An Input-Output Analysis on Japanese Enterprises in China

Jian TENG[*], Wenhui FANG[**], and Meltem OKUR DINCSOY[***]

Introduction

As the purpose of the study, we mainly focused on the foreign direct investment (FDI), which is an international capital movement, change trade movements between investor countries and receiver countries based on interdependent relationships such as technology transfer, structural demand and supply of both countries. Thus, it has a great influence on both investor and receiver countries.

According to our investigations, it can be briefly said that FDI in China by Japanese companies has showed an expanding tendency since 2000 after the doldrums in the late 1990's and reached $6.53 billion in 2005 with 19.8% according to the previous year. On the other hand, it is observed that in 2002 as a peak year of the number of Japanese companies in China reached 177 with 22.0% increase according to the previous year. In this point, the purpose of our research is firstly to create an International Input-Output Table for analyzing Japanese enterprises in China, secondly to examine the dependence

[*] Professor of Economics, Okayama University; 1-1 Tsushima-Naka 3-Chome Okayama 700-8530, Japan, teng@e.okayama-u.ac.jp
[**] Professor of Economics, Keiwa College, 1270 Tomizuka Shibata-shi, Niigata 957-8585 Japan, fang@keiwa-c.ac.jp
[***] Graduate School of Humanities and Social Sciences, Okayama University; 1-1 Tsushima-Naka 3-Chome Okayama 700-8530, Japan, meltemokur@hotmail.com

between China and Japan by using this original table, and thirdly to make a suggestion for the best economic relationship between China and Japan.

Yamada (2001) analyzed the influence of Japan's FDI by using International Input-Output Analysis; however, the subject of Yamada's study is Japanese enterprises in U.S.A. Also, the reconstructed U.S.A.-Japan International Input-Output Table has a drawback in comparing current prices of two different time points (1990 and 1995). As a different point of this study, we focused on economic activities of Japanese enterprises in China and examined I-O table with constant prices covering 1995 and 2000.

The first section clarifies the framework of this study. Then, the second section explains how to project the International Input-Output Table for Japanese Enterprises Analysis (hereinafter called "Japanese Enterprises Analysis Table") in order to analyze Japanese enterprises in China. The third section analyzes economic effects of Japan's foreign direct investment in China by using the unique Japanese Enterprises Analysis Table. Lastly, the summary of this study is given with the conclusion remarks.

1 Framework of the Study

As the approach of our study, the structure of International Input-Output Table can

be showed as selected countries are y, z（y, z = C, J）of which C is China, and J is Japan. Then, the following correlation is formulated according to the International Input-Output Table between China and Japan.

$$\sum_{z} X^{yz} + \sum_{z} F^{yz} + \sum_{\gamma} L^{y\gamma} = X^{y} \quad (1)$$

$$\sum_{y} X^{yz} + BA^{z} + WTA^{z} + DA^{z} + V^{z} = X^{z} \quad (2)$$

Therefore;

X^{yz}, F^{yz} : Intermediate input , final uses of selected areas

$L^{y\gamma}$: Export of country y to country γ

BA^{z} : International freight/insurance for import of country z's intermediate sections from other selected countries

WTA^{z} : Import of country z's intermediate sections from the world

DA^{z} : Tariffs and duties on imported goods for the entire import of country z's intermediate sections

V^{z} : Value -added of country z

X^{y}, X^{z} : Domestic production of selected countries (gross output and gross input)

On the other hand, non-Japanese enterprises in China are Cc, and Japanese enterprises in China are Cj, when selected countries/companies are e, f, z （$e, f = Cc, Cj, J; z = C, J$） and formulas (1) and (2) can be rewritten as follows;

$$\sum_{f} X^{ef} + \sum_{z} F^{ez} + \sum_{\gamma} L^{e\gamma} = X^{e} \quad (3)$$

$$\sum_{e} X^{ef} + BA^{f} + WTA^{f} + DA^{f} + V^{f} = X^{f} \quad (4)$$

Table 1 shows the Format of the Japanese Enterprises Analysis Table.

(Table 1)

2 Projection of Japanese Enterprises Analysis Table

2.1 Materials Used for Projection

The 1990-1995-2000 Linked China-Japan International Input-Output Tables (Teng and Fang, 2006) (hereinafter called "Linked China-Japan Table") is used in projecting the Japanese Enterprises Analysis Table. This table has 33 sectors and standardizes each year's price valuation in USD, then converts them in real terms by price basis inflator of 2000.[1]

Also, materials of the Research on Japanese Enterprises' Overseas Activities (hereinafter called "Basic Research") by the Ministry of Economy, Trade and Industry (the former Ministry of International Trade and Industry) are used in projecting economic activities of Japanese enterprises in China. Data in the Basic Research such as Japanese enterprises' sales by region and country, sales by buyer and supplier, and enterprises' costs and profits are especially functional for this study. However, for data by region and country, aggregation and disclosure of data of Japanese enterprises in China started from 1994.[2] Due to this constraint of materials, 1995 and 2000 are used as the subject year for the analysis in this study.

For sector classification, the Basic Research has 18 sectors, and the Linked

[1] See Teng and Fang, 2006 for details of the Linked China-Japan Table.
[2] "Japanese Enterprises" mean enterprises in China if not otherwise specified.

China-Japan Table has 33 sectors. As a result of consolidating sectors of the Basic Research and the Linked China-Japan Table, the number of sectors of the Japanese Enterprises Analysis Table ends up in 16 (See Table 2).

For prices in the Basic Research, the currency unit of Japanese enterprises' data is converted from local currency to Japanese yen. In this study, nominal prices of Japanese enterprises in yen terms are reevaluated to USD terms by using the yen's exchange rate against USD. Moreover, price basis inflator of 2000 is created and used for converting nominal values of 1995 into real terms.

(Table 2)

2.2 Projection of Japanese Enterprises Analysis Table

(1) Japanese Enterprises' Output

Output of Japanese enterprises means the price-aggregate of products produced by production activities in China and it is very important for controlling both rows and columns of I-O tables. However, due to the constraint of materials, Japanese enterprises' sales by industry in the Basic Research are used as the output by industry in this study (See Table 3). Also, as commercial sales differs from the concept of commercial domestic output (commercial margin) in I-O tables, general administrative and selling

expenses (rent expense, packaging and transport expense, payroll, and depreciation expense) and operating profits of Japanese enterprises are aggregated and used as the commercial sector's output.(See Table 4).

(Table 3)

(Table 4)

(2) Japanese Enterprises' Input and Value Added

a) Japanese Enterprises' Total Input and Total Value Added

In this study, Japanese enterprises' total input and total value added are determined as follows.

Japanese enterprises' total input (ETA^{Cj} : row vector by section column) is calculated by subtracting payroll and depreciation expense from Japanese enterprises' cost of sales in the Basic Research (consumption of goods and services were used for manufacturing and sales of products).

Total value added (V^{Cj} : row vector by section column) is calculated by subtracting total input from total sales. For classified subitems of value added, payroll and depreciation expense are divided based on the data of the Basic Research. Then, payroll and depreciation expense are subtracted from total value added (sum of column values), and the remaining amount is defined as other value added including operating

surplus and net taxes on production.

However, in projection by industry, the total amount of payroll and depreciation expense in selling expense and operating profits in the commercial sector is regarded as this sector's total value added. Then, total input of this sector is calculated by subtracting total value added from domestic output.

b) Division by Country and Region

Japanese enterprises' total input (ETA^{Cj}) calculated in the previous section is divided longitudinally into the three groups, "Input from China", "Input from Japan", and "Input from the World" by the following method.

First, input (valued at CIF: duties and imposition on imports deducted) is divided into "Input from the World (WTA^{Cj})" and "Input from the Target Area (China and Japan)" based on the local supply rate (ratio of purchase amount from supplier) in the Basic Research (See Table 5). Then, international freight and insurance premium (BA^{Cj}) are subtracted in order to match "Input from the Target Area" with producers' price in the I-O table. Finally, based on the local supply rate in the Basic Research, "Input from the Target Area" valued at produces' price is divided into "Input from China (X^{CCj})" and "Input from Japan (X^{JCj})".

(Table 5)

(3) Input from Non-Japanese Enterprises and Japanese Enterprises in China

a) Sales of Intermediate Goods to China by Japanese Enterprises

First, "Sales of Intermediate Goods to China by Japanese Enterprises (X^{CjC})" is separated from Intermediate Demand of Domestic China (X^{CC}). Yamada [2001] used a ratio of Japanese enterprises in economic activities of a designated country (U.S.A.) in order to separate economic activities of Japanese enterprises in the U.S.A.-Japan International Input-Output Table. A similar method was used in this study that is as follows;

Sales of Intermediate Goods to China by Japanese Enterprises (row total column vector of $X^{Cjc}+X^{Cjj}$) ＝ Intermediate Demand of Domestic China (row total column vector of X^{CC})* × Ratio of Sales to China by Japanese Enterprises (column vector) in Total Sales to Domestic China ($X^{CC}+F^{CC}$) (5)

b) Input Between Japanese Enterprises

Next, by longitudinal column section, "Input from Japanese Enterprises (column total of X^{Cjj})" is separated from input from China into Japanese enterprises. This process is to project transactions between Japanese enterprises.

Input from Japanese Enterprises into Japanese Enterprises (column total row vector

* indicates a square matrix with the vector lined diagonally (also applied below)

of X^{Cjj}) ＝ Input from China into Japanese Enterprises (column total row vector of $X^{Ccj}+X^{Cjj}$)* × Ratio (column vector) of Input and Purchase Amount of Japanese Enterprises' Goods in Input and Purchase Amount in Domestic China ($X^{CC}+F^{CC}$) (6)

c) Input from Japanese Enterprises into Non-Japanese Enterprises

By longitudinal column section, "Input from Japanese Enterprises (column total of X^{Cjc})" is separated from input from China into non-Japanese enterprises.

Input from Japanese Enterprises into Non-Japanese Enterprises (column total row vector of X^{Cjc}) ＝ Input from China into Non-Japanese Enterprises (column total row vector of $X^{Ccc}+X^{Cjc}$)* × Ratio (column vector) of Input and Purchase Amount of Japanese Enterprises' Goods in Input and Purchase Amount in Domestic China (7)

d) Lines of Input from Japanese Enterprises into Japanese Enterprises and Non-Japanese Enterprises

We made balance adjustments by the RAS method using the following data such as sales of intermediate goods to China by Japanese enterprises (row total column vector of X^{CjC}), input from Japanese enterprises into Japanese enterprises and non-Japanese enterprises (column total row vector of X^{Cjj} and X^{Cjc}), and corresponding input factor in the Linked China-Japan Table determined in the preceding section. Then, we projected all factors in the lines of input, X^{Cjc} and X^{Cjj}, from Japanese enterprises into Japanese

enterprises and non-Japanese enterprises.

(4) Input from Japanese Enterprises in Japan

a) Sales of Intermediate Goods to Japan by Japanese Enterprises

First, by lateral row section, sales of intermediate goods by Japanese enterprises are separated from China's sales of intermediate goods to Japan and separation method is as follows;

Sales of Intermediate Goods to Japan by Japanese Enterprises (row total column vector of XCjJ) = China's Sales of Intermediate Goods to Japan (row total column vector of XCJ)* × Ratio of Sales to Japan by Japanese Enterprises in China's Total Sales to Japan (column vector) (8)

b) Input from Japanese Enterprises into Japan

Next, by longitudinal column section, input from Japanese enterprises is separated from input from China into Japan. That is,

Input from Japanese Enterprises into Japan (column total row vector of X^{CjJ}) ＝ Input from China into Japan (column total row vector of X^{CJ}) × Ratio of Purchase Amount of Japanese Enterprises' Goods in Japan's Total Import of Chinese Goods (column vector)* (9)

c) Lines of Input from Japanese Enterprises in Japan

Lastly, we made balance adjustments by the RAS method using the following data such as sales of intermediate goods to Japan by Japanese enterprises (row total column vector of X^{CjJ}), input from Japanese enterprises into Japan (column total row vector of X^{CjJ}), and corresponding input factors in the Linked China-Japan Table in the preceding sections a) and b). Then, we projected factors in the lines of input from Japanese enterprises into Japan, X^{CjJ}.

(5) Calculation of Final Demand Section

a) Sales of Final Goods to China and Japan by Japanese Enterprises

Sales of final goods to China by Japanese Enterprises (F^{CjC}) and sales of final goods to Japan (F^{CjJ}) are calculated by subtracting sales of intermediate goods to China by Japanese enterprises (X^{CjC}) and sales of intermediate goods to Japan (X^{CjJ}) from sales to China by Japanese enterprises and sales to Japan.

b) Purchase of Final Goods by Item from Japanese Enterprises by China and Japan

We calculated sales of final goods to China by industry by Japanese enterprises and sales of final goods to Japan (row total column vector of F^{CjC} and F^{CjJ}) in the preceding sections. Sales of final goods by final demand item to Japan, that is, purchase of final goods by final demand item from Japanese enterprises by China and purchase of final goods from Japanese enterprises by Japan (column total row vector of F^{CjC} and F^{CjJ}) are

calculated pro rata to the ratios by final demand item of China and Japan.

c) Lines of Final Demand of Japanese Enterprises

We projected factors in the lines of final demand (sales) to China and Japan by Japanese enterprises, F^{CjC} and F^{CjJ}, using the following data such as sales of final goods by industry by Japanese enterprises, sales of final goods to Japan (row total column vector), purchase of final goods by item from Japanese enterprises by China, purchase of final goods by item from Japanese enterprises by Japan (column total row vector), and final demand purchase factor (ratio of purchase by industry = purchase of final demand by industry / total final demand) of China and Japan in the Linked China-Japan Table.

(6) Projection of Export to the World

It is necessary to divide enterprises in China involved in export to the world into Japanese enterprises and non-Japanese enterprises. Here, the export value to third countries of Japanese enterprises in the Basic Research is regarded as the export value to the world. The export value to the world of non-Japanese enterprises is calculated by subtracting the export value to third countries of Japanese enterprises from China's export value to the world in the Linked China-Japan Table.

(Table 6)

Based on the above-mentioned procedure, we projected economic activities of Japanese enterprises in 1995 and 2000 and created the Japanese Enterprises Analysis Table dividing economic activities in China included in the Linked China-Japan Table of the same period into Japanese enterprises and non-Japanese enterprises. Table 6 shows the Japanese Enterprises Analysis Table (one section).

3 Analysis of Economic Activities of Japanese Enterprises

In this chapter, we look at economic activities of Japanese enterprises in China and their recent change by using the Japanese Enterprises Analysis Table.

3.1 Demand Structure and Cost Structure

The amount of production of Japanese enterprises increased approximately eightfold from 6.957 billion dollars in 1995 to 52.817 billion dollars in 2000 (See Table 7). This far exceeds the amount of non-Japanese enterprises in China (1.6 times) and that of Japan (1.1 times) for the same period. Besides, the trade of Japanese enterprises grew forty times from 0.07 billion dollars in 1995 to 2.934 billion dollars in 2000.

(Table 7)

The amount of production of Japanese enterprises in China in 2000 is 24.8 billion dollars, which makes up 47% of the total amount (See Table 8). In addition, the amount

for the intermediate demand of non-Japanese enterprises is 17.6 billion dollars (33.3%), and that for the final demand of China is 7.2 billion dollars (13.6%). Also, 30.8% of the production of Japanese enterprises is for the export to Japan and 21.4% for the "export to the world" (excludes export to Japan).

By industry, the production of Japanese enterprises for China increased in the most sectors from 1995 to 2000. For the production for Japan for the same period, the amount decreased for the Food, the Textile, the Wood & Pulp, and the Petroleum & Coal sectors, while it increased for the General Machinery, the Electric Machinery, the Transportation Equipment, the Precision Instruments, the Trade, the Service, and the other sectors[3]. The export to Japan is shifting from labor-intensive industries to more sophisticated capital/technology-intensive industries and service sectors.

(Table 8)

The intermediate input ratio of Japanese enterprises in 2000 is 71.8%, 12.8 points down from 84.6% in 1995, while the value added ratio increased by the same amount (See Table 9). The intermediate input from Japan in particular decreased by 13.6 points from 25.5% to 11.9% for the same period. By industry, the intermediate input from Japan decreased significantly for the Textile (▲29.3 points), the Metal Refining (▲19.2

[3]However, since no figures are available for the agriculture, forestry and fisheries industry and the mining industry, their changes are unknown.

points), the Electric Machinery (▲18.8 points), and the Wood & Pulp (▲17.2 points).

(Table 9)

3.2 Production Repercussion and Production Inducing Effect

(1) Production Repercussion

In this section, we examine the production repercussion effect of economic activities of Japanese enterprises by using the Leontief inverse matrix of the Japanese Enterprises Analysis Table. The columns of the matrix indicate the production volume of each sector induced by one unit of final demand in the column sections. The subtotals of these column values (the induced production volume of each sector) indicate the total production volume induced by one unit of final demand (Total Repercussion Effect), and we can obtain the average induced production volume (Average Repercussion Effect) by dividing the total induced production volume by the number of industries.

The industry-wide average repercussion effect in 2000 is 2.7 for non-Japanese enterprises in China, 2.3 for Japanese enterprises in China, and 2.1 for Japan (See Table 10). Compared to 1995, we observe no significant change for non-Japanese enterprises and Japan, while the repercussion effect of Japanese enterprises decreased. The production repercussion of the final demand of Japanese enterprises on the counterpart (0.1 billion dollars × the Leontief inverse matrix) in 2000 is 84.41 million dollars for

non-Japanese enterprises in China, 16.31 million dollars for Japan, and 12.04 million dollars for the export to the world, all of which decreased compared to 1995.

(Table 10)

(2) Production Inducing Effect

We divide final demand into three parts, “Final Demand of China”, “Final Demand of Japan”, and “Export to the World” and examine how much the domestic production volume of which industry increases by one unit of final demand in some final demand sector by using the production inducement coefficient. Table 11 shows the amount of production of Japanese enterprises induced by 0.1 billion dollars of final demand (0.1 billion dollars × production inducement coefficient, same for the following) by using the Japanese Enterprises Analysis Table. According to this table, the amount of production of Japanese enterprises induced by the “Export to the World” (excludes export to Japan) in 2000 is 2.58 million dollars, nearly six times the figure of 1995 (0.45 million dollars). The amount induced by the “Final Demand of China” in 2000 is 1.79 million dollars, nearly five times the figure of 1995 (0.37 million dollars). The amount induced by the “Final Demand of Japan” is significantly small compared to the “Export to the World” and the “Final Demand of China” but grew almost eightfold from 0.04 million dollars in 1995 to 0.31 million dollars in 2000.

(Table 11)

(Table 12)

When we look at the production inducing effect on Japanese enterprises by final demand in 2000 by industry, we find, for the “Export to the World”, the effect of the Electric Machinery amounts to 1.54 million dollars, which makes up 60.0% of the entire industry (See Table 12). For the “Final Demand of China”, the induced amount is 0.61 million dollars for the Electric Machinery and 0.33 million dollars for the Transportation Equipment, the sum of which make up 53% of the total induced amount by this final demand. The percentage of the sum of the Electric Machinery and the Transportation Equipment decreased from 73% in 1995 to 53%, but the induced production amount of these two industries by the “Final Demand of China” is predominantly large. For the induced amount by the “Final Demand of Japan”, the Electric Machinery, the General Machinery, and the Precision Instruments make up 63 ～71% of the entire industry from 1995 to 2000. It should be also noted that the inducement effect on the textile industry by the “Final Demand of Japan” is relatively large (21％～10％). This largely depends on the develop-and-import scheme of Japanese enterprises. The Japanese textile market must produce a big inducement effect on Japanese enterprises expanding into China’s textile industry such as UNIQLO.

(3) Dependence on Production Inducement

We look at what kind of final demand induces domestic production of Japanese enterprises by using the degree of dependence on production inducement (See Table 13). The degree of dependence of Japanese enterprises on production inducement by the "Final Demand of China" in 2000 is 36.2%, half of that of non-Japanese enterprises in China (77.8%), while the degree of dependence on production inducement by the "Export to the World" is 35.7%, twice of that of non-Japanese enterprises in China (19.4%). The degree of dependence of Japanese enterprises on production inducement by the "Final Demand of Japan" is 28.1%, which far exceeds that of non-Japanese enterprises (2.8%). This is a distinctive characteristic of Japanese enterprises. Compared to 1995, the degree of dependence on production inducement by the "Final Demand of China" for both non-Japanese and Japanese enterprises in China decreased (non-Japanese enterprises in China ▲1.9 points, Japanese enterprises ▲3.7 points), while the "Export to the World" increased (approximately 2 points up). By final demand item, the degree of dependence on production inducement by the "Household Demand of China" is the highest (38.2%) for non-Japanese enterprises in China, which can be classified as the "Chinese Household Demand Dependent Type". On the other hand, the degree of dependence on production inducement by the "Export to the World" is the

highest (35.7%) for Japanese enterprises, which can be classified as the “Export to the World Dependent Type”.

(Table 13)

By industry, many Japanese enterprises heavily depend on the “Final Demand of China” (exceeds the figure of the entire Japanese enterprises with 36.2%), which can be classified as the “Chinese Final Demand Dependent Type” (See Table 14). However, some industries e.g. the Precision Instruments, the General Machinery, and the Textile, have a high degree of dependence on the “Final Demand of Japan”, and the Trade, the Electric Machinery, and the Metal Refining heavily depend on the “Export to the World”. The statistics in 1995 also show a high degree of dependence on the “Final Demand of China” for many Japanese enterprises, which also indicates characteristics of the “Chinese Final Demand Dependent Type”. The Mining and the Petroleum & Coal had a high degree of dependence on the “Final Demand of Japan” in 1995, but the degree decreased in 2000. This may be attributable to the stricter regulations for these industries due to the tight energy demand and supply. Also, the Other Manufacturing, the Precision Instruments, the General Machinery, and the Chemical Industry had a high degree of dependence on the “Export to the World”, but the degree decreased in 2000.

(Table 14)

Conclusion

In this paper, we examined and explained the process of creating the Japanese Enterprises Analysis Table and review activities of Japanese enterprises in China by using tables.

In the process of arranging the table, we used the data for “1990, 1995, and 2000 from Connected International Input-Output Table China-Japan” and “Research on Japanese Enterprises’ Overseas Business Activities” in order to create an International Input-Output Table for analyzing Japanese enterprises. “1990-1995-2000 Connected International Input-Output Table China-Japan” indicates that price evaluations of each year are in US dollars and converted in real terms by price basis inflator of 2000. “Research on Japanese Enterprises’ Overseas Business Activities” was started in 1970 and conducted every year by the Ministry of Economy, Trade and Industry of Japan in order to collect data with regard to Japanese enterprises’ overseas business activities.

In this study, we also computed the value of production, value of intermediary input, value-added, and final demand/purchase of Japanese enterprises by using these materials. Besides, we implemented the balance adjustment by RAS method and created an International Input-Output Table for analyzing Japanese enterprises in 1995 and 2000 as well.

In this paper, we also examined activities of Japanese enterprises by using the Japanese Enterprises Analysis Table and our findings in this study can be briefly summarized as follows;

1. Production of Japanese enterprises in China kept growing from 1995 to 2000 at a pace far exceeding those of non-Japanese enterprises and domestic enterprises in Japan.

2. Export to Japan as a distribution root of products has a tendency to shift from labor-intensive industries to more sophisticated capital/technology-intensive industries and service sectors. For the cost structure of production, the intermediate input ratio decreased.

3. Both the industry-wide average production repercussion effect and the repercussion effect on the counterpart of Japanese enterprises decreased. The production inducing effect of Japanese enterprises is largest in the “Export to the World” and grew most in the “Final Demand of Japan”.

4. The production inducing effect of Japanese enterprises is prominent in machinery sectors such as the Electric Machinery. However, the inducing effect by the “Final Demand of Japan” plays a large role for the textile production of Japanese enterprises.

5. Production of non-Japanese enterprises in China shows characteristics of the “Chinese Household Demand Dependent Type”, while that of Japanese enterprises is

similar to the “Export to the World Dependent Type”.

Consequently, the results are preliminary and as the next steps of our study, we have aimed to continue improving the Japanese Enterprises Analysis Table for exploring the theoretical/empirical issues behind the quantitative results with regard to Japanese enterprises.

References

Ministry of Economy, Trade and Industry (2003) **Research on Japanese Enterprises' Overseas Activities**. 31 (National Printing Bureau) .

Ministry of International Trade and Industry (1998) **Research on Japanese Enterprises' Overseas Activities**. 26 (National Printing Bureau).

Teng, J. and Wenhui, F. (2006) 1990-1995-2000 Linked China－Japan International Input-Output Tables, **Economic Statistics Review**, 33-4, pp. 62-74.

Yamada, M. (2002) Overseas Production of Japanese Firms and Japan-US Interdependence: An Input-Output Analysis, **Journal of Applied Input-Output Analysis**, 8, pp. 15-35.

Table 1 The Format of the International Input-Output Table for Analysis of Japanese Enterprises in China

	Intermediate Demand			Final Demand		Export to Rest of World	Total Output
	Non-Japanese Enterprises	Japanese Enterprises	Japan	China	Japan		
Non-Japanese Enterprises	X^{Ccc}	X^{Ccj}	X^{CcJ}	F^{CcC}	F^{CcJ}	$L^{Cc\gamma}$	X^{Cc}
Japanese Enterprises	X^{Cjc}	X^{Cjj}	X^{CjJ}	F^{CjC}	F^{CjJ}	$L^{Cc\gamma}$	X^{Cj}
Japan	X^{JCc}	X^{JCj}	X^{JJ}	F^{JC}	F^{JJ}	$L^{J\gamma}$	X^{J}
Freight and Insurance	BA^{Cc}	BA^{Cj}	BA^{J}	BF^{C}	BF^{J}		
Rest of World	WTA^{Cc}	WTA^{Cj}	WTA^{J}	WTF^{C}	WTF^{J}		
Tariff and Import Commodity Taxes	DA^{Cc}	DA^{Cj}	DA^{J}	DF^{C}	DF^{J}		
Intermediate Input	EA^{Cc}	EA^{Cj}	EA^{J}	EF^{C}	EF^{J}		
Value-added	V^{Cc}	V^{Cj}	V^{J}				
Total Input	X^{Cc}	X^{Cj}	X^{J}				

Table 2 Converter for the Sector Classification of Japanese Enterprises Analysis Table

No.	Japanese Enterprises Analysis Table (16-Sector Classification)	No.	Basic Research (18-Sector Classification)	No.	Linked China-Japan Table (33-Sector Classification)
01	Agriculture, Forestry and Fis	01	Agriculture, Forestry and	01	Agriculture
				02	Forestry
				03	Animal Husbandry
				04	Fishery
02	Mining	02	Mining	05	Coal Mining
				06	Crude Oil and Natural Gas
				07	Metal Mining
				08	Non-metal Mining
03	Food and Tobacco	04	Food and Tobacco	09	Food and Tobacco
04	Textile, Clothing and Leathe	05	Textile	10	Textile
				11	Clothing and Leather
05	Timber, Furniture, Manufacture of Paper and Printing	06	Timber, Manufacture of Paper	12	Timber, Furniture
				13	Manufacture of Paper and Printing
06	Oil and Coal	14	Oil and Coal	14	Oil and Coal
07	Chemical Products	07	Chemical Products	15	Chemical Products
08	Smelting of Metals	09	Non-ferrous metals	18	Smelting of Metals
		08	Ferrous metals		
09	Machinery	10	Machinery	20	Machinery
10	Electric Machinery	11	Electric Machinery	21	Electric Machinery
				22	Electronic
11	Transport Equipment	12	Transport Equipment	23	Transport Equipment
12	Measuring Instruments	13	Measuring Instruments	24	Measuring Instruments
13	Other Manufacturing Goods	15	Other Manufacturing Goo	25	Other Manufacturing Goods
				16	Rubber Products
				17	Non-metal Mineral Products
				19	Metal Products
14	Construction	03	Construction	27	Construction
15	Trade	16	Trade	30	Trade
16	Other Services and Others	17	Services	32	Other Services
				33	Public Administration
		18	Others	28	Transportation
				29	Communication
				31	Banking and the Insurance
				26	Electricity, Gas and Water
90	Total		Total	90	Total

Table 3 Sales by Buyer, Japanese Enterprises (in Current Prices)

(1000US $)

	Sector	Sales to China	Export to Japan	Export to Rest of World	Total
	Agriculture, Forestry and Fishery	81873	72581	4444	158899
	Mining	96	4646	0	4742
	Food and Tobacco	96598	27546	4029	128174
	Textile, Clothing and Leather	75377	459388	16468	551233
	Timber, Furniture, Manufacture of Paper and Printing	28184	1488	0	29673
	Oil and Coal	11099	9685	0	20785
	Chemical Products	155018	17266	72783	245067
1995	Smelting of Metals	116532	11663	5922	134117
	Machinery	77886	251478	218488	547852
	Electric Machinery	1002371	876334	1063757	2942462
	Transport Equipment	1283606	79864	97183	1460653
	Measuring Instruments	56794	135371	138571	330736
	Other Manufacturing Goods	81980	67276	142728	291984
	Construction	29609	553	43	30204
	Trade	897523	362046	375473	1635041
	Other Services and Others	119573	14725	64	134361
	Total	4114119	2391909	2139953	8645981
	Agriculture, Forestry and Fishery	0	0	0	0
	Mining	0	0	0	0
	Food and Tobacco	864962	136921	24524	1026408
	Textile, Clothing and Leather	1326065	1509697	392920	3228681
	Timber, Furniture, Manufacture of Paper and Printing	188568	2598	3693	194859
	Oil and Coal	20933	2765	2431	26130
	Chemical Products	1406087	203656	191203	1800946
2000	Smelting of Metals	1617092	143333	272367	2032792
	Machinery	1114058	2308834	893013	4315904
	Electric Machinery	9339362	7778027	7268925	24386313
	Transport Equipment	3980607	427948	283845	4692400
	Measuring Instruments	818669	1639120	242433	2700223
	Other Manufacturing Goods	1560898	694507	464118	2719523
	Construction	193737	1113	2171	197021
	Trade	1153122	856753	924319	2934195
	Other Services and Others	1658161	544790	358690	2561641
	Total	25242321	16250063	11324653	52817038

Table 4 Output of Commercial Sectors, Japanese Enterprises

（1000US $）

	General Administrative	Selling Expenses				Operating Profits	Total
		Rent	Packaging and Transport	Payroll	Depreciation		
1995	60536	4848	797	12970	734	-6540	73345
2000	1598042	147156	164378	405159	85488	533972	2934195

Sources: Ministry of Economy, Trade and Industry (2003), Ministry of International Trade and Industry (1998)

Table 5 Purchase Value and its Composition by Sector, Japanese Enterprises

Table 5-1 Purchase Value

（1000US $）

Sector	1995				2000			
	From China	From Japan	Fron Rest of World	Total Supply	From China	From Japan	Fron Rest of World	Total Supply
Agriculture, Forestry and Fishery	104508	5220	0	109728	160490	1995	16118	178603
Mining	43	0	0	43	1216	464	195	1874
Food and Tobacco	59622	2881	829	63332	514058	6189	123281	643528
Textile, Clothing and Leather	52031	204965	49266	306262	792929	818076	399666	2010671
Timber, Furniture, Manufacture of Paper and	6762	3891	0	10653	112248	14503	5651	132402
Oil and Coal	457	574	4029	5061	8806	1531	4046	14382
Chemical Products	50436	10217	16862	77514	567913	401281	143899	1113093
Smelting of Metals	66734	35881	11184	113800	827271	686044	139055	1652371
Machinery	125324	115671	62386	303381	1821045	1212007	303962	3337014
Electric Machinery	410887	1170997	616458	2198341	6011376	6181433	7012879	19205688
Transport Equipment	418743	511620	36285	966649	1111849	1249234	95203	2456287
Measuring Instruments	37402	70168	143940	251510	1161743	1031224	46664	2239631
Other Manufacturing Goods	47906	21539	12577	82022	789570	405586	212870	1408026
Construction	27653	32	0	27684	155229	0	4565	159794
Trade	272688	144121	53158	469966	13084467	15772293	14614689	43471448
Other Services and Others	34510	5358	2647	42515	1733692	292363	627123	2653178
Total	1715703	2303136	1009622	5028461	28853902	28074223	23749865	80677990

Table 5-2 Composition of Purchase

(Total Supply=100)

Sector	1995				2000			
	From China	From Japan	Fron Rest of World	Total Supply	From China	From Japan	Fron Rest of World	Total Supply
Agriculture, Forestry and Fishery	95.24	4.76	0.00	100.00	89.86	1.12	9.02	100.00
Mining	100.00	0.00	0.00	100.00	64.85	24.75	10.40	100.00
Food and Tobacco	94.14	4.55	1.31	100.00	79.88	0.96	19.16	100.00
Textile, Clothing and Leather	16.99	66.92	16.09	100.00	39.44	40.69	19.88	100.00
Timber, Furniture, Manufacture of Paper and	63.47	36.53	0.00	100.00	84.78	10.95	4.27	100.00
Oil and Coal	9.03	11.34	79.62	100.00	61.23	10.65	28.13	100.00
Chemical Products	65.07	13.18	21.75	100.00	51.02	36.05	12.93	100.00
Smelting of Metals	58.64	31.53	9.83	100.00	50.07	41.52	8.42	100.00
Machinery	41.31	38.13	20.56	100.00	54.57	36.32	9.11	100.00
Electric Machinery	18.69	53.27	28.04	100.00	31.30	32.19	36.51	100.00
Transport Equipment	43.32	52.93	3.75	100.00	45.27	50.86	3.88	100.00
Measuring Instruments	14.87	27.90	57.23	100.00	51.87	46.04	2.08	100.00
Other Manufacturing Goods	58.41	26.26	15.33	100.00	56.08	28.81	15.12	100.00
Construction	99.88	0.12	0.00	100.00	97.14	0.00	2.86	100.00
Trade	58.02	30.67	11.31	100.00	30.10	36.28	33.62	100.00
Other Services and Others	81.17	12.60	6.23	100.00	65.34	11.02	23.64	100.00
Total	34.12	45.80	20.08	100.00	35.76	34.80	29.44	100.00

Sources: Ministry of Economy, Trade and Industry (2003), Ministry of International Trade and Industry (1998)

Table 6 International Input-Output Table for Analysis of Japanese Enterprises in China (Constant Prices)

(1000US $)

Table 6-1 (1995, 2000 prices)

		Intermediate Demand			Final Demand			Statistical Discrepancy	Total Output
		China		Japan					
		Non-Japanese Enterprises	Japanese Enterprises		China	Japan	Export to Rest of		
China	Non-Japanese Enterprises	1043203176	1927486	14591942	701182656	14826393	139675235	-3142943	1912263945
	Japanese Enterprises	2012957	19974	762742	1237255	1182932	1741455	0	6957314
Japan		12379283	1771775	3589391412	7896363	4248001612	381660468	-6879786	8234221128
Freight and Insurance		3149484	338588	4376602	1099225	1345811			
Rest of World		97896535	1000175	255806530	42030011	120063405			
Tariff and Import Commodity Tax		2673835	119060	16427241	732125	0			
Intermediate Input		1160604464	5887863	3881356469	754177634	4385420152			
Total Value-added		751659481	1069452	4352864659					
Total Input		1912263945	6957314	8234221128					

Table 6-2 (2000)

		Intermediate Demand			Final Demand			Statistical Discrepancy	Total Output
		China		Japan					
		Non-Japanese Enterprises	Japanese Enterprises		China	Japan	Export to Rest of		
China	Non-Japanese Enterprises	1787621351	15370121	14280746	992610875	19301832	226086075	3054008	3058325008
	Japanese Enterprises	17604572	438958	6407614	7198792	9842449	11324653	0	52817038
Japan		14500703	6295656	3765944734	8366548	4598161631	493233502	11023996	8897526770
Freight and Insurance		27016059	6774937	30101821	10494992	13850643			
Rest of World		104943538	8003590	229782968	49514659	148268628			
Tariff and Import Commodity Tax		6025057	1031501	30725952	1787168	0			
Intermediate Input		1957711281	37914763	4077243834	1069973035	4789425183			
Total Value-added		1100613727	14902275	4820282936					
Total Input		3058325008	52817038	8897526770					

Table 7 Gross Output Value and Growth Rates

（1000US $）

		1995	2000	Growth Rate(1995=1.00)
China	Non-Japanese Enterprises	1912263945	3058325008	1.60
	Japanese Enterprises	6957314	52817038	7.59
Japan		8234221128	8897526770	1.08

Table 8 Gross Output Value and its Composition by Sector, Japanese Enterprises

Table8-1 Gross Output Value

(1000US $)

	Demand to Chin				Demand to Japan				Export to Rest of Worl		Total Output	
			Intermediate Demand				Intermediate Demand					
Code No.	1995	2000	1995	2000	1995	2000	1995	2000	1995	2000	1995	2000
Cj 01	75795	0	39922	0	67193	0	49317	0	4114	0	147102	0
Cj 02	128	0	116	0	6210	0	6146	0	0	0	6338	0
Cj 03	82207	864962	29320	315031	23443	136921	13187	65674	3429	24524	109079	1026408
Cj 04	61726	1326065	41404	874697	376190	1509697	51231	159869	13486	392920	451402	3228681
Cj 05	26359	188568	23301	171726	1392	2598	973	1593	0	3693	27751	194859
Cj 06	15666	20933	15073	20363	13670	2765	13347	2687	0	2431	29336	26130
Cj 07	147463	1406087	131244	1298159	16424	203656	11460	130210	69236	191203	233124	1800946
Cj 08	89439	1617092	89907	1604104	8951	143333	8756	138167	4545	272367	102935	2032792
Cj 09	61188	1114058	41222	790413	197562	2308834	71969	800552	171645	893013	430395	4315904
Cj 10	974341	9339362	694531	6815071	851829	7778027	424508	3670560	1034011	7268925	2860182	24386313
Cj 11	1381374	3980607	714839	2327267	85947	427948	31146	142472	104585	283845	1571905	4692400
Cj 12	91700	818669	73361	670539	218573	1639120	39599	266162	223740	242433	534012	2700223
Cj 13	55180	1560898	49675	1438943	45283	694507	25151	296417	96069	464118	196533	2719523
Cj 14	34419	193737	3998	23632	643	1113	643	0	49	2171	35111	197021
Cj 15	39379	1153122	31799	918189	15885	856753	5436	447389	16474	924319	71738	2934195
Cj 16	133821	1658161	53217	775395	16479	544790	9873	285863	71	358690	150372	2561641
Cj 90	3270185	25242321	2032930	18043530	1945674	16250063	762742	6407614	1741455	11324653	6957314	52817038

Table8-2 Composition of Gross Output

(Total output=100)

	Demand to Chin				Demand to Japan				Export to Rest of Worl		Total Output	
			Intermediate Demand				Intermediate Demand					
Code No.	1995	2000	1995	2000	1995	2000	1995	2000	1995	2000	1995	2000
Cj 01	51.53	-	27.14	-	45.68	-	33.53	-	2.80	-	100.00	-
Cj 02	2.02	-	1.84	-	97.98	-	96.97	-	0.00	-	100.00	-
Cj 03	75.36	84.27	26.88	30.69	21.49	13.34	12.09	6.40	3.14	2.39	100.00	100.00
Cj 04	13.67	41.07	9.17	27.09	83.34	46.76	11.35	4.95	2.99	12.17	100.00	100.00
Cj 05	94.98	96.77	83.97	88.13	5.02	1.33	3.51	0.82	0.00	1.90	100.00	100.00
Cj 06	53.40	80.11	51.38	77.93	46.60	10.58	45.49	10.28	0.00	9.30	100.00	100.00
Cj 07	63.26	78.07	56.30	72.08	7.05	11.31	4.92	7.23	29.70	10.62	100.00	100.00
Cj 08	86.89	79.55	87.34	78.91	8.70	7.05	8.51	6.80	4.42	13.40	100.00	100.00
Cj 09	14.22	25.81	9.58	18.31	45.90	53.50	16.72	18.55	39.88	20.69	100.00	100.00
Cj 10	34.07	38.30	24.28	27.95	29.78	31.90	14.84	15.05	36.15	29.81	100.00	100.00
Cj 11	87.88	84.83	45.48	49.60	5.47	9.12	1.98	3.04	6.65	6.05	100.00	100.00
Cj 12	17.17	30.32	13.74	24.83	40.93	60.70	7.42	9.86	41.90	8.98	100.00	100.00
Cj 13	28.08	57.40	25.28	52.91	23.04	25.54	12.80	10.90	48.88	17.07	100.00	100.00
Cj 14	98.03	98.33	11.39	11.99	1.83	0.57	1.83	0.00	0.14	1.10	100.00	100.00
Cj 15	54.89	39.30	44.33	31.29	22.14	29.20	7.58	15.25	22.96	31.50	100.00	100.00
Cj 16	88.99	64.73	35.39	30.27	10.96	21.27	6.57	11.16	0.05	14.00	100.00	100.00
Cj 90	47.00	47.79	29.22	34.16	27.97	30.77	10.96	12.13	25.03	21.44	100.00	100.00

Note : Cj is Japanese enterprises in China, and number is sector(See table 2).

Table 9 Composition of Gross Input, Japanese Enterprises

(Total Input=100)

		1995	2000
China	Non-Japanese Enterprises	28	29
	Japanese Enterprises	0	1
Japan		25	12
Freight and Insurance		5	13
Rest of World		14	15
Tariff and Import Commodity Taxes		2	2
Intermediate Input		85	72
Total Value-added		15	28
Total Input		100	100

Table 10 Average Repercussion Effect, Japanese Enterprises

		1995			2000		
		Non-Japanese Enterprises	Japanese Enterprises	Japan	Non-Japanese Enterprises	Japanese Enterprises	Japan
China	Non-Japanese Enterprises	2.4076	1.0024	0.0147	2.4768	0.8441	0.0155
	Japanese Enterprises	0.0039	1.1691	0.0004	0.0179	1.0114	0.0020
Japan		0.0430	0.3279	1.9786	0.0290	0.1631	1.9303
Rest of World		0.1488	0.2289	0.1015	0.1007	0.1204	0.0819
Total Input		2.6118	2.7921	2.1044	2.6540	2.2595	2.0536

Table 11 Production induced (per 0.1 Billion Final Demand), Japanese Enterprises

(10000US $)

	Final Demand, China	Final Demand, Japan	Export to Rest of World
1995	36.8	4.2	45.1
2000	178.5	31.0	257.8
Rates(1995=1.00)	4.85	7.45	5.72

Table 12 Composition of Production induced by Sector, Japanese Enterprises

	Final Demand, China		Final Demand, Japan		Export to Rest of World	
Code No.	1995	2000	1995	2000	1995	2000
Cj 01	2.55	0.00	3.48	0.00	0.54	0.00
Cj 02	0.00	0.00	0.31	0.00	0.02	0.00
Cj 03	2.83	4.28	1.29	0.96	0.30	0.32
Cj 04	1.74	5.02	20.53	10.34	1.24	3.76
Cj 05	0.76	0.72	0.13	0.08	0.20	0.22
Cj 06	0.44	0.09	0.71	0.02	0.17	0.04
Cj 07	4.13	5.48	1.12	1.49	4.15	2.84
Cj 08	2.45	6.24	0.52	0.92	1.11	3.92
Cj 09	1.94	4.58	9.80	13.93	8.37	6.92
Cj 10	26.88	34.32	41.20	45.03	57.96	59.74
Cj 11	46.40	18.46	4.73	2.65	8.24	3.47
Cj 12	1.81	2.49	11.83	11.18	11.29	3.23
Cj 13	1.54	5.79	2.34	4.51	4.72	5.00
Cj 14	1.13	0.93	0.09	0.06	0.09	0.06
Cj 15	1.11	4.40	0.92	5.30	1.03	6.96
Cj 16	4.28	7.22	1.00	3.53	0.57	3.51
Cj 90	100.00	100.00	100.00	100.00	100.00	100.00

Table 13 Dependence on Production Inducement, Japanese Enterprises

(Total Final I

			Final Demand, China					Final Demand, Japan				
				Private Consumption	Other Consumption	Fixed Capital Formation	Change in Stock		Private Consumption	Other Consumption	Fixed Capital Formation	Change in Stock
1995	China	Non-Japanese	79.72	36.96	10.63	27.86	4.27	3.33	2.36	0.14	0.80	0.02
		Japanese Enterprises	39.93	18.64	2.41	15.68	3.20	26.18	18.58	0.43	7.00	0.18
	Japan		0.46	0.14	0.02	0.27	0.04	89.52	47.80	12.09	29.22	0.41
2000	China	Non-Japanese	77.80	38.23	9.83	29.84	-0.10	2.79	2.00	0.11	0.68	0.00
		Japanese Enterprises	36.19	18.59	2.75	14.91	-0.06	28.11	18.50	0.54	9.25	-0.18
	Japan		0.49	0.16	0.02	0.32	0.00	87.60	48.74	13.92	24.91	0.02

Table 14 Dependence on Production Inducement by Sector, Japanese Enterprises

(Total Final Demand=100)

	Final Demand, China		Final Demand, Japan		Export to Rest of World	
Code No.	1995	2000	1995	2000	1995	2000
Cj 01	48.22	0.00	43.10	0.00	8.67	0.00
Cj 02	2.06	0.00	89.72	0.00	8.23	0.00
Cj 03	72.00	80.13	21.57	13.98	6.43	5.89
Cj 04	10.68	29.94	82.84	47.94	6.48	22.12
Cj 05	75.12	71.98	8.28	5.94	16.60	22.08
Cj 06	42.09	64.88	44.10	9.63	13.81	25.49
Cj 07	49.18	58.00	8.78	12.28	42.04	29.72
Cj 08	65.61	57.66	9.14	6.60	25.25	35.74
Cj 09	12.55	20.62	41.54	48.67	45.90	30.71
Cj 10	26.07	26.77	26.20	27.28	47.73	45.96
Cj 11	82.13	77.09	5.49	8.61	12.37	14.30
Cj 12	9.47	17.31	40.51	60.48	50.02	22.21
Cj 13	21.78	40.71	21.69	24.63	56.53	34.67
Cj 14	89.72	89.90	4.41	4.43	5.87	5.67
Cj 15	42.81	28.60	23.26	26.75	33.92	44.65
Cj 16	79.01	53.80	12.08	20.44	8.91	25.76
Cj 90	39.93	36.19	26.18	28.11	33.89	35.69