APPLICATION OF NATIONALITY-ADJUSTED NET SALES AND VALUE ADDED FRAMEWORK: THE CASE OF JAPAN

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ABSTRACT

This paper applies the nationality-adjusted net sales and value added framework proposed in Baldwin and Kimura (1996) to Japan. Despite possibly large estimation errors due to statistical deficiencies, the framework is very useful for analyzing the relationship of the Japanese economy to the world economy. We find that Japan is special in the following four aspects. First, Japanese-owned firms have become increasingly dependent on the marketing activities of their foreign affiliates, rather than depending on cross-border exports by parent firms located in Japan. Second, the much smaller activities of Japanese affiliates of foreign firms (JAFF) relative to those of foreign affiliates of Japanese firms (FAJF) are apparent in terms of sales, value added, and employment, at both the macroeconomic and sectoral levels. Third, Japanese net sales to foreigners are consistently larger than cross-border net exports of Japan. Fourth, among the activities of FAJF, the importance of commercial FAJF is particularly large; these commercial FAJF handle a large portion of Japanese exports and imports.

The paper concludes by discussing a number of statistical improvements required by the Japanese government in order to apply our analytical framework more rigorously.

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I. Introduction

In the companion paper for the United States (Baldwin and Kimura (1996)), we propose

a nationality-adjusted net sales and value-added framework and apply it to United States data

in order to show its usefulness in analyzing a number of current economic issues and to specify

points for statistical improvements. The framework should eventually be expanded to an

internationally integrated statistical system that captures the entire activities of multinational

enterprises in the world. As a preliminary effort, this paper applies the framework to Japan.

The proposed framework analyzes the globalization of firms' activities from a new

viewpoint. The traditional balance of payments (BOP) statistics conceptually presents

international transactions between economic agents in different locations, a framework

consistent with GDP or national accounts statistics.[1] Since the BOP format primarily follows

the residency of economic agents, the value added of foreign affiliates is conceptually

decomposed into a residents' portion and a nonresidents' portion, with the latter portion being

captured as investment income (including retained earnings). Thus, the BOP framework is not

very convenient in analyzing the behavior of globalized firms'. Merchandise and services

transactions between parent companies and affiliates may be qualitatively different from usual

transactions between domestic firms and foreign firms. A firm may have its own resources for

competitiveness, such as firm-specific technologies and managerial abilities, that can be used

both inside and outside of the home country. Furthermore, even if a firm has multiple

establishments across the world, it may make managerial decisions jointly. Our proposed

framework assigns nationalities to firms and treats each firm as an individual entity. By doing so, we can analyze the competitiveness of firms in international markets, the importance of foreign-controlled affiliates in a national economy, firms' decisions on whether to export or to invest abroad, and other related issues. These features of firms' activities are particularly important in the case of Japan where firms' activities have been rapidly globalized.

Although Japan is one of the few countries that collect extensive operational data on inward and outward direct foreign investment (DFI), we still encounter a number of problems in applying the framework. We try to identify explicitly various statistical deficiencies in the available data and relate them to the proposed statistical format. However, despite large possible estimation errors, we believe that the framework is very useful for analyzing the relationship of the Japanese economy to the world economy. Our analysis confirms the often-claimed asymmetry between inward and outward DFI of Japan. We also find a rapid expansion of Japanese firms' activities abroad that exceeds the expansion of exports. In addition, we show that the activities of commercial affiliates of Japanese firms abroad, particularly those of general trading companies, play an important role in Japanese international transactions.

In the next section, the existing data for Japanese inward/outward DFI are briefly explained. Sections III and IV present our estimation of aggregate and sectoral net sales by Japanese to foreigners and the value added of foreign affiliates. Section V provides a preliminary overview on commercial affiliates of Japanese firms, which are specific to Japan and must be taken into consideration in developing an internationally integrated statistical format. Section VI summarizes what is special for Japan and discusses directions for the improvement of the statistical format.

II. Data on sales and purchases by affiliates

A MITI data set (hereinafter referrerd to as "the old FAJF series") is the only currently-available source for time-series data on the sales and purchases of foreign affiliates of Japanese firms (FAJF). The International Enterprises Section of MITI annually distributes questionnaires to parent Japanese companies that are identified by the Foreign Exchange and Foreign Trade Control Law as having foreign affiliates with more than a 10% share.[2] A detailed survey was initiated in 1980 and has been conducted every three years since 1983. A shortened questionnaire is used in the other years. Among the particularly useful information collected is data on purchases by FAJF (such data are not collected in the U.S. surveys of foreign direct investment).[3] This survey, however, is so-called *shounin toukei,* which means "approved statistics," and it is not legally mandatory for firms to fill in the questionnaire. Therefore, the data are much less reliable than the U.S. data. A serious problem is low coverage. For example, in 1992, only 65.5% of the questionnaires sent to foreign affiliates were returned to MITI. Moreover, not all firms returning the questionnaire answered all of the questions. To make matters worse, MITI does not report the number of firms that answered each question. This problem is particularly serious for purchases data. In addition, not all firms that provide total sales or purchases data report by-destination disaggregation of sales or by-origin disaggregation of purchases.

The Research and Statistics Department of the Minister's Secretariat of MITI has recently begun to publish another statistical series covering FAJF. This survey called the Basic Survey of Business Structure and Activity (hereinafter "the new FAJF series"), collects data on FAJF as a part of information obtained on private firms' activities in Japan. The new series

is so-called *shitei toukei*, which means "designated statistics," and therefore companies have a legal obligation to return completed questionnaires. The survey was scheduled to be conducted annually beginning in 1995. Since the figures for the 1991 financial year were not published until December 1994, we have figures for only one year thus far. Table 1 presents the 1991 financial year data on the activities of FAJF from the two sources, the old and new FAJF series. The new FAJF series provides more reliable figures than the old FAJF series, but the coverage is narrower and biased toward large companies.[4]

Data on Japanese affiliates of foreign firms (JAFF) are also reported by the International Enterprises Section of MITI. The structure of this survey is basically the same as that of the old FAJF survey. The coverage is, however, even narrower; for the 1992 financial year, for instance, only 53.7% of the questionnaires were returned to MITI.[5]

Another difference between the MITI and BEA data is that the former data set does not report sales of goods and services separately. In particular, the questionnaire by the International Enterprises Section of MITI does not explicitly specify sales and purchases as "sales and purchases of goods and services" so that we are not sure if firms report services transactions. Therefore, in our estimations, we tentatively use merchandise trade (not including services trade) for cross-border trade data.

III. Estimation of aggregate net sales

(1) Defining nationalities

MITI's old FAJF series defines foreign affiliates of Japanese firms (FAJF) as firms in which Japanese have more than a 10% share and majority-owned affiliates as firms in which

Japanese have more than a 50% share. For our purposes, it is better to use the data for majority-owned affiliates, but they are not available in time series form.[6] Thus, we define FAJF as firms in which Japanese have more than a 10% share. This may cause considerable measurement errors, particularly since it is a common practice for general Japanese trading companies to participate in a joint venture between Japanese and foreign companies as a third party with a minor share. For inward DFI, MITI's JAFF series defined Japanese affiliates of foreign firms (JAFF) as majority-owned affiliates until the 1990 financial year and as affiliates with more than one-third shares in the 1991 and 1992 financial years.

As in the case of the United States, we do not have data on sales and purchases by foreign citizens in Japan and those by Japanese living abroad. It is therefore necessary to classify households on a country-of-residence basis rather than on a nationality basis.

The term, "Japanese," thus consists of Japanese-owned firms in Japan and abroad, households of Japanese and private foreign citizens residing in Japan (Japanese-resident households), and Japanese government units. Similarly, the term, "foreigners," consists of foreign-owned firms in Japan and abroad, households of foreign and Japanese citizens residing abroad (foreign-resident households), and foreign governments.

(2) Estimates of net sales of Japanese to foreigners

Table 2 presents estimates of the net sales of Japanese to foreigners for 1987-1992. The table consists of (I) cross-border sales to and purchases from foreigners by Japanese, (II) sales to and purchases from foreigners by FAJF, and (III) Japanese sales to and purchases from JAFF (also see Figure 1).

In Part I, Japanese cross-border sales (exports) to foreigners are estimated by subtracting the sum of Japanese exports shipped to FAJF and Japanese exports shipped by JAFF from cross-border exports of Japan valued on an f.o.b. basis. The estimate of such cross-border sales (exports) in 1987, for example, is 11,714 billion yen, which is much smaller than Japan's cross-border exports of 33,315 billion yen.

Quite aside from the above-mentioned coverage problem, the 11,714 billion yen figure is, for several reasons, still only an approximate estimate. The most serious problem is that the figure for Japanese exports shipped to FAJF (20,571 billion yen) is a very rough estimate. Among FAJF reporting the total amount of purchases are many that do not provide purchase figures disaggregated by origin, i.e., a considerable portion of FAJF do not report separately local purchases, purchases from Japan, and purchases from third countries. In 1987, for example, only 38.4% of total purchases by FAJF can be disaggregated by origin. We, hence, first calculate the ratio of purchases from Japan to total purchases for firms in each sector reporting purchases by origin. Then we multiply that ratio by total purchases by all firms in the sector and sum up all sectors' estimates of purchases from Japan. Another potential estimation problem concerns the treatment of purchases by FAJF from commercial FAJF. When an FAJF in the commercial sector imports intermediate goods and sells them to a non-commercial FAJF, both the commercial and non-commercial FAJF may treat these purchases as purchases from abroad. This means that the purchases ratios from Japan (and those from third countries) may be overstated to some extent. The estimation of purchases by FAJF from Japan or Japanese exports shipped to FAJF (20,571 billion yen) in 1987, may therefore differ from the true figure. In addition, exports by JAFF to FAJF are subtracted twice in this

calculation since they are included in both Japanese exports shipped to FAJF and Japanese exports shipped by JAFF. This, however, probably does not affect our estimates very much.[7]

The lower half of Part I of Table 2 shows our estimates of Japanese cross-border purchases (imports) from foreigners, namely, 9,622 billion yen in 1987. These are again much smaller than cross-border imports (21,737 billion yen). They are calculated by subtracting the sum of Japanese imports shipped by FAJF and Japanese imports shipped to JAFF from Japanese cross-border imports valued on a c.i.f. basis. Again, the estimates of Japanese imports shipped by FAJF or sales to Japan by FAJF (9,294 billion yen) may contain large errors. Since a large portion of FAJF do not report by-destination disaggregation of their sales (to the local market, to Japan, or to third countries), sales by FAJF to Japan are estimated by calculating the ratio of sales to Japan to total sales for each industrial sector, multiplying this ratio by total sales of the sector, and summing up all sectors' estimates of sales to Japan. Again, the ratios of sales to Japan to total sales may be overstated due to double-counting in the transaction through commercial FAJF. In addition, Japanese imports from FAJF shipped to JAFF are subtracted twice.[8]

By subtracting 9,622 billion yen from 11,714 billion yen, we obtain Japanese net cross-border sales to foreigners, 2,093 billion yen in 1987. Our estimates are consistently smaller than the cross-border trade balance, except in 1992.

Part II of Table 2 presents estimates of sales to and purchases of FAJF to and from foreigners. To obtain sales of FAJF to foreigners (42,160 billion yen in 1987), we subtract from their total sales both sales among themselves and their sales to Japan. Data on sales among FAJF are not available. However, intra-group sales of FAJF to local markets and third

countries, which are a part of sales among FAJF, can be estimated. The old FAJF series for the years 1989 and 1992 give shares of intra-group sales of FAJF (to local markets, to Japan, and to third countries) to total sales of FAJF for each sector. By multiplying each sector's total sales by these shares and adding them across sectors, we obtain proxies for sales among FAJF. Since these shares are available only for 1989 and 1992, the 1989 shares are used for 1987-1988 and 1990-1991. The other term to be subtracted, Japanese imports shipped by FAJF, may contain a large error, as discussed above.

Purchases of FAJF from foreigners abroad (23,950 billion yen in 1987) are calculated by subtracting from their total purchases both purchases from other FAJF and Japanese exports shipped to FAJF. Data on purchases by FAJF are directly available, which is an advantageous feature of the Japanese statistics compared with the U.S. BEA statistics. The next term, purchases from other FAJF by FAJF, is not directly available. We use intra-group sales of FAJF to local and third countries, estimated above, as a proxy.[9] The other terms to be subtracted, Japanese exports shipped to FAJF, may contain large estimation errors for the above-mentioned reasons. Our estimation of net sales by FAJF to foreigners is 23,950 billion yen for 1987.

Part III of Table 2 presents the estimates of net sales of Japanese to JAFF, which were -5,927 billion yen in 1987. Again, the JAFF series published by MITI directly provide data on purchases by JAFF. Sales among JAFF, however, are not available. We thus calculate Japanese sales to JAFF (3,464 billion yen in 1987) by subtracting Japanese imports shipped to JAFF from total purchases by JAFF. Japanese purchases from JAFF (9,391 billion yen in 1987) are obtained by subtracting Japanese exports shipped by JAFF from total sales by JAFF.

By summing up these three components, we obtain estimates of net sales to foreigners by Japanese, for example, 20,116 billion yen in 1987.

Despite the possible differences from the true figures, our nationality-based account characterizes various key feature of the Japanese economy. First, the asymmetry between FAJF and JAFF is apparent. As often pointed out (see, for example, Lawrence (1993) and Bergsten and Noland (1993, pp. 79-82)), the activities of JAFF are much smaller than those of FAJF. Second, net sales by Japanese to foreigners are consistently larger than the cross-border net sales (exports). This, of course, is due to the larger activities of FAJF than those of JAFF. According to our estimates, nationality-adjusted net sales grew at a considerably faster pace than cross-border net sales between 1988 and 1992.[10] The strong yen, the saving-investment balance, the so-called "bubble economy," the competitive edge vis-a-vis the exchange rate, and fear of foreign protectionism seem to have accelerated Japanese outward DFI. Third, compared with the United States, the proportion of cross-border transactions through foreign affiliates is large. Based on our estimates for 1987, U.S. exports and imports through foreign affiliates of U.S. firms (FAUSF) are 25.1% and 15.2% of total U.S. exports and imports, while Japanese exports and imports through FAJF are 61.7% and 42.8% of total Japanese exports and imports. Although the ratio on the export side for Japan sharply declines to 34.1% in 1992, both ratios are still higher than those for the United States.[11] As we mentioned, our estimates of by-destination sales and by-origin purchasesof FAJF could contain large errors, but we can still infer that Japan depends on its foreign affiliates in export and import transactions much more extensively than the United States does. Activities by FAJF in the commercial sector are particularly important. According to our estimates, Japanese

exports and imports through commercial FAJF amounted to 48.2% and 36.0% of total Japanese exports and imports in 1987. We discuss commercial FAJF further in Section V.

(3) Estimates of value added by FAJF and JAFF

The same data set as we used in constructing Table 2, can also be utilized to estimate value added by FAJF and JAFF. Since the old FAJF and JAFF series published by MITI directly report total sales and purchases by FAJF and FAFF, value added can be calculated by simply subtracting total purchases from total sales. Strictly speaking, we need to take into consideration such factors as depreciation, indirect taxes, and changes in inventory stock, but data on these variables are not available. Table 3 and Figure 2 present our estimates. The format of the table and the figure follows our companion paper for the United States.

Table 3 also reports ratios of value added by FAJF to value added by all Japanese-owned firms, the latter being defined as Japanese GDP plus value added by FAJF minus value added by JAFF, and ratios of value added by JAFF to the GDP of Japan.[12] The ratio of value added by FAJF to the value added by all Japanese-owned firms increased during the period, but the figures of 8.33% and 7.87% for 1991 and 1992 may be overstated due to an unusually low purchases figure compared with the corresponding sales figure.[13] We can, however, conclude that Japanese firms have increased the extent of production abroad and have roughly reached the same degree of internationalization of activities as U.S. firms have. As reported in our companion paper, the ratio of value added by FAUSF to that of U.S-owned firms ranges from 5 to 6 %. The ratio of value added by JAFF to Japanese GDP, in contrast, is generally only a little larger than 1%. The asymmetry between the behavior of FAJF and JAFF is

obvious.

The proportion of foreign activities by Japanese firms is often measured by the foreign production ratio, which is defined as the ratio of the value of production of FAJF to total domestic production. The figure for the manufacturing sector in the 1993 fiscal year, for example, is estimated as 6.4% by MITI (1994, p. 46). The value of production, however, includes the value of intermediate inputs and thus is not appropriate for measuring the size of economic activities in Japan and abroad. Our value added method is conceptually better for indicating the proportion of foreign activities of Japanese firms although it may contain considerable measurement errors due to the quality of data.

(4) Comparison of exports and DFI on a value added basis

In other empirical studies, firms' choice between exports and DFI is usually captured by comparing basically incomparable figures, namely, exports and DFI flows. Our value added method makes it possible to compare directly two ways by which firms can sell their products to foreigners abroad: by producing domestically and exporting or by producing abroad and selling there.

Following the companion paper for the United States, we calculate Japanese value added figures in exports of Japanese-owned firms. They are useful in comparing the proportion of Japanese firms' sales activities to foreigners through cross-border transactions and through the activities of FAJF. To obtain the estimates, we subtract exports by FAJF from total cross-border exports and then subtract the import component in the remaining exports.[14] In Japan, input-output tables are presented in the non-competitive-import form and hence

directly provide the import inducement coefficient of exports or the direct and indirect import

content of exports. This was 10.36% in 1990. By using this figure for 1987-1992, Japanese

value added in exports of Japanese-owned firms can be calculated. This amounted to 28,941

billion yen in 1987, for example. Out of the 28,941 billion yen, 10,501 billion yen is the value

added in exports by Japanese firms located in Japan to foreigners abroad. This figure is

directly comparable with the 10,384 billion yen of value added in the goods and services sold

by FAJF to foreigners. There are two ways for Japanese firms to sell their products to

foreigners: by producing in Japan and exporting or producing abroad and selling there. The

comparison between 10,501 billion yen and 10,384 billion yen provides a clear idea of the

relative importance of these two marketing methods. Compared with the same figures for the

United States reported in Baldwin and Kimura (1996), transactions by Japanese foreign

affiliates are more important, due mainly to the large ratio of exports by FAJF to total exports.

Even after discounting the large estimates of value added by FAJF in 1991 and 1992,

transactions by FAJF seem to be becoming more important over time.

Value added in exporting countries by foreign-owned firms is estimated in a similar

way. Because input-output tables for the rest of the world are not available, the figure for

Japan, 10.36%, is tentatively used. The estimate of value added in exporting countries by

foreign-owned firms abroad is 11,154 billion yen in 1987. Out of this, value added in foreign

exports to Japanese in Japan is 8,625 billion yen. This figure can be directly compared with

3,727 billion yen, which is the value added in goods and services sold by JAFF to Japanese in

Japan. The importance of transactions through JAFF seems to be becoming smaller over time.

IV. Estimation of sectoral net sales

(1) Sectoral net sales

In this section, we estimate nationality-based net sales by individual industrial sectors. We believe that they provide a better idea of firms' international competitiveness determined by technological know-how and managerial ability than cross-border net exports do.

A problem arising in sectoral matching of DFI figures and trade statistics is that affiliate data are classified by industries while cross-border trade data are classified by commodities. This difference leads to a serious problem, particularly in the treatment of the commercial sector. We therefore estimate net sales only for the manufacturing sector.

Nationality-adjusted sales for individual sectors are calculated as follows:

Nationality-adjusted sales = Japan's cross-border exports

+ sales by FAJF + purchases by JAFF - Japan's exports shipped to FAJF

- Japan's imports shipped by FAJF - sales to other FAJF by FAJF

- Japan's exports shipped by JAFF - Japan's imports shipped to JAFF.

On the other hand, nationality-adjusted purchases for individual sectors are defined as

Nationality-adjusted purchases = Japan's cross-border imports

+ sales by JAFF + purchases by FAJF - Japan's exports shipped to FAJF

- Japan's imports shipped by FAJF - purchases from other FAJF by FAJF

- Japan's exports shipped by JAFF - Japan's imports shipped to JAFF.

Nationality-adjusted net sales are calculated by subtracting nationality-adjusted purchases from nationality-adjusted sales. We assume that each industry purchases intermediate inputs only from their own industry, since the data of sectoral purchases by industrial origin are not

available. This is, of course, a strong assumption but should roughly hold for the manufacturing sector. Nationality-adjusted net sales of an individual industrial sector then become equivalent to cross-border net sales (exports) plus value added by FAJF minus value added by JAFF for the sector. By following this estimation procedure, possible estimation errors in by-destination sales and by-origin purchases by FAJF and JAFF are canceled out in the calculation.[15]

Table 4 presents cross-border net sales, nationality-adjusted net sales, and their ratios to the corresponding total sales (of all firms in Japan or of all Japanese-owned firms). To be consistent with the macroeconomic figures, we use sectoral data on the value of output (in producer prices) obtained from the national account statistics as a proxy of the total sales of all firms in Japan.[16] The figures for aggregate cross-border net sales are slightly different from those for the cross-border merchandise trade balance shown in Table 2, because the former are based on United Nations data reported in U.S. dollars, while the latter are from the Japan Statistical Yearbook reported in yen. The other data are taken directly from the FAJF and JAFF series published by MITI.

For the manufacturing sector as a whole, net sales figures, both cross-border and nationality-adjusted, are positive as expected. However, whereas the ratios of nationality-adjusted net sales to total sales have increased since 1989, those of cross-border ones have not changed much. This suggests that the international competitiveness of Japanese manufacturing firms has increased, while that of firms in territorial Japan has not. We again have to note reservation about the 1991-1992 figures, however. As for sectoral patterns, large positive net sales, both cross-border and nationality-adjusted, are found in general machinery, electrical

machinery, transport equipment, and precision machinery, and negative net sales are shown for food processing, textiles, chemicals (except nationality-adjusted net sales in 1992), and petroleum and coal products. The ratios of nationality-adjusted net sales to total sales sometimes exhibit significant sudden changes, for example, textiles in 1989 and petroleum and coal products in 1992, even though the ratios of cross-border net sales to total sales do not change appreciably. Such jumps are mainly caused by drastic increases in sectoral value added by FAJF.

(2) Sectoral significance of FAJF and JAFF

The macroeconomic significance of the activities of FAJF and JAFF have already been discussed. The sectoral importance of the activities of FAJF and JAFF can be obtained by using sectoral data on output, value added, and employment in the Japanese national accounts statistics. Table 5 presents shares of FAJF in Japanese-owned firms (firms in Japan minus JAFF plus FAJF) and shares of JAFF in firms in Japan in terms of sales, value added, and employment.

Although there are some irregular up-and-downs partly due to the sampling problem, the figures still provide useful information for analyzing differences in the relative importance of FAJF and JAFF across manufacturing subsectors and across time. The value added shares are particularly useful for comparative purposes. The major findings are as follows: first, the value added share of FAJF in Japanese-owned firms for the total manufacturing sector increased from 3.76% in 1987 to 8.57% in 1990, and then to 10.76% by 1992. The importance of the activities of foreign affiliates for Japanese-owned manufacturing firms does not appear

to be as extensive as for U.S.-owned firms but has been increasing. We again need to discount the figures for 1991 and 1992, however. The share of JAFF in the activities of all firms in Japan has been low and nearly constant. The asymmetry of inward and outward DFI is also apparent at the sectoral level.

Second, industries of comparative advantage for Japan, such as electrical machinery and transport equipment, have rapidly increased the ratio of value added in FAJF to that in Japanese-owned firms. In 1992, the ratios were as high as 17.29% and 29.66% for electrical machinery and transport equipment. The value added shares of JAFF to firms in Japan, in contrast, started from a low level in 1987 and still remained low in 1992, e.g., 5.09% and 0.69% in these sectors. The value added shares of FAJF to Japanese-owned firms for general machinery and precision machinery show some anomalies in 1992; in that year, value added by FAJF in these industries decreased drastically. We are not sure whether this is due to a small, unstable sample, to industry reclassification of firms, or changes in firms' strategies.

Third, in industries of comparative disadvantage for Japan, such as textiles and chemicals, the shares of FAJF to Japanese-owned firms have also increased. The share of JAFF to firms in Japan also increased in the chemical industry. Large outward and inward DFI characterizes the chemical industry in the case of the United States, and the Japanese chemical industry seems to behave in the same manner.

V. Commercial FAJF and the presence of general trading companies

A special feature of foreign affiliates of Japanese firms is the large presence of commercial FAJF in the commercial sector, particularly in the wholesale trade sector. Table

6 presents the Japan-U.S. comparison of manufacturing and commercial affiliates in 1991. The table classifies industries both for parent companies and for foreign affiliates. FAJF in the wholesale trade sector have 75% and 56% shares in all FAJF in terms of sales and value added, while FAUSF (foreign affiliates of U.S. firms) in the wholesale trade sector (excluding petroleum wholesale trade) have shares of 18% and 12%.[17] Although the figures for FAUSF would become larger by including wholesale petroleum trade, the figures for FAJF are still much larger than those for FAUSF. FAJF in the wholesale trade sector are also characterized by high value added per employee compared with FAUSF.

Table 6 also shows an interesting contrast between figures based on the industry classification of parent companies and those based on the classification of affiliates. In the case of FAUSF, we see that most of FAUSF in the wholesale trade sector have parent companies in non-wholesale-trade sectors. This means that a major function of wholesale FAUSF is undertaking foreign marketing operations for manufacturing parent companies. In contrast, in the case of FAJF, about a half of FAJF in the wholesale trade sector have parent companies in the wholesale trade sector. This suggests that general trading companies (GTCs) play a large role in Japanese international transactions.

A special study conducted by the Japan Foreign Trade Council presents data for sales by the "major branches" of the nine largest Japanese GTCs.[18] The "major branches" are defined as foreign affiliates of GTCs that have close contacts with the Japanese headquarters and organize local activities. The sample covered 197 affiliates in 37 countries. Table 7 presents the sales figures. Although we have some reservations on the quality of these data, particularly because of double-counting of transactions among the firms, the significance of

GTCs' activities is apparent. The sales to Japan by the GTC major branches have a 98% share in those by commercial FAJF in our estimates. The same share in terms of the sales to third countries is 105%. These shares are, of course, subject to estimation errors, but they clearly indicate that the presence of GTCs in international transactions of commercial FAJF is large.

VI. Concluding remarks

In this paper, we applied our nationality-based net sales and value added framework to Japanese data. Foreign production activities of Japanese firms have been increasingly important, and the nationality-based net sales estimates proved to be useful in analyzing firms international activities. Our value added accounting also provides an integrated framework for analyzing both exports and activities of foreign affiliates and thereby in understanding key characteristics of the Japanese economy.

We found that Japan is special in the following four aspects. First, Japanese-owned firms have become increasingly dependent on the marketing activities of their foreign affiliates (FAJF), rather than depending on cross-border exports by parent firms located in Japan. Second, the asymmetry between inward and outward DFI is apparent in terms of sales, value added, and employment, at both the macroeconomic and sectoral levels. Third, Japanese net sales to foreigners are consistently larger than cross-border net exports of Japan. Fourth, among the activities of FAJF, the importance of commercial FAJF is particularly large, with these commercial affiliates handling a large portion of Japanese exports and imports. Our statistical framework is useful for identifying these characteristics.

To apply our analytical framework more rigorously, a number of statistical

improvements are required. First, MITI or the Government of Japan must develop an enforceable data collection system for both inward and outward DFI on a proper legal basis. This statistical reform should increase the coverage of the surveys as well as improve the quality of the information on the questionnaires, particularly that on by-destination sales and by-origin purchases of affiliates. In this regard, introducing the new FAJF series has been a major step by MITI in improving data collection. Hopefully, more questions on foreign affiliates will be included in the survey, and the survey will be integrated with the old FAJF series. Second, the extended surveys of the old FAJF series implemented once every three years report ratios of "within-the-same-firm-group" sales and purchases to total sales and purchases, but no data on sales among FAJF or among JAFF are collected, as the U.S. BEA surveys do. Adding questions on sales among affiliates will help apply our method more precisely. Third, we need to develop a proper statistical framework to capture the activities of commercial FAJF. Possible double-counting in the sales to or purchases from Japan or third countries by FAJF must be corrected. In addition, possible double-counting coming from the definition of FAJF must be eliminated..

References

Baldwin, Robert E. and Kimura, Fukunari. (1996) "Measuring U.S. International Goods and

Services Transactions." (In this volume).

Bergsten, C. Fred and Noland, Marcus. (1993) *Reconcilable Differences? United States -*

Japan Economic Conflict. Washington, D.C.: Institute for International Economics.

Economic Planning Agency (EPA), Government of Japan. (1994) *Heisei 6-nen ban kokumin*

keizai keisan nenpou (Annual Report on National Accounts, 1994). Tokyo: Economic

Planning Agency, Government of Japan [EPA94].

International Monetary Fund. (1992) *International Financial Statistics Yearbook 1992*.

Washington, D.C.: International Monetary Fund [IMF92].

International Monetary Fund. (1994) *International Financial Statistics November 1994*.

Washington, D.C.: International Monetary Fund [IMF94].

Lawrence, Robert Z. (1993) "Japan's Low Levels of Inward Investment: The Role of

Inhibitions on Acquisitions" in Kenneth A. Froot, ed., *Foreign Direct Investment*.

Chicago: The University of Chicago Press.

Lipsey, Robert E.; Blomstrom, Magnus; and Ramstetter, Eric. (1996) "Internationalized

Production in World Output." (In this volume).

Mataloni, Jr., Raymond J. (1994) "U.S. Multinational Companies: Operations in 1992."

Survey of Current Business (June): 42-62.

Management and Coordination Agency, Government of Japan. (1994) *1990 Input-Output*

Tables: Explanatory Report. Tokyo: Management and Coordination Agency,

Government of Japan [IO90].

Ministry of International Trade and Industry, Government of Japan (1990a) *Dai 18, 19 kai wagakuni kigyou no kaigai jigyou katsudou (The 18th and 19th Survey of Foreign Affiliates of Japanese Firms)*. Tokyo: Printing Office, Ministry of Finance, Government of Japan [OLD87/88].

Ministry of International Trade and Industry, Government of Japan. (1990b) *Dai 22, 23 kai gaishi-kei kigyou no doukou (The 22nd and 23rd Survey of Japanese Affiliates of Foreign Firms)*. Tokyo: Printing Office, Ministry of Finance, Government of Japan [AF87/88].

Ministry of International Trade and Industry, Government of Japan (1991a) *Dai 4 kai kaigai toushi toukei souran (The 4th Statistics on Japanese Direct Investment Abroad)*. Tokyo: Printing Office, Ministry of Finance, Government of Japan [OLD89].

Ministry of International Trade and Industry, Government of Japan. (1991b) *Dai 24 kai gaishi-kei kigyou no doukou (The 24th Survey of Japanese Affiliates of Foreign Firms)*. Tokyo: Printing Office, Ministry of Finance, Government of Japan [AF89].

Ministry of International Trade and Industry, Government of Japan (1992a) *Dai 21 kai wagakuni kigyou no kaigai jigyou katsudou (The 21st Survey of Foreign Affiliates of Japanese Firms)*. Tokyo: Printing Office, Ministry of Finance, Government of Japan [OLD90].

Ministry of International Trade and Industry, Government of Japan. (1992b) *Dai 25 kai gaishi-kei kigyou no doukou (The 25th Survey of Japanese Affiliates of Foreign Firms)*. Tokyo: Printing Office, Ministry of Finance, Government of Japan [AF90].

Ministry of International Trade and Industry, Government of Japan (1993a) *Dai 22 kai wagakuni kigyou no kaigai jigyou katsudou (The 22nd Survey of Foreign Affiliates of Japanese Firms)*. Tokyo: Printing Office, Ministry of Finance, Government of Japan [OLD91].

Ministry of International Trade and Industry, Government of Japan. (1993b) *Dai 26 kai gaishi-kei kigyou no doukou (The 26th Survey of Japanese Affiliates of Foreign Firms)*. Tokyo: Printing Office, Ministry of Finance, Government of Japan [AF91].

Ministry of International Trade and Industry, Government of Japan (1994a) *Dai 5 kai kaigai toushi toukei souran (The 5th Statistics on Japanese Direct Investment Abroad)*. Tokyo: Printing Office, Ministry of Finance, Government of Japan [OLD92].

Ministry of International Trade and Industry, Government of Japan. (1994b) *Dai 27 kai gaishi-kei kigyou no doukou (The 27th Survey of Japanese Affiliates of Foreign Firms)*. Tokyo: Printing Office, Ministry of Finance, Government of Japan [AF92].

Ministry of International Trade and Industry, Government of Japan. (1994c) *White Paper on International Trade: Japan 1994*. Tokyo: Japan External Trade Organization.

Ministry of International Trade and Industry, Government of Japan (1994d) *Results of the Basic Survey of Business Structure and Activity, 1992: Volume 3 Report by Subsidiary Companies*. Tokyo: Shadan Houjin Tsuusan Toukei Kyoukai [NEW91].

Statistical Bureau, Management and Coordination Agency, Government of Japan. (1990) *Japan Statistical Yearbook 1990*. Tokyo: Printing Office, Ministry of Finance, Government of Japan [JSY90].

Statistical Bureau, Management and Coordination Agency, Government of Japan. (1992)

Japan Statistical Yearbook 1992. Tokyo: Printing Office, Ministry of Finance, Government of Japan [JSY92].

Statistical Bureau, Management and Coordination Agency, Government of Japan. (1994) *Japan Statistical Yearbook 1993/94.* Tokyo: Printing Office, Ministry of Finance, Government of Japan [JSY93/94].

Statistical Bureau, Management and Coordination Agency, Government of Japan. (1995) *Japan Statistical Yearbook 1995.* Tokyo: Printing Office, Ministry of Finance, Government of Japan [JSY95].

United Nations. (1992) *1990 International Trade Statistics Yearbook: Volume 1 Trade by Country.* New York: United Nations [UN90].

United Nations. (1993) *1992 International Trade Statistics Yearbook: Volume 1 Trade by Country.* New York: United Nations [UN92].

U.S. Department of Commerce. (1994) *U.S. Direct Investment Abroad: Operations of U.S. Parent Companies and Their Foreign Affiliates. Revised 1991 Estimates.* Washington, D.C.: U.S. Government Printing Office [FAUSF91].

ENDNOTES

1. The BOP framework determines the residency of individuals and firms by whether or not they reside in a country for one year or more (in the IMF version of the BOP manual; in the Japanese version, more than two years for Japanese abroad and more than six months for foreigners in Japan). This means that, for example, a U.S. affiliate of a Japanese firm established more than a year ago is treated as American. Hence, merchandise and services trade is basically captured as transactions between economic agents in different geographical locations, rather than between economic agents with different nationalities.

2. One of the problems of this list of enterprises is that there is no systematic procedure for updating the list. It therefore may include enterprises or foreign affiliates which once existed but are not in business anymore.

3. BEA (Bureau of Economic Analysis, U.S. Department of Commerce) tried to collect purchases data in the past, but it deleted the question from the questionnaire because it could not collect reliable figures.

4. The new FAJF series can be used for checking the accuracy of the old FAJF series. For the 1991 financial year data, for example, one may question the quality of sales and purchases data reported by the old FAJF series, which differ widely from those in the new FAJ F series. MITI is currently trying to reformulate the formats of the old and new FAJF series into an integrated framework.

5. Again, one of the problems is that there is no systmatic procedure to update the list of JAFF. MITI is currently trying to integrate the JAFF series and domestic establishment surveys. The OECD is promoting this approach with a number of countries, including the UK and France.

6. The definition of FAJF in the new FAJF series is "majority-owned."

7. Possible errors listed in this paragraph do not affect our estimation of Japanese net sales to foreigners shown in Part IV of Table 2. As Lois Steckler of the Board of Governors points out in personal correspondence, Japanese net sales to foreigners are conceptually equivalent to cross-border net exports plus FAJF's value added (sales minus purchases) minus JAFF's value added (sales minus purchases). The possible error terms are canceled out in the calculation of Japanese net sales to foreigners.

8. These possible errors do not affect our estimation of Japanese net sales to foreigners.

9. Intra-group purchases from local and third countries can be estimated in a symmetric manner. However, the estimates differ from intra-group sales to local and third countries, though these must be equivalent in principle.

10. The estimate of nationality-adjusted sales of 1988 is particularly small, while those of 1991 and 1992 look very large. This fluctuation is mainly due to changes in the value added by FAJF, which may contain large estimation errors. We, however, can at least conclude that the activities of JAFF expanded until 1990.

11. The decline in the estimated ratio on the export side for 1992 may be due to the understatement of purchases by FAJF.

12. Value added by Japanese-owned firms as well as Japanese GDP includes production that takes place outside firms, such as in the government and household sectors.

13. As mentioned in Footnote 5 of Table 1, the 1991 data of sales and purchases provided by the new FAJF series suggest much smaller value added by FAJF. The ratios of value added by FAJF to sales under the old FAJF series in Table 3 also look too large for 1991 and 1992. This may be due to the small number of FAJF providing purchases figures, though this cannot be proven from

published documents.

14. Precisely speaking, we must consider the JAFF component in these exports to avoid double-counting, but the data are not available.

15. The sector matching list between our industry (commodity) classification and SITC Rev. 2 is available upon request.

16. Alternatively, we can use sales data of "Financial Statements of Corporations by Industry" by the Ministry of Finance or value of shipments data of "Census of Manufactures" collected by MITI, though figures widely differ mainly due to the difference in coverage and the definition of firms or establishments.

17. It should be noted that FAJF do not include affiliates (or parent companies) in the finance, insurance, and real estate sectors, while FAUSF do include affiliates (or parent companies) in the finance (excluding banking), insurance, and real estate sectors. We should also take into account that affiliates in the service sector have a larger share in the case of FAUSF than in the case of FAJF.

18. The nine largest Japanese GTCs are C.Itoh, Mitsui, Sumitomo, Marubeni, Mitsubishi, Nissho Iwai, Tomen, Nichimen, and Kanematsu Gosho. The study by the Japan Foreign Trade Council covers only the financial years 1983 and 1987.

Table 1: Comparison between the Old and the New FAJF Series: 1991 F/Y

| | No. of FAJF covered | | Number of employees | | Sales by FAJF (in millions of yen) | | By-destination shares in sales by FAJF (%) | | | | | | Purchases by FAJF (in millions of yen) | | By-origin shares in purchases by FAJF (%) | | | | | | Purchases/sales ratios (%) | |
| | | | | | | | Local | | Japan | | Third countries | | | | Local | | Japan | | Third countries | | | |
	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91
Total	8,505	2,851	1,620,829	919,294	88,737,186	67,311,539	69.8	65.5	11.8	14.2	18.4	20.3	47,850,264	53,895,778	36.5	27.8	41.8	n.a.	21.7	n.a.	53.9	80.3
Manufacturing	3,528	1,723	1,261,012	744,253	25,364,961	16,149,008	69.5	74.2	8.4	7.4	22.1	18.3	10,380,640	10,484,599	43.6	44.6	42.4	n.a.	13.9	n.a.	40.9	64.9
Food	157	67	33,788	9,833	493,781	214,800	53.0	62.5	25.9	23.5	21.1	13.9	193,038	105,103	88.3	75.4	4.7	n.a.	7.0	n.a.	39.1	48.9
Textiles	185	60	92,020	21,663	676,604	192,059	55.3	64.9	10.1	9.7	34.6	25.3	173,492	103,101	44.1	50.9	20.0	n.a.	36.0	n.a.	25.6	53.7
Chemicals	495	151	78,262	26,377	1,090,600	591,268	66.3	61.1	5.9	5.8	27.7	33.1	482,020	266,287	62.8	52.6	23.6	n.a.	13.6	n.a.	44.2	45.0
Basic metals	216	93	59,726	18,752	1,411,713	310,581	78.9	79.4	5.1	8.0	16.0	12.6	725,757	201,238	51.4	60.4	17.3	n.a.	31.3	n.a.	51.4	64.8
General machinery	291	162	65,687	42,072	2,367,135	1,176,577	67.2	79.5	4.4	5.7	28.4	14.9	505,600	614,433	43.2	65.2	48.1	n.a.	8.1	n.a.	21.4	52.2
Electrical machinery	940	530	435,796	329,712	8,107,032	5,906,542	64.0	61.2	10.9	11.2	25.0	27.6	3,836,972	3,820,493	32.1	36.5	49.5	n.a.	18.5	n.a.	47.3	64.7
Transport equipment	425	218	257,264	136,271	7,004,617	5,283,201	85.0	89.4	2.6	1.7	12.3	8.9	2,910,419	3,960,656	51.2	45.4	45.4	n.a.	3.4	n.a.	41.6	75.0
Precision machinery	139	75	28,689	25,318	405,423	361,769	48.8	54.6	19.4	24.2	31.8	21.2	127,440	195,332	28.4	22.5	67.0	n.a.	4.6	n.a.	31.4	54.0
Petroleum and coal products	18	3	5,644	n.a.	139,736	n.a.	61.3	n.a.	0.0	n.a.	38.7	n.a.	46,729	n.a.	58.9	n.a.	17.4	n.a.	23.7	n.a.	33.4	n.a.
Other manufacturing	662	364	204,136	134,255	2,868,271	2,112,211	68.1	78.0	9.9	7.9	22.0	14.2	1,379,173	1,212,771	51.2	36.5	31.1	n.a.	17.4	n.a.	48.1	57.4
Commerce	2,589	1,112	238,975	171,098	58,337,017	50,811,689	69.0	62.7	14.5	16.4	16.5	20.9	35,486,167	43,290,361	31.5	23.7	42.4	n.a.	26.1	n.a.	60.8	85.2
Services	619	n.a.	37,588	n.a.	1,173,761	n.a.	96.1	n.a.	2.8	n.a.	1.1	n.a.	441,532	n.a.	79.2	n.a.	15.6	n.a.	5.2	n.a.	37.6	n.a.
Others	1,769	17	83,254	55	3,861,447	43,620	75.4	13.8	16.9	36.5	7.7	49.7	1,541,928	37,282	89.0	1.3	8.7	n.a.	2.3	n.a.	39.9	85.5

| | No. of FAJF covered | | Number of employees | | Sales by FAJF (in millions of yen) | | By-destination shares in sales by FAJF (%) | | | | | | Purchases by FAJF (in millions of yen) | | By-origin shares in purchases by FAJF (%) | | | | | | Purchases/sales ratios (%) | |
| | | | | | | | Local | | Japan | | Third countries | | | | Local | | Japan | | Third countries | | | |
	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91	OLD91	NEW91
World total	8,505	2,851	1,620,829	919,294	88,737,186	67,311,539	69.8	65.5	11.8	14.2	18.4	20.3	47,850,264	53,895,778	36.5	27.8	41.8	n.a.	21.7	n.a.	53.9	80.3
North America	2,399	971	444,289	272,999	40,368,155	32,957,029	84.4	77.4	10.5	12.4	5.1	10.2	22,215,404	27,365,443	52.7	34.4	37.2	n.a.	10.1	n.a.	55.0	83.0
United States	2,177	890	415,666	255,264	37,653,870	30,795,603	84.8	77.3	10.5	12.2	4.7	10.5	20,844,276	25,496,874	53.9	35.0	36.3	n.a.	9.8	n.a.	55.4	82.8
Middle & South America	584	108	105,519	52,444	2,524,748	1,218,308	59.3	47.8	24.1	28.7	16.6	23.5	1,298,949	909,132	34.6	36.3	36.3	n.a.	29.1	n.a.	51.4	74.6
Asia	3,156	949	744,520	386,110	16,702,312	11,211,411	57.5	46.9	15.2	18.7	27.3	34.4	9,334,981	8,665,570	33.7	24.5	39.6	n.a.	26.7	n.a.	55.9	77.3
ASEAN4	1,194	364	394,330	211,021	4,713,576	1,835,711	60.4	47.6	13.9	19.4	25.7	32.9	2,721,950	1,293,308	42.1	33.7	36.9	n.a.	21.0	n.a.	57.7	70.5
NIEs4	1,693	529	277,459	154,995	11,576,548	9,297,727	54.1	46.7	16.4	18.5	29.5	34.8	6,469,430	7,317,362	29.5	21.4	41.0	n.a.	29.5	n.a.	55.9	78.7
Middle East	51	4	9,276	n.a.	907,197	n.a.	21.5	n.a.	40.8	n.a.	37.6	n.a.	605,886	n.a.	9.3	n.a.	41.2	n.a.	49.4	n.a.	66.8	n.a.
Europe	1,785	688	250,608	178,216	23,661,636	18,207,633	63.4	59.3	5.3	9.5	31.3	31.2	11,864,239	13,764,828	15.6	17.3	49.3	n.a.	35.1	n.a.	50.1	75.6
EC	1,615	657	240,333	175,603	22,591,507	17,952,678	66.4	59.0	5.6	9.5	28.0	31.5	11,039,056	13,573,922	17.0	17.3	49.3	n.a.	33.6	n.a.	48.9	75.6
Oceania	407	129	56,368	24,134	4,051,605	3,118,578	62.4	54.1	30.3	37.3	7.3	8.6	2,117,517	2,765,517	40.9	29.8	54.3	n.a.	4.8	n.a.	52.3	88.7
Africa	123	2	10,249	n.a.	521,533	n.a.	31.0	n.a.	31.0	n.a.	38.0	n.a.	413,288	n.a.	78.1	n.a.	9.2	n.a.	12.8	n.a.	79.2	n.a.

Footnotes:
1. The sample set of the old FAJF series (OLD91) includes affiliates in which Japanese have more than 10% share and affiliates in which Japanese-owned affiliates have more than 50% share, and the parent companies of which is in industries other than finance, insurance, and real estates).
2. The new FAJF series (NEW91) covers majority-owned foreign affiliates of Japanese firms with more than US$1 million of capital, in mining, manufacturing, and commerce sector, whose parent companies have more than 50 employees and more than 30 million yen of capital in mining, manufacturing, and commerce sector.
3. "n.a." in NEW91 means that the data are not available, a part of which is due to the small number of samples.
4. Sales and purchases by FAJF obtained from NEW91 are converted from the US dollar to yen by using IMF92, p.437 (US$ 1 = 134.71 yen).
5. Large differences between two series are partly due to the different coverages and partly due to the data quality of the old FAJF series. One of the serious problems of the old FAJF series is that not all firms which returned the questionnaire provide figures for all questions (at least for 1991 and 1992) and MITI publicizes total figures only. What we are particularly concerned is the quality of affiliates which are unknown for purchases. The purchases figures between the old and new series are probably understated in the old FAJF series (at least for 1991 and 1992), though we could not make any adjustment because the numbers of affiliates are unknown for purchases. We do not attempt any such adjustments. Lipsey, Blomstrom, and Ramstetter (1996) in this volume try to adjust the data for fluctuation in survey coverage by using various information from other sources.

Data sources: OLD91, pp. 57, 75, 78-101, 126. NEW91, pp. 398-401, 450-453.

Table 2 Net Sales by Japanese to Foreigners, 1987-1992
   (in millions of yen)

Transaction	Amount					
	1987	1988	1989	1990	1991	1992
I. Cross-border sales to and purchases from foreigners by Japanese						
Exports to foreigners						
+ Japanese exports (merchandise only)	33,315,000	33,939,000	37,823,000	41,457,000	42,360,000	43,012,000
- Japanese exports shipped to FAJF	20,571,156	24,271,567	25,067,600	24,644,049	19,364,991	14,653,484
- Japanese exports shipped by JAFF	1,029,374	1,495,679	1,259,571	1,885,337	1,921,777	1,841,958
Total	11,714,470	8,171,754	11,495,829	14,927,614	21,073,232	26,516,558
Imports from foreigners						
+ Japanese imports (merchandise only)	21,737,000	24,006,000	28,979,000	33,855,000	31,900,000	29,527,000
- Japanese imports shipped by FAJF	9,294,170	11,184,629	17,802,290	17,647,431	11,013,452	11,514,761
- Japanese imports shipped to JAFF	2,820,984	3,198,105	4,122,046	5,714,953	5,381,077	4,724,046
Total	9,621,846	9,623,266	7,054,664	10,492,616	15,505,471	13,288,193
Net cross-border sales to foreigners	2,092,624	-1,451,512	4,441,165	4,434,998	5,567,761	13,228,365
II. Sales to and purchases from foreigners by FAJF						
Sales by FAJF						
+ Sales by FAJF	54,808,975	68,426,994	93,177,600	99,806,407	88,737,186	79,007,218
- Sales to other FAJF	3,354,457	4,795,450	6,228,815	7,800,237	6,570,591	8,455,537
- Japanese imports shipped by FAJF	9,294,170	11,184,629	17,802,290	17,647,431	11,013,452	11,514,761
Total	42,160,348	52,446,915	69,146,495	74,358,739	71,153,143	59,036,921
Local purchases abroad by FAJF						
+ Purchases by FAJF	42,135,754	57,987,023	77,139,161	73,880,197	47,850,264	39,660,435
- Purchases from other FAJF	3,354,457	4,795,450	6,228,815	7,800,237	6,570,591	8,455,537
- Japanese exports shipped to FAJF	20,571,156	24,271,567	25,067,600	24,644,049	19,364,991	14,653,484
Total	18,210,141	28,920,006	45,842,746	41,435,911	21,914,682	16,551,414
Net sales to foreigners by FAJF	23,950,207	23,526,909	23,303,749	32,922,828	49,238,461	42,485,506
III. Japanese sales to and purchases from JAFF						
Japanese sales to JAFF						
+ Purchases by JAFF	6,284,978	7,665,564	9,247,364	12,032,837	12,060,981	11,275,793
- Sales among JAFF	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
- Japanese imports shipped to JAFF	2,820,984	3,198,105	4,122,046	5,714,953	5,381,077	4,724,046
Total	3,463,994	4,467,459	5,125,318	6,317,884	6,679,904	6,551,747
Japanese purchases from JAFF						
+ Sales by JAFF	10,420,519	12,292,986	14,003,962	16,810,563	17,792,870	16,300,170
- Sales among JAFF	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
- Japanese exports shipped by JAFF	1,029,374	1,495,679	1,259,571	1,885,337	1,921,777	1,841,958
Total	9,391,145	10,797,307	12,744,391	14,925,226	15,871,093	14,458,212
Net sales to JAFF	-5,927,151	-6,329,848	-7,619,073	-8,607,342	-9,191,189	-7,906,465
IV. Net sales by Japanese to foreigners	20,115,680	15,745,549	20,125,841	28,750,484	45,615,033	47,807,406
(Figures in parentheses are in millions of dollars.)	(139,074)	(122,868)	(145,882)	(198,567)	(338,617)	(377,477)
Reference:						
Cross-border merchandise trade balance	11,578,000	9,933,000	8,844,000	7,602,000	10,460,000	13,485,000
(Figures in parentheses are in millions of dollars.)	(80,047)	(77,511)	(64,106)	(52,504)	(77,648)	(106,475)
Exchange rates (rf; yen per dollar)	144.64	128.15	137.96	144.79	134.71	126.65

FAJF: Foreign affiliates of Japanese firms abroad, which include affiliates in which Japanese have more than 10% share and affiliates in which Japanese
majority-owned affiliates have more than 50% share. Only the parent firms with the largest share report the figures.
Only affiliates whose parent companies are in industries other than finance, insurance, and real estates are covered.
Coverages of affiliates data (in terms of number of affiliates) for 1987-1992 are 79.4%, 78.8%, 72.3%, 78.2%, 78.5%, and 65.5%.

JAFF: Majority-owned (with more than one-third shares from 1991 F/Y) Japanese affiliates of foreign firms in Japan, which report their direct investment
to MITI and have foreign participation in management. Coverages of affiliates data (in terms of number of affiliates) for 1987-1992 are 50.1%, 52.3%,
51.8%, 51.8%, 51.9%, and 53.7%.

Years: Japanese exports and imports are on the calendar-year basis while data for FAJF and JAFF are on the financial-year basis.

Attachment to Table 2: Estimation Procedure and Data Sources

(Figures in parentheses are for 1987, 88, 89, 90, 91 and 92, respectively; in millions of yen.)

Japanese exports --- Merchandise exports only. JSY90 (p. 338), 92 (p. 338), 95 (p. 417) (33,315,000; 33,939,000; 37,823,000; 41,457,000; 42,360,000; 43,012,000).

Japanese exports shipped to FAJF --- One of the shortfalls of the old FAJF series is that firms in the sample report total purchases while many of them fail to report the by-origin disaggregation. For example, out of total purchases in 1987 (42,135,754), only 38.4% (16,189,035) are disaggregated into local purchases (5,880,385), purchases from Japan (7,721,739), and purchases from third countries (2,586,911). We therefore estimate Japanese exports shipped to FAJF as the sum of sectoral estimates, each of which is derived from multiplying total purchases of the sector by the share of purchases from Japan of the sector (calculated from the limited sample). OLD87/88 (pp. 94-95, 202-203), 89 (pp. 222-223), 90 (pp. 104-105), 91 (pp. 100-101), 92 (pp. 210-211) (20,571,156; 24,271,567; 25,067,600; 24,644,049; 19,364,991; 14,653,484).

Japanese exports shipped by JAFF --- AF87/88 (pp. 71, 225), 89 (p. 73), 90 (p. 77), 91 (p. 75), 92 (p. 79) (1,029,374; 1,495,679; 1,259,571; 1,885,337; 1,921,777; 1,841,958).

Japanese imports --- Merchandise imports only. JSY90 (p. 338), 92 (p. 338), 95 (p. 417) (21,737,000; 24,006,000; 28,979,000; 33,855,000; 31,900,000; 29,527,000).

Japanese imports shipped by FAJF --- As in *Japanese exports shipped to FAJF*, firms in the sample report total sales while many of them fail to report the by-destination disaggregation. For example, out of total sales in 1987 (54,808,975), only 42.2% (23,144,497) are disaggregated into local sales (15,388,102), sales to Japan (3,770,459), and sales to third countries (3,985,936). We therefore estimate Japanese imports shipped by FAJF as the sum of sectoral estimates, each of which is derived from multiplying total sales of the sector by the share of sales to Japan of the sector (calculated from the limited sample). OLD87/88 (pp. 82-83, 190-191), 89 (pp. 210-211), 90 (pp. 88-89), 91 (pp. 88-89), 92 (pp. 198-199) (9,294,170; 11,184,629; 17,802,290; 17,647,431; 11,013,452; 11,514,761).

Japanese imports shipped to JAFF --- AF87/88 (pp. 105, 239), 89 (p. 107), 90 (p. 111), 91 (p. 109), 92 (p. 113) (2,820,984; 3,198,105; 4,122,046; 5,714,953; 5,381,077; 4,724,046).

Sales by FAJF --- OLD87/88 (pp. 83, 191), 89 (p. 211), 90 (p. 89), 91 (p. 89), 92 (p. 199) (54,808,975; 68,426,994; 93,177,600; 99,806,407; 88,737,186; 79,007,218).

Sales to other FAJF --- Although the data of sales among FAJF are not available, intra-firm transaction between affiliates can be estimated. For 1989, by using the same method as in estimating *Japanese imports from FAJF*, we first estimate local sales and sales to third countries of each sector. Then, by multiplying ratios of intra-group sales in local sales and sales to third countries of each sector, we can estimate intra-firm trade of the sector. The sum of sectoral estimates provides a proxy of sales to other FAJF. For 1987, 88, 90, and 91, ratios of intra-group sales in 1989 are used. OLD87/88 (pp. 82-83, 190-191), 89 (pp. 210-211, 229), 90 (p. 88-89), 91 (pp. 88-89), 92 (pp. 198-199, 217) (3,354,457; 4,795,450; 6,228,815; 7,800,237; 6,570,591; 8,455,537).

Purchases by FAJF --- OLD87/88 (pp. 95, 203), 89 (p. 223), 90 (p. 105), 91 (p. 101), 92 (p. 211) (42,135,754; 57,987,023; 77,139,161; 73,880,197; 47,850,264; 39,660,435).

Purchases from other FAJF --- The data of purchases among FAJF are not available. As a proxy, we use *sales to other FAJF* estimated above.

Purchases by JAFF --- AF87/88 (pp. 105, 239), 89 (p. 107), 90 (p. 111), 91 (p. 109), 92 (p. 113) (6,284,978; 7,665,564; 9,247,364; 12,032,837; 12,060,981; 11,275,793).

Sales among JAFF --- Not available.

Sales by JAFF --- AF87/88 (pp. 71, 225), 89 (p. 73), 90 (p. 77), 91 (p. 75), 92 (p. 79) (10,420,519; 12,292,986; 14,003,962; 16,810,563; 17,792,870; 16,300,170).

Exchange rates --- Yen per dollar (rf series). IMF92 (p. 437), 94 (p. 316). (144.64; 128.15; 137.96; 144.79; 134.71; 126.65).

Table 3 Value Added by FAJF and JAFF, 1987-1992
   (in millions of yen)

Transaction	Amount					
	1987	1988	1989	1990	1991	1992
I. Value added by FAJF						
+ Sales by FAJF	54,808,975	68,426,994	93,177,600	99,806,407	88,737,186	79,007,218
- Local purchases abroad by FAJF	18,210,141	28,920,006	45,842,746	41,435,911	21,914,682	16,551,414
- Japanese exports shipped to FAJF	20,571,156	24,271,567	25,067,600	24,644,049	19,364,991	14,653,484
- Purchases from other FAJF	3,354,457	4,795,450	6,228,815	7,800,237	6,570,591	8,455,537
Total	12,673,221	10,439,971	16,038,439	25,926,210	40,886,922	39,346,783
In goods and services sold to:						
Japanese	2,289,149	1,835,052	3,283,783	4,972,830	5,480,404	6,421,800
Foreigners	10,384,072	8,604,919	12,754,656	20,953,380	35,406,518	32,924,983
Received by:						
Japanese	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Foreigners	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Value added / sales ratio (%)	23.12	15.26	17.21	25.98	46.08	49.80
II. Japanese value added in exports of Japanese-owned firms	28,940,835	29,082,193	32,775,458	35,472,039	36,904,826	36,248,823
In export to FAJF	18,439,984	21,757,033	22,470,597	22,090,926	17,672,923	12,901,895
In exports to foreigners	10,500,851	7,325,160	10,304,861	13,381,113	19,231,902	23,346,928
III. Value added by JAFF						
+ Sales by JAFF	10,420,519	12,292,986	14,003,962	16,810,563	17,792,870	16,300,170
- Purchases within Japan by JAFF	3,463,994	4,467,459	5,125,318	6,317,884	6,679,904	6,551,747
- Japanese imports shipped to JAFF	2,820,984	3,198,105	4,122,046	5,714,953	5,381,077	4,724,046
- Purchases from other JAFF	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Total	4,135,541	4,627,422	4,756,598	4,777,726	5,731,889	5,024,377
In goods and services sold to:						
Japanese	3,727,018	4,064,407	4,328,771	4,241,895	5,112,798	4,456,610
Foreigners	408,523	563,015	427,827	535,831	619,091	567,767
Received by:						
Japanese	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Foreigners	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Value added / sales ratio (%)	39.69	37.64	33.97	28.42	32.21	30.82
IV. Value added in exporting country by foreign-owned firms	11,153,753	11,493,077	10,018,803	14,528,465	18,722,702	16,146,171
In exports to Japanese	8,625,023	8,626,296	6,323,801	9,405,581	13,899,104	11,911,536
In exports to JAFF	2,528,730	2,866,781	3,695,002	5,122,884	4,823,597	4,234,635
Reference:						
Gross domestic product of Japan	353,989,000	376,889,000	402,311,000	432,862,000	455,862,000	465,431,000
Ratio of value added of FAJF to that of Japanese-owned firms (%)	3.50	2.73	3.88	5.71	8.33	7.87
Ratio of value added of JAFF to Japanese GDP (%)	1.17	1.23	1.18	1.10	1.26	1.08

[Value added of Japanese-owned firms] = [GDP of Japan] + [value added of FAJF] - [value added of JAFF] .
All the data are in financial years (April-March).
Figures in II and IV are estimated by using the import inducement coefficient of export (10.36%) obtained from IO90
(pp. 321, 388). See the text in the detail.

Data sources:
   GDP of Japan: JSY92, p. 555; JSY95, p. 142. See Attachment to Table 2 for other data.

Table 4 Cross-Border and Nationality-Adjusted Net Sales by Sector (millions of yen, %)

(a) Cross-border net sales

	1987	1988	1989	1990	1991	1992
Total	11,528,693	9,939,713	8,874,690	7,550,636	10,478,920	13,504,594
Manufacturing	21,297,715	19,675,032	20,204,591	20,925,081	22,848,678	24,918,951
Food	-1,101,196	-1,310,955	-1,584,472	-1,707,678	-1,752,546	-1,826,175
Textiles	-324,978	-718,266	-1,133,064	-1,058,343	-1,017,400	-1,099,777
Chemicals	-296,351	-375,906	-391,840	-336,878	-196,899	-214,835
Basic metals	905,759	455,336	281,819	62,211	115,725	637,167
General machinery	6,270,341	6,767,426	7,705,274	8,379,562	8,813,466	8,624,089
Electrical machinery	6,114,123	6,393,681	6,880,890	7,282,399	7,477,108	7,424,773
Transport equipment	8,576,168	7,640,115	8,223,757	8,784,646	9,085,143	9,731,532
Precision machinery	1,261,682	1,260,404	1,347,500	1,411,273	1,470,442	1,428,276
Petroleum and coal products	-1,059,410	-982,160	-1,228,198	-1,444,532	-1,011,156	-741,460
Other manufacturing	951,576	545,357	102,925	438,679	748,050	955,361
Others	-9,769,022	-9,735,318	-11,329,901	-13,374,444	-12,369,758	-11,414,357

(b) Nationality-adjusted net sales

	1987	1988	1989	1990	1991	1992
Total	20,066,373	15,752,262	20,156,531	28,699,120	45,633,953	47,827,000
Manufacturing	21,589,169	21,055,289	23,208,815	28,484,365	33,803,547	36,509,672
Food	-1,085,176	-1,269,383	-1,542,527	-1,573,097	-1,656,842	-1,647,090
Textiles	-214,835	-538,177	-993,237	-607,435	-541,197	-760,918
Chemicals	-704,518	-796,094	-941,477	-393,287	-258,662	94,310
Basic metals	1,380,705	948,252	616,772	600,633	473,811	1,365,507
General machinery	6,209,419	6,948,108	8,000,782	9,344,367	10,164,196	9,161,093
Electrical machinery	6,489,225	7,219,511	7,218,124	9,788,039	10,709,812	10,186,766
Transport equipment	9,071,394	8,349,570	9,760,246	10,850,617	13,139,792	15,183,381
Precision machinery	1,302,296	1,450,029	1,516,363	1,398,055	1,625,172	1,383,764
Petroleum and coal products	-2,187,322	-2,211,888	-1,717,838	-1,941,294	-1,630,928	-746,129
Other manufacturing	1,327,980	955,361	1,291,607	1,017,767	1,778,394	2,288,990
Others	-1,522,796	-5,303,026	-3,052,284	214,756	11,830,403	11,317,328

(c) Cross-border net sales / total sales

	1987	1988	1989	1990	1991	1992
Total	1.79	1.44	1.18	0.92	1.22	1.57
Manufacturing	7.75	6.63	6.27	6.01	6.24	7.09
Food	-3.39	-3.93	-4.61	-4.74	-4.66	-4.74
Textiles	-4.50	-9.66	-15.10	-14.00	-13.48	-15.15
Chemicals	-1.35	-1.62	-1.56	-1.25	-1.22	-0.71
Basic metals	3.04	1.37	0.78	0.16	0.30	1.90
General machinery	22.04	20.59	20.70	19.08	18.35	20.91
Electrical machinery	15.29	14.35	14.16	13.99	13.32	14.33
Transport equipment	25.38	21.43	20.54	20.00	19.72	20.58
Precision machinery	32.17	29.81	29.44	28.40	27.64	29.80
Petroleum and coal products	-10.40	-9.90	-11.37	-11.42	-7.83	-5.99
Other manufacturing	1.42	0.76	0.13	-0.15	0.50	0.87
Others	-4.70	-4.37	-4.65	-5.12	-4.54	-4.11

(d) Nationality-adjusted net sales / total sales

	1987	1988	1989	1990	1991	1992
Total	2.91	2.10	2.42	3.19	4.90	5.19
Manufacturing	7.70	6.88	6.92	7.83	8.88	9.96
Food	-3.33	-3.77	-4.44	-4.33	-4.39	-4.24
Textiles	-2.82	-6.75	-12.69	-7.37	-6.63	-9.83
Chemicals	-3.28	-3.51	-3.90	-1.50	-0.97	0.35
Basic metals	4.49	2.76	1.65	1.52	1.19	3.93
General machinery	21.75	20.76	21.13	20.85	21.40	21.29
Electrical machinery	15.04	14.73	13.57	17.01	17.27	17.93
Transport equipment	24.65	21.33	20.80	21.36	24.81	27.13
Precision machinery	32.55	28.41	31.23	29.81	29.96	29.35
Petroleum and coal products	-28.92	-29.87	-21.40	-21.24	-17.05	-7.67
Other manufacturing	1.95	1.30	1.61	1.18	1.96	2.60
Others	-0.37	-1.20	-0.61	0.04	2.15	2.04

Cross-border net sales = cross-border net exports .

Nationality-adjusted net sales = nationality-adjusted sales - nationality-adjusted purchases .

Nationality-adjusted sales = Japan's cross-border exports + sales by FAJF + purchases by JAFF - Japan's exports shipped to FAJF - Japan's imports shipped by FAJF - sales to other FAJF by FAJF
 - Japan's exports shipped by JAFF - Japan's imports shipped to JAFF .

Nationality-adjusted purchases = Japan's cross-border imports + sales by JAFF + purchases by FAJF - Japan's exports shipped to FAJF - Japan's imports shipped by FAJF - sales to other FAJF by FAJF
 - Japan's exports shipped by FAJF - Japan's imports shipped to JAFF .

Cross-border net sales / total sales = ratios of cross-border net exports to sales by all firms in Japan .

Nationality-adjusted net sales / total sales = ratios of nationality-adjusted net sales to sales by Japanese-owned firms (all firms in Japan + FAJF - JAFF) .

The old FAJF and JAFF series are on the financial-year basis while the others are on the calendar-year basis.

Data sources: OLD87/88, 89, 90, 91, 92, AF87/88, 89, 90, 91, 92, EPA94, MF92, UN90, 92.

Table 5 Sales, Value Added, and Employment Shares of FAJF and JAFF (%)

(a) Sales

	Share of FAJF in Japanese-owned firms						Share of JAFF in firms in Japan					
	1987	1988	1989	1990	1991	1992	1987	1988	1989	1990	1991	1992
Total	7.39	8.52	10.47	10.40	8.91	7.99	1.50	1.65	1.73	1.92	1.92	1.76
Manufacturing	4.66	5.76	6.64	7.21	6.66	6.85	2.68	2.76	2.86	3.08	2.90	2.88
Food	0.84	1.35	1.49	1.37	1.31	1.43	0.64	0.61	0.56	0.57	0.81	0.56
Textiles	5.37	6.90	4.32	8.63	8.29	6.53	0.18	0.12	0.18	0.34	0.86	0.37
Chemicals	4.53	5.30	5.37	6.93	7.07	6.26	6.40	7.76	9.28	8.87	10.28	8.87
Basic metals	3.55	4.29	4.23	4.05	3.55	4.46	0.25	0.92	0.84	0.87	0.99	1.21
General machinery	3.03	3.30	2.95	7.10	4.98	2.86	2.70	1.55	1.25	1.38	1.20	0.83
Electrical machinery	10.97	13.07	12.74	13.83	13.07	12.88	3.96	4.36	4.47	4.72	4.00	4.44
Transport equipment	8.72	9.66	15.40	13.74	13.23	15.97	0.59	0.80	0.86	0.25	0.26	0.55
Precision machinery	5.22	20.78	9.23	9.05	7.47	6.42	3.31	4.37	3.68	14.15	5.65	7.93
Petroleum and coal products	0.96	0.22	0.16	0.26	1.46	6.57	26.46	25.53	25.80	27.93	27.01	26.53
Other manufacturing	1.80	2.15	3.68	3.48	3.16	2.71	0.42	0.57	0.57	0.46	0.37	0.53
Commerce	37.22	40.57	47.21	46.59	41.07	36.02	4.15	5.13	5.80	6.64	7.29	6.13
Services	0.28	0.40	0.44	0.70	0.88	0.88	0.04	0.07	0.04	0.09	0.31	0.26
Others	0.62	0.82	1.44	1.11	1.14	1.12	0.05	0.08	0.06	0.11	0.05	0.04

(b) Value added

	Share of FAJF in Japanese-owned firms						Share of JAFF in firms in Japan					
	1987	1988	1989	1990	1991	1992	1987	1988	1989	1990	1991	1992
Total	3.54	2.75	3.92	5.79	8.40	7.94	1.18	1.24	1.19	1.12	1.27	1.09
Manufacturing	3.76	4.70	5.84	8.57	10.53	10.76	3.48	3.47	3.37	2.98	3.07	2.77
Food	0.99	1.32	1.31	1.98	2.14	2.10	0.86	0.99	0.98	1.00	1.47	0.91
Textiles	4.30	6.61	6.06	16.54	17.54	12.08	0.07	0.04	0.31	0.60	1.12	0.47
Chemicals	3.51	4.46	5.39	9.64	13.57	11.18	8.21	8.97	10.65	10.18	12.91	8.74
Basic metals	6.33	6.44	4.63	7.55	6.63	10.47	0.44	1.24	1.31	2.38	3.28	3.37
General machinery	2.21	2.21	2.78	8.08	9.75	3.19	2.77	0.79	0.72	0.61	0.44	1.08
Electrical machinery	8.84	10.96	11.05	17.25	18.03	17.29	6.47	6.31	9.33	6.31	5.07	5.09
Transport equipment	5.30	6.92	12.21	14.60	24.30	29.66	0.74	0.76	0.40	0.28	0.31	0.69
Precision machinery	5.68	13.41	11.12	12.71	12.13	6.38	3.31	4.04	3.25	13.29	5.77	8.56
Petroleum and coal products	0.52	0.13	0.06	0.21	2.09	11.98	27.84	30.59	11.45	11.43	14.03	12.06
Other manufacturing	1.80	2.02	4.34	3.69	3.89	4.46	0.45	0.65	0.69	0.49	0.40	0.52
Commerce	15.05	8.96	13.83	17.75	28.83	26.71	1.33	1.67	1.61	1.47	2.48	2.03
Services	0.22	0.27	0.35	0.90	1.01	1.22	0.02	0.04	0.01	0.09	0.26	0.20
Others	0.55	0.34	0.58	1.36	1.20	1.04	0.04	0.06	0.05	0.13	0.04	0.04

(c) Employment

	Share of FAJF in Japanese-owned firms						Share of JAFF in firms in Japan					
	1987	1988	1989	1990	1991	1992	1987	1988	1989	1990	1991	1992
Total	1.84	2.05	1.76	2.30	2.36	2.03	0.25	0.27	0.27	0.28	0.30	0.28
Manufacturing	5.86	6.68	5.80	7.49	7.39	6.61	0.84	0.89	0.92	0.93	0.97	0.96
Food	1.56	1.91	1.81	2.03	2.03	1.84	0.27	0.18	0.19	0.22	0.28	0.22
Textiles	7.37	8.34	4.68	7.36	7.61	7.37	0.02	0.01	0.02	0.14	0.16	0.14
Chemicals	11.37	12.26	11.03	14.00	14.86	13.18	6.23	8.41	9.63	9.11	10.51	9.64
Basic metals	10.47	12.31	11.25	9.62	8.48	8.53	0.27	0.77	0.75	0.76	0.97	1.00
General machinery	3.40	3.78	3.15	4.85	3.51	2.67	1.48	0.76	0.68	0.73	0.81	0.50
Electrical machinery	12.68	13.82	11.45	14.86	14.81	13.55	1.84	2.04	2.00	2.19	1.95	2.10
Transport equipment	9.29	11.63	9.48	13.47	14.32	13.30	0.23	0.32	0.38	0.20	0.20	0.33
Precision machinery	5.91	10.63	6.39	8.55	7.82	3.66	1.22	1.34	1.12	1.50	1.98	2.35
Petroleum and coal products	4.75	12.05	0.82	13.29	13.62	2.05	22.88	21.57	20.37	20.40	18.65	19.19
Other manufacturing	2.17	2.20	3.11	3.57	3.43	2.99	0.12	0.14	0.17	0.14	0.11	0.14
Commerce	1.53	1.52	1.16	1.50	1.99	1.34	0.20	0.25	0.23	0.24	0.33	0.25
Services	0.18	0.17	0.22	0.34	0.26	0.32	0.01	0.01	0.01	0.02	0.05	0.04
Others	0.29	0.30	0.28	0.33	0.33	0.30	0.03	0.03	0.02	0.03	0.02	0.01

Data sources: OLD87/88, 89, 90, 91, 92, AF87/88, 89, 90, 91, 92, EPA94.

Table 6 Comparison of Manufacturing and Commercial Affiliates: Japan and the United States, 1991

	Number of affiliates	(%)	Sales (millions of dollars)	(%)	Value added (millions of dollars)	(%)	Employment	(%)	Average number of employees	Value added ratio [value added /sales] (%)	Value added productivity [value added /employment] (dollars)	By-destination shares in sales (%) Local	Japan/USA	Third countries	By-origin shares in purchases (%) Local	Imports
(a) Foreign affiliates of Japanese firms (FAJF)																
By parent companies' classification																
All industries	2,851	100.00	498,193	100.00	98,105	100.00	919,294	100.00	322	19.69	106,718	65.47	14.24	20.29	27.84	72.16
Manufacturing	2,119	74.32	240,706	48.32	67,213	68.51	741,615	80.67	350	27.92	90,631	78.10	8.36	13.54	36.85	63.15
Wholesale and retail trade	710	24.90	256,964	51.58	30,645	31.24	174,829	19.02	246	11.93	175,284	53.62	19.77	26.61	20.90	79.10
Wholesale	638	22.38	254,658	51.12	30,021	30.60	162,918	17.72	255	11.79	184,272	53.30	19.87	26.83	20.60	79.40
Retail	72	2.53	2,307	0.46	624	0.64	11,911	1.30	165	27.03	52,349	89.32	8.89	1.79	60.02	39.98
By affiliates' classification																
All industries	2,851	100.00	498,193	100.00	98,105	100.00	919,294	100.00	322	19.69	106,718	65.47	14.24	20.29	27.84	72.16
Manufacturing	1,723	60.43	119,880	24.06	42,049	42.86	744,253	80.96	432	35.08	56,498	74.22	7.44	18.34	44.64	55.36
Wholesale and retail	1,112	39.00	377,193	75.71	55,833	56.91	171,098	18.61	154	14.80	326,325	62.71	16.37	20.92	23.71	76.29
Wholesale	1,012	35.50	372,534	74.78	54,795	55.85	154,294	16.78	152	14.71	355,136	62.35	16.52	21.13	23.59	76.41
Retail	100	3.51	4,659	0.94	1,038	1.06	16,804	1.83	168	22.28	61,778	90.86	4.98	4.14	34.87	65.13
(b) Foreign affiliates of U.S. firms (FAUSF)																
By parent companies' classification																
All industries	15,710	100.00	1,242,635	100.00	335,963	100.00	5,386,500	100.00	343	27.04	62,371	66.35	10.10	23.55	n.a.	n.a.
Manufacturing	10,720	68.24	982,139	79.04	n.a.	n.a.	3,945,600	73.25	368	n.a.	n.a.	65.23	10.40	24.37	n.a.	n.a.
Manufacturing (exc. petro.&coal prod.)	10,689	68.04	784,872	63.16	n.a.	n.a.	3,778,700	70.15	354	n.a.	n.a.	63.64	10.13	26.24	n.a.	n.a.
Wholesale and retail trade	1,041	6.63	127,437	10.26	n.a.	n.a.	519,000	9.64	499	n.a.	n.a.	60.21	10.31	29.48	n.a.	n.a.
Wholesale	871	5.54	102,057	8.21	n.a.	n.a.	180,100	3.34	207	n.a.	n.a.	52.41	11.03	36.56	n.a.	n.a.
Wholesale (excl. petro. wholesale)	750	4.77	79,613	6.41	n.a.	n.a.	168,400	3.13	225	n.a.	n.a.	45.78	12.27	41.95	n.a.	n.a.
Retail	170	1.08	25,380	2.04	n.a.	n.a.	338,900	6.29	1994	n.a.	n.a.	91.58	7.42	0.99	n.a.	n.a.
By affiliates' classification																
All industries	15,710	100.00	1,242,635	100.00	335,963	100.00	5,386,500	100.00	343	27.04	62,371	66.35	10.10	23.55	n.a.	n.a.
Manufacturing	6,459	41.11	680,525	54.76	n.a.	n.a.	3,355,400	62.29	519	n.a.	n.a.	62.90	10.98	26.12	n.a.	n.a.
Manufacturing (exc. petro.&coal prod.)	6,390	40.67	596,257	47.98	182,082	54.20	3,299,600	61.26	516	30.54	55,183	59.86	11.99	28.15	n.a.	n.a.
Wholesale and retail trade	4,339	27.62	367,216	29.55	n.a.	n.a.	1,040,100	19.31	240	n.a.	n.a.	70.78	6.50	22.72	n.a.	n.a.
Wholesale	4,121	26.23	327,559	26.36	n.a.	n.a.	554,800	10.30	135	n.a.	n.a.	67.55	7.27	25.18	n.a.	n.a.
Wholesale (excl. petro. wholesale)	3,807	24.23	227,069	18.27	40,832	12.15	520,500	9.66	137	17.98	78,448	70.22	4.53	25.26	n.a.	n.a.
Retail	218	1.39	39,657	3.19	n.a.	n.a.	485,300	9.01	2226	n.a.	n.a.	97.39	0.21	2.40	n.a.	n.a.

The definition of foreign affiliates: For Japan, see footnote 2 of Table 1. For the U.S., see Baldwin and Kimura (1996).
The definition of value added:
 Japan: sales minus purchases.
 U.S.: gross product in Mataloni (1994, p. 61).
Data sources: NEW91, FAUSF91, Tables III.A.2, III.E.8, III.F.3, III.F.9, III.G.4, and III.G.11. Mataloni (1994, p. 61).

Table 7   Sales and Purchases by Commercial FAJF and Major Foreign Branches of Japanese General Trading Companies, 1987
(in millions of yen; %)

	(a) GTC branches	(b) Commercial FAJF	(c) Total FAJF	(d) (a)/(b)*100	(e) (b)/(c)*100
Total sales	23,482,200	39,876,831	54,808,975	58.89	72.76
to local	8,209,900	24,796,290	36,219,960	33.11	68.46
to Japan	7,631,200	7,825,381	9,294,170	97.52	84.20
to third countries	7,641,200	7,255,160	9,294,845	105.32	78.06
Total purchases	n.a.	31,914,173	42,135,754	n.a.	75.74
from local	n.a.	9,637,230	14,535,836	n.a.	66.30
from Japan	n.a.	16,063,493	20,571,156	n.a.	78.09
From third countries	n.a.	6,213,450	7,028,762	n.a.	88.40

All data are for 1987 financial year.

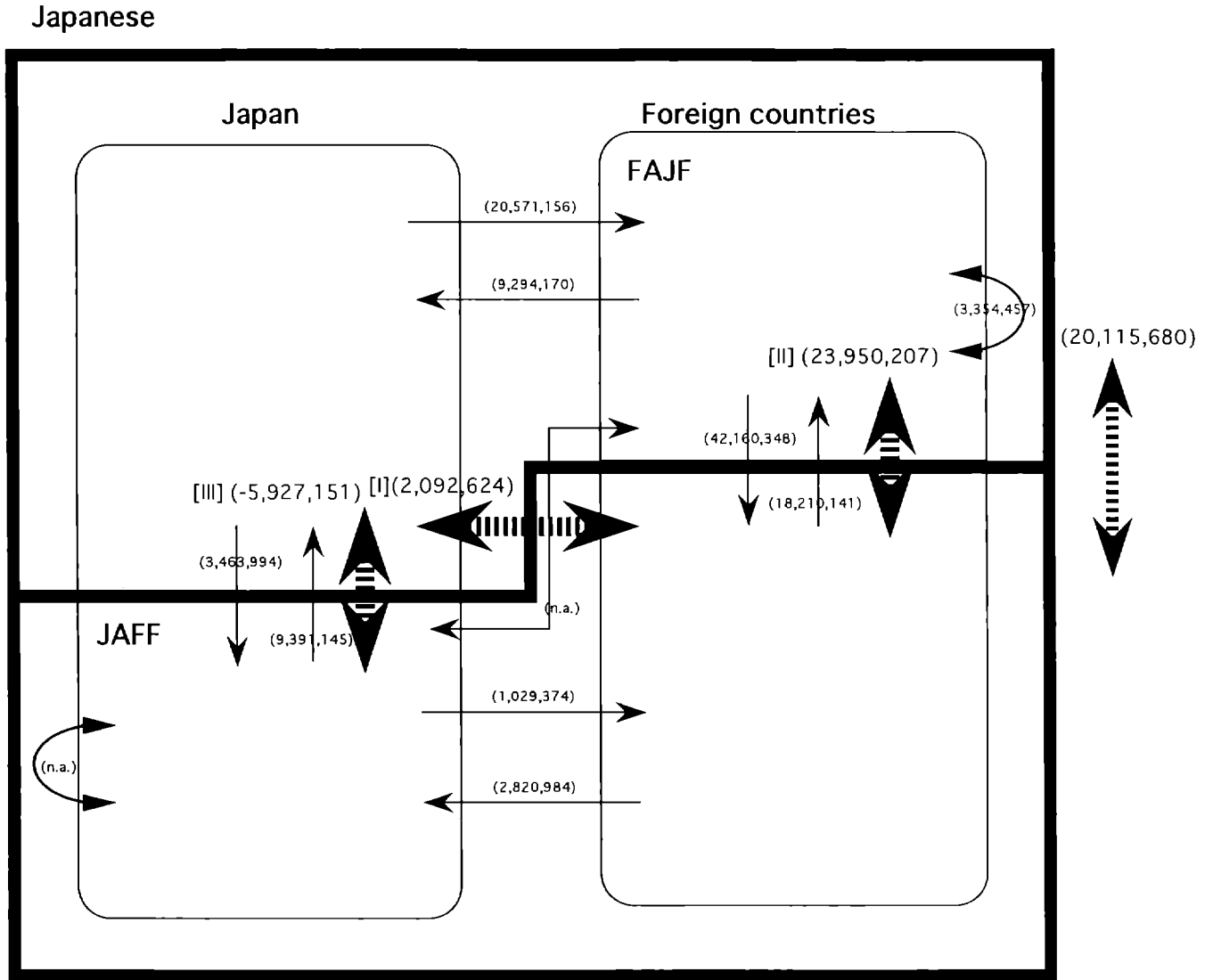The data labelled as GTC branches are for major foreign branches of nine Japanese general trading companies,
which include 197 affiliates in 37 countries.

The GTC branch data are originally in US dollars and are converted by IMF92, p. 437 ($1 = 144.64 yen).

By-destination sales by commercial FAJF and total FAJF are estimated by using sectoral by-destination ratios.
See the text for details.

Data sources: GTC, OLD87/88.

Figure 1
Estimation of Aggregate Net Sales
by Japanese to Foreigners, 1987
(in millions of yen)

Japanese

Japan

Foreign countries

FAJF

(20,571,156)

(9,294,170)

(3,354,457)

[II] (23,950,207)

(20,115,680)

(42,160,348)

[III] (-5,927,151) [I](2,092,624)

(18,210,141)

(3,463,994)

(n.a.)

JAFF

(9,391,145)

(n.a.)

(1,029,374)

(2,820,984)

Foreigners

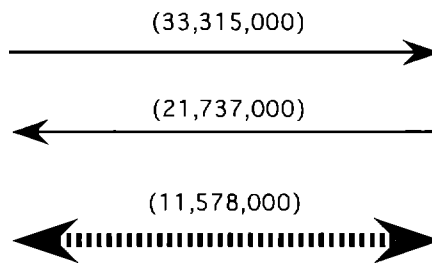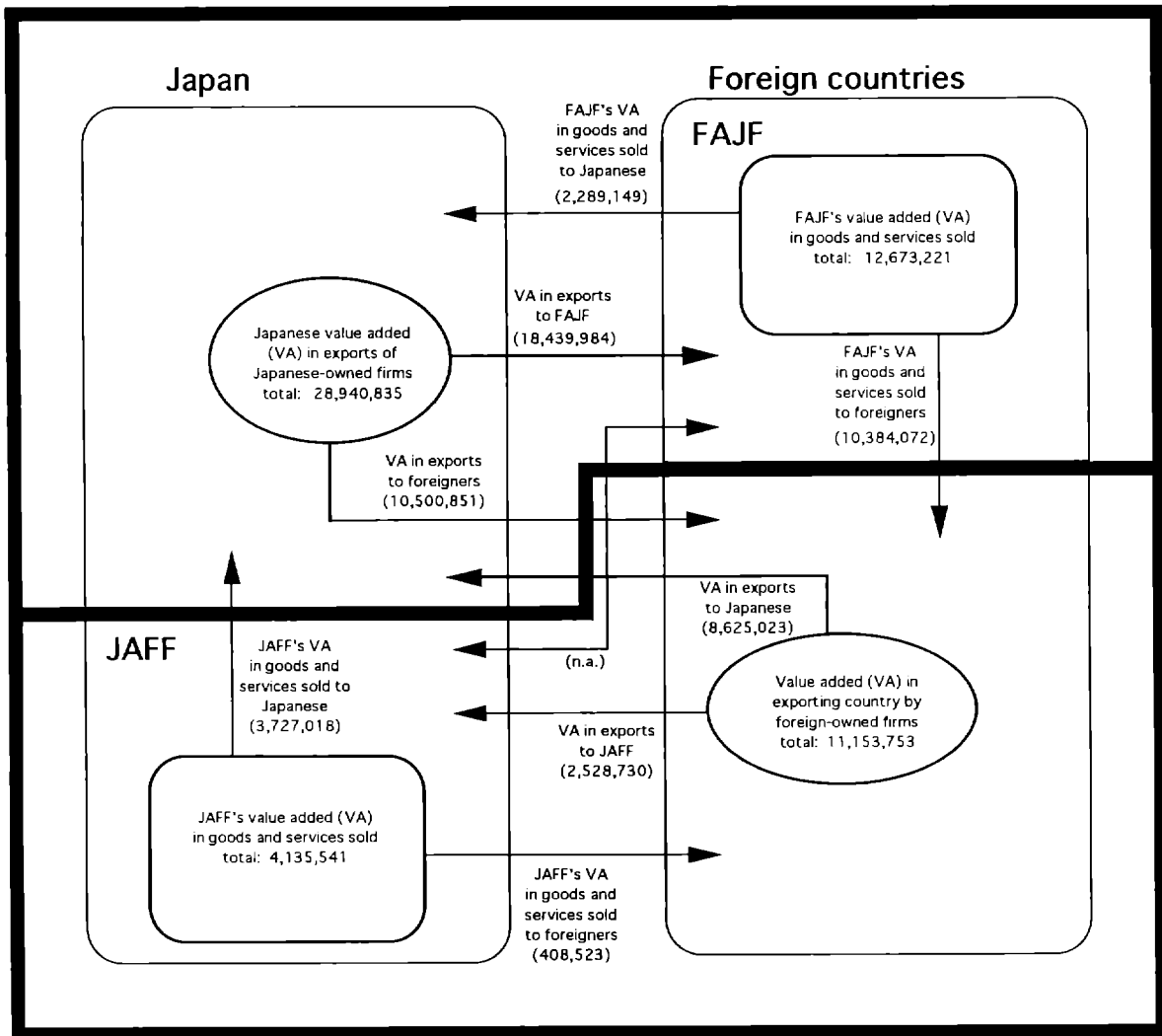(33,315,000)

(21,737,000)

(11,578,000)

Figure 2
Estimation of Value Added
in Goods and Services Sold by FAJF and JAFF
and Exports of Japanese-Owned and
Foreign-Owned Firms, 1987
(in millions of yen)

Japanese

Japan

Foreign countries

FAJF's VA in goods and services sold to Japanese (2,289,149)

FAJF

FAJF's value added (VA) in goods and services sold total: 12,673,221

VA in exports to FAJF (18,439,984)

Japanese value added (VA) in exports of Japanese-owned firms total: 28,940,835

FAJF's VA in goods and services sold to foreigners (10,384,072)

VA in exports to foreigners (10,500,851)

VA in exports to Japanese (8,625,023)

JAFF

JAFF's VA in goods and services sold to Japanese (3,727,018)

(n.a.)

Value added (VA) in exporting country by foreign-owned firms total: 11,153,753

VA in exports to JAFF (2,528,730)

JAFF's value added (VA) in goods and services sold total: 4,135,541

JAFF's VA in goods and services sold to foreigners (408,523)

Foreigners