

IV - 25

EFFECTS OF JAPANESE INVESTMENT ON THE PHILIPPINE ECONOMY

Tohoku U. Stu. Mem. L.L. Y. Mendoza
Tohoku U. Member Hajime Inamura

1. Introduction

This research is part of a larger study which has as its objective the development of a world trade model to be used in estimating future cargo demand of ports in Japan.

The variables which affect volume of international trade include economic growth, cost of production, trade policies, to name a few. This paper focuses on the effect of foreign direct investment on the amount of trade flow. In particular, the effects of Japanese investment on the production structure of Philippine industries, on the amount of domestic production and the amount of Philippine imports are discussed here.

2. Data Used

Data on Japanese equity investment for year 1991 were obtained from the Securities Exchange Commission of the Philippines. In that year, Japan invested in 44 out of 188 industry sectors. The investments totalled 175,433,076 pesos or \$ 6,384,027 with 34.64 % of investments flowing into the manufacturing sector. The remaining 65.36% were poured into the Trade and Services sector such as wholesale trade, real estate agencies and financial services. Effects of investment on the Trade and Services sector was not looked into as investment does not affect the structure of industry. Rather it stimulates the retail consumption and/or the production of overall industries through capital supply.

Computations were made using the 1985 Philippine-Japan Input-Output table as this is the most recent compilation.

3. Methodology

The effects of investments to the manufacturing sector were studied using input-output analysis. The investment to a particular sector was assumed to go only into the procurement of buildings and equipment. Amount of production added by the project was then determined by first multiplying amount of investment by a depreciation rate of 10% to get an annual figure for depreciation and amortization of fixed capital and then dividing the resulting figure by the coefficient of depreciation given in the 1985 Japanese Input-Output table. On the assumption that the foreign firm's production function resembles that of its parent, the additional production was distributed to the producing sectors and primary inputs (value added) following the breakdown of technical coefficients in the Japanese Input-Output

table. It was assumed in this study that the size of the coefficients in the 1985 table remain unchanged. The table was again used to determine the amount of input to be imported as against that which will be purchased from the domestic market.

Table 1 Investment to Manufacturing Sector

SECTOR	JAPAN INVT	
	P '000	%
Condiments	250	0.41
Other processed foods	56	0.09
Wearing apparel & apparel accessories	3,303	5.44
Other textile goods	660	1.09
Plywood & Other primary wood prods	1,150	1.89
Wooden furniture, fixtures	19	0.03
Printing & Publishing	1,000	1.65
Plastic products	4,683	7.70
Other fabricated metal products	32,660	53.74
Other special industry machinery	427	0.70
Sewing, knitting, embroidery machines	71	0.12
Semi-conductor dev./integrated circuits	550	0.90
Wiring devices	200	0.33
Motor vehicles	13,000	21.39
Bicycles	1,000	1.65
Scientific, measuring, controlling equip.	400	0.66
Music instruments, discs, tapes	100	0.16
Sporting and athletic goods	750	1.23
Miscellaneous manufactures	500	0.82
TOTAL	60,779	100.00

In the case where the project would procure its raw materials from both the domestic market and foreign market, additional domestic production and imports required were computed using the analytical scheme discussed below.

Total production was computed as:

$$X_j = \sum x_{ij} + \sum v_{kj}$$

$$x_{ij} = 'x_{ij} + \Delta x_{ij}, v_{kj} = 'v_{kj} + \Delta v_{kj}$$

where:

X_j : Total production of industry j
 x_{ij}, v_{kj} : input and value added of industry j
 $'x_{ij}, 'v_{kj}$: input and value added of industry j without project

Δx_{ij} , Δv_{kj} : additional input and value added by the project

The new input and import coefficients are computed as follows:

$$a_{ij} = x_{ij}/X_j$$

$$m_i = M_i/X_i, M_i = 'M_i + \Delta M_i$$

where:

a_{ij} : input coefficient

m_i : import coefficient

' M_i : imports before the project

ΔM_i : imports added by the project

Table 2 shows the more significant changes in the input coefficients of Sector 100 (Other fabricated metals) before and after investment.

Table 2 Input Coeffs. Before and After Investment

SECTOR	BEFORE		% CHANGE
	INVT.	AFTER INVT.	
Other non-metallic	0.00003	0.00026	856.17
Bolts,nuts,rivets	0.00008	0.00092	1016.99
Other fab. metals	0.00019	0.00239	1148.13

The table 3 shows the more significant changes in the import coefficients before and after investment.

Table 3 Import Coeffs. Before and After Investment

SECTOR	BEFORE		% CHANGE
	INVT.	AFTER INVT.	
Plywood	0.00242	0.00256	5.55
Wooden furniture	0.00026	0.00027	3.81
Bolts,nuts,rivets	0.02811	0.02868	2.04

Additional domestic production is computed

as: $\Delta X = (I - A + M)^{-1} \Delta f$

$$\Delta f_i = \sum_j \Delta X_j * b_{ij}$$

where:

I : identity matrix

A : input coefficient matrix

M : import diagonal matrix

Δf : procured from domestic market

ΔX_j : input of sector i added by proj.

b_{ij} : ratio of amount procured from Phil.'s sector i to total amount procured by Japan's sector j

Total additional imports was calculated using:

$$\Delta X * M + \Delta M$$

where: $\Delta X * M$: import resulting from additional domestic production

ΔM : import required as a direct result of investment

4. Results and Discussion

The flow of Japanese investment into the manufacturing sector in the amount of \$ 2,211,721 resulted in additional domestic production totalling approximately \$ 1000 as against an increase in imports in the amount of \$ 3,644,599. As can be noted, Japanese foreign direct investment hardly made a dent in the domestic market. Rather, intermediate input and final demand requirements as a result of the investment would have to be mostly supplied by foreign markets rather than by the local markets in the levels given below. For comparison purposes, the 1985 level of imports have also been tabulated.

Table 4 Add'l Import and Domestic Requirement

SECTOR	1991 DOM. PROD'N	IMPORT REQ.(1991)	1985 LEVEL
	(\$ '000)	(\$ '000)	(\$ '000)
Plastic products	0.002	103	5,787
Hot rolled steel	0.002	100	18,909
Cold-finished steel	0.002	198	23,848
Cast & forged steel	0.003	104	0
Other steel prods.	0.002	182	32,383
Other non-ferrous	0.025	129	35,795
Motor vehicles	0.128	625	42,156
Bicycles	0	146	599
Electricity	0.016	116	0
Wholesale trade	0.143	231	43,206
OTHERS	0.636	1,711	4,501,912
TOTAL	0.959	3,645	4,704,595

5. Further Study

The effects of foreign direct investment are by no means limited to those studied here. Direct investment also results in the displacement of output of other firms, both foreign and domestic, and in changes in the factor markets. These areas should be studied to be able to get a more accurate picture of the effects of foreign direct investment. Moreover, in this study, a 10% rate of depreciation was set arbitrarily due to the unavailability of actual data. Data on depreciation allowances can be used although these are usually very arbitrary measures of physical life.

References

1. International Input-Output Table: Philippines-Japan (1985). International Developing Economies, Tokyo.
2. Petri, Peter A. (1992) Platforms in the Pacific: The Trade Effects of Direct Investment in Thailand, *Journal of Asian Economics*, V. 3, No. 2, pp. 173-196, 1992