

# Japan's Foreign Direct Investment and Employment\*

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## Abstract

In this paper, we examine the influence of Foreign Direct Investment (FDI) from Japan, i.e., the overseas business activities of Japanese companies, on domestic production and employment in Japan. Although FDI has mainly been discussed with an emphasis on its negative aspect of “industrial hollowing-out,” the positive influence of its “export promotion effect,” which involves the increase of component supplies to the local corporations, was greater than we had anticipated. Needless to say, the negative consequences of the “export substitution effect” and the “re-import effect” were also sizeable; consequently, the net decline in domestic manufacturing employment due to FDI was approximately one million. Moreover, the overseas transfer of manufacturing also influences domestic commerce and the service industry, causing a decline in employment of approximately 1.7 million in the Japanese economy. Industrial hollowing-out should be considered in light of not only manufacturing but also the entire economy. The present number of unemployed people in Japan has reached 3.5 million; approximately half are the result of the overseas transfer of manufacturing.

Key Words: Foreign direct investment, Industrial hollowing-out,  
Input-output table

JEL Classification: C67, F14, F23

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\* This research is financially supported by the Subsidy for Scientific Research from the Ministry of Education and Science of Japan, Basic Research (B) (1) 13430003.

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## 1 Introduction

The success of “processing trade” can be cited as one of the reasons for the immense growth of the Japanese economy during the postwar days. However, the floating exchange system significantly altered the foreign economic conditions around Japan, especially following the yen appreciation after the G5 Plaza accord in September 1985. During the 1.5 years that followed, as a result of the Plaza accord, the exchange rate decreased from 230 yen/dollar to 150 yen/dollar; this rapid yen appreciation severely damaged Japanese industries. The Japanese manufacturers who were losing price competitiveness began to relocate their factories to the contemporary export counterparts; thus, the term industrial hollowing-out appeared in Japanese mass media.<sup>(1)</sup>

**Figure 1** shows the transition in the amount and destination of FDI from Japan after 1980.<sup>(2)</sup> A rapid increase of FDI can be observed after 1985. Japan’s export markets, such as North America and Europe, constituted most of the FDI destinations; in other words, localization of production has advanced in those areas. Japan’s FDI stagnated with the economic slump at the beginning of 1990s but increased afterward with the further appreciation of the yen (it exceeded 80 yen/dollar in April 1995). Later, the Japanese government intervened in dollar-buying and announced “overseas loan and investment promotion measures for the correction of the yen appreciation” (August 1995); the exchange rate again climbed to triple digits. Although the trend of growth of FDI ceased, the level re-

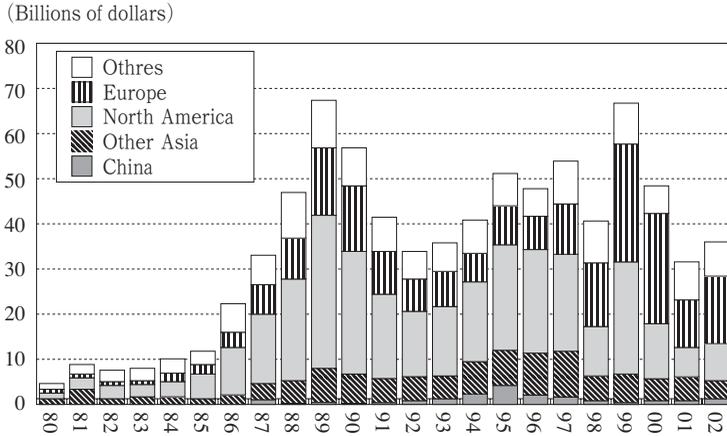
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(1) The definition of “industrial hollowing-out” is summarized in the Japan Institute of Labor (2000) and Watanabe (2002).

(2) FDI statistics from the Department of Treasury are not on an “execution basis” but on a “notification basis.” There is a big difference between notification and execution; execution could decrease to as little as half the notification.

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Figure 1 Transition of FDI from Japan



Remark: Statistics are on the reporting basis

Data Source: Ministry of Finance, *Monthly Statistical Report of Public Finance*

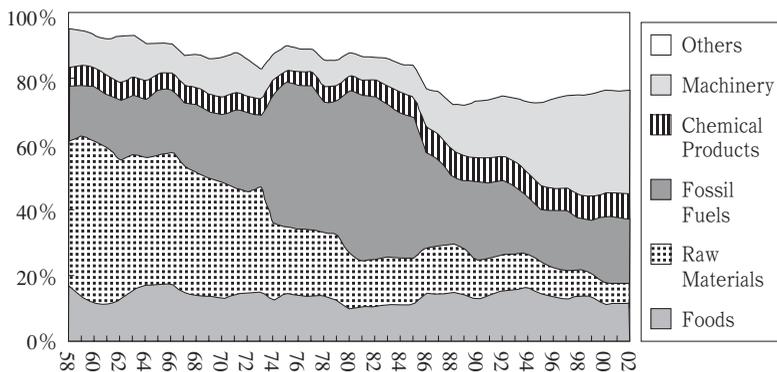
mained high. Thus, FDI had been undertaken in correlation with the fluctuation in the exchange rate.<sup>(3)</sup>

The transfer of factories overseas has also changed Japan's import structure. **Figure 2** shows the transition of the share of Japan's imports (in dollars) by item. We will classify foods, raw materials, and fossil fuels as "raw materials and fuels" and the remainder as "products." Raw materials and fuels accounted for 70% or more of the imports until the first half of the 1980s. It is clear that before 1980, Japan was a processing trade country that imports raw materials and exports products. However, it is shown that product imports, especially machinery, increased rapidly in the latter half of the 1980s. In 1989, "products" exceeded

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(3) The amount of FDI to China is unexpectedly small. This is one of the grounds for assuming that the "Economic slump in Japan cannot be ascribed to China."

Figure 2 Transition of the share of the import of Japan



Remark: Fabrics, Non-metal minerals, and Metals are included in Others.

Data Source: JETRO <http://www.jetro.go.jp/ec/j/trade/#trade-statics>

50% of the share of imports. The overseas transfer of the production base is regarded as one of the factors prompting the increase in product importation, though this may not explain all the scenarios.<sup>(4)</sup>

The term hollowing-out originally emerged in the U.S. under the Reagan administration in the 1980s.<sup>(5)</sup> The U.S. adopted a tight monetary policy to control inflation when its public finances incurred a large deficit. Therefore, the U.S.'s economic situation at the time was characterized by a high interest rate and a high dollar rate. Over time, U.S. manufacturers began to lose competitiveness and started transferring factories overseas. As a matter of fact, the 1985 *White Paper on World Economy*, published by the Japanese government, dealt with in-

(4) According to *The Overseas Business Activities of Japanese Companies*, cited in this paper, overseas affiliates' export value to Japan (re-import value) was approximately 8 trillion yen in the beginning of the 1990s and has expanded rapidly to more than 12 trillion yen after 1996. This corresponds to the trend of expansion of the import of manufactured goods, especially those with mechanical components, as shown in **Figure 2**.

(5) Business Week (1986).

dustrial hollowing-out as a problem facing the U.S. economy. However, in the 1990s, industrial hollowing-out in Japan became one of the primary economic matters.

In this paper, by applying the framework of the Input-output analysis, we analyze the ways in which the overseas business activities of Japanese companies influence domestic production activities and employment in Japan after 1990.<sup>(6)</sup> We present the estimated results first: manufacturing employment decreased by 0.4 to 0.6 million during the ten years following 1990. This influence has recently grown stronger, and the total employment cutback in 1999 had reached 1.6 to 1.7 million. Considering that in 2003 over three million people were unemployed, it should be true that FDI partially contributes to the present situation of unemployment in Japan. In the following sections, we will explain the estimation model and present estimated results, and compare these results with those from preceding researches.

## 2 Previous empirical studies on hollowing-out in Japan

In this section, we present the results of some preceding researches on the relation between FDI and employment, applying the Input-Output Analysis.<sup>(7)</sup> Three effects of FDI are usually considered to be the “export substitution effect,” the “re-import effect,” and the “export promotion effect”.<sup>(8)</sup> The goods that have been

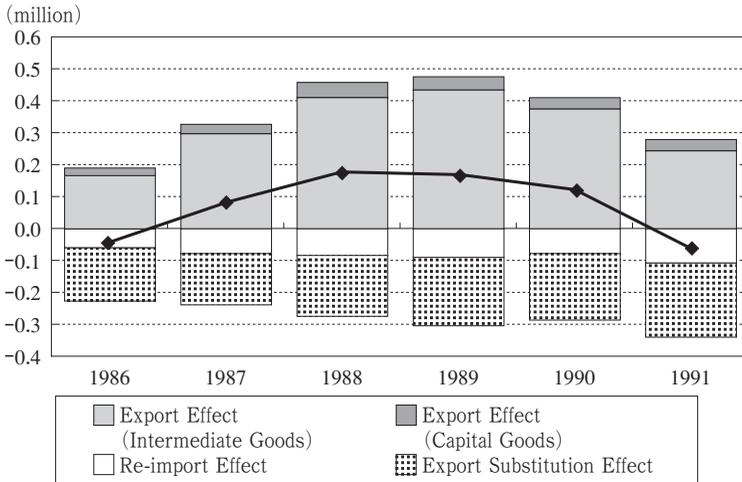
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(6) Fujii (1999) and Ozawa (2003) analyzed industrial hollowing-out for specific areas in Japan. It should be noted that this paper covers all of Japan from a macroeconomic perspective. However, our coverage is limited to the perspective of trade among the various effects caused by FDI.

(7) The Japan Institute of Labor (2000) and Watanabe (2002) conducted a survey of the validation study on industrial hollowing-out.

(8) For example, see Inaba (1999).

Figure 3 Effect on employment (1) (by Ministry of Labor)



Source: quoted from Ministry of Labor, *White Paper on Labor 1994*

produced by domestic firms have so far been manufactured abroad through FDI. Therefore, two negative effects occur: (1) the negative effect of the export substitution effect is the substitution of exports from overseas affiliates, and (2) the negative effect of the re-import effect, which refers to the increase of imports from overseas affiliates into Japan. However, in order to establish overseas factories, the export of Japanese capital goods must necessarily increase; these export components from Japan are necessary so as to enable overseas affiliates to continue their production activities. These positive outcomes for the Japanese economy are referred to as the export promotion effect. The influences on production and employment are analyzed on the basis of both the positive and negative effects of FDI.

First, the Ministry of Labor's *White Paper on Labor* (1994) analyzes the influence of FDI on domestic employment between 1986 and 1991. **Figure 3**

summarizes the results.

- (a) The export substitution effect and the re-import effect somewhat exceeded the export promotion effects in 1986.
- (b) Although the export substitution effect and the re-import effect increased in 1987 and 1988, which constituted the FDI's rapid growth period, the export promotion effect, components supplied to a local company, rose rapidly. As a result, employment increased by 0.186 million in 1988.
- (c) However, in 1991, domestic manufacturing employment decreased by approximately 0.07 million as a consequence of the increasing export substitution and re-import effects, while the size of export promotion effect decreased due to the decrease in new FDI.

Although the Ministry of Labor's *White Paper on Labor* (1994) states that "the influence of the overseas transfer of the manufacturing industries on its employment cannot be disregarded in the microeconomic viewpoint," the number of employees in Japan's manufacturing sector was approximately 15 million in 1990; therefore, on the basis of this figure, it can be said that FDI's influence on employment was marginal around 1990.

Next, the 24<sup>th</sup> report of the Ministry of International Trade and Industry (MITI) (1995)—*The Overseas Business Activities of Japanese Companies*—estimated the extent of the influence of FDI between 1993 and 1995 on employment in four industries: textiles, general machinery, electric machinery, and transportation equipment. The result is presented in **Table 1A**. 1993 marked positive effects in the assembly industries, i.e., transportation equipment, electric machinery, and general machinery, while it recorded negative effects in labor-intensive industries like the textile industry. Negative effects were found in electric machinery in 1994 and in transportation equipment in 1995 due to the

Table 1A Effect on Employment of FDI (2) (by MITI )  
(Manufacturing,1993, 1994, and 1995)

	Effect on Employment (persons)		
	1993	1994	1995
Textile	-7,923	-8,046	-9,232
General Machinery	26,978	24,716	23,943
Elect. Machinery	12,373	-34,869	-21,755
Trans. Equipment	40,229	11,718	-2,613
Total	71,657	-6,481	-9,657

Source: quoted from MITI, *The Overseas Business Activities of Japanese Companies*, vol 24.

Table 1B Effect on Employment of FDI (3) (by MITI )

	Effect on Employment (10 Thousand)
1991	6.6
1992	6.8
1993	-0.6
1994	-8.2
1995	-4.0

Source: quoted from MITI, *The Overseas Business Activities of Japanese Companies*, vol 26.

increase of the re-import effect. With regard to the influence of FDI on domestic employment, this estimation suggests that the negative effects are increasing gradually because of the expansion of re-import.

MITI's 26<sup>th</sup> report, *The Overseas Business Activities of Japanese Companies*, in 1997, presents an estimation for the period between 1991 and 1995. The result is shown in **Table 1B**. Using data from the 24<sup>th</sup> report, MITI's 26<sup>th</sup> report reveals that Japan's FDI has accelerated, thereby reducing employment after 1993.

Finally, the Ministry of Health, Labor and Welfare's (MHLW) *White Paper on Labor Economy* (2003) presents similar calculations for the year 2000. The results (shown in **Table 1C**) of this paper were greater than those in the *White*

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Table 1C Effect on Employment of FDI (4)  
(by MHLW) (Manufacturing, 2000)

	Effect on Employment (10 Thousand)
Export Promotion of Capital Goods	1.8
Export Promotion of Intermediate Goods	83.0
Export Substitution	-117.0
Re-import	-23.7
Total	-55.9

Source: quoted from MHLW, *White paper of Labor 2003*.

*Paper on Labor* (1994). The total negative effects from the export substitution and the re-import effects exceeded the positive effects of export promotion; as a result, approximately 0.6 million manufacturing job opportunities were lost. This can be argued to be a fairly large figure, since it represents 4% of the employees in the manufacturing sector. Moreover, this white paper states that “The loss of job opportunity caused by the re-import effect constitutes about 0.27 million; as the bulk of the re-import involves Asian regions, FDI to Asian regions is the main reason for the loss of job opportunity in Japan.”

### 3 The model

#### 3-1 Input-output model

The demand structure for goods produced in Japan has changed due to FDIs; this change in demand in the manufacturing sector has spread to related industries through inter-industrial relations. The change in the total domestic output is calculated using Leontief's open model, as follows:

$$\mathbf{x} = [\mathbf{I} - (\mathbf{I} - \hat{\mathbf{M}}) \mathbf{A}]^{-1} [(\mathbf{I} - \hat{\mathbf{M}}) \mathbf{f} + \mathbf{e}], \quad (1)$$

where,  $\mathbf{x}$ ,  $\mathbf{f}$ , and  $\mathbf{e}$  are vectors representing the amount of production, domestic

final demand, and export, respectively;  $\mathbf{A}$  is an input coefficient matrix, and  $\hat{\mathbf{M}}$  is the diagonal matrix representing the rate of import, whose element  $m_i$  is defined as follows:

$$m_i = M_i / (\sum_j a_{ij} X_j + f_i). \quad (2)$$

The influence on employment is obtained by multiplying the labor coefficient by equation (1) as follows:

$$\mathbf{n} = \hat{\mathbf{N}}\mathbf{x}, \quad (3)$$

where  $\mathbf{n}$  is a vector representing the number of employees, and  $\hat{\mathbf{N}}$  is a diagonal matrix of the labor coefficient.

### 3-2 The export promotion effect

With regard to the export promotion effect, the Ministry of Labor and the MHLW independently estimated the effect of the export change in capital goods and intermediate goods. However, according to the data provided in *The Overseas Business Activities of Japanese Companies*, the export value of capital goods from an investing country to a host country is extremely small in comparison with the export value of intermediate goods. Regarding both these figures in recent years, while the export of intermediate goods is valued at 35 trillion yen, the export of capital goods is valued at 0.35 trillion yen; according to data from 2000, the latter is only 1% of the former. Therefore, in this analysis, we decided to focus on the effect that increases the export of intermediate goods and omit the export of capital goods.

In order to estimate the influence on Japan, from among the imports of intermediate goods for overseas affiliates, those from Japan (i.e., Japanese exports) were assumed to be equivalent to the increment of exports  $\mathbf{e}$  in equation (1). However, there are two statistical problems with the data in *The Overseas*

*Business Activities of Japanese Companies.*

First, although the total purchases of overseas affiliates are presented in *The Overseas Business Activities of Japanese Companies*, the industry from which they are imported has not been indicated. Preceding studies have assumed that import purchases for the overseas affiliates are from their own industry. Certainly, it may be the case that most of the overseas affiliates purchase from their own industry, for example, the textile industry purchases cloth from Japan. However, assuming that goods are necessarily imported from the same industry might not depict the current state correctly; for example, overseas electronics affiliates might import metal or plastic goods from Japan's non-electronic sector.<sup>(9)</sup> Therefore, in this paper, we decided to estimate the export promotion effect assuming the following two extreme cases:

Case A: Here, we assume that overseas affiliates purchase Japanese goods from their corresponding industry, as was assumed in the earlier research.

Case B: In this case, we assume that overseas affiliates' importation from Japan is in the same ratio as Japan's input coefficient. In other words, the overseas affiliates purchase imported goods in the same way as Japanese domestic firms.

The second statistical problem lies in the use of the concept of "commerce" in the industrial classification of *The Overseas Business Activities of Japanese Companies*. In the Input-output table, "commerce" refers to the industry that produces a commercial margin; the export of commerce refers to the commercial

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(9) The assumption of importation from the same industry is fundamentally unrealistic, for example, local construction industries importing from Japan's construction industries. The estimation in this case should be understood as a simulation based on a certain assumption.

Table 2 Import of Local Firms from Japan (1999, Billion Yen)

	Original Data Commerce Unadjusted	Case A	Case B
		Same sector import Commerce Adjusted	Adjusted by IO structure Commerce Adjusted
Primary Industry	3.6	7.5	46.5
Mining	30.3	63.3	784.5
Foods	7.6	15.0	146.5
Textile	22.3	45.5	164.2
Woods & Paper	108.7	222.6	895.0
Chemicals	12.0	25.9	590.1
Oil & Coal Products	468.6	1,025.5	339.2
Metals	414.5	884.7	2,315.7
Machinery	1,078.5	2,235.8	1,006.6
Elect. Machinery	6,009.5	12,631.0	6,376.9
Trans. Equipment	4,274.1	9,232.5	5,399.8
Precision Apparatus	456.4	925.7	243.0
Other Manufacturing	2.9	6.0	2,793.3
Construction	549.2	1,099.1	222.3
Elect. Gas & Water	0.0	0.0	751.7
Commerce	18,631.1	2,165.0	2,103.4
Service & Others	1,343.6	2,827.9	9,234.3
Total	33,412.9	33,412.9	33,412.9

Source: calculated by the authors based on the data in *The Overseas Business Activities of Japanese Companies vol. 30*.

margin that is included in the export goods. However, neither the purchase nor the export of commerce is defined in such a manner in *The Overseas Business Activities of Japanese Companies*. **Table 2** shows the overseas affiliates' purchases from Japan in 1999. In the original data of imports from Japan by industry, "commerce" accounts for 55.8% of all imports. The Ministry of Labor and the MITI's research uses this value as the importation from the Japanese commerce sector. However, the influence on Japan's manufacturing sector cannot be estimated correctly by this approach. For a more appropriate interpretation, the

larger part of the importation of this commerce is considered to be an import from Japan's manufacturing sector, and the commercial margin given in the Input-output table is considered to be a component of it. In other words, it is necessary to divide the overseas affiliate commerce imports from Japan by Japan's commercial export margin and that of other industries. Then, although it may be a bold assumption, we adjusted the import data based on the following procedure:

- 1) First, we allocate the overseas commerce purchases, as set in *The Overseas Business Activities of Japanese Companies*, to the purchases of other industries. The ratio was assumed to be identical to the share of the purchases of the other industries. At this point, commercial margin is included in the purchases of each industry.
- 2) Then, we subtract the commercial margin, assuming that the ratio of the commercial margin to the overseas affiliates' purchases in each industry is identical to the ratio in Japan. We then combine the subtracted commercial margins; this is considered to be the purchases of overseas affiliate commerce.

The adjusted overseas affiliates' purchases from Japan are given in the second column of **Table 2**. Here, the rate of the commercial margin is 6.5%<sup>(10)</sup> and represents the cases in which the overseas affiliates import from their own industry. These commerce data fall under the assumption of Case A. The data under the assumption of Case B are shown in the third column. Naturally, these totals are identical.

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(10) In the estimate of the *White Paper on Labor* (1994) and the reports by the MITI, the imports and exports of the local affiliates' commerce do not appear to have been adjusted. Since this underestimates the imports and exports of the manufacturing industry, it would explain why these estimated results appear small.

### 3-3 The export substitution effect

There are two cases in which Japanese exports are substituted by overseas affiliates: “domestic sales in the host country” and “exports to a third country.” For instance, when a Japanese automobile maker shifts to the U.S., Japanese car exports to the U.S. will decrease by the number of cars the automobile maker produces in the U.S. Therefore, though it may be an overstatement, it is considered that the total domestic sales in the host country substitutes the Japanese exports.

The exports from the overseas affiliates to a third country are more difficult to evaluate. Although some portion of the exports to a third country might comprise products from Japan, domestic products or imports from other countries might also be substituted. From this, it can be deemed that there exist many uncertain elements; therefore, in this paper, we have decided not to consider this effect in the calculations.

The handling of the sales of overseas affiliate commerce also poses a problem. In *The Overseas Business Activities of Japanese Companies*, commerce occupies approximately half of the total sales of overseas affiliates. Four such cases are included in the sales of overseas affiliate commerce.

Case 1: sales of goods purchased from Japan’s local affiliates

Case 2: sales of goods imported from Japan

Case 3: sales of goods purchased from local non-Japanese companies

Case 4: sales of goods imported from countries other than Japan

Since the above survey is based on a questionnaire, there is a possibility that the figures from Case 1 might be double-counted with the exports of the local Japanese corporations. Additionally, Case 2 is not an example of export substitution but of export promotion; thus, it has already been counted. Further, Cases

3 and 4 are not directly related to Japan. Thus, we consider that there is little in the sales of overseas affiliate commerce that is directly related to Japanese companies. Consequently, in this paper, we have assumed that the sales of overseas affiliate commerce do not substitute Japanese products.

### **3-4 The re-import effect**

The re-import effect refers to the decrease in the final demand for domestic goods due to the increase in Japanese importation of overseas affiliates' products; it presents certain problems as well. First, regarding the sales of the overseas affiliates to Japan, the final and intermediate goods are not differentiated in *The Overseas Business Activities of Japanese Companies*. However, in actuality, a large portion of overseas affiliate exports to Japan is considered to be final goods.<sup>(11)</sup> Thus, in this paper, we assume that Japanese imports from overseas affiliates are all final goods and that the final demand in Japan decreases by that amount.

A second problem concerns overseas affiliate commerce. As mentioned in Section 3-3, sales of commerce might be double-counted with the exports of the local Japanese corporations. Thus, we have decided to exclude the sales of overseas affiliate commerce vis-à-vis the re-import effect.

## **4 The influence of FDI on the Japanese economy**

This paper analyzes the decade of the 1990s. The influence of the FDI of each year on domestic production and employment is estimated based on the model explained in Section 3-1. First, the influence on domestic production is shown,

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(11) The importation of intermediate goods from the overseas affiliates to Japan seems to be increasing in recent years with the increase in horizontal labor specialization. In that sense, the re-import effect is overestimated.

Table 3 Effect on Domestic Product in 1999 by FDI

(Unit: Billion Yen)

	Domestic Product	Export Promotion (Case A)	Export Promotion (Case B)	Export Substitution	Re-import	Total (Case A)	Total (Case B)
Primary Industry	13,902	140	281	-394	-112	-366	-225
Mining	1,355	207	919	-475	-303	-571	141
Foods	37,608	235	492	-1,048	-71	-884	-627
Textile	7,988	199	332	-1,555	-204	-1,560	-1,427
Woods & Paper	26,440	1,356	2,239	-2,227	-536	-1,407	-524
Chemicals	24,826	1,144	2,059	-1,892	-515	-1,263	-348
Oil & Coal Products	10,958	1,461	903	-3,695	-315	-2,549	-3,107
Metals	20,900	4,688	6,192	-6,521	-939	-2,772	-1,267
Machinery	26,008	3,083	1,491	-3,017	-457	-391	-1,983
Elect. Machinery	51,466	17,690	9,046	-14,976	-3,831	-1,117	-9,761
Trans. Equipment	40,347	15,488	9,186	-21,597	-915	-7,024	-13,327
Precision Apparatus	3,757	1,053	296	-806	-288	-41	-798
Other Manufacturing	39,865	2,913	5,007	-3,676	-585	-1,348	746
Construction	77,167	1,421	617	-3,323	-329	-2,232	-3,035
Elect. Gas & Water	27,507	1,132	2,043	-1,510	-256	-634	277
Commerce	97,246	4,609	4,188	-3,125	-497	987	566
Service & Others	398,414	12,851	18,726	-20,122	-3,698	-10,968	-5,094
Total	905,756	69,669	64,017	-89,958	-13,851	-34,141	-39,793

Source: calculated by the authors

followed by that on domestic employment. These influences were estimated using the industry levels for ten years. The transition of the total effect is shown by the time series; however, only the data for the examination by industry for 1999 is presented due to space constraints.

#### 4-1 The influence on domestic production

**Table 3** shows the influence of FDI on domestic production for 1999. As mentioned above, two cases are considered under the export promotion effect: in Case A, overseas affiliates purchase only from their own industry in Japan, and

in Case B, overseas affiliates purchase with the same input coefficients as those of the Japanese domestic industries.

With regard to the aggregated effects, the influence is observed to vary by industry, displaying various patterns. In actuality, the demand of commerce increases as a result of Japan's foreign direct investment. This consequence is reasonable since foreign direct investment promotes commercial activities. It is interesting to note that in Case B, domestic demand in Japan increases only in other manufacturing industries such as electricity, gas, and water service, and commerce. On the other hand, it is in the manufacture of transportation equipment that an extremely big reduction is observed in both cases. It is clear that the overseas operation of the automobile industry considerably influences Japan's domestic production of automobiles.

The total effect of export promotion in Cases A and B are 69.7 trillion yen and 64.0 trillion yen, respectively, where the effect of Case A is larger by approximately 10 percent. In Case B, the electric machinery and transportation equipment that represent Japanese overseas operations reflect smaller export promotion effects than those in Case A; however, the service and other industries in Case B show a larger export promotion effect than those in Case A. This reflects the trend toward a service economy (in the sense that each industry requires a large sum of intermediate input from the service industry) when compared to Case A. The variation between Cases A and B stems from the differing assumptions regarding which Japanese industry's exports would be promoted by the purchases of overseas affiliates. Using the electric machinery industry as an example, we observe that the direct influence on this industry (the increment of vector  $e$  in Equation (1)) is larger in Case A than it is in Case B, as shown in **Table 2**. The same can be said for the transportation equipment industry.

Further, since both electric machinery and transportation equipment are industries that exhibit a large backward linkage effect, the total (direct and indirect) effect of export promotion becomes larger in Case A.

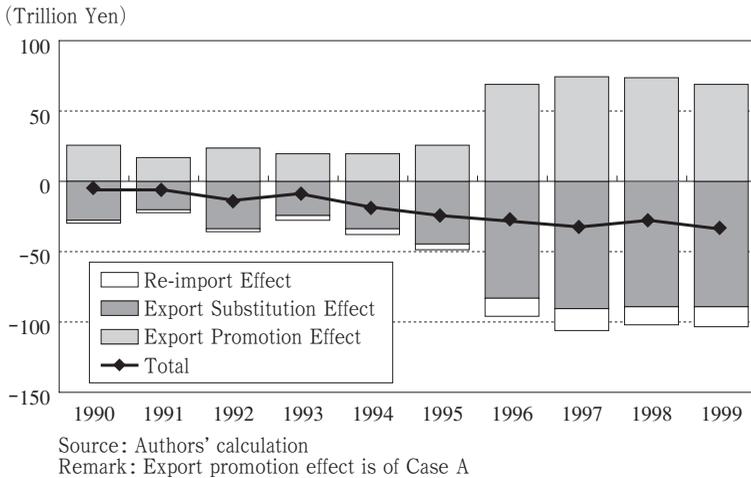
Now, let us examine the export substitution effect. This effect was estimated as -90.0 trillion yen of the total of all industries. The effects on the electric machinery and transportation equipment industries are large, marking -15.0 trillion yen and -21.6 trillion yen, respectively. These two industries account for 40.7% of the export substitution effect. Moreover, its influence on the service and other industries was also large, similar to the influence of the export promotion effect, where the effect on the transportation equipment industry was as large as that on the service industry.

Finally, the re-import effect was estimated as -13.9 trillion yen of the total of all industries. This effect was especially large in the electric machinery industry, marking -3.8 trillion yen; however, its influence on the transportation equipment industry was relatively small, marking about -0.9 trillion yen. Based on this, it is possible to deduce that the overseas operation of the automobile industry was market-oriented. Its influence on the service and other industries was also sizeable, and was equivalent to that on the electric machinery industry.

**Figure 4** shows the summary of these results by time series, where figures from Case A are used to determine the export promotion effect. Japan's foreign direct investment increased rapidly due to the appreciation of the yen in 1995; the export promotion effect (positive), export substitution effect (negative), and re-import effect (negative) have also expanded with the change in the yen. Often, only the negative aspects of FDI are discussed, such as those concerning domestic production. However, after 1996, the export promotion effect exceeded a 30 trillion yen export value and was on a scale of 70 trillion yen when the

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Figure 4 Effect on domestic product of FDI



indirect effects were incorporated; this is considerably sizeable. Needless to say, since FDI also has negative effects, it is necessary to examine the net influence. When the change in demand for domestic goods is seen as a net amount, the negative effects appear to be still larger. While the net reduction in the final demand due to foreign direct investment was -2.4 trillion yen in 1990, it had expanded by approximately 7.3 times to -17.9 trillion yen in 1999. Since Japan's GDP in 1999 was approximately 510 trillion yen, it is estimated that the overseas business activities of Japanese companies deducted about 3.5% of the final demand. Regarding the influence on the entire production, including the effects of indirect induction, the total expanded from -4.9 trillion in 1990 to -34.1 trillion yen in 1999 under the conditions of Case A and from -7.3 trillion to -39.8 trillion yen under the conditions of Case B.

Table 4 Effect on Domestic Employment in 1999 by FDI

(Unit: Million)

	Domestic Employment	Export Promotion (Case A)	Export Promotion (Case B)	Export Substitution	Re- import	Total (Case A)	Total (Case B)
Primary Industry	4.326	0.043	0.087	-0.123	-0.035	-0.114	-0.070
Mining	0.078	0.012	0.053	-0.027	-0.017	-0.033	0.008
Foods	1.598	0.010	0.021	-0.045	-0.003	-0.038	-0.027
Textile	0.409	0.010	0.017	-0.080	-0.010	-0.080	-0.073
Woods & Paper	0.322	0.017	0.027	-0.027	-0.007	-0.017	-0.006
Chemicals	0.453	0.021	0.038	-0.035	-0.009	-0.023	-0.006
Oil & Coal Products	0.037	0.005	0.003	-0.012	-0.001	-0.009	-0.010
Metals	0.492	0.110	0.146	-0.153	-0.022	-0.065	-0.030
Machinery	1.389	0.165	0.080	-0.161	-0.024	-0.021	-0.106
Elect. Machinery	2.022	0.695	0.355	-0.588	-0.151	-0.044	-0.383
Trans. Equipment	1.091	0.419	0.248	-0.584	-0.025	-0.190	-0.360
Precision Apparatus	0.236	0.066	0.019	-0.051	-0.018	-0.003	-0.050
Other Manufacturing	4.652	0.340	0.584	-0.429	-0.068	-0.157	0.087
Construction	6.865	0.126	0.055	-0.296	-0.029	-0.199	-0.270
Elect. Gas & Water	0.443	0.018	0.033	-0.024	-0.004	-0.010	0.004
Commerce	12.079	0.572	0.520	-0.388	-0.062	0.123	0.070
Service & Others	30.198	0.974	1.419	-1.525	-0.280	-0.831	-0.386
Total	66.690	3.604	3.706	-4.548	-0.766	-1.710	-1.609

Source: calculated by the authors

#### 4-2 The influence on domestic employment

We set a focus on the influence that FDI gave on domestic employment. We can estimate the influence of FDI on employment by multiplying the employment coefficients by the results explained in Section 3-1. **Table 4** shows the influence of FDI on domestic employment in 1999. Totaling the three effects, the decrease in employment due to the overseas activities of Japanese companies is 1.710 million in Case A and 1.609 million in Case B. Nevertheless, the transfer of manufacturing overseas seems to explain half of the recent increase in unemployment, since the number of unemployed people was 3.150 million in 1999. However, the

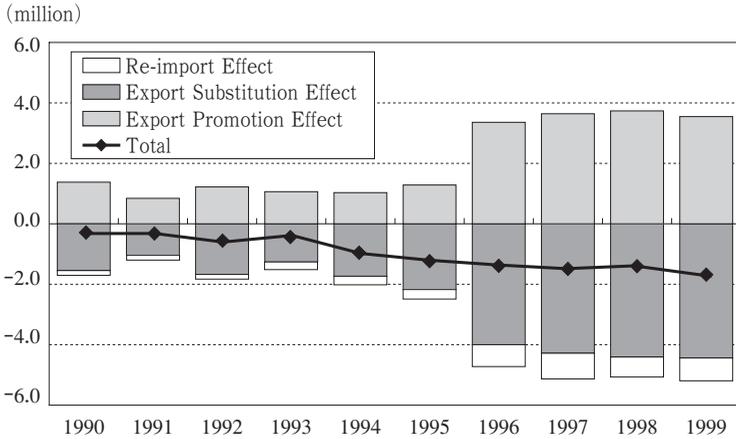
direct influence on manufacturing seems unexpectedly small; the total manufacturing employment decreased by an estimated 0.646 million in Case A and 0.966 million in Case B.

The influence of the export promotion effect on employment is undoubtedly large in sectors such as electric machinery and transportation equipment; employment increased by 0.695 million and 0.419 million in Case A and 0.355 million and 0.248 million in Case B. However, in the service and other industries, this influence is much greater. The share of influence on the employment of the service and other industries, which is 27% (0.974 million) in Case A and 38% (1.419 million) in Case B, greatly expands in comparison with that on production, which is 18% in Case A and 29% in Case B. Since the service industry is more labor-intensive, it can function as an example of how manufacturing performance impacts employment. Consequently, the influence on employment is larger in Case B than in Case A, contrary to the influence on production.

However, the fact that the influence of the service and other industries on employment is more than that on production has both positive and negative consequences; employment in the service and other industries decreased the most, exceeding the decrease in the electric machinery and transport machinery industries with regard to the export substitution effect and the re-import effect. Employment decreased by 1.525 million due to the export substitution effect and by 0.280 million due to the re-import effect. In addition, the figures are comparatively large for commerce; employment decreased by 0.388 million due to the export substitution effect and by 0.062 million due to the re-import effect.

**Figure 5** shows the influences that FDI has given on domestic employment by time series. The line chart shows all the effects, that is, the export promotion, export substitution, and re-import effects. The negative effects rapidly expanded

Figure 5 Effect on employment of FDI



Source: Authors' calculation

Remark: Export promotion effect is of Case A

around 1994. Since the exports to a third country are not considered in this paper, these figures might be underestimated; were they to be included, it is possible that the line chart would shift a little bit lower. FDI appears to have influenced Japan's domestic employment to a considerably greater extent in the latter half of the 1990s.<sup>(12)</sup>

## 5 Concluding remarks

In this paper, we examined the influence that the overseas business activities

(12) Each effect expanded from 1996, as shown in **Figures 4 and 5**. The factors considered to contribute to this are as follows (as explained in the paper): (1) The sharp yen appreciation against the dollar in 1995 triggered the increase of FDI. (2) In the data of *The Overseas Business Activities of Japanese Companies*, the amounts of sales or purchases are converted from local currency to yen, such that they are afterwards expanded in yen due to a "weak yen against the dollar."

of Japanese companies, in other words, FDI, had on domestic production and employment in Japan; this examination was based on information from *The Overseas Business Activities of Japanese Companies* by the METI. We considered the following three effects concerning FDI: The positive export promotion effect, in which component supplies from Japan to overseas affiliates increase due to FDI, the negative export substitution effect, in which overseas affiliate goods replace the exports from Japan, and the negative re-import effect (boomerang effect), in which exports to Japan from local affiliates increase. Although FDI tends to be regarded as negative for the investing country, the export promotion effect was found to be larger than expected. Regarding the aggregate of these three effects, though many industries, such as the electric machinery and transportation industries, were negatively influenced, it was found that there were also a few industries, such as the general and precision machinery industries in Case A, which were comparatively only marginally influenced. Consequently, it is considered that industrial hollowing-out receives so much attention because the problems were elicited in a certain region where large factories had shifted abroad rather than because foreign direct investment exerts a more powerful influence on manufacturing as a whole.<sup>(13)</sup>

Although the change in employment in the manufacturing sector due to FDI differs depending on the method of estimating the change in the final demand, employment recently decreased by an estimated 0.6 to 1.0 million. This decrease was observed mostly in the manufacturing sector of the electric and transportation machinery industries. On the other hand, as noted by Ono (2002), this

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(13) Refer to the *White Paper on Small and Medium Enterprises* (2002) (Part 1, Chapter 3) and Seki et al. (2003) for the analysis concerning the hollowing-out of the regional economy or small and medium-sized manufacturing.

manufacturing is related to employment in other manufacturing and service industries. Regarding the influence of employment on all industries, a reduction of approximately 1.6 to 1.7 million was observed. If these figures are compared with the 3.15 million unemployed in 1999, it can be argued that FDI accounts for about the half of Japan's current unemployment. Fukao (1995a) states that "the possibility that FDI causes a serious employment problem in the entire Japanese economy at present is low," providing data on the number of employees in domestic manufacturing and the overseas affiliates from the 1980s to the early 1990s. Moreover, Fukao also states that "from a macroeconomic viewpoint, inappropriate finance and monetary policy have far more serious influences than the overseas production, for instance." However, as our study has revealed, FDI's influence on employment has become considerably larger in the latter half of the 1990s; the situation seems to have changed somewhat since Fukao's research was conducted in 1995. At the same time, regarding the industrial hollowing-out, it seems that we should consider the entire industry without being limited to the trends in the manufacturing sector alone.<sup>(14)</sup>

Finally, we were unable to consider FDI's "import conversion effect" in this paper. This effect describes how the industrial or trade structures in Japan change due to Japanese companies' development of overseas operations. Although it is difficult to incorporate this effect into the framework of Input-output analysis, we will try to include at least part of it in future studies.

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(14) For instance, refer to the *White Paper on Economy and Public Finance (2002)*. Here, industrial hollowing-out is analyzed from perspectives such as trade structure, industrial structure, and international division of labor structure.

## Data sources

(1) Sales and purchases of overseas affiliates

METI, *The Overseas Business Activities of Japanese Companies*, various issues. Concerning those after the 26th survey, in 1996, we obtain the data from METI's website, (<http://www.meti.go.jp/statistics/>).

These data are prepared based on the questionnaire survey from the overseas affiliates; therefore, the response rate varies among survey years and industries. Fukao (1995b) notes the necessity of caution when making comparisons by time series or among industries.

(2) Input-output tables

METI, *Extended Input-Output tables*, various issues. We owe the Input-output table data to the website of Prof. Takayuki Kiji of Keio University, Faculty of Commerce (<http://news.fbc.keio.ac.jp/~kiji/oihiroba/index.html>). We acquired time series data of extended Input-output tables, although an ID and password are necessary to log-in. The members of the Pan Pacific Association of Input-Output Studies (PAPAIOS) are eligible to access the contents; Prof. Kiji should be contacted for the ID and password.

(3) The number of the person engaged

Economic and Social Research Institute, Cabinet Office, *Annual Report on National Accounts*, an individual engaged by economic activity, various issues (<http://www.esri.cao.go.jp/en/sna/h15-nenpou/index.html>).

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