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Foreign Direct Investment and Services Trade
The Case of Japan

Kyoji Fukao and Keiko Ito

13.1 Introduction

Because many services are either untradable or at least difficult to trade, a substantial part of the international delivery of services is conducted through affiliates established within other countries. For this reason, it has been argued that the compilation of statistics on international sales of services must include information not only on *cross-border transactions,* as recorded in the balance-of-payment statistics, but also on services delivered through *establishment transactions* (Kravis and Lipsey 1988; Ascher and Whichard 1991). Being aware of this issue, the U.S. government has made efforts to improve official statistics, so that in the case of the United States, relatively reliable statistics on these two types of international transactions of services are available from the 1980s onward (U.S. Congress 1986; U.S. Department of Commerce 1995c, 1999). In contrast, although Japan has the second largest market for services in the world, Japan's official statistics on establishment transactions of services have many drawbacks in comparison with U.S. statistics.

In this paper, we estimate the sales and employment of Japanese affiliates of foreign firms (JAFFs) and foreign affiliates of Japanese firms (FAJFs) in the service sector at the three-digit industry level for the year 1995. Our estimation is based mainly on data provided by Toyo Keizai and the results of the Establishment and Enterprise Census of Japan, which is conducted by the Japan Management and Coordination Agency. Using our estimates, we compare Japan's establishment transactions with Japan's cross-border

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transactions at the three-digit industry level. We also compare Japan's purchases of services from foreigners with U.S. purchases from foreigners. Although our new estimates possibly contain large estimation errors due to statistical deficiencies, we think that our results are more comprehensive and balanced than existing statistics on this issue.

According to our new statistics, actual foreign activities in Japan are much greater than those reported in Japan's Ministry of International Trade and Industry's (MITI, which is now the Ministry of Economy, Trade, and Industry, METI) survey, *Gaishi-kei Kigyo Doko Chosa* (*Survey on Trends of Business Activities by Japanese Subsidiaries of Foreign Firms*).

Probably the most commonly cited statistics on Japan's inward direct investment are those provided by the Ministry of Finance (MOF; 1999; the data are also available in Organization for Economic Cooperation and Development [OECD] 1999a). According to these data, Japan's outward direct investment stock in the service sector is nine times greater than the corresponding inward direct investment stock (table 13.1). Since no other OECD country has an imbalance of this magnitude, it has been argued that the imbalance indicates the closedness of the Japanese economy to inward direct investment in the service industries (General Agreement on Tariffs and Trade [GATT] 1995; MITI 1998b; Stern 2000).

However, since the MOF data only record cross-border capital flows, they do not necessarily correspond to the extent of affiliates' actual activities. For example, because of Japanese regulations, many foreign banks and insurance companies entered the Japanese market by setting up branches rather than founding subsidiary companies. This fact makes their investment flows relatively small compared with the actual magnitude of their affiliates' activities measured by sales or employment. According to our new statistics, imbalances between the activities of JAFFs and those of FAJFs are smaller than those indicated by the MOF's foreign direct investment (FDI) statistics. In terms of employment, the JAFF-FAJF ratio is 0.22.

Although our new estimates of foreign activities in Japan are larger than existing estimates, we found that foreign activities in Japan are substantially smaller than foreign activities in the United States. Japan's ratio of number of workers employed by majority-owned foreign affiliates to total number of workers is 0.4 percent, which is one-seventh of the corresponding U.S. ratio of 2.8 percent. We also found that, compared with the United States, Japan's purchases from foreigners are concentrated in a limited number of industries. Four industries—financial intermediary services, wholesale trade, air transportation, and hotels and lodging places—account for about 54 percent of Japan's total purchases of services from foreigners.

Because our data are compiled at the three-digit industry level, we can use them for cross-industry regression. We estimated an empirical model explaining the determinants of Japan's inward FDI penetration. We found that inward FDI penetration is closely related to several characteristics of

Table 13.1 **Japan's Inward and Outward FDI: Position at the End of March 2001 (billions of yen)**

Industry	Inward FDI Stock
Construction	21
Real estate	339
Commerce	2,028
Business and personal services	1,526
Transportation services	48
Communication services	1,155
Finance and insurance	2,595
Others	168
Nonmanufacturing total	7,880
Manufacturing	5,324
Total amount	13,203
	Outward FDI Stock
Agriculture and forestry	424
Fishery	257
Mining	5,193
Construction	821
Commerce	11,016
Finance and insurance	20,347
Business and personal services	11,398
Transportation services	7,862
Real estate	12,524
Others	1,824
Nonmanufacturing total	71,665
Manufacturing	34,187
Branches	1,656
Total amount	107,669

Sources: MOF (1999); [http://www.mof.go.jp].
Note: Cumulated value of FDI flows approved or notified from 1950 onwards.

industries. Japan's inward FDI penetration is relatively high in industries that have higher advertisement intensity, a lower presence of government activities, and a lower presence of official restrictions on inward FDI. We found that the presence of *keiretsu* does not have significant negative effects on FDI penetration.

The paper is organized as follows: In the succeeding section, we discuss existing data on Japan's international transactions of services through affiliates. In section 13.3, we explain how we estimated sales and employment by JAFFs and FAJFs in the service sector. In section 13.4, we provide a general overview of Japan's international transactions of services using our new statistics. In section 13.5, we undertake an econometric investigation of the determinants of Japan's FDI penetration in the service sector at the three-digit industry level. Section 13.6 concludes.

13.2 Existing Data on Japan's International Transactions of Services through Affiliates

In the case of inward direct investment in nonmanufacturing industries, MITI's survey *Gaishi-kei Kigyo Doko Chosa* (*Survey on Trends of Business Activities by Japanese Subsidiaries of Foreign Firms*) is the only official source on the sales and employment of foreign firms' Japanese subsidiaries.[1] According to this survey, foreign firms' Japanese subsidiaries employed only 63,000 workers in nonmanufacturing industries at the end of March 1998. The survey is loosely based on the U.S. Department of Commerce's survey of FDI in the United States, but MITI's survey has the following serious drawbacks for the purpose of studies on inward direct investment in the service sector.

1. It is not mandatory and suffers from a low response ratio. In the case of the survey for the 1997 fiscal year, only 49.5 percent of the questionnaires sent out were returned to MITI. Moreover, usually not all the questions in the returned questionnaires are answered.
2. The survey does not cover subsidiaries in real estate, finance, and insurance.
3. The survey covers only Japanese companies that are more than one-third foreign-owned and does not cover branches and other establishments directly owned by foreign firms.
4. In MITI's report on inward FDI, all the data on nonmanufacturing subsidiaries are aggregated into three industries only: commerce, services, and others (agriculture, construction, etc.). In the case of outward FDI, the data on nonmanufacturing subsidiaries are aggregated into six industries: agriculture, mining, construction, commerce, services, and others. No data at a more detailed industry level are published.

Because of the low response ratio and the exclusion of real estate, finance, and insurance, the number of subsidiaries covered by MITI's survey is substantially smaller than that of other surveys on foreign subsidiaries conducted by private companies. For example, the number of nonmanufacturing subsidiaries covered by the MITI survey for 1997 was only 983.[2]

1. MITI's other survey, *Kigyo Katsudo Kihon Chosa* (*Basic Survey on Business Activities by Enterprises*), also collects data on JAFFs as a part of information obtained on Japanese firms. However, this survey covers only the manufacturing and commerce sectors. Moreover, the response ratio of this survey is also low. In 1999, the Japan Management and Coordination Agency added questions on whether firms were majority-owned by foreigners to their survey *Service-gyo Kihon Chosa* (*Basic Survey on Service Sector*), which covers several service industries. A coming report of this survey probably includes some information on JAFFs.

2. Mainly focusing on manufacturing sectors, Kimura and Baldwin (1996) estimated sales and procurements by JAFFs and FAJFs using the results of MITI's surveys. They did not make adjustments to account for these problems.

The results of this survey on Japanese companies majority-owned by foreign firms are reproduced in OECD (1999b). In the case of inward direct investment in Japan's service sector, the formats of tables in the OECD publication are quite misleading. According to the publication, Japanese subsidiaries in finance, insurance, real estate, and business services that were majority-owned by foreign firms employed only 3,800 workers in 1996. However, this number is in fact only for business service subsidiaries, because MITI's survey does not cover the other subsectors.

Concerning foreign subsidiaries of Japanese firms, MITI conducts the survey *Kaigai Jigyo Katsudo Doko Chosa* (*Survey on Trends of Japan's Business Activities Abroad*), which covers foreign subsidiaries with more than a 10 percent Japanese ownership. This survey has similar setbacks as the survey on inward direct investment. It suffers from a low response ratio and does not cover Japanese-owned subsidiaries in the finance and insurance sector. According to this survey, foreign subsidiaries of Japanese firms employed 487,000 workers in nonmanufacturing sectors, excluding agriculture, fishery, and mining, at the end of March 1998.

Compared with these surveys by MITI, Toyo Keizai's microdata, *Gaishi-kei Kigyo Soran: CD-ROM-ban* (*Directory of Japanese Subsidiaries Abroad: CD-ROM version*) and *Kaigai Shinshutsu Kigyo Soran: CD-ROM-ban* (*Directory of Japanese Subsidiaries Abroad: CD-ROM version*) have a substantially broader coverage of subsidiaries. Toyo Keizai conducts its own surveys for this database.[3] Toyo Keizai also uses additional data, such as financial reports, for nonresponding firms. The data cover all industries. In principle, the Toyo Keizai data on inward FDI cover subsidiaries with a 49 percent or higher foreign ownership. However, in the case of listed or large subsidiaries, the data cover those with a 20 percent or higher foreign ownership. The data on outward FDI primarily cover foreign subsidiaries with a 20 percent or higher Japanese ownership in principle. Judging by the number of subsidiaries and number of workers employed by subsidiaries, the coverage of the Toyo Keizai data is much broader than that of MITI. In the case of foreign firms' Japanese subsidiaries in nonmanufacturing sectors excluding the primary sector, the Toyo Keizai data for 1997 cover 2,456 subsidiaries, which employed 204,000 workers.[4] In the case of foreign subsidiaries of Japanese firms in nonmanufacturing sectors excluding the primary sec-

3. In the case of inward FDI, Toyo Keizai and Dun & Bradstreet Japan Ltd. jointly conduct their surveys for this database.

4. A private company, Teikoku Data Bank Ltd., provides a database, "Cosmos," which covers 1.1 million Japanese firms for 1999. In the case of the nonmanufacturing sector, the database contains information on 1,236 firms that were more than one-quarter foreign-owned. The database was too expensive for us to use for this research. Some statistics on these firms are available at http://www.tdb.co.jp.

tor, the data for 1995 cover 10,378 subsidiaries, which employed 865,000 workers.

13.3 Estimation of Sales and Employment by JAFFs and FAJFs in the Service Sector

We use Toyo Keizai's data as the basic statistics for our estimation. Sales and employment data for JAFFs and FAJFs in service sectors at the three-digit level are estimated for the year 1995. We chose 1995 because the most recent input-output (I-O) tables (Japanese Government 1999) are available for this year.

Although the coverage is broader, the Toyo Keizai data have several shortcomings. We revised the data using additional statistics in the following way. (For details regarding the estimation procedures, please see the appendix.)

13.3.1 Branches and Other Establishments Directly Owned by Foreign Firms

In the case of the banking and insurance sector, the Toyo Keizai data cover Japanese branches and other establishments directly owned by foreign firms. However, the data only partially cover such establishments in other sectors. The Statistics Bureau of the Japan Management and Coordination Agency (1998) records the number of workers employed by Japanese branches and other establishments directly owned by foreign firms at the four-digit industry level.[5] We used these data for estimations on Japanese branches and other establishments directly owned by foreign firms. In the case of outward investment, Toyo Keizai's database covers such establishments. According to the Toyo Keizai data, foreign establishments directly owned by Japanese firms employed 44,000 workers in 1995.

13.3.2 Estimation of Sales

Although for most subsidiaries the number of workers is reported in the Toyo Keizai data, information on sales is not available for many subsidiaries. In the case of Japanese subsidiaries of foreign firms, we calculated each industry's average value of sales per worker from data on subsidiaries, for which both the number of workers and the sales were available. We used these values in order to estimate the sales of subsidiaries for which data on

5. *Jigyosho Kigyo Tokei Chosa* (*Establishment and Enterprise Census of Japan*), conducted by the Japan Management and Coordination Agency, is the most basic and important survey on Japanese establishments and covers all the industries. The survey collects both data on establishments and data on enterprises, and these two sets of data are linked. In the survey, companies are asked whether they are majority-owned by foreign firms. Therefore, the data collected in this survey are ideal for a compilation of statistics on the number of workers employed by all the JAFFs. However, such statistics are not included in the report on this survey, and we did not have enough time to get access to microdata of the survey.

sales were not available in the Toyo Keizai database and sales by Japanese branches and other establishments directly owned by foreign firms.[6] In the case of foreign subsidiaries of Japanese firms, we used both microdata of MITI's survey and Toyo Keizai's data to get average values of sales per worker for subsidiaries at the three-digit industry level. Using these values, we estimated the sales of subsidiaries for which information on sales were not available in the Toyo Keizai database. Since employment data is more reliable than sales data, we will mainly use employment data for international comparison and regression analysis.

For wholesale and retail trade and financial intermediary services, sales are not a suitable measure of activities. In the case of trade services, we estimated the distribution margins of JAFFs. Using 1995 I-O tables, we calculated the average values of distribution margins per worker in the wholesale and retail trade sectors. Multiplying the total number of workers of JAFFs by these average values, we derived our estimations for their distribution margins. In the case of subsidiaries in financial intermediary services, following Toyo Keizai, we use current incomes instead of sales as a measure of activities.

13.3.3 Industry Classification

Toyo Keizai's industry classification, which has thirty-one nonmanufacturing sectors, is not detailed enough for our analysis.[7] We therefore reclassified all subsidiaries into one of fifty-one sectors using information on the subsidiary's line of business, which is included in the Toyo Keizai data. Table 13.2 shows the correspondence between our own classification and several other standard classifications.[8,9] In our estimation, affiliates are classified according to their primary industry. Therefore, services supplied by JAFFs that are engaged in industries that are not classified as "services" are excluded from our estimation. For example, computer-related services provided by computer makers are not included. In the case of the United

6. We have also examined financial reports. Because the majority of foreign-owned firms are unlisted and the Toyo Keizai usually reports sales in the case of listed firms, this strategy did not help us substantially. We thought that the sales-employment ratio might be different for firms of different scale, and so we investigated whether this ratio depended on the scale of firm for several major industries, but we found no significant relationship.

7. Toyo Keizai's classification contains eleven wholesale trade sectors. For the other nonmanufacturing subsidiaries, it contains only twenty sectors.

8. We aimed at setting the target of our analysis as broad as possible. Our classification includes all the nonmanufacturing industries except agriculture, fishery, forestry, and mining. Our data cover electricity, gas, and water supply, which are not covered by the General Agreement on Trade in Services, and agricultural services and ship and aircraft repair, which are not classified in the service sector in Standard Industrial Classification for Japan (Statistics Bureau, Japan Management and Coordination Agency 1993).

9. For definitions of industries in Japan's, the United States', and the General Agreement on Tariffs and Trade (GATT) secretariat's classifications systems, see United Nations (1991), GATT (1991), Statistics Bureau of Japan Management and Coordination Agency (1993), MITI (1999c), Japanese Government (1999), and Nijhowne and Usher (1999).

Table 13.2 Correspondence Table

Fukao-Ito Industry Code	Definition	1995 Japan I-O Standard Classification			1992 U.S. I-O Standard Classification			1992 BEA Classification for FDI in the U.S. Establishment Data			GATT Secretariat Classification	
1	Construction and civil engineering	4111-011	4111-021	4112-011	11	12		15	16	17	3.A	3.B
		4112-021	4121-011	4131-011				6522			3.C	3.D
		4131-021	4131-031	4132-011							3.E	
		4132-021	4132-031	4132-099								
2	Electricity	5111-001	5111-041		680100	780200	790200	491	4931		171	1.F.j[a]
3	Gas supply	5121-011			680201	680202		492	4932		172	1.F.j[a]
4	Steam and hot water supply	5122-011			680301[a]			494[a]	4953[a]	4959[a]	173	1.F.j[a]
5	Water supply	5211-011	5211-021		680302[a]			4952	496[a]		180	
6	Sewerage systems	5211-031									6.A	
7	Sanitary services	5212-011	5212-021		680302[a]			4953[a]	4959[a]	496[a]	6.B	
8	Wholesale trade	6111-011			69A			50	51		4.A	4.B
9	Retail trade	6112-011			69B			52-57	59		4.C	4.D[a]
10	Financial intermediary services	6211-011	6211-012		70A			60	61	62	7.B.a–l	6.B
		6211-013	6211-014									
11	Life insurance	6212-011			70B[a]			63[a]	64[a]		7.A.a	7.A.c,d[a]
12	Casualty insurance	6212-021									7.A.b	7.A.c,d[a]
13	Real estate	6411-011	6411-021	6421-011	710100	710201		65			1.D	
14	Railway passenger transportation	7111-011	7111-012		650100[a]			—			11.E.a	
15	Railway freight transportation	7112-011						—			11.E.b	
16	Road passenger transportation	7121-011	7121-021	7131-011	650200	790100		411	412	413	11.F.a	11.F.c[a]
								4141	4142	415		
17	Road freight transportation	7122-011	7122-021	7132-011	650301	650302		421[a]	422		11.F.b	11.F.c[a]
18	Water transportation	7141-011	7142-011	7142-012	65C			441-444	448	449	11.A.a,b,c	11.B.a,b,c
		7143-011										
19	Air transportation	7151-011	7151-012	7151-013	65D			451	452	458	11.C.a,b,c	
		7151-014										
20	Storage facility services	7171-011			650301	650302		421[a]	422		11.H.b	

21	Supporting services for transport	7161-011	7181-011		650701	650702		47	417	423	1.F.q.	9.B
		7189-011	7189-021	7189-031	750003	790300		752			9.C	11.A.e,f
		7189-041	7189-051	7189-061							11.B.e,f	11.C.e
		7189-099									11.E.c,e	11.F.e
											11.H.a,c,d	11.I
22	Postal service	7311-011			780100			—			2.A	2.B
23	Telecommunications	7312-011	7312-021	7312-031	660100			481	482	489	2.C	
		7319-099										
24	Broadcasting	7321-011	7321-021	7321-031	660200	670000		483	484		2.D.c,d	
25	Education	8211-011	8211-021		770401[a]	770402[a]	770403[a]	841[a]	842[a]		5.A	5.B
		8213-011	8213-021	8213-031	770600[a]	730112[a]		823[a]	824[a]	829[a]	5.C	5.D
		8213-041						833[a]	8731[a]	8732[a]	10.C.a–n	
26	Research institutes (natural sciences)	8221-011	8221-031	8221-051							1.C.a	
27	Research institutes (social sciences & humanities)	8221-021	8221-041	8221-061							1.C.b	
28	Research within firms	8222-011									1.C.c	
29	Medical services	8311-011	8311-021	8311-031	770100[a]	770200[a]	770301[a]	80[a]			1.A.h,j	8.A
					770303[a]	770305[a]					8.B	8.C
30	Health and hygiene	8312-011	8312-021	8312-031							6.C	
31	Private non-profit organizations' services	8411-011	8411-021		770501	770502	770503	—			12	
					770504							
32	Advertising	8511-011	8511-012		73D			731			1.F.a	
33	Computer programming and software	8512-011			730104[a]			7371	7372	7373	1.B.b	
34	Information services	8512-012	8512-021		730106[a]			7374-76	7379	7381	1.B.a,c,d,e	1.F.b
								7383			10.B	
35	Goods and equipment rental and leasing	8513-011	8513-012	8513-013	730107			735	7377	784	1.E.a,b,d,e	
		8513-014	8513-015		760102							
36	Automobile renting	8514-011			750001			751			1.E.c	
37	Automobile repairing	8515-101			750002			753	754		11.F.d	
38	Machine repairing	8516-101			720204			7378	76		1.F.i,n	
39	Building maintenance services	8519-011			730102			734			1.F.o	
40	Legal and accounting services	8519-021			730301	730303		81	872		1.A.a,b,c	
41	Civil engineering and construction services	8519-031			730302[a]			8712			1.A.d,f	
42	Personnel supply services	8519-041			730103			736			1.F.k	

(*continued*)

Table 13.2 (continued)

Fukao-Ito Industry Code	Definition	1995 Japan I-O Standard Classification			1992 U.S. I-O Standard Classification			1992 BEA Classification for FDI in the U.S. Establishment Data			GATT Secretariat Classification	
43	Other business services	8519-099			730109	730111	730302[a]	733	7382	7389	1.A.e,g	1.F.c-e,l,m
								8711	8713	8734	1.F.r,s,t	6.D
								874			11.D	11.G.a,b
44	Amusement and recreation services	8611-011	8611-021	8611-031	760101	760201	760202	781	782	783	2.D.a,b	
		8611-041	8611-051	8611-061	760203	760204	760205	792	793	794	10.A	10.D
		8611-071	8611-099		760206			7992	7993	7996		
								7997	7999			
45	Eating and drinking places	8612-011	8612-021	8612-031	74			58			4.D[a]	
46	Hotels and lodging places	8613-011			72A			70 excl. 704			9.A[a]	
47	Individual educational facilities	8619-081			760205			7991			12[a]	
48	Other personal services	8619-011	8619-021	8619-031	720201	720202	720203	721	726	722	1.F.p	
		8619-041	8619-051	8619-061	720205	720300	730101	763	764	769	12[a]	
		8619-071	8619-099		040002	730108		723	724	725		
								078	729	7384		
49	Agricultural services	0131-011	0131-021		770304	040001		07 excl. 078			1.A.i	1.F.f
50	Ship repairing	3611-101			610100	610200		373			11.A.d	11.B.d
51	Aircraft repairing	3622-101			60			372			11.C.d	

Note: Dashes indicate that there is no classification code applicable to the industry.

[a] Indicates an industry that corresponds to more than one industry in the Fukao-Ito classification.

States, sales of services by foreign firms' affiliates in the manufacturing industry accounted for 6 percent of total sales of services by foreign firms' U.S. affiliates in 1996 (U.S. Department of Commerce 1999). The data on the sales of services by JAFFs in the nonservice sector are available from MITI (1998a). We found that such sales were negligible. The data on the sales of services by FAJFs in nonservice sectors are only available for U.S. affiliates. According to the U.S. Department of Commerce (1999), sales of services by affiliates of Japanese firms in manufacturing industry accounted for 4 percent of total service sales of Japanese firms' U.S. affiliates in 1996. Our estimates on service sales by FAJFs are probably smaller than the actual values because of this problem. There are several other industry classification problems in our estimations. For example, since foreign firms supply legal and accounting services to Japan mainly through consulting firms, such activities are classified as "other business services" instead of "legal and accounting services."

13.3.4 Definition of Nationality

As we have already explained, Toyo Keizai adopts multiple criteria in the coverage of Japanese subsidiaries. For listed or unlisted but large subsidiaries, the cutoff capital participation rate is 20 percent. For unlisted and small subsidiaries, the cutoff rate is 49 percent. If we used these data without adjustment, we might obtain biased results. In order to solve this problem, we calculated two sets of estimations for JAFFs, one for JAFFs with a 49 percent and higher foreign capital participation rate, plus all the other establishments directly owned by foreign firms, and the other for JAFFs including all the JAFFs recorded in the Toyo Keizai database plus all the other establishments directly owned by foreign firms.

13.3.5 Cross-Border Transactions of Services by Affiliates

In our estimation, we did not take account of cross-border transactions of services by affiliates. Japanese affiliates of foreign firms provide services not only to Japanese customers but also to foreigners. Foreign affiliates of Japanese firms export their services to Japan. To get consistent statistics, we should subtract these values from sales by JAFFs and sales by FAJFs, respectively. Similarly, Japan's service imports include imports by JAFFs, and Japan's service exports include exports to FAJFs. To avoid double-counting and to make statistics of cross-border transactions of services consistent with our estimates of sales by affiliates, we should subtract these values from Japan's service imports and exports.[10] As table 13.3 shows, JAFFs and FAJFs in service sectors are quite active in international transactions. However, there are no data on what percentage of imports and exports by affili-

10. To be more rigorous, we should also take account of transactions among JAFFs and transactions among FAJFs. Kimura and Baldwin (1996) make this point.

Table 13.3 **Cross-Border Transactions by Affiliates in Service Sectors, 1997 (%)**

Transactions	Business and Personal Services	Transportation and Communication Services, etc.
Exports by JAFFs/Total Sales by JAFFs	3.9	26.8
Imports by JAFFs/Total Procurement by JAFFs	8.2	35.1
Exports to Japan by FAJFs/Total Sales by FAJFs	22.4	11.0
Imports from Japan by FAJFs/Total Procurement by FAJFs	11.0	13.3

Sources: MITI (1999a,b).

ates are service transactions, and there are no data at a more detailed industry classification level. Because of these deficiencies of the statistics, we could not adjust for this factor.

Table 13.4 presents the estimates of sales and employment by JAFFs and FAJFs. In order to compare our estimates on establishment transactions with Japan's cross-border transactions and the size of each industry, we adjusted the data of Japan's 1995 I-O tables to our definitions of sales and industry classifications. Table 13.5 presents data on Japan's cross-border transactions of services and sales and on employment of Japan's service industries. In the I-O tables, the output level of the financial sector is measured by imputed interests and financial transaction fees. We replaced this with the financial sector's total current income, which is reported in MOF's *Annual Report of Financial Institutions* (MOF various years) and the financial report of each firm.

The Japanese government estimates data on sectoral service trade for the I-O tables, using several sources, including balance-of-payments data for internal use, which are confidential and more detailed than publicly available statistics (Kuwabara 1989). In principle, I-O table data on services consist of "special trade (cross-border trade)" and "direct purchases" and do not include factor incomes, such as compensation of employees and construction services provided by nonresidents. For trade in construction services, we used data reported in the balance-of-payments statistics. We did not take account of compensation of employees because detailed industry level data were not available.[11]

In order to compare Japan's purchases of services from foreigners with U.S. purchases, we adjusted corresponding U.S. statistics for the year 1992,

11. According to Karsenty (2000), compensation of employees accounts for only 1.4 percent of world total international transactions in services. In several industries, however, such as amusement and recreation, this mode of transaction probably plays a substantial role.

Table 13.4 **Japan's International Purchases and Sales of Private Services, 1995: Sales and Employment of Japanese Affiliates of Foreign Firms (JAFFs) and Foreign Affiliates of Japanese Firms (FAJFs) (millions of yen)**

Industry	Japan's Purchases from JAFF and Employment by JAFF								Sales Abroad and Employment by FAJF	
	Sales by:			No. of Workers Employed by:						
	Japanese Subsidiaries of Foreign Firms (a)	Branches and Other Establishments of Foreign Firms (b)	JAFFs (a+b)	Japanese Subsidiaries of Foreign Firms (c)	Branches and Other Establishments of Foreign Firms (d)	JAFFs (c+d)	Sales by Majority-Owned Affiliates	No. of Workers Employed by Majority-Owned Affiliates	Sales by FAJFs, Branches and Other Establishments (e)	No. of Workers by FAJFs, Branches and Other Establishments
1 Construction and civil engineering	108,702	12,758	121,460	3,732	438	4,170	77,653	2,666	1,134,973	40,323
2 Electricity	0	0	0	0	0	0	0	0	5,679	210
3 Gas supply	114	0	114	5	0	5	114	5	1,084	40
4 Steam and hot water supply	0	0	0	0	0	0	0	0	0	0
5 Water supply	0	0	0	0	0	0	0	0	0	0
6 Sewerage systems	0	0	0	0	0	0	0	0	0	0
7 Sanitary services	985	0	985	43	0	43	0	0	64	14
8 Wholesale trade	905,849	102,752	1,008,601	73,424	8,309	81,733	856,791	69,428	3,653,874	296,165
9 Retail trade	28,499	3,240	31,739	6,555	732	7,287	26,226	6,019	260,861	60,000
10 Financial intermediary services	172,785	2,226,314	2,399,099	5,100	14,210	19,310	2,359,257	17,921	11,123,551	157,062
11 Life insurance	82,849	138,034	220,883	4,308	4,197	8,505	220,883	8,505	1,201,167	17,748
12 Casualty insurance	36,093	69,213	105,306	1,846	3,540	5,386	105,306	5,386	1,397,069	24,123
13 Real estate	5,204	5,284	10,487	65	66	131	10,087	126	422,193	12,925
14 Railway passenger transportation	0	0	0	0	0	0	0	0	8,287	29
15 Railway freight transportation	253	0	253	3	0	3	253	3	12,287	43
16 Road passenger transportation	0	0	0	0	0	0	0	0	0	0
17 Road freight transportation	44,691	1,181	45,871	530	14	544	45,871	544	93,096	4,165
18 Water transportation	189,465	49,263	238,728	2,111	552	2,663	230,887	2,570	297,059	12,967
19 Air transportation	255,995	681,959	937,954	3,144	8,306	11,450	915,946	11,189	187,522	6,474
20 Storage facility services	8,432	0	8,432	100	0	100	0	0	170,404	7,313
21 Supporting services for transport	40,703	53,800	94,503	1,743	2,018	3,761	94,632	3,501	545,166	26,035

(*continued*)

Table 13.4 (continued)

Industry	Japan's Purchases from JAFF and Employment by JAFF								Sales Abroad and Employment by FAJF	
	Sales by:			No. of Workers Employed by:						
	Japanese Subsidiaries of Foreign Firms (a)	Branches and Other Establishments of Foreign Firms (b)	JAFFs (a+b)	Japanese Subsidiaries of Foreign Firms (c)	Branches and Other Establishments of Foreign Firms (d)	JAFFs (c+d)	Sales by Majority-Owned Affiliates	No. of Workers Employed by Majority-Owned Affiliates	Sales by FAJFs, Branches and Other Establishments (e)	No. of Workers by FAJFs, Branches and Other Establishments
22 Postal service	0	0	0	0	0	0	0	0	0	0
23 Telecommunications	74,654	1,727	76,380	1,643	38	1,681	37,495	838	6,684	421
24 Broadcasting	29,171	0	29,171	642	0	642	4,544	100	6,702	361
25 Education	0	5,656	5,656	0	247	247	5,656	247	0	0
26 Research institute (natural sciences)	0	5,289	5,289	0	231	231	5,289	231	0	0
27 Research institutes (social sciences & humanities)	0	0	0	0	0	0	0	0	0	0
28 Research within firms	2,633	0	2,633	115	0	115	2,633	115	90,774	3,852
29 Medical services	3,934	328	4,262	336	28	364	2,318	104	7,810	322
30 Health and hygiene	0	0	0	0	0	0	0	0	582	98
31 Private non-profit organizations' services	96	0	96	6	0	6	96	6	178	39
32 Advertising	262,323	2,394	264,716	1,863	17	1,880	258,194	1,824	161,203	4,844
33 Computer programming and software	612,381	28,317	640,698	10,647	503	11,150	519,999	8,827	66,986	4,077

34	Information services	406,130	43,936	450,067	9,354	1,012	10,366	286,970	6,158	189,768	105,601
35	Goods and equipment rental and leasing	12,754	916	13,669	557	40	597	13,669	597	185,322	9,857
36	Automobile renting	1,076	0	1,076	47	0	47	1,076	47	7,356	590
37	Automobile repairing	206	572	778	9	25	34	778	34	9,097	1,070
38	Machine repairing	8,678	5,014	13,692	379	219	598	13,692	598	4,167	1,206
39	Building maintenance services	8,220	0	8,220	359	0	359	8,220	359	1,407	1,600
40	Legal and accounting services	0	0	0	0	0	0	0	0	128	28
41	Civil engineering and construction services	687	7,121	7,808	30	311	341	7,808	341	1,401	30
42	Personnel supply services	25,526	35,249	60,775	848	1,171	2,019	51,250	1,603	8,797	286
43	Other business services	126,308	59,528	185,836	5,115	2,467	7,582	162,210	6,528	3,625,729	34,694
44	Amusement and recreation services	47,930	34,398	82,328	673	483	1,156	82,328	1,156	71,646	5,889
45	Eating and drinking places	419,862	6,525	426,387	7,979	124	8,103	233,924	4,620	77,300	22,631
46	Hotels and lodging places	53,441	10,349	63,791	2,334	452	2,786	14,700	642	274,396	40,661
47	Individual educational facilities	29,184	3,084	32,268	1,268	134	1,402	8,662	371	730	76
48	Other personal services	36,149	234	36,382	2,011	13	2,024	36,199	2,016	5,866	877
49	Agricultural services	0	0	0	0	0	0	0	0	111,291	193
50	Ship repairing	0	74	74	0	3	3	74	3	40,370	4,009
51	Aircraft repairing	0	436	436	0	11	11	436	11	0	0
Total		4,041,960	3,594,945	7,636,905	148,923	49,911	198,834	6,702,126	165,238	25,470,031	908,948

Source: See appendix.

Notes: "Majority-owned foreign affiliates" refers to those affiliates in which foreign investors' ownership share is 49 percent or more.

Table 13.5 **Japan's International Purchases and Sales of Private Services, 1995: Cross-Border Trade, Size of Industry, and "Revealed Comparative Advantage" (millions of yen)**

Industry	Cross-Border Trade		Size of Industry		Japan's International Purchases and Sales		"Revealed Comparative Advantage"	
	Imports (f)	Exports (g)	Total Domestic Output (h)	No. of Employees	Purchases from Foreigners (a+b+f)[a]	Japan's Sales to Foreigners (e+g)[b]	(Sales by FAJFs – Sales by JAFFs)/ Total Domestic Output (%)	(Exports – Imports)/ Total Domestic Output (%)
1 Construction and civil engineering	301,900	620,000	88,149,287	7,046,117	423,360	1,754,973	1.150	0.361
2 Electricity	274	24,593	16,737,515	13,472	274	30,272	0.034	0.145
3 Gas supply	904	131	1,968,145	49,184	1,018	1,215	0.049	–0.039
4 Steam and hot water supply	0	0	104,384	1,778	0	0	0.000	0.000
5 Water supply	572	3,130	2,900,361	91,045	572	3,130	0.000	0.088
6 Sewerage systems	69	483	1,658,461	34,126	69	483	0.000	0.025
7 Sanitary services	0	415	3,094,654	256,638	985	479	–0.030	0.013
8 Wholesale trade	2,099,751	3,078,626	63,201,010	5,110,711	3,108,352	6,732,500	4.185	1.549
9 Retail trade	10,759	20,952	39,120,545	8,838,477	42,498	281,813	0.586	0.026
10 Financial intermediary services	1,676,742	999,376	56,272,142	1,375,573	4,075,841	12,122,927	15.504	–1.204
11 Life insurance	137,151	4,663	5,275,873	529,579	358,034	1,205,830	18.581	–2.511
12 Casualty insurance	60,894	78,437	3,250,105	191,173	166,200	1,475,506	39.745	0.540
13 Real estate	4,491	5,151	64,185,198	683,186	14,978	427,344	0.641	0.001
14 Railway passenger transportation	81,477	19,061	6,100,164	267,391	81,477	27,348	0.136	–1.023
15 Railway freight transportation	0	26	185,463	9,695	253	12,313	6.489	0.014
16 Road passenger transportation	127,869	21,092	10,184,846	667,492	127,869	21,092	0.000	–1.048
17 Road freight transportation	0	5,901	17,409,419	1,521,601	45,871	98,997	0.271	0.034
18 Water transportation	956,300	890,900	4,562,409	192,703	1,195,028	1,187,959	1.279	–1.433
19 Air transportation	1,119,200	343,500	2,414,322	57,735	2,057,154	531,022	–31.083	–32.129
20 Storage facility services	0	125	1,604,686	122,026	8,432	170,529	10.094	0.008
21 Supporting services for transport	1,437,067	1,279,547	7,652,467	467,136	1,531,570	1,824,713	5.889	–2.058
22 Postal service	7,413	9,201	2,142,138	194,657	7,413	9,201	0.000	0.083
23 Telecommunications	67,630	38,668	9,941,337	366,386	144,010	45,352	–0.701	–0.291
24 Broadcasting	0	16	2,679,336	69,143	29,171	6,718	–0.839	0.001
25 Education	156	36	22,229,403	2,441,916	5,812	36	–0.025	–0.001

26	Research institutes (natural sciences)	29,316	19,602	1,718,560	196,646	34,605	19,602	–0.308	–0.565
27	Research institutes (social sciences & humanities)	3,309	1,932	153,952	18,744	3,309	1,932	0.000	–0.894
28	Research within firms	0	0	9,145,081	578,465	2,633	90,774	0.964	0.000
29	Medical services	748	59	29,814,230	2,553,400	5,010	7,869	0.012	–0.002
30	Health and hygiene	0	0	692,307	73,680	0	582	0.084	0.000
31	Private non-profit organizations' services	39,342	47,139	4,658,723	522,564	39,438	47,317	0.002	0.167
32	Advertising	337,106	102,314	6,952,700	193,050	601,822	263,517	–1.489	–3.377
33	Computer programming and software	59,623	27,653	4,208,484	373,312	700,321	94,639	–13.632	–0.760
34	Information services	227,355	111,803	3,356,042	269,379	677,422	301,571	–7.756	–3.443
35	Goods and equipment rental and leasing	226,823	102,787	9,720,931	198,576	240,492	288,109	1.766	–1.276
36	Automobile renting	16	1	942,393	29,499	1,092	7,357	0.666	–0.002
37	Automobile repairing	236	120	6,845,341	668,227	1,014	9,217	0.122	–0.002
38	Machine repairing	6	1	5,960,245	229,443	13,698	4,168	–0.160	0.000
39	Building maintenance services	0	0	2,458,526	371,067	8,220	1,407	–0.277	0.000
40	Legal and accounting services	127,224	47,240	2,168,840	274,714	127,224	47,368	0.006	–3.688
41	Civil engineering and construction services	153,051	120,264	4,917,179	547,427	160,859	121,665	–0.130	–0.667
42	Personnel supply services	0	55	995,809	232,861	60,775	8,852	–5.220	0.006
43	Other business services	428,333	296,833	14,164,779	1,595,626	614,169	3,922,562	24.285	–0.928
44	Amusement and recreation services	218,910	26,493	13,517,060	846,133	301,238	98,139	–0.079	–1.424
45	Eating and drinking places	954,507	129,314	22,894,947	3,548,471	1,380,894	206,614	–1.525	–3.604
46	Hotels and lodging places	1,633,060	278,316	7,004,908	592,493	1,696,851	552,712	3.007	–19.340
47	Individual educational facilities	502	127	1,972,389	568,397	32,770	857	–1.599	–0.019
48	Other personal services	3,528	985	8,783,951	1,740,629	39,910	6,851	–0.347	–0.029
49	Agricultural services	0	0	676,113	88,664	0	111,291	16.460	0.000
50	Ship repairing	12,892	38,451	305,995	12,487	12,966	78,821	13.169	8.353
51	Aircraft repairing	10	8,408	160,514	4,046	446	8,408	–0.272	5.232
Total		12,546,516	8,803,927	597,213,669	46,926,940	20,183,421	34,273,958	2.986	–0.627

Source: See appendix.

[a] Purchases from foreigners are the sum of figures in columns (a) and (b) in table 13.4 and figures in column (f) in this table.

[b] Japan's sales to foreigners are the sum of figures in column (e) in table 13.4 and figures in column (g) in this table.

which are reported in U.S. Department of Commerce (1995a,c) to our definition of sales and industry classifications. The results are reported in table 13.6. We should note that U.S. data on inward direct investment cover all the subsidiaries that are more than 10 percent foreign-owned: that is, the coverage of U.S. data is broader than Japan's data in the case of purchases from affiliates. For United States-Japan comparison, we also prepared table 13.7 in which we compared sales and number of employees of majority-owned foreign affiliates in the U.S. and Japan. The U.S. data are taken from the U.S. Department of Commerce (1995b). Since the U.S. data are not available at the three-digit industry level, the United States-Japan comparison in table 13.7 is done at the more aggregated industry level.

13.4 An Overview of Japan's International Sales and Purchases of Services

According to our new statistics (tables 13.4 and 13.5), JAFFs in the service sector employed 199,000 workers in 1995, which is about three times greater than the number reported in MITI (1999b).

Imbalances between the activities of JAFFs and those of FAJFs are also smaller than those reported in the MOF FDI statistics. In terms of employment, the JAFF-FAJF ratio is 0.22 (199,000/909,000). In terms of sales, the ratio is 0.30 (7.6 trillion yen/25.5 trillion yen). The MOF statistics exaggerate the gap, probably for the following reasons.

First, during the second half of the 1980s, Japanese firms engaged in a large amount of FDI in the tertiary sector, especially in the United States. Stock and real estate bubbles in Japan at this period enabled real estate companies, general construction companies, institutional investors, and other small investors to borrow large funds to invest in foreign real estate (Wilkins 1990; Kenneth Leventhal and Company 1994). During this period, Japanese firms in the tertiary sector, especially banks and general construction companies, also expanded their business in purely domestic markets in foreign countries, such as retail banking in California or Britain or the development of shopping malls in the United States (Wilkins 1990; Graham and Krugman 1991). Because a substantial part of FDI in the real estate sector was conducted as portfolio investment, activities by affiliates measured by sales or employment are relatively small compared with capital flows. Moreover, although many of Japan's FDI projects in the tertiary sector resulted in failure afterward, withdrawals of equity investment or repayments of loans or bonds are not subtracted from the MOF statistics, which are gross data. These factors exaggerate Japan's outward FDI in the MOF statistics.

Second, as we have already pointed out, because of Japanese authorities' regulations, many foreign banks and insurance companies entered Japan through the setting up of branches instead of the founding of subsidiary companies. This fact makes their investment flows relatively small

Table 13.6 **Purchases from Foreigners: U.S. (1992)–Japan (1995) Comparison**

Industry	Ratio of Imports to Total Domestic Output		Ratio of No. of Workers Employed by Affiliates of Foreign Firms to Total No. of Workers (Inward FDI Penetration)			Ratio of Sales by Affiliates of Foreign Firms to Total Domestic Output		
	Japan (a)	United States (b)	Japan	Japan, Majority-owned	United States (more than 10% foreign owned)	Japan (c)	Japan, Majority-owned	United States (more than 10% foreign owned) (d)
1 Construction and civil engineering	0.003	0.000	0.001	0.000	0.020	0.001	0.001	0.029
2 Electricity	0.000	0.004	0	0	0.002	0	0	0.002
3 Gas supply	0.000	0	0.000	0.000	0.007	0.000	0.000	0.035
4 Steam and hot water supply	0	0	0	0	0.070	0	0	0.041
5 Water supply	0.000	0	0	0	0.087	0	0	0.015
6 Sewerage systems	0	0	0	0	0.087	0	0	0.015
7 Sanitary services	0	0	0.000	0.000	0.070	0.000	0.000	0.041
8 Wholesale trade	0.033	0.095	0.016	0.014	0.084	0.016	0.014	0.084
9 Retail trade	0.000	0	0.001	0.001	0.038	0.001	0.001	0.038
10 Financial intermediary services	0.030	0.003	0.014	0.013	0.066	0.043	0.042	0.066
11 Life insurance	0.026	0.005	0.016	0.016	0.143	0.042	0.042	0.072
12 Casualty insurance	0.019	0.005	0.028	0.028	0.143	0.032	0.032	0.072
13 Real estate	0.000	0	0.000	0.000	0.020	0.000	0.000	0.006
14 Railway passenger transportation	0.013	0.036	0	0	0	0	0	0
15 Railway freight transportation	0	0.036	0.000	0.000	0	0.001	0.001	0
16 Road passenger transportation	0.013	0.041	0	0	0.067	0	0	0.026
17 Road freight transportation	0	0.008	0.000	0.000	0.019	0.003	0.003	0.021
18 Water transportation	0.210	0.488	0.014	0.013	0.083	0.052	0.051	0.085
19 Air transportation	0.464	0.082	0.198	0.194	0.120	0.388	0.379	0.022
20 Storage facility services	0	0.008	0.001	0.000	0.019	0.005	0.000	0.021
21 Supporting services for transport	0.188	0.187	0.091	0.091	0.087	0.012	0.012	0.116
22 Postal service	0	0	0	0	0	0	0	0
23 Telecommunications	0.007	0.034	0.005	0.002	0.004	0.008	0.004	0.005
24 Broadcasting	0	0	0.009	0.001	0.013	0.011	0.002	0.061
25 Education	0.000	0.008	0.000	0.000	0.064	0.000	0.000	0.003
26 Research institutes (natural sciences)	0.017	0.008	0.001	0.001	0.064	0.003	0.003	0.003

(*continued*)

Table 13.6 (continued)

Industry	Ratio of Imports to Total Domestic Output		Ratio of No. of Workers Employed by Affiliates of Foreign Firms to Total No. of Workers (Inward FDI Penetration)			Ratio of Sales by Affiliates of Foreign Firms to Total Domestic Output		
	Japan (a)	United States (b)	Japan	Japan, Majority-owned	United States (more than 10% foreign owned)	Japan (c)	Japan, Majority-owned	United States (more than 10% foreign owned) (d)
27 Research institutes (social sciences & humanities)	0.021	0.008	0	0	0.064	0	0	0.003
28 Research within firms	0	0	0.000	0.000	0.048	0.000	0.000	0.038
29 Medical services	0.000	0.000	0.000	0.000	0.027	0.000	0.000	0.006
30 Health and hygiene	0	0.000	0	0	0.027	0	0	0.006
31 Private non-profit organizations' services	0.008	0	0.000	0.000	0	0.000	0.000	0
32 Advertising	0.048	0.004	0.010	0.009	0.075	0.038	0.037	0.011
33 Computer programming and software	0.014	0.002	0.030	0.024	0.041	0.152	0.124	0.042
34 Information services	0.068	0.002	0.038	0.038	0.041	0.134	0.086	0.042
35 Goods and equipment rental and leasing	0.023	0	0.003	0.003	0.054	0.001	0.001	0.074
36 Automobile renting	0.000	0	0.002	0.002	0.057	0.001	0.001	0
37 Automobile repairing	0.000	0.000	0.000	0.000	0.006	0.000	0.000	0.003
38 Machine repairing	0.000	0	0.003	0.003	0.029	0.002	0.002	0.081
39 Building maintenance services	0	0	0.001	0.000	0.078	0.003	0.003	0.049
40 Legal and accounting services	0.059	0.003	0	0	0.001	0	0	0.001
41 Civil engineering and construction services	0.031	0.005	0.001	0.001	0.014	0.002	0.002	0.004
42 Personnel supply services	0	0.017	0.009	0.007	0.068	0.061	0.051	0.054
43 Other business services	0.030	0.004	0.005	0.004	0.041	0.013	0.011	0.052
44 Amusement and recreation services	0.016	0.002	0.001	0.001	0.043	0.006	0.006	0.040
45 Eating and drinking places	0.042	0.021	0.002	0.001	0.027	0.019	0.010	0.019
46 Hotels and lodging places	0.233	0.196	0.005	0.001	0.100	0.009	0.002	0.120
47 Individual educational facilities	0.000	0	0.002	0.001	0.009	0.016	0.004	0.003
48 Other personal services	0.000	0.000	0.001	0.001	0.013	0.004	0.004	0.012
49 Agricultural services	0	0.001	0	0	0.008	0	0	n.a.
50 Ship repairing	0.042	0.015	0.000	0.000	0.024	0.000	0.000	0.028
51 Aircraft repairing	0.000	0.119	0.003	0.003	0.041	0.003	0.003	0.027
Total (weighted average)	0.018	0.021	0.005	0.005	0.044	0.010	0.008	0.040

Industry	Ratio of Total Purchases from Foreigners to Total Domestic Output (Foreign Sales Penetration)		Share of Imports in Total Purchases from Foreigners		FDI Restrictiveness Index	
	Japan (a+c)	United States (b+d)	Japan (a/[a+c])	United States (b/[b+d])	Japan	United States
1 Construction and civil engineering	0.005	0.030	0.713	0.013	0.000	0.050
2 Electricity	0.000	0.006	1	0.631	1.000	0.300
3 Gas supply	0.001	0.035	0.888	0	1.000	0.217
4 Steam and hot water supply	0	0.041	n.a.	0	0.625	0.300
5 Water supply	0.000	0.015	1	0	0.250	0.300
6 Sewerage systems	0.000	0.015	1	0	0.000	0.050
7 Sanitary services	0.000	0.041	0	0	0.250	0.050
8 Wholesale trade	0.049	0.178	0.676	0.530	0.250	0.098
9 Retail trade	0.001	0.038	0.253	0	0.250	0.098
10 Financial intermediary services	0.072	0.069	0.411	0.037	0.500	0.525
11 Life insurance	0.068	0.077	0.383	0.064	0.500	0.264
12 Casualty insurance	0.051	0.077	0.366	0.064	0.500	0.264
13 Real estate	0.000	0.006	0.300	0	0.000	0.050
14 Railway passenger transportation	0.013	0.036	1	1	1.000	0.050
15 Railway freight transportation	0.001	0.036	0	1	1.000	0.050
16 Road passenger transportation	0.013	0.067	1	0.608	1.000	1.000
17 Road freight transportation	0.003	0.028	0	0.269	0.625	0.775
18 Water transportation	0.262	0.574	0.800	0.852	1.000	1.000
19 Air transportation	0.852	0.103	0.544	0.791	1.000	1.000
20 Storage facility services	0.005	0.028	0	0.269	0.250	1.000
21 Supporting services for transport	0.200	0.303	0.938	0.618	0.533	0.797
22 Postal service	0.003	0	1	n.a.	1.000	0.763
23 Telecommunications	0.014	0.039	0.470	0.862	0.750	0.525
24 Broadcasting	0.011	0.061	0	0	1.000	0.406
25 Education	0.000	0.012	0.027	0.723	0.150	0.680
26 Research institutes (natural sciences)	0.020	0.012	0.847	0.723	1.000	1.000
27 Research institutes (social sciences & humanities)	0.021	0.012	1	0.723	0.000	1.000
28 Research within firms	0.000	0.038	0	0	1.000	1.000

Table 13.6 (continued)

Industry	Ratio of Total Purchases from Foreigners to Total Domestic Output (Foreign Sales Penetration)		Share of Imports in Total Purchases from Foreigners		FDI Restrictiveness Index	
	Japan (a+c)	United States (b+d)	Japan (a/[a+c])	United States (b/[b+d])	Japan	United States
29 Medical services	0.000	0.006	0.149	0.004	1.000	0.860
30 Health and hygiene	0	0.006	n.a.	0.004	0.000	0.050
31 Private non-profit organizations' services	0.008	0	0.998	n.a.	1.000	1.000
32 Advertising	0.087	0.016	0.560	0.282	0.000	0.050
33 Computer programming and software	0.166	0.044	0.085	0.041	0.250	0.288
34 Information services	0.202	0.044	0.336	0.041	0.167	0.208
35 Goods and equipment rental and leasing	0.025	0.074	0.943	0	0.500	0.549
36 Automobile renting	0.001	0.025	0.015	0	0.000	0.050
37 Automobile repairing	0.000	0.003	0.233	0.017	0.250	0.050
38 Machine repairing	0.002	0.081	0.000	0	0.500	0.525
39 Building maintenance services	0.003	0.049	0	0	0.000	0.050
40 Legal and accounting services	0.059	0.003	1	0.829	0.250	0.217
41 Civil engineering and construction services	0.033	0.009	0.951	0.561	0.125	0.050
42 Personnel supply services	0.061	0.071	0	0.236	0.625	0.050
43 Other business services	0.043	0.057	0.697	0.079	0.345	0.401
44 Amusement and recreation services	0.022	0.043	0.727	0.056	0.063	0.169
45 Eating and drinking places	0.060	0.040	0.691	0.513	0.125	0.050
46 Hotels and lodging places	0.242	0.316	0.962	0.621	0.000	0.050
47 Individual educational facilities	0.017	0.003	0.015	0	1.000	1.000
48 Other personal services	0.005	0.013	0.088	0.029	0.500	0.525
49 Agricultural services	0	n.a.	n.a.	n.a.	1.000	0.525
50 Ship repairing	0.042	0.043	0.994	0.353	1.000	1.000
51 Aircraft repairing	0.003	0.146	0.022	0.816	0.000	0.050
Total (weighted average)	0.028	0.061	0.445	0.206	0.493	0.419

Source: See appendix.

Notes: "Majority-owned foreign affiliates" refers to those affiliates in which foreign investors' ownership share is 49 percent or more. The correlation coefficient between foreign sales penetration ratio in Japan and the United States is 0.4205. n.a. = not available.

Table 13.7 **Sales and Number of Employees of Majority-Owned Foreign Affiliates: U.S. (1992)–Japan (1995) Comparison**

Fukao-Ito Industry Code	Sectors	Ratio of No. of Workers Employed by Majority-Owned Foreign Affiliates to Total No. of Workers		Ratio of Sales by Majority-Owned Foreign Affiliates to Total Domestic Output	
		Japan	United States	Japan	United States
1	Construction	0.000	0.010	0.001	0.016
8	Wholesale trade	0.014	0.067	0.014	0.067
9	Retail trade	0.001	0.033	0.001	0.033
10	Finance, except depository institutions[a]	0.013	0.012	0.042	n.a.
13	Real estate	0.000	0.028	0.000	0.013
14, 15, 16, 17, 18, 19, 20, 21	Transportation	0.005	0.022	0.026	0.027
	Services	0.002	0.021	0.011	0.019
46	Hotels and other lodging places	0.001	0.073	0.002	0.094
33, 34	Computer and data processing services	0.023	0.014	0.107	0.020
44	Motion pictures, including television tape and film	0.001	0.038	0.006	0.098
29, 30	Health services	0.000	0.007	0.000	n.a.
28, 32, 35, 36, 37, 38, 39, 40, 41, 42, 43	Business services	0.002	0.032	0.008	0.019
45, 47, 48	Other services	0.001	0.005	0.008	n.a.
	Total (Weighted-average)	0.004	0.028	0.012	0.027

Sources: U.S. Department of Commerce (1995b); see also tables 13.4 and 13.5.

Note: "Majority-owned foreign affiliates" refers to those affiliates in which foreign investors' ownership share is 49 percent or more for Japan, and 50 percent or more for the United States. n.a. = not available.

[a]The ratio of sales for the U.S. financial sector was not calculated because definitions of output in U.S. I-O tables differ from those of sales in U.S. establishment data. For details, see appendix.

compared with the actual sizes of their affiliates' activities measured by sales or employment.

Using table 13.6, we can compare Japan's and the U.S.'s purchases of services from foreigners. For the service sector as a whole, Japan's ratio of imports to total domestic output is 1.8 percent, which is almost at the same level as the corresponding U.S. ratio, 2.1 percent. However, in the case of purchases from majority-owned foreign affiliates (table 13.7), Japan's ratio of purchases from affiliates to total domestic output is 1.2 percent, which is less than half of the corresponding U.S. ratio of 2.7 percent. In terms of employment, Japan's ratio of the number of workers employed by majority-owned foreign affiliates to the total number of workers is 0.4 percent, which is one-seventh of the corresponding U.S. ratio of 2.8 percent. It seems that Japan's market for services is more closed for establishment transactions than for cross-border transactions.

In order to test whether Japan's market for services is more closed for establishment transactions than for cross-border transactions, we estimated gravity models for both the direction of U.S. service exports and the regional distribution of sales of services by U.S. firms' foreign affiliates.[12,13] The results are summarized in table 13.8. The dependent variables are the logarithm of U.S. exports and sales by affiliates. As explanatory variables, we use the logarithm of each country's gross domestic product (GDP), the logarithm of per capita GDP, the logarithm of distance from the United States, and a dummy for Japan. The equations are estimated for 1992 and 1997. The Japan dummies are not significant both in the U.S. export equations and in sales-by-affiliates equations. In other words, we cannot conclude that Japan's market for services is significantly more closed to sales by U.S. firms than other countries' markets. However, it seems that the signs of the estimated coefficients of Japan dummies are consistent with our findings from the United States-Japan comparison based on table 13.6 and table 13.7. The coefficients of the Japan dummies take a positive value in the case of the export equations and a negative value in the case of equations for sales by affiliates. The results imply that Japan's purchases of services through establishment transactions from U.S. firms in 1997 were about 50 percent less than the predicted value.

Next, we study Japan's purchases of services from foreigners by industry. Figure 13.1 shows the industry composition of Japan's purchases. Purchases are concentrated in a limited number of industries. Four indus-

12. There are several empirical studies that estimated an econometric model explaining the regional distribution of U.S. direct investment abroad and found that a Japan dummy is negative and significant. However, these studies are based either on data on FDI in manufacturing industries (Grubert and Mutti 1991) or on data on FDI in all the industries (Eaton and Tamura 1994). On this issue, also see Lawrence (1993) and Development Bank of Japan (1997).

13. Francois (1999) estimates gravity models for the direction of U.S. exports of business and financial services and construction services.

Table 13.8 **Determinants of U.S. Cross-Border Sales of Services and Sales of Services by Foreign Affiliates of U.S. Firms: Cross-Country Estimation Based on Gravity Models**

	1992		1997	
	ln(EX92)	ln(OFDI92)	ln(EX97)	ln(OFDI97)
ln(GDP92)	0.5577	0.6543		
	(5.279)***	(2.701)**		
ln(GDPPC92)	0.1783	0.7330		
	(2.180)**	(3.394)***		
ln(GDP97)			0.6054	0.6441
			(6.187)***	(3.742)***
ln(GDPPC97)			0.1897	0.6973
			(2.523)**	(5.432)**
ln(DIST)	–0.4460	0.3503	–0.3305	–0.0184
	(–1.747)*	(0.480)	(–1.532)	(–0.036)
DJPN	0.7112	–0.6982	0.4637	–0.6018
	(1.093)	(–0.567)	(0.810)	(–0.666)
_cons	8.3935	–0.8909	7.3418	2.9577
	(3.217)***	(–0.117)	(3.284)***	(0.558)
N	32	25	32	25
F	21.23***	11.36***	22.59***	17.05***
Adj. R^2	0.723	0.6333	0.7358	0.7279

Sources: U.S. Department of Commerce (1999); IMF (various issues).

Note: t-statistics are in parentheses. Definition of variables: EX92 = U.S. cross-border sales of services in 1992; OFDI92 = Sales of services by foreign affiliates of U.S. firms in 1992; EX97 = U.S. Cross-border sales of services in 1997; OFDI97 = Sales of services by foreign affiliates of U.S. firms in 1997; GDP92 = 1992 nominal GDP in U.S. dollars; GDPPC92 = 1992 nominal GDP per capita in U.S. dollars; GDP97 = 1997 nominal GDP in U.S. dollars; GDPPC97 = 1997 nominal GDP per capita in U.S. dollars; DIST = Distance between each country's capital city and Washington D.C.; DJPN = Japan dummy.

***p = .01 (two-tailed test)

**p = .05 (two-tailed test)

tries—financial intermediary services, wholesale trade, air transportation, and hotels and lodging places—account for 54 percent of Japan's total purchases of services from foreigners. In the case of financial services, most foreign banks and insurance companies entered Japan through setting up branches (see table 13.4). In 1995, Citibank employed 1,100 workers and earned an annual current income of 326 billion yen. Goldman Sachs Ltd. And Salomon Brothers Asia Ltd. employed 510 and 450 workers, respectively, at their Tokyo branches. Almost all the air passenger transportation services by foreign firms are conducted through their Japanese branches. However, in the case of airfreight transportation and water transportation there are several large affiliates. In 1995, Federal Express Japan and United Parcel Service Yamato employed 852 and 650 workers, respectively. A European water transportation company, Maersk, employed 360 workers.

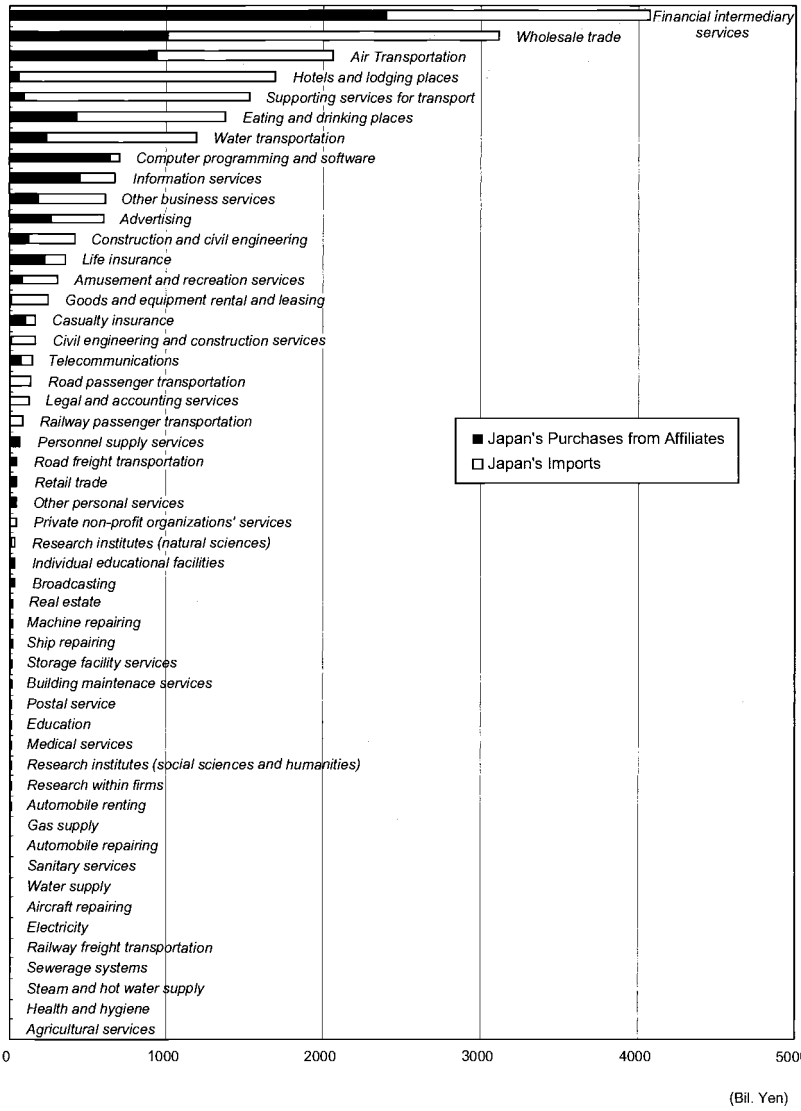

Fig. 13.1 Japan's international purchases of services, 1995
Source: Tables 13.4 and 13.5.

Foreign manufacturing firms set up large wholesale affiliates in order to promote their sales in Japan. For example, Caterpillar Mitsubishi Construction Machinery employed 2,235 workers at its wholesale affiliates. Kodak Japan Ltd. employed 1,078 workers.

In figure 13.2, we compare Japan's and the United States' sectoral importance of purchases from foreigners, which we measure by a ratio of to-

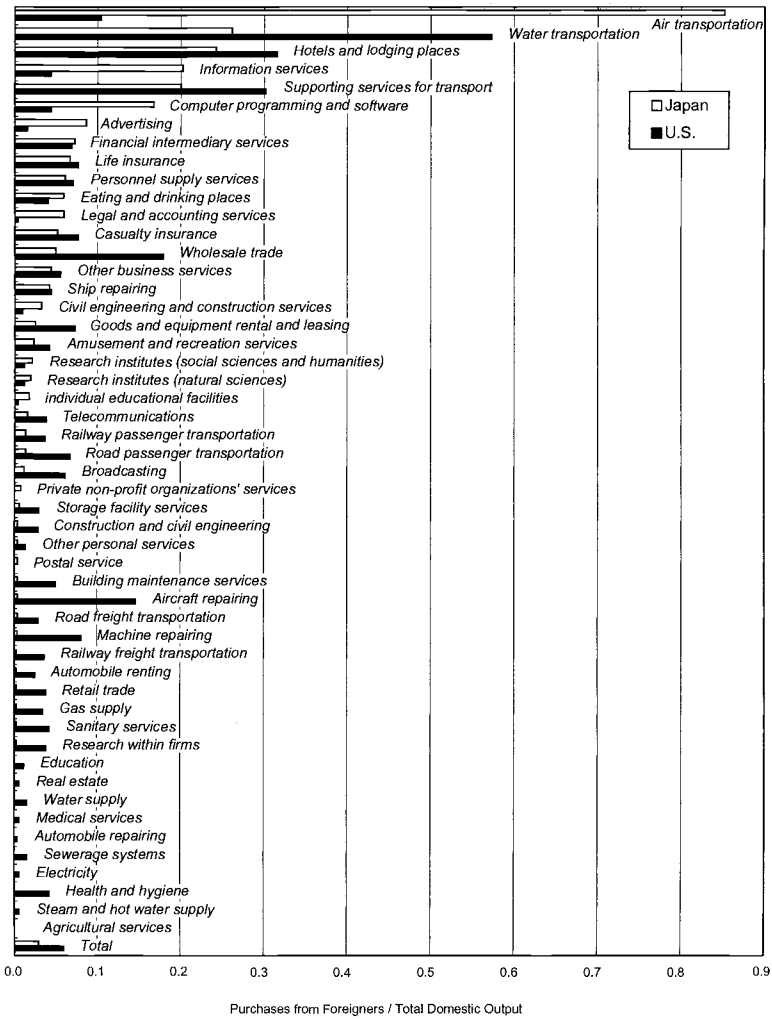

Fig. 13.2 Purchases from foreigners: Japan (1995) and United States (1992) comparison

Source: Table 13.6.

tal purchases from foreigners to total domestic output. In Japan, differences in this ratio among industries are more remarkable than in the United States. Japan's variation coefficient of this ratio among industries is 2.42, compared to a variation coefficient of only 1.59 for the United States.

Figure 13.3 shows Japan's "revealed comparative advantage" measured as the ratio of net exports to total domestic output and the ratio of net purchases from affiliates (sales by FAJFs minus sales by JAFFs) to total domestic output. According to figure 13.3, Japan is most competitive in in-

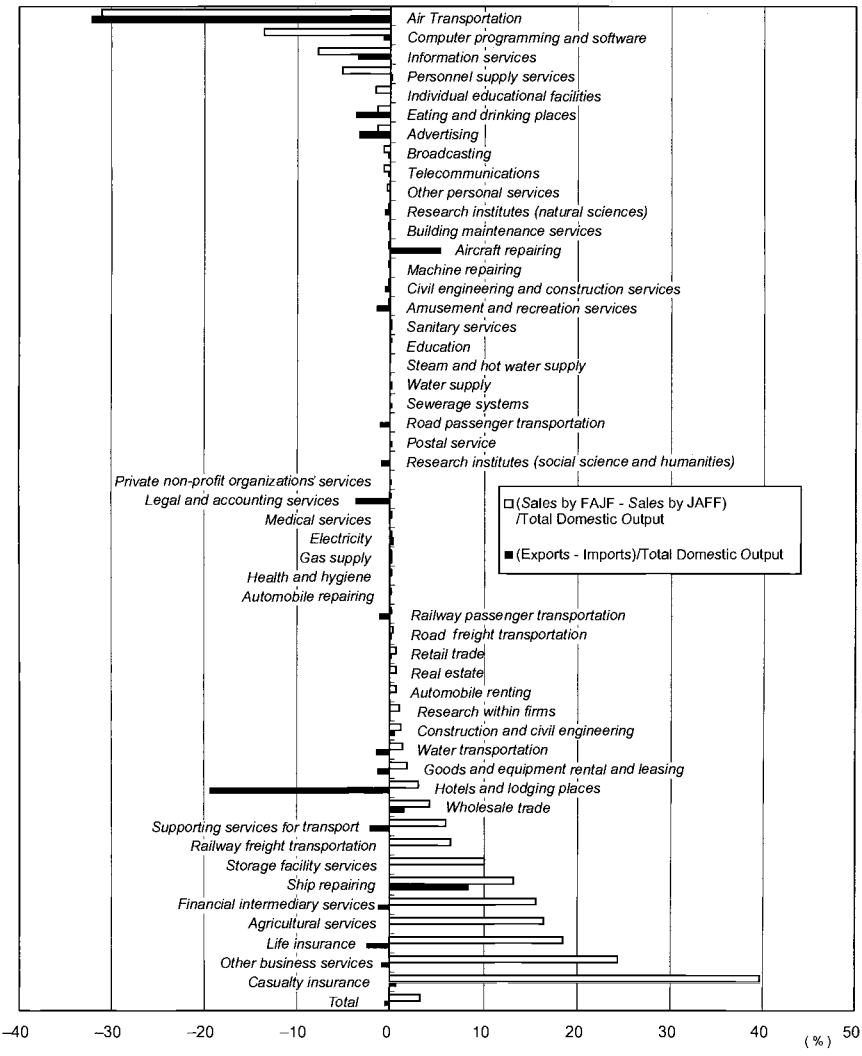

Fig. 13.3 Japan's "revealed comparative advantage"
Source: Table 13.5.

dustries that support Japan's international activities, such as casualty and life insurance, other business services, agricultural services,[14] and financial intermediary services. Among all of Japan's FDI, investment in these kinds of supporting industries for Japan's international activities has the longest history. Japan's large trading companies (*sogo shosha*), banks, insurance companies, and transportation companies started their FDI before the sec-

14. Japan's large trading companies (*sogo shosha*) own several warehouse companies in the United States for imports of agricultural products.

ond World War. The Japanese government sometimes backed up this type of investment. Figure 13.3 also shows that Japan is least competitive in air transportation, computer programming and software, and information services, both in international trade and in establishment transactions.

As we have already seen, for the service sector as a whole Japan's ratio of the number of workers employed by majority-owned foreign affiliates to the total number of workers is one-seventh of the corresponding U.S. ratio. Among our fifty-one service-sector categories, in which categories is the Japanese market more closed to international establishment transactions than the U.S. market? Figure 13.4 shows the differences in Japan's inward FDI penetration and the corresponding U.S. penetration by industry. In order to minimize the bias in our cross-industry comparisons, we use the data for majority-owned affiliates for Japan's penetration. We should note that the U.S. data cover all affiliates whose foreign ownership ratio is 10 percent or higher. There are some similarities between figure 13.3 and figure 13.4. Japan has a higher penetration ratio than the United States in air transportation, computer programming and software, and information services. Japan has a lower penetration ratio than the United States in casualty and life insurance, financial intermediary services, hotels and lodging places, and supporting services for transport.

So far, our analysis was static and mainly based on Japan's 1995 data. We should note, however, that FDI into Japan is growing at amazing speed. Table 13.9 shows MOF statistics on FDI flows into Japan. According to the statistics, the inward direct investment stock in Japan's nonmanufacturing sector has grown eightfold in the last ten years. The total of FDI flows in the last three years is greater than the FDI stock at the end of the 1997 fiscal year. In recent years, the number of cases of cross-border M&A has been increasing especially.[15] In 1999, AT&T and British Telecom jointly bought a combined 30 percent share of Nippon Telecom. A British company, Cable and Wireless, acquired International Digital Communications (IDC) by a takeover bid.

Probably the following two factors have contributed to the recent increase of inward FDI. First, in recent years, the Japanese government promoted important deregulatory and related measures in order to transform Japan's socioeconomic system into a new system that is more open to the international community and based on the rules of self-responsibility and market principles. As a part of this deregulation program, the Japanese government alleviated or abolished several regulations on inward FDI. For example, all restrictions on foreign ownership and on foreign board members in Type 1 telecommunications carriers (except for Nippon Telegraph and Telephone and Kokusai Denshin Denwa) including their radio station licenses, removed in 1998. In 1999, all restrictions on foreign capital and the appointment of foreign directors in all cable television businesses were re-

15. According to MITI (2000), there were 129 investments into Japan through cross-border mergers and acquisitions in 1999.

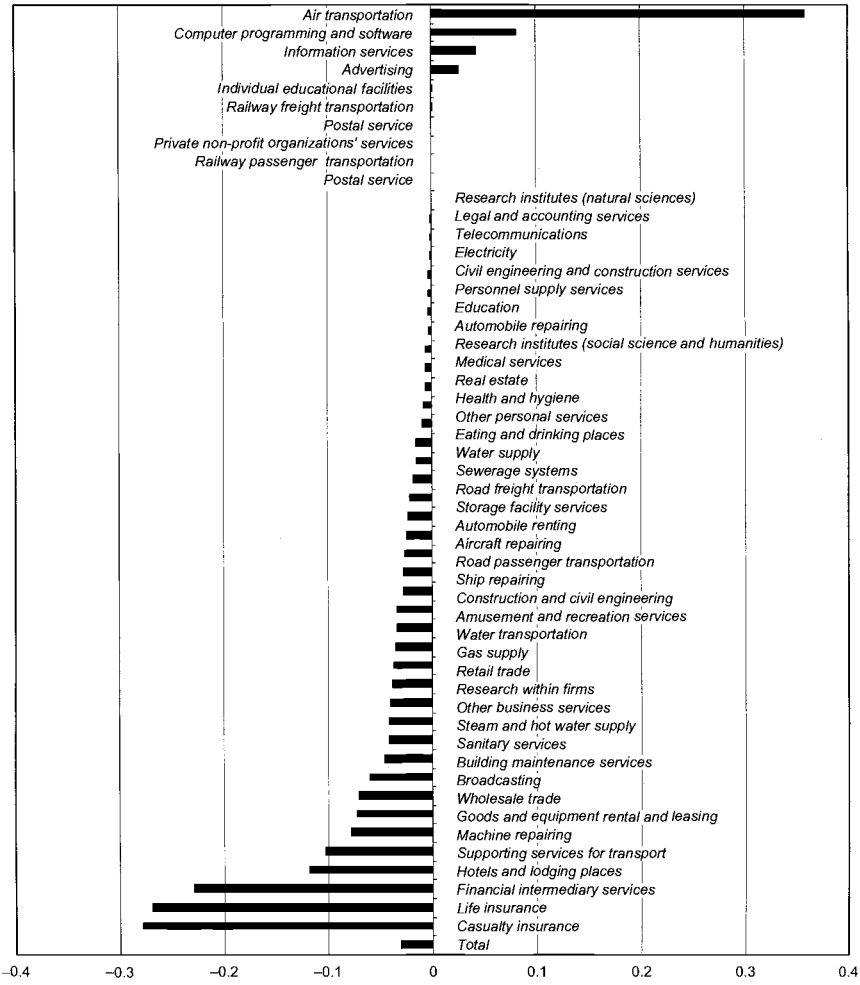

Fig. 13.4 Share of workers employed by affiliates: Japan (1995) and United States (1992) comparison ([Japan's no. of workers employed by majority-owned affiliates/Japan's total no. of workers] minus [no. of U.S. workers employed by affiliates/total no. of U.S. workers])

Source: Table 13.6.

moved. Second, the recent stagnation of Japan's land and stock prices created a kind of "fire-sale" situation, from which foreign investors benefited.[16]

As we have seen in section 13.2, MOF FDI statistics are not appropriate measures for JAFFs' activities. Therefore, using Toyo Keizai data, we compared JAFFs' employment in 1997 with that in 1990. Table 13.10 and figure

16. For more detail on Japan's recent deregulation measures, see Japan Investment Council (various years).

Table 13.9 **FDI Flows into Japan (billions of yen)**

Fiscal Year	1950–90	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	Total
Construction	12.9	3.1	0.0	0.1	0.4	0.1	0.0	0.3	1.4	2.2	0.0	20.5
Real estate	115.8	9.4	30.7	10.7	3.2	1.6	26.5	48.2	41.6	16.8	34.6	339.0
Commerce	416.6	107.3	155.4	100.5	113.5	67.9	166.4	99.6	175.9	348.5	276.1	2,027.8
Business and personal services	150.3	73.7	106.7	24.0	37.4	49.1	236.0	88.8	318.1	205.8	236.5	1,526.4
Transportation services	19.8	3.5	2.5	5.1	0.8	1.2	1.0	0.4	6.1	2.2	5.7	48.3
Communication services	20.8	13.6	6.3	3.2	3.0	5.3	2.1	3.3	16.8	330.0	750.8	1,155.1
Finance and insurance	96.4	120.3	19.0	4.0	68.7	100.1	27.3	161.6	456.9	511.5	1,029.3	2,595.2
Others	110.4	1.1	1.8	27.4	0.3	3.2	0.2	8.7	11.1	2.5	1.3	168.0
Nonmanufacturing total	942.7	331.9	322.5	175.0	227.3	228.4	459.5	410.8	1,027.8	1,419.6	2,334.4	7,880.0
Manufacturing	1,666.5	257.7	208.1	183.6	205.4	141.2	311.1	267.4	312.6	979.7	790.7	5,324.0
Total amount	2,608.5	589.6	530.6	358.6	432.7	369.7	770.7	678.2	1,340.4	2,399.3	3,125.1	13,203.3

Sources: MOF (1999); [http://www.mof.go.jp].
Note: FDI flows approved or notified from 1950 onward.

Table 13.10 **Recent Trends in JAFF's Employment and Japan's Imports, 1990–97 (millions of yen)**

Industry	No. of JAFF		No. of Workers Employed by JAFF		Imports	
	1990	1997	1990	1997	1990	1997
Agriculture	2	1	154	198	2,825,836	2,863,929
Mining	0	2	0	70	7,735,520	8,185,535
Manufacturing	965	828	314,299	286,933	23,265,941	32,849,284
Services and others	2,181	2,456	150,206	203,940	9,253,169	7,984,945
Construction	13	18	2,070	2,026	n.a.	660,100
Wholesale trade	1,321	1,380	75,575	78,900	327,447	350,615
Retail trade	23	46	2,065	10,910	n.a.	n.a.
Finance	215	248	19,949	25,356	700,947	1,090,322
Insurance	22	37	11,970	14,298	54,476	246,100
Real estate	13	12	85	115	7,726	n.a.
Eating and drinking places	13	11	5,281	8,388	813,644	127,748
Advertising	23	25	1,864	4,912	289,852	295,448
Electricity	0	0	0	0	2,249	n.a.
Gas and steam supply	1	2	4	15	697	n.a.
Water supply	0	0	0	0	955	n.a.
Sanitary services	1	4	0	44	0	n.a.
Transportation	62	58	4,851	8,088	2,306,259	1,612,056
Supporting services for transport	55	17	1,884	1,097	167,769	72,807
Telecommunications	13	36	815	2,926	47,036	180,270
Broadcasting	0	1	0	6	153	n.a.
Research institutes	5	1	283	n.a.	17,597	17,980
Medical and health services	8	10	170	677	930	n.a.
Private nonprofit organizations' services	0	1	0	6	28,108	28,463
Information services[a]	172	326	11,378	25,676	218,713	n.a.
Goods and equipment rental and leasing	2	3	371	489	151,981	241,400
Other business services	169	173	6,025	13,455	385,959	815,999
Amusement and recreation services	14	12	622	1,807	266,458	205,003
Hotels and lodging places	11	14	1,603	1,655	1,478,421	341,682
Other personal services	18	21	3,166	3,094	7,823	1,722
Not classified	7		175		1,977,969	1,697,230
Total	3,148	3,287	464,659	491,141	43,080,466	51,883,693

Sources: Toyo Keizai Shinpo-sha (various years); Economic Planning Agency (1999); Japanese Government (1994).

Notes: The correlation coefficient between the percentage change in the number of employees and the percentage change in imports (1990–97) is 0.3534. The data on JAFFs partially cover Japanese branches and other establishments directly owned by foreign firms. n.a. = not available.

[a]Information services imports for 1997 are included in other business services.

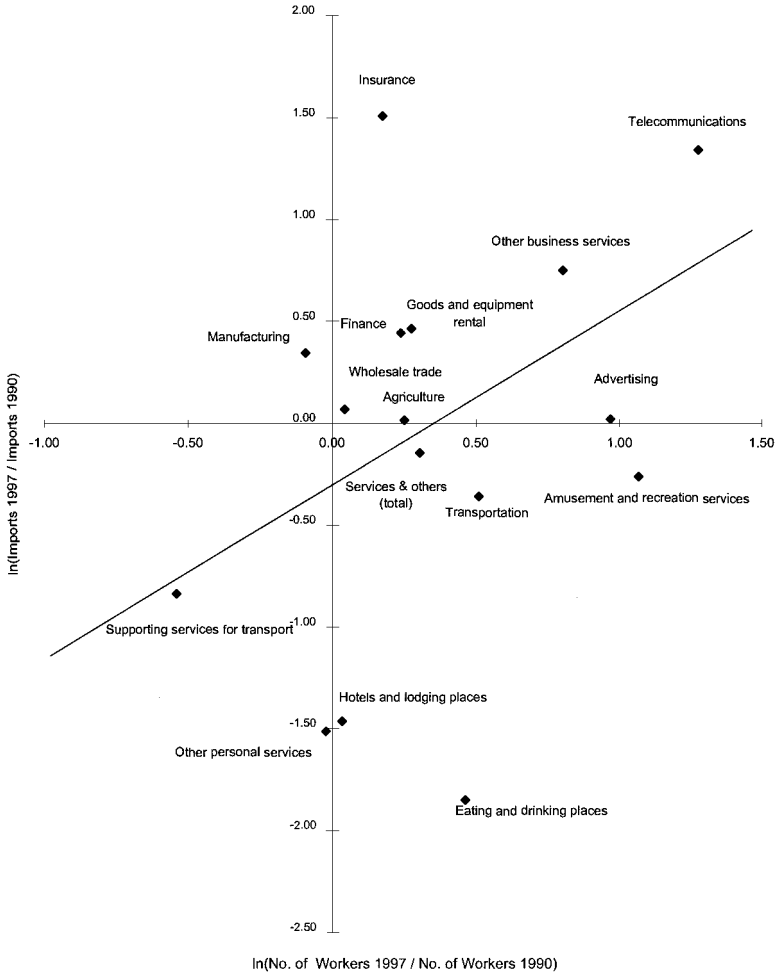

Fig. 13.5 Recent trends in JAFF's employment and Japan's imports: 1990–97
Source: Table 13.10.

13.5 show changes in the number of workers employed by JAFFs and changes in Japan's imports of services. According to table 13.10, the number of workers employed by JAFFs in nonmanufacturing sectors excluding primary industries increased by 36 percent, which is substantially smaller than MOF FDI statistics indicate.[17] According to MOF statistics, inward FDI stocks tripled from the end of 1990 to the end of 1997. Probably, MOF statistics exaggerate the increase of JAFFs' activities in recent years.

17. On the other hand, U.S. firms, for example, increased their sales of services through their affiliates in Japan by 122 percent in this period (U.S. Department of Commerce 1999).

According to table 13.10 and figure 13.5, increases of JAFFs' employment in service sectors are quite uneven among industries. Japanese affiliates of foreign firms' employment in retail trade, advertising, telecommunications, information services, and other business services has doubled, whereas that in wholesale trade, hotels and lodging places, and insurance industries was relatively stagnant.

13.5 Econometric Analysis of Determinants of Inward Foreign Direct Investment Penetration

As we have seen in the previous section, there are significant differences in inward FDI penetration in the various service industries. What industry characteristics affect the inward FDI penetration of each industry? In this section, we conduct an empirical study on this issue.

This type of cross-industry analysis on FDI into Japan has been conducted by Lawrence (1993); Weinstein (1996); Nakamura, Fukao, and Shibuya (1997); and Horaguchi (1995).[18] One of the most hotly debated issues in these studies was whether Japan's *keiretsu* relationships impede inward FDI. It has been argued that *keiretsu* relationships reduce inward FDI through cross-shareholdings and long-term supplier relationships. Using MITI (1991) data on only ten industries, Lawrence (1993) did a cross-industry regression and found that *keiretsu* relationships significantly impeded inward FDI. By constructing a panel data based on MOF data, Weinstein (1996) conducted a similar kind of regression and found that the coefficient on the shares of financial group member sales in each sector is negative but not significant in many cases. By using their newly compiled statistics on Japan's inward FDI penetration (the share of sales by JAFFs in total sales) in fifty-eight manufacturing industries from microdata of MITI's *Kigyo Katsudo Kihon Chosa* (*Basic Survey on Business Activities by Enterprises*), Nakamura, Fukao, and Shibuya (1997) conducted a cross-industry regression. They found that sales concentration as measured by the Herfindahl index has significant negative effects on Japan's inward FDI penetration, whereas capital intensity and skilled-worker intensity have significant positive effects on the FDI penetration. They also found that *keiretsu* variables and a government barrier dummy variable based on the OECD (various issues) do not have a significant effect on FDI penetration. Horaguchi (1995) also found that a coefficient on the *keiretsu* share was not significant.

These previous empirical studies mainly focused on the manufacturing sectors. No empirical analysis on inward FDI penetration in the service sectors has been conducted. The lack of analysis on the service sectors is probably due to the deficiency of data, as we have already suggested in section 13.2.

18. In the case of FDI into the United States, Ray (1989), Kogut and Chang (1991), and Pugel, Kragas, and Kimura (1996) conducted similar types of cross-industry analyses.

In this section we estimate an empirical model that explains the determinants of Japan's inward FDI penetration. The variables of this estimation are defined in table 13.11, and the estimation results are shown in table 13.12. Further details on the definitions and sources of the variables are provided in the appendix. We use Japan's FDI penetration ratio in the ser-

Table 13.11 Definition of Variables for Analysis on Inward FDI Penetration

Dependent Variable		
Japan's inward FDI penetration		
FDIJA	Share of workers employed by majority-owned JAFF in Japan's total workers: 1995	
Independent Variables		**Expected Sign of Coefficients**
U.S. inward FDI penetration		
FDIUS	Share of workers employed by foreign firms' U.S. affiliates in U.S. total workers: 1992	+
FDI Restrictiveness		
RINVJAUS	Japan's FDI restrictiveness minus U.S. FDI restrictiveness: 1994	–
Public Services		
PUBEMP	Share of workers employed by local or central governments in Japan's total workers: 1996	–
Productivity		
DPROD	Japan's productivity level (United States = 1): 1990	–/+
Locational advantage		
LAND	Land intensity (land input [book value] per employee: industry average: 1995)	–
UNIV	Skilled-labor intensity (share of university graduates in total workers: 1992)	+
Labor market structure		
JOBSEP	Job separation rate: 1995	+
Advantages in the managerial resources		
ADINT	Advertisement intensity (ratio of advertising expenses to the gross value-added: 1995)	+
RDINT	R&D intensity (ratio of R&D expenses to the gross value-added: 1995)	+
Keiretsu		
KRETS	Share of workers employed by horizontal or vertical *keiretsu* firms in total workers: 1998	–
HORIZ	Share of workers employed by horizontal *keiretsu* firms in total workers: 1998	–
VERT	Share of workers employed by vertical *keiretsu* firms in total workers: 1998	–

Source: See appendix.

Note: "Majority-owned foreign affiliates" refers to those affiliates in which foreign investors' ownership share is 49 percent or more.

Table 13.12 Determinants of Japan's Inward FDI Penetration: Tobit Estimation

	Japan's Inward FDI Penetration (Dependent variable: FDIJA)					
	Eq. (1)	Eq. (2)	Eq. (3)	Eq. (4)	Eq. (5)	Eq. (6)
FDIUS	0.280	0.301	0.326	0.160	0.162	0.171
	(2.454)**	(2.512)**	(2.405)**	(3.367)***	(2.968)***	(2.685)***
RINVJAUS	–0.026	–0.026	–0.027	–0.016	–0.016	–0.017
	(–2.306)**	(–2.354)**	(–2.427)**	(–1.696)*	(–1.668)*	(–1.666)*
PUBEMP	–0.084	–0.090	–0.091	–0.046	–0.047	–0.048
	(–3.079)***	(–2.951)***	(–3.060)***	(–2.218)**	(–2.055)**	(–2.029)**
DPROD	0.041	0.043	0.042	0.020	0.020	0.020
	(2.821)***	(2.781)***	(2.937)***	(1.894)*	(1.791)*	(1.800)*
LAND	–0.058	–0.072	–0.047	–0.088	–0.089	–0.082
	(–0.720)	(–0.849)	(–0.577)	(–1.497)	(–1.441)	(–1.384)
UNIV	–0.057	–0.058	–0.057	–0.011	–0.012	–0.012
	(–1.621)	(–1.638)	(–1.691)*	(–0.637)	(–0.630)	(–0.639)
JOBSEP	–0.657	–0.641	–0.898	–0.403	–0.402	–0.473
	(–1.565)	(–1.496)	(–1.792)*	(–1.535)	(–1.540)	(–1.486)
ADINT	1.527	1.521	1.550	0.730	0.731	0.748
	(2.751)***	(2.818)***	(2.978)***	(2.557)**	(2.544)**	(2.524)**
RDINT	–0.161	0.053	–0.234	–0.104	–0.086	–0.170
	(–0.603)	(0.150)	(–0.739)	(–0.569)	(–0.468)	(–0.822)
KRETS		–0.016			–0.001	
		(–1.169)			(–0.178)	
HORIZ			–0.076			–0.017
			(–1.612)			(–0.756)
VERT			0.023			0.009
			(1.072)			(1.050)
_cons	–0.031	–0.031	–0.026	–0.014	–0.014	–0.013
	(–1.957)*	(–1.935)*	(–1.665)*	(–1.922)*	(–1.880)*	(–1.750)*
N	45	45	45	44	44	44
Wald χ^2	18.40**	20.65**	23.53**	26.33***	30.09***	30.91***
Log likelihood	80.450	80.753	81.853	97.495	97.501	97.728

Notes: The numbers in parentheses are *z*-statistics based on the Huber-White-sandwich robust standard errors. The following six industries are excluded from the estimations due to the availability of some variables: postal service, education, research institutes (natural sciences), research institutes (social sciences and humanities), health and hygiene, and private nonprofit organizations' services. The air transportation industry is excluded from the estimations for equations (4), (5), and (6).

***p = .01 (two-tailed test)

**p = .05 (two-tailed test)

*p = .10 (two-tailed test)

vice industries as the dependent variable.[19] Japan's FDI penetration is defined by Japan's ratio of the number of workers employed by majority-owned foreign affiliates to the total number of workers.

19. On the theoretical foundation of cross-industry estimation, see Kogut and Chang (1991), Petri (1991), and Lawrence (1993). On *keiretsu,* also see Saxonhouse (1993).

In order to control for differences in the tradability of different services, we used FDIUS (U.S. inward FDI penetration). We expect a positive coefficient for this variable.

To know the effects of government regulations on inward FDI, we prepared the variable RINVJAUS (Japan's FDI restrictiveness minus U.S. FDI restrictiveness). Following Hoekman (1996), we compiled a frequency measure for FDI restrictiveness at the three-digit industry level, using data from General Agreement on Trade in Services (GATS) schedules for Japan and the United States (World Trade Organization [WTO] 1997), Asia-Pacific Economic Cooperation (APEC; 1996), OECD (various issues), Japan Investment Council (various years), and the Japanese Government (various years). The two countries' FDI restrictiveness indexes are reported in table 13.6. RINVJAUS is defined as the difference between Japan's and the United States' FDI restrictiveness. We expect a negative coefficient for this variable. Inward FDI in an industry will be limited, if establishments owned by government dominate the industry. To study this effect, we used the variable PUBEMP (share of workers employed by local or central government). We expect a negative coefficient for PUBEMP.

In cases in which cross-border transactions of services are not difficult, multinational corporations will choose the location where the production costs are lowest.[20] Therefore, the inward FDI penetration ratio will be affected by Japan's locational advantage for each industry. Because Japan's land prices and wages of unskilled workers are relatively high, Japan probably has a locational disadvantage for land-intensive or unskilled-worker-intensive industries. Consequently, we would expect a positive coefficient for UNIV (skilled-labor intensity) and a negative coefficient for LAND (land intensity). It has been argued that firm-specific skills play a more important role in Japanese firms and that this feature has hindered the development of the secondary labor market in Japan. This fact might impede the new entry of foreign firms (Weinstein 1996). In order to take this factor into account, we prepared JOBSEP (job separation rate). We expect a positive coefficient for this variable.

In order to take into account the effects of *keiretsu,* we used three *keiretsu* variables, HORIZ (the share of workers employed by horizontal *keiretsu* firms), VERT (the share of workers employed by vertical *keiretsu* firms), and KRETS (the share of workers employed by horizontal or vertical *keiretsu* firms). If *keiretsu* impede inward FDI, we will have negative coefficients.

The standard FDI theory (see, e.g., Caves 1982; Dunning 1988) emphasizes intangible assets, such as the stock of technological knowledge accumulated by research and development (R&D) or the accumulation of

20. Brainard (1993, 1997) discusses this issue for the case of manufacturing products. For the issue of locational advantage, also see Dunning (1988).

marketing know-how from past advertising as the source of multinational enterprises' advantages. When a firm moves production overseas, it is in a disadvantageous position in relation to local firms because of differences in terms of language, customs, and institutions. Multinational enterprises will exist only if the foreign establishments they control and operate attain lower costs or higher revenue productivity than the same establishments functioning under local management. According to this theory, we will observe more active FDI in R&D-intensive or advertisement-intensive industries. We would expect positive coefficients for ADINT (advertisement intensity) and RDINT (R&D intensity). If Japanese firms' productivity level is higher than that of foreign firms, Japanese firms will have a higher sales share in the world market, and inward FDI will be limited. To take this factor into account, we used DPROD (an index comparing Japan's productivity in each industry with the U.S. equivalent), which was taken from Kawai (1996). It is problematic to use this variable for the following reasons. First, since Japanese firms compete not only with U.S. firms but also with other countries' firms, DPROD is not an appropriate variable. Second, in Kawai's methodology, if Japan's absolute producer price level in one industry is higher than the corresponding U.S. price level and if this gap cannot be explained by Japan-United States differences in factor prices and prices of intermediate inputs, then Japan's productivity in that industry is inferred to be lower compared to the United States. However, there is a possibility that Japan's high absolute price level (relatively low DPROD) might reveal either Japan's higher industry rent or Japan's higher fixed costs. Third, there might exist a reverse causality. High inward FDI penetration might increase DPROD by either reducing the industry rent or improving that industry's productivity.

Since there exists a lower bound, zero, for our dependent variable, we conduct a tobit estimation. The results are summarized in table 13.12. Among our fifty-one industries, we were unable to obtain data for six industries, that is, postal services, education, research institutes on natural sciences, research institutes on social sciences and humanities, health and hygiene, and private nonprofit organizations' services. Therefore, the maximum sample size is forty-five. As we have seen in figure 13.4, inward FDI in Japan's air transportation industry stands out and seems to be an outlier. We checked the robustness of our results by excluding the air transportation industry from our sample.

In the case of policy variables, we achieved significant results. The estimated coefficients of RINVJAUS (Japan's FDI restrictiveness minus U.S. FDI restrictiveness) and PUBEMP (the share of workers employed by local or central government) are negative and significant. These results imply that by eliminating its restrictions on inward FDI and reducing government activities, Japan can increase inward FDI.

In the case of locational advantage variables, the estimated coefficient of LAND is negative, as we expected, but is not significant. Contrary to our expectations, the coefficients of UNIV (skilled-labor intensity) and JOBSEP (job separation rate) are negative but insignificant in many cases. The coefficient of DPROD is positive and significant.

In the case of the variables that stand for the importance of intangible assets, the estimated coefficient of ADINT (advertisement intensity) is positive and significant. Consistent with the standard theory of FDI, Japan's inward FDI penetration is relatively high in industries that have higher advertisement intensity. The coefficient of RDINT (R&D intensity) is not significant. In the case of *keiretsu* variables, we did not get significant results, suggesting that *keiretsu* do not work as an impediment to inward FDI in Japan's service sector.

13.6 Conclusions

In this paper, we estimated the sales and employment of JAFFs and FAJFs in the service sector at the three-digit industry level for the year 1995.

We found that imbalances between activities of JAFFs and FAJFs are smaller than those reported in the MOF FDI statistics. In terms of employment, the JAFF-FAJF ratio is 0.22. We compared Japan's purchases of services from foreigners with U.S. purchases. For the service sector as a whole, Japan's ratio of imports to total domestic output is 1.8 percent, which is almost at the same level as the corresponding U.S. ratio, 2.1 percent. However, in the case of purchases through establishment transactions, Japan's ratio of the number of workers employed by majority-owned foreign affiliates to the total number of workers is 0.4 percent, which is one-seventh of the corresponding U.S. ratio, 2.8 percent. It seems that Japan's market for services is more closed for establishment transactions than for cross-border transactions

We also found that, compared with the United States, Japan's purchases from foreigners are concentrated in a limited number of industries. Four industries—financial intermediary services, wholesale trade, air transportation, and hotels and lodging places—account for about 54 percent of Japan's total purchases of services from foreigners. From the viewpoint of "revealed comparative advantage," Japan is most competitive in industries that support Japan's international activities, such as casualty and life insurance, other business services, and financial intermediary services. Japan is least competitive in air transportation, computer programming and software, and information services, both in international trade and in establishment transactions.

Using our cross-industry data, we estimated an empirical model explaining the determinants of Japan's inward FDI penetration. We found that in-

ward FDI penetration is closely related to several characteristics of industries. Japan's inward FDI penetration is relatively high in industries that have higher advertisement intensity, a lower presence of government activities, and a lower presence of official restrictions on inward FDI. We found that the presence of *keiretsu* does not have significant negative effects on FDI penetration.

We should note that our new estimates may contain large estimation errors due to statistical deficiencies, as we pointed out in section 13.3. We hope that the Japanese government will make greater efforts to improve its statistics on Japan's international sales and purchases of services. Some fundamental improvements can be achieved without great cost. For example, as we have already discussed in section 13.3, the Japanese government could easily compile reliable statistics on the number of workers employed by majority-owned JAFFs for all the industries at the four-digit industry level by making use of the microdata of *Jigyosho Kigyo Tokei Chosa* (*Establishment and Enterprise Census of Japan*) conducted by the Japan Management and Coordination Agency.

Appendix

Description of Variables and Data Sources

Size of Industry

Our data on total domestic output, total domestic demand, and number of workers for each industry were taken from *1995 Input-Output Tables* (Japanese Government 1999). In I-O tables, the output level of the financial sector is measured by imputed income from interest and transaction fees. We replaced this with the financial sector's total current income. We calculated the domestic total current income of the financial intermediary services industry by summing up all banks' current incomes, all securities companies' operating revenues, and all other financial institutions' operating revenues (MOF *Annual Report of Financial Institutions* [various years]; MOF *Annual Report of Securities Companies* [various years]).

Sales and Employment by Japanese Affiliates of Foreign Firms

Our data on the number of workers employed by foreign firms' Japanese subsidiaries were taken from the Toyo Keizai's *Directory of Japanese Subsidiaries of Foreign Firms* (Toyo Keizai Shinpo-sha various years). Our data on the number of workers employed in Japanese branches and other establishments directly owned by foreign firms were taken from the Statistics Bureau of the Japan Management and Coordination Agency (1998). We estimated the sales of those Japanese subsidiaries for which such data were not

available in the Toyo Keizai database as well as the sales of Japanese branches and establishments directly owned by foreign firms.

For details of estimation procedures, see section 13.3.

Sales and Employment by Foreign Affiliates of Japanese Firms

Our data on the number of workers employed by Japanese firms' foreign subsidiaries were taken from Toyo Keizai's *Directory of Japanese Subsidiaries Abroad.* Using the Toyo Keizai database, we estimated foreign subsidiaries' sales in the same way as JAFFs' sales. Moreover, we referred to MITI's (1999a) microdata in our estimate of FAJFs' sales when data from Toyo Keizai were not available. For details of the estimation procedures, see section 13.3.

Cross-Border Trade

Our data on Japan's services imports and exports were primarily taken from statistics on Japan's special trade and direct purchases that are included in the *1995 Input-Output Tables* (Japanese Government 1999).

In the context of our analysis, cross-border service trade statistics in Japan's I-O tables have the following shortcomings:

1. Imports and exports in I-O tables do not include payments and receipts for construction services, which, if provided by nonresidents, should be considered as service imports.
2. As merchandise imports are on a cost plus insurance and freight (c.i.f.) basis, I-O output tables omit those services—transportation and insurance—that are associated with the import of goods and already included in the value of goods imports.
3. The value of overseas wholesalers' activities is included in the value of goods imports either on a free on board (f.o.b.) basis or on a c.i.f. basis, while the value of domestic wholesalers' activities for exported goods is properly summed up in the output of wholesale trade sector.

In order to solve these problems, we used Bank of Japan (various issues) data on trade of construction and civil engineering, water transportation, and air transportation services. For imports of wholesale trade services that are included in the value of goods imports, we estimated distribution margins in the following way. We calculated the ratio of distribution margins for exported goods to total exports on an f.o.b. basis and estimated margins on imported goods by multiplying imports on an f.o.b. basis by the commercial margin ratio. We obtained the value of goods imports on an f.o.b. basis from Bank of Japan (various issues).

In the case of financial intermediary services, we calculated a measure of import quantities that is comparable to our measure of activities for this sector, that is, current income. We derived it by multiplying this industry's import-output ratio of the I-O tables with this industry's total current income.

U.S. Imports and Total Domestic Output

Our data on U.S. imports and total domestic output were taken from the 1992 U.S. input-output tables (U.S. Department of Commerce 1995a). Due to the same shortcomings as in the case of Japan's input-output tables, we revised the data of the I-O tables, using data on cross-border transactions from *U.S. International Services* (U.S. Department of Commerce 1999) for construction and civil engineering, railway passenger and freight transportation, road passenger and freight transportation, water and air transportation, and supporting services for transport. Data on imports of financial intermediary services, telecommunications, eating and drinking places, and hotels and lodging places were also taken from U.S. Department of Commerce (1999). For imports of wholesale trade services, we estimated distribution margins that are included in the value of goods imports in the same way as with Japan's imports. We should note that import data in U.S. Department of Commerce (1999) exclude imports from U.S. firms' foreign affiliates.

Sales by Foreign Firms' U.S. Affiliates

The data on sales by foreign firms' U.S. affiliates were taken from U.S. Department of Commerce (1995c). We derived sales data for industries in which these are confidential by multiplying the number of workers employed by foreign-owned establishments by the sales-employee ratio of all establishments. As with the estimation of Japan's purchases from JAFFs, sales of the wholesale and retail trade were adjusted to be based on margins, using total U.S. output and the number of workers employed by all establishments in the United States.

U.S. Ratio of Total Purchases from Foreigners to Total Domestic Output

This ratio is defined by "(Sales by foreign firms' U.S. affiliates + imports)/ total domestic output." For financial intermediary services and insurance industries, definitions of output in U.S. I-O tables differ from those of sales in U.S. establishment data in the same way as in Japanese I-O tables. Hence, we used the number of workers as a measure of activities in these industries, as follows: U.S. ratio of total purchases from foreigners to total domestic output = (the number of workers employed by foreign firms' U.S. affiliates / total number of workers) + (the value of imports / total domestic output).

Japan's Inward Foreign Direct Investment Penetration (FDIJA)

The variable FDIJA is defined as the share of the number of workers employed by majority-owned JAFFs in Japan's total number of workers in 1995. Our data on Japan's total number of workers were taken from the *1995 Input-Output Tables* (Japanese Government 1999).

U.S. Inward Foreign Direct Investment Penetration (FDIUS)

The variable FDIUS is defined as the share of the number of workers employed by foreign firms' U.S. affiliates in the U.S. total number of workers in 1992. The data were taken from the U.S. Department of Commerce (1995c).

Skilled Labor Intensity (UNIV)

UNIV is defined as the ratio of the number of university graduate employees to the total number of employees in that particular industry. The data were taken from Prime Minister's Office (1998) and Ministry of Labor (1996).

Land Intensity (LAND)

Our data on LAND are taken from the Development Bank of Japan (2000) and Nikkei QUICK Information Technology (2000). We first calculated the ratio of the book value (unit: billions yen) of owned land to the number of employees for each firm. LAND is a weighted average of the land-employee ratio in each industry. We used the number of employees of each firm as a weight. For water supply and sewerage systems industries, we calculated the land-employee ratio using MOF (1996). We first regressed the ratio calculated by the Development Bank of Japan data on the ratio calculated by MOF data for the industries for which the ratios calculated by both data were available. We then took the adjusted ratios for water supply and sewerage systems industries by using the estimated regression equation.

Differences between Japanese and U.S. Foreign Direct Investment Restrictiveness (RINVJAUS)

Following Hoekman (1996), we compiled a frequency measure for FDI restrictiveness at the three-digit industry level, using data from GATS schedules for Japan and the United States (WTO 1997). The GATS schedule of each country shows to which service sectors and under what conditions the basic principles of the GATS—market access and national treatment—are applied in that country. The GATS schedule covers 155 service sectors. The commitments and limitations are in every case entered with respect to each of the four modes of supply, cross-border supply, consumption abroad, commercial presence, and presence of natural persons. It seems that commitments on the commercial presence mode of supply have the most significant impact on inward FDI, so we used only information on this mode of supply. For sectors uncovered by the GATS schedule, we acquired information on each country's FDI restrictiveness from APEC (1996), OECD (various issues), Japan Investment Council (various years), and the Japanese Government (various years). RINVJAUS is defined as the difference between Japan's and the U.S. FDI restrictiveness.

Share of Public Services (PUBEMP)

PUBEMP is defined as the ratio of the number of workers employed by the establishments owned by the central or local governments to the total number of employees in that particular industry in Japan. The data were taken from the Statistics Bureau of Japan Management and Coordination Agency (1998).

Productivity (DPROD)

DPROD is defined as the productivity of a particular industry in Japan relative to that in the United States. The data are based on Kawai (1996). For these data, also see Kawai and Urata (1997).

Advertisement Intensity (ADINT)

ADINT is defined as the ratio of advertising expenses to the gross value added in each industry. The data were taken from the *1995 Input-Output Tables* (Japanese Government 1999). The advertising expenses are defined as the amount of input from the advertising industry to each industry.

Research and Development Intensity (RDINT)

RDINT is defined as the ratio of R&D expenses to the gross value added in each industry. The data were taken from the *1995 Input-Output Tables* (Japanese Government 1999). The R&D expenses are defined as the amount of input from the research industry to each industry.

***Keiretsu* (KRETS)**

KRETS is defined as the share of workers employed by *keiretsu* firms in the total work force. The data on *keiretsu* were taken from Toyo Keizai Shinpo-sha (1992, 2000). We treated all the firms that belong to horizontal or vertical *keiretsu* groups and all the subsidiaries of such firms as *keiretsu* firms.

Horizontal *Keiretsu* (HORIZ)

HORIZ is defined as the share of workers employed by horizontal *keiretsu* firms in the total work force. The data on *keiretsu* were taken from Toyo Keizai Shinpo-sha (1992, 2000). We treated all the firms that belong to the *Shacho-kai* (President Clubs) of seven corporate groups (Mitsui, Mitsubishi, Sumitomo, Fuyo, Sanwa, Ichikan, and Tokai) and all the subsidiaries of such firms as horizontal *keiretsu* firms.

Vertical *Keiretsu* (VERT)

VERT is defined as the share of workers employed by vertical *keiretsu* firms in the total work force. The data on *keiretsu* were taken from Toyo

Keizai Shinpo-sha (1992, 2000). We treated all the firms that belong to forty-three independent corporate groups (Toyota, Nissan, Hitachi, Toshiba, Matsushita, Taisei, etc.) and all the subsidiaries of such firms as vertical *keiretsu* firms.

Job Separation Rate (JOBSEP)

The data on job separation rates were taken from Ministry of Labor (1995).

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Comment Mario B. Lamberte

Doing analysis on trade in services, which in recent years has expanded tremendously, is not going to be as easy as doing analysis on trade in goods. First, the conceptual issues need to be addressed so that trade in services can be accurately represented in the economy. Second, the measurement issues need to be tackled. Third, detailed data on trade in services must be collected. These are the tasks that the paper by Fukao and Ito tries to accomplish before they proceeded with their descriptive and econometric analysis.

The authors' aim was to improve the statistics on trade in services in Japan by including not only cross-border transactions, which are captured in existing balance-of-payments tables, but also establishment transactions, by using a much more comprehensive data set than the ones currently used by official bodies, such as the Ministry of Finance. They were able to estimate the sales and employment of Japanese affiliates of foreign firms (JAFFs) and foreign affiliates of Japanese firms (FAJFs) in the service sector at the three-digit industry level for the years when data were available to them. The authors are frank in pointing out that their estimates of establishment transactions have several drawbacks owing to the statistical deficiencies. Nonetheless, they deem their estimates much more reliable than those that are currently available for Japan. More specifically, their estimates of establishment transactions show that imbalances between the activities of JAFFs and FAJFs are much smaller than the estimates provided by earlier studies. This suggests that the Japanese economy is much more open to inward direct investment in the service industries than previous studies have portrayed it to be. This finding is important because it points out that inaccurate statistics can lead to faulty analysis and erroneous conclusions.

I am sure their approach can provide a useful guide to countries that want to improve their statistics on trade in services. For developing economies, the task of gathering information on establishment transactions will likely be focused on those of the affiliates of foreign firms. Because of regulations, many foreign firms have entered the service sector of developing economies by setting up branches rather than organizing subsidiaries. Although most developing countries have begun liberalizing their service sector, nonetheless establishment transactions through affiliates will likely remain substantial in these countries. Thus, efforts of capital-exporting countries to improve their statistics on both cross-border and establishment transactions can benefit developing economies if such information is shared with them.

The authors have mainly relied on Toyo Keiza's data as basic statistics for

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their estimation of sales and employment data for both JAFFs and FAJFs in the service sector. It might help the readers appreciate the reliability of the Toyo Keizai data if the authors could add a paragraph in the appendix describing the sample size, the collection method, and the response rate. Whenever possible, the authors made adjustments in the Toyo Keizai data set to complete the information required for their analysis. For instance, information on sales was not available for many subsidiaries covered by the Toyo Keizai data. To remedy this problem, the authors "calculated each industry's average value of sales per worker from data on subsidiaries, for which both the number of workers and the sales were available" and used these values "to estimate the sales of subsidiaries for which data on sales were not available in the Toyo Keizai data set and sales of Japanese branches and other establishments directly owned by foreign firms." This procedure will likely produce biased results. My own experience with this kind of survey in the Philippines is that large firms often do not voluntarily provide vital information about their companies, such as sales or profits. However, such information can be obtained from the Philippine Securities and Exchange Commission, which requires all corporations to submit financial statements on a regular basis. I am sure Japan has similar requirement for all corporations, including subsidiaries of foreign firms. If the Toyo Keizai data set includes identification of the individual firms in the survey, then the authors can use the data available at the securities and exchange commission to fill in the information on sales not reported by many subsidiaries. However, this is going to be a long and painful process. The alternative is to construct an econometric model with sales on the left-hand side and some characteristics of the firms on the right-hand side and apply this model to firms that have complete information. The estimated model can be used in estimating sales of those firms that did not provide such information.

The nationality requirement of Japanese subsidiaries in the Toyo Keizai data set, 20 percent capital participation rate in listed and unlisted but large subsidiaries and 49 percent for unlisted and small subsidiaries, appears to be restrictive. Some foreign firms may be interested only in gaining a small foothold in domestic firms to secure much larger collateral business with them. This is prevalent in banking, insurance, retail, and transport service sectors, especially because most countries restrict equity participation of foreign firms in these sectors. As the authors pointed out, the U.S. data on inward direct investment cover all subsidiaries that are more than 10 percent foreign-owned, which obviously is a much broader coverage than the data set used by the authors. If it is not possible to adjust the Toyo Keizai data set to conform to the U.S. definition of subsidiaries, future data collection efforts could perhaps take this into account.

One of the interesting results observed by the authors is that Japan's purchases of services from foreigners are concentrated in the four industries,

namely, finance, wholesale trade, water transport, and air transportation. It might be worthwhile to dig deeper into this result. Was entry by foreigners into the other industries (e.g., life insurance, advertising, telecommunications) more restrictive than the four mentioned above?

The econometric analysis of the determinants of inward foreign direct investment (FDI) penetration is instructive. The authors found that *keiretsu* impede inward FDI. I expected from the authors some discussion about the policy implications of this finding. Should *keiretsu* relationships be prohibited in order to encourage more inward FDI? Or should *keiretsu* be subjected to market discipline to give foreign firms a fair chance in competing with Japanese firms?

The authors should tighten a bit the role of the three-firm concentration ratio, CR3, in their model. The coefficient of CR3 could take either a positive value, if it indicates the existence of economies of scale, or a negative value, if incumbent firms block the entry of potential new competitors, including foreign firms. The results seem to support the first interpretation. However, one should take a closer look at the interpretation of CR3 suggested by the authors. The existence of economies of scale in the industry can actually deter any entrants, in which case the coefficient of CR3 should have been negative. The other thing that needs to be examined closely is why every time CR3 is dropped from the equation the *keiretsu* variable, GRP, loses its explanatory power. There must be something going on between these two variables that needs to be sorted out.

Comment

Chong-Hyun Nam

This is a very interesting paper, and not only interesting but also very informative. One learns a lot from this kind of empirical work.

This paper tries to be very ambitious. A lot of effort was put into establishing basic data, such as sales of services by Japanese affiliates of foreign firms and by foreign affiliates of Japanese firms. The sales by these subsidiary firms are called establishment transactions, and they are compared with cross-border transactions.

Based on this data set, a great deal of interesting empirical work was conducted. A revealed comparative advantage profile was estimated for the Japanese service industries, and, using a gravity model, the authors investigated determinants of U.S. exports of services through cross-border sales or through establishment sales. Determinants of inward foreign direct investment (FDI) were also examined.

I have only a few brief comments to make. My first comment goes to data

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preparation, which is a major part of the work in the study. In the paper, I find that nationality of subsidiary firms is being determined on a somewhat arbitrary basis, and that sales by these subsidiary firms may have been subject to a large measurement error. For instance, in order to be listed as foreign subsidiaries in Japan, the cutoff foreign capital participation rate is 20 percent for large subsidiaries and 49 percent for small subsidiaries. The capital participation cutoff rate is even lower (at 10 percent) to be listed as overseas subsidiaries of the U.S. firms. However, sales by these subsidiaries are all 100 percent counted as establishment sales, although their mother company's capital participation rate may vary between 10 percent and 100 percent. I wonder how one could justify this.

My second comment falls on some empirical findings as shown in table 13.6 and table 13.10. The estimation results in table 13.6 suggest that Japan has relatively fewer barriers to cross-border trade among sample countries but has relatively greater impediments to the establishment of foreign subsidiaries in Japan. The estimation results in table 13.10 suggest that such market structure variables as entry rate, concentration ratio, and the presence of *keiretsu* have played an important role in determining the level of inward FDI in Japan. Contrary to our expectation, however, other economic variables, such as unskilled-labor intensity, land intensity, or FDI restrictiveness, all turned out to be rather unimportant.

I think, despite all the econometric problems associated with estimation, these findings are the highlight of the paper, and they are telling, indeed. It is so much so because the current market structure is really the historical outcome of past economic policy environments in Japan, and, therefore, domestic policy reforms must be instituted to fix the unusually low level of inward FDI in Japan.

In fact, I noticed from table 13.7 that inward FDI has been skyrocketing lately in such industries as telecommunication services and finance and insurance services. An explanation for this would be interesting. I suspect that domestic policy changes, including regulatory reforms, must have played an important role for such phenomena.

My final comment is concerned with the measurement of revealed comparative advantage, as shown in figure 13.3. According to the results, Japan seems highly competitive in such traditional service industries as casualty insurance, business services, and financial intermediary services, but least competitive in such more modern service industries as air transportation, computer programming and software, and information services.

Again, I think, the paper can get some good mileage out of exploring further the determinants of revealed comparative advantage. It seems to me very interesting to find out whether such a comparative advantage profile has been affected by domestic policy factors in any significant way.