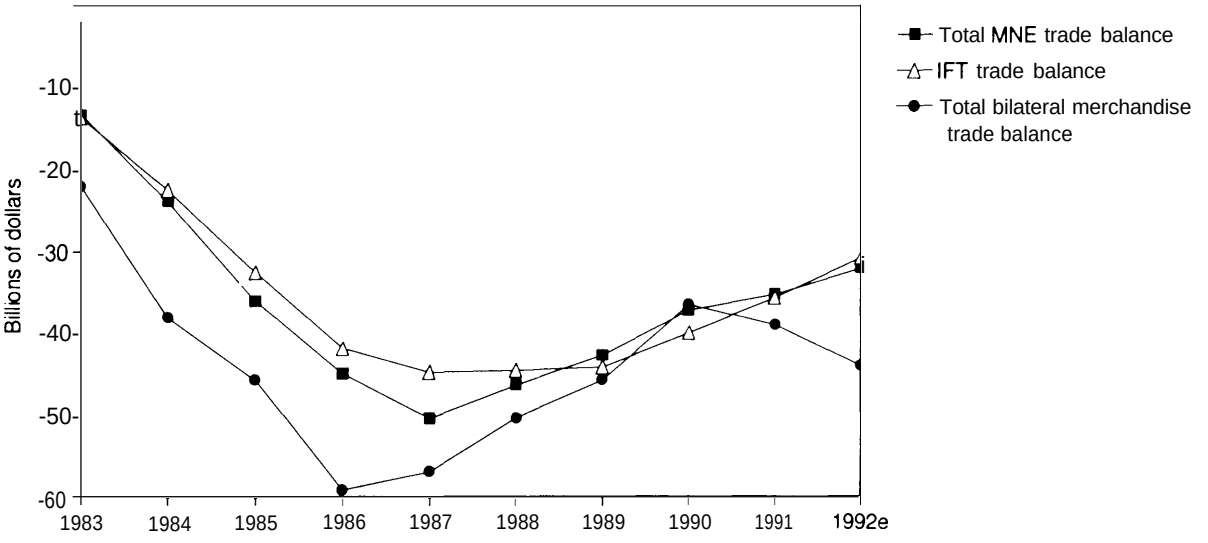
FIGURE 6-3: U.S. Merchandise Trade Balance with Europe, 1983-1992 (constant 1987 dollars)



NOTE 1992 data are preliminary

SOURCE OTA, based on data from BEA, *FDIUS*, table G-4 (1983-1986) and table G-2 (1987-1992), U S Department of Commerce, Bureau of Economic Analysis, *U S Direct Investment Abroad Operations of U S Parent Companies and their Foreign Affiliates* revised 1983-1991 estimates and preliminary 1992 estimates (Washington, DC U S Government Printing Office, 1986-1994), tables 50 (1983-1988) and III H I (1989-1992) (hereafter cited as BEA, *USDIA*); BEA SCt3 72(6) 88-90, table 2, June 1992; 73(3) 90-91, table 2, March 1993, 74(3) 68-69, table 2, March 1994

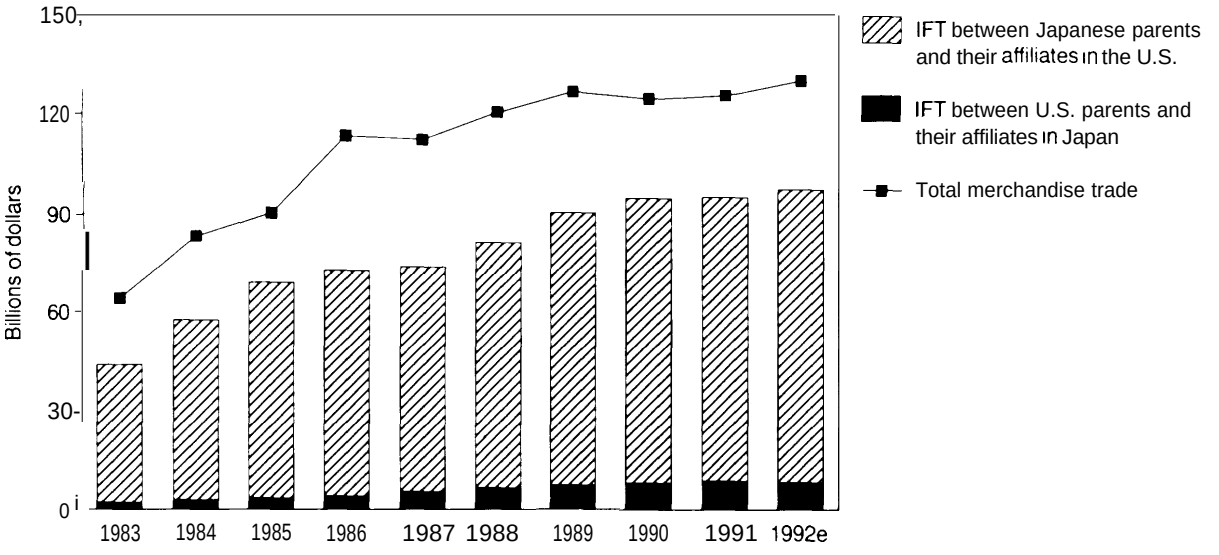
FIGURE 6-4: U.S. Merchandise Trade Balance with Japan, 1983-1992 (constant 1987 dollars)



NOTE 1992 data are preliminary

SOURCE OTA, based on data from BEA, *FDIUS*, table G-4 (1983-1986) and table G-2 (1987-1992), BEA, *USDIA*, table 50 (1983-1 988) and table III H I (1989-1992), BEA *SCB* 72(6) 88-90, table 2, June 1992, 73(3) 90-91 table 2, March 1993, 74(3) 68-69, table 2, March 1994

FIGURE 6-5: Total Merchandise and Intrafirm Trade: Japan and the United States, 1983-1992 (constant 1987 dollars)



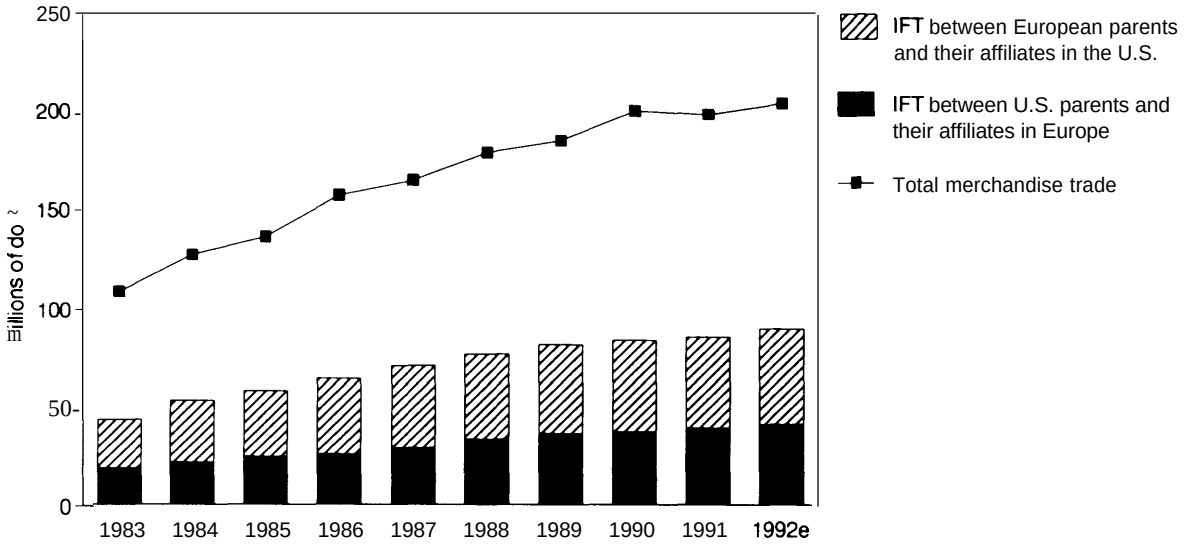
NOTE: 1992 data are preliminary.

SOURCE: OTA based on data from BEA, *FDIUS,* table G-3 (1983-1986) and table G-1 (1987-1 992) BEA, *USDIA,* table 50 (1 983-1 988) and table Ill H I (1989- 1992) BEA SCB 73(10) 54, table 1, October 1993, 73(3) 90-91, table 2, March 1993

Figures 6-3 and 6-4 also illustrate that total merchandise trade, total affiliated trade, and intrafirm trade (IFT) are much less closely related in U.S.-European trade than in U.S.-Japanese trade. Total affiliated trade measures the balance of exports and imports by both U.S.-based MNE parent groups and foreign affiliates in the United States, whether those goods are exchanged within or outside of the MNE network. IFT measures the balance of trade within MNE networks only. Consequently, figures 6-3 and 6-4 indicate that, over time, trade between the United States and Japan centers more on MNEs than is the case with trade between the United States and Europe.

Figures 6-5 and 6-6 look more closely at the relationship between MNEs and total merchandise trade by examining IFT, which represents trade flows within MNE networks. Together, the figures illustrate two important patterns. First, IFT is much more significant in U.S.-Japanese merchandise trade than in U.S.-European merchandise trade. On average between 1983 and 1992, IFT has accounted for 70 percent of all U. S.-Japanese merchandise trade, compared to 43 percent of all U.S.-European merchandise trade. Moreover, the volume of intrafirm trade between the United States and Japan is greater than that between the United States and all of Europe. In 1992, U.S.-Japan IFT totalled $97.0 billion, compared to $90.4 billion for U.S.-Europe IFT. Second, the figures illustrate that IFTbetween the United States and Japan is dominated by Japanese MNEs, while IFT between the United States and Europe is more evenly divided between MNEs based in each region. Between 1983 and 1992, Japanese MNEs on average accounted for 93 percent of all bilateral intrafirm trade with the United States, while European MNEs accounted for 58 percent of U.S.-European IFT. In terms of volume, in 1992 Japan-based MNEs accounted for $88.5 billion of a total $97.0 billion in IFT with the United States, while Europe-based MNEs accounted for $49.3 billion of a total $90.4 billion in IFT with the United States. These figures indicate

FIGURE 6-6: Total Merchandise and Intrafirm Trade: Europe and the United States, 1983-1992 (constant 1987 dollars)



NOTE: 1992 data are preliminary.

SOURCE: OTA, based on data from BEA, *FDIUS,* table G-3 (1983-1986) and table G-1 (1987-1992), BEA, *USDIA,* table 50 (1983-1988) and table III.H.I (1989-1992), BEA SCB 73(10) 54, table 1, October 1993, 73(3) 90-91, table 2, March 1993

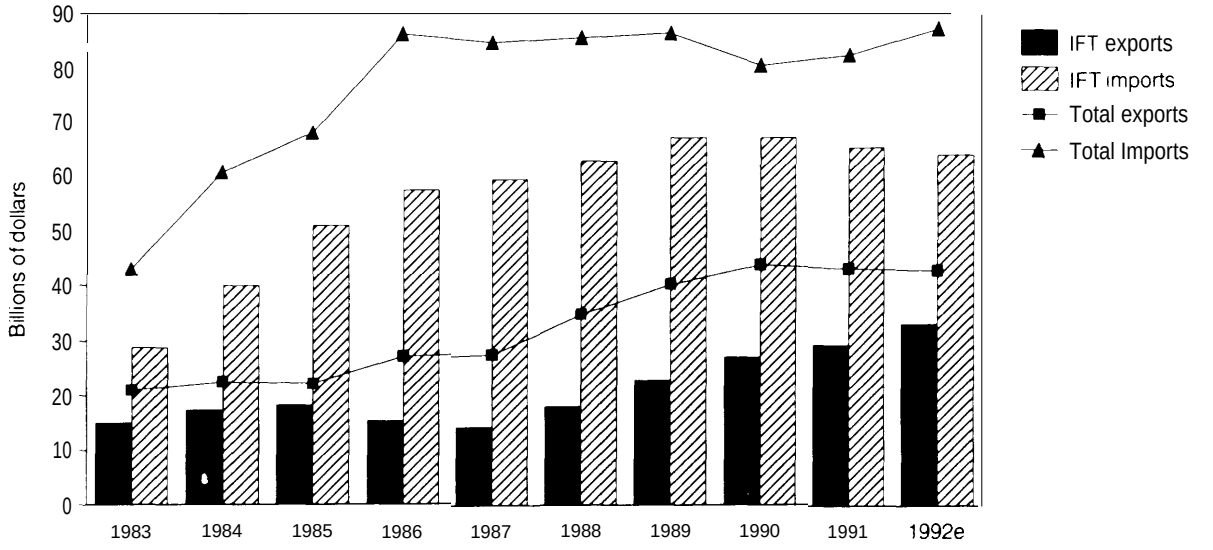
that the U.S.-Japanese trading relationship is heavily weighted toward Japanese MNEs, and that the U.S. relationship with Europe is more diversified across corporate structures and national ownership-a pattern that again reflects the distribution of FDI in each relationship.

The data considered in figures 6-3 through 6-6 illustrate a consistent correlation between bilateral investment balances and bilateral trade balances. Of course, investment flows do not determine trade flows per se. Trade is affected by a broad range of factors, including exchange rates, variations in national growth rates and productivity levels, and different rates of domestic savings and investment. Nevertheless, greater levels of FDI can promote trade through the import and export activities of foreign affiliates, including intrafirm trade. As a result, trade balances among the advanced industrial states often are associated with investment balances. To the extent that this relationship holds, the U.S. trade deficit with Japan may now be structurally linked to the U.S.-Japan imbalance in direct investment. Since intrafirm trade accounts for the majority of trade between the United States and Japan, it is unlikely that bilateral trade flows will equilibrate as long as the bilateral investment relationship remains heavily imbalance.

National Variations in Intrafirm Trade

In the U.S. trade accounts, intrafirm trade consists of all exports and imports exchanged between (1) U.S. MNE parents and their afiliates abroad, and (2) foreign MNEs parents and their affiliates in the United States. Relative to total merchandise exports and imports, IFT accounts for a huger percentage of both exports and imports in U.S.-Japan trade than in U.S.-European trade (see figures 6-7 and **6-8).** From 1983 to 1992, IFT accounted for an average of 66 percent of the merchandise exports and 73 percent of the merchandise imports in

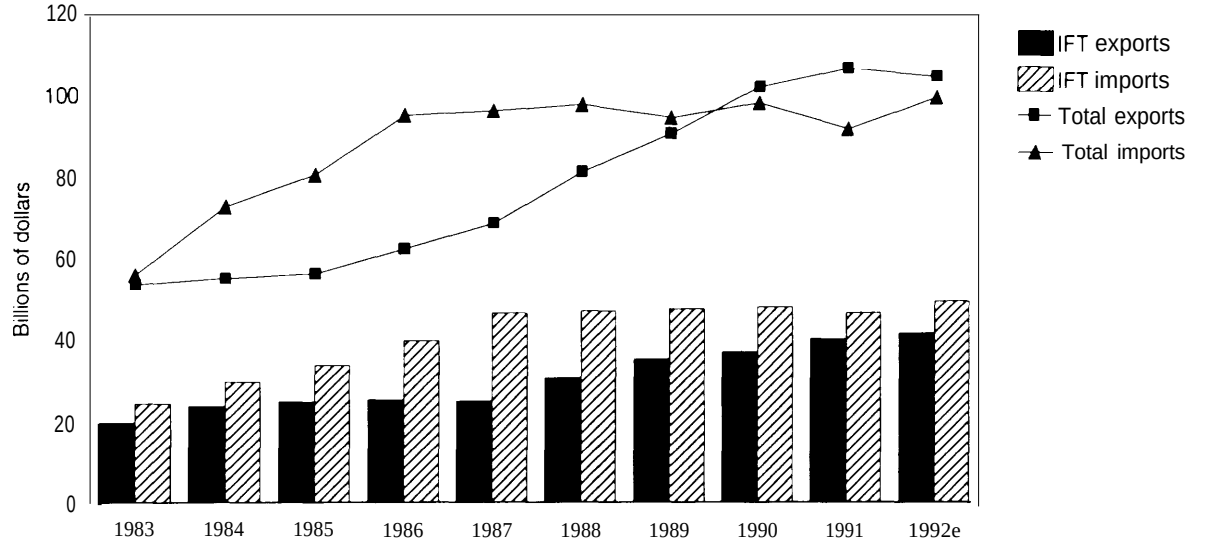
FIGURE 6-7: Total Merchandise and Intrafirm Exports and Imports: Japan and the United States, 1983-1992 (constant 1987 dollars)



NOTE 1992 data are preliminary

SOURCE OTA, based on data from BEA *FDIUS*, table G-3 (1 983-1986) and table G-1 (1987-1 992) BEA *USDIA*, table 50 (1983-1988) and table III H I (1 989-1 992) BEA *SCB* 73(10) 54, table 1 October 1993 73(3) 90-91, table 2, March 1993

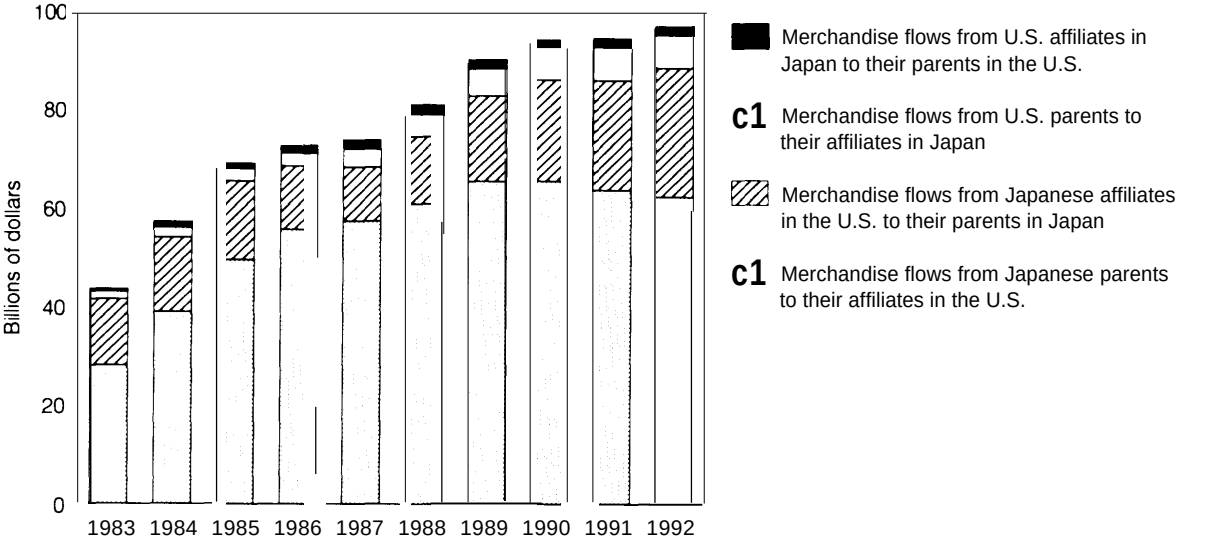
FIGURE 6-8: Total Merchandise and Intrafirm Exports and Imports: Europe and the United States, 1983-1992 (constant 1987 dollars)



NOTE 1992 data are preliminary

SOURCE OTA based on data from BEA. *FDIUS*. table G-3 (1983-1986) and table G-1 (1987-1992) BEA *USDIA* table 50 *1983-1 988)* and table III H I (1989-1992) BEA *SCB* 73(10) 54 table 1 October 1993 73(3) 90-91, table 2, March 1993

FIGURE 6-9: Volume and Direction of U.S.-Japanese Intrafirm Trade, 1983-1992 (constant 1987 dollars)



NOTE: 1992 data are preliminary.

SOURCE: OTA, based on data from BEA, *FDIUS* table G-4 (1983-1986) and table G-2 (1987-1992), BEA, USDIA, table 50 (1983-1988) and table III H 1 (1989-1 992), BEA, *SCB* 73(6) 78, table 2, June 1993

U.S.-Japanese trade, compared to 39 and 46 percent respectively in U.S.-European trade.[3]

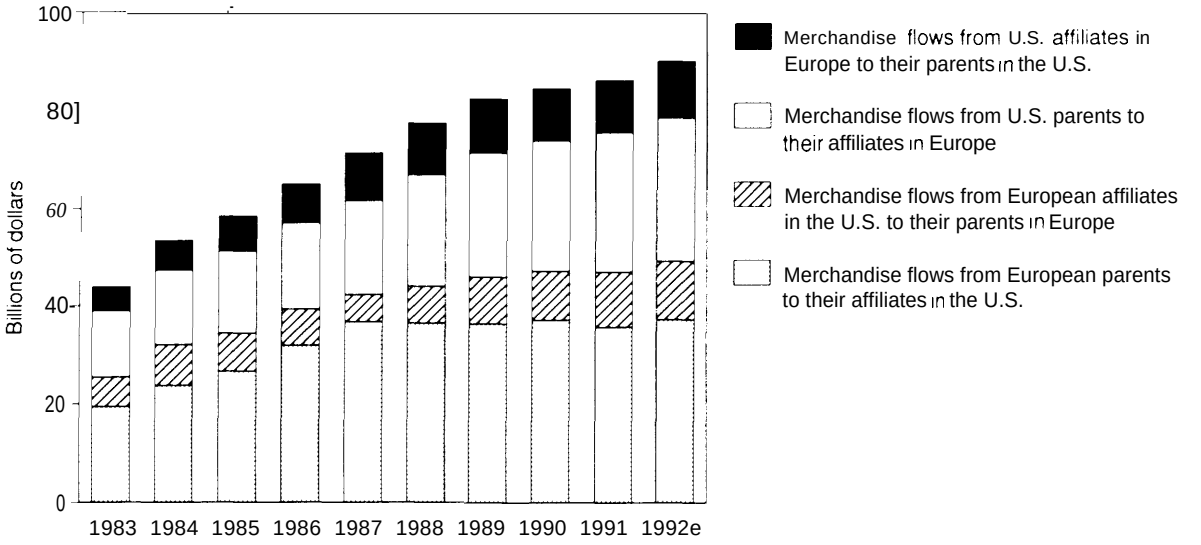
When bilateral IFT is disaggregate to show the volume and direction of trade within MNE networks, two important patterns emerge (see figures 6-9 and 6-10). First, in terms of direction, considerably more I IT flows from parents to affiliates than vice versa. This pattern holds across the advanced industrial nations, with ratios ranging from a minimum of 2.4:1 for Japanese parents and their affiliates in the United States to 3.8:1 for U.S. parents and their affiliates in Japan.[4] Second, in terms of volume, IFT imports by Japanese affiliates in the United States far outweigh both IFT imports by all European affiliates as well as IFT exports by U.S. MNEs to their affiliates in Japan. In 1992, Japanese affiliates in the United States imported $62.2 billion from their parent firms, while U.S. MNEs exported $6.8 billion to their affiliates in Japan. By comparison, European affiliates in the United States imported $41.9 billion from their parent firms, while U.S. MNEs exported $32.2 billion to their affiliates in Europe.

Variations in the volume and direction of bilateral IFT are consistent with variations in the distribution of FDI. Simply put, IFT imports by Japanese affiliates in the United States dominate bilateral IFT flows, reflecting the fact that the vol-

[3]IFT data from U.S. Department of Commerce, BEA surveys of *Foreign Direct Investment in the United States* and *U.S. Direct Investment Abroad* (Washington, DC: 1983-1991 issues, and 1992 estimates). Total merchandise trade flows from U.S. Department of Commerce, BEA, *Survey of Current Business* (Washington, DC: June 1992), table 2, p. 90; and *Survey of Current Business* (Washington, DC: June 1993), table 2, p. 78.

[4]These ratios measure [he]992 merchandise flows of parents to affiliates over those from affiliates to parents, in constant dollars. In the case of U.S. parents and their affiliates in Europe, the ratio is 2.5: I; for European parents and their affiliates in the United States, it is 3. 1: 1. Based on data in U.S. Department of Commerce, annual BEA surveys, op. cit. footnote 3.

FIGURE 6-10: Volume and Direction of U.S.-European Intrafirm Trade, 1983-1992 (constant 1987 dollars)



NOTE: 1992 data are preliminary.

SOURCE: OTA based on data from BEA*FDIUS* table G-4 (1983-1 986) and table G-2 (1987-1 992) BEA*USDIA* tables 50 (1983-1 988) and III H 1 (1989-1991) BEA SCB 73(6): 78 table 2 June 1993

ume of Japanese direct investment in the United States far exceeds U.S. direct investment in Japan. Likewise, the similarity in IFT flows between the United States and Europe reflects the relative balance of FDI between the two regions.

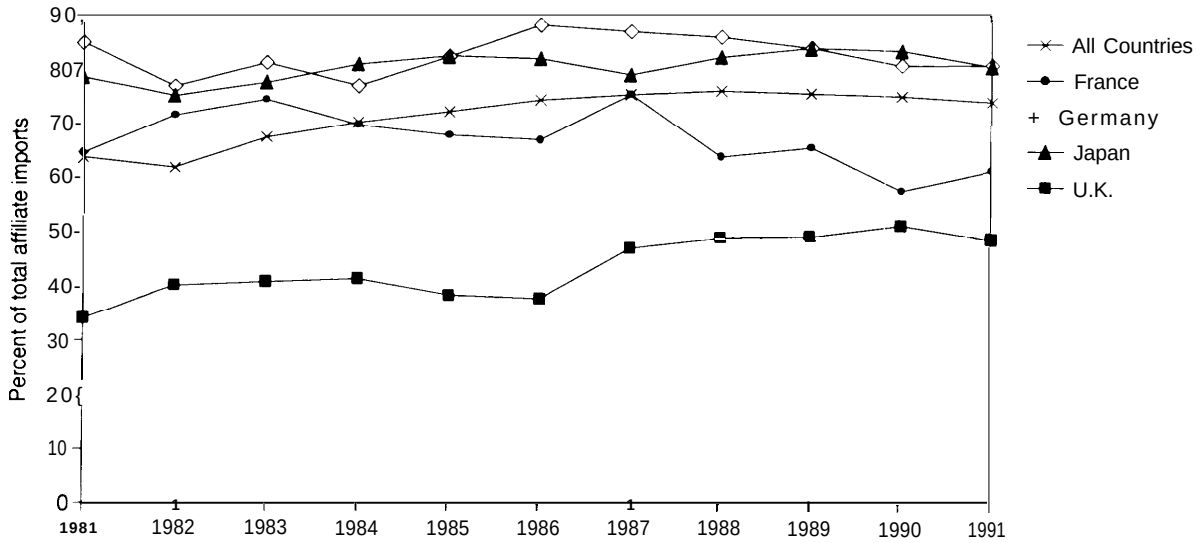
In addition, variations in the proportion of IFT to total trade may indicate that Japanese affiliates in the United States have a stronger propensity to trade through IFT channels than their European counterparts. As figure **6-11** demonstrates, German and Japanese affiliates have a stronger than average tendency to import from their parent groups, their respective IFT imports averaging 82.6 and 80.5 percent of total imports from 1981 to 1991. French and U.K. affiliates import noticeably less from their parent groups, averaging 67.1 and 43.2 percent respectively over the same time period.

Since IFT trade flows primarily from parents to affiliates, one would expect affiliates' I IT propensity to be weaker for exports than for imports. Figure 6-12 indicates that this is indeed the case. From 1981 to 1991, the average IFT export propensity for all foreign affiliates in the United States was 42 percent, comparedto71 percent for imports. The figure also shows a slightly different cross-national pattern. As with import propensity, France and the U.K. have the lowest export propensity; however, unlike import propensity, Germany's export propensity also has been below average for most of the decade, while Japan remains above average throughout, at61 percent for the entire period.

Together, figures 6-11 and 6-12 indicate that Japanese affiliates consistently have demonstrated a strong tendency to trade within MNE networks.[5] German affiliates have had a higher propensity to import than to export within MNE

[5] OECD data also indicates that U.S.-based affiliates of Japanese MNEs use FDIUS as a conduit for trade to a greater degree than do U.S. firms in all foreign markets. See OECD, Directorate for Science, Technology and Industry, *Globalisation of Industrial Activities: Background Synthesis Report* (Paris, France: OECD, prepublication draft dated Nov. 26, 1993), p.16.

FIGURE 6-11: Intrafirm Imports as a Percentage of Total Imports by Foreign Affiliates in the United States 1981-1991



SOURCE: BEA, *SCB* 73(10) 57, table 3, October 1993

networks, while French and British affiliates consistently have had a lower than average propensity. The figures also show that IFT imports have increased as a percentage of all trade by affiliates, from 63.5 percent in 1981 to 74.1 percent in 1991. By contrast, IFT exports have fluctuated slightly but increased little over the decade, from 42.0 percent of all trade in 1981 to 42.3 percent in 1991.

Some analyses suggest that the gradual rise in IFT imports is due mostly to the increased wholesale trading activity of Japanese and Korean affiliates in the United States, primarily in the automotive sector.[6] Accordingly, variations in IFT observed above may be due not only to the differences in the bilateral volume of FDI but also to the sectoral composition of foreign direct investment in the United States (FDIUS). Other analysts maintain that the trading behavior of foreign affiliates changes over time, as they become more deeply integrated with the local economy. These different explanations of the relationship between trade, IFT, and investment are analyzed in the following section.

Explaining National Variations in Intrafirm Trade

The data presented in figures 6-7 through 6-12 portray three principal variations in IFT. First, IFT accounts for a larger percentage of both exports and imports in U.S.-Japan trade than in U.S.-European trade. Second, IFT between the United States and Japan is skewed toward imports by the U.S. affiliates of Japanese firms, while IFW between the United States and Europe is more symmetrical. Moreover, because IFT is a large percentage of U.S.-Japan trade, the volume of IFT imports by Japanese affiliates in the United States far outweighs that by European affiliates-$62.2 billion and $41.9 billion, respectively, in 1992.

[6] Ibid.

FIGURE 6-12: Intrafirm Exports as a Percentage of Total Exports by Foreign Affiliates in the United States 1981-1991

SOURCE: BEA, SCB 73(10) 57, table 3, October 1993

Third, Japanese affiliates tend to import and export within MNE networks, while German affiliates have a strong IFT import propensity only and both French and U.K. affiliates have a weaker tendency in both directions.

As suggested above, variations in the volume and direction of bilateral IFT conform to variations in the distribution of FDI. The similarity in IFT between the United States and Europe reflects a relatively equal distribution of FDI, while the asymmetry in IFT between the United States and Japan reflects an unequal distribution of FDI. However, variations in the propensity of foreign affiliates to import-and in particular to use IFT channels-could be explained by two additional factors: the sectoral composition of FDI, and the relative age of FDI.

Variations in the Sectoral Composition of FDI

One of the principal determinants of the trading behavior of foreign affiliates is the sector in which they are located. The wholesale trade sector is most closely associated with total trade as well as IFT, because many wholesaling operations function primarily as distribution channels for components or finished products imported from their parent companies. Since 1985, wholesaling affiliates in the United States have imported twice as much as they have exported. In 1991, the ratio of imports to exports for wholesale trade affiliates in the United States was 2.2: 1, compared to 1.2: 1 for affiliates in the manufacturing sector and 1.8:1 for all industries.' In 1991, foreign wholesaling affiliates in the United States ran a trade deficitof$51

[7]U.S. Department of Commerce, BEA, op. cit. footnote 2, table 2 p.54. The foreign wholesale trade affiliates of U.S. companies follow the same pattern; over the past decade they have imported more than triple the value of their exports.

billion, compared to $7.3 billion for manufacturing affiliates (the total trade deficit for all afiliates that year was $72.2 billion). Over the last decade, wholesaling operations accounted for over 70 percent of the total trade deficit run by all foreign affiliates in the United States.[8]

IFT comprises the majority of imports by wholesale trade affiliates. In each year from 1985 to 1991, approximately 80 percent of all imports by wholesale trade affiliates came from their foreign parent groups.[9] Moreover, like most wholesalers, wholesale trade affiliates simply resell the goods they import. According to the most recent benchmark survey by the Bureau of Economic Analysis (BEA), more than 90 percent of the imports by wholesale trade affiliates were goods that required no additional processing, assembly, or manufacturing.[10]

These characteristics of wholesale trade affiliates, combined with the sectoral composition of FDI, partly explain the unusually prominent role of IFT imports by Japanese affiliates in the U. S.-Japan trading relationship (see figure **6-5).** Japanese FDIUS is more concentrated in wholesale trade than is either European FDIUS or U.S. direct investment in either Japan or Europe (as seen in figures 5-10 to 5-15 in chapter 5). Consequently, U.S.-Japanese trade bears the hallmark of wholesale trade affiliates-a high import propensity, most of which flows from parent firms in Japan to their affiliates in the United States.[11] Through the mid-1980s, wholesale trade affiliates accounted for over 95 percent of all imports and exports by Japanese affiliates in the United States. Although the proportion declined somewhat since then, by 1991 they still accounted for 84 percent of all trade by Japanese affiliates in the United States. In 1991, Japanese wholesale trade affiliates alone accounted for 42 percent ($67.7 billion) of the imports and 35 percent ($31.8 billion) of the exports of all foreign affiliates in the United States.

Wholesale trade affiliates account for far less of all trade by European afiliates in the United States, as is consistent with the more balanced composition of European FDIUS. In most cases, wholesale trade affiliates account for less than one-third of all exports and imports by European affiliates in the United States. One notable exception is imports by German affiliates, 57 percent of which were imported by wholesale trade affiliates, mostly in automobiles.[13]

Compared to the wholesale trade sector, foreign affiliates in U.S. manufacturing industries have a much lower import propensity and consequently have accounted for less than one-eighth of the total trade deficit of foreign affiliates in the United States. '4 However, their share of the total affiliated trade deficit has grown rapidly since the mid-1980s, partly reflecting the rapid growth of foreign investment in manufacturing during that period. Between 1985 and 1990, the sales of for-

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[8] Ibid. See figure *6-1* for the total merchandise trade deficit of foreign affiliates in the United States since 1982.

[9] Ibid., p. 54.

[10] Ibid. The BEA's last benchmark survey covers data for 1987. The forthcoming 1992 benchmark survey is scheduled to be released after this report has gone to press.

[11] For a statistical analysis of this relationship, see H. Yamawaki, "Exports and Foreign Distributional Activities: Evidence on Japanese Firms in the United States," *Review of Economics and Statistics* 73(2):294-300, May 1991.

[12] U.S. Department of Commerce, BEA, op. cit., footnote 3, p. 56 and table 4, p. 58. Among Japanese affiliates in the United States in 1991, wholesale trade affiliates imported $67.7 billion of a total $80.6 billion, and exported $31.8 billion of a total $37.6 billion (in constant 1987 dollars).

[13] Ibid., p. 58. There is one other exception to the generally moderate proportion of wholesale trade to total trade among European affiliates: 50 percent of the exports by French affiliates were shipped by wholesale trade affiliates in 1991; most were in in farm-product raw materials.

[14] ibid., p. 56.

TABLE 6-1: Foreign Content of Intermediate Goods Purchased by Foreign Affiliates in the United States, by Sector and Country, 1990 and 1991

	All countries		France		Germany		Japan		United Kingdom	
	1990	1991	1990	1991	1990	1991	1990	1991	1990	1991
All Industries	194	196	12.1	107	21,6	199	30.2	317	9.6	9.2
All manufacturing	16.7	173	17.3	16.2	21.4	20.9	284	280	9.4	100
Chemicals and allied products	12.1	13.2	96	95	184	18.5	5.1	7,2	11.6	13.2
Primary and fabricated metals	140	14,1	73	69	200	214	6 6	5.9	7.2	73
Non-electrical machinery	310	304	n/a	20.3	25.9	255	485	453	129	9.5
Electric and electronic equipment	307	286	n/a	375	43,7	39,2	41 4	381	113	143
Motor vehicles and equipment	404	45.1	n/a	n/a	n/a	n/a	49.3	528	n/a	n/a
Wholesale trade	323	339	11,6	121	399	396	346	383	153	122

NOTES: Data for 1991 is preliminary n/a denotes unavailable data, suppressed to avoid disclosure of individual companies data.

SOURCE: Adapted from U S Department of Commerce, Bureau of Economic Analysis, *Survey of Current Business* 73(10): 64, table 10, October 1993

eign manufacturing affiliates in the United States grew 78 percent (from $197 to $350 billion in constant 1987 dollars), while the sales of wholesale trade affiliates grew 24 percent (from $266 billion to $331 billion). [15]

Part of the reason manufacturing affiliates often run trade deficits is that they import intermediate goods used for production in the United States. [16] As shown in table 6-1, the foreign content of all intermediate goods purchased by manufacturing foreign affiliates in the United States averaged 17.3 percent in 1991. The foreign content among manufacturing affiliates varies significantly by sector, ranging from 13.2 percent in chemicals to 45.1 percent in autos.] [7] However, table 6-1 also shows considerable variation by country. For all foreign manufacturing affiliates in the United States, Japanese affiliates have the highest foreign content at 28.0 percent in 1991; German affiliates have the second highest foreign content at 20.9 percent, while French and British affiliates have considerably lower foreign shares at 16.2 and 10.0 respectively. Across sectors, Japanese affiliates have the highest foreign content in the non-electrical machinery and motor vehicles and equipment sectors, while German affiliates have the highest foreign shares in chemicals, electric and electronic equipment, and primary and fabricated metals. The substantial variations in foreign content across sectors indicate that Japanese affiliates in the United States rely more on foreign suppliers than do European affiliates. French and British affiliates import a relatively low percentage of intermediate goods, while Ger-

15 Ibid.

16 Another reason for trade deficits among manufacturing affiliates is that many of them also have wholesale trade operations. Since the BEA collects data on an enterprise basis, the entire trade account of individual affiliates is recorded under their primary business activity. Many affiliates that are primarily manufacturing operations also conduct secondary wholesale trade activities.

17 Table 6.1 shows only selected manufacturing industries. In general, foreign content is highest in industries that purchase a lot of manufactured intermediate goods, such as the machinery and transportation equipment industries. Foreign content is generally the lowest in industries that use raw materials subject to high transportation costs, such as beverages, primary ferrous metals, and stone, clay, and glass products. U.S. Department of Commerce, BEA, op. cit., footnote 2, pp. 64-65.

TABLE 6-2: Sectoral Variances in Intrafirm Trade

Industries	Intrafirm trade as percent of total industry trade
Science-based	
Pharmaceuticals	70
Computers	50-80
Semiconductors	70
Scale-intensive, high product differentiation	
Motor vehicles	50-80
Consumer electronics	30-50
Resource and labor-intensive	
Nonferrous metals	30
Steel	5-1o
Clothing	5-10

SOURCE Adapted from Organisation for Economic Co-operation and Development, Directorate for Science, Technology, and Industry, Glob-*alization of Industrial Activities Background Synthesis Report* (Paris OECD, 1993), p 66, table 21

man affiliates import substantial percentages of intermediate goods across several manufacturing sectors.

The higher reliance of Japanese manufacturing affiliates in the United States on imported intermediate goods helps to explain their high ratio of imports to exports. In 1991, the average ratio for all foreign manufacturing affiliates was 1 .22:1, while the ratio for Japanese manufacturing affiliates was 2.29: 1, indicating that they imported more than twice as much as they exported. By comparison, German manufacturing affiliates imported only slightly more than they exported, while French and British manufacturing affiliates actually ran trade surpluses. [18]

Moreover, a large portion of the imported intermediate goods shown in table 6-1 represents IFT. Across countries, IFT is most common in both science-based industries and scale-intensive industries that have highly differentiated products (table 6-2). Science-based industries, such as pharmaceuticals, computers, and semiconductors, are characterized by high R&D costs, low transport costs, and relatively high profit margins. Consequently, foreign affiliates have a strong incentive to import intermediate goods from their parent firm. Scale-intensive industries with highly differentiated products, such as motor vehicles and consumer electronics, typically produce complex consumer goods that use large quantities of manufactured parts, components, and subassemblies. In these industries, firms frequently source components from within their MNE networks. By contrast, IFT is usually quite low in resource and labor-intensive industries, such as nonferrous metals, steel, and textiles. These sectors are characterized by high transportation costs and lower levels of manufactured intermediate goods. Consequently, IFT tends to be quite low.[19] In essence, the more technologically sophisticated the sector and the individual product, and the higher the value added, the more likely intermediate goods will be produced in the MNE's home country and then shipped to foreign affiliates for final assembly.

Together, the concentration of Japanese FDIUS in wholesale trade, plus the high foreign content of intermediate inputs used by Japanese manufacturing affiliates—particularly in high-technology and complex, scale-intensive industries[20]—help to explain why IFT is much more prominent in U.S.-Japan trade than in U.S.-European trade. Available evidence from Japan's Ministry of International Trade and Industry (MITI) indicates

[18] Ibid., table 4, p. 58.

[19] Organization for Economic Co-operation and Development (OECD), Directorate for Science, Technology, and Industry, *Globalisation of Industrial Activities: Background Synthesis Report* (Paris, France: OECD, 1993), pp. 7,28.

[20] Several studies suggest that Japanese firms focus their U.S. manufacturing investments in R&D-intensive industries. See B. Kogut and S. J. Chang, "Technological Capabilities and Japanese Foreign Direct Investment in the United States," *The Review of Economies and Statistics* 73(3):408, Aug. 1991; and T. Drake and R. Caves, "Changing Determinants of Japan's Foreign Direct Investment in the United States," Discussion Paper 1483 (Cambridge, MA: Harvard Institute of Economic Research, May 1990).

TABLE 6-3: Value of Exports and Share of Intrafirm Trade of Japanese MNE Parent Companies by Sector, 1988 and 1991 (in billions of nominal yen and percent)

	1988		1991	
Industry	Exports	*IFT* as a percent of exports	Exports	IFT as a percent of exports
All Industries	46,6942	355	52,586.3	275
All manufacturing	28,907.8	42.0	32,7826	402
Chemicals	1,454.6	27,7	1,512,2	187
Nonferrous metals	328.1	230	2592	210
Machinery	2,307.5	31,5	1,528.5	34.7
Electric machinery	9,550.9	46,0	10,705,7	455
Transport equipment	9,5652	48.4	13,0789	41 3
Commerce	17,099.5	25,6	18,772,5	6 4

NOTES: Commerce Includes wholesale and retail trade to distributors and dealers.

SOURCE: Ministry of International Trade and Industry, Industrial Policy Bureau, International Business Affairs Division Kaigai Toshi *Tokei Soran: Dai 3-kai Kaigai Jigyo Katsudo Kihon Chosa* (Tokyo MITI, 1989), tables 1-19,20,23, and 24 and *Kaigai Toshi Tokei Soran: Dai 4-kal Kaigai Jigyo Katsudo Kihon Chosa* (Tokyo: MITI, 1991), tables 1-22,23, 25, 26, and 27

that Japan's 117 pattern with the United States is consistent with Japan's worldwide trade (see table 6-3), although it appears to play a larger role in Japan's trade with North America than in Japan's trade with Europe (see tables 6-4 and 6-5).[2]

In short, national differences in both the tendency to trade within MNE networks and the overall import propensity of foreign affiliates are related to differences in the sectoral composition of FDI. Where FDI is concentrated in wholesale trade, and where manufacturing FDI is concentrated in R&D and complex, scale-intensive industries, both the IFT propensity and the total import propensity of foreign affiliates is likely to be high. Japanese affiliates in the United States are more concentrated in sectors characterized by high IFT than are European affiliates, which helps to explain the greater significance of IFT in U. S.-Japan trade than in U.S.-European trade.

However, other important variations cannot be explained by the composition of FDI. In particular, the substantial variations in foreign content seen in table 6-1 indicate that Japanese affiliates in the United States rely much more heavily on foreign suppliers than do most European affiliates in the same industry. Some analysts argue that this difference is consistent with the relative age of FDI. The more recent the FDI, they argue, the less likely that firms will be deeply integrated in local economies and, consequently, they will be more likely to source from the home market (and often from the parent firm).

[2] MITI data presented in tables 6-8 through 6-10 cannot be precisely compared to U.S. data presented in table 6- I (or U.S. sectoral data elsewhere), since each country uses a different industrial classification system.

TABLE 6-4: Value of Exports and Share of Intrafirm Trade of Japanese MNE Parent Companies to North America by Sector, 1986 and 1989 (in billions of nominal yen and percent)

	1986		1989	
Industry	Exports	IFT as a percent of exports	Exports	IFT as a percent of exports
All industries	17,626,6	21.2	17,026.4	52.2
All manufacturing	10,374,0	25.6	9,1900	63,4
Chemicals	83.3	3.8	223.9	48,8
Nonferrous metals	41.9	2.0	90.7	29.2
Machinery	452.4	18.6	443,2	67,2
Electric machinery	2,811,7	25.7	3,126.9	65.5
Transport equipment	5,971.6	32.7	4,020,9	64.6
Commerce	7,396,6	162	7,509,3	34,6

NOTES: Commerce includes wholesale and retail trade to distributors and dealers.

SOURCE: Ministry of International Trade and Industry, Industrial Policy Bureau, International Business Affairs Division, *Kagai Toshi Tokei Soran: Dai* 3-kai *Kaigai Jigyo Katsudo Kihon Chosa* (Tokyo: MITI, 1989), tables 1-19,20,23, and 24, and Kaigai Toshi Tokei *Soran: Dai 4-kai Kaigai Jigyo Katsudo Kihon Chosa*(Tokyo: MITI, 1991), tables 1-22, 23, 25, 26, and 27

The FDI Life Cycle Theory

In theory, the FDI life cycle is quite straightforward.[22] When MNEs establish affiliates in a foreign country, the new firms tend to import intermediate goods, since they have more developed business relations, established standards and certification procedures, and secure sources in the home market. Foreign affiliates can be expected to increase their local sourcing over time, as they become more deeply integrated into the local economy and consequently can realize the efficiencies of local sourcing. By this explanation, Japanese affiliates in the United States have different sourcing patterns than their European counterparts because Japanese investment in the United States is relatively new. Over time, the theory predicts, the volume of Japanese intrafirm trade will decrease and local content will increase as Japanese affiliates become more deeply embedded in the U.S. economy.

In practice, however, it is difficult to observe the FDI life cycle. There is no standard expectation regarding the amount of time that firms need to operate in local markets before it is reasonable to expect high degrees of local content. In addition, data limitations make it very difficult to measure local content, particularly in industries that produce products with large numbers of complex manufactured parts and components. Furthermore, it can become unwieldy to define local con-

22 One of the earliest formulations of the FDI]ife cycle theory was put forth by John Dunning as the "eclectic theory" of FDI; see J. H. Dunning, "Trade, Location of Economic Activity and MNE: A Search for an Eclectic Approach," in B. Ohlin, P. Hesselborn and P. Wilkman (eds.), *The International Allocation of Economic Activity* (London, UK: Macmillan, 1977), pp. 395-418. *See* also J. H. Dunning, Japanese Participation in British *Industry* (London, UK; Dover, NH: Croom Helm, 1986); J. H. Dunning, *Multinational Enterprises and the Global Economy* (Reading, MA: Addison-Wesley, 1993); and J. Hennert, *A Theory of Multinational Enterprise* (Ann Arbor, MI: University of Michigan Press, 1985).

TABLE 6-5: Value of Exports and Share of Intrafirm Trade of Japanese MNE Parent Companies to Europe by Sector, 1986 and 1989 (in billions of nominal yen and percent)

	1986		1989	
Industry	Exports	IFT as a percent of exports	Exports	IFT as a percent of exports
All industries	9,7126	360	12,0802	305
All manufacturing	5,618.2	434	5,4030	431
Chemicals	1280	140	2279	27.1
Nonferrous metals	487	124	374	201
Machinery	409.7	443	3573	478
Electric machinery	1,8852	506	2,1188	598
Transport equipment	1,6099	337	1,6916	232
Commerce	3,7482	24.4	7,0056	202

NOTES: The sources definition for commerce Includes wholesale and retail trade to distributors and dealers

SOURCE: Ministry of International Trade and Industry Industrial Policy Bureau International Business Affairs Division Kaigai Toshi Tokei *Soran: Dai 3-kai Kaigai Jigyo Katsudo Kihon Chosa* (Tokyo MITI, 1989) tables 1-19 20 23, and 24 and Kaigai Toshi *Tokei Soran: Dai 4-kai Kaigai Jigyo Katsudo Kihon Chosa* (Tokyo: MITI, 1991), tables 1-22 23 25 26 and 27

tent in industries that include a large number of foreign affiliates that produce intermediate goods locally.

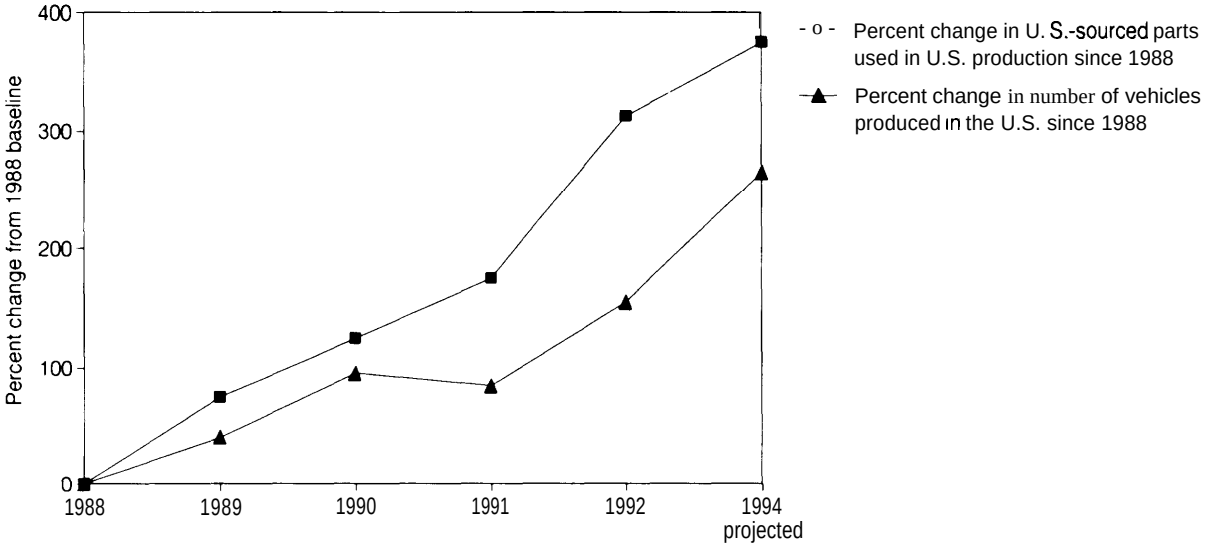
The difficulties of measuring local content can be seen in the U.S. automotive sector, which has attracted a great deal of Japanese investment since the mid- 1980s.23 As these affiliates have increased U.S. production capacity, they have also increased the volume of purchases from domestic parts suppliers. Data provided by the Toyota Motor Corporation, for example, indicate that Toyota will have increased its U.S. sourcing for local production from $800 million in 1988 to a projected $3.8 billion in 1994, as its U.S. production will have grown from 164,500 to 600,000 vehicles (see figure 6-13). These figures indicate that Toyota's U.S. sourcing has increased at a somewhat faster rate than its U.S. production, as would be expected by the life-cycle theory of FDI. According to Toyota, the local content rate for its U.S. production currently ranges from a high of 75 percent for the Camry to a low of 60 percent for the Hilux truck, based on EPA CAFE measurement standards .24

Some analysts note that Toyota's local content rates are relatively high given the difficulties new firms face in establishing local sources for parts and components. Switching from traditional to new suppliers can be costly and time-consuming. It requires new standards and certification procedures, creates uncertainties regarding the reliability and quality of supplies, often introduces new price differentials, and can damage existing relations with traditional suppliers. Over time these challenges may be overcome, but when affiliates

23 At present, the three largest foreign affiliates producing automobiles in the United States are Honda, Nissan, and Toyota. Mazda, Mitsubishi, and Subaru-Isuzu also have assembly facilities in the United States. BMW and Daimler-Benz are currently establishing U.S. plants, and should begin production in the near future.

24 Toyota Motor Corporation, press release, June 14, 1994, p.13.

FIGURE 6-13: Percent Change in Toyota's U.S. Sourcing and U.S. Production Since 1988



NOTE: Data points show total percentage change from a 1988 baseline of $08 billion in U.S.-sourced parts and 164,500 vehicles produced in the United Slates For 1994, Toyota projects $38 billion in U.S.-sourced parts and 600,000 vehicles, representing a 350 and 265 percent Increase, respectively since 1988

SOURCE: OTA, based on data in Toyota Motor Corp., "This is Toyota U S A 1993, " Corporate Brochure, 1993

are relatively new the disadvantages of local sourcing tend to outweigh the advantages, such as reduced foreign exchange risk, lower transportation costs, and greater operational flexibility.

Other analysts note that the significance of particular local content levels partly depends on the reference point. For instance, Toyota's domestic content is higher than average for all foreign affiliates in the U.S. automotive sector (55 percent in 1991), but it is lower than the average for all manufacturing affiliates (83 percent in 1991).

More importantly, local content estimates vary greatly, mostly due to difficulties in determining the national origin of complex components—many of which contain parts made in different countries. For instance, while Toyota and Honda claim domestic content levels of approximately 70 percent, the BEA estimates that Japanese affiliates in the automotive sector on average purchase about 50 percent of their inputs from domestic suppliers.[25] Although the apparent discrepancy in these figures could be due to very low local content levels by other Japanese affiliates, conflicting firm-level estimates suggest that part of the problem is due to different measurement techniques. For instance, a U.S. Customs Service audit of the Honda Corporation in 1990 concluded that its domestic content was considerably less than the company claimed.[26]

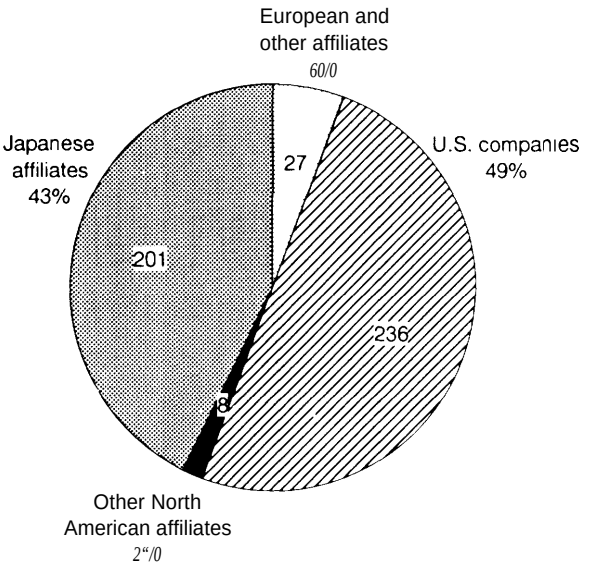
[25] In 1990, the local content for all Japanese automotive affiliates was 50.7 percent, in 1991 it was 47.2 percent. See Table 6-1.

[26] Local content estimates frequently diverge due to different techniques for classifying complex components that include both domestic and foreign value-added. Different depreciation allowances can also affect the results. For a discussion of the different estimates of Honda's local content, see U.S. Congress, Office of Technology Assessment, *Multinationals and the National Interest: Playing by Different Rules,* OTA-ITE-569 (Washington, DC: U.S. Government Printing Office, September 1993), pp. 96-97. The enterprise-level data needed to completely assess tbe local content rates of individual firms is not publically available due to disclosure restrictions.

A further complicating factor is that 43 percent of all U.S. suppliers to the three major Japanese automobile transplant assemblers—Toyota, Honda, and Nissan—are themselves affiliates of Japanese-based MNEs (figure **6-14),** Moreover, 53 percent of those suppliers have an equity link with one or more of these three Japanese transplant assemblers in the United States.[27] In light of these facts, some analysts have noted that the Japanese transplant assemblers may be purchasing a large percent of their local parts and components from affiliates of Japanese supplier firms, often ones within the same keiretsu.[28] Indeed, the timing of direct investments in the United States by Japanese automotive suppliers suggests that there are close links between the transplant assemblers and their traditional supplier base. As figure 6-15 shows, most of the Japanese-affiliated suppliers in the United States were established between 1986 and 1992, in the wake of major investments by the three largest Japanese automotive assemblers—Honda began production in Ohio in 1982; Nissan began truck production in 1983 and automobile production in 1985 in Tennessee; and Toyota began automobile production in 1988 in Kentucky (after having established the NUMMI joint venture with GM).

In the context of these interfirm linkages, domestic content becomes increasingly difficult to measure and interpret. From one point of view, it is preferable that Japanese transplant assemblers source from firms located in the United States—regardless of national origin—rather than importing those goods. From another perspective, keiretsu relations are widely regarded as restrictive in Japan; if transferred to the United States or Europe, there is concern that they might convey unfair competitive advantages to Japanese automotive assemblers and suppliers.[29] Although the former point is certainly true, there is also evidence to support the latter. Several managers in the U.S. and European automotive industries told OTA that the primary sourcing decisions of Ja-

FIGURE 6-14: Suppliers to Japanese Automobile Transplants, by National Affiliation



NOTE: Number of firms given in chart, total number -472

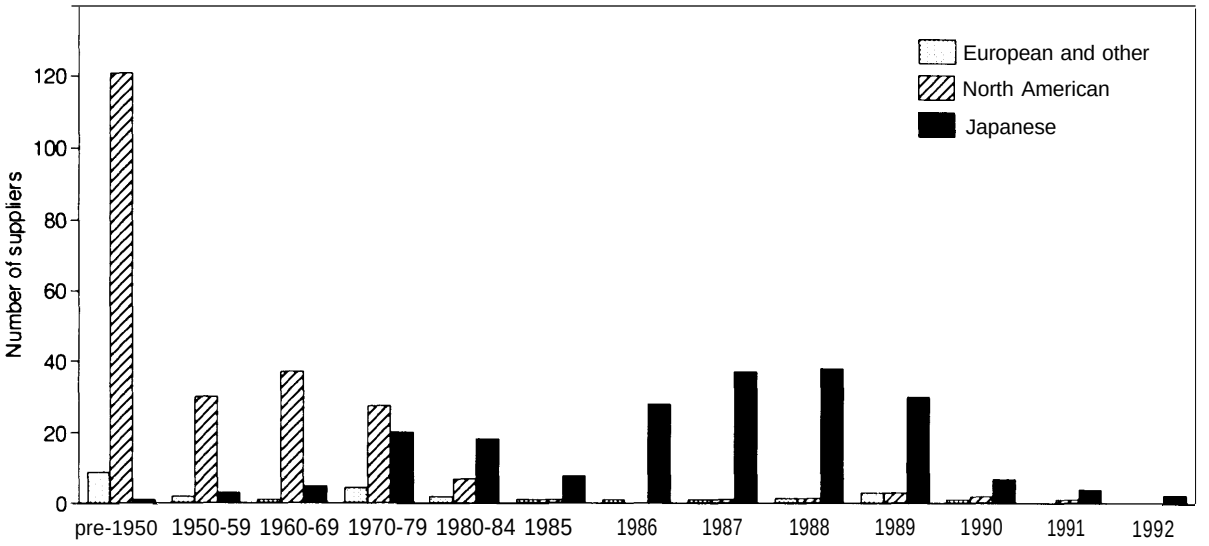
SOURCE: OTA, based on The *ELM Guide to U S Automotive Sourcing* (East Lansing, MI ELM International Inc., 1992), and The *ELM Guide to Japanese Affiliated Suppliers m North America* 4th ed. (East Lansing, MI ELM International Inc., 1993)

[27] OTA Auto Supplier Database, based on information from ELM International Inc., *The ELM Guide to U.S. Automotive Sourcing* (East Lansing, MI: ELM International Inc., 1992) and ELM International Inc., The *ELM* Chide *to Japanese Affiliated Suppliers in North America*, 4th ed. (East Lansing, MI: ELM International Inc., 1993).

[28] For example, see C. Howes, *Transplant.r and the U.S. Automobile Industry* (Washington, DC: Economic Policy Institute, 1993)

[29] There is little doubt that keiretsu relationships constitute an impediment to competition in the Japanese automotive industry. According to Jotaro Yabe of Japan Fair Trade Commission, "It makes economic sense for auto-makers to organize their distributors into keiretsu. For example, it contributes to maintaining after-sales service and to raising sales efficiency. On the other hand, it prevents the entry of foreign cars into the market, and is thus seen as a problem.. ..Business practices, however, restrict the freedom of dealers to handle other manufacturers cars, including foreign cars." See J. Yabe, "Freedom of Distributors Restricted: Problems including Rebates for Reaching Goals," *Nihon Keizai Shimbun*, p.14, 11 October 1993.

FIGURE 6-15: Suppliers to Japanese Automobile Transplants, by Year of Establishment



SOURCE: OTA, based on *The ELM Guide to U S Automotive Sourcing* and *The ELM Guide to Japanese Affiliated* Suppliers in *North America*

pan's U.S. transplant assemblers are made in Japan, and that outside firms face considerable difficulties breaking into Japanese supplier networks. When asked to confirm this, a representative of Toyota Motor Corporation told OTA that all sourcing and engineering decisions for U.S. production require the approval of the parent company. Many U.S. and European suppliers have pursued business with the Japanese transplant assemblers by establishing joint ventures with Japanese companies and opening technical facilities in Japan. They have done this because they believe that it will lead to business with the Japanese transplant assemblers in the United States.

Although sourcing relationships are very difficult to trace, some studies suggest that keiretsu-related sourcing patterns are not exclusive to Japanese affiliates in the U.S. automotive industry. For example, one recent study indicates that keiretsu linkages are common among Japanese affiliates in the European automotive and semiconductor sectors.[30] However, the great variety and complexity of manufactured inputs in modem industry, combined with the proprietary nature of the information, make systematic and comprehensive studies of international sourcing patterns difficult if not impossible.

Combined, the relatively recent presence of Japanese FDI, the complexity and uncertain origin of manufactured inputs, and the complex patterns of national affiliation among producers and their suppliers all make local content estimates inherently problematic. Consequently, the FDI life cycle theory is difficult to confirm by analyzing the sourcing behavior of foreign affiliates.

Indicators that focus on the output of affiliates also provide important but inconclusive evidence. For instance, the FDI life cycle theory predicts that foreign affiliates will shift over time from purely domestic to more internationally diversified sales. In the case of Japanese manufacturing

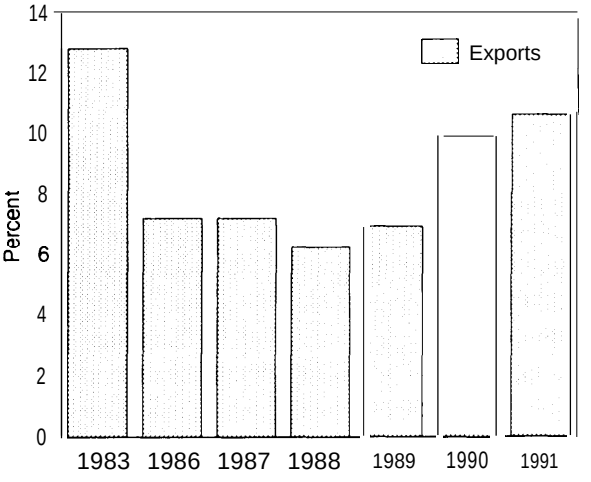
30 M. Mason and D. Encarnation (eds.), *Does Ownership Matter? Japanese Multinationals in Europe* (Oxford, UK: Clarendon press, forthcoming 1994), pre-publication copy, pp. 147, *156,* and 314.

affiliates in North America, exports have increased as a percentage of all sales since the late 1980s, yet they were the highest in 1983 at 12.8 percent and actually decreased from then until 1988, when they hit a low of 6.2 percent (see figure **6- 16).**

Although individual MNEs may conform to a FDI life-cycle pattern, aggregate data on the sourcing and sales behavior of Japanese affiliates in the United States and Europe do not provide conclusive evidence. Japanese affiliates in the United States clearly import more of their production inputs than do their European counterparts (see table 6-1). It remains to be seen whether this pattern will change over time. Japanese affiliates may also begin to export a larger percentage of their sales as they become more embedded in foreign markets and become more fully integrated and independent production facilities. To date, however, there is insufficient evidence to determine whether Japanese affiliates will indeed become more deep] y rooted in the U.S. economy and exhibit production and trade tendencies similar to most European affiliates.[31] Akio Morita may be correct in observing that Japanese MNEs have institutional characteristics that encourage them to behave differently than their European and U.S.-based counterparts.[32]

In sum, the bilateral distribution of FDI clearly affects the relative symmetry of bilateral trade flows. This is most evident in the U.S.-Japan economic relationship, where significant asymmetries in investment have contributed to an imbalance trading relationship marked by consistent Japanese trade surpluses, most of which can be associated with flows of merchandise from Japanese MNE parents to their affiliates in the United States.

FIGURE 6-16: Exports of Japanese Manufacturing Affiliates in North America as a Percent of Total Sales, 1983-1992



SOURCE: Adapted from Ministry of International Trade and Industry Industrial Policy Bureau, International Business Affairs Division *Dai* 18/19 *kai Wagakuni Kigyo no Kaigai Jigyo Katsudo* (Tokyo: Okura-sho Inasatsuyoku, 1991), p 18, table 11, and *Dai* 22 *kai Wagakuni Kigyo no Kaigai Jigyo Katsudo* ((Tokyo: Okura-sho Inasatsuyoku, 1993), p 22, table 2-16

The composition of investment also has a significant effect on trading patterns. An important factor is whether FDI is concentrated in manufacturing or wholesale trade. The concentration of Japanese FDIUS on wholesale trade shows up clearly in the aggregate trade data of Japanese affiliates in the United States. Since the mid- 1980s, Japanese affiliates consistently have accounted

[31] This process may be taking place within individual Japanese firms that have been in the U.S. economy for some time. For instance, Honda—which began U.S. production in 1983—recently announced plans to expand its North American car and engine manufacturing facilities, use the increased capacity to boost exports from (he region from 43,000 to 150,000 units by the end of the decade, and generally accord the region greater independence within Honda's global business. J. Griffiths, "Honda to spend $3 10m on bolstering US plants," *Financial Times*, p. 1, July 201994.

[32] See A. Morita, 'Nihon-gata Keiei ga abunai', *Bungei Shinju*, pp.94-103, February 1992.

for 40 percent of the exports and 50 percent of the imports of all foreign affiliates in the United States. All but a small share of their trade has been by wholesale trade affiliates.[33]

Much of the merchandise trade of affiliates is IFT, especially on the import side. Wholesale trade affiliates have particularly strong tendencies toward I IT, reflecting their role as distributors for their parent's products. Although at lower levels than in wholesale trade, affiliates in manufacturing industries also have high import tendencies, largely due to IFT imports of parts, components, and subassemblies. The considerable differences in IFT tendencies across firms may partly be explained by the relative age of FDI, although there is insufficient data to determine if most affiliates routinely increase local sourcing and diversify trading over time. Evidence to date indicates that foreign affiliates integrate with local economies to different degrees and through different channels, only some of which can be explained by the relative age of FDI.

In addition to their immediate effect on trade flows, cross-national differences in the distribution and composition of FDI have important implications for the U.S. technology base. As the above analysis indicates, FDI can be concentrated in different sectors and deployed to very different effects. Consequently, different forms of FDI can and do have different implications for the U.S. technology base.

FORMS OF FDI-CONTRIBUTIONS TO THE U.S. TECHNOLOGY BASE

FDI can take many forms, some of which are more likely to result in technology development in the United States. Five basic types of FDI are listed below, in ascending order of their contribution to the U.S. technology base:

1. distribution facilities for imported products;
2. final assembly facilities for imported components;
3. manufacturing facilities that use a mix of imported and locally manufactured components;
4. integrated design, engineering, and manufacturing facilities that provide customized products for the local market; and
5. fully integrated research and production facilities that are a strategic component of a firm's global R&D, sourcing, and manufacturing operations.

By this ranking, FDI that is concentrated in wholesale trade makes a relatively limited contribution to the U.S. technology base, since wholesale trade affiliates are principally distribution or final assembly facilities for imported goods. Manufacturing FDI contributes substantially more, although the level of contribution varies with the degree of local content. In general, the higher the local content, the greater the demand for high value-added components produced by domestic suppliers, and the greater the liklihood that advanced manufacturing process technology will be transferred to or developed in the United States. Manufacturing FDI that includes an R&D element provides a strong contribution to the U.S. technology base because it creates avenues both for importing and developing technology. It may also employ and train U.S. scientific and technological personnel. Facilities that only include design and customization research can also provide important contributions to the U.S. technology base, although not as extensively as fully integrated manufacturing facilities that include independent product and process-oriented research.

Consequently, national variations in the composition of FDIUS are associated with differences in the contribution that foreign affiliates make to the U.S. technology base. The data are consistent with this expectation. German affiliates in the aggregate have the highest R&D intensity of all foreign afiliates in the United States, which reflects both the concentration of German FDIUS in R&D-intensive industrial sectors such as chemi-

[33] U.S. Department of Commerce, BEA, op. cit., footnote 2, p.53.

cals and pharmaceuticals, and the willingness of German-based MNEs to develop or purchase technology assets in the United States. U.K. and French affiliates have nearly average R&D intensities, which reflects the dispersion of each country's investment across a range of industries with different R&D requirements. Japanese affiliates have a very low R&D intensity, which reflects both the high percentage of Japanese FDIUS in the wholesale trade sector, and the reluctance of Japanese-based MNEs to conduct technology development abroad.[34]

As discussed in chapter 4, R&D by foreign affiliates in the United States is relatively small but is growing rapidly. It can play a large role in individual sectors. European affiliates, for example, exhibit very high R&D intensities and contribute substantially to technology development in the U.S. pharmaceutical and chemical sectors. However, in the aggregate, most R&D conducted overseas by foreign affiliates is devoted to product customization for local markets or, at best, to the support of local production facilities. Fully integrated affiliates that conduct independent product R&D are relatively rare, in part because overseas R&D facilities are comparatively difficult to establish. In many industries, foreign plants can be constructed quickly or moved on the basis of changes in factor costs. R&D facilities, by contrast, take a long time to set up and are difficult to move.[35]

Apart from conducting R&D overseas, MNEs can transfer process and product technology abroad through FDI and local production. Indeed, technological leadership often stimulates FDI. Technological advantages and ancillary capabilities such as marketing know-how frequently outweigh the disadvantages of operating in unfamiliar markets, and can encourage firms to pursue market advantages on a global basis.[36]

In addition, MNEs can also use FDI as a means of keeping abreast of technological developments in foreign markets. In a globalizing economy, where markets are liberalizing, technology is diffusing, and customization is increasingly important, firms must constantly upgrade and expand their technological capabilities. Doing so often requires access to technological developments on a global basis, wherever they emerge. Some analysts believe that there is no systematic evidence that foreign firms use merger and acquisition strategies to obtain U.S.-developed technology. Others suggest that MNEs often enter into joint ventures and other foreign investment arrangements to establish a listening post for overseas technological developments.[37]

Among the major industrialized economies, Japanese' firms are most widely known for using FDI as a means of acquiring foreign technology. For example, U.S. investments by Japanese-based MNEs in R&D-intensive, high-technology industries are frequently motivated by a desire to gain

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34 See table 4-2 and figure 4-5 in chapter 4.

35 See chapter 4 for a discussion of R&D within MNE networks.

36 For example, Japanese FDI in certain segments Of the semiconductor industry has been ascribed to leadership in MOS memory and bipolar logic technologies. See Y. Kimura, "Japanese Direct Investment in the European Semiconductor Industry," in Mason and Incarnation (eds.), op. cit., footnote 29, p.300.

37 A Department of Commerce study concluded that foreign investors were not disproportionately interested in targeting high technology acquisitions in the United States. See S.0. McGuire and D. Dalton, "Influence of Foreign Direct Investment on the Development and Transfer of U.S. Technology," in U.S. Department of Commerce, Economics and Statistics Administration, *Foreign Direct Investment in the United Stales: An Update (* Washington, DC: June 1993), p.62. At the same time, MNEs frequently point to foreign technological capabilities as an important motive for FD1. For instance, in a survey conducted by Japan's Science and Technology Agency, Japanese MNEs cited the search for new technologies as the second most important motive for investing in Europe and the United States (the first being to meet local market needs). See OECD, Economic Analysis and Statistics Division, Directorate for Science, Technology and Industry, *Performance of Foreign Affiliates in OECD Countries* (Paris, France: OECD, forthcoming), diagram 19p. 53. This motive was mentioned frequently in OTA interviews with MNEs in Europe and Japan.

TABLE 6-6: Number of High-Technology Firm Acquisitions and Establishments by Selected Countries, 1987-1990

Industry	All countries	Germany	U.K.	Japan
Industrial chemicals	75	9	23	7
Drugs	26	2	6	7
Engines and turbines	7	1	1	1
Other transportation	21	1	10	1
Computers and equipment	77	6	19	20
Communications equipment	31	1	12	6
Electronic components	154	6	42	48
Instruments	131	10	46	27
Computer and data processing services	72	1	19	11
Engineering and architectural services	39	3	12	5
R&D and testing services	30	5	4	12

SOURCE: Adapted from Organisation for Economic Co-operation and Development, Economic Analysis and Statistics Division, *Performance of Foreign Affiliates* in *OECD Countries* (Paris: OECD, forthcoming), p 91, table 5 of pre-publication draft.

access to U.S. technological capabilities, often through cooperative agreements.[38] In many occasions these agreements resulted in the acquisition of the U.S. company by the Japanese investor. One report on foreign investment in U.S. high technology companies found that, between 1988 and 1993, Japanese companies accounted for 57 percent of all identified cases, having acquired or invested in 438 U.S. firms. Half of these acquisitions were in information technologies, primarily computers, semiconductors, and electronics. U.K. firms accounted for the second largest percentage of acquisitions, at 13 percent; they focused on computers, electronics, and advanced materials .39

Foreign acquisitions in the United States were particularly common in the late 1980s.[40] During this period, MNEs based in Japan and the United Kingdom acquired or established the largest number of U.S. high-technology firms (see table 6-6).[41] Despite this similarity, Japanese and British FDIUS differed in two important respects. First, Japanese investment in the United States expanded rapidly while U.K. investment grew by smaller increments. In just over a decade, Japanese investment overtook U.K. investment that had taken centuries to establish. Second, U.K. investment tended to be scattered over a variety of unrelated sectors, ranging from publishing to precision instruments. By comparison, Japanese investment was concentrated in a set of vertically integrated sectors, primarily electrical equipment, primary metals, and motor vehicles.[42] Third, U.K.

38 See B. K_ogut and S.J. Chang, op. cit., footnote 20, p. 411. See also Drake and Caves, Op. cit., footnote 20; and H. Yamawaki, "Entry Patterns of Japanese Multinationals in U.S. and European Manufacturing," in Mason and Encarnation (eds.), op. cit., footnote 29, p. I I.

39 See L.M. Spencer, *Foreign* Acquisitions *of U.S. High Technology Companies: Database Report* (Washington DC: ESI, March 1994), pp. 1,2 and 5.

40 See figure 5-8 in chapter 5.

41 See also Spencer, op. cit. footnote 38.

42 See Figure 3-4 in U.S. Congrees, OTA, OP. cit., footnote 25, p. 58.

affiliates spend more on R&D in the United States than do Japanese affiliates. Finally, unlike the U.S.-U.K. trade relationship, Japanese investment in the 1980s coincided with a record bilateral trade deficit and a particularly high merchandise trade deficit for affiliates.

Although Japanese MNEs appear to use FDI as a strategic channel for acquiring foreign technology more frequently than others, the need to do so is not exclusive. MNEs throughout the advanced industrial economies increasingly require access to foreign technological developments, particularly in R&D-intensive and technologically complex industries. Executives of numerous MNEs told OTA that technological capabilities have become much more dispersed than in the past, and that they need to maintain a global technological horizon to remain competitive. Moreover, the high costs of maintaining technological leadership have been pressuring them to focus on developing their core technological competencies, while licensing or subcontracting subsidiary technologies to other firms.

In this context, barriers to overseas investment may exert a significant effect on the U.S. technology base, perhaps comparable to the technological activities of foreign affiliates in the United States. Ironically, the automotive industry illustrates this point from both perspectives. In recent years, Toyota, Nissan and Honda have transferred much of their manufacturing process technology and management techniques to their United States operations. Analysts widely conclude that diffusion of this knowledge has assisted the Big Three in improving their own performance, leading to rapid advances by the entire industry in assembly plant productivity and quality. However, one of the reasons that U.S. automobile manufacturers had become relatively uncompetitive in their manufacturing process technology is that, in the past, they experienced restrictions to investment in Japan and consequently lacked the vantage point to see important technological developments as they emerged.[43] In short, in highly internationalized industries, competitiveness requires constant exposure to new process and product technologies—wherever they develop. When FDI is restricted, whether through formal or informal barriers, firms can be excluded from important developments in product and process technologies, which can lead to considerable competitive disadvantages.

Across the United States, Europe, and Japan, legal barriers to investment are largely an anachronism. Nevertheless, as this and the preceding chapter illustrate, imbalances in investment flows remain. Although firm-level investment decisions are complex and affected by a wide range of macro- and macroeconomic factors, the aggregate distribution of investment across the Triad suggests that informal yet effective barriers to FDI persist. As Part IV demonstrates, part of this problem may be attributable to informal barriers that emerge from fundamental differences in the structure of corporate governance and finance across the United States, Europe, and Japan.

[43] Of course, the difficulties experienced by the Big Three have been due to a complex array of internal and external factors.