

19th Annual Northeast Asia Economic Forum Conference
August 27, 2010
Session 5: Cross-Border Regional Cooperation



Economic Interdependence and Production of Multinational Firms: Input output Analysis

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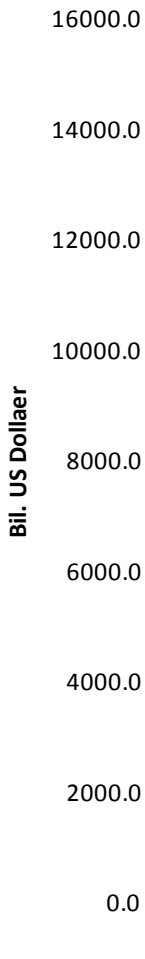
1. Background and Motivation
2. Input-Output Analysis: Overseas Production of Japanese Firms
3. Chinese Economy as one of the Core Countries in NEA
4. Concluding Remarks

1 Background and Motivation

- Northeast Asia as fast economic development area
- Income differential and energy inefficiency are still exist in these area. 

- To overcome these problem, cross-border cooperative activities by both private and government are required.
- Here, we would like present a method to evaluate activities of private sector using input-output analysis.

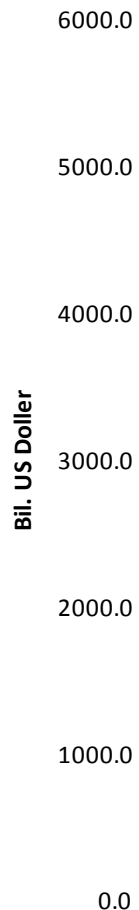


Current GDP



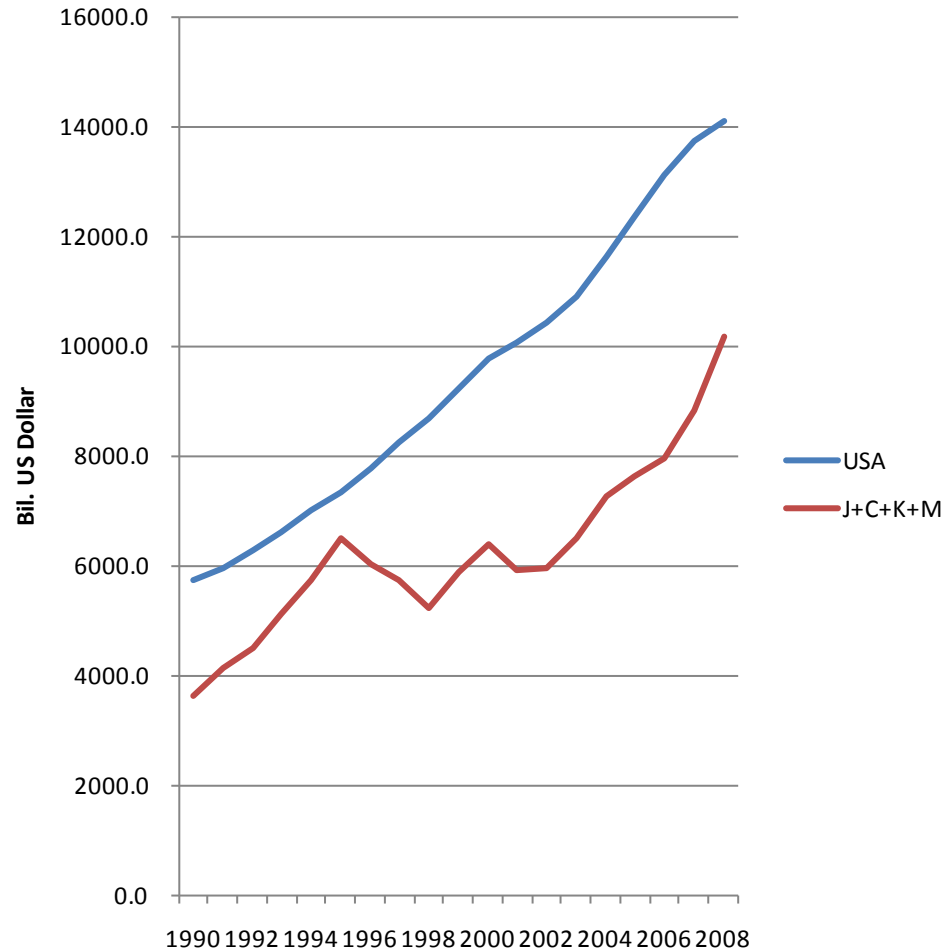
1990

Current GDP



1990

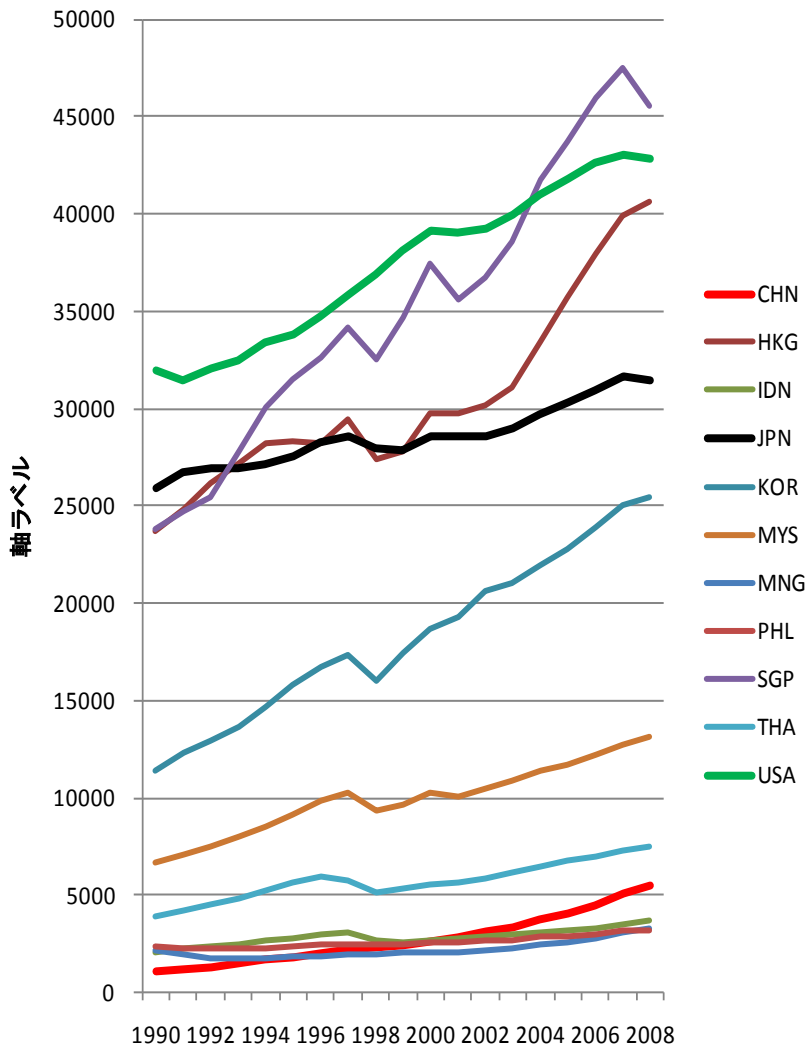
GDP, current



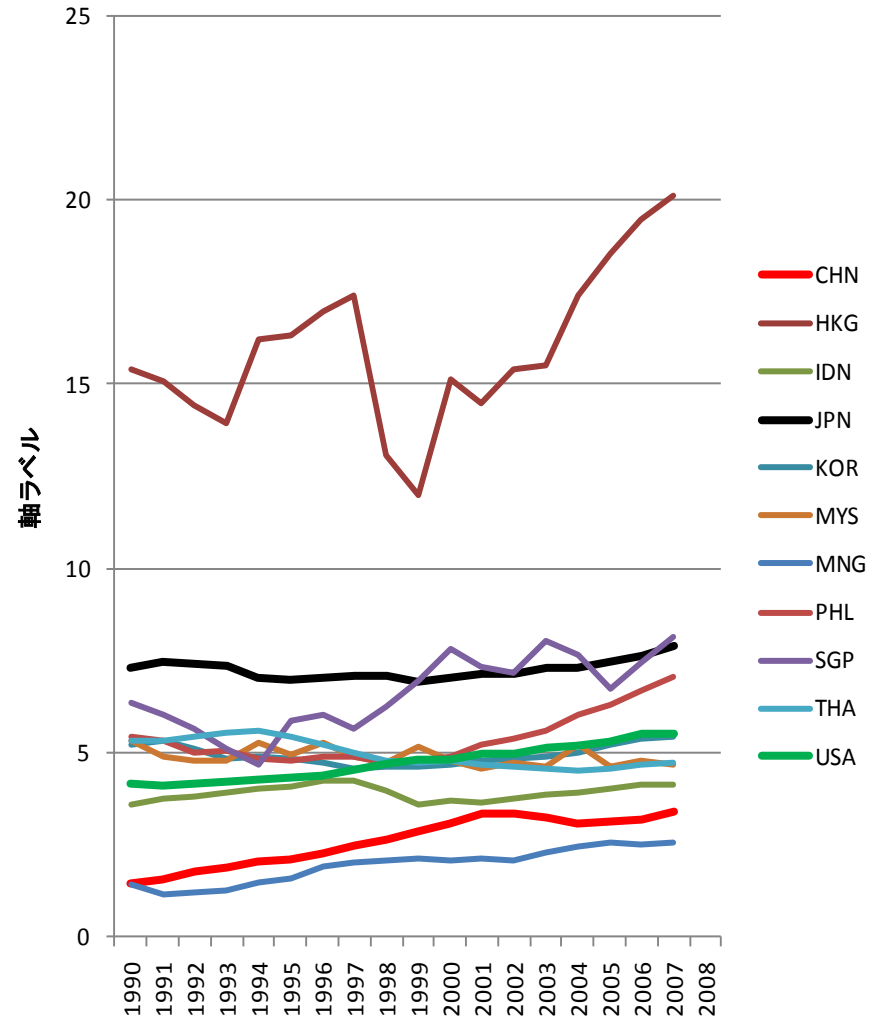
1990 1992 1994 1996 1998 2000 2002 2004 2006 2008



GDP per capita (constant 2005 PPP \$)



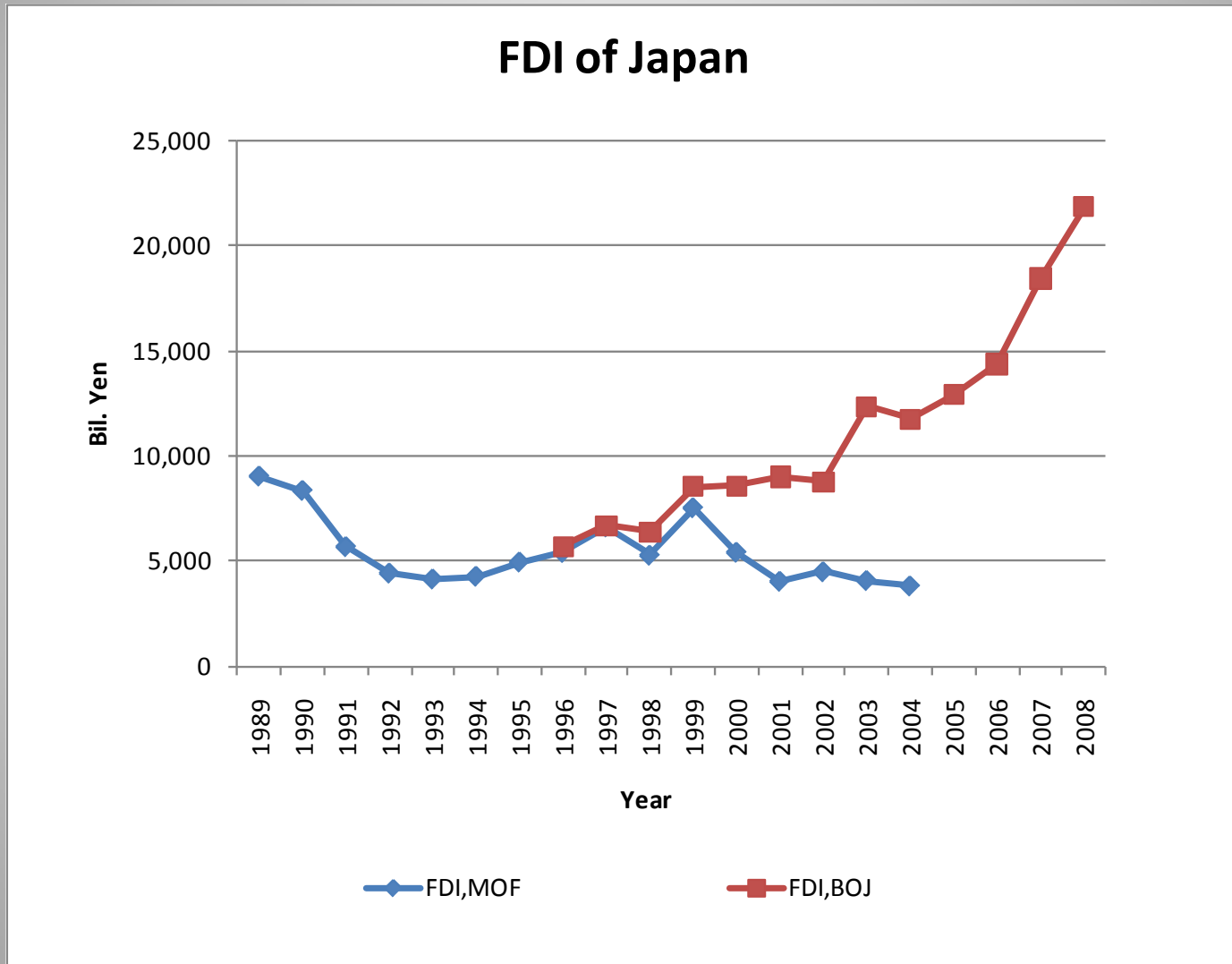
GDP per unit of energy use (constant 2005 PPP \$ per kg of oil equivalent)



2 Input-Output Analysis: Overseas Production of Japanese Firms

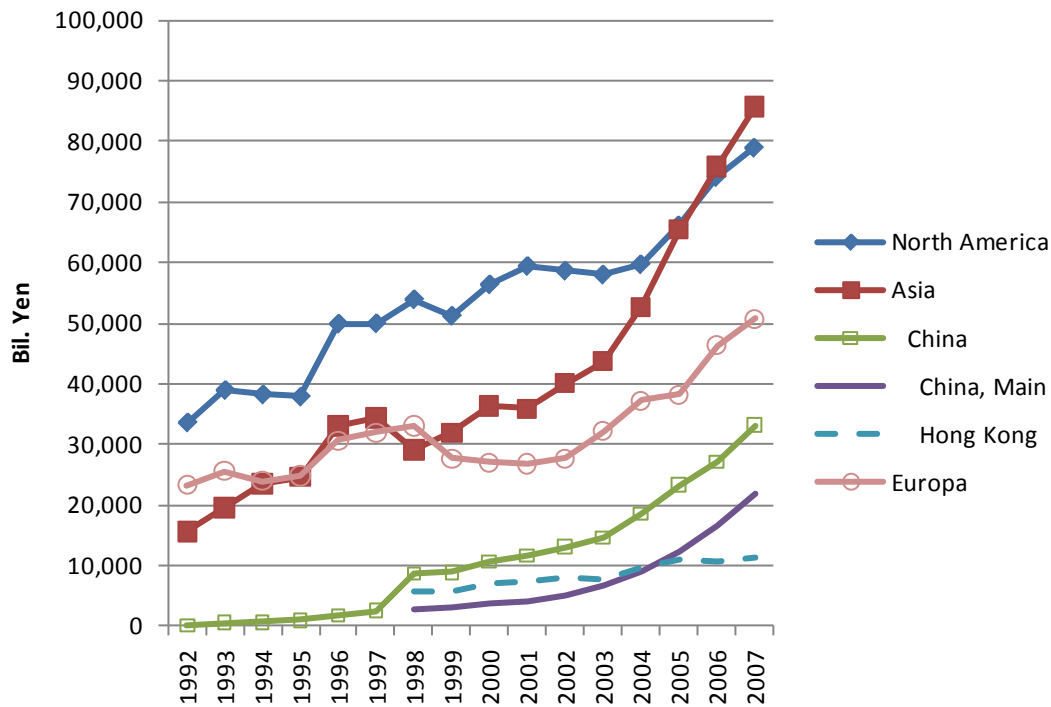
- Asia International Input-Output table 2000 of IDE, Japan is the latest version. I-O Table 2005 will be published in next year, though updated I-O table is available for each country.
- In this I-O table, Indonesia, Thailand, Malaysia, the Philippines, Singapore, Taipei, South Korea, Japan, and US are included.
- Here we discuss on the interdependence among countries, especially through production activities of multinational firms.

Overseas Activities of Japanese Firms

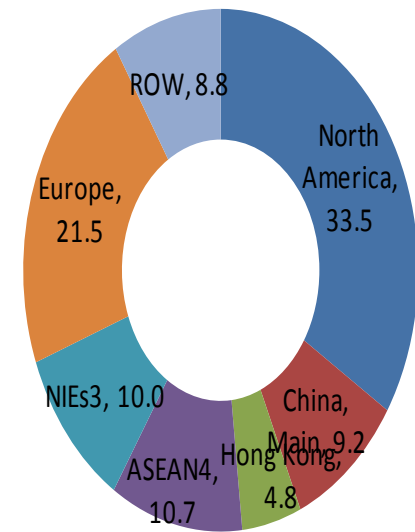


Overseas Activities of Japanese Firms

Overseas Production of Japanese Firms



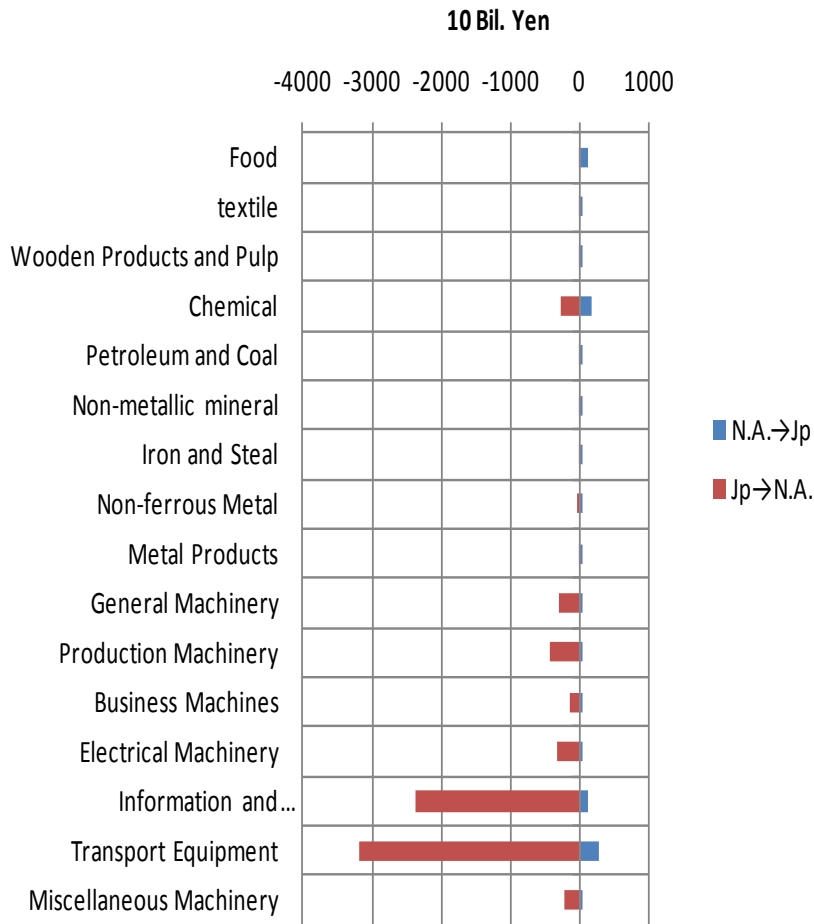
Regional Share of Overseas Production, 2007 Unit:%



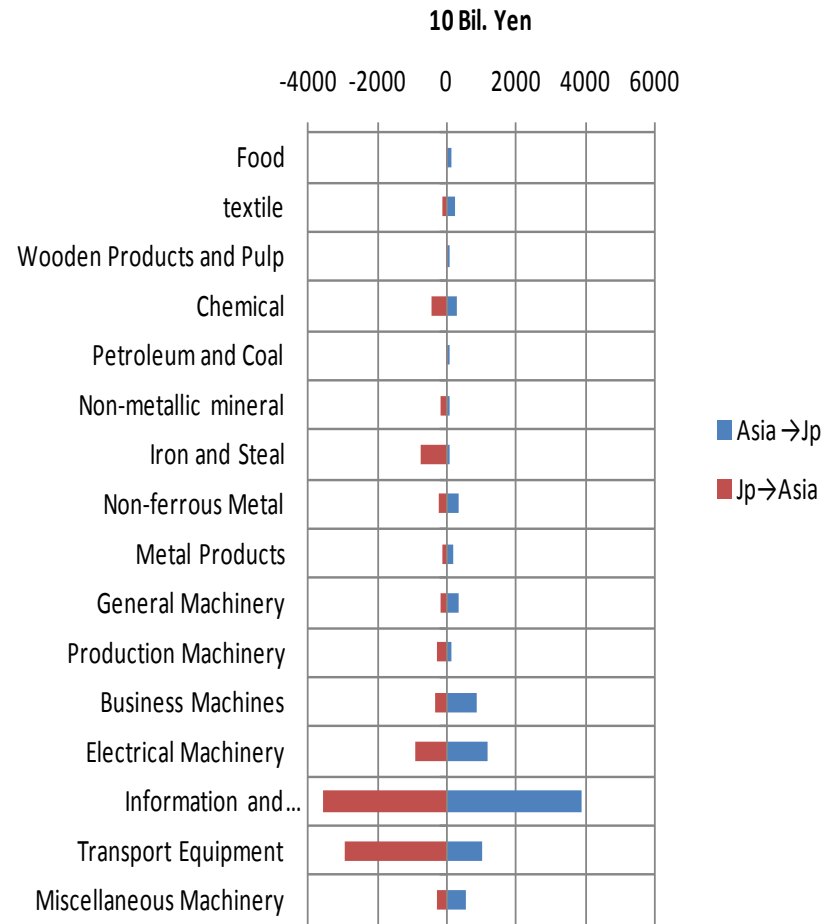
2007 Sales in North America (left) and Asia (right)

2007 Sales in North America	(Unit : Bil. Yen, %)				(Unit : Bil. Yen, %)			
	Total	Japan	N. Am.	Aisa	Total	Japan	N. Am.	Aisa
Total	79,052.8	4.29	92.12	1.23	85,717.1	16.38	2.25	76.81
Manufacturing	35,178.7	2.23	93.91	1.01	49,249.5	19.12	3.03	72.99
Food	536.0	22.37	72.00	1.98	1,119.0	12.37	1.84	82.40
textile	146.1	5.07	90.42	x	976.6	25.32	2.57	69
Wooden Products and Pulp	244.2	17.71	55.31	23.23	154.1	12.33	1.07	79.24
Chemical	2,511.6	6.15	82.44	3.29	3,910.2	7.78	1.76	86.88
Petroleum and Coal	216.5	0.99	91.39	3.45	268.8	37.16	-	62.77
Non-metallic mineral	319.3	0.87	97.21	0.15	490.5	12.79	3.49	81.38
Iron and Steal	612.2	0.08	99.84	-	1,936.3	4.04	0.98	94
Non-ferrous Metal	284.3	0.33	91.07	1.23	1,422.3	22.18	0.69	75.48
Metal Products	92.8	1.10	96.13	0.08	668.1	26.94	1.20	68.42
General Machinery	929.5	0.24	96.14	0.11	1,039.5	30.08	4.39	56.38
Production Machinery	1,063.0	2.11	85.80	3.20	913.6	16.38	1.96	77.34
Business Machines	375.6	2.89	86.50	1.48	1,745.7	50.54	7.30	35.15
Electrical Machinery	752.2	0.91	86.68	x	4,465.3	26.33	2.18	62
Information and Communication Machinery	4,401.8	2.43	90.80	1.74	10,144.0	38.51	5.09	52.14
Transport Equipment	20,695.8	1.31	97.35	0.10	18,178.9	5.61	2.24	87.22
Miscellaneous Machinery	1,997.8	1.53	96.02	0.82	1,816.6	28.99	6.09	59.94
Non-Manufacturing	43,874.1	5.94	90.69	1.41	36,467.6	12.68	1.20	81.97

Sales and Purchasing of Japanese subsidiary in North America with Japan



Sales and Purchasing of Japanese subsidiary in Asia with Japan



Institute of Developing Economies-JETRO

The schematic image of the 2000 Asian international input-output table

code	Intermediate Demand (A)										Final Demand (F)										Export (L)			Statistical Discrepancy (QX)	Total Outputs (XX)
	Indonesia (AI)	Malaysia (AM)	Philippines (AP)	Singapore (AS)	Thailand (AT)	China (AC)	Taiwan (AN)	Korea (AK)	Japan (AJ)	U.S.A. (AU)	Indonesia (FI)	Malaysia (FM)	Philippines (FP)	Singapore (FS)	Thailand (FT)	China (FC)	Taiwan (FN)	Korea (FK)	Japan (FJ)	U.S.A. (FU)	Export to Hong Kong (LH)	Export to EU (LO)	Export to R.O.W. (LW)		
Indonesia	A ^{II}	A ^{IM}	A ^{IP}	A ^{IS}	A ^{IT}	A ^{IC}	A ^{IN}	A ^{IK}	A ^{IJ}	A ^{IU}	F ^{II}	F ^{IM}	F ^{IP}	F ^{IS}	F ^{IT}	F ^{IC}	F ^{IN}	F ^{IK}	F ^{IJ}	F ^{IU}	L ^H	L ^O	L ^W	Q ^I	X ^I
Malaysia	A ^{MI}	A ^{MM}	A ^{MP}	A ^{MS}	A ^{MT}	A ^{MC}	A ^{MN}	A ^{MK}	A ^{MJ}	A ^{MU}	F ^{MI}	F ^{MM}	F ^{MP}	F ^{MS}	F ^{MT}	F ^{MC}	F ^{MN}	F ^{MK}	F ^{MJ}	F ^{MU}	L ^{MH}	L ^{MO}	L ^{MW}	Q ^M	X ^M
Philippines	A ^{PI}	A ^{PM}	A ^{PP}	A ^{PS}	A ^{PT}	A ^{PC}	A ^{PN}	A ^{PK}	A ^{PJ}	A ^{PU}	F ^{PI}	F ^{PM}	F ^{PP}	F ^{PS}	F ^{PT}	F ^{PC}	F ^{PN}	F ^{PK}	F ^{PJ}	F ^{PU}	L ^{PH}	L ^{PO}	L ^{PW}	Q ^P	X ^P
Singapore	A ^{SI}	A SM	A ^{SP}	A ^{SS}	A ST	A ^{SC}	A ^{SN}	A ^{SK}	A ^{SJ}	A ^{SU}	F ^{SI}	F SM	F ^{SP}	F ^{SS}	F ST	F ^{SC}	F ^{SN}	F ^{SK}	F ^{SJ}	F ^{SU}	L ^{SH}	L ^{SO}	L ^{SW}	Q ^S	X ^S
Thailand	A ^{TI}	A TM	A ^{TP}	A ^{TS}	A ^{TT}	A ^{TC}	A ^{TN}	A ^{TK}	A ^{TJ}	A ^{TU}	F ^{TI}	F TM	F ^{TP}	F ^{TS}	F ^{TT}	F ^{TC}	F ^{TN}	F ^{TK}	F ^{TJ}	F ^{TU}	L TH	L ^{TO}	L ^{TW}	Q ^T	X ^T
China	A ^{CI}	A ^{CM}	A ^{CP}	A ^{CS}	A ^{CT}	A ^{CC}	A ^{CN}	A ^{CK}	A ^{CJ}	A ^{CU}	F ^{CI}	F ^{CM}	F ^{CP}	F ^{CS}	F ^{CT}	F ^{CC}	F ^{CN}	F ^{CK}	F ^{CJ}	F ^{CU}	L ^{CH}	L ^{CO}	L ^{CW}	Q ^C	X ^C
Taiwan	A ^{NI}	A ^{NM}	A ^{NP}	A ^{NS}	A ^{NT}	A ^{NC}	A ^{NN}	A ^{NK}	A ^{NJ}	A ^{NU}	F ^{NI}	F ^{NM}	F ^{NP}	F ^{NS}	F ^{NT}	F ^{NC}	F ^{NN}	F ^{NK}	F ^{NJ}	F ^{NU}	L ^{NH}	L ^{NO}	L ^{NW}	Q ^N	X ^N
Korea	A ^{KI}	A ^{KM}	A ^{KP}	A ^{KS}	A ^{KT}	A ^{KC}	A ^{KN}	A ^{KK}	A ^{KJ}	A ^{KU}	F ^{KI}	F ^{KM}	F ^{KP}	F ^{KS}	F ^{KT}	F ^{KC}	F ^{KN}	F ^{KK}	F ^{KJ}	F ^{KU}	L ^{KH}	L ^{KO}	L ^{KW}	Q ^K	X ^K
Japan	A ^{JI}	A ^{JM}	A ^{JP}	A ^{JS}	A ^{JT}	A ^{JC}	A ^{JN}	A ^{JK}	A ^{JJ}	A ^{JU}	F ^{JI}	F ^{JM}	F ^{JP}	F ^{JS}	F ^{JT}	F ^{JC}	F ^{JN}	F ^{JK}	F ^{JJ}	F ^{JU}	L ^{JH}	L ^{JO}	L ^{JW}	Q ^J	X ^J
U.S.A.	A ^{UI}	A ^{UM}	A ^{UP}	A ^{US}	A ^{UT}	A ^{UC}	A ^{UN}	A ^{UK}	A ^{UJ}	A ^{UU}	F ^{UI}	F ^{UM}	F ^{UP}	F ^{US}	F ^{UT}	F ^{UC}	F ^{UN}	F ^{UK}	F ^{UJ}	F ^{UU}	L ^{UH}	L ^{UO}	L ^{UW}	Q ^U	X ^U
Freight and Insurance	BA ^I	BA ^M	BA ^P	BA ^S	BA ^T	BA ^C	BA ^N	BA ^K	BA ^J	BA ^U	BF ^I	BF ^M	BF ^P	BF ^S	BF ^T	BF ^C	BF ^N	BF ^K	BF ^J	BF ^U	← International freight and insurance on the trade between member countries (A**, F**).				
Import from Hong Kong	A ^{HI}	A ^{HM}	A ^{HP}	A ^{HS}	A ^{HT}	A ^{HC}	A ^{HN}	A ^{HK}	A ^{HJ}	A ^{HU}	F ^{HI}	F ^{HM}	F ^{HP}	F ^{HS}	F ^{HT}	F ^{HC}	F ^{HN}	F ^{HK}	F ^{HJ}	F ^{HU}	← Valued at C.I.F.				
Import from EU	A ^{OI}	A ^{OM}	A ^{OP}	A ^{OS}	A ^{OT}	A ^{OC}	A ^{ON}	A ^{OK}	A ^{OJ}	A ^{OU}	F ^{OI}	F ^{OM}	F ^{OP}	F ^{OS}	F ^{OT}	F ^{OC}	F ^{ON}	F ^{OK}	F ^{OJ}	F ^{OU}	← Import duties and import commodity taxes levied on all trade.				
Import from the R.O.W.	A ^{WI}	A ^{WM}	A ^{WP}	A ^{WS}	A ^{WT}	A ^{WC}	A ^{WN}	A ^{WK}	A ^{WJ}	A ^{WU}	F ^{WI}	F ^{WM}	F ^{WP}	F ^{WS}	F ^{WT}	F ^{WC}	F ^{WN}	F ^{WK}	F ^{WJ}	F ^{WU}					
Duties and Import Commodity Taxes	DA ^I	DA ^M	DA ^P	DA ^S	DA ^T	DA ^C	DA ^N	DA ^K	DA ^J	DA ^U	DF ^I	DF ^M	DF ^P	DF ^S	DF ^T	DF ^C	DF ^N	DF ^K	DF ^J	DF ^U					
Value Added	V ^I	V ^M	V ^P	V ^S	V ^T	V ^C	V ^N	V ^K	V ^J	V ^U															
Total Inputs	X ^I	X ^M	X ^P	X ^S	X ^T	X ^C	X ^N	X ^K	X ^J	X ^U															

* Each cell of A** and F** represents a matrix of 76 x 76 and 76 x 4 dimension, respectively.

In a columnwise direction, each cell in the table shows the input compositions of industries of respective country. A^{II} for example shows the input compositions of Indonesian industries vis-à-vis domestically produced goods and services, i.e. domestic transactions of Indonesia. A^{MI} in contrast shows the input composition of Indonesian industries for the imported goods and services from Malaysia. The cells A^{PI}, A^{SI}, A^{TI}, A^{CI}, A^{NI}, A^{KI}, A^{JI}, A^{UI}, A^{HI}, A^{OI}, A^{WI} allow the same interpretation for the imports from other countries.

BA and DA give international freight & insurance and taxes on these import transactions.

Turning to the 11th column from the left side of the table, it shows the compositions of goods and services that have gone to final demand sectors of Indonesia. F^{II} and F^{MI}, for example, maps the the inflow into Indonesian final demand sectors, of goods and services domestically produced and of those imported from Malaysia, respectively. The rest of the column is read in the same manner as is done for the 1st column of the table.

L^H, L^O, L^W are exports (vectors) to Hong Kong, EU and the Rest of the World, respectively.

Vs and Xs are value added and total input/output, as seen in the conventional national I-O table.

2. Theoretical framework

International input-output model

$$\begin{array}{c}
 \left[\begin{array}{cc|c} A_{11} & A_{12} & x_1 \\ A_{21} & A_{22} & x_2 \end{array} \right] + \left[\begin{array}{c} F_{11} \\ F_{21} \end{array} \right] + \left[\begin{array}{c} F_{12} \\ F_{22} \end{array} \right] + \left[\begin{array}{c} E_1 \\ E_2 \end{array} \right] = \left[\begin{array}{c} x_1 \\ x_2 \end{array} \right] \\
 \leftarrow \text{home} \\
 \leftarrow \text{foreign}
 \end{array}$$



$$\begin{array}{c}
 \left[\begin{array}{ccc|c} A_{11} & A_{12} & A_{13} & x_1 \\ A_{21} & A_{22} & A_{23} & x_2 \\ A_{31} & A_{32} & A_{33} & x_3 \end{array} \right] + \left[\begin{array}{c} F_{11} \\ F_{21} \\ F_{31} \end{array} \right] + \left[\begin{array}{c} F_{12} \\ F_{22} \\ F_{32} \end{array} \right] + \left[\begin{array}{c} E_1 \\ E_2 \\ E_3 \end{array} \right] = \left[\begin{array}{c} x_1 \\ x_2 \\ x_3 \end{array} \right] \\
 \leftarrow \text{home} \\
 \leftarrow \text{foreign} \\
 \leftarrow \text{overseas act.}
 \end{array}$$

we can derive the production induced by the final goods, which are supplied by Japanese overseas activity,

$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} B_{11} & B_{12} & B_{13} \\ B_{21} & B_{22} & B_{23} \\ B_{31} & B_{32} & B_{33} \end{bmatrix} \left\{ \begin{array}{ccc} \boxed{F_{11}} & \boxed{F_{12}} & \boxed{E_1} \\ F_{21} & + & F_{22} & + & E_2 \\ \boxed{F_{31}} & \boxed{F_{32}} & \boxed{E_3} \end{array} \right\}$$

Export to home

Sales to invested country

Export to the third country

$$\begin{bmatrix} \Delta x_1 \\ \Delta x_2 \\ \Delta x_3 \end{bmatrix} = \begin{bmatrix} B_{13} (\Delta F_{31} + \Delta F_{32} + \Delta E_3) \\ B_{23} (\Delta F_{31} + \Delta F_{32} + \Delta E_3) \\ B_{33} (\Delta F_{31} + \Delta F_{32} + \Delta E_3) \end{bmatrix}$$

If we assume that 100α percent of the Japanese overseas production of final goods substitutes for some part of the domestic final demand and export demand in Japan, the induced effect on the production are derived from the following equation

$$\Delta F_{11} + \Delta F_{12} + \Delta E_1 = -\alpha(\Delta F_{31} + \Delta F_{32} + \Delta E_3)$$



$$\begin{bmatrix} \Delta x_1 \\ \Delta x_2 \\ \Delta x_3 \end{bmatrix} = \alpha \begin{bmatrix} B_{11}(-\Delta F_{31} - \Delta F_{32} - \Delta E_3) \\ B_{21}(-\Delta F_{31} - \Delta F_{32} - \Delta E_3) \\ B_{31}(-\Delta F_{31} - \Delta F_{32} - \Delta E_3) \end{bmatrix}$$

Table 1 The Definition of Sectors

78 sectors for
each country



	Sectors
1	Agriculture, forestry and fishery
2	Mining
3	Construction
4	Food
5	Textile
6	Timber, wood, and pulp
7	Chemical industry
8	Iron and Steel
9	Nonferrous metals
10	General machinery
11	Electrical machinery
12	Transport equipment
13	Precision instrument
14	Petroleum and coal
15	Other manufacturing
16	Commerce
17	Public service
18	Other service
19	Finance and real estate
20	Others

Recompiled Input-Output Table, 2000

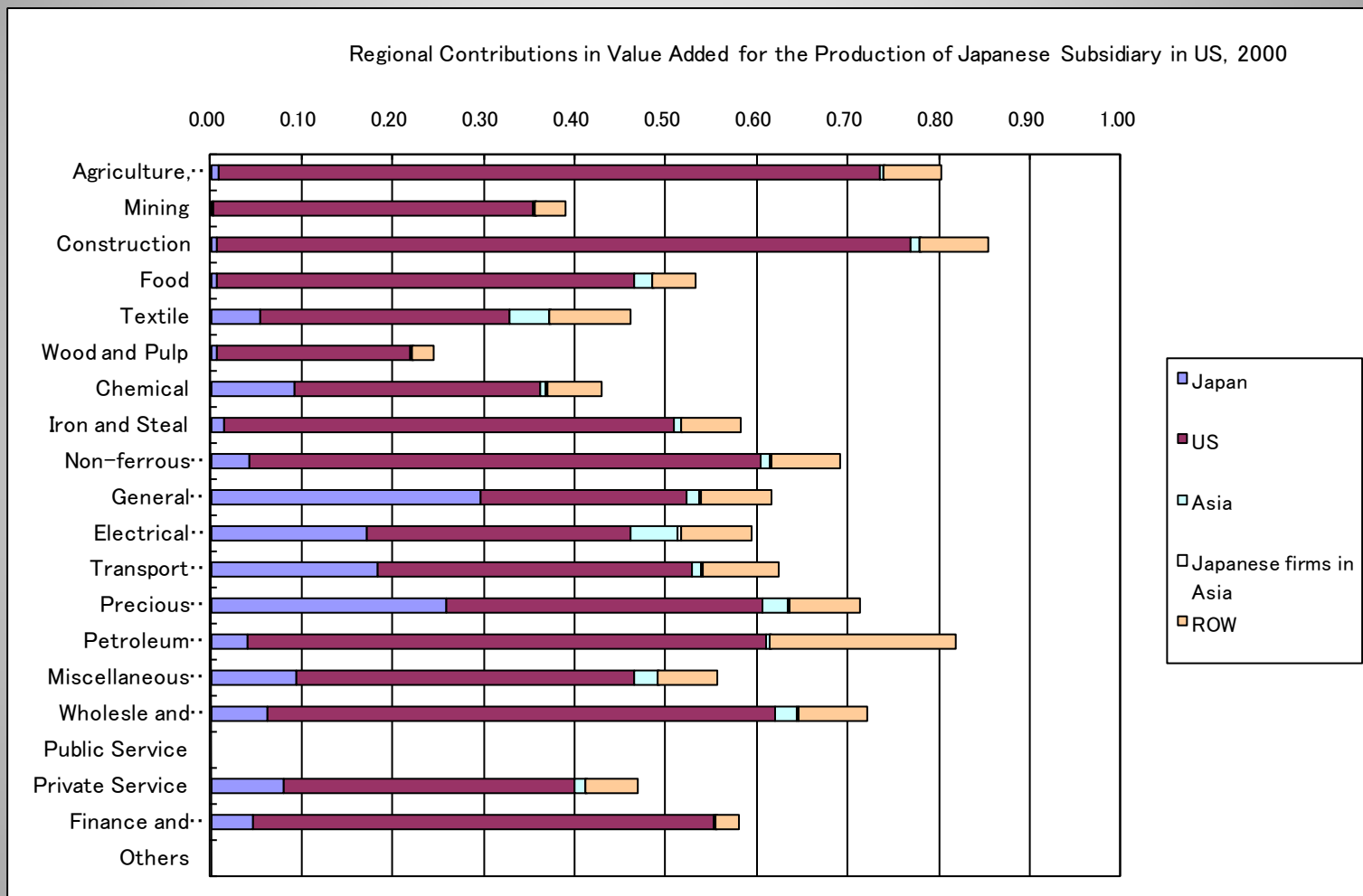
Unit: Bil. Dollar										
	Intermediate Demand					Final Demand				Output
	Japan	US	Asia	Japanese firm in US	Japanese Firm in Asia	Japan	US	Asia	ROW	
Japan	3715.05	20.90	71.91	38.80	41.41	4432.92	75.16	42.52	243.59	8682.27
US	32.45	7195.64	70.61	109.36	1.35	23.88	9436.09	30.97	765.92	17666.26
Asia	47.76	98.44	2987.51	5.34	84.61	33.08	107.29	2142.28	518.80	6025.12
Jap Firm in US	6.60	115.60	2.96	3.24	0.07	3.18	131.49	0.69	14.56	278.38
Jap Firm in Asia	25.16	5.11	94.53	0.61	4.91	23.64	5.30	46.18	6.48	211.93
ROW	205.40	568.94	361.89	6.99	18.76	101.21	459.56	136.03	0.00	0.00
Value Added	4649.86	9661.63	2435.70	114.03	60.82	0.00	0.00	0.00	0.00	0.00
Output	8682.27	17666.26	6025.12	278.38	211.93	4617.91	10214.90	2398.66	1549.35	32863.96
	Intermediate Demand					Final Demand				Output
	Japan	US	Asia	Japanese firm in US	Japanese Firm in Asia	Japan	US	Asia	ROW	
Japan	0.428	0.001	0.012	0.139	0.195	0.960	0.007	0.018	0.157	0.264
US	0.004	0.407	0.012	0.393	0.006	0.005	0.924	0.013	0.494	0.538
Asia	0.006	0.006	0.496	0.019	0.399	0.007	0.011	0.893	0.335	0.183
Jap Firm in US	0.001	0.007	0.000	0.012	0.000	0.001	0.013	0.000	0.009	0.008
Jap Firm in Asia	0.003	0.000	0.016	0.002	0.023	0.005	0.001	0.019	0.004	0.006
ROW	0.024	0.032	0.060	0.025	0.089	0.022	0.045	0.057	0.000	0.000
Value Added	0.536	0.547	0.404	0.410	0.287	0.000	0.000	0.000	0.000	0.000
Output	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

simulation 1

How much is the contribution of Japanese overseas production?

Regional contribution of Japanese overseas production through the induced value added in each region.

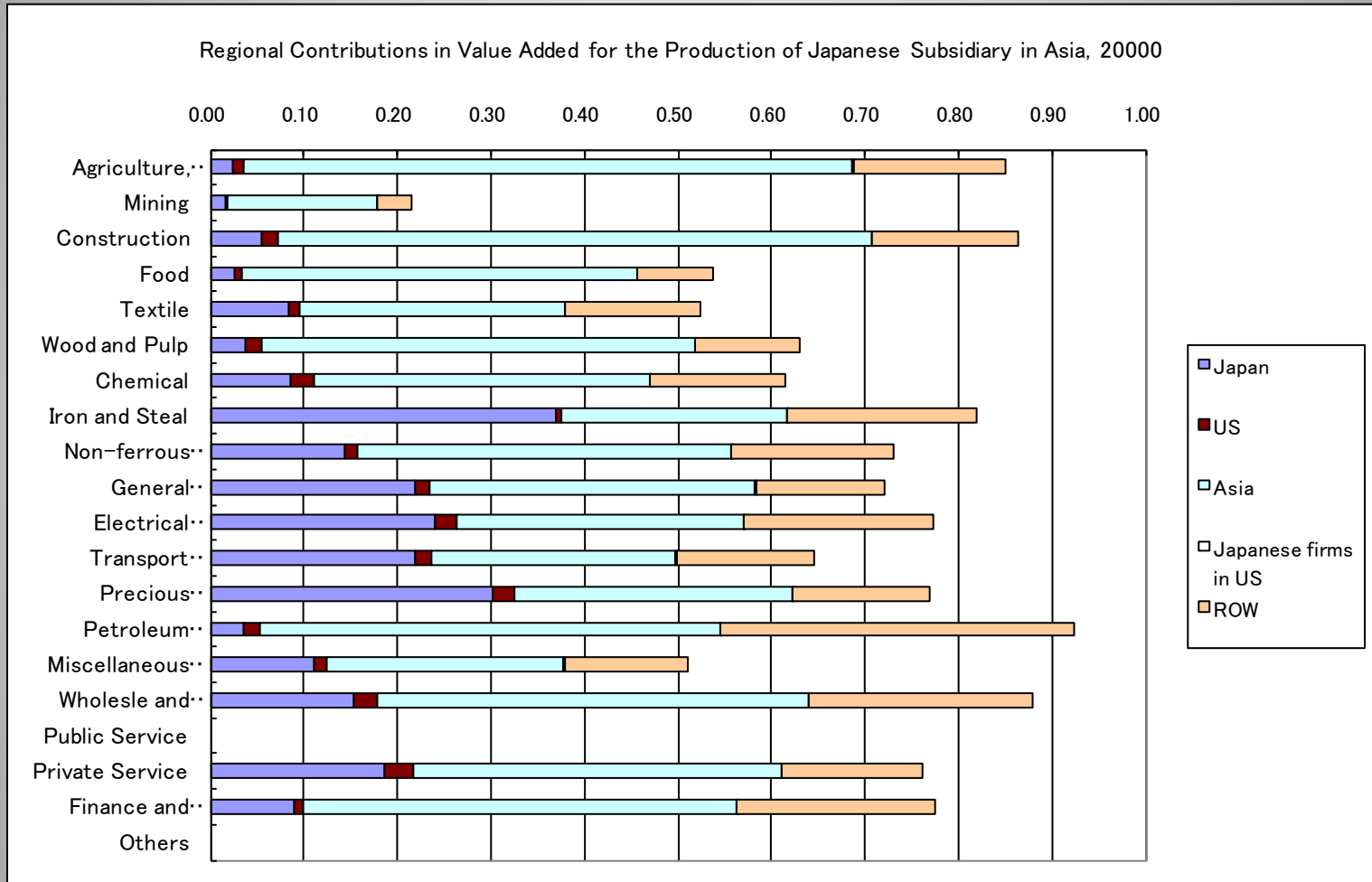
Simulation 1-a



Japanese overseas firms in the US

- The US contributions are dominant.
- The contribution of Japan,
is relatively large in machinery sectors, petroleum and coal, and miscellaneous manufacturing.
- Asian contribution is not so large,
but a little bit for the case of electrical machinery, and miscellaneous manufacturing.
- The contribution of Japanese overseas firms in Asia is negligible.

Simulation 1-b



Japanese overseas production in Asia

- The contribution of local economy in Asia is the largest.
- Japan contributes almost as much as the local economy in cases of machinery sectors, textile, chemical industry, iron and steel, and not-metal industry.
- The contribution of the US is not so high.
- The contribution of Japanese overseas firms in the US is negligible.

The patterns of the Japanese contribution to her overseas firms are different between both the US and Asia.

- 1) The contribution to the US is concentrated to the cases of machinery sectors.
- 2) The contribution to Asia is a little bit broad; textile, chemical industry, iron and steel, and non-ferrous metal are added.
- 3) The interrelation between Japanese overseas activities in the US and in Asia seems to be negligible at least in the sense of the contribution to the value added.

simulation 2

How affect the overseas production of Japanese firms on Japanese economy?

the induced demand effect and the substitution effect of Japanese overseas production on Japanese economy.

we can derive the production induced by the final goods, which are supplied by Japanese overseas activity,

$$\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} B_{11} & B_{12} & B_{13} \\ B_{21} & B_{22} & B_{23} \\ B_{31} & B_{32} & B_{33} \end{bmatrix} \left\{ \begin{bmatrix} F_{11} \\ F_{21} \\ F_{31} \end{bmatrix} + \begin{bmatrix} F_{12} \\ F_{22} \\ F_{32} \end{bmatrix} + \begin{bmatrix} E_1 \\ E_2 \\ E_3 \end{bmatrix} \right\}$$

Export to home

Sales to invested country

Export to the third country

$$\begin{bmatrix} \Delta x_1 \\ \Delta x_2 \\ \Delta x_3 \end{bmatrix} = \begin{bmatrix} B_{13} (\Delta F_{31} + \Delta F_{32} + \Delta E_3) \\ B_{23} (\Delta F_{31} + \Delta F_{32} + \Delta E_3) \\ B_{33} (\Delta F_{31} + \Delta F_{32} + \Delta E_3) \end{bmatrix}$$

<- Case-1

If we assume that 100α percent of the Japanese overseas production of final goods substitutes for some part of the domestic final demand and export demand in Japan, the induced effect on the production are derived from the following equation

$$\Delta F_{11} + \Delta F_{12} + \Delta E_1 = \alpha(\Delta F_{31} + \Delta F_{32} + \Delta E_3)$$



$$\begin{bmatrix} \Delta x_1 \\ \Delta x_2 \\ \Delta x_3 \end{bmatrix} = \alpha \begin{bmatrix} B_{11}(-\Delta F_{31} - \Delta F_{32} - \Delta E_3) \\ B_{21}(-\Delta F_{31} - \Delta F_{32} - \Delta E_3) \\ B_{31}(-\Delta F_{31} - \Delta F_{32} - \Delta E_3) \end{bmatrix}$$

<- Case-2/3
 $\alpha=1/\alpha=0.1$

Simulation 2-a

Unit: \$1 billion										
	Case 1		Case 2		Case 3		Case 1+Case 2		Case 1+Case 3	
	Induced Product Effect		Substitute effect		Substitute effect		Total Effect		Total Effect	
	Jp Firms in US	Jp Firms in Asia	Jp Firms in US	Jp Firms in Asia	Jp Firms in US	Jp Firms in Asia	Jp Firms in US	Jp Firms in Asia	Jp Firms in US	Jp Firms in Asia
Change in Demand			$\alpha=1$	$\alpha=1$	$\alpha=0.10$	$\alpha=0.10$	$\alpha=1$	$\alpha=1$	$\alpha=0.10$	$\alpha=0.10$
Japan	0.00	0.00	-103.20	-72.94	-11.67	-7.71	-103.20	-72.94	-11.67	-7.71
US	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Asia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Jp Firms in US	149.92	0.00	0.00	0.00	0.00	0.00	149.92	0.00	149.92	0.00
Jp Firms in Aisa	0.00	81.60	0.00	0.00	0.00	0.00	0.00	81.60	0.00	81.60
Total	149.92	81.60	-103.20	-72.94	-11.67	-7.71	46.72	8.66	138.25	73.89
Change in Product										
Japan	50.16	38.63	-242.51	-161.73	-28.07	-17.44	-192.35	-123.11	22.09	21.19
US	107.13	3.51	-3.48	-2.51	-0.40	-0.28	103.65	1.00	106.73	3.24
Asia	9.34	71.66	-4.87	-4.18	-0.54	-0.44	4.47	67.48	8.80	71.22
Jp Firms in US	152.74	0.17	-0.43	-0.29	-0.05	-0.03	152.31	-0.12	152.69	0.14
Jp Firms in Aisa	1.08	85.43	-2.02	-1.71	-0.24	-0.20	-0.94	83.72	0.84	85.22
Total	320.45	199.40	-253.30	-170.43	-29.30	-18.39	67.15	28.97	291.15	181.01
Ratio										
Japan	33.46	47.34	-161.76	-198.20	-18.72	-21.37	-128.30	-150.86	14.74	25.97
US	71.46	4.31	-2.32	-3.08	-0.27	-0.34	69.14	1.22	71.19	3.97
Asia	6.23	87.82	-3.25	-5.12	-0.36	-0.54	2.98	82.70	5.87	87.28
Jp Firms in US	101.88	0.21	-0.29	-0.35	-0.03	-0.04	101.60	-0.15	101.85	0.17
Jp Firms in Aisa	0.72	104.69	-1.35	-2.09	-0.16	-0.25	-0.63	102.59	0.56	104.44
Total	213.75	244.36	-168.96	-208.85	-19.55	-22.53	44.79	35.50	194.20	221.83

Simulation 2-b

Unit: Bil. Dollar

	Sectors	Japaese Export share in World Trade	Case-4		Case-5		
			Total Effect on Japaese Industries		Total Effect on Japaese Industries		
			(%)	Jp Firms in US	Jp Firms in Asia	Jp Firms in US	Jp Firms in Asia
				$\alpha=1$	$\alpha=1$	$\alpha=0.11$	$\alpha=0.11$
1	Agriculture, Forestry, and Fishery	0.16	-1.12	-0.80	0.06	0.06	
2	Mining	0.10	-0.25	-0.39	0.03	0.03	
3	Construction	0.00	-2.78	-2.84	0.16	0.16	
4	Food	0.68	-5.03	-2.96	0.10	0.11	
5	Textile	1.70	-1.26	-4.59	0.14	0.30	
6	Wood and Pulp	1.33	-2.17	-1.65	0.36	0.33	
7	Chemical	6.49	-10.19	-3.75	1.26	1.88	
8	Iron and Steal	9.93	-7.97	-2.30	1.14	2.09	
9	Non-ferrous metal	4.47	-4.16	-2.80	1.17	1.27	
10	General Machinery	11.38	-7.95	-5.23	2.04	1.58	
11	Electrical machinery	11.78	-31.75	-37.86	8.03	5.68	
12	Transport Equipment	13.48	-69.35	-24.25	-0.70	-0.51	
13	Precious Instrument	15.95	-1.90	-2.70	0.00	0.15	
14	Petroleum and Coal	1.01	-1.39	-0.94	0.18	0.24	
15	Miscellaneous Manufacturing	6.26	-12.70	-8.54	1.35	1.47	
16	Wholesle and retail	0.00	-7.80	-5.04	2.83	2.46	
17	Public Service	0.00	-0.08	-0.05	0.01	0.01	
18	Private Service	0.00	-10.79	-7.42	1.55	1.60	
19	Finance and Real Estate	0.00	-4.57	-3.10	0.73	0.70	
20	Others	0.00	-9.15	-5.90	1.65	1.58	
	Average in US	11.31	-	-	-	-	
	Average in Asia	10.56	-	-	-	-	
	Total	-	-192.35	-123.11	22.09	21.19	

The overseas production positively contributes to the production in the invested economy; the US and Asia.

However, for Japan, it depends on the scale of substitution effect.

If the substitution is as much as about 10 percent of the overseas production, the negative effect of the substitution is expected to be overcome by the positive effect of the induced effect in Japan.

If the substitution effect is larger than these values, the overall effect on the Japanese domestic production is expected to decrease seriously, which brings unemployment in the domestic labor market.

3 Chinese Economy as one of the Core Countries in NEA

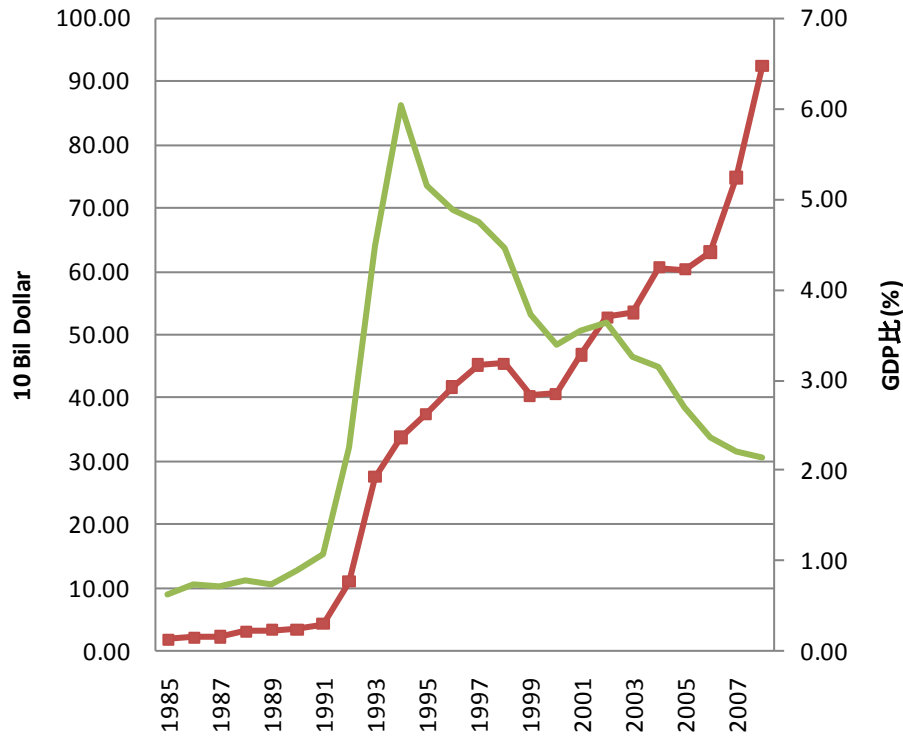
Economic Situation have been changing from 2000 to 2010.

- Economy of Japan has been depressed for two decades.
- Chinese economic growth continues for long period after the open policy.
- Chinese GDP becomes almost same as Japanese one.

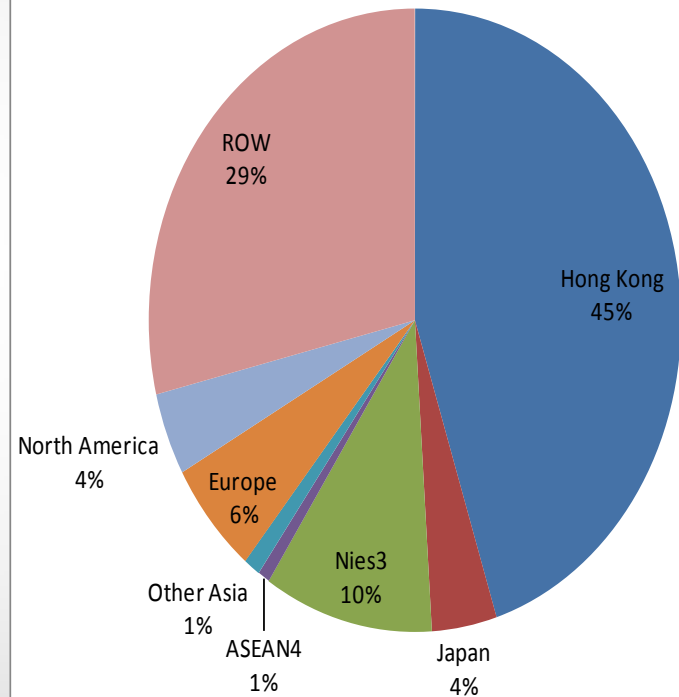
Necessity for cooperative activities seems to be strengthened.

FDI in China

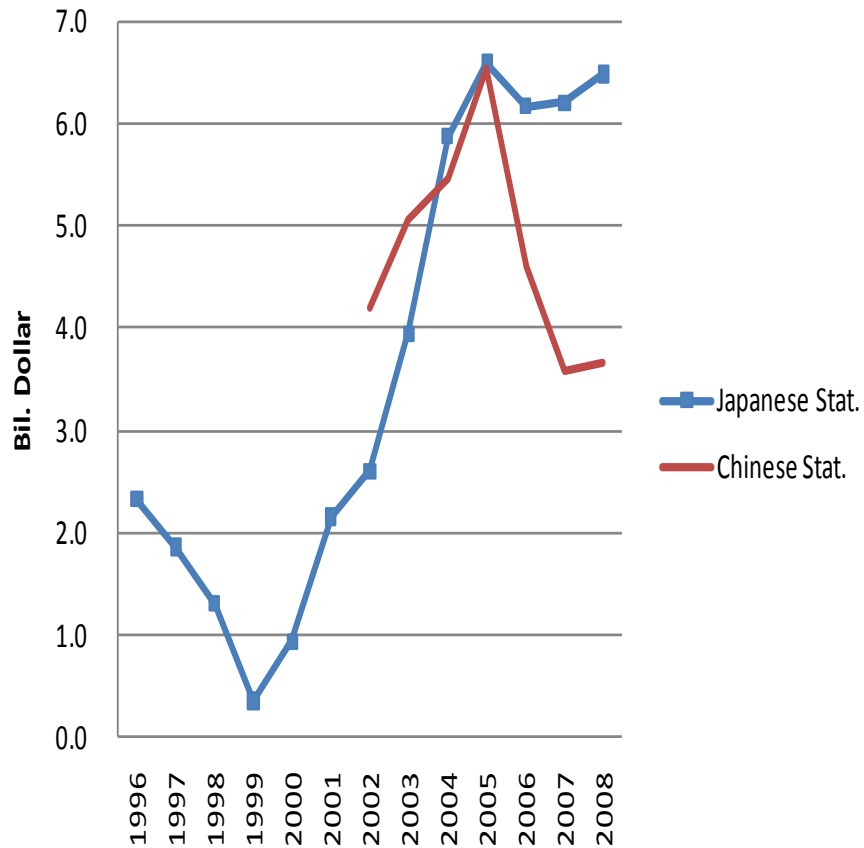
FDI in China



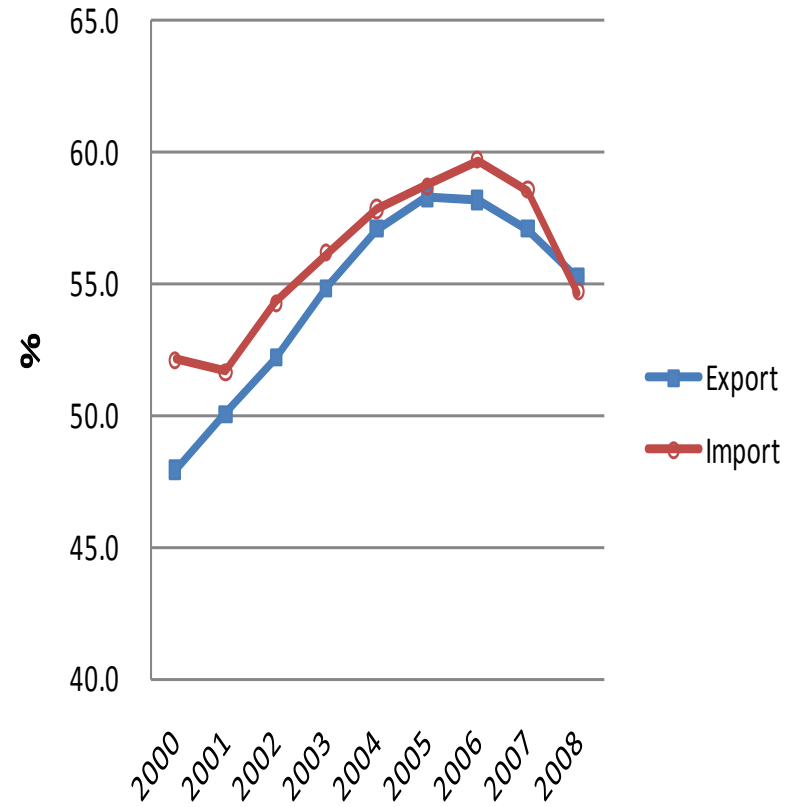
Regional Shares of FDI in China, 2008



Japanese FDI in China



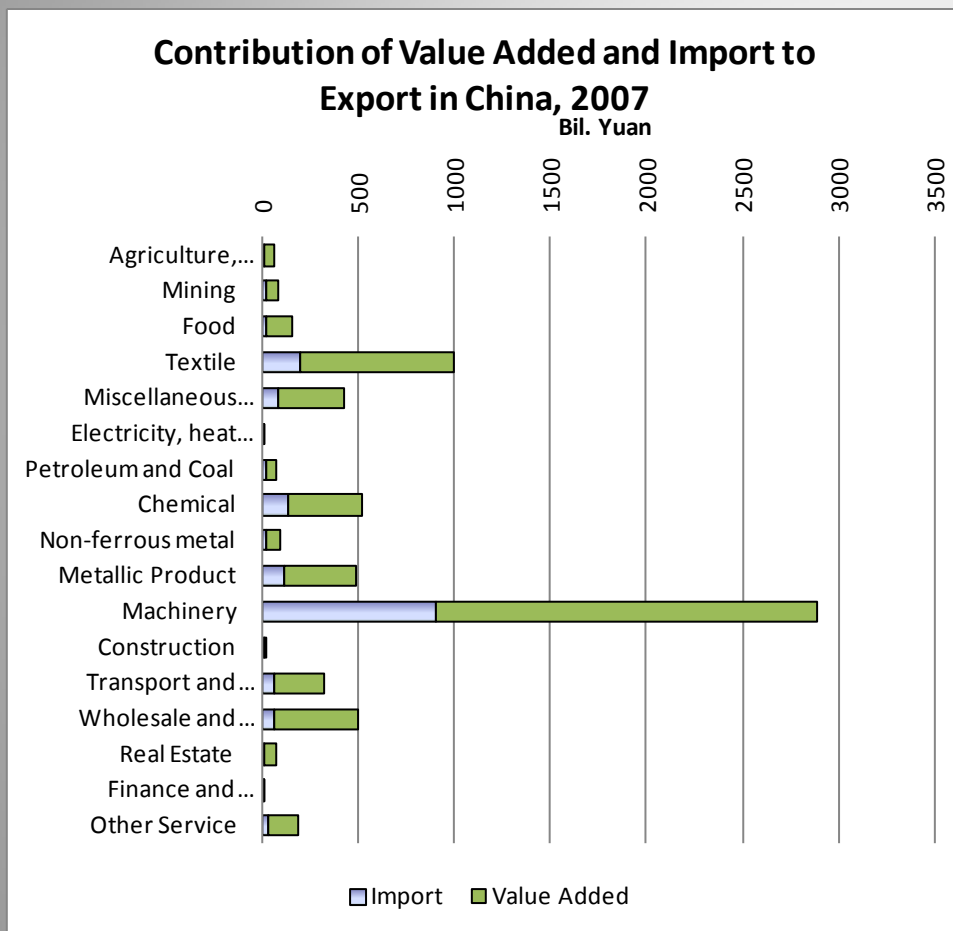
Contribution of Foreign firms to international Trade in China



Chinese Input-output Table, 2005 17 sectors table

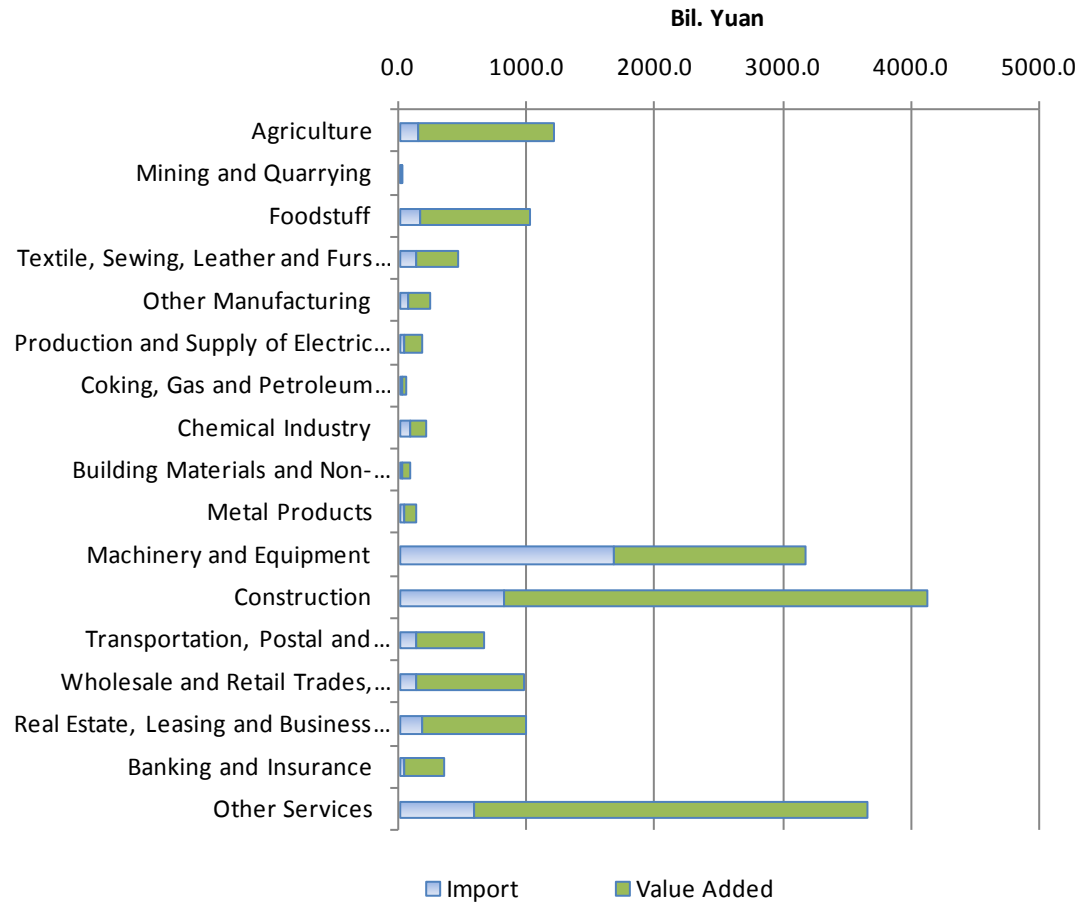
Share of Japanese firms to Chinese Export, 2005

Unit: Bil. Yuan



	Export	Jap Firms	Share(%)
Agriculture	60.0	0.6	0.97
Mining	79.3	0.0	0.01
Food	156.8	4.0	2.57
Textile and Fur Product	989.6	12.8	1.29
Petroleum and Coal	70.5	0.0	0.01
Chemical	513.4	6.9	1.35
Non-metallic Mineral	90.3	0.4	0.47
Metal products	479.4	6.6	1.38
Machinery	2887.7	262.7	9.10
Miscellaneous Manufacturing	425.8	19.2	4.50

Contribution of Value Added and Import to Domestic Final Demand in China, 2005



4 Concluding Remarks

FDI activity is important for the economic development in China.

Such production brings international trade between China and home/the third country.

Diffusion in technology, in broad sense, would be expected through such activities.

Improvement in energy efficiency would be also expected through such activities.

Our analysis has to be revised, using new Asia International Input-output Table 2005, which is to be published next year.

METI, Japan has a project to compile Japan-China international Input-Output Table, which is more detailed table than that of IDE/JETRO.

Using these tables, the economic interdependence in NEA region would be evaluated in precise and detailed way.

Cooperation in the such research field is also expected.

Thank you very much