Foreign Direct Investment and Trade in Japan: An Empirical Analysis Based on the Establishment and Enterprise Census for 1996

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ABSTRACT

Using micro-data of the *Establishment and Enterprise Census*, we compile new statistics on the employment of Japanese affiliates of foreign firms at the 3-digit industry level for the year 1996. We find that the existing official statistics severely underestimate inward FDI. Nevertheless, the level of inward FDI in Japan is much lower than that in the United States. The results of our regression analyses imply that by eliminating the restrictions on inward FDI and reducing government activities, Japan can increase inward FDI in the service sector. Our results also suggest that the *keiretsu* do not act as an impediment to inward FDI.

1. Introduction

According to the standard theory (Caves, 1982; Dunning, 1988), foreign direct investment is a form of long-term international capital movement accompanied by investors' intangible assets, such as the stock of technological knowledge accumulated by R&D or the accumulation of marketing know-how from past advertising activity. The host country is expected to benefit from the inflow of such intangible assets. Especially in the case of the service sector, since many services are not tradable, customers in one country cannot enjoy the advanced services of foreign firms, if these do not establish affiliates in that country. Being aware of this issue, the Japanese Government has lifted its regulations and made efforts to promote inward FDI in recent years.[1] Although FDI in Japan is increasing rapidly, the FDI stock in Japan is still very small.

In spite of the importance of FDI in Japan, Japan's official statistics on inward FDI have many drawbacks in comparison with U.S. statistics as we will discuss in the next section.[2] Probably due to the deficiency of data, there are not many empirical investigations on why FDI in Japan is so small. In this paper, we compile new statistics on the employment of Japanese affiliates of foreign firms (JAFF) in Japan at the 3-digit industry level for the year 1996. Our new statistics are based mainly on micro-data of the *Establishment and Enterprise Census* of Japan, which is conducted by the Japan Management and Coordination Agency. Using our statistics, we compare FDI in Japan with FDI in the United States at the 3-digit industry level. We also compare FDI in Japan with Japan's outward direct investment and Japan's international trade in goods and services.

According to our new statistics, actual foreign activities in Japan are much greater than those reported in METI's (the Ministry of Economy, Trade and Industry, formerly the Ministry of

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[1] For detail of deregulations and promotion policies, see Japan Investment Council (various years) and Japanese Government (various years).

[2] Weinstein (1997) also discusses this issue.

International Trade and Industry, MITI) survey, *Gaishi-kei Kigyo Doko Chosa* (*Survey on Trends of Business Activities by Japanese Subsidiaries of Foreign Firms*). However, we found that foreign activities in Japan are substantially smaller than those in the United States. Moreover, compared with the U.S., inward FDI in Japan is concentrated in a limited number of industries, such as motor vehicles and parts, electric equipment and computers, drugs and medicines, wholesale trade, eating and drinking places, retail trade, and financial intermediary services.

Since our statistics 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. In the manufacturing sector, Japan's inward FDI penetration is relatively high in industries that have a higher research and development intensity, capital intensity, and skilled-labor intensity. On the other hand, in the service sector, Japan's inward FDI penetration is relatively high in industries that have a higher market concentration ratio, 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 goods and services through affiliates and explain how we compiled our new statistics on JAFF. In section 3, we provide a general overview of FDI in Japan. In section 4, we undertake an econometric investigation of the determinants of Japan's FDI penetration at the 3-digit industry level.

2. Existing Data on FDI in Japan and Compilation of the New Statistics

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, 1999).[3]

According to these data, Japan's outward direct investment stock in the service sector is nine times greater than the corresponding inward direct investment stock (Table 1). Since no other OECD country has an imbalance of this magnitude, it has been argued that this imbalance indicates the closedness of the Japanese economy to inward direct investment in the service industries (GATT, 1995; MITI, 1998a; Stern, 2000). In the case of the manufacturing sector, the outward direct investment stock is six times greater than the corresponding inward direct investment stock. 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.

INSERT TABLE 1

In the case of inward direct investment, the *Gaishi-kei Kigyo Doko Chosa* (*Survey on Trends of Business Activities by Japanese Subsidiaries of Foreign Firms*) by the Ministry of Economy, Trade and Industry (METI) is the only official source on the sales and employment of foreign firms' Japanese subsidiaries. [4] The survey is loosely based on the U.S. Department of Commerce's survey of foreign direct investment in the United States, but METI's survey has the following serious drawbacks for the purpose of studies on inward direct investment.

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[3] Although many previous studies mentioned shortcomings of the MOF data, they used the data for the analysis on inward FDI in Japan. For details of the data issues, see, for example, Matsuoka and Rose (1994), Kimura (1997), and Weinstein (1997).

[4] METI's other survey, the *Kigyo Katsudo Kihon Chosa* (*Basic Survey on Business Activities by Enterprises*), also collects data on JAFF as part of information obtained on Japanese firms. But this survey covers only the manufacturing and commerce sectors.

(i) It is not mandatory and suffers from a low response ratio.[5]

(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.

Because of the low response ratio and the exclusion of real estate, finance, and insurance, the number of subsidiaries covered by METI's survey is substantially smaller than that of other surveys on foreign subsidiaries conducted by private companies.[6, 7] Using Toyo Keizai's data as the basic statistics for the estimation, Fukao and Ito (2003) estimated 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 for the year 1995.[8] Although the coverage is broader, the Toyo Keizai data have several shortcomings. Probably the most serious drawback is its coverage and reliability. Toyo Keizai conducts its own surveys for this database and uses additional data such as financial reports for non-responding firms. But since firms are not obliged by law to report correct information, Toyo

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[5] In the case of the survey for the 1999 fiscal year, only 56.3% of the questionnaires sent out were returned to METI. Moreover, usually not all the questions in the returned questionnaires are answered.

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

[7] A private company, Teikoku Data Bank Ltd. also provides the 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. Some statistics on these firms are available at <www.tdb.co.jp>.

[8] By compiling the Toyo Keizai data for the year 1992, Weinstein (1997) found that the total sales of foreign affiliates was over five times larger than the numbers published in the METI survey.

Keizai's data is not perfect in their coverage.[9]

Compared with METI's statistics and Toyo Keizai's data, data collected in the *Jigyosho-Kigyo Tokei Chosa* (*Establishment and Enterprise Census of Japan*), conducted by the Japan Management and Coordination Agency (which is now the Statistics Bureau, Ministry of Public Management, Home Affairs, Posts and Telecommunications) are advantageous in several respects. This is the most basic and important survey on Japanese establishments and covers all industries. Since it is mandatory, the data are more reliable. 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 what percentage of their paid-in capital is owned by foreign firms. Therefore we can compile statistics at the establishment level and choose any cut-off ratio.[10] The data also include branches and other establishments directly owned by foreign firms. In Table 2, we compare the *Establishment and Enterprise Census* data with METI's statistics and the Toyo Keizai data. Judging by the number of

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[9] Toyo Keizai data also have the following shortcomings. (i) Industry Classification; in Toyo Keizai's data, information at the establishment level is not available. We need to classify affiliates according to their primary industry based on line-of-business. For example, computer makers sometimes supply computer-related services. However, the Toyo Keizai data do not allow us to treat their service and manufacturing activities separately. (ii) Definition of Nationality; 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%. (iii) 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.

[10] Each establishment is asked about its major activity at the 4-digit industry level. If we compiled the data at an industry level this detailed, our data on many industries would include less than three JAFF and we would be forced to suppress the data for secrecy. For this reason, we compile the data at the 3-digit industry level. In the case of manufacturing industries, we basically use the *Standard Industry Classification for Japan* (Management and Coordination Agency, 1993). In the case of non-manufacturing industries, we use our own classification (for details, see Fukao and Ito, 2003). For details of the data compilation, also see Fukao and Ito (2001) and Ito and Fukao (2001).

JAFF and number of workers employed by JAFF, the coverage of the Census data and the Toyo

Keizai data is much broader than that of METI data in the case of non-manufacturing sectors.

INSERT TABLE 2

Although the data collected in this survey are ideal for a compilation of statistics on the

number of workers employed by all JAFF, such statistics are unfortunately not included in the report

on this survey. Therefore we compiled micro-data of the survey by ourselves. In spite of the merits

listed above, the micro-data of the Census have the following shortcomings.[11]

(i) Information on Activities

Data collected in the *Establishment and Enterprise Census* do not include basic information

on activities, such as sales and profits. They include information on employment, location, and date

of establishment. Therefore we measure activities of JAFF by number of workers.

(ii) Years Covered

The question on the percentage of paid-in capital owned by foreigners was only added to the

survey by the Japan Management and Coordination Agency in 1996. The same question was also

included in their 2001 survey, which is not available yet. So the only available data at present are

those for 1996.

(iii) Definition of Nationality

In the 1996 survey, head offices and independent establishments were asked what percentage

of their paid-in capital was owned by foreigners. When we set our cut-off capital participation rate at

10%, our data on JAFF include all the affiliates of which one or several foreigners owned 10% or

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[11] For about five percent of all establishments, we were not able to link them with any head office although they replied that they are neither a head office nor an independent establishment. We treated them as Japanese independent establishments. Our estimates on the employment of JAFF probably underestimate the actual values because of this problem.

more in total. In the case of U.S. statistics on U.S. affiliates owned by foreign firms (USAFF), the data include only the affiliates of which a single foreigner owns 10% or more (U.S. Department of Commerce, 1995a). Therefore our definition of JAFF (10% foreign-owned or more) is broader than the U.S. definition of USAFF. In the case of data on affiliates owned 50% or more by foreign firms, there is no such gap between our statistics and U.S. statistics (U.S. Department of Commerce, 1995b). Both the statistics include all the affiliates of which the ownership of one or several foreigners exceeds 50% in total. A substantial amount of stocks issued by Japanese prime firms is owned by foreign institutional investors as portfolio investments.[12] When we set our cut-off ratio at 10%, probably our data will include such portfolio investments. Taking account of this risk, we will mainly use the 33.4% or 50% cut-off ratio.[13]

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For the U.S.-Japan comparison we prepared Table 3, in which we compared the share of the number of workers employed by majority-owned foreign affiliates in the United States and Japan. Since the U.S. data are not available at the 3-digit industry level, the U.S.-Japan comparison in Table 3 is done at the more aggregated industry level.

INSERT TABLE 3

In order to compare our data on Japan's inward FDI with Japan's outward FDI, we prepared data on outward FDI. In the case of the manufacturing sector, we compiled micro-data underlying MITI (1998b). In the case of the non-manufacturing sector except the primary sector, we used the

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[12] According to the Japan National Conference of Stock Exchanges (2001), 11.9% of total market value in Japanese stock markets was owned by foreigners on March 31, 1996. On March 31, 2001, this ratio was 18.8%.

[13] Data on the number of establishments and the number of workers of foreign-owned affiliates in the U.S. and the Japanese economy at the 3-digit industry level have been excluded from this version owing to space constraints. Interested readers are referred to Fukao and Ito (2001) and Ito and Fukao (2001) for the detailed data.

micro-data of Toyo Keizai Shimpo-sha (1996).[14] We should note that compared with the data on

Japan's inward FDI, the data on outward FDI are probably smaller than the actual values because of

the limited coverage of the METI and Toyo Keizai data.[15] In order to compare Japan's establishment

transactions with Japan's cross-border transactions, we also adjusted the data of Japan's *1995*

Input-Output Tables to our industry classifications. Table 4 compares these data.

<div align="center">INSERT TABLE 4</div>

3. An Overview of FDI in Japan

3.1 Characteristics of Inward FDI in Japan

According to our new statistics, JAFF with 33.4% or more foreign ownership in the

non-manufacturing sector employed 308,000 workers in 1996, which is nearly five times greater

than the number reported in MITI (1999). In the case of the manufacturing sector, JAFF with 33.4%

or more foreign ownership employed 176,000 workers in 1996, which is 1.1 times greater than the

number reported in MITI (1999). The underestimation of METI's survey is crucial in the case of the

service sector (Table 2).

Table 4 shows the industry composition of workers employed by JAFF (33.4% or more

foreign-owned). In the case of the manufacturing sector, the top four industries - motor vehicles &

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[14] For details on this compilation, see Fukao and Ito (2003).

[15] Concerning foreign subsidiaries of Japanese firms, METI conducts the survey *Kaigai Jigyo Katsudo Doko Chosa (Survey on Trends of Japan's Business Activities Abroad)*, which covers foreign subsidiaries with more than a 10% Japanese ownership. This survey has similar setbacks as METI's 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. Compared with these surveys by METI, 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.

parts, electronic parts & devices, electric equipment & computers, and drugs and medicines - account for a majority of all the workers employed by JAFF in the manufacturing sector. In the case of the service sector, FDI is even more concentrated in a limited number of industries, such as wholesale trade, eating and drinking places, retail trade, and computer programming and software.

Using Table 4, we can compare Japan's inward FDI with its outward FDI. In the case of the service sector (Panel B), the imbalances between the activities of JAFF and those of FAJF are smaller than those reported in the MOF FDI statistics. In terms of employment, the JAFF (33.4% or more foreign-owned)/FAJF(10% or more foreign-owned) ratio is 0.34 (=0.65/1.89). The MOF statistics in Table 1 exaggerate the gap, probably for the following reasons.

First, during the second half of the 1980s, Japanese firms engaged in a large amount of FDI in the tertiary sector, especially in the United States. Stock market and real estate bubbles in Japan during 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 United States (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 afterwards, 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 regulations by Japanese authorities, 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.

Looking at Japan's inward and outward FDI in the service sector by detailed industry (Panel B of Table 4), outward FDI is concentrated in industries that support Japan's international business, such as casualty and life insurance, transportation, other business services, agricultural services,[16] financial intermediary services.[17] However, activities of JAFF are much smaller than those of FAJF in almost all industries except air transportation. Moreover, we can see from Table 4 that there has been a fair amount of international transactions through both FDI and trade some services related to goods trade and tourism (such as wholesale trade, financial and insurance services, transportation, advertising, information services, and hotels and lodging services). However, international transactions are very limited in some services such as utilities, telecommunications and broadcasting, education, medical and heath services, and personal services. Most of these sectors are related to national security or public health and international transactions are highly regulated.[18]

In the case of the manufacturing sector (Panel A of Table 4), imbalances between the activities of JAFF and those of FAJF are greater than those reported in the MOF FDI statistics in Table 1. In terms of employment, the JAFF (33.4% or more foreign-owned)/FAJF (10% or more foreign-owned) ratio is 0.095 (=1.36/14.29). The very small inward FDI but large outward FDI observed in textiles and apparel seems to correspond to Japan's comparative disadvantages in these industries. Outward FDI activity is very strong in electrical machinery and motor vehicles where

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

[17] 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.

[18] For Japan's regulations on inward FDI, see Appendix Tables 1, 2, and 3.

most labor-intensive processes are moved to developing countries. In addition, outward FDI in the motor vehicle industry was undertaken in order to avoid trade friction with the U.S. and European countries. On the other hand, inward FDI is concentrated in industries such as chemicals, drugs and medicines, electric and electronics, and motor vehicles, where proximity to consumers plays an important role.

3.2 Comparison between Inward FDI in Japan and in the United States

Next we compare FDI in Japan with FDI in the United States. Using Tables 3 and 4, we can compare Japan's and America's purchases of goods and services from foreigners. For the service sector as a whole, Japan's ratio of imports to total domestic output is 2.11%, which is almost the same level as the corresponding U.S. ratio at 2.07% (Panel B of Table 4). But in the case of inward FDI (Table 3), Japan's ratio of the number of workers employed by majority-owned foreign affiliates to the total number of workers is 0.59%, which is less than one fifth of the corresponding U.S. ratio of 2.77%. It seems that Japan's market for services is more closed for establishment transaction than for cross-border transactions.

In the case of the manufacturing sector, Japan's ratio of the number of workers employed by majority-owned foreign affiliates to the total number of workers is 0.79%, which is less than one-thirteenth of the corresponding U.S. ratio of 10.48%. Compared with the case of the service sector, the gap between FDI in Japan and that in the United States is much larger in the case of the manufacturing sector (Table 3). In cases where cross-border transactions in goods and services are not difficult, multinational corporations will choose the location where the production costs are lowest. Since Japan's wage rates and land prices are relatively high, Japan probably has a locational disadvantage for manufacturing industries except those in which proximity to consumers plays an

important role.[19] It is more efficient for multinationals to export their products to Japan from their manufacturing affiliates in China and elsewhere. We know that a substantial part of Japan's FDI in U.S. manufacturing industries was the result of U.S. trade barriers, such as "voluntary" restraints on car exports and anti-dumping policies on electrical machinery exports from Japan during the 1980s. Therefore in the case of the manufacturing sector the low level of inward FDI does not necessarily imply the existence of substantial impediments to inward investment and we cannot argue that Japan's low level of inward FDI itself is problematic.[20]

Compared with the case of the manufacturing sector, the low level of FDI in Japan's service sector is a more serious issue. Since many services are untradable, Japanese customers cannot enjoy advanced services of foreign firms if the foreign firms do not establish affiliates in Japan. As already mentioned, services related to goods trade such as financial and insurance services and transportation services are more likely to be traded by crossing borders. However, as for relatively untradable services, customers have to go abroad to buy them or foreign firms establish affiliates to provide them. For example, utility services, education, personal supply services, hotels and lodging places, and personal services, are less likely to be traded.[21]

Using Table 3, we can compare Japan's and the United States' penetration of inward FDI, which we measure by the ratio of the number of workers employed by majority-owned foreign affiliates to the total number of workers at a detailed industry level. According to Table 3, this ratio is higher for Japan than that for the United States in only three industries: finance except depository

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[19] For more details on this issue, see Brainard (1997) and Carr, Markusen and Maskus (2001).

[20] Eaton and Tamura (1994) pointed out this possibility.

[21] Our data on Japan's services imports and exports are primarily taken from statistics on Japan's "special trade (cross-border trade)" and "direct purchases" that are included in *the 1995 Japan Input-Output Tables* (Japanese Government, 1999). Large components of the special trade are handling charges of financial transactions and payment for goods transportation. Most of the imports and exports in the hotels and lodging places sector comes from "direct purchases" by tourists.

institutions, computer and data processing services, and other services (such as eating and drinking places and individual education facilities). It is also interesting to note that in Japan, differences in this ratio among industries are more remarkable than in the United States. Japan's variation coefficient of this ratio among manufacturing industries is 1.43 compared to a variation coefficient of only 0.93 for the United States (Table 3). In the case of non-manufacturing industries, Japan's variation coefficient is 1.26 compared to that of 0.74 for the United States (Table 3). In Japan, there are what may be labeled 'sanctuary sectors', such as medical services, utilities, and education, in which almost no foreign affiliate exists (Table 4). Inward FDI is impeded by a lack of market access. For example, private corporations which seek profits are prohibited to do business in major areas of education and medical services. However, in the U.S., the inward FDI ratios in these sectors are not small, which is a conspicuous difference between Japan and the United States.

3.3 Recent Trends of Inward FDI in Japan

So far, our analysis was static and mainly based on data for 1996. But we should note that FDI into Japan is growing at an amazing speed. Table 5 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 eight-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 cross-border M&A cases has been increasing especially.[22] In 1999, AT&T and British Telecom jointly bought a combined 30% share of Nippon Telecom. A British company, Cable & Wireless, acquired IDC (International Digital Communications) by a takeover bid. An American company, GE Capital acquired Japan Lease. In 2000, an American company, Ripplewood Holdings and others acquired The Long-Term Credit Bank of Japan.

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

INSERT TABLE 5

Probably the following two factors have contributed to the recent increase in inward FDI. First, in recent years, the Japanese government promoted important deregulatory and related measures in order to transform Japan's economic system into one 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 relaxed 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, were removed in 1998. In 1999, all restrictions on foreign capital and the appointment of foreign directors in all cable TV businesses were ended.[23] Moreover, the recent stagnation of Japan's land and stock prices has created a kind of "fire-sale" situation, from which foreign investors have benefited.[24]

Using Toyo Keizai data, we compared JAFF's employment in 2000 with that in 1990 (Table 6). Table 6 shows changes in the number of workers employed by JAFF and changes in Japan's imports of services. According to Table 6, the number of workers employed by JAFF in the service sector has grown by 78%, which is substantially smaller than MOF FDI statistics indicate in Table 5.[25] According to MOF statistics, inward FDI stocks in the non-manufacturing sectors have grown eight-fold from the end of 1990 to the end of 2000. Probably, the MOF statistics exaggerate the

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

[24] We can confirm the recent increase in FDI to Japan's service sector by our micro-data of the *Establishment and Enterprise Census of Japan*. We can see that in the case of the manufacturing sector, the majority of 10% or more foreign-owned establishments were started up before 1984. In contrast with this, in the case of the service sector, many foreign-owned establishments were started up after 1990. However, we should note that in cases of acquisitions and capital participation, the date of establishment can be earlier than the date of FDI.

[25] On the other hand, U.S. firms, for example, increased their sales of services through their affiliates in Japan by 122% from 1990 to 1997 (U.S. Department of Commerce, 1999).

increase of JAFF's activities in recent years. On the other hand, the number of workers employed by JAFF in manufacturing sectors only increased by less than 8% in this period, although the inward FDI stocks in the manufacturing sector tripled according to the MOF statistics. This probably reflects the fact that Japan has been losing comparative advantages in the labor-intensive manufacturing industries.[26] According to Table 6, increases of JAFF's employment are quite uneven among industries. JAFF's employment in advertising, telecommunications, information services, precision instruments, and iron and steel etc. has more than doubled, while that in wholesale trade, hotels and lodging places, and many manufacturing industries was relatively stagnant.

INSERT TABLE 6

Probably we can partly explain the recent rapid increase in JAFF in the service sector by the history of Japan's regulations on inward FDI.[27] After joining the OECD in 1964, Japan gradually and systematically relaxed its regulations on inward FDI. In the case of the manufacturing sector, Japan lifted almost all the regulations by 1980 except those on FDI in the petroleum and leather product industries (See Appendix Tables 1 and 3). In the cases of many service industries, however, Japan continued to restrict inward FDI by foreign exchange law and other regulatory laws until quite recently (See Appendix Tables 1 and 2). In particular, inward FDI in life insurance, telecommunications, and broadcasting services was highly restricted until the late 1990s.

4. Econometric Analysis of Determinants of FDI in Japan

As we have seen in the previous section, there are significant differences in inward FDI penetration in the various industries and in Japan and the United States. Is Japan more closed to the

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[26] Fujii and Kimura (2001) analyzed the exit pattern of firms in the Japanese manufacturing sector and found that JAFF were more likely to exit from the market.

[27] Japan's process of inward FDI liberalization and Japan's remaining major restrictions on inward FDI are summarized in Appendix Tables 1, 2 and 3.

inward FDI compared with other countries? And, what industry characteristics affect the inward FDI

penetration of each industry? In this section we conduct an empirical study on this issue.

4.1 Estimation of the Gravity Model

In order to test whether Japan's market is more closed for establishment transactions than for

cross-border transactions, we estimated gravity models both for the direction of U.S. exports and the

regional distribution of sales by U.S. firms' foreign affiliates.[28] The results are summarized in Table

7. The dependent variables are the logarithms 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. In some equations, we add a dummy variable

which indicates countries where English is one of the predominant languages. The equations are

estimated for 1992 and 1998 for the manufacturing sector (Panel A) and for 1992 and 1999 for the

service sector (Panel B). The Japan dummies are not significant both in the U.S. export equations

and in the sales-by-affiliates equations. Even though we cannot conclude that the Japanese market is

significantly more closed to sales by U.S. firms than other countries' markets, the magnitude of the

coefficient of the Japan dummy is quite large. Moreover, it seems that the signs of the estimated

coefficients of the Japan dummies are consistent with our findings from the U.S.-Japan comparison

based on Tables 3 and 4. 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. In the

service sector (Panel B), the results imply that without controlling for the language factor, Japan's

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[28] 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. 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).

purchases of services through establishment transactions from U.S. firms were about 70% less than

the predicted value in 1992 and still 50% less than the predicted value in 1999. However, when the

language factor is controlled for, Japan's purchase of services through establishment transactions

from U.S. firms were only about 10% less than the predicted value in 1999. These results confirm

the recent rapid increase of inward FDI in Japan and also suggest that the Japanese market for

services is not that closed to inward FDI. On the other hand, in the manufacturing sector (Panel A),

the absolute value of the coefficient of the Japan dummy in the sales-by-affiliates equations is larger

than that in the service sector, and is also large even after controlling for the language factor.

Comparing the size of coefficient of the Japan dummy in the 1998 sales-by-affiliates equation with

that in the 1992 equations, there is no evidence suggesting that inward FDI in Japan increased

remarkably during the period. These findings are consistent with the observations discussed in the

previous section.[29]

INSERT TABLE 7

4.2 Cross-Industry Analysis on Determinants of Inward FDI penetration

Cross-industry analyses on the determinants of FDI into Japan have been conducted by

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[29] Although the estimated coefficients on the Japan dummies are not statistically significant, this might be the result of specification errors, such as missing variables. In particular, many previous studies found that Japan dummies tend to have a significantly negative coefficient for the manufacturing sector as we already mentioned in footnote 31. These previous studies mainly use FDI flows or assets as dependent variables, while our gravity model regressions use sales by affiliates as the dependent variable. This might be one reason why we do not obtain a significantly negative coefficient for the Japan dummies. That is, even though there are relatively small numbers of affiliates of foreign firms in Japan, sales by these affiliates could be fairly large owing to Japan's larger market scale and higher income. However, in any case, at least we can say from our results that there is no strong evidence suggesting that the Japanese market is particularly closed to sales by U.S. firms.

Lawrence (1993), Weinstein (1996), Nakamura, Fukao, and Shibuya (1995, 1997), Horaguchi (1995), and Fukao and Ito (2003).[30] 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 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. Nakamura, Fukao, and Shibuya (1995, 1997), 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 METI's *Kigyo Katsudo Kihon Chosa* (*Basic Survey on Business Activities by Enterprises*) 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 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. For the Japanese service industries, Fukao and Ito (2003) conducted a cross-industry regression and found that the inward FDI penetration is low in industries where government-owned establishments are dominant. Moreover, they found that the relatively higher FDI restrictiveness in Japan compared to the United States has significantly negative effects on Japan's inward FDI. In the case of *keiretsu* variables, Fukao and Ito (2003) did not obtain significant results, suggesting that the *keiretsu* do not

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[30] 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.

act as an impediment to inward FDI in Japan's service sector.

These previous empirical studies have some shortcomings with regard to the databases used in the analyses. First, several studies such as Lawrence (1993) are based on a very small sample size. Second, although FDI in services is an important issue, except for Fukao and Ito (2003), there is no study on FDI in this sector. And third, as we mentioned in Section 2, the data these studies used are based on firm-level surveys. Yet, as one firm is often involved in diversified businesses spanning different industries, it is more appropriate to use establishment-level surveys to capture the size of activities in each detailed industry.

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 8. Further details on the definitions and sources of the variables are provided in the Appendix. We use Japan's FDI penetration ratio as the dependent variable.[31] Japan's FDI penetration is defined as Japan's ratio of the number of workers employed by companies that are 10% or more foreign-owned to the total number of workers. In addition, taking into account the different attributes of manufacturing and service sectors, we assume different models for the estimations of the two sectors.

INSERT TABLE 8

The standard theory of FDI (see, for example, 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 a 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

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

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 *RDINT* (R&D intensity) and *ADINT* (advertisement intensity). If Japanese firms' productivity level is higher than that of foreign firms, Japanese firms would 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). We should note that 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.

In cases where cross-border transactions are not difficult, for example due to low transportation costs or the characteristics of the services, multinational corporations will choose the location where production costs are lowest.[32] Therefore, the inward FDI penetration ratio will be affected by Japan's locational advantage for each industry. Since Japan's capital prices are relatively low and land prices and wages of unskilled workers are relatively high, Japan probably has a locational

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

advantage for capital-intensive industries and a disadvantage for land-intensive or unskilled worker-intensive industries. Consequently, we would expect positive coefficients for *CLRATIO* (capital-labor ratio) and *UNIV* (skilled-labor intensity), and a negative coefficient for *LAND* (land intensity). Since it is considered that the capital intensity is a more important determinant in the manufacturing sector and it is difficult to get reliable data on capital intensity in the case of the non-manufacturing sector, we introduce *CLRATIO* only in the manufacturing sector regressions. It has been argued that firm-specific skills play a more important role in Japanese firms and that this feature has hindered the development of the secondary labor market in Japan. This fact might impede the entry of foreign firms (Weinstein, 1996). In order to take this factor into account, we prepared *JOBSEP* (job separation rate).[33] We expect a positive coefficient for this variable.

Industrial organization theory, moreover, suggests that new entries are often deterred in an oligopolistic market. For example, an incumbent firm often takes strategic actions to deter new entries, and entry into an industry may be difficult where the minimum efficient scale is large relative to the market size. Therefore, we introduced two variables representing market concentration, *HERF* (Herfindahl index) and *CR4* (top 4-firm concentration ratio), and would expect negative coefficients for both.

To find out the effects of government regulation on inward FDI, we prepared the variables *REGCUR* and *REGPAST* for the manufacturing sector regressions, and *RINVJAUS* (Japan's FDI restrictiveness minus U.S. FDI restrictiveness) for the service sector regressions. *REGCUR* is a dummy variable which takes one for currently regulated industries, and *REGPAST* is a dummy variable which takes one for industries regulated in the past. To construct *RINVJAUS*, following

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[33] Weinstein (1996) used data on wage gaps between JAFF and independent Japanese firms in order to test whether Japan's low liquidity of labor impedes inward FDI. But since this data is only available at quite an aggregated level, we do not use it.

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, APEC (1996), OECD (various issues), Japan Investment Council (various years), and the Japanese Government (various years).[34] According to these indices, Japan has not been welcoming to FDI in the fields of transportation, medicine, postal services, temporary staffing services, agriculture-related services, ship repair, and electricity/gas. *RINVJAUS* is defined as the difference between the FDI restrictiveness of Japan and the United States. We expect a negative coefficient for this variable.

Moreover, inward FDI in an industry will be limited, if government-owned establishments dominate the industry. To study this effect, we used *PUBEMP* (the share of workers employed by local or central government). We expect a negative coefficient for *PUBEMP*.

In order to take account of the effects of the *keiretsu*, we used two *keiretsu* variables, *HORIZ* (the share of workers employed by horizontal *keiretsu* firms) and *VERT* (the share of workers employed by vertical *keiretsu* firms). If the *keiretsu* impede inward FDI, we will have negative coefficients. In order to control for differences in the tradability of different goods and services, we used *FDIUS* (U.S. inward FDI penetration), though we think that tradability is a more important determinant of FDI in the service sector than in the manufacturing sector. We expect a positive coefficient for this variable.[35]

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[34] Interested readers are referred to Ito and Fukao (2001) for the FDI restrictiveness indices at the 3-digit industry level.

[35] In his comment on an earlier version of this paper, Sadao Nagaoka pointed out that market growth might be an important determinant of inward FDI. Consequently, we added a new variable, the growth rate of domestic demand from 1985 to 1995, which we obtained from Japan's Linked Input-Output Tables. The estimated coefficient of this variable was negative but insignificant both for the manufacturing and the service sector. Moreover, inclusion of this variable in our regression equations did not substantially change the estimated values and the significance of coefficients on

We conduct an ordinary least squares regression for the manufacturing sector and a Tobit estimation for the service sector, since there exists a lower bound, zero, for our dependent variable in the latter. The results are summarized in Tables 9 and 10. For the manufacturing sector, we integrated 58 manufacturing industries into 38 industries in order to be consistent with the *keiretsu* data published in Dodwell Marketing Consultants (1995). For the service sector, among our 50 industries, we were unable to obtain data for nine industries, namely other insurance services, postal services, education, research institutes for natural sciences, research institutes for social sciences and humanities, health and hygiene, private non-profit organizations' services, social insurance and welfare, and unclassified services. Therefore, the maximum sample size is 41.

INSERT TABLE 9 AND TABLE 10

The determinants of Japan's inward FDI penetration are very different for the manufacturing sector and the service sector. In the manufacturing sector, we found advantages in managerial resources and factor intensity to be significant, while policy variables were significant in the service sector.

The results we obtained for the manufacturing sector are as follows: The estimated coefficients on *RDINT* (R&D intensity), *UNIV* (skilled-labor intensity) and *CLRATIO* (capital-labor ratio) are significantly positive and robust. Consistent with the standard theory of FDI, Japan's inward FDI penetration is relatively high in industries that have a higher R&D intensity, a higher skilled-labor intensity, and a higher capital-labor ratio. The coefficient on *ADINT* (advertisement intensity), however, is not significant. The estimated coefficient on *LAND* (land intensity) was negative as we expected but insignificant in most cases. In the case of the market structure variables, the estimated coefficient on *HERF* (Herfindahl index) is insignificant. Contrary to our expectations, the coefficient

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other variables. Therefore, we only report the estimated results of the equations without domestic demand growth.

on *JOBSEP* (job separation rate) is negative, but insignificantly so. The coefficient of *DPROD* is positive but insignificant. In the case of policy variables, the estimated coefficients on *REGCUR* (a dummy for currently regulated industries) and *REGPAST* (a dummy for industries regulated in the past) are not significant. This result may imply that almost all the regulations in the manufacturing sector had already been lifted by 1980 and did not matter in recent years. The estimated coefficients on *PUBEMP* (the share of workers employed by local or central government) are negative and significant, as we expected. The estimated coefficients on the two *keiretsu* variables, *HORIZ* (the share of workers employed by horizontal *keiretsu* firms) and *VERT* (the share of workers employed by vertical *keiretsu* firms) are not significant.

In the service sector, 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 are consistent with the results obtained by Fukao and Ito (2003), and imply that by eliminating its restrictions on inward FDI and reducing government activities, Japan can increase inward FDI in the service sector. In the case of locational advantage variables for the service sector, as we expected, the estimated coefficient on *LAND* (land intensity) is negative while the coefficient on *UNIV* (skilled-labor intensity) is positive in many cases. However, they are not significant. Contrary to our expectations, the coefficient on *JOBSEP* (job separation rate) is negative but insignificant. In the case of the variables that stand for the importance of intangible assets, the estimated coefficient on *RDINT* (R&D intensity) is negative and the coefficient on *ADINT* (advertisement intensity) is positive. But both are not significant in many cases. The coefficient on *DPROD* is positive but insignificant. In the service sector, the estimated coefficient on *HERF* (Herfindahl index) is positive and significant in most cases. One interpretation of this result is as follows: the Herfindahl index tends to be higher when economies of scale work at the firm level; in such industries we will observe active inward and outward FDI.

In the case of the *keiretsu* variables, we did not get significant results in both the manufacturing and the service sectors, which is consistent with the results obtained in most of the previous studies. Again, this suggests that *keiretsu* do not work as an impediment to inward FDI in Japan.[36]

5. Conclusions

In this paper we compiled new statistics on the employment of Japanese affiliates of foreign firms (JAFF) in Japan at the 3-digit industry level for the year 1996, using micro data of *the Establishment and Enterprise Census of Japan*. According to our new statistics, JAFF with 33.4% or more foreign ownership in the service sector employed 308,000 workers in 1996, which is nearly five times greater than the number reported in MITI (1999). In the case of the manufacturing sector, JAFF with 33.4% or more foreign ownership employed 176,000 workers in 1996, which is 10% greater than the number reported in MITI (1999). The underestimation in METI's survey is substantial in the case of the service sector (Table 2).

Using our statistics, we compared FDI in Japan with FDI in the United States at the 3-digit industry level. We found that as of 1996, the share of employment by JAFF in the service sector reached one fifth of that of the United States. However, FDI into Japan is growing at an amazing speed. The total of FDI flows in the last three years is greater than the FDI stock at the end of the 1996 fiscal year. If this growth continues, the share of employment by Japanese affiliates of foreign firms in the service sector may reach a level almost equal to that observed in the United States.

In order to examine whether Japan's inward FDI is significantly lower than in other countries,

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[36] As Fukunari Kimura and Sadao Nagaoka pointed out, it is difficult to test the effect of impediments which cover all industries (such as Japan's inferior accounting standards) by our cross-industry regression.

we estimated a gravity model using the data on U.S. exports and sales by U.S. firms' foreign affiliates. Moreover, we also estimated an empirical model to examine the determinants of Japan's inward FDI penetration using our cross-industry statistics. The results of the gravity model showed that Japan's purchases through establishment transactions from U.S. firms tended to be less than the predicted value in both the manufacturing and the service sectors, but could not conclude that Japan's market was significantly more closed to sales by U.S. firms than other countries' markets. The results of our cross-industry regression analysis showed that the determinants of Japan's inward FDI penetration were very different for the manufacturing sector and the service sector. In the manufacturing sector, we found advantages in managerial resources and factor intensity to be significant. In the service sector, policy variables were significant. This result implies that by eliminating restrictions on inward FDI and reducing government activities, Japan can increase inward FDI in service sector. In the case of the *keiretsu* variables, we did not obtain significant results in both the manufacturing and the service sectors. This suggests that the *keiretsu* do not work as an impediment to inward FDI in Japan.

We found that compared with FDI in the U.S., FDI in Japan's service sector is more concentrated in a limited number of industries, such as wholesale trade, eating and drinking places, retail trade, and computer programming and software. In Japan, there are what may be labeled "sanctuary" sectors, such as medical services, utilities, postal services, and education. If international competition in these sectors were introduced through the participation of foreign capital, this would undoubtedly contribute to Japan's structural reform process. In order to remove government impediments to direct investments by foreign companies, not only should the principle of equal treatment irrespective of nationality be applied, but restrictions on market access should be eased. In the "sacred" sectors, restrictions on market access, which take precedence over equal treatment, impede direct investment by foreign companies. In fact, even Japanese corporations are sometimes

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prohibited from participating in those markets because of legal restrictions. The very existence of public entities also impedes participation by private companies. In order to encourage market participation by foreign companies in areas in which government involvement is high, there is a need to solve difficult issues such as how to introduce competitive principles without violating the public interest.

Appendix: Description of Variables and Data Sources

1.   Notes to Table 4

Imports, Exports, and Domestic Output:

Our data on Japan's imports, exports, and total domestic output are taken from the *1995 Japan Input-Output Tables* (Japanese Government, 1999).

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

(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 wholesalers' activities is included in the value of goods imports either on an FOB basis or on a CIF basis, while the value of domestic wholesalers' activities for exported goods is properly summed up in the output of wholesale trade sector.

In order to solve these problems, we used Bank of Japan (various issues) data on trade in 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 an FOB basis by the commercial margin ratio. We obtained the value of goods imports on an 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 this by multiplying the industry's import/output ratio of the I-O tables with the industry's total current income.

Our data on U.S. imports and total domestic output are 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 I-O 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 are 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) exclude imports from U.S. firms' foreign affiliates.

2. Notes to Table 8

Japan's Inward FDI Penetration (FDIJA):

The share of the number of workers employed by JAFF (Japanese Affiliates of Foreign Firms) that are 10% or more foreign-owned in Japan's total number of workers in 1996. Our data are compiled using the micro-data of the 1996 *Establishment and Enterprise Census* of Japan.

R&D Intensity (RDINT):

RDINT is defined as the ratio of R&D expenses to the gross value-added in each industry. In the case of the manufacturing sector, the data are compiled using the industry-level data provided in Nakamura, Fukao and Shibuya (1995, 1997). In the case of the service sector, the data are taken

from the 1995 Japan I-O Tables (Japanese Government, 1999). R&D expenses are defined as the amount of input from the research industry to each industry.

Advertisement Intensity (ADINT):

ADINT is defined as the advertising expenses per employee in each industry. In the case of the manufacturing sector, the industry-level data provided in Nakamura, Fukao and Shibuya (1995, 1997) are used. In the case of the service sector, the data are taken from the 1995 Japan I-O Tables (Japanese Government, 1999). The advertising expenses are defined as the amount of input from the advertising industry to each industry.

Capital-Labor Ratio (CLRATIO):

The industry-level data provided in Nakamura, Fukao and Shibuya (1995, 1997) are used.

Land Intensity (LAND):

Our data on LAND are taken from the Development Bank of Japan (2000) and Nikkei QUICK Information Technology (2000). We first calculated the ratio of the book value (unit: billions of 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 using the Development Bank of Japan's data on the ratio calculated using MOF's data for the industries that have the ratios calculated by both data. We then took the adjusted ratios for water supply and sewerage systems industries by using the estimated regression equation.

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 are taken from Prime Minister's Office (1995) and Ministry of Labor (1996).

Herfindahl Index (HERF):

    HERF is calculated from each firm's share of the number of employees in the total number of employees in each industry. The data are complied using the micro-data of the 1996 *Establishment and Enterprise Census* of Japan.

Top 4-Firm Concentration Ratio (CR4):

CR4 is calculated from each firm's share of the number of employees in the total number of employees in each industry. The data are complied using the micro-data of the 1996 *Establishment and Enterprise Census* of Japan.

U.S. Inward FDI Penetration (FDIUS):

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

Currently Regulated Industries (REGCUR):

REGCUR is a dummy variable which takes one for currently regulated industries, otherwise zero. According to the information in the OECD's *Code of Liberalisation of Capital Movements* (various years), the currently regulated industries are the petroleum and the leather and leather products industries.

Industries Regulated in the Past (REGPAST):

REGPAST is a dummy variable which takes one for industries regulated in the past, otherwise zero. According to the information in the OECD's *Code of Liberalisation of Capital Movements* (various years), the industries regulated in the past are food and related products, textile products and apparel, pharmaceuticals, miscellaneous chemicals, stone, clay, and glass products, special industry machinery, electric equipment and computers, and electronic parts and devices industries.

Differences between Japan's and U.S. FDI Restrictiveness (RINVJAUS):

RINVJAUS is defined as the difference between the FDI restrictiveness of Japan and the United States. 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. 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, i.e. 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 not covered by the GATS schedule, we obtained information on each country's FDI restrictiveness from APEC (1996), OECD (various issues), Japan Investment Council (various years), and the Japanese Government (various years). Our measure for FDI restrictiveness has been excluded owing to space constraints. Interested readers are referred to Ito and Fukao (2001) for the measure.

Share of Public Services (PUBEMP):

PUBEMP is defined as the ratio of the number of workers employed by establishments owned by the central or local governments to the total number of employees in that particular industry in Japan. The data are taken from 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).

Job Separation Rate (JOBSEP):

The data on *JOBSEP* are taken from Ministry of Labor (1995).

Vertical Keiretsu (VERT):

VERT is defined as the share of workers employed by vertical *keiretsu* firms in the total work force. In the case of the manufacturing sector, the industry-level data provided in Nakamura, Fukao and Shibuya (1995, 1997) are used. In the case of the service sector, the data on *keiretsu* were taken from Toyo Keizai Shimpo-sha (1992, 2000). We treated all the firms that belong to forty-three independent corporate groups (Toyota, Nissan, Hitachi, Toshiba, Matsushita, Taisei, etc.) and all the subsidiaries of such firms as vertical *keiretsu* firms.

Horizontal Keiretsu (HORIZ):

HORIZ is defined as the share of workers employed by horizontal *keiretsu* firms in the total work force. In the case of the manufacturing sector, the industry-level data provided in Nakamura, Fukao and Shibuya (1995, 1997) are used. In the case of the service sector, the data on *keiretsu* were taken from Toyo Keizai Shimpo-sha (1992, 2000). We treated all the firms that belong to the *Shacho-kai* (Presidents' Clubs) of seven corporate groups (Mitsui, Mitsubishi, Sumitomo, Fuyou, Sanwa, Ichikan, and Tokai) and all the subsidiaries of such firms as horizontal *keiretsu* firms.

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Table 1. Japan's Inward and Outward FDI: Position at the End of March 2001

(Billion Yen)

Panel A. Inward FDI

Industry	Inward FDI Stock
Manufacturing Total	5,324
Food and related products	110
Textile products	24
Rubber and leather products	82
Chemicals and allied products	1,272
Petroleum	443
Glass and stone products	30
Primary and fabricated metals	220
Machinery	2,978
Other manufacturing	165
Non-manufacturing Total	7,880
Construction	21
Real estate	339
Commerce	2,028
Business and personal services	1,526
Transportation services	48
Communication services	1,155
Finance and insurance	2,595
Others	168
Total Amount	13,203

Panel B. Outward FDI

Industry	Outward FDI Stock
Manufacturing Total	34,187
Food and related products	3,181
Textile products	1,508
Lumber and pulp	994
Chemicals and related products	4,478
Ferrous and nonferrous metals	3,419
Machinery	2,858
Electronics and electrical machinery	9,126
Transportation equipment	4,751
Other manufacturing	3,873
Non-manufacturing Total	71,665
Agriculture and Forestry	424
Fishery	257
Mining	5,193
Construction	821
Commerce	11,016
Finance and Insurance	20,347
Business and Personal Services	11,398
Transportation Services	7,862
Real Estate	12,524
Others	1,824
Branches	1,656
Total Amount	107,669

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

Table 2. Comparison of Major Statistics on FDI in Japan

	Our statistics based on micro-data of "Establishment and Enterprise Census of Japan"			METI "Survey on Trends of Business Activities by Japanese Subsidiaries of Foreign Firms	Toyo Keizai Shimpo-sha "Directory of Japanese Subsidiaries of Foreign Firms"
Years Covered	1996 (Data of the 2001 Survey are not available yet)			Annual data are available from 1970	Annual data are available from 1985
Industries Covered	Covers all industries			Does not cover finance, insurance, and real estate	Covers all industries
Response Ratio	Mandatory.			Not-mandatory. Response ratio for the 1996 Survey was 52.1%	Not mandatory. There is no information on response ratio
Industry Classification	Establishment level, 3-digit industry classification (Original micro-data is at 4-digit level)			Firm level, 24 industries (including 5 non-manufacturing industries)	Firm level, 55 industries
Definition of Nationality	We can choose any cut-off capital participation ratio			The cut-off ratio is 33.4%	For listed or major firms, the cut-off ratio is 20%, otherwise 49%
Coverage of Branches Directly Owned by Foreign Firms	All covered			Not covered	Covered in the case of finance and insurance
Comparison for 1996					
Date of Survey	October 1, 1996			March 31, 1996	October, 1998
Cut-off Ratio	>10%	>33.4%	>=50%	>=33.4%	>=20% or >=49%
Primary Industry					
Number of Workers Employed by JAFF	2,338	407	248	N.A.	268
Number of Japanese Firms Owned by Foreign Firms	7	4	4	N.A.	3
Number of Japanese Establishments Directly Owned by Foreign Firms	66	10	6	N.A.	N.A.
Manufacturing Industry					
Number of Workers Employed by JAFF	1,025,450	176,186	102,155	163,135	286,933
Number of Japanese Firms Owned by Foreign Firms	600	370	311	480	828
Number of Japanese Establishments Directly Owned by Foreign Firms	2,714	986	857	N.A.	N.A.
All Other Industries				Excluding Real Estate and Finance, including Mining	
Number of Workers Employed by JAFF	1,132,702	308,245	279,844	61,961	203,940
Number of Japanese Firms Owned by Foreign Firms	2,499	2,065	1,887	641	2,456
Number of Japanese Establishments Directly Owned by Foreign Firms	32,190	12,082	10,699	N.A.	N.A.
Available Information	Number of workers (in detailed category of male, female, full-time, part-time etc.), start-up date, form of ownership, location. No information on sales or profits.			Detailed information on business activities is available. But many firms do not answer such detailed questions.	Number of workers and start-up date are available for most firms. Sales data are available for some firms.

Source: Authors' compilation.

Table 3. Number 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 (%)		Fukao-Ito Industry Classification Code
	Japan	U.S.	
Manufacturing	**0.79**	**10.48**	
Food and related products	0.28	15.38	201-206
Textile products and apparel	0.14	3.92	207-212
Lumber, wood, furniture, and fixtures	0.02	1.61	213-215
Paper and related products	0.11	5.99	216, 217
Printing and publishing	0.13	6.98	218-220
Miscellaneous plastic products	0.36	3.38	228
Rubber products	1.08	32.30	229, 230
Stone, clay, and glass products	0.16	20.84	232-234
Chemicals and related products	4.24	47.89	221-225
Primary and fabricated metals	0.35	9.37	235-240
General industrial machinery	0.98	9.97	241, 242, 244
Electronic and electrical equipment	1.36	18.87	245-247, 249, 250
Office and computing machines	3.86	12.06	243, 248
Motor vehicles and equipment	0.34	6.70	251
Other transport equipment	0.64	3.29	252
Instruments and related products	0.40	11.54	253-256
Construction	**0.05**	**1.05**	301
Wholesale trade	**2.19**	**6.66**	308
Retail trade	**0.21**	**3.26**	309
Finance, except depository institutions	**1.40**	**1.21**	310
Real estate	**0.02**	**2.79**	314
Transportation	**0.49**	**2.17**	315-321
Services	**0.60**	**2.06**	
Hotels and other lodging places	0.09	7.27	345
Computer and data processing services	1.63	1.41	332, 333
Motion pictures, including television tape and film	0.13	3.82	343
Health services	0.00	0.71	328, 329
Business services	0.45	3.21	331,334-342
Other services	1.03	0.49	344, 346, 347
Non-Manufacturing except primary industry	**0.59**	**2.77**	
Agriculture, forestry, and fishing	**0.08**	**1.75**	348, 102, 103
Mining	**0.13**	**5.55**	104
All Industries	**0.61**	**4.61**	

Note: For the Fukao-Ito classification code, see Table IV and also refer to Ito and Fukao (2001).
Sources: Compiled from micro-data of the *Establishment and Enterprise Census* for 1996 and
      U.S. Department of Commerce (1995b)

Table 4. Japan's International Transactions : FDI vs. Cross-Border Trade

<Panel A> Manufacturing Sector

Fukao-Ito Code	Industry	Inward		Outward		U.S. Inward	
		Ratio of No. of Workers Employed by JAFF to Total No. of Domestic Workers	Ratio of Imports to Total Domestic Output	Ratio of No. of Workers Employed by FAJF to Total No. of Domestic Workers	Ratio of Exports to Total Domestic Output	Ratio of No. of Workers Employed by USAFF to Total No. of Domestic Workers	Ratio of Imports to Total Domestic Output
		(%)	(%)	(%)	(%)	(%)	(%)
201-204	Food products	0.11	12.19	5.03	0.48	10.46	5.21
205	Beverages & tobacco	1.91	4.90	6.28	0.37	8.99	5.37
206	Prepared feed & fertilizers	0.16	0.89	6.51	0.08	10.06	0.96
207	Reeling plants & spinning mills	0.01	23.62	73.25	4.17	8.57	3.94
208	Woven & knit fabrics mills	0.00	13.59	18.73	26.21	4.40	12.66
209	Dyed & finished textiles	0.13	0.00	9.41	0.00	6.32	12.66
210	Other textile mill products	0.04	12.77	12.40	10.19	12.55	13.28
211, 212	Textile outer garments & apparel	0.20	27.83	7.48	0.62	2.75	54.97
213, 214	Sawmills & wood	0.00	22.54	2.32	0.16	2.26	10.98
215	Furniture & fixtures	0.06	6.59	0.66	1.00	3.71	12.74
216	Pulp & paper mills	0.02	8.19	8.28	2.74	9.23	14.00
217	Paper products	0.16	1.18	2.68	1.46	6.95	2.46
218-220	Publishing & printing	0.13	0.74	1.07	0.36	6.56	1.81
221	Industrial inorganic chemicals	3.66	9.58	16.58	1.11	22.79	13.24
222	Industrial organic chemicals	3.55	9.10	22.54	17.55	36.49	13.24
223	Oil products & detergents	1.96	4.44	61.86	3.36	19.23	4.65
224	Drugs & medicines	7.21	7.28	10.04	2.15	33.30	21.17
225	Toilet preparations & others	4.83	11.44	31.36	19.45	20.32	6.33
226	Petroleum refining	12.27	12.00	5.26	2.82	26.79	8.53
227	Petroleum & coal products	0.99	2.53	0.10	2.89	17.81	0.65
228	Plastic products	0.41	1.99	3.91	3.31	10.41	10.58
229	Tires & inner tubes	4.03	6.43	226.60	27.98	51.07	22.71
230	Rubber & plastic footwear	0.46	10.10	5.44	7.77	13.36	10.58
231	Leather products & fur skins	0.00	55.48	2.95	2.70	5.29	134.45
232	Glass & its products	1.24	5.60	43.99	10.70	22.13	12.01
233	Cement & its products	0.00	0.20	1.59	0.83	19.39	2.12
234	Clay, pottery & stone products	0.20	6.28	9.07	8.30	18.07	27.94
235	Blast furnace & basic steel	0.02	3.46	20.03	9.18	23.86	17.96
236	Iron & steel foundries	0.00	0.43	27.75	0.34	9.97	5.72
237	Nonferrous metals	4.37	108.04	16.81	7.42	19.01	20.01
238	Nonferrous rolling & castings	0.96	4.60	12.35	9.72	14.03	7.09
239	Fabricated structural metal	0.27	0.64	0.66	0.37	6.30	1.26
240	Miscellaneous metal work	0.35	2.78	2.74	5.00	7.65	9.38
241	Metal working machinery	0.97	2.42	8.17	24.90	6.85	34.66
242	Special industry machinery	2.16	5.19	13.65	27.14	16.18	19.40
243	Office & household machines	4.31	2.95	10.65	16.42	13.11	18.79
244	General industrial machinery	0.98	3.42	4.61	18.84	9.36	16.32
245	Electrical industrial machinery	1.38	6.12	6.82	22.79	17.03	18.53
246	Household electric appliances	0.52	3.19	147.76	5.01	20.10	82.65
247	Communication equipment	0.68	3.56	36.60	24.44	19.26	12.31
248	Electric equipment & computers	7.94	15.74	5.71	28.43	9.24	53.50
249	Electronic parts & devices	2.11	9.60	27.11	31.26	12.65	28.92
250	Miscellaneous electric equipment	3.13	7.57	31.52	24.80	13.36	31.19
251	Motor vehicles & parts	4.72	3.19	42.05	20.64	11.74	34.24
252	Miscellaneous transport equipment	4.56	9.12	6.02	28.02	3.43	11.48
253, 256	Miscellaneous precision instruments	0.65	14.65	7.43	17.13	13.99	16.78
254	Optical instruments & lenses	0.11	12.77	22.71	41.40	14.27	33.06
255	Watches, clocks & parts	0.00	42.62	30.77	40.75	14.23	360.39
257	Ordnance & accessories	0.00	8.07	0.00	0.13	12.36	3.64
258	Miscellaneous manufacturing	0.60	34.73	6.41	10.36	8.68	57.72
Manufacturing Total		**1.36**	**7.63**	**14.29**	**11.66**	**11.01**	**16.89**

Note: FAJF: Foreign Affiliates of Japanese Firms (10% or more Japanese-owned), JAFF: Japanese Affiliates of Foreign Firms (33.4% or more foreign-owned), USAFF: U.S. Affiliates of Foreign Firms (10% or more foreign-owned)

Sources: Compiled from micro-data of the *Establishment and Enterprise Census* for 1996, MITI (1998b), and U.S. Department of Commerce (1995a). Also see Appendix.

Table 4. Japan's International Transactions : FDI vs. Cross-Border Trade

--- Continued ---

<Panel B> Service Sector

Fukao-Ito Code	Industry	Inward		Outward		U.S. Inward	
		Ratio of No. of Workers Employed by JAFF to Total No. of Domestic Workers	Ratio of Imports to Total Domestic Output	Ratio of No. of Workers Employed by FAJF to Total No. of Domestic Workers	Ratio of Exports to Total Domestic Output	Ratio of No. of Workers Employed by USAFF to Total No. of Workers	Ratio of Imports to Total Domestic Output
		(%)	(%)	(%)	(%)	(%)	(%)
301	Construction and civil engineering	0.05	0.34	0.70	0.70	1.97	0.04
302	Electricity	0.02	0.00	0.12	0.15	0.16	0.36
303	Gas supply	0.00	0.05	0.08	0.01	0.67	0.00
304	Steam and hot water supply	0.00	0.00	0.00	0.00	6.98	0.00
305	Water supply	0.00	0.02	0.00	0.11	8.69	0.00
306	Sewerage systems	0.00	0.00	0.00	0.03	8.69	0.00
307	Sanitary services	0.00	0.00	0.01	0.01	6.98	0.00
308	Wholesale trade	2.31	3.32	5.85	4.87	8.37	9.45
309	Retail trade	0.29	0.03	0.66	0.05	3.79	0.00
310	Financial intermediary services	1.47	2.98	13.37	1.78	6.62	0.25
311	Life insurance	1.46	2.60	3.28	0.09	14.34	0.49
312	Casualty insurance	3.97	1.87	18.41	2.41	14.34	0.49
313	Other insurance services	0.18	n.a.	n.a.	n.a.	14.34	0.49
314	Real estate	0.02	0.01	1.38	0.01	1.97	0.00
315	Railway transportion	0.00	1.30	0.01	0.30	0.00	3.63
316	Road passenger transportion	0.00	1.26	0.01	0.21	6.75	4.10
317	Road freight transportion	0.05	0.00	0.27	0.03	1.92	0.77
318	Water transportation	1.42	20.96	17.34	19.53	8.34	48.85
319	Air transportation	17.26	46.36	12.61	14.23	12.02	8.16
320	Storage facility services	0.41	0.00	5.18	0.01	1.92	0.77
321	Supporting services for transport	1.02	18.78	4.34	16.72	8.71	18.71
322	Postal service	0.00	0.35	0.00	0.43	0.00	0.00
323	Telecommunications	0.22	0.68	0.19	0.39	0.37	3.36
324	Broadcasting	0.21	0.00	0.52	0.00	1.28	0.00
325	Education	0.05	0.00	0.00	0.00	6.44	0.84
326	Research institutes (natural sciences)	2.95	1.71	0.00	1.14	6.44	0.84
327	Research institutes (soc. sci. & humanities)	0.00	2.15	0.00	1.25	6.44	0.84
328	Medical services	0.02	0.00	0.01	0.00	2.72	0.00
329	Health and hygiene	0.01	0.00	0.11	0.00	2.72	0.00
330	Private non-profit organization services	0.00	0.84	0.00	1.01	0.00	0.00
331	Advertising	1.20	4.85	3.23	1.47	7.55	0.44
332	Computer programming & software	1.97	1.42	1.02	0.66	4.08	0.18
333	Information services	1.63	6.77	40.74	3.33	4.08	0.18
334	Goods & equipment rental & leasing	0.95	2.33	3.65	1.06	5.36	0.00
335	Automobile renting	0.34	0.00	1.76	0.00	5.67	0.00
336	Automobile repairing	0.12	0.00	0.31	0.00	0.64	0.01
337	Machine repairing	2.23	0.00	0.49	0.00	2.88	0.00
338	Building maintenance services	0.01	0.00	0.23	0.00	7.85	0.00
339	Legal & accounting services	0.00	5.87	0.01	2.18	0.06	0.25
340	Civil eng. & construct. services	0.07	3.11	0.01	2.45	1.44	0.50
341	Personnel supply services	1.19	0.00	0.12	0.01	6.79	1.67
342	Other business services	0.67	3.02	2.98	2.10	4.10	0.45
343	Amusement & recreation services	0.13	1.62	0.52	0.20	4.32	0.24
344	Eating and drinking places	1.58	4.17	0.55	0.56	2.71	2.05
345	Hotels and lodging places	0.20	23.31	4.46	3.97	9.99	19.63
346	Individual education facilities	0.23	0.03	0.01	0.01	0.94	0.00
347	Other personal services	0.02	0.04	0.06	0.01	1.27	0.04
348	Agricultural services	0.00	0.00	0.18	0.00	0.82	0.10
349	Social insurance & welfare	0.02	0.00	0.00	0.00	n.a.	n.a.
350	Unclassified services	0.01	n.a.	n.a.	n.a.	n.a.	n.a.
Services Total		**0.65**	**2.11**	**1.89**	**1.48**	**4.03**	**2.07**

Note: FAJF: Foreign Affiliates of Japanese Firms (10% or more Japanese-owned), JAFF: Japanese Affiliates of Foreign Firms (33.4% or more foreign-owned), USAFF: U.S. Affiliates of Foreign Firms (10% or more foreign-owned)
Sources: Compiled from micro-data of the *Establishment and Enterprise Census* for 1996, Toyo Keizai Shimpo-sha (1996), and U.S. Department of Commerce (1995a). Also see Appendix.

Table 5. FDI Flows into Japan (Billion Yen)

Fiscal Year	1950-90	91	92	93	94	95	96	97	98	99	2000	Total
Manufacturing Total	1,666.5	257.7	208.1	183.6	205.4	141.2	311.1	267.4	312.6	979.7	790.7	5,324.0
Food and related products	44.2	17.1	1.2	10.4	3.2	4.1	0.3	2.2	25.8	1.5	0.0	110.0
Textile products	9.8	1.3	0.7	0.7	0.1	2.3	0.9	1.9	3.6	0.2	2.4	23.8
Rubber and leather products	11.0	7.6	9.6	5.4	4.0	2.1	10.7	18.8	4.8	7.0	1.1	82.1
Chemicals and allied products	447.3	122.6	93.1	54.2	23.4	109.5	69.5	74.0	39.7	60.3	178.8	1,272.5
Petroleum	102.1	23.4	5.9	5.9	14.7	2.0	8.2	5.8	8.4	13.5	253.4	443.3
Glass and stone products	20.7	0.6	-	0.5	1.8	0.0	0.0	0.7	-	5.7	0.0	30.0
Primary and fabricated metals	91.6	10.7	5.2	17.7	19.6	0.1	52.8	0.3	2.0	17.9	1.9	219.6
Machinery	874.5	59.5	82.9	78.1	133.9	18.2	155.8	145.2	212.9	865.2	351.9	2,978.1
Other manufacturing	65.3	14.9	9.4	10.8	4.8	2.9	12.9	18.5	15.3	8.5	1.2	164.5
Non-manufacturing Total	942.7	331.9	322.5	175.0	227.3	228.4	459.5	410.8	1,027.8	1,419.6	2,334.4	7,880.0
Construction	12.9	3.1	0.0	0.1	0.4	0.1	0.0	0.3	1.4	2.2	0.0	20.5
Real Estate	115.8	9.4	30.7	10.7	3.2	1.6	26.5	48.2	41.6	16.8	34.6	339.0
Commerce	416.6	107.3	155.4	100.5	113.5	67.9	166.4	99.6	175.9	348.5	276.1	2,027.8
Business and Personal Services	150.3	73.7	106.7	24.0	37.4	49.1	236.0	88.8	318.1	205.8	236.5	1,526.4
Transportation Services	19.8	3.5	2.5	5.1	0.8	1.2	1.0	0.4	6.1	2.2	5.7	48.3
Communication Services	20.8	13.6	6.3	3.2	3.0	5.3	2.1	3.3	16.8	330.0	750.8	1,155.1
Finance and Insurance	96.4	120.3	19.0	4.0	68.7	100.1	27.3	161.6	456.9	511.5	1,029.3	2,595.2
Others	110.4	1.1	1.8	27.4	0.3	3.2	0.2	8.7	11.1	2.5	1.3	168.0
Total Amount	2,608.5	589.6	530.6	358.6	432.7	369.7	770.7	678.2	1,340.4	2,399.3	3,125.1	13,203.3

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

Table 6. Recent Trends in JAFF's Employment and Japan's Imports: 1990 -2000

Industry	No. of Workers Employed by JAFF 2000 (persons)	Growth Rate of No. of Workers Employed by JAFF: 1990-2000 (%)	Real Growth Rate of Imports: 1990-1995 (%)
Agriculture	251	63.0	-1.9
Mining	57	n.a. (2)	16.9
Manufacturing	338,433	7.7	29.9
Food products	7,493	-6.1	35.9
Textile & apparel	4,114	53.5	58.4
Wood products	0	-100.0	30.1
Pulp & paper products	1,348	-23.6	29.5
Publishing & printing	1,292	40.6	-12.7
Chemical products	33,832	-27.5	5.4
Drugs & medicines	37,472	33.4	30.5
Petroleum & coal products	5,029	-54.5	-15.3
Plastic products	1,383	-14.9	111.4
Rubber & leather	13,121	538.2	39.0
Glass & pottery products	2,199	-45.8	-6.3
Iron & steel	65	983.3	14.8
Metal products	1,545	-80.3	19.2
Non-metal Products	1,861	-77.5	7.2
Machinery	19,411	-24.7	-3.7
Electric equipment	67,627	-31.1	129.1
Motor vehicles & parts	110,544	116.0	31.7
Miscellaneous transp. equip.	746	-42.3	-28.4
Precision instruments	23,453	305.3	41.3
Miscellaneous manufacturing	5,898	-35.5	-8.0
Services and others	267,114	77.8	6.8
Construction	1,502	-27.4	n.a. (1)
Wholesale trade	77,750	2.9	-49.5
Retail trade	13,578	557.5	-92.6
Finance	32,239	61.6	14.7
Insurance	33,440	179.4	260.3
Real estate	389	357.6	-54.6
Eat. & drink. places	10,341	95.8	8.3
Advertising	5,933	218.3	6.9
Electricity	0	n.a. (1)	-87.6
Gas & steam supply	0	-100.0	33.1
Watersupply	0	n.a. (1)	-38.2
Sanitary services	2	n.a. (2)	n.a. (1)
Transportation	11,825	143.8	25.5
Support. serv. for transp.	4,760	152.7	13.0
Telecommunications	8,421	933.3	49.4
Broadcasting	473	n.a. (2)	-100.0
Research institutes	70	-75.3	73.3
Medical & health services	390	129.4	-23.8
Private non-profit org. serv.	6	n.a. (2)	37.9
Information services	37,752	231.8	38.3
Goods & equip. rental	4,126	1,012.1	82.8
Other business serv.	20,132	234.1	30.4
Amusement & rec. serv.	1,084	74.3	-32.6
Hotels & lodg. places	1,538	-4.1	0.3
Oth. personal services	1,363	-56.9	-7.2
Not classified	0	-100.0	-33.4
Total	605,855	30.4	20.7

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

n.a. (1) -- not available due to zero values for both years

n.a. (2) -- not available due to a zero value for the starting year

Sources: Toyo Keizai Shimpo-sha (various years) and Japanese Government (2000)

Table 7.   Determinants of U.S. Cross-Border Sales and Sales by Foreign Affiliates of U.S. Firms: Cross Country Estimation Based on Gravity Models

<Panel A> Manufacturing Sector

	Year 1992				Year 1998			
	ln (EX92)	ln (EX92)	ln (OFDI92)	ln (OFDI92)	ln (EX98)	ln (EX98)	ln (OFDI98)	ln (OFDI98)
ln (GDP92)	0.447	0.448	1.202	1.213				
	(4.19)***	(4.17)***	(4.26)***	(4.92)***				
ln (GDPPC92)	-0.059	-0.054	-0.008	0.160				
	(-0.56)	(-0.50)	(-0.03)	(0.62)				
ln (GDP98)					0.444	0.450	0.862	0.912
					(3.86)***	(3.89)***	(5.36)***	(6.00)***
ln (GDPPC98)					-0.082	-0.085	0.319	0.332
					(-0.71)	(-0.73)	(1.91)*	(2.12)**
ln (DIST)	-0.364	-0.452	-0.267	-1.191	-0.391	-0.519	-0.401	-0.801
	(-1.22)	(-1.34)	(-0.45)	(-1.96)*	(-1.28)	(-1.50)	(-1.04)	(-2.01)*
DJPN	1.372	1.458	-1.819	-1.030	1.257	1.389	-1.569	-1.211
	(1.25)	(1.31)	(-1.09)	(-0.70)	(1.12)	(1.22)	(-1.22)	(-1.00)
LANG		0.188		1.721		0.274		0.981
		(0.57)		(2.95)***		(0.80)		(2.42)***
_cons	14.295	14.916	-20.157	-14.388	15.142	16.047	-12.724	-10.938
	(5.08)***	(4.92)***	(-2.46)**	(-1.94)*	(5.12)***	(5.05)***	(-2.85)***	(2.57)**
No. of Obs.	58	58	30	30	56	56	40	40
F	8.96***	7.15***	7.85***	9.97***	7.64***	6.19***	12.57***	12.61***
Adj. R-squared	0.359	0.350	0.486	0.607	0.326	0.321	0.543	0.598

Note: t-statistics are in parentheses.

*P=.10, **P=.05, ***P=.01

Definition of variables:

 EX92: U.S. cross-border sales of goods in 1992.

 OFDI92: Sales by foreign manufacturing affiliates of U.S. firms in 1992.

 EX98: U.S. Cross-border sales of goods in 1998.

 OFDI98: Sales by foreign manufacturing affiliates of U.S. Firms in 1998.

 GDP92: 1992 nominal GDP in U.S. dollars.

 GDPPC92: 1992 nominal GDP per capita in U.S. dollars.

 GDP98: 1998 nominal GDP in U.S. dollars.

 GDPPC98: 1998 Nominal GDP per capita in U.S. dollars.

Table 7. Determinants of U.S. Cross-Border Sales and Sales by Foreign Affiliates of U.S. Firms: Cross Country Estimation Based on Gravity Models   --- *Continued* ---

<Panel B> Service Sector

	Year 1992				Year 1999			
	ln (EX92)	ln (EX92)	ln (OFDI92)	ln (OFDI92)	ln (EX99)	ln (EX99)	ln (OFDI99)	ln (OFDI99)
ln (GDP92)	0.558	0.560	0.654	0.660				
	(5.28)***	(5.56)***	(2.70)**	(2.75)**				
ln (GDPPC92)	0.178	0.198	0.733	0.769				
	(2.18)**	(2.52)**	(3.39)***	(3.55)***				
ln (GDP99)					0.567	0.568	0.564	0.614
					(6.33)***	(6.92)***	(3.89)***	(5.26)***
ln (GDPPC99)					0.214	0.230	0.630	0.658
					(3.15)***	(3.67)***	(5.39)**	(7.01)**
ln (DIST)	-0.446	-0.645	0.350	0.150	-0.381	-0.570	-0.414	-0.879
	(-1.75)*	(-2.44)**	(0.48)	(0.20)	(-1.89)*	(-2.85)***	(-1.28)	(-3.03)***
DJPN	0.711	0.898	-0.698	-0.482	0.291	0.478	-0.484	-0.120
	(1.09)	(1.43)	(-0.57)	(-0.39)	(0.56)	(0.99)	(-0.60)	(-0.18)
LANG		0.419		0.496		0.398		0.911
		(1.93)*		(1.16)		(2.43)**		(3.50)***
_cons	9.421	10.821	-5.698	-4.575	8.659	10.037	5.402	7.589
	(2.21)**	(2.62)**	(-0.49)	(-0.39)	(2.41)**	(3.01)***	(0.95)	(1.66)
No. of Obs.	32	32	25	25	31	31	25	25
F	21.23***	19.43***	11.36***	9.52***	28.97***	28.75***	18.44***	25.47***
Adj. R-squared	0.723	0.748	0.633	0.640	0.789	0.822	0.744	0.836

Note: t-statistics are in parentheses.

*P=.10, **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.

EX99: U.S. Cross-border sales of services in 1999.

OFDI99: Sales of services by foreign affiliates of U.S. Firms in 1999.

GDP92: 1992 nominal GDP in U.S. dollars.

GDPPC92: 1992 nominal GDP per capita in U.S. dollars.

GDP99: 1999 nominal GDP in U.S. dollars.

GDPPC99: 1999 Nominal GDP per capita in U.S. dollars.

Table 8. Definition of Variables for Analysis of Inward FDI Penetration

Dependent Variable:

Japan's Inward FDI Penetration:

FDIJA	Share of workers employed by 10% or more foreign-owned JAFF in Japan's total workers: 1996

Independent Variables: [Expected Sign of Coefficients]

Advantages in Managerial Resources:

RDINT	R&D intensity: Ratio of R&D expenses to the gross value-added: 1995	[+]
ADINT	Advertisement intensity: Advertising expenses per employee: 1995	[+]

Factor Intensity:

CLRATIO	Capital-Labor Ratio: Tangible Fixed Assets per employee: 1992	[+]
LAND	Land intensity: Land input (book value) per employee: Industry average: 1995	[-]
UNIV	Skilled-labor intensity: Share of university graduates in total workers: 1992	[+]

Market Structure

HERF	Herfindahl Index calculated from share of number of employees: 1996	[-]
CR4	The top 4-firm concentration ratio calculated from share of number of employees: 1996	[-]

U.S. Inward FDI Penetration

FDIUS	Share of workers employed by foreign firms' U.S. affiliates in U.S. total workers: 1992	[+]

FDI Restrictiveness:

REGCUR	A dummy that takes 1 for currently regulated industries	[-]
REGPAST	A dummy that takes 1 for industries regulated in the past	[-/+]
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	[-/+]

Labor Market Structure:

JOBSEP	Job separation rate:1995	[+]

Keiretsu:

VERT	Share of workers employed by vertical Keiretsu firms in total workers: 1998	[-]
HORIZ	Share of workers employed by horizontal Keiretsu firms in total workers: 1998	[-]

Note: For more detailed definitions and sources of the variables, see Appendix.

Table 9. Determinants of Japan's Inward FDI Penetration in the Manufacturing Sector: OLS Estimation with Robust Standard Errors

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	Japan's Inward FDI Penetration								

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
RDINT	89.67	86.03	84.18	89.37	76.02	91.29	88.90	94.16	89.51
	(3.58) ***	(3.21) ***	(2.90) ***	(3.53) ***	(2.80) ***	(3.60) ***	(3.41) ***	(3.66) ***	(3.35) ***
ADINT	-4.62	-4.68	-4.90	-4.30	-4.67	-4.25	-4.65	-4.21	-4.67
	(-1.41)	(-1.45)	(-1.29)	(-1.24)	(-1.43)	(-1.39)	(-1.36)	(-1.35)	(-1.33)
CLRATIO	0.28	0.27	0.29	0.28	0.27	0.27	0.29	0.28	0.29
	(2.29) **	(2.27) **	(2.46) **	(2.23) **	(2.19) **	(2.35) **	(2.18) **	(2.29) **	(2.05) *
LAND	-0.23	-0.25	-0.24	-0.23	-0.24	-0.18	-0.22	-0.18	-0.22
	(-1.61)	(-1.68)	(-1.66)	(-1.59)	(-1.70) *	(-1.50)	(-1.59)	(-1.44)	(-1.56)
UNIV	47.99	47.85	43.74	44.85	57.39	49.17	47.84	51.04	48.42
	(2.88) ***	(2.90) ***	(2.42) **	(2.51) **	(3.28) ***	(2.81) ***	(2.76) **	(2.62) **	(2.61) **
HERF	0.48		4.78	-1.24	0.15	-14.63	1.08	-3.58	5.58
	(0.01)		(0.13)	(-0.04)	(0.00)	(-0.52)	(0.03)	(-0.08)	(0.11)
CR4		0.04							
		(0.34)							
DPROD			2.81						
			(0.82)						
JOBSEP				-1.04					
				(-0.74)					
PUBEMP					-12.74				
					(-2.56) **				
VERT						-2.44		-2.40	
						(-1.50)		(-1.45)	
HORIZ						1.54		1.82	
						(0.67)		(0.74)	
REGCUR							-0.79		-0.95
							(-0.24)		(-0.27)
REGPAST							0.16		0.18
							(0.08)		(0.09)
FDIUS								-0.06	-0.02
								(-0.40)	(-0.12)
_cons	-4.66	-4.91	-6.72	-2.76	-4.83	-5.11	-4.66	-5.27	-4.65
	(-2.35) **	(-2.56) **	(-2.56) **	(-0.75)	(-2.54) **	(-2.57) **	(-2.21) **	(-2.46) **	(-2.15) **
No. of obs	38	38	38	38	38	38	38	38	38
F	19.16 ***	18.75 ***	14.16 ***	17.49 ***	19.03 ***	25.29 ***	13.85 ***	20.45 ***	11.92 ***
Adj R2	0.635	0.636	0.643	0.636	0.659	0.646	0.635	0.647	0.635

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

2) *P=.10, **P=.05, ***P=.01 (two-tailed test)

Table 10. Determinants of Japan's Inward FDI Penetration in the Service Sector:
Tobit Estimation with Robust Standard Errors

	Japan's Inward FDI Penetration					
	(Dependent Variable: FDIJA10)					
	(1)	(2)	(3)	(4)	(5)	(6)
RDINT	-277.11	-153.40	-247.10	-287.04	-511.82	-325.76
	(-1.26)	(-1.06)	(-1.16)	(-1.30)	(-1.79) *	(-1.40)
ADINT	1.53	0.19	1.38	1.54	2.21	2.04
	(1.40)	(0.30)	(1.30)	(1.42)	(1.33)	(1.67) *
UNIV	1.96	1.45	1.94	1.93	-0.22	1.79
	(0.39)	(0.29)	(0.40)	(0.38)	(-0.05)	(0.35)
LAND	-17.71	-12.37	-26.50	-17.04	-18.36	-20.24
	(-0.82)	(-0.44)	(-1.08)	(-0.82)	(-1.39)	(-1.04)
HERF	30.88		27.08	31.68	26.91	36.66
	(2.00) **		(1.70) *	(2.05) **	(1.40)	(2.24) **
CR4		0.13				
		(2.01) **				
DPROD			1.75			
			(1.01)			
JOBSEP				-22.04		
				(-0.27)		
PUBEMP	-0.12	-0.04	-0.12	-0.12	-0.05	-0.12
	(-2.71) ***	(-1.92) *	(-2.83) ***	(-2.71) ***	(-1.56)	(-2.87) ***
VERT					8.49	
					(0.53)	
HORIZ					44.42	
					(1.60)	
RINVJAUS						-4.15
						(-1.90) *
FDIUS	0.81	0.67	0.80	0.81	0.31	0.72
	(1.80) *	(1.74) *	(1.76) *	(1.80) *	(1.28)	(1.60)
_cons	-1.80	-3.37	-2.95	-1.35	-1.95	-1.23
	(-0.87)	(-1.25)	(-1.35)	(-0.45)	(-1.36)	(-0.59)
No. of obs	41	41	41	41	41	41
Wald	14.75 **	13.17 *	20.95 ***	14.68 *	31.60 ***	16.77 **
Log likelihood	-119.97	-118.952	-119.614	-119.956	-111.334	-119.265

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

2) The following nine industries are excluded from the estimations due to the unavailability of some variables: other insurance services, postal services, education, research institutes (natural sciences), research institutes (social sciences and humanities), health and hygiene, private non-profit organizations' services, social insurance and welfare, and unclassified services.

3) *P=.10, **P=.05, ***P=.01 (two-tailed test)

Table A.1 The Process of Inward FDI Liberalization in Japan

	For Newly Established Firms			For Existing Firms	
	Number of Industries			Foreign Ownership	
	Up to 50% Foreign Ownership Permitted	Up to 100% Foreign Ownership Permitted	Total	By one Foreign "Person" (*1)	By All Foreign "Persons" (*1)
Phase I (July 1967)	33	17	50	up to 7%	up to 20% (*2)
Phase II (Mar. 1969)	160	17	204	up to 7%	up to 20% (*2)
Phase III (Sep. 1970)	447	77	524	up to 7%	less than 25% (*2)
Automobile Industry Liberalization (June 1971)					
Phase IV (Aug. 1971)	(*3)	228	-	less than 10%	less than 25% (*2)
Phase V (May 1973)	In principle, 100% liberalized with the exception of 22 industries (excepted 5 industries and 17 industries with a time limit) (*4)			(*5)	
Liberalization of the 17 industries with a time limit (From Dec. 1974 to May 1976) (*6)					
Retail Trade Liberalization (June 1975)					
Amendments to the Foreign Exchange Law (Dec. 1980)					
	Inward FDI is not subject to prior permission, but in general, to **prior notification** to the Minister of Finance and the related Ministers in order to determine if an inquiry is necessary. The amendments abolished the condition that takeovers by foreigners require the agreement with the owners of acquired firms.				
Discontinuance of Foreign Participation Restriction for the Designated Companies (July 1984) (*7)					
Amendments to the Foreign Exchange Law (Jan. 1992)					
	Inward FDI is now subject, in general, to **ex post facto reporting** or, in certain cases, prior notification to the Minister of Finance and the related Ministers in order to determine if an inquiry is necessary. An ex post facto report is required to be submitted within 15 days after the investment is made.				
Amendments to the Foreign Exchange Law (April 1998)					
	Telecommunications and media industries changed from prior to ex post notification.				

Notes: (*1) "Person" means any person, any government or its representative, and any foreign juridical person or association.

(*2) other than the excepted industries

(*3) All industries other than "100% liberalized industries" and 7 industries to which individual screenings are applied.
"100% liberalized industries" are the industries in which 100% foreign participation in the share capital is automatically approved

(*4) The excepted 5 industries are: 1. Agriculture, forestry and fishery; 2. Oil; 3. Mining; 4. Leather and leather products manufacturing; and 5. Retail trade

(*5) For all industries other than the excepted 5 industries and 17 industries with a time limit 100% foreign ownership is allowed if the firm agrees. In other cases, the foreign ownership restrictions are same as before

(*6) The liberalization dates for the 17 industries with a time limit are as follows:

Year	Industries
Dec. 1974	Integrated circuits
May 1975	Meat products, Tomato processed products, Prepared feed for animals, Pharmaceuticals and agricultural chemicals, Ferroalloy, Music records, Real estate, Electronic precision machinery, Packing machinery, Oil pressure instruments, Apparel (including wholesale trade), Prepared food products for food service industry
Dec. 1975	Manufacture of computers, Sales and leasing of computers
April 1976	Information service industry
May 1976	Fruit juice, Sensitive materials for photography

(*7) The specified 11 companies, such as Hitachi and Arabian Oil.

Sources: Nakamura, Fukao, and Shibuya (1997) Table 9; APEC(1999)

Table A.2 Major Restrictions on Inward FDI in Japan

Apart from the regulations written in the Foreign Exchange Law, certain other laws, such as the following restrict FDI in Japan:

Sector	Prohibition, Limitation, or Special Conditions
Air transport	A license to operate a domestic air transport business shall only be granted to: a juridical person or association with less than a third of voting rights controlled by foreigners.
Maritime transport	Transport of goods and passengers between Japanese ports is reserved to Japanese ships. Foreign ownership of Japanese ships can only occur through an enterprise incorporated in Japan in accordance with the Ship Law.
Telecommunications	Foreign participation in the share capital of Nippon Telegraph and Telephone corporation (NTT) is restricted to less than one-fifth. The limitations on foreign capital paticipation (formerly limited to less than a third) in all Type I telecommunications carriers (except for NTT and KDD) were abolished in February 1998. The limitation on foreign capital participation in KDD was eliminated in July 1998.
Broadcasting	Foreigners or foreign-controlled enterprises (where any of the officers executing the business is a foreigner, or 20% or more of whose voting rights in aggregate are owned by foreigners) are not granted: 1) licenses for broadcasting stations including AM, FM or television broadcasting stations; and 2) approvals as program-supplying broadcasters. (The bills which prohibited the granting of permissions to foreigners for the installation of cable television facilities were removed in June, 1999.)
Mining	No one other than Japanese citizens or a Japanese juridical person shall become a mining right owner. Japan has no performance requirement or regulation tied in any way to the export orientation of an investment proposal under the Foreign Exchange Law.
Insurance	Foreign insurers are required in all cases to lodge an initial deposit for the establishment of branches which is essentially equivalent to the share capital required of domestic companies. Initial deposits may be required of national insurers in some cases.

Sources: APEC (1999); Japan Investment Council (various years);
      Nakamura, Fukao, and Shibuya (1997) Table 11.

Table A.3 Reservations to the OECD Code of Liberalization of Capital Movements:
U.S. - Japan Comparison

Year	Japan	United States
1973	Agriculture, forestry and fisheries Mining Petroleum Leather and leather products Retail Trade Integrated circuits, Meat products, Tomato processed products, Prepared feed for animals, Pharmaceuticals and agricultural chemicals, Ferroalloy, Music records Real estate, Electronic precision machinery, Packing machinery, Oil pressure instruments, Apparel (including wholesale trade), Prepared food products for food service industry Manufacture of computers, Sales and leasing of computers, Information service industry, Fruit juice, Sensitive materials for photography Sectors related to national security or public health*	Fresh water shipping, Domestic radio communications, Domestic air transport Coastal shipping, Hydro-electric power production, Other forms of communications, Utilization and production of atomic energy Sectors related to national security or public health*
1982	Agriculture, forestry and fisheries Mining Petroleum Leather and leather products Sectors related to national security or public health*	Fresh water shipping, Domestic radio communications, Domestic air transport Coastal shipping, Hydro-electric power production, Other forms of communications, Utilization and production of atomic energy Sectors related to national security or public health*
1993	Agriculture, forestry and fisheries Mining Petroleum Leather and leather products Air transport, Maritime transport Investment trust management business Sectors related to national security or public health*	Atomic energy Broadcasting (radio and television) Air transport Coastal and domestic shipping Ocean thermal energy, Hydroelectric power, Geothermal steam or related resources on federal lands, Mining on federal lands or on the outer continental shelf or on the deep seabed Fishing in the "Exclusive Economic Zone" Deepwater ports Sectors related to national security or public health*
1997	Agriculture, forestry and fisheries Mining Petroleum Leather and leather products Air transport, Maritime transport Investment trust management business Sectors related to national security or public health*	Atomic energy Broadcasting (radio and television) Air transport Coastal and domestic shipping Ocean thermal energy, Hydroelectric power, Geothermal steam or related resources on federal lands, Mining on federal lands or on the outer continental shelf or on the deep seabed Fishing in the "Exclusive Economic Zone" Deepwater ports Sectors related to national security or public health*

*   Under the OECD Code, members are not prevented from taking action in certain sectors, for reasons such as the protection of their essential security interests. That is, a reservation to the Code is not necessary for those sectors. In accordance with the April 1984 decision, however, such measures as controls imposed for reasons of national security or public health are now examined by the Committee. As a result, some items of reservations related to those reasons are added to the Code in 1990s.

Sources: Nakamura, Fukao, and Shibuya (1997), Table 12.
          OECD, *Code of Liberalisation of Capital Movements* , various years.