Occasional Paper

Impacts on Domestic and Host Economies of Taiwan's DFI toward Mainland China

by
Chin Chung

No.9202 *January 1992*

CHUNG-HUA INSTITUTION FOR ECONOMIC RESEARCH
75 Chang-Hsing St., Taipei, Taiwan
Republic of China

This paper is intended to provide economic information and stimulate further research. Any opinions expressed within are solely those of the authors and not those of the Chung-Hua Institution for Economic Research.

Impacts on Domestic and Host Economies of Taiwan's DFI toward Mainland China

by

Chin Chung

No.9202 *January 1992*

Impacts on Domestic and Host Economies of Taiwan's DFI toward Mainland China

by
Chin Chung
Chung-Hua Institution
for Economic Research

paper prepared for the Third Annual Conference
of Chinese Economic Association (UK)
London School of Economics
16-17 December,1991

Impacts on Domestic and Host Economies of Taiwan's DFI toward Mainland China

by
Chin Chung*

I. Introduction

There are two strands of empirical literature concerning the economic impacts of direct foreign investment (DFI) upon the host (DFI-receiving) and the home (DFI-originating) countries, each focusing on a distinctive set of problems that emanate from the particular role a country takes in relation to DFI operations. The first strand of literature, usually adopting the view of the less developed countries, concerns itself mainly with the effect of DFI flows on the host economy's employment, output, technological progress, balance of payments performance, and other macroeconomic aspects of the recipient country.[1] The second strand of literature, on the other hand, centers around such issues as the possibility of industrial "hollowing-out" in the investment-originating countries, the long-term competitiveness of the domestic industries, and the trespassing of national sovereignty by overpowered multinational corporations.[2] Despite conceptual reciprocity and almost identical analytical tools, these two strands of literature have been

---

* Assistant Research Fellow, Chung-Hua Institution for Economic Research

1 See, for example, Cohen(1975), Carr(1982), Schive (1978),(1990), and Blomstrom(1989).

2 e.g., Vernon(1966), (1971), Buckley and Casson(1976), and Knickerbocker(1973).

worked out more or less independently,[3] which in part reflects the asymmetry in social aspirations as well as in economic circumstances between the DFI-receiving and the DFI-emanating countries.

An important reason for this dichotomy of empiricism may simply be a lack of proper samples that lend themselves readily to simultaneous reciprocal analyses. Take U.S. DFI in the ASEANs for example, since it constitutes only a small share in the world-wide network of U.S. multinational operations, it makes relatively little sense, or so it seems, for either the home or the host country to try to analyze the feedback effects on the U.S. economy of the said capital flow. Likewise, since U.S. DFI represents only a portion of total foreign resources injected into the host countries, local governments are typically more concerned with the aggregate volume and industrial-orientation of foreign capital rather than with its country-specific origin per se.[4] A simultaneous study of the two sets of effects, i.e., those on the host and the home economy, respectively, becomes viable, or even necessary, only when the originating and the recipient countries mutually count "heavy" in their reciprocal roles with respect to DFI flows. Taiwan's recent surge of DFIs toward mainland China provides just this special analytical setting.

The initiation of Taiwan's outward DFIs may be traced back to the 1960's. Overseas operations at that early stage, however, were sporadic in nature and did not show any obvious trend. The situation changed gradually over the 70's as the pool of surplus labor in the economy steadily drew near, and eventually passed, its point of exhaustion. Especially after the mid-80's, the escalation of domestic labor cost coupled with pressure

[3] Kojima (1973), (1978) may be a prominent exception, whose work on Japanese DFIs has dealt with impacts on the originating and recipient countries at both a theoretical and an empirical level.

[4] The host countries usually do show a concern over the behavioral pattern of different DFI-originating countries in terms of their export propensity, average rate of local procurement and type of technology being introduced, ect. These concerns, however, do not go beyond the potential impacts that may fall on the host economy and are not with the home country per se. See, for example, Chou(1988) and Grosse(1989).

from currency appreciation has forced export-oriented Taiwanese manufacturers to diversify their production base into Southeast Asia, the U.S., the EC market, and among them mainland China, in an attempt to rehabilitate their threatened competitiveness in the world market. Table 1 shows the growing momentum of DFI activities during the 80's, and one observes an abrupt rise of DFI toward mainland China that overtook almost all other destinations soon after 1987, at which time the Taiwan government lifted its ban on kinship visits to the mainland after a 40-year freeze.

While changes in domestic macroeconomic conditions constitute the "push" factor common for all recent DFI activities emanating from Taiwan, it is the traditional ties between the two sides of the Taiwan Strait that explain the bulky movement of Taiwanese DFI toward mainland China. Cultural and linguistic identity effectively lowers the implicit barriers to entry typically faced by a foreign investor. With negligible entry cost in this sense and an added convenience of geographical proximity, Taiwan's direct investment into mainland China soared from 0.1 billion US dollars in 1987 to almost 1 billion US dollars in 1990, with another 1 billion US dollars readily projected for 1991.

II. Characterization of Taiwan's DFI in Mainland China

According to the mainland official statistics, Taiwan's accumulative DFIs ranked fourth place after Hong Kong, the U.S. and Japan at the end of 1990 (see Table 2). In terms of manufacturing investment, however, Taiwan may be second only to Hong Kong in view of the fact that U.S. and Japanese investments are more often tilted toward the resources- and service-related activities. Unlike the western and Japanese multinationals that possess sophisticated technologies, glaring brand names, and oligopolistic market power in the international arena, Taiwan's DFI firms are more akin to those of Hong Kong in that they are characterized mainly by ample OEM experience and dexterity in

Table 1 Major recipients of Taiwan's outward DFIs in the 80's

unit:million US dollars

year / country	1984	1985	1986	1987	1988	1989	1990	1991*
U.S.	30.5	35.7	46.0	70.0	123.3	508.7	428.7	205.4
Europe	...	0.9	0.2	10.2	17.0	73.3	265.9	212.2
Malaysia	...	...	4.1	91.0	313.0	815.0	2,383.0	741.0
Thailand	...	...	70.0	300.0	842.0	871.0	761.0	124.4
Indonesia	...	...	18.0	8.0	913.0	158.0	618.0	902.7
Philippines	...	...	0.4	0.9	109.0	149.0	140.7	6.9
Mainland China	...	...	...	100.0	421.0	523.0	984.0	1.000.0

* The 1991 figures are cumulative up to different months. The deadline for the U.S. and Europe is September, with August for Malaysia, July for Thailand and Indonesia, and June for the Philippines. The figure on mainland China is a projction for the whole year.

Sources: The U.S. and Europecan figures are from the Investment Commission, Ministry of Economic Affairs, Taiwan, Sept.,1991; the ASEAN figures are from the Industrial Development and Investment Center, Ministry of Economic Affairs, Taiwan, based on host-country BOI reports; and figures on mainland China are adopted from *China Economic News*, Beijing, various issues.

Table 2 Major Sources of DFIs in mainland China (1979-90)
unit:100 million US Dollars
(contracted value)

orign / year	Hong Kong	U.S.	Japan	Taiwan
1979-84	64.9	10.2	11.5	...
1985	41.3	11.5	4.7	...
1986	14.4	5.3	2.1	...
1987	19.5	3.4	3.0	1.0
1988	34.7	3.7	2.7	4.2
1989	31.6	6.4	4.4	5.2
1990	36.8	3.6	4.6	9.9
1979-90	243.2	44.1	33.0	20.3
(1987-90)	(122.6)	(17.1)	(14.7)	(20.3)

note: figures in parantheses are cumulative 1987-90.

Source: *Almanac on China's Foreign Economic Relations and Trade*,various issues.

labor-intensive production techniques. In fact, it was the successful export drive of labor-intensive products under the auspices of western and Japanese industrial conglomerates and trading giants that explained, in good part, the miraculous growth of the Taiwan economy over the past 40 years. Now that the comparative advantage has shifted against labor-intensive production at home, Taiwanese manufacturers can benefit the most by embodying their production know-how and a well-established OEM network in the form of self-initiated DFI operations based in another low-wage country. Table 3 presents a listing of DFI activities in the mainland that had been registered with the Taipei authorities as of April 8, 1991. It is obvious that most of the investment projects fall within the labor-intensive categories. Moreover, the majority of these operations are export-oriented instead of being geared toward the local market. According to a recent survey (Ouyang, Lin and Chou, 1991) conducted on 153 Taiwanese DFI firms across 61 different industries, 85%-90% of the outputs produced in the mainland were shipped to a third market, about 6% was shipped back to Taiwan, and less than 10% was retained for sale in the mainland in 1990. Thus the behavioral pattern of Taiwan's DFIs in the mainland fits nicely with the "defensive" prototype ala Kojima (1973) who stresses cost-reduction in defending existing markets as the underlying driving force of outward DFIs.

In addition to being "defensive" in nature, the investment projects listed in Table 3 are typically small-scaled, reflecting in part the underlying structure of enterprise composition of the Taiwan economy.[5] The scale factor, however, is more apparent in the mainland than elsewhere due probably to political reasons (i.e., risk-aversion under existing tensions across the Strait) and because of lower barriers to entry discussed previously. If we compare, for example, DFIs toward Malaysia (the largest ASEAN

[5] Taiwan is quite renowned for its large pool of small and medium sized enterpries (SMEs) in manufacturing that play a leading role both in domestic production and in international trade. In 1988, for example, SMEs accounted for 98% of the total number of manufactuing firms in Taiwan, produced 44% of the manufacturing output, and were responsible for 63% of Taiwan's total exports.

Table 3 Registered DFI cases in Mainland China
by Industry Associations Classification

Industry	Invested Values (US$1000s)	Number of Cases	Average Size	Industry	Invested Values (US$1000s)	Number of Cases	Average Size
1.Electric and Electronic Components	102,748	242	430	30.Sanitary Products	6,675	36	185
2.Vehicle	78,923	202	391	31.Zipper	6,490	10	649
3.Footwear	58,751	306	192	32.Rubber	6,478	31	209
4.Services	56,472	62	186	33.Trade	6,393	37	173
5.Plastic Products	44,582	129	346	34.Spectacles	5,593	14	400
6.Textiles	31,995	74	432	35.Toy	5,126	56	92
7.Metal Products	30,440	85	358	36.Knitting	4,945	24	206
8.Agric. Product and Livestocks	21,378	35	611	37.Glasswork	4,920	10	492
9.Athletic Products	20,348	59	345	38.Frozen Fishery	4,557	19	240
10.Apparel	17,876	106	169	39.Kichen & Toilet Equipment	3,761	22	171
11.Lamp Decoration	17,566	67	262	40.Medical Industry	3,007	11	273
12.Handbags, Suitcase	16,466	40	412	41.Furniture	2,891	15	193
13.Wood Processing	15,688	46	341	42.Printing	2,793	21	133
14.Food Processing	13,807	39	354	43.Gloves	2,247	15	150
15.Electric Appliance	13,343	37	361	44.Motor Vehicle	2,185	7	312
16.Woolen Textiles	13,012	62	210	45.Dyeing	2,030	5	406
17.Handicraft	11,062	48	231	46.Fertilizers	1,800	1	1,800
18.Clock and Timer	10,989	12	916	47.Lacquer Painting Liquid	1,655	15	110
19.Umbrellas	10,829	62	175	48.Education Tools	1,518	6	253
20.Vegetable & Fruit Processing	10,609	36	295	49.Fishery Equipment	1,328	2	664
21.Pottery & China Making	10,214	54	189	50.Hand Machinery	1,318	6	220
22.Bamboo Products	10,210	48	213	51.Gift Products	903	14	65
23.Machinery	9,461	30	315	52.Optics	751	4	188
24.Medical Equipment	9,251	10	925	53.Pearl & Jewel	410	7	59
25.Mine & Stone Product	8,964	28	320	54.Synthetic resin	400	3	133
26.Petrochemical	7,158	37	194	55.Aquatics breeding	185	2	93
27.Paper Products	6,920	15	461	56.Others	980	68	15
28.Leather	6,680	58	115				
29.Paper Making	6,680	11	607	Total	753,915	2,053	465

Source: Investment Commission, Ministry of Economic Affairs, Taiwan, May 1991.

recipient of Taiwan's DFI) with those in the mainland, the average size of investment in the former is 5.1 million US dollars, or 10 times the average size of investment in mainland China, which is only 465 thousand US dollars (cf. Table 4). On the other hand, the frequency of investment is clearly much higher in the mainland than in Malaysia when one compares the total number of DFI projects in the two regions (2,053 cases for the mainland vs. 239 cases for Malaysia). This implies that mainland China stands out as an ideal destiny for relocation of Taiwan's threatened labor-intensive lines of production, even though currently these investments are still being made on a trial basis due to uncertainly caused by political intricacies. If political tensions between the two sides of the Taiwan Strait continue to ease, one may expect to find a rapid expansion of both the operational scale and the total volume of DFIs encompassing a even wider range of manufacturing activities.

Another notable characteristic of Taiwan's DFI that has important implications for the host country is its tendency to rely heavily on home sources for intermediate inputs supply. The same survey by Ouyang, Lin and Chou (1991) reports that, on average, 86.61% of the machinery and equipment and 69.94% of the raw materials, semi-products, components and parts required in overseas production were shipped in from Taiwan. The remainder was procured from a variety of sources, including upstream DFI firms originating in Taiwan, and only a minimum amount was furnished locally by mainland producers. This pattern of international sourcing, to be sure, is frequently observed for DFI operations worldwide as it provides a ready channel for internal transactions between the parent firm and the overseas subsidiary when the two entities are vertically integrated production-wise. Even in the absence of substantial parent-subsidiary interal linkages, as is often the case with Taiwanese DFIs whose parent firms are usually quite specialized, reliance on the long-standing network of customer-supplier relationships from home seems to be a better way to guarantee a stable supply of inputs and to ensure the quality of

Table 4 Taiwan's DFI cases toward Malaysia
(1987-89 accumlative)

unit:thousand US Dollars

Industry	Invested Value	Number of Cases	Average Size
1.Electric and Electronics Products	508,418	102	4,984
2.Chemistry and Chemical Products	112,480	10	11,248
3.Textile Products	103,062	10	10,306
4.Processed Food	101,901	8	12,738
5.Limber and Wood Products	68,223	32	2,132
6.Nonmetallic Products	66,539	10	6,654
7.Rubber and Rubber Products	65,851	55	1,197
8.Furniture	48,192	24	2,008
9.Metal Products	29,860	12	2,488
10.Basis Metals	20,594	13	1,584
11.Plastic Products	20,312	11	1,847
12.Machinery	13,520	6	2,253
13.Transportation Equipment	12,143	7	1,735
14.Paper, Printing and Publication	4,485	5	897
15.Scientific and Precision Measurment Instrument	2,698	1	2,698
16.Leather and Leather Products	1,585	1	1,585
17.Others	5,226	16	327
Total	1,219,819	239	5,104

Source:Malaysian Board of Investment, 1990.

output in the face of fierce international competition. This having been said, one must observe that several institutional factors peculiar to the mainland economy also help reinforce this tendency of outward purchase by DFI firms. First of these institutional factors is the virtual non-existence of a consumer-goods industrial base, especially in the coastal areas of Fujian and Guandong where the four special economic zoons are located, due to a relative neglect of these industries by the mainland authorities prior to the policy reversal of 1979. As a result, very few indigenous producers are as yet capable of supplying qualified semi-products, components and parts in accordance with DFI firms' specifications. A second factor that has limited the degree of local involvement is the predominance in the mainland of large-scale, low-efficiency, state-owned enterprises, whose potentials to furnish local supplies are inadvertently handicapped by red tape, poor management, obsolete techniques and insufficient quality control. Poor traffic condition between different localities also adds to the problem in terms of frequent delays of shipments. These factors together force upon the emergence of a DFI "export enclave" which has little spillover into the local economy, yet which is viewed by many DFI firms to be a more efficient means to regain their competitive edge in the world marketplace.

III. Impacts on Domestic and Host Economies of Taiwan's DFI in Mainland China: An Input-output Analysis

If the above characterization of the current Taiwanese DFI toward mainland China is correct, that is, if these investments are basically "defensive" in nature, one may expect to find a concomitant "export shift" from Taiwan to the mainland along with the transfer of production sites. Exports, as well as employment and output, in the heavily-invested

industries will tend to shrink domestically while those for the mainland will expand. On the earnings side, however, since a better part of intermediate inputs has to be acquired from outside mainland China and little room is left for local spillovers, foreign exchange earnings for the host economy consist mainly in direct wage bills plus some possible rental payments on land and factory units. The lion's share of the export earnings will be kept in the hands of Taiwanese investors and, more often than not, remains outside the mainland economy.

For Taiwan in the past few years, output and employment did shrink in such labor-intensive industries as wearing apparel, leather products, wood products, and textiles. The manufacturing production index for these sectors, using 1986 as the base year, showed a steady decline after 1987 and plummeted to 63.48-92.05 in 1990(see table 5). Even in the more strategic and dynamic sectors such as electronics and precision instruments there have been signs of stagnation after 1989. Recall also that Taiwan has experienced a severe problem of labor shortage in recent years, particularly in the manufacturing sector. The extent of the problem is vividly addressed in Table 6. For the manufacturing sector as a whole, employment drops from 2,624 thousand people in 1987 to 2,260 thousand in 1990, rendering a net loss of 364 thousand jobs (or 14% of the 1987 total manufacturing employment) in three years. Particularly traumatized were the labor-intensive sectors, including textiles, apparel, leather, wood, plastic, non-metallic, and electrical and electronics industries, each suffering from a loss of 10-80 thousand workers during that period. Similarly, the export performance of these sectors has been on the decline. Table 7 shows the changing structure of exports for all manufactured products between 1987 and 1990. Aside from generating much smaller shares than before, some of the above-mentioned sectors (e.g. apparel and leather goods) actually went through an absolute contraction in export volumes during 1989 and 1990.

All of this, however, is not a consequence of surging Taiwanese DFI but rather

Table 5 The Manufacturing Production Index for Taiwan (1987-1990)

base year : 1986

Item	1987	1988	1989	1990
Total Manufacturing Production	111.19	115.39	119.28	117.28
1.Processed Food	104.57	105.77	103.54	108.57
2.Beverages & Tobacco	105.85	111.69	123.16	138.43
3.Textile Products	104.73	94.03	97.55	92.05
4.Wearing Apparel and Other Clothing Ornamenting Textile Articles	102.66	85.61	83.87	75.75
5.Leather, Fur and Articles Thereof	100.88	95.85	93.46	85.98
6.Wood, Bamboo and Rattan Products	103.48	93.20	86.75	63.48
7.Pulp, Paper Allied Products and Printed Matter	106.29	110.02	120.79	126.37
8.Chemicals	103.65	108.01	110.30	119.61
9.Chemical Products	117.66	127.89	136.45	129.55
10.Rubber and Plastic Products	112.35	118.05	115.30	107.89
11.Non-metallic Products	105.99	110.08	115.77	117.87
12.Basic Metals	107.46	120.34	126.99	129.67
13.Metal Products	111.50	120.01	126.64	122.41
14.Machineries	117.81	134.03	135.35	139.46
15.Electrical Machineries and Apparatus	123.68	136.27	142.60	141.15
16.Transportation Equipments	122.82	125.17	148.23	152.48
17.Precision Instruments and Equipments	114.72	131.71	147.31	144.51
18.Other Manufactured Products	110.88	116.44	111.13	100.29

Source : Industrial Production Statistics Monthly, Oct. 1991, Department of Statistics, Ministry of Economic Affairs,ROC.

Table 6 Changes in Taiwan's Manufacturing Employment

unit:1000 persons

Item	1987	1988	1989	1990
Total Manufacturing Employment	2624.1	2580.7	2452.6	2260.1
1.Process Food	127.0	119.1	115.4	116.3
2.Beverages &Tobacco	16.0	16.8	18.2	20.2
3.Textile Products	291.9	279.6	254.7	215.5
4.Wearing Apparel and Other Clothing Ornamenting Textile Articles	140.2	129.4	109.9	92.8
5.Leather,Fur and Articles Thereof	69.7	66.5	59.5	49.9
6.Wood,Bamboo and Rattan Products	120.8	114.9	103.7	84.2
7.Pulp,Paper Allied Products and Printed Matter	108.8	112.6	113.4	110.7
8.Chemicals	61.5	62.3	60.1	60.0
9.Chemical Products	66.2	67.6	70.5	71.0
10.Rubber and Plastic Products	334.6	331.0	301.5	253.8
11.Non-metallic Products	102.7	100.1	96.8	91.1
12.Basic Metals	78.4	80.3	80.1	75.1
13.Metal Products	232.6	237.3	237.7	228.3
14.Machineries	105.8	110.9	115.1	117.3
15.Electrical Machineries and Apparatus	446.6	439.4	418.2	397.5
16.Transportation Equipment	127.0	128.2	127.9	125.8
17.Precision Instruments and Equipment	39.7	39.8	38.6	37.4
18.Other Manufactured Products	154.6	144.9	131.3	113.2

Source: *Monthly statistics of the Replubic of China*, Oct. 1991, Directorate-General of Budget, Accounting and Statistics, Execrtive Yuan, ROC.

Table 7 Changes in Taiwan's Manufacturing Exports

unit:million US dollars,%

item \ year	1987		1988		1989		1990	
	value	share	value	share	value	share	value	share
Total Export of Manufactures	52,788	100.00	59,553	100.00	64,225	100.00	62,670	100.00
1.Processed Food	2,494	4.72	2,331	3.91	2,374	3.70	2,302	3.67
2.Beverages & Tobacco	19	0.04	22	0.04	22	0.03	20	0.03
3.Textile Products	3,499	6.63	3,859	6.48	4,880	7.60	5,504	8.78
4.Wearing Apparel and Other Clothing Ornamenting Textile Articles	5,489	10.40	5,155	8.66	5,339	8.31	4,481	7.15
5.Leather, Fur and Articles Thereof	1,645	3.12	1,857	3.12	1,829	2.85	1,389	2.22
6.Wood, Bamboo and Rattan Products	2,230	4.22	2,219	3.73	2,208	3.44	1,834	2.93
7.Pulp, Paper Allied Products and Printed Matter	316	0.60	448	0.75	520	0.81	630	1.01
8.Chemicals	974	1.85	1,593	2.67	1,804	2.81	1,976	3.15
9.Chemical Products	785	1.49	857	1.44	958	1.49	1,025	1.64
10.Rubber and Plastic Products	5,138	9.73	5,631	9.46	5,373	8.37	4,778	7.62
11.Non-metallic Products	1,156	2.19	1,249	2.10	1,197	1.86	1,114	1.78
12.Basic Metals	752	1.42	1,314	2.21	1,498	2.33	1,366	2.18
13.Metal Products	3,228	6.12	3,490	5.86	3,966	6.18	4,049	6.46
14.Machineries	2,377	4.50	3,190	5.36	3,851	6.00	4,232	6.75
15.Electrical Machineries and Apparatus	13,496	25.51	16,647	27.95	18,112	28.20	17,889	28.54
16.Transportation Equipment	2,370	4.49	2,521	4.23	3,022	4.71	3,434	5.48
17.Precision Instruments and Equipment	1,054	2.00	1,298	2.18	1,552	2.42	1,528	2.44
18.Other Manufactured Products	5,766	10.92	5,869	9.86	5,721	8.91	5,118	8.17

Source : *Monthly Statistics of Exports and Imports*, Aug. 1991, Department of Statistics, Minintry of Finance , ROC.

part and parcel of its contributing factors. Indeed, the causation here runs both ways and one tends to reinforce the other. Moreover, there may be cyclical movements along an apparently structural transformation path such that short-run and long-run adjustments are intricately intertwined. What proportion, then, of the above observed aggregate changes may be attributed to the recent wave of Taiwanese DFIs toward mainland China per se?

To answer this question, we conducted an industrial linkage analysis based on the officially registered investment volume of 754 million US dollars and the 1986 input-output table for the Taiwan economy. Our purpose is to gauge the potential impacts on both the domestic and host economies in terms of output and employment changes and the extent of subsequent "export shifts" in an essentially comparative static framework. Compared with the accumulative 2 billion US dollar investment from Taiwan (as of end of 1990) registered with the Chinese officials, our figure seems to be a severe underestimate. It may nonetheless serve as a good approximation for the "realized" capital inflow in view of another mainland China report that the average realization rate of DFIs from all sources has scored at roughly 45% of the contractual amount for the past decade.[6] More importantly for our purpose, the registration data from Taipei provides us with detailed information on the cross-industry distribution of investment projects, which is essential for the kind of exercise we're engaged in.

To fix ideas, the transplantation of production activities immediately leads to an increase in overseas production at the expense of domestic output. The two quantities need not be the same, however, for at least two reasons. First, the productivity of capital may be different at home and abroad. Entrepreneurs carry out foreign investment projects in order to seek greater profits, so it is reasonable to assume a higher return

[6] *Almanac on China's Foreign Economic Relations and Trade*, 1990, Beijing.

on capital abroad than at home. The fact that DFI firms usually adopt more labor-intensive techniques of production[7] also tends to boost the average productivity of capital abroad. Second, as mentioned above, Taiwan's current DFI operations in the mainland involve very few local linkages and rely primarily on home sources for raw materials and intermediate inputs supply. Therefore, despite the displacement of "first-round" activities from a linkage analysis point of view, the second and third ... rounds of spillover effects are retained domestically as long as the "home purchase" policy prevails. This tends to mitigate the net effect on domestic output while accelerating export trade from Taiwan to the mainland. Given production technologies, employment changes at home and abroad are a direct result of variations in the respective output levels. And given the size of overseas production, the extent of "export shifts" within the DFI sectors is determined by the average propensity to export of the DFI firms.

Equations (1) to (6) succinctly summarize these theoretical considerations:

$$(1)\ \Delta Y^* = \Delta K_I\ (Y_I^*/K_I)$$

$$(2)\ \Delta T = \delta D \Delta Y^*$$

$$(3)\ \Delta Y = B\ T\text{-}B[\ K_I(Y_I/K_I)]$$

$$(4)\ \Delta L = \Delta Y(L_I/Y_I)$$

$$(5)\ \Delta L^* = \Delta Y^*(L_I^*/Y_I)$$

$$(6)\ \Delta X^* = \alpha\, \Delta Y^*$$

[7] According to another survey conducted on Taiwanese electric and elctronics DFIs in mainland China (Chiu, et al, 1991), the average scale of operation in the mainland in terms of invested capital is 650 thousand US dollars, or roughly one-fourth that of the parent company (2,460 thousand US dollars). However, the average number of workers employed in the mainland (312 persons) is 1.5 times that of the parent firm (210 persons). This amounts to saying that the average labor-capital ratio in the mainland is 5.6 times that of the parent firm.

where $\triangle Y, \triangle K, \triangle T, \triangle L$ and $\triangle X$ stand for changes in output, capital, investment-induced exports, employment, and third-market bound exports of the invested industries, respectively. D is the 29-sector domestic input coefficient matrix, $B = [I-(I-\hat{M})A]^{-1}$ is the 29-sector competitive industrial linkage matrix, Y_i/K_i and L_i/Y_i are the capital productivity and labor requirement ratios, and δ and α are the average propensities to purchase intermediate products from home and to export finished products to the third market, respectively. A $*$ is attached when the term refers to a foreign concern.

We obtained the relevant figures on Y_i/K_i and L_i/Y_i for each sector i from the 1986 Industrial and Commercial Census Report for the Taiwan Area. Lacking reliable empirical data, we tentatively assumed, on the basis of our previous considerations, that overseas capital productivity, Y_i^*/K_i, is 1.2 times its domestic counterpart, and that overseas labor requirement per unit of output, L_i^*/Y_i, is 4-6 times that domestically.[8] As to the values of δ and α, previous experience from DFIs toward Southeast Asian countries indicates that overseas subsidiaries tend to maintain their former customer-supplier relationships during their first years of operations and start to divert to local suppliers only after they have firmly established themselves in the host economy. Since Taiwan's DFIs into mainland China are a relatively new phenomenon, and also because of the "DFI enclave" phenomenon discussed earlier, we assumed $\delta = 1$ here for simplicity.[9] Finally, $\alpha = .70$ seemed to be a natural assumption to make for most of the export-oriented DFIs in China today as a preferential tax treatment is being associated with this minimum export rule. In view of the previous survey results, however, one may take the estimates based on $\alpha = .70$ as the lower bound of the actual extent of "export shifts".

[8] cf. note 7.

[9] Note, however, that $\delta = 1$ together with the use of D-matrix in our calculations only means that all of the intermediate inputs previously furnished by indigenous producers in Taiwan continue to be supplied by these same producers.

Table 8 presents our estimated results. From column 5 of that table we can see that, for Taiwan, the initial loss of GDP due to production transplantation together with its multiplier effects on other sectors of the economy adds up to a total of 4,646 million US dollars annually, which is nevertheless partly offset by the increased overseas demand for raw materials and intermediate products(column 3)[10] together with their backward linkages totalling 2,400 million dollars(column 4). As a result, the net loss for the home economy in terms of static output decline is 2,246 million dollars per annum, as shown in column 6 of table 8. This figure is roughly 1.4% of Taiwan's actual GDP of 164.1 billion US dollars in 1990.

On the other hand, Taiwan's DFI operations directly generated an output value of 2,647 million US dollars in the mainland in 1990, roughly 0.8% of the latter's gross national output of that year. This number is significant enough to account for more than 25% of all foreign contributions to mainland China's annual industrial production in 1990.[11] More importantly, the influx of Taiwanese DFI has created thousands of new job-openings by the month for the coastal areas of mainland China. It is estimated that, as of the end of 1990, between 282 to 423 thousand mainlanders have received employment in the manufacturing sector due to Taiwanese investment (column 8), while the same flow of DFIs has resulted in a net reduction of 53.9 thousand manufacturing jobs in Taiwan(column 7).[12]

[10] It may be noted that these investment-induced exports (altogether 1,140 million US dollars) accounted for about 35% of the actual export volume (3,287 million US dollars) from Taiwan to mainland China in 1990.

[11] In 1990, foreign-related industrial production in mainland China amounted to 10.4 billion US dollars, or 3% of the country's annual gross national output. See *Economic Daily News*, July 17, Beijing. Note that this figure does not include DFIs' output value in the agricultural or the tertiary sector.

[12] The reduction of manufacturing jobs, however, did not pose a threat to the unemployment situation in Taiwan. As a matter of fact, the unemployment rate in Taiwan has been at its lowest level around 1.7% ever since the mid 80's. What is really occurring is a gradual yet persistent reshuffling of employment from manufacturing to the service sector as the economy slowly undergoes a process of structural transformation.

Table 8 Estimated Results of DFI's Inpacts on the Domestic and Host Economies

units : 10 thousand US dollars, persons

Industrial Classification	(1) ΔK_i	(2) ΔY^*	(3) ΔT	(4) $B\Delta T$	(5) $B[\Delta K_i (Y_i/K_i)]$	(6) ΔY	(7) ΔL	(8) ΔL^* (i)	(8) ΔL^* (ii)	(9) ΔX^*
1.Agr. Products & Livestock	(2,137.8)	—	2,934.3	6,576.3	- 6,877.2	- 300.9	—	—	—	—
2.Forestry	(0.0)	—	330.3	595.9	- 679.4	- 83.5	—	—	—	—
3.Fisheries	(18.5)	—	454.7	723.8	- 767.6	- 43.8	—	—	—	—
4.Minerals	(0.0)	—	530.2	2,305.0	- 2,181.1	123.9	—	—	—	—
5.Processed Food	2,897.3	7,996.6	1,428.0	4,084.8	-12,286.0	- 8,201.2	- 1,454.9	5,674.4	8,511.5	5,597.6
6.Beverages & Tobacco	0.0	0.0	13.4	31.2	- 35.7	- 4.5	- 0.3	0.0	0.0	0.0
7.Fabrics	3,897.0	9,726.9	21,780.8	34,542.3	-37,029.5	- 2,487.2	- 576.1	9,012.6	13,519.0	6,808.8
8.Garments & Accessories	10,505.6	56,226.0	6,634.1	9,880.3	-55,156.0	-45,275.7	-17,340.4	86,137.1	129,205.7	39,358.2
9.Wood & Wooden Product	2,878.9	9,016.7	2,145.5	3,062.1	-10,559.0	- 7,496.9	- 3,438.9	16,544.4	24,816.6	6,311.7
10.Papaer & Prod., Ptg. &Pub	1,640.3	3,759.6	4,658.4	10,214.5	-12,074.6	- 1,860.1	- 466.5	3.771.9	5.657.8	2,631.7
11.Chemical Materials	180.0	423.4	3,980.3	14,752.8	-13,044.1	1,708.7	145.4	144.1	216.2	296.4
12.Art. Fibers, Plastics & Prod	5,146.0	21,798.4	19,536.5	40,172.4	-52,363.5	-12,191.1	- 2,987.3	21,365.7	32,048.6	15,258.9
13.Misc. Chemical Product	484.7	1,425.1	4,497.3	8,759.9	- 8,913.3	- 153.4	- 26.8	995.7	1,493.6	997.6
14.Petroleum Products	715.8	1,365.7	2,561.9	8,179.7	- 9,249.6	- 1,069.9	- 57.8	295.1	422.7	956.0
15.Non-metallic Minerals	2,409.8	3,730.4	1,357.4	2,523.3	- 5,620.6	- 3,097.3	- 826.8	3,983.3	5.975.0	2,611.3
16.Steel & Iron	0.0	0.0	7,741.7	22,001.1	-19,367.0	2,634.1	287.0	0.0	0.0	0.0
17.Misc. Metals & Metallic Prod.	3,171.8	9,134.8	10,567.9	17,281.2	-24,184.1	- 6,902.9	- 1,403.3	7,428.2	11,142.3	6,394.4
18.Machinery	946.1	2,656.7	1,387.5	2,472.3	- 4,349.5	- 1,877.2	- 594.2	3,364.0	5,046.0	1,859.7
19.Household Elec. Appliances	370.0	1,638.3	504.9	686.1	- 1,960.0	- 1,273.9	- 257.1	1,322.8	1,984.2	1,146.8
20.Electronic Products	964.3	4,269.9	2,722.9	391.6	- 6,710.4	- 6,318.8	- 1,275.2	3,446.9	5,170.4	2,988.9
21.Elec. Machinery & Apparatus	10,274.8	45,496.8	9,723.9	12,452.3	-47,480.8	-35,028.5	- 7,052.2	36,639.3	54,958.9	31,847.8
22.Transport Equipments	8,110.8	22,580.5	3,783.9	5,023.4	-24,260.5	-19,237.1	- 3,106.3	14,584.5	21,876.8	15,806.4
23.Miscellaneous Products	12,356.5	52,638.7	4,772.2	5,389.9	-47,390.1	-41,991.2	-13,471.7	67,550.5	101,325.7	36,847.1
24.Cinstruction	0.0	0.0	—	799.6	- 1,813.9	- 1,014.3	—	—	—	—
25.Electricity	0.0	0.0	—	6,418.4	- 9,930.3	- 3,511.9	—	—	—	—
26.Gas & City Water	0.0	0.0	—	216.9	- 436.4	- 219.5	—	—	—	—
27.Trans., Comm. & Warehousing	0.0	0.0	—	3,288.1	- 6,971.3	- 3,683.2	—	—	—	—
28.Wholesale & Retail Trade	639.3	537.1	—	6,320.1	-14,454.8	- 8,134.7	—	—	—	—
29.Miscellaneous Services	5,647.2	10,300.5	—	10,883.1	-28,456.0	-17,572.9	—	—	—	—
Total	75,391.5	264,722.1	114,048.0	240,037.4	-464,602.3	-224,564.9	- 53,903.4	282,260.5	423,370.7	177,719.3

Note: In column(8), (i) are estimates based on the assumption that Y^*/L is four times Y/L, and (ii) are estimates based on the assumption Y^*/L is six times Y/L.

The apparent asymmetry of the employment effect for the home and host economies arises from two sources. The first is the asymmetry embedded in the output effect, discussed previously, for the two economies. The other is the tendency of DFI firms to revert to more labor-intensive methods of production in an attempt to fully exploit the comparative advantage element in the host economy. For Taiwan's DFI firms, labor-intensive production technologies are a familiar long-time friend from the "good old days" of Taiwan when labor abundance rather than labor shortage was the common fact of life. As they venture into the new territory of mainland China, Taiwanese entrepreneurs are quick to adapt these technologies to the new environment which they find rather similar to the one they experienced in Taiwan 15-20 years ago. This strategy of capitalizing on the crude labor of mainland China based on Taiwanese production proficiency has proved successful enough and promised to bring handsome returns to both the investing and the invested party. It seems clear in retrospect that, aside from ample OEM experience and a firmly established market outlet, dexterity in the labor-intensive methods of production provides the ultimate vantage point in the surging Taiwanese DFIs toward low-wage countries.

Regarding the extent of the export shift, column 9 of Table 8 indicates that, as a result of the registered investment flow, the annual volume of exports designated "MIC" (Made in China) will increase, and those designated "MIT" will decrease, by 1.8 billion dollars.[13] This amounts to a 2.8% drop in export performance for Taiwan evaluated at the latter's 1990 actual export level of 62.7 billion US dollars, or a 2.9% gain for the mainland evaluated at its 1990 export level of 62.1 billion dollars. As pointed out earlier, however, this transfer of export records is more apparent than real since the bulk of

[13] Total foreign-related exports from mainland China were 7.8 billion US dollars in 1990. Taiwan's contribution would be around one-fourth of this volume. However, if we include the value of offshore-processing, which was not counted as part of China's exports by the Customs, Taiwan DFIs' share would fall to approximately 1/7.

hard currency earnings fall in the hands of the Taiwan investors. Nevertheless, an estimated 294-420 million US dollars[14] (approximately 11-16% of the annual overseas production value) still go to the mainland authorities in the form of workers' compensations stipulated by law to be paid in foreign exchange only. This and other miscellaneous expenses currently constitute the bulk of hard currency earnings for mainland China under Taiwanese DFIs.

IV. Some Longer-term Issues

The above static analysis ignores the long-term impacts of DFIs on the domestic and the host economy. For the home country, the long-term issue is essentially one of industrial restructuring called forth by the changing comparative advantage of international division of labor. It poses a particularly serious challenge for a newly-industrializing economy such as Taiwan, which still lacks a firm grasp on advanced technologies to compete effectively in the "up market" and whose past economic performance was largely based on the very industries that are now exiting the country. In order to prevent the exodus of labor-intensive production from hampering the growth prospects of the economy, indigenous entrepreneurs must endeavour to upgrade their technology and to explore into higher ends of their product spectrum so that a healthy new pattern of parent-subsidiary division of labor may be established.

So far the performance of the Taiwan economy has been volatile but hopeful. The real growth rate of domestic manufacturing investment has revived since the second

[14] The estimation is based on a monthly wage rate of 350-500 RMB per worker and a total employment of 350 thousand workers due to Taiwanese DFIs.

quarter of 1991, after a 4-year plunge from 36.73% in 1986 to -2.56% in 1990. Exports of capital-intensive and technology-intensive products have been on a healthy rise, filling the void caused by the DFI-related "export shifts" in a wide array of labor-intensive products. Even some of the more traditional, labor-intensive sectors, e.g., footwear and wearing apparel, have witnessed a renound in export values despite a continuous drop in export quantity. This latter development suggests that the efforts dealing with upgrading the quality of products in pursuit of a higher unit price might be paying off.

For the host country, on the other hand, two crucial aspects that will have a lasting impact on the economy are the extent of technological transfer and the creation of sectoral linkage effects over time. In the context of the mainland economy, both of these processes will involve a gradual emergence of a pool of relatively small-size, privately-run firms that produce to satisfy local, as well as export, market demand.

One can hardly dispute that the type of technology being transferred to the mainland via Taiwan is "appropriate" in terms of its high labor-absorption rate. Moreover, Taiwan's past experience has shown that it is also conducive to a more equal distribution of income. As the technology itself is pretty standardized, it is quite easy for local firms to replicate through labor mobility or perhaps through "coercive learning" on the part of the state enterprises. However, if we broaden the concept of "technology" to include managerial efficiency, versatility in restructuring the production lines in accordance with customer's shifting orders, and an organizational skill to engage in flexible intra-firm and inter-firm sourcing of production activities, all of which are long-time imprints from a highly competitive, marker-oriented economy, it is obvious that the present "export enclave" model of DFI is hardly a fruitful way to maximize the potential benefits of a technological transfer. In order for the transfer to have a widespread and lasting effect on the economy, local firms adopting the same technology and following a similar set of motives must be encouraged to develope as a matter of policy. Similar arguments go for

the creation of intersectoral linkage effects, only in this case different sectors rather than different enterprises within the same sector are involved.

What is really at issue here is the need for a systematic transformation toward a more competitive environment that is condusive to the growth of indigenous entrepreneurship. To achieve this end, both a macro and micro aspects need to be addressed. At the macro level, an extensive price reform program which is capable of creating appropriate market signals for the supply- and demand-sides is essential, and greater freedom on the part of entrepreneurs to engage in intra-national transactions and international trade must also be allowed for. At the micro level, private and semi-private village and township enterprises need to be further encouraged to take part in the economic process and contribute their rightful share. As Taiwan's past experience has vividly born out, these smaller-sized, highly motivated firms can be expected to perform much better than the giant state-owned enterprises in various labor-intensive lines of production, if only for their innate responsiveness and flexibility with respect to market signals. A thriving pool of small- and medium-sized enterprises who are financially independent will not only provide a fiscal relief for the local and central governments, but can also absorb in large quantity the surplus rural labor and therefore foster the economic development of local communities. Together with the technological know-how and production hardware introduced by the DFIs, indigenous entrepreneurs will then be well-equipped to face the harsh environment of the marketplace and to compete effectively not only with fellow indigenous producers, but also with foreign-related firms, in providing for local as well as export market demand.

In closing, a few points may be mentioned on mainland China's current trade imbalances with the U.S. and with Taiwan; both of which are no doubt induced in part by Taiwan's DFI operations in the mainland. As our calculations in the last section indicated, Taiwan has already "shifted" an estimated 1.8 billion US dollars' worth of

exports from its own trade account onto that of mainland China's as a result of a relatively minor sum of 754 million US dollars' investment. If a total of 2 billion (or a probable 3 billion at the end of 1991) US dollars of investment contracts was to be realized, and if the same industrial distribution is assumed for the sake of argument, the potential "export shift" would soon amount to a dramatic 5-7 billion US dollars. Since the U.S. has long been the prime importer of Taiwanese labor-intensive products, whether produced at home or abroad, an escalation of trade frictions between mainland China and the U.S. seems inevitable with the continuing injection of MIC products into the U.S. market fueled by Taiwanese DFIs. This points to the limits of an export-oreinted strategy as it applies to a country of vast scale. Mainland China must now choose between a more libralized trade regime at home and an increasingly impeded market outlet abroad. Taiwan's DFI operations in the mainland only hasten the time of a showdown for the mainland.

Just as Taiwan's DFI has elevated mainland China's trade surplus with the U.S., so it has aggravated China's trade deficit with Taiwan. The derived demand for intermediate inputs constituted over one-third of mainland China's total imports from Taiwan in 1990. With the ongoing investment flow, this share is expected to rise further and put additional pressure on the bilateral deficit situation of mainland China, which in 1990 registered at 2 billion US dollars and is projected to be 3.5 billion US dollars for 1991. The phenomenon is reminiscent of Japan's DFI operations in Taiwan during the 60's and the 70's which has resulted in Taiwan's heavy surplus with the U.S. and a sustained deficit with Japan. In a way, Taiwan is now duplicating the same strategy of indirectly exporting to the U.S. through its production bases in the mainland and, to a lesser extent, in other Asian countries. Also similar to the situation between Japan and Taiwan, where restricted access to the Japanese market explained a good part of Taiwan's long-term deficit with Japan, mainland China currently faces a high degree of

import protection from Taiwan (only a list of 159 items, most of which are agricultural products and raw materials, is allowed as legal imports from the mainland as of mid-1991). If this protective wall was to be removed, the current bilateral imbalance would no doubt be improved substantially, if not entirely reversed, by an increasing volume of return-purchases of semi-finished and finished products produced by Taiwanese DFIs in the mainland.

V. Conclusion

The recent surge of Taiwan's DFI toward mainland China provides an exciting case for economists to examine the various aspects of DFI's impacts on the domestic and host economies at the same time. This paper retreives the characteristics of Taiwan's DFI operations in the mainland and finds that they are mostly small-scaled, labor-intensive, and highly export-oriented. These traits of Taiwanese DFIs suggest that they are adjoin to a "defensive" prototype ala Kojima who stresses cost-reduction to defend the existing market as an underlying driving force for outward DFIs. At a time when domestic labor cost has skyrocketed, Taiwanese manufacturers have brought their labor-intensive technology into full play by turning to another low-wage country, such as mainland China, to produce the same type and quality of products at an internationally competitive price.

Based on a registered investment volume of 754 million US dollars and the 1986 input-output table for the Taiwan area, we conducted an industrial linkage analysis to determine the static impacts of DFIs on employment, output, and export performance of the home and the host economy. Our results suggest that the most significant short-run changes, in terms of proportions, occur in the external sector of these ecomomies. This is so because the phenomenon of an "export shift" from one country (the home) onto

the other (the host) is at the heart of a defensive-DFI strategy. This transfer of exports, however, is more apparent than real since the lion's share of foreign exchange earnings will fall in the hands of the investors, especially when the host economy is as yet unable to furnish qualified semi-products, components and parts required in these DFI operations. The formation of "export enclaves" has also limited the extent of employment and output generation within the host economy due to insignificant local linkage effects.

For the home country, the long-term challenge is one of re-orientation based on its changing comparative advantage positions. It will not be an easy task for Taiwan and a huge amount of effort is required to upgrade its technology in order for Taiwan to be competitive in the "up market" of the international arena; while for the host economy, it is the ability to absorb in full the "technology" being transferred by the DFI firms -- including the element of entrepreneurship therein -- that will provide the ultimate test of success of these DFI activities in mainland China.

References

1. Agmon, Tamir, and Charles P. Kindleberger, eds. *Multinationals from Small Countries,* Cambridge, Mass.: MIT Press, 1977.

2. Blomstrom, Magnus, *Foreign Investment and Spillovers,* Routledge, 1989.

3. Buckley, P.J., and M. Casson, *The Future of the Multinational Enterprise*, London: Macmillan, 1976.

4. Busjeet, Vinod, *Foreign Investors from Less-Developed Countries A strategic Profile,* Harvard University Ph.D. dissertation, 1980.

5. Carr, David W., *Impact of Foreign Direct Investment on the Economic Development of Australia,* Ph.D. dissertation, 1979.

6. Caves, R.E., "International Corporations : The Industrial Economics of Foreign Investment," *Economica,* Feb. 1971, pp. 1-27.

7. Chiu, Lee-in C., Feng-cheng Fu, Chin Chung, and Lyang-chaw Chen, *A Feasibility Study of Integrating Intra-Industry Investment Toward Mainland China: A case Study of the Electronics Industry* (in Chinese), CIER, 1991.

8. Chiu, Lee-in C. and Chin Chung, "An Assessment on Taiwan's Indirect Investment Toward Mainland China," Occasional paper No.9201, CIER, 1992.

9. Chou, T.C., "American and Japanese Direct Foreign Investment in Taiwan: A Comparative Study," *Hitotsubashi Journal of Economics,* Vol. 29, 1988, pp.165-79.

10. Chung, Chin, "Macroeconomic Impacts on the Domestic Economy of Recent Taiwanese DFIs toward Mainland China" (in Chinese), paper presented at the Conference on Investment Strategies and Policy-Making in Relation to Mainland China, CIER, Taipei, Sept. 17-18, 1991.

11. Cohen, Banjamin I., *Multinational Firms and Asian Exports,* Yale University Press, 1975.

12. Dunning, John H., *International Production and the Multinational Enterprise,* London: George Allen & Unwin, 1981.

13. Grosse, Robbert, *Multinationals in Latin America,* International Business Series, Routledge, 1989.

14. Hymer, Stephen H., *The International Operation of National Firms: A Study of Direct Foreign Investment,* Ph. D.Dissertation, MIT(1960), published by MIT Press, Cambridge M.A., 1976.

15. Johnson, H.G. "Survey of the Issues," in P. Prysdale, ed., *Direct Foreign Investment in Asia and Pacific,* Toronto, Canada: University of Toronto Press, 1978.

16. Kamath, Shyam J., "Foreign Direct Investmest in a Centrally Planned Developing Economy: The Chinese Case, "*Economic Development and Cultural Chang,*" 39(1),

Oct. 1990,pp.106-30.

17. Kindleberger, C.P., *American Business Abroad,* New Haven, C.T.: Yale University Press, 1969.

18. Kindleberger, C.P. , and D.B. Audretsch, *The Multinational Corporation in the 1980s,* Cambridge, M.A.: MIT Press, 1983.

19. Knickerbocker, F.T., *Oligopolistic Reaction and Multinational Enterprise,* Cambridge, M.A.: MIT Press, 1973.

20. Kojima, Kiyoshi, "A Macroeconomic Approach to Foreign Direct Investment," *Hitotsubashi Journal of Economics,* Vol.14, 1973, pp.1-21.

21. Kojima, K., *Direct Foreign Investment: A Japanese Model of Multinational Business Operations,* New York: Praeger Press, 1978.

22. Kojima, Kiyoshi, *Japanese Direct Investment Abroad,* SSRI monograph, no.1 International Christian University, Social Science Research Institute, Tokyo, 1990.

23. Kumar, Krishna, and Maxwell G. McLeod, eds., *Multinationals from Developing Countries,* Lexington, Mass.: D.C. Heath and Co, 1981.

24. Kumar, Krishna, and Kee Young Kim, "The Korean Manufacturing Multinationals", *Journal of International Business Studies,* Spring/Summer 1984.

25. Kuo, Wen-jeng, Da-nien Liu, and Ker-yi Jing, *The Impacts of Outward Direct Investment on Taiwanese Economic Development-An ASEAN Reginal Survey* (in Chinese) CIER, 1991.

26. Lecraw, D, "Direct Investment by Firms from Less Developed Countries," *Oxford Economic Papers,* Vol.29, No.3. November, 1977, pp.442-457.

27. Ouyan, C.S., Y.J.Lin and W.S.Chou, *Trade-Warning System for Monitoring Taiwan-China Economic Interdependence and Its Applications* (in Chinese), CIER, 1991.

28. Schive, Chi, *Direct Foreign Investment, Technology Transfer and Linkage Effects: A Case Study of Taiwan,* Ph.D. dissertation, 1978.

29. Schive, Chi and B.A. Majumdar, "Direct Foreign Investment and Linkage Effects: The Experience of Taiwan", *Canadian Journal of Development Studies,* 11(2), 1990, pp. 325-42.

30. Schive, Chi, "The Foreign Factor: The Multinational Corporation's Contribution to the Economic Modernization of the Republic of China", in *Studies in Economic, Social and Political Change: The Republic of China,* Standford, Hoover Institution Press, 1990, pp.xiv, 138.

31. Singer, H.W. "The Distribution of Gains between Investing and Borrowing Countries," *American Economic Review,* 40, 1950, reprinted in *Readings in International Economics,* ed. Richard E. Caves and Harry G. Johnson, Homewood, Ill.: Richard D.Irwin, 1968.

32. Sumantoro, "MNCs and the Host Country: The Indonesian Case", Research Notes and Discussion Paper No.45, Institute of Southeast Asian Studies, Singapore, 1984.

33. Vernon, Raymond, "International Investment and international Trade In the Product Cycle," *Quarterly Journal of Economics,* May 1966, pp. 190-207.

34. Vernon, Raymond, *Sovereignty at Bay: The Multinational Spread of U.S. Enterprises,* Basic Books, New York, 1971.

35. Wells, Louis T.Jr., "Transfer of Appropriate Technology to Third World Countries: Developing Country Investors as a Source," Research Proposal submitted to the National Science Foundation, Washington D.C., 1977.

36. Wells, Louis T.Jr., and V'Ella Warren, "Developing Country Investors in Indonesia," *Bulletin of Indonesian Economic Studies,* Vol.vx, No.1, March 1979, pp.69-84.

Occasional Paper Series

1. Jia-Dong Shea & Ya-Hwei Yang, "Finalcial System and the Allocation of Investment Funds," December 1990. ***(No.9001)***
2. Li-Min Hsueh, "The Development of Small and Medium Sized Enterprises in Taiwan," December 1990. ***(No.9002)***
3. Jiann-Chyuan Wang, "The Informal Sector and Public Policy in Taiwan," January 1991. ***(No.9101)***
4. Tzong-Shian Yu, "An Analysis of the Present Taiwan Economy," March 1991. ***(No.9102)***
5. Jiann-Chyuan Wang, "The Changing Role of Taiwan in Pacific-rim Regional Development," March 1991. ***(No.9103)***
6. Tzong-Shian Yu, "A Trade-oriented Economic Development Model--The Case of Taiwan, R.O.C." April 1991. ***(No.9104)***
7. Li-Min Hsueh, "Land Policies Problems in Taiwan," June 1991. ***(No.9105)***
8. Tzong-Shian Yu, "Economic Policy-Making and The Stage of Economic Development -- The Case of Taiwan," June 1991. ***(No.9106)***
9. Tzong-Shian Yu, "Achievements in Taiwan's Economic Development -- A Miracle?" September 1991. ***(No.9107)***
10. Tong-Eng Wang, "Toward Regional Economic Cooperation in Northeast Asia," October 1991. ***(No.9108)***

11. Cherng-Shin Ouyang, "Some Policy Reflections on the Emergence of the Republic of China as a Newly Industrializing Economy," October 1991. ***(No.9109)***

12. Chien-Nan Wang, "The ASEAN Economic Co-operation -- Status and Challenges," November 1991. ***(No.9110)***

13. Jiann-Chyuan Wang, "Should Government Intervene in Civil Research and Development?--The Case of Taiwan," November 1991. ***(No.9111)***

14. San, Gee, "The Economic Development of Taiwan, R. O. C.: Experiences and Challenges," December 1991. ***(No.9112)***

15. Cherng-Shin Ouyang, "China's Rural Economic Reform - An Assessment," December 1991. ***(No.9113)***

16. Lee-in Chen Chiu and Chin Chung, "An Assessment of Taiwan's Indirect Investment Toward Mainland China," January 1992. ***(No.9201)***

17. Chin Chung, "Impacts on Domestic and Host Economies of Taiwan's DFI toward Mainland China," January 1992. ***(No.9202)***