

**Foreign Direct Investment and Service Trade:
The Case of Japan**

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1. Introduction

Since 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 U.S., relatively reliable statistics on these two types of international transactions of services are available from the 1980's onwards (U.S. Congress 1986; U.S. Department of Commerce 1995a, 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 (JAFF) and foreign affiliates of Japanese firms (FAJF) in the service sector at the 3-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 -border transactions at the 3-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 OECD 1999a). According to these data, Japan's outward direct investment stock in the service sector is twelve times greater than the corresponding inward direct investment stock (Table 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 (GATT 1995; MITI 1998a; Stern 2000).

INSERT TABLE 1

But 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 JAFF and those of FAJF are smaller than those indicated by the MOF's 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%, which is one seventh of the corresponding U.S. ratio of 2.8%. We also found that compared with the U.S., 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% of Japan's total purchases of services from foreigners.

Since our data are compiled at the 3-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 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 3, we explain how we estimated sales and employment by JAFF and FAJF in the service sector. In section 4, we provide a general overview of Japan's international transactions of services using our new statistics. In section 5, we undertake an econometric investigation of the determinants of Japan's FDI penetration in the service sector at the

3-digit industry level.

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

In the case of inward direct investment in non-manufacturing 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 non-manufacturing industries at the end of March 1998. The survey is loosely based on the U.S. Department of Commerce's survey of foreign direct investment 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.

(i) 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% of the questionnaires sent out were returned to MITI. Moreover, usually not all the questions in the returned questionnaires are answered.

- (ii) The survey does not cover subsidiaries in real estate, finance, and insurance.
- (iii) 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.
- (vi) In MITI's report on inward FDI, all the data on non-manufacturing subsidiaries are aggregated into three industries only: commerce, services, and others (agriculture, construction, etc.). In the case of outward FDI, the data on non-manufacturing 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 other surveys on foreign subsidiaries conducted by private companies. For example, the number of non-manufacturing subsidiaries covered by the MITI survey for 1997 was only 983.²

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 which were majority-owned by foreign firms employed only 3,800 workers in 1996. But this number is in fact only for business service subsidiaries, because MITI's survey does not cover the other sub-sectors.

Concerning foreign subsidiaries of Japanese firms, MITI conducts the survey *Kaigai Jigyo_Katudo Doko Chosa (Survey on Trends of Japan's Business Activities Abroad)*, which covers foreign subsidiaries with more than a 10% 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 non-manufacturing sectors, excluding agriculture, fishery, and mining at the end of March, 1998.

Compared with these surveys by MITI, Toyo Keizai's micro-data, *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 non-responding firms. The data covers all industries.

In principle, the Toyo Keizai data on inward FDIs cover subsidiaries with a 49% or higher foreign ownership. But in the case of listed or large subsidiaries, the data covers those with a 20% or higher foreign ownership. The data on outward FDI primarily covers foreign subsidiaries with a 20% 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 non-manufacturing 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 non-manufacturing sectors excluding the primary sector, the data for 1995 cover 10,378 subsidiaries, which employed 865,000 workers.

3. Estimation of Sales and Employment by JAFF and FAJF in Service Sector

We use Toyo Keizai's data as the basic statistics for our estimation. Sales and employment data for Japanese affiliates of foreign firms (JAFF) and foreign affiliates of Japanese firms (FAJF) in service sectors at the 3-digit level are estimated for the year 1995. We chose 1995 because the most recent I-O tables (Japanese Government 1998) 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 Appendix.)

(i) 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. Statistics Bureau, 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 4-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.

(ii) 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 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 micro data of MITI's survey and Toyo Keizai's data to get average values of sales per worker for subsidiaries at the 3-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 JAFF. 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 JAFF 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.

(iii) Industry Classification

Toyo Keizai's industry classification, which has 31 non-manufacturing sectors, is not detailed enough for our analysis.⁷ We therefore re-classified all subsidiaries into one of 51 sectors using information on subsidiary's line-of-business, which is included in the Toyo Keizai data. Table 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 JAFF 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 U.S., sales of services by foreign firms' affiliates in manufacturing industry accounted for 6% 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 JAFF in non-service sector are available from MITI (1998b). We found that such sales were negligible. The data on the sales of "services" by FAJF in non-service sectors are only available for U.S. affiliates. According to U.S. Department of Commerce (1999), sales of services by affiliates of Japanese firms in manufacturing industry accounted for 4% of total service sales of Japanese firms' U.S. affiliates in 1996. Our estimates on service sales by FAJF 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.”

INSERT TABLE 2

(iv) 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 cut-off capital participation rate is 20%. For unlisted and small subsidiaries the cut-off rate is 49%. If we used these data without adjustment, we might get biased results. In order to solve this problem, we calculated two sets of estimations for JAFF, one for JAFF with a 49% and higher foreign capital participation rate plus all the other establishments directly owned by foreign firms and the other for JAFF which include all the JAFF recorded in the Toyo Keizai database plus all the other establishments directly owned by foreign firms.

(v) Cross-Border Transactions of Services by Affiliates

In our estimation, we did not take account of cross-border transactions of services by affiliates. JAFF provide services not only to Japanese customers but also to

foreigners. FAJF export their services to Japan. To get consistent statistics, we should subtract these values from sales by JAFF and sales by FAJF respectively. Similarly, Japan's service imports include imports by JAFF and Japan's service exports include exports to FAJF. 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 3 shows, JAFF and FAJF in service sectors are quite active in international transactions. But there is no data on what percentage of imports and exports by affiliates are service transactions. And there is no data at a more detailed industry classification level. Because of these deficiencies of the statistics, we could not adjust for this factor.

INSERT TABLE 3

Panel A of Table 4 presents the estimates of sales and employment by JAFF and FAJF.

INSERT TABLE 4

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. Panel B of Table 4 presents data on Japan's cross-border transactions of services and sales and

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* 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 is 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 non-residents. For trade in construction services, we used data reported in the balance of payments statistics. We did not take account of compensation of employees since 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 which are reported in U.S. Department of Commerce (1995a, 1995c) to our definition of sales and industry classifications. The results are reported in Table 5. We should note that U.S. data on inward direct investment cover all the subsidiaries that are more than 10%

foreign-owned, i.e. the coverage of U.S. data is broader than Japan's data in the case of purchases from affiliates. For U.S.-Japan comparison, we also prepared Table 6, in which we compared sales and number of employees of majority-owned foreign affiliates in U.S. and Japan. U.S. data is taken from the U.S. Department of Commerce (1995b). Since the U.S. data is not available at the 3-digit industry level, the U.S.-Japan comparison in Table 6 is done at the more aggregated industry level.

INSERT TABLE 5 AND TABLE 6

4. An Overview of Japan's International Sales and Purchases of Services

According to our new statistics (Table 4), JAFF in the service sector employed 199,000 workers in 1995, which is about three times greater than the number reported in MITI (1999a).

Imbalances between the activities of JAFF and those of FAJF 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 because for the following reasons.

First, during the second half of the 1980's, 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 & 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 U.S. (Wilkins 1990; Graham and Krugman 1991). Since 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. And 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 setting up branches instead of founding subsidiary companies. This fact makes their investment flows relatively small compared with the actual sizes of their affiliates' activities

measured by sales or employment.

Using Table 5, we can compare Japan and America'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%, which is almost at the same level as the corresponding U.S. ratio, 2.1%. But in the case of purchases from majority owned foreign affiliates (Table 6), Japan's ratio of purchases from affiliates to total domestic output is 1.2%, which is less than half of the corresponding U.S. ratio of 2.7%. 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%, which is one seventh of the corresponding U.S. ratio of 2.8%. It seems that Japan's market for services is more closed for establishment transaction 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 both for 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 6. The dependent variables are the logarithm of U.S. exports and sales by affiliates. As explanatory variable, we use the logarithm of each country's GDP, the logarithm of per capita GDP, the logarithm of distance from the U.S., 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. But it seems that the signs of the estimated coefficients of Japan dummies are consistent with our findings from the U.S.-Japan comparison based on Table 5 and Table 6. 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% less than the predicted value.

INSERT TABLE 7

Next, we study Japan's purchases of services from foreigners by industry. Figure 1 shows the industry composition of Japan's purchases. Purchases are concentrated in a limited number of industries. Four industries, financial intermediaries, wholesale trade, air transportation, and hotels and lodging places account for 54% 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 Panel A of Table 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 branch. Almost all the air passenger transportation services by foreign firms are conducted through their Japanese branches. But in the case of airfreight transportation and water transportation there are several large affiliates. In 1995, Federal Express Japan and UPS Yamato employed 852 and 650 workers, respectively. A European water transportation company, Maersk, employed 360 workers. 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 their wholesale affiliates. Kodak Japan Ltd. employed 1,078 workers.

In Figure 2, we compare Japan's and the United States' sectoral importance of purchases from foreigners, which we measure by a ratio of total 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.

INSERT FIGURE 1, FIGURE 2, AND FIGURE 3

Figure 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 FAJF minus sales by JAFF) to total domestic output. According to Figure 3, Japan is most competitive in industries that support Japan's international activities, such as casualty and life insurance, other business services, agricultural services,¹⁴ 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, transportation companies started their FDI before the Second World War. The Japanese government sometimes backed up this type of investment. Figure 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 51 service sector categories, in which categories is the Japanese market more closed to international establishment transactions than the U.S. market? Figure 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 where the foreign ownership ratio is 10% or higher. There are some similarities between Figure 3 and Figure 4. Japan has a higher penetration ratio than the U.S. in air transportation, computer programming and software, and information services. Japan has a lower penetration ratio than the U.S. in casualty and life insurance, financial intermediary services, hotels and lodging places, and supporting services for transport.

INSERT FIGURE 4

INSERT FIGURE 5

So far, our analysis was static and mainly based on Japan's 1995 data. But we should note that FDI into Japan is growing at amazing speed. Table 8 shows MOF statistics on FDI flows into Japan. According to the statistics, the inward direct investment stock in Japan's non-manufacturing sector has grown six-fold 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 1996 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% share of Nippon Telecom. A British company, Cable and Wireless

acquired IDC (International Digital Communications) by a takeover bid.

INSERT TABLE 8

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 socio-economic 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 I telecommunications carriers (except for NTT and KDD), including their radio station licenses, removed in 1998. In 1999, all restrictions on foreign capital and the appointment of foreign directors in all cable TV businesses were removed. 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 2, MOF FDI statistics are not appropriate measures for JAFF's activities. Therefore, using Toyo Keizai data, we compared JAFF's employment in 1997 with that in 1990. Table 9 and Figure 5 show changes in the number of workers employed by JAFF and changes in Japan's imports of services. According to Table 9,

the number of workers employed by JAFF in non-manufacturing sectors excluding primary industries increased by 36%, 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 JAFF's activities in recent years.

According to Table 9 and Figure 5, increases of JAFF's employment in service sectors are quite uneven among industries. JAFF employment in retail trade, advertising, telecommunications, information services, and other business services has doubled, while that in wholesale trade, hotels and lodging places, and insurance industries were relatively stagnant.

INSERT TABLE 9 AND FIGURE 5

5. Econometric Analysis of Determinants of Inward FDI 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 share-holdings 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 foreign direct investment. 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 JAFF in total sales) in 58 manufacturing industries from micro-data 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, while 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 2.

In this section we estimate an empirical model explaining the determinants of Japan's inward FDI penetration. The variables of this estimation are defined in Table 10. Further details on the definitions and sources of the variables are provided in Appendix. We use Japan's FDI penetration ratio in the service 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.

INSERT TABLE 10, 11

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 a variable, *RINVJAUS* (Japan's FDI restrictiveness minus U.S. FDI restrictiveness). Following Hoekman (1996), we compiled a frequency measure for FDI restrictiveness

at the 3-digit industry level, using data from GATS (General Agreement on Trade in Services) schedules for Japan and the United States (WTO 1997), APEC (1996), OECD (various issues), Japan Investment Council (various years), and the Japanese Government (various years). The two countries' FDI restrictiveness indices are reported in Panel B of Table 5. *RINVJAUS* is defined as the difference between Japan's and the U.S.'s 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 a variable, *PUBEMP* (share of workers employed by local or central government). We expect a negative coefficient for *PUBEMP*.

In cases where 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. Since 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 new entry of foreign firms (Weinstein 1996). In order to take account of this factor, we prepared *JOBSEP* (job separation rate). We expect a positive coefficient for this variable.

In order to take account of 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 (for example, see Caves 1982 and Dunning 1988) emphasizes intangible assets, such as the stock of technological knowledge accumulated by R&D or the accumulation of 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 account of this factor, 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 (1996) 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-U.S. 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. But 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* through 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 11. Among our 51 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 non-profit organizations' services. Therefore, the maximum sample size is 45. As we have seen in Figure 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 air transportation industry from our sample.

In the case of policy variables, we got 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 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.

6. Conclusions

In this paper, we estimated the sales and employment of Japanese affiliates of foreign firms (JAFF) and foreign affiliates of Japanese firms (FAJF) in the service sector at the 3-digit industry level for the year 1995.

We found that imbalances between activities of JAFF and FAJF 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%, which is almost at a same level as the corresponding U.S. ratio, 2.1%. But 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%, which is one seventh of the corresponding U.S. ratio, 2.8%. It seems that Japan's market for services is more closed for establishment transaction than for cross-border transactions.

We also found that compared with the U.S., 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% 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 inward 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 possibly contain large estimation errors due to statistical deficiencies as we pointed out in Section 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 3, the Japanese government could easily compile reliable statistics on the number of workers employed by majority owned JAFF for all the industries at the 4-digit industry level by making use of the micro-data of *Jigyosho-Kigyo Tokei Chosa (Establishment and Enterprise Census of Japan)*, conducted by 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 Japan Input-Output Tables (Japanese Government 1998). 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 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 (see MOF's *Annual Report of Financial Institutions*; MOF's *Annual Report of Securities Companies*).

Sales and Employment by JAFF (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*. 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, 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, please see Section 3.

Sales and Employment by FAJF (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 JAFF's sales. Moreover, we refer to MITI's (MITI 1999b) micro-data in our estimate of FAJF's sales when data from Toyo Keizai were not available. For details of the estimation procedures, please see Section 3.

Cross-Border Trade:

Our data on Japan's services imports and exports are primarily taken from statistics on Japan's special trade and direct purchases that are included in the 1995 Japan Input-Output Tables (Japanese Government 1998).

In the context of our analysis, cross-border service trade statistics in Japan's I-O

tables have the following shortcomings:

i) Imports and exports in I-O tables do not include payments and receipts for construction services which, if provided by non-residents, should be considered as service imports.

(ii) As merchandise imports are on a CIF 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.

(iii) The value of overseas whole-sellers' activities is included in the value of goods imports either on FOB basis or on CIF basis, while the value of domestic whole-sellers' activities for exported goods are 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 which 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 FOB basis, and estimated margins on imported goods by multiplying imports on a FOB basis by the commercial margin ratio. We obtained the value of goods imports on a FOB basis from

Bank of Japan (various issues).

In the case of financial intermediary services, we calculated a measure of import quantities which 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 1995c). 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 of 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 imports data in U.S. Department of Commerce (1999) excludes 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 (1995a). Sales data for industries where these are confidential are derived 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 JAFF, sales of the wholesale and retail trade are adjusted to be based on margins, using U.S. total output and 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 the following: *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 FDI Penetration (FDIJA):

The share of the number of workers employed by majority-owned JAFF in Japan's total number of workers in 1995. Our data on Japan's total number of workers were taken from the 1995 Japan I-O Tables (Japanese Government 1995).

U.S. Inward FDI Penetration (FDIUS):

The share of the number of workers employed by foreign firms' U.S. affiliates in s total number of workers in 1992. The data were taken from the U.S. Department of Commerce (1995a).

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 (1995) and Ministry of Labor (1996).

Land Intensity (LAND):

Our data on *LAND* is 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 where 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 Japan's and U.S. FDI Restrictiveness (RINVJAUS):

Following Hoekman (1996), we compiled a frequency measure for FDI restrictiveness at the 3-digit industry level, using data from GATS (General Agreement

on Trade in Services) 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 got 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.'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 is taken from the Statistics

Bureau, 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 this 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 is taken from the 1995 Japan I-O Tables (Japanese Government 1998). The advertising expenses are defined as the amount of input from the advertising industry to each industry.

R&D Intensity (RDINT):

RDINT is defined as the ratio of R&D expenses to the gross value-added in each industry. The data is taken from the 1995 Japan I-O Tables (Japanese Government 1998). 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 (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 (2000). We treated all the firms that belong to the *Shacho-kai* (President Clubs) of seven corporate groups (Mitsui, Mitsubishi, Sumitomo, Fuyou, 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 (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 is taken from Ministry of Labor (1995).

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ENDNOTES

¹ MITI's other survey, *Kigyo Katsudo Kihon Chosa (Basic Survey on Business Activities by Enterprises)*, also collects data on JAFF as a part of information obtained on Japanese firms. But 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 or not 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 JAFF.

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

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 non-manufacturing sector, the database contains information on 1,236 firms which 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 <www.tdb.co.jp>.

⁵ *Jigyosho-Kigyo Tokei Chosa (Establishment and Enterprise Census of Japan)*, conducted by 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 or not. Therefore, the data collected in this survey are ideal for a compilation of statistics on the number of workers employed by all the JAFF. But such statistics are not included in the report on this survey and we did not have enough time to get access to micro-data of the survey.

⁶ We have also examined financial reports. Since 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 11 wholesale trade sectors. For the other non-manufacturing subsidiaries, it contains only 20 sectors.

⁸ We aimed at setting the target of our analysis as broad as possible. Our classification includes all the non-manufacturing industries except agriculture, fishery, forestry, and mining. Our data cover electricity, gas, and water supply, which are not covered by GATS, and agricultural services and ship

and aircraft repairing, 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 U.S., and the GATT Secretariat's classifications systems, see United Nations (1991), GATT (1991), Statistics Bureau of Japan Management and Coordination Agency (1993), MITI (1995), Japanese Government (1998), and Nijhowne and Usher (1999).

¹⁰ To be more rigorous, we should also take account of transactions among JAFF and transactions among FAJF. Kimura and Baldwin (1996) makes this point.

¹¹ According to Karsenty (1999), compensation of employees accounts for only 1.4% of world total international transactions in services. But in several industries, such as amusement and recreation, this mode of transactions probably plays substantial roles.

¹² There are several empirical studies which estimated an econometric model explaining the regional distribution of U.S. direct investment abroad and found that a Japan dummy is negative and significant. But these studies are based either on data of FDI in manufacturing industries (Grubert and Mutti 1991) or on data of 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.

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

¹⁵ According to MITI (2000), there were 129 investments into Japan through cross-border M&A in 1999.

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

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

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

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).

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

Table 1. Japan's Inward and Outward FDI: Position at the End of March 2000

(Billion Yen)

Panel A. Inward FDI

Industry	Inward FDI Stock
Construction	20
Real Estate	301
Commerce	1,731
Business and Personal Services	1,281
Transportation Services	42
Communication Services	403
Finance and Insurance	1,561
Others	164
Non-manufacturing Total	5,504
Manufacturing	4,495
Total Amount	9,999

Panel B. Outward FDI

Industry	Outward FDI Stock
Agriculture and Forestry	421
Fishery	243
Mining	5,122
Construction	811
Commerce	10,646
Finance and Insurance	19,418
Business and Personal Services	11,204
Transportation Services	5,444
Real Estate	12,483
Others	1,823
Non-manufacturing Total	67,615
Manufacturing	32,896
Branches	1,629
Total Amount	102,300

Cumulated value of FDI flows approved or notified from 1950 onwards.

Data Sources: MOF (1999) and <www.mof.go.jp>

Table 2. Correspondence Table: Fukao-Ito Classification in correspondence to 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

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
3	Gas supply	5121-011			680201	680202		492	4932		172	*1.F,j
4	Steam and hot water supply	5122-011			*680302			*496	*4953	*4959	173	*1.F,j
5	Water supply	5211-011	5211-021		*680301			494	4952		180	
6	Sewerage systems	5211-031									6.A	
7	Sanitary services	5212-011	5212-021		*680302			*496	*4953	*4959	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
10	Financial intermediary services	6211-011	6211-012		70A			60	61	62	7.B,a-i	6.B
		6211-013	6211-014									
11	Life insurance	6212-011			*70B			*63	*64		7.A.a	*7.A,c,d
12	Casualty insurance	6212-021									7.A.b	*7.A,c,d
13	Real estate	6411-011	6411-021	6421-011	710100	710201		65			1.D	
14	Railway passenger transportation	7111-011	7111-012		*650100			--			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
								414	4142	415		
17	Road freight transportation	7122-011	7122-021	7132-011	650301	650302		*421	422		11.F.b	*11.F.c
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	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	680100			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	*770402	*770403	*841	*842		5.A	5.B
		8213-011	8213-021	8213-031	*770600	*730112		*823	*824	*829	5.C	5.D
		8213-041						*833	*8731	*8732	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	*770200	*770301	*80			1.A,h,j	8.A
					*770303	*770305					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			7371	7372	7373		
											1.B.b	
34	Information services	8512-012	8512-021		*730106			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			8712				
											1.A,d,f	
42	Personnel supply services	8519-041			730103			736				
											1.F.k	
43	Other business services	8519-099			730109	730111	*730302	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	
46	Hotels and lodging places	8613-011			72A			70 ex. 704			*9.A	
47	Individual educ. facilities	8619-081						7991			*12	
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	
		8619-071	8619-099		040002	730108		723	724	725		
								078	729	7364		
49	Agricultural services	0131-01	0131-02		770304	040001		07 excl 078			1.Ai	1.F.f
50	Ship repairing	3611-10			610100	610200		373			11.A.d	11.B.d
51	Aircraft repairing	3622-10			60			372			11.C.d	

Asterisks "*" in the table indicate that each industry with "*" corresponds to more than one industry in the Fukao-Ito classification.

Table 3. Cross-Border Transactions by Affiliates in Service Sectors: 1997

	(%)	
	Business and Personal Services	Transportation and Communication Services, etc.
Exports by JAFF/Total Sales by JAFF	3.9	26.8
Imports by JAFF/Total Procurement by JAFF	8.2	35.1
Exports to Japan by FAJF/Total Sales by FAJF	22.4	11.0
Imports from Japan by FAJF/Total Procurement by FAJF	11.0	13.3

Data Sources: MITI (1999a, b)

Table 4. Japan's International Purchases and Sales of Private Services, 1995

(in Millions of Japanese Yen)

<Panel A. Sales and Employment of Japanese Affiliates of Foreign Firms (JAFF) and Foreign Affiliates of Japanese Firms (FAJF) >

Industry	Japan's Purchases from JAFF and Employment by JAFF							Sales Abroad and Employment by FAJF			
	Sales by			No. of Workers Employed by				Sales by Majority-Owned Affiliates	No. of Workers Employed by Majority Owned Affiliates	Sales by FAJF (incl. Branches and Other Establishments)	No. of Workers Employed by FAJF (incl. Branches and Other Establishments)
	Japanese Subsidiaries of Foreign Firms	Branches and Other Establishments of Foreign Firms	JAFF	Japanese Subsidiaries of Foreign Firms	Branches and Other Establishments of Foreign Firms	JAFF					
a	b	a+b	c	d	c+d	e					
1 Construction and civil eng.	108702	12758	121460	3732	438	4170	77653	2666	1134973	40323	
2 Electricity	0	0	0	0	0	0	0	0	5679	210	
3 Gas supply	114	0	114	5	0	5	114	5	1084	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	905849	102752	1008601	73424	8309	81733	856791	69428	3653874	296165	
9 Retail trade	28499	3240	31739	6555	732	7287	26226	6019	260861	60000	
10 Financial intermediary serv.	172785	2226314	2399099	5100	14210	19310	2359257	17921	11123551	157062	
11 Life insurance	82849	138034	220883	4308	4197	8505	220883	8505	1201167	17748	
12 Casualty insurance	36093	69213	105306	1846	3540	5386	105306	5386	1397069	24123	
13 Real estate	5204	5284	10487	65	66	131	10087	126	422193	12925	
14 Railway passenger transp.	0	0	0	0	0	0	0	0	8287	29	
15 Railway freight transportation	253	0	253	3	0	3	253	3	12287	43	
16 Road passenger transp.	0	0	0	0	0	0	0	0	0	0	
17 Road freight transportation	44691	1181	45871	530	14	544	45871	544	93096	4165	
18 Water transportation	189465	49263	238728	2111	552	2663	230887	2570	297059	12967	
19 Air transportation	255995	681959	937954	3144	8306	11450	915946	11189	187522	6474	
20 Storage facility services	8432	0	8432	100	0	100	0	0	170404	7313	
21 Supporting serv. for transport	40703	53800	94503	1743	2018	3761	94632	3501	545166	26035	
22 Postal service	0	0	0	0	0	0	0	0	0	0	
23 Telecommunications	74654	1727	76380	1643	38	1681	37495	838	6684	421	
24 Broadcasting	29171	0	29171	642	0	642	4544	100	6702	361	
25 Education	0	5656	5656	0	247	247	5656	247	0	0	
26 Research institutes (natural sci.)	0	5289	5289	0	231	231	5289	231	0	0	
27 Research institutes (soc. sci. &)	0	0	0	0	0	0	0	0	0	0	
28 Research within firms	2633	0	2633	115	0	115	2633	115	90774	3852	
29 Medical services	3934	328	4262	336	28	364	2318	104	7810	322	
30 Health and hygiene	0	0	0	0	0	0	0	0	582	98	
31 Private non-profit org. serv.	96	0	96	6	0	6	96	6	178	39	
32 Advertising	262323	2394	264716	1863	17	1880	258194	1824	161203	4844	
33 Computer prog. & software	612381	28317	640698	10647	503	11150	519999	8827	66986	4077	
34 Information services	406130	43936	450067	9354	1012	10366	286970	6158	189768	105601	
35 Goods & equip. rental & leas.	12754	916	13669	557	40	597	13669	597	185322	9857	
36 Automobile renting	1076	0	1076	47	0	47	1076	47	7356	590	
37 Automobile repairing	206	572	778	9	25	34	778	34	9097	1070	
38 Machine repairing	8678	5014	13692	379	219	598	13692	598	4167	1206	
39 Building maintenance serv.	8220	0	8220	359	0	359	8220	359	1407	1600	
40 Legal & accounting serv.	0	0	0	0	0	0	0	0	128	28	
41 Civil eng. & construct. serv.	687	7121	7808	30	311	341	7808	341	1401	30	
42 Personnel supply services	25526	35249	60775	848	1171	2019	51250	1603	8797	286	
43 Other business services	126308	59528	185836	5115	2467	7582	162210	6528	3625729	34694	
44 Amusement & recreation serv.	47930	34398	82328	673	483	1156	82328	1156	71646	5889	
45 Eating and drinking places	419862	6525	426387	7979	124	8103	233924	4620	77300	22631	
46 Hotels and lodging places	53441	10349	63791	2334	452	2786	14700	642	274396	40661	
47 Individual educ. facilities	29184	3084	32268	1268	134	1402	8662	371	730	76	
48 Other personal services	36149	234	36382	2011	13	2024	36199	2016	5866	877	
49 Agricultural services	0	0	0	0	0	0	0	0	111291	193	
50 Ship repairing	0	74	74	0	3	3	74	3	40370	4009	
51 Aircraft repairing	0	436	436	0	11	11	436	11	0	0	
Total	4041960	3594945	7636905	148923	49911	198834	6702126	165238	25470031	908948	

Note: 1) "Majority-owned foreign affiliates" here refers to those affiliates in which foreign investor's ownership share is 49% or more.

2) For data sources, see Appendix A.

Table 4. Japan's International Purchases and Sales of Private Services, 1995 --- Continued ---

(in Millions of Japanese Yen)

<Panel B. Cross-Border Trade, Size of Industry, and "Revealed Comparative Advantage">

Industry	Cross-Border Trade		Size of Industry		Japan's International Purchases and Sales		"Revealed Comparative Advantage"	
	Imports	Exports	Total Domestic Output	Number of Employees	Japan's Purchases from Foreigners	Japan's Sales to Foreigners	(Sales by FAJF - Sales by JAFF)/ Total Domestic Output (%)	(Exports - Imports)/ Total Domestic Output (%)
	f	g	h		a+b+f	e+g	(%)	(%)
1 Construction and civil eng.	301900	620000	88149287	7046117	423360	1754973	1.150	0.361
2 Electricity	274	24593	16737515	13472	274	30272	0.034	0.145
3 Gas supply	904	131	1968145	49184	1018	1215	0.049	-0.039
4 Steam and hot water supply	0	0	104384	1778	0	0	0.000	0.000
5 Water supply	572	3130	2900361	91045	572	3130	0.000	0.088
6 Sewerage systems	69	483	1658461	34126	69	483	0.000	0.025
7 Sanitary services	0	415	3094654	256638	985	479	-0.030	0.013
8 Wholesale trade	2099751	3078626	63201010	5110711	3108352	6732500	4.185	1.549
9 Retail trade	10759	20952	39120545	8838477	42498	281813	0.586	0.026
10 Financial intermediary serv.	1676742	999376	56272142	1375573	4075841	12122927	15.504	-1.204
11 Life insurance	137151	4663	5275873	529579	358034	1205830	18.581	-2.511
12 Casualty insurance	60894	78437	3250105	191173	166200	1475506	39.745	0.540
13 Real estate	4491	5151	64185198	683186	14978	427344	0.641	0.001
14 Railway passenger transp.	81477	19061	6100164	267391	81477	27348	0.136	-1.023
15 Railway freight transportation	0	26	185463	9695	253	12313	6.489	0.014
16 Road passenger transp.	127869	21092	10184846	667492	127869	21092	0.000	-1.048
17 Road freight transportation	0	5901	17409419	1521601	45871	98997	0.271	0.034
18 Water transportation	956300	890900	4562409	192703	1195028	1187959	1.279	-1.433
19 Air transportation	1119200	343500	2414322	57735	2057154	531022	-31.083	-32.129
20 Storage facility services	0	125	1604686	122026	8432	170529	10.094	0.008
21 Supporting serv. for transport	1437067	1279547	7652467	467136	1531570	1824713	5.889	-2.058
22 Postal service	7413	9201	2142138	194657	7413	9201	0.000	0.083
23 Telecommunications	67630	38668	9941337	366386	144010	45352	-0.701	-0.291
24 Broadcasting	0	16	2679336	69143	29171	6718	-0.839	0.001
25 Education	156	36	22229403	2441916	5812	36	-0.025	-0.001
26 Research institutes (natural sci.)	29316	19602	1718560	196646	34605	19602	-0.308	-0.565
27 Research institutes (soc. sci. & hu)	3309	1932	153952	18744	3309	1932	0.000	-0.894
28 Research within firms	0	0	9145081	578465	2633	90774	0.964	0.000
29 Medical services	748	59	29814230	2553400	5010	7869	0.012	-0.002
30 Health and hygiene	0	0	692307	73680	0	582	0.084	0.000
31 Private non-profit org. serv.	39342	47139	4658723	522564	39438	47317	0.002	0.167
32 Advertising	337106	102314	6952700	193050	601822	263517	-1.489	-3.377
33 Computer prog. & software	59623	27653	4208484	373312	700321	94639	-13.632	-0.760
34 Information services	227355	111803	3356042	269379	677422	301571	-7.756	-3.443
35 Goods & equip. rental & leas.	226823	102787	9720931	198576	240492	288109	1.766	-1.276
36 Automobile renting	16	1	942393	29499	1092	7357	0.666	-0.002
37 Automobile repairing	236	120	6845341	668227	1014	9217	0.122	-0.002
38 Machine repairing	6	1	5960245	229443	13698	4168	-0.160	0.000
39 Building maintenance serv.	0	0	2458526	371067	8220	1407	-0.277	0.000
40 Legal & accounting serv.	127224	47240	2168840	274714	127224	47368	0.006	-3.888
41 Civil eng. & construct. serv.	153051	120264	4917179	547427	160859	121665	-0.130	-0.667
42 Personnel supply services	0	55	995809	232861	60775	8852	-5.220	0.006
43 Other business services	428333	296833	14164779	1595626	614169	3922562	24.285	-0.928
44 Amusement & recreation serv.	218910	26493	13517060	846133	301238	98139	-0.079	-1.424
45 Eating and drinking places	954507	129314	22894947	3548471	1380894	206614	-1.525	-3.604
46 Hotels and lodging places	1633060	278316	7004908	592493	1696851	552712	3.007	-19.340
47 Individual educ. facilities	502	127	1972389	568397	32770	857	-1.599	-0.019
48 Other personal services	3528	985	8783951	1740629	39910	6851	-0.347	-0.029
49 Agricultural services	0	0	676113	88664	0	111291	16.460	0.000
50 Ship repairing	12892	38451	305995	12487	12966	78821	13.169	8.353
51 Aircraft repairing	10	8408	160514	4046	446	8408	-0.272	5.232
Total	12546516	8803927	597213669	46926940	20183421	34273958	2.986	-0.627

Note: For data sources, see Appendix A.

Table 5. Purchases from Foreigners: U.S. (1992) - Japan (1995) Comparison

<Panel A>

	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	U.S.	Japan	Japan Majority-Owned	U.S. (More Than 10% Foreign Owned)	Japan	Japan Majority-Owned	U.S. (More Than 10% Foreign Owned)
	a	b				c		d
1 Construction and civil eng.	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 serv.	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 transp.	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 transp.	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 serv. for transp.	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	0.017	0.008	0.001	0.001	0.064	0.003	0.003	0.003
27 Research institutes (soc. sci. &	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 org. serv.	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 prog. & 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 & equip. rental & leas.	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 serv.	0	0	0.001	0.000	0.078	0.003	0.003	0.049
40 Legal & accounting serv.	0.059	0.003	0	0	0.001	0	0	0.001
41 Civil eng. & construct. serv.	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 & rec. serv.	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 educ. 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

Note: 1) "Majority-owned foreign affiliates" here refers to those affiliates in which foreign investor's ownership share is 49% or more.

2) For data sources, see Appendix A.

Table 5. Purchases from Foreigners: U.S. (1992) - Japan (1995) Comparison

-- Continued --

<Panel B>

	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	U.S. b+d	Japan a/(a+c)	U.S. b/(b+d)	Japan	U.S.
1 Construction and civil eng.	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 serv.	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 transp.	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 transp.	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 serv. for transp.	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	0.020	0.012	0.847	0.723	1.000	1.000
27 Research institutes (soc. sci. &	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
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 org. serv.	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 prog. & 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 & equip. rental & leas.	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 serv.	0.003	0.049	0	0	0.000	0.050
40 Legal & accounting serv.	0.059	0.003	1	0.829	0.250	0.217
41 Civil eng. & construct. serv.	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 & rec. serv.	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 educ. 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

Note: 1) The Correlation coefficient between Foreign Sales Penetration Ratio in Japan and the United States is 0.4205.

2) For data sources, see Appendix A.

**Table 6. Sales and No. of Employees of Majority-Owned Foreign Affiliates:
U.S. (1992) - Japan (1995) Comparison**

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	U.S.	Japan	U.S.
Construction	0.000	0.010	0.001	0.016
Wholesale trade	0.014	0.067	0.014	0.067
Retail trade	0.001	0.033	0.001	0.033
Finance, except depository institutions*	0.013	0.012	0.042	0.012
Real estate	0.000	0.028	0.000	0.013
Transportation	0.005	0.022	0.026	0.027
Services	0.002	0.021	0.011	0.019
Hotels and other lodging places	0.001	0.073	0.002	0.094
Computer and data processing services	0.023	0.014	0.107	0.020
Motion pictures, including television tape and film	0.001	0.038	0.006	0.098
Health services	0.000	0.007	0.000	n.a.
Business services	0.002	0.032	0.008	0.019
Other services	0.001	0.005	0.008	n.a.
Total (Weighted-average)	0.004	0.028	0.012	0.027

Note 1: We did not calculate the ratio of sales for the U.S. financial sector, because definitions of output in U.S. I-O tables differ from those of sales in U.S. establishment data. For the details, see Appendix A.

Note 2: "Majority-owned foreign affiliates" here refers to those affiliates in which foreign investor's ownership share is 49% or more for Japan, and 50% or more for the U.S.

Note 3: Each sector in the table is corresponding to the Fukao-Ito classification as following;

Sectors	Fukao-Ito Classification
Construction	1
Wholesale trade	8
Retail trade	9
Finance, except depository institutions	10
Real estate	13
Transportation	14,15,16,17,18,19,20,21
Hotels and other lodging places	46
Computer and data processing services	33,34
Motion pictures, including television tape and film	44
Health services	29,30
Business services	28,32,35,36,37,38,39,40,41,42,43
Other services	45,47,48

Sources: Panel A and B of Table 4; U.S. Department of Commerce (1995b)

Table 7. 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

	Year 1992		Year 1997	
	ln (EX92)	ln (OFDI92)	ln (EX97)	ln (OFDI97)
ln (GDP92)	0.5577 (5.279)***	0.6543 (2.701)**		
ln (GDPPC92)	0.1783 (2.180)**	0.7330 (3.394)***		
ln (GDP97)			0.6054 (6.187)***	0.6441 (3.742)***
ln (GDPPC97)			0.1897 (2.523)**	0.6973 (5.432)**
ln (DIST)	-0.4460 (-1.747)*	0.3503 (0.480)	-0.3305 (-1.532)	-0.0184 (-0.036)
DJPN	0.7112 (1.093)	-0.6982 (-0.567)	0.4637 (0.810)	-0.6018 (-0.666)
_cons	8.3935 (3.217)***	-0.8909 (-0.117)	7.3418 (3.284)***	2.9577 (0.558)
No. of Obs.	32	25	32	25
F	21.23***	11.36***	22.59***	17.05***
Adj. R-squared	0.723	0.6333	0.7358	0.7279

Note: t-statistics are in parentheses.

**P=.05

***P=.01

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

Sources: U.S. Department of Commerce (1999); IMF, *International Financial Statistics* (various issues).

Table 8. FDI Flows into Japan

(Billion Yen)

Fiscal Year	1950-90	91	92	93	94	95	96	97	98	99	Total
Construction	12.9	3.1	0.0	0.1	0.4	0.1	0.0	0.3	1.4	2.2	20.4
Real Estate	115.8	9.2	28.7	9.7	3.1	1.6	26.5	48.2	41.6	16.8	301.1
Commerce	416.6	104.4	148.9	94.7	107.9	67.9	166.4	99.6	175.9	348.5	1,730.9
Business and Personal Services	150.3	72.7	102.7	22.3	35.5	49.1	236.0	88.8	318.1	205.8	1,281.3
Transportation Services	19.8	3.5	2.4	4.6	0.8	1.2	1.0	0.4	6.1	2.2	42.0
Communication Services	20.8	13.2	6.0	2.9	2.9	5.3	2.1	3.3	16.8	330.0	403.3
Finance and Insurance	96.4	118.6	18.3	3.7	66.6	100.1	27.3	161.6	456.9	511.5	1,561.1
Others	110.4	1.1	1.7	25.1	0.1	3.2	0.2	8.7	11.1	2.5	164.1
Non-manufacturing Total	942.7	325.8	308.8	163.2	217.4	228.4	459.5	410.8	1,027.8	1,419.6	5,504.0
Manufacturing	1,665.8	252.8	200.7	168.6	195.1	141.2	311.1	267.4	312.6	979.7	4,495.0
Total Amount	2,608.5	578.4	509.4	331.8	412.6	369.7	770.7	678.2	1,340.4	2,399.3	9,999.0

FDI flows approved or notified from 1950 onwards.
Data Sources: MOF (1999) and <www.mof.go.jp>

Table 9. Recent Trends in JAFF's Employment and Japan's Imports: 1990 - 97

(in millions of yen)

Industry	No. of JAFF 1990	No. of JAFF 1997	No. of Workers Employed by JAFF 1990	No. of Workers Employed by JAFF 1997	Imports 1990	Imports 1997
Agriculture	2	1	154	198	2825836	2863929
Mining	0	2	0	70	7735520	8185535
Manufacturing	965	828	314299	286933	23265941	32849284
Services and others	2181	2456	150206	203940	9253169	7984945
Construction	13	18	2070	2026	n.a.	660100
Wholesale trade	1321	1380	75575	78900	327447	350615
Retail trade	23	46	2065	10910	n.a.	n.a.
Finance	215	248	19949	25356	700947	1090322
Insurance	22	37	11970	14298	54476	246100
Real estate	13	12	85	115	7726	n.a.
Eat. & drink. places	13	11	5281	8388	813644	127748
Advertising	23	25	1864	4912	289852	295448
Electricity	0	0	0	0	2249	n.a.
Gas & steam supply	1	2	4	15	697	n.a.
Watersupply	0	0	0	0	955	n.a.
Sanitary services	1	4	0	44	0	n.a.
Transportation	62	58	4851	8088	2306259	1612056
Support. serv. for transp.	55	17	1884	1097	167769	72807
Telecommunications	13	36	815	2926	47036	180270
Broadcasting	0	1	0	6	153	n.a.
Research institutes	5	1	283	n.a.	17597	17980
Medical & health services	8	10	170	677	930	n.a.
Private non-profit org. serv.	0	1	0	6	28108	28463
Information services*	172	326	11378	25676	218713	n.a.
Goods & equip. rental	2	3	371	489	151981	241400
Other business serv.	169	173	6025	13455	385959	815999
Amusement & rec. serv.	14	12	622	1807	266458	205003
Hotels & lodg. places	11	14	1603	1655	1478421	341682
Oth. personal services	18	21	3166	3094	7823	1722
Not classified	7		175		1977969	1697230
Total	3148	3287	464659	491141	43080466	51883693

Note: 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 JAFF partially cover Japanese branches and other establishments directly owned by foreign firms.

* Information Services imports for 1997 are included in Other Business Services.

Sources: Toyo Keizai Sinpo-sha (various years) and Economic Planning Agency (1992, 1999); Japanese Government (1990).

Table 10. 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	[-]

Note: 1) "Majority-owned foreign affiliates" here refers to those affiliates in which foreign investor's ownership share is 49% or more.

2) For more detailed definitions and sources of the variables, see Appendix A.

Table 11. Determinants of Japan's Inward FDI Penetration: Tobit Estimation

Japan's Inward FDI Penetration						
(Dependent Variable : FDIJA)						
	(1)	(2)	(3)	(4)	(5)	(6)
FDIUS	0.280 (2.454)**	0.301 (2.512)**	0.326 (2.405)**	0.160 (3.367)***	0.162 (2.968)***	0.171 (2.685)***
RINVJAUS	-0.026 (-2.306)**	-0.026 (-2.354)**	-0.027 (-2.427)**	-0.016 (-1.696)*	-0.016 (-1.668)*	-0.017 (-1.666)*
PUBEMP	-0.084 (-3.079)***	-0.090 (-2.951)***	-0.091 (-3.060)***	-0.046 (-2.218)**	-0.047 (-2.055)**	-0.048 (-2.029)**
DPROD	0.041 (2.821)***	0.043 (2.781)***	0.042 (2.937)***	0.020 (1.894)*	0.020 (1.791)*	0.020 (1.800)*
LAND	-0.058 (-0.720)	-0.072 (-0.849)	-0.047 (-0.577)	-0.088 (-1.497)	-0.089 (-1.441)	-0.082 (-1.384)
UNIV	-0.057 (-1.621)	-0.058 (-1.638)	-0.057 (-1.691)*	-0.011 (-0.637)	-0.012 (-0.630)	-0.012 (-0.639)
JOBSEP	-0.657 (-1.565)	-0.641 (-1.496)	-0.898 (-1.792)*	-0.403 (-1.535)	-0.402 (-1.540)	-0.473 (-1.486)
ADINT	1.527 (2.751)***	1.521 (2.818)***	1.550 (2.978)***	0.730 (2.557)**	0.731 (2.544)**	0.748 (2.524)**
RDINT	-0.161 (-0.603)	0.053 (0.150)	-0.234 (-0.739)	-0.104 (-0.569)	-0.086 (-0.468)	-0.170 (-0.822)
KRETS		-0.016 (-1.169)			-0.001 (-0.178)	
HORIZ			-0.076 (-1.612)			-0.017 (-0.756)
VERT			0.023 (1.072)			0.009 (1.050)
_cons	-0.031 (-1.957)*	-0.031 (-1.935)*	-0.026 (-1.665)*	-0.014 (-1.922)*	-0.014 (-1.880)*	-0.013 (-1.750)*
No. of Obs.	45	45	45	44	44	44
Wald chi2	18.4**	20.65**	23.53**	26.33***	30.09***	30.91***
Log Likelihood	80.450	80.753	81.853	97.495	97.501	97.728

Note: 1) The numbers in parentheses are z-statistics based on the Huber-White-sandwich robust standard errors.

2) 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 non-profit organizations' services.

3) The air transportation industry is excluded from the estimations for equations (4), (5), and (6).

*P=.10 (two-tailed test)

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

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

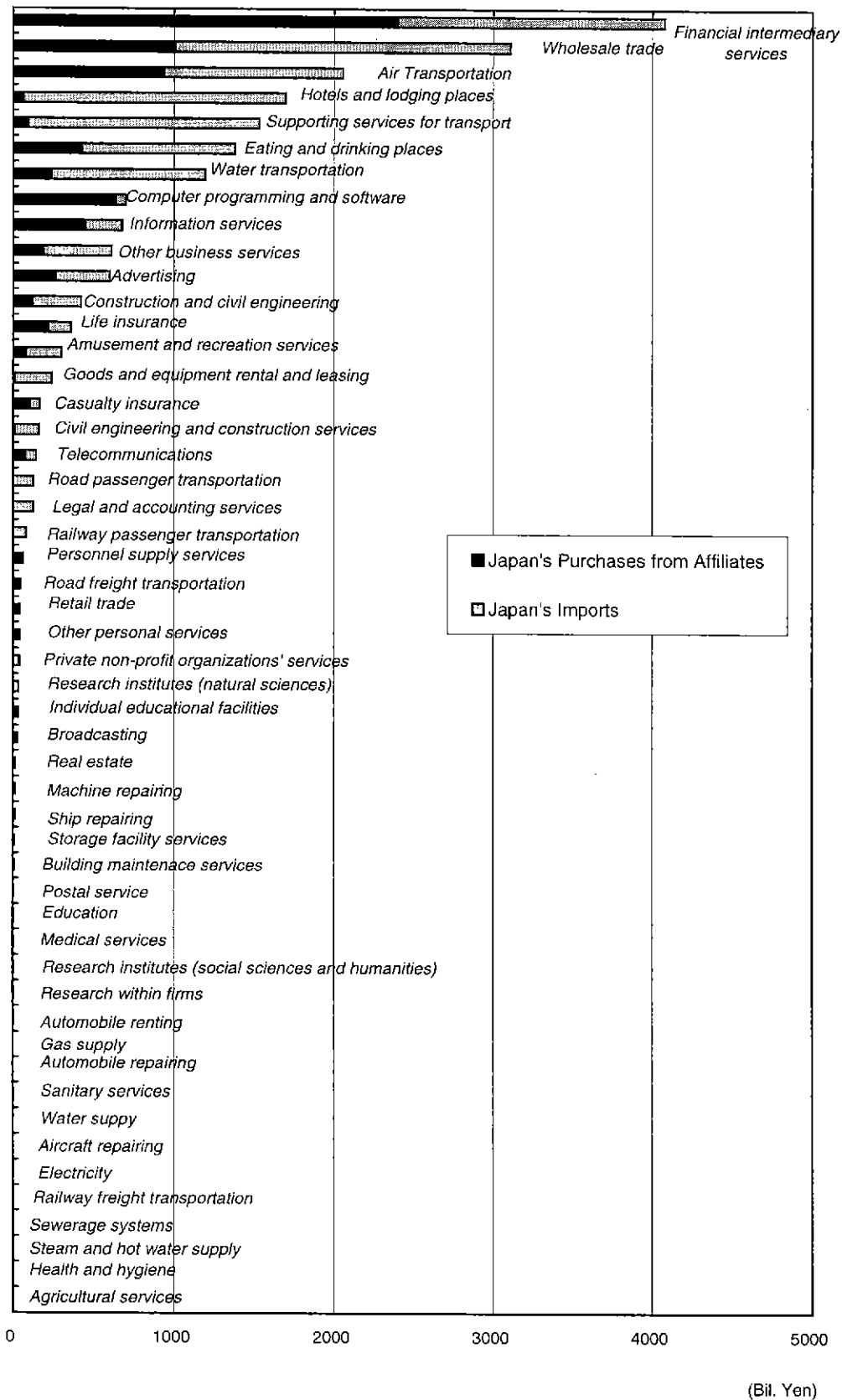


Figure 1. Japan's International Purchases of Services, 1995

Source: Panel A and B of Table 4.

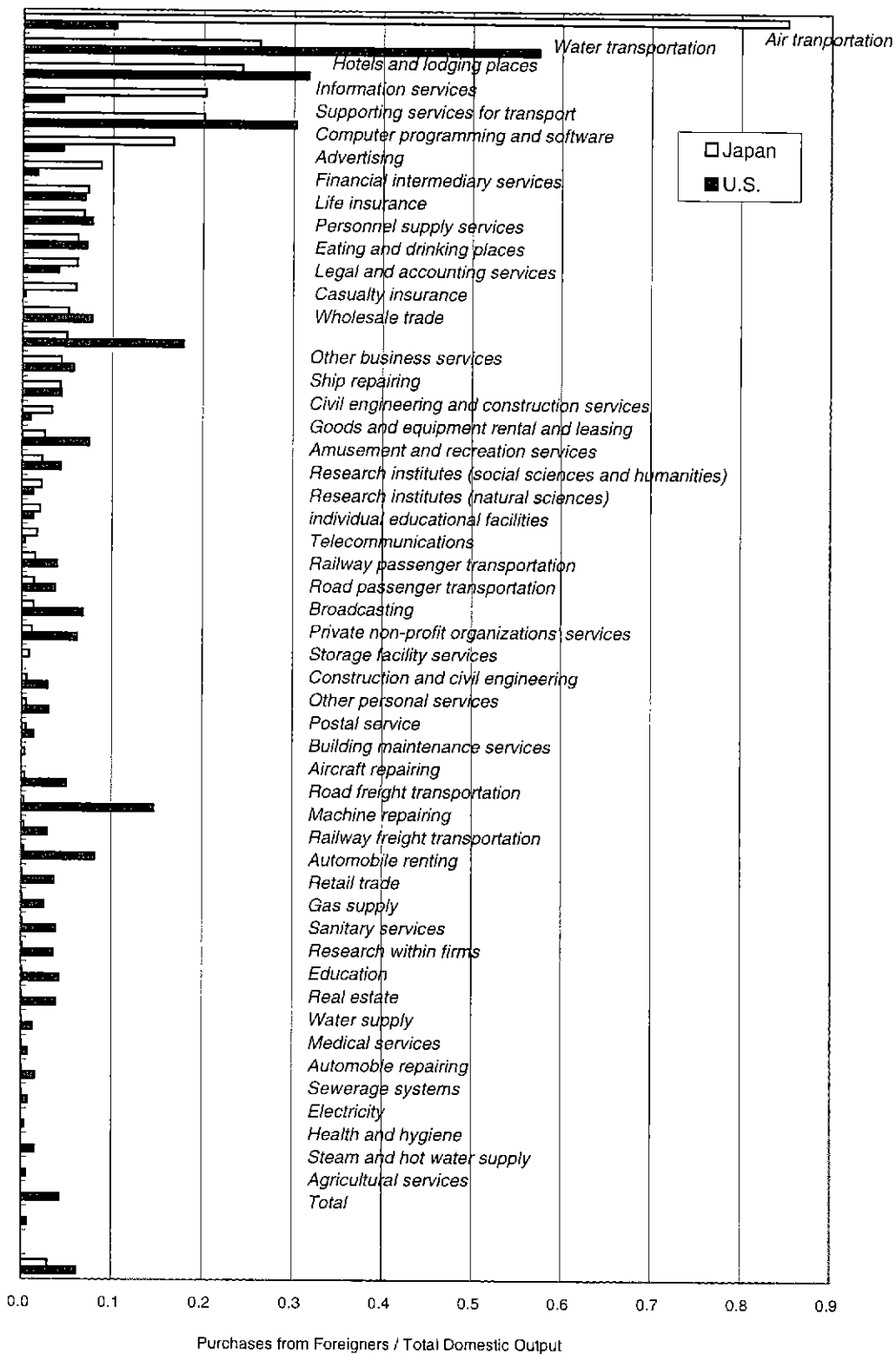


Figure 2.
Purchases from Foreigners: Japan (1995) and U.S. (1992) Comparison

Source: Panel B of Table 5.

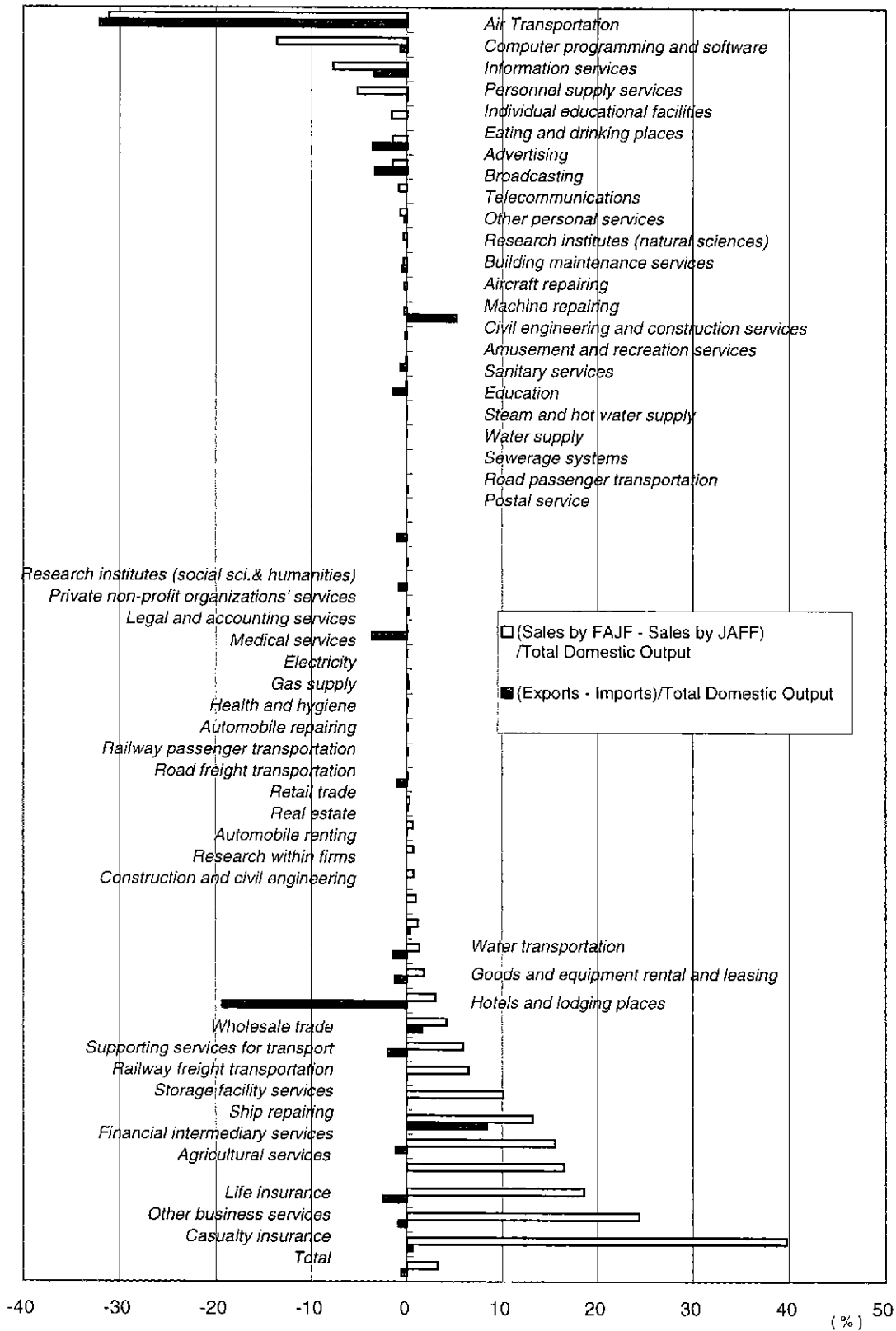
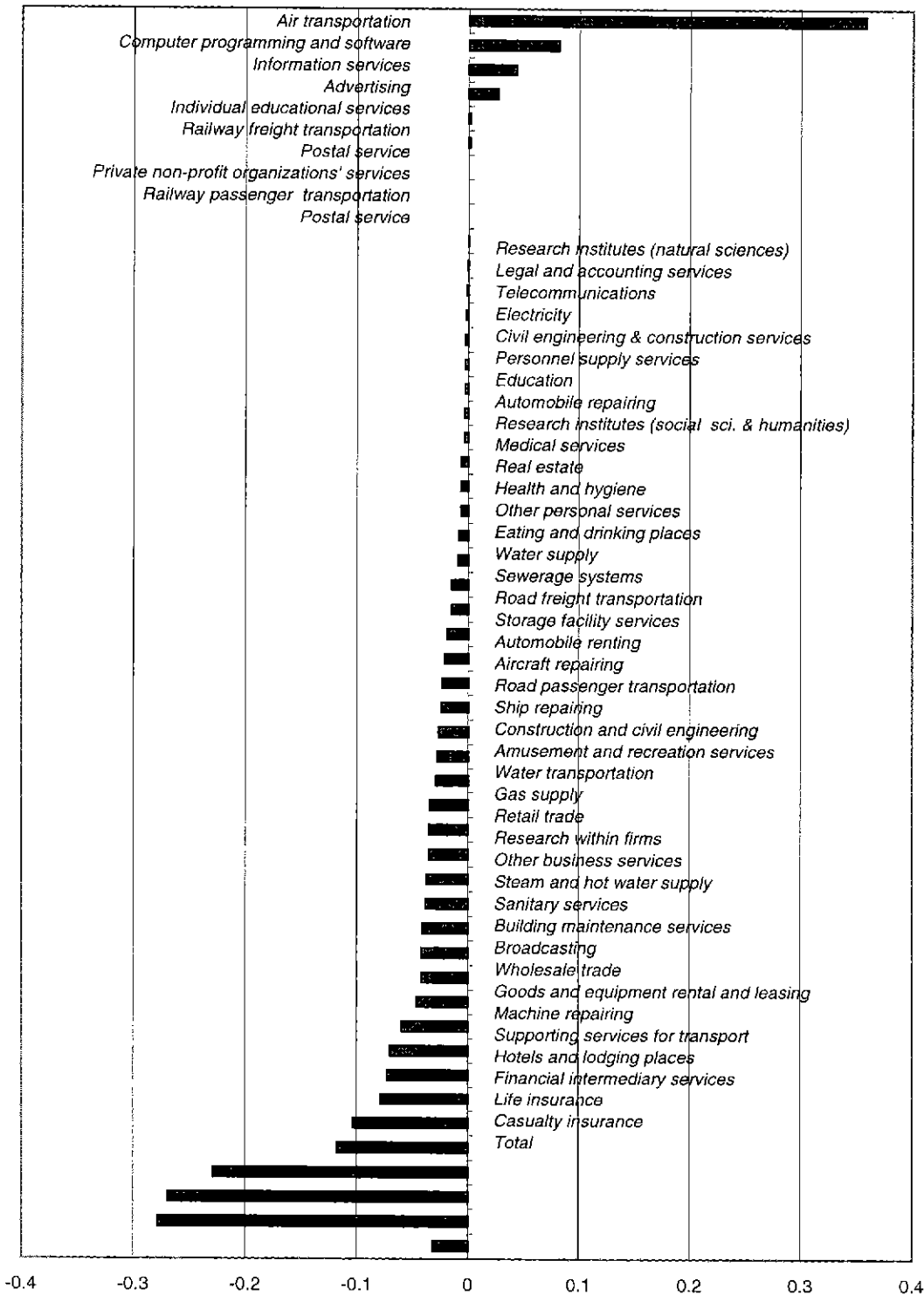


Figure 3. Japan's "Revealed Comparative Advantage"

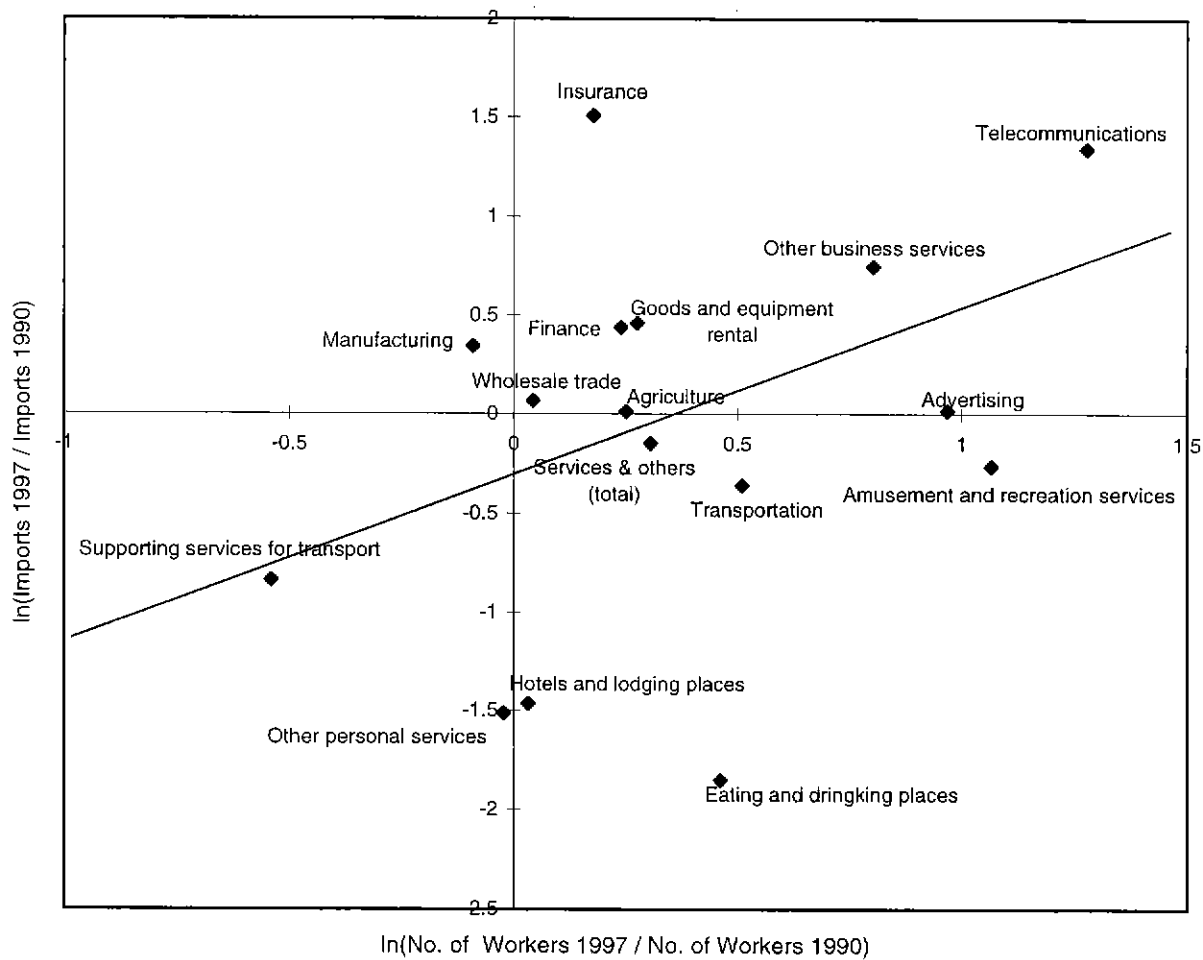
Source: Panel B of Table 4.



(Japan's No. of Workers Employed by Majority-owned Affiliates/ Japan's Total No. of Workers) minus (U.S. No. of Workers Employed by Affiliates/ U.S. Total No. of Workers)

Figure 4.
Share of Workers Employed by Affiliates: Japan (1995) - U.S. (1992) Comparison

Source: Panel A of Table 5.



$Y = -0.351 + 0.716 * X$
t-value (-1.188) (1.418)
No. of Obs. 16
Adj. R2 0.0631

Figure 5. Recent Trends in JAFF's Employment and Japan's Imports : 1990 - 97

Source: Table 9.