THE IMPACT ON THE TAIWANESE ECONOMY FROM THE EMERGENCE OF MAINLAND CHINA

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There is as yet no consensus among economists as to whether the relationship between trade and investment is substitutive or complementary. However, if one looks at the development of trade between Taiwan and mainland China, it is quite obvious that this trade has been stimulated by Taiwanese investment in mainland China. This investment has created demand for Taiwanese raw materials and components in mainland China, speeding up the growth of "cross-strait" trade between Taiwan and mainland China, and creating a situation where Taiwan has a growing trade deficit with mainland China. At the same time, Taiwanese products are finding it increasingly difficult to compete with mainland China products in international markets. A unique business model whereby orders are received in Taiwan but production takes place in mainland China and goods are shipped from mainland China has gradually taken shape. The shifting of production from Taiwan to mainland China by Taiwanese companies has thus created a new pattern of trade, the impact of which on the development of Taiwanese industry warrants in-depth investigation. As mainland China's economic take-off progresses, and as Taiwanese companies operating in mainland China start to localize their operations, Taiwanese companies will need to start thinking about how to maintain their competitive advantage in the cross-strait division of labor.

At the same time, since mainland China's accession to the World Trade Organization (WTO) there has been growing enthusiasm for economic integration between mainland China and other parts of East Asia. Under these circumstances, given the state of the political and economic relationship between Taiwan and mainland China, the risk of Taiwan becoming marginalized has increased substantially. Another topic addressed in this paper is how this situation will affect the division of labor between Taiwanese-invested companies in mainland China and their parent companies in Taiwan.

1. DEVELOPMENT TRENDS OF TAIWANESE INVESTMENT IN CHINA

Since the mid-1980s, the economic environment in Taiwan has changed dramatically. With the rapid revaluation of the New Taiwan Dollar, a steadily worsening labor shortage, rising labor costs, and a shortage of land suitable for industrial purposes, while at the same time the government was working to liberalize the financial sector (including the forex market). Many companies found that keeping production in Taiwan no longer offered any comparative advantage, and they started to shift their operations overseas. The first wave of overseas investment was mainly directed at the nations of Southeast Asia, including Malaysia, Thailand, Indonesia, and the Philippines. In 1987 Taiwan began to allow its citizens to travel to mainland China to visit relatives there. Mainland China's low costs and its abundant supply of land and labor enabled it to attract Taiwanese investment. The fact that there was no language barrier to overcome in mainland China made Taiwanese businesspeople that much more willing to invest there. Taiwan's small and medium-sized enterprises (SMEs) generally suffer from a shortage of employees with strong foreign language skills and have insufficient experience with the international division of labor; when establishing production facilities overseas, they generally need to maintain close contact with their original production network in Taiwan if they are to maintain competitive advantage. Due to the need to keep investment risk to a minimum, mainland China became the favored investment location for these SMEs. With SMEs taking the lead, the early 1990s saw the beginning of "mainland China fever" among Taiwanese businesses.

According to statistics of the Investment Commission of the Ministry of Economic Affairs (MOEA), the approved Taiwanese investment in mainland China amounted to US$2,607 million in 2000, US$2,784 million in 2001, and US$3,405 million in 2002, respectively 33.9%, 38.8%, and 57.6% of Taiwan's total foreign investments those years (Table 1). It is without doubt that mainland China has become Taiwan's most important overseas investment location. Moreover, Taiwanese investment in Southeast Asia previously also began to turn to mainland China. On the other hand, according to official Chinese records, up to the end of 2002, the accumulated total of Taiwanese investment in China was 55,691 cases, with a negotiated amount of US$60,028 million, or 7.2% of total direct foreign investments in China. In terms of investment amount, Taiwanese investments

ranked number three among all foreign investors in China , putting in an actual amount of US$30,330 million up to the end of 2002, that is 7.4% of the total actual amount of foreign investment. These figures far exceed those published by the MOEA. There are at least two reasons for these discrepancies. (1) Certain investments in mainland China maybe unknown to the MOEA because they were following unconventional channels or investing in categories or in ways not compliant with current laws. (2) Calculations used different data . For example, the MOEA based their statistics on actual investment, whereas the MOC used negotiated amount; in addition, the MOEA counted compensation for processing and assembly work as trade rather than investment. In general it is thought that the Chinese data stand closer to the truth, but many Taiwanese investors were still investing in China via a third country, again contributing to an underestimation of the amount of Taiwanese investment in the Chinese data..

Table 1: Taiwanese Investment in Mainland China

	MOEA Approved Data			Data Released Officially by China			
	Cases	Amount	Average Amount per Case	Cases	Negotiated Amount	Amount per Case	Actual Amount
	number	US$ million	US$ million	number	US$ million	US$ million	US$ million
1991	237	174	0.73	3,446	2,783	0.81	844
1992	264	245	0.94	6,430	5,543	0.86	1,050
1993	1,262 (8,067)	1,140 (2,028)	0.90 (0.25)	10,948	9,965	0.91	3,139
1994	934	962	1.03	6,247	5,395	0.86	3,391
1995	490	1,093	2.23	4,778	5,777	1.21	3,162
1996	383	1,229	3.21	3,184	5,141	1.61	3,475
1997	728 (7,997)	1,615 (2,720)	2.22 (0.34)	3,014	2,814	0.93	3,289
1998	941 (643)	1,519 (515)	2.37 (0.80)	2,970	2,982	1.00	2,915
1999	488	1,253	2.57	2,499	3,374	1.35	2,599
2000	840	2,607	3.10	3,108	4,042	1.30	2,296
2001	1,186	2,784	2.35	4,214	6,914	1.64	2,980
2002	1,490	3,859	2.59	4,853	5,298	1.09	4,190
Accumulated total, end 2002	27,276	26,610	0.98	55,691	60,028	1.08	33,330

Note: Cases in parentheses were registered for approval afterwards.
Source: Data on mainland China are from the amount of direct investment tallied by the Ministry of Foreign Trade and Economic Cooperation, PRC.MOEA.

There has also been a significant change in the industries in which Taiwanese investment in mainland China was concentrated. In the early 1990s, there was substantial investment in the electronics and electro-mechanical industry, the food industry, and the plastics industry. In the late 1990s, the electronics and electro-mechanical industry alone accounted for over 30% of all investment; no other industry had a share of more than 10% (Table 2).

Table 2: Taiwan's Overseas Investment by Industry, 1952-2002

	Taiwan's Overseas Investment (Excluding Mainland China)				Investment in Mainland China	
	1952 – 1992		1993 – 2002		1991 – 2002	
	Approved Investment		Approved Investment		Approved Investment	
	US$1,000	% of Total	US$1,000	% of Total	US$1,000	% of Total
Food and beverages	198,662	6.20	292,642	3.16	1,491,253	6.15
Textiles	232,865	7.26	556,012	6.01	976,944	4.03
Garments	13,832	0.43	238,657	2.58	435,126	1.80
Leather goods	4,440	0.14	20,674	0.22	220,724	0.91
Wood products	33,925	1.06	209,266	2.26	651,411	2.69
Paper products	110,721	3.45	125,678	1.36	626,734	2.59
Chemical	712,530	22.23	947,553	10.24	1,754,643	7.24
Plastics products	147,498	4.60	78,727	0.85	706,729	2.92
Rubber products	-	-	94,294	1.02	1,895,086	7.82
Non-metal products	207,981	6.49	217,615	2.35	1,271,802	5.25
Basic metals	456,676	14.25	438,097	4.74	2,248,162	9.27
Machinery	28,732	0.90	43,930	0.47	875,787	3.61
Electronics and electrical appliances	1,057,767	33.00	5,245,662	56.70	8,669,863	35.77
Transportation	-	-	576,048	6.23	999,963	4.13
Precision instruments	-	-	166,182	1.80	1,416,084	5.84
Total	3,205,629	100.00	9,251,037	100.00	24,240,311	100.00

Source: Investment Commission Website.

There has also been a change in the division of labor. In the early days, Taiwanese businesspeople investing in mainland China were attracted by the mainland's cheap land and labor; their aim was to maintain Taiwan's competitiveness in the international supply chain. Most products were exported after processing; investment in mainland China was based on a regional division of labor, with a vertical division between the Taiwanese-invested company in mainland China and its Taiwan parent company or other related companies. Initially, most of the companies investing in mainland China were SMEs; for the most part, their operations involved renting factory buildings and then importing materials from Taiwan to process for export. In this vertical division of labor, the parent company in Taiwan supplied machinery, raw materials and semi-finished goods. After processing, the goods were export to the United States, Europe, or some other market, creating a complementary trade model whereby orders were received in Taiwan but production was performed in mainland China and the finished goods were shipped from mainland China.

However, as mainland China's economy began to take off, its domestic market gradually expanded, and the desire to get a foothold in the domestic market became an important motivation for Taiwanese companies investing in mainland China. Since 2000 there has been a new wave of investment in mainland China, with an increase in both the scale of investment and the level of production. As the industry cluster effect has developed, the Changjiang (Yangtze) River Delta has become an important center for Taiwanese hi-tech manufacturers. According to Investment

Commission data, the average size of Taiwanese investment projects in mainland China grew from less than US$1 million in the early 1990s to US$200 million in 1995, to over US$300 million in 2000. What is more, the products being manufactured are different now. In the case of the electronics industry, whereas initially the products being made in mainland China were mainly low-end peripherals such as keyboards, mouse and computer casings, the mainland China operations of Taiwanese companies are now manufacturing monitors, motherboards, notebook PCs and even semiconductors. At the same time, the manufacturers of raw materials and intermediate goods have also been moving production to mainland China so as to maintain their links with the downstream producers. The division of labor between Taiwan and mainland China is becoming blurred, and it will become increasingly difficult for Taiwan to maintain its advantage.

As a rule, when a company first sets up operations in a new investment location its production technology does not conform exactly to the technology used in that location, so it has to purchase raw materials from its home country. As time passes, however, adjustments are made to the production technology, and the company finds that it can purchase intermediate goods locally. If the raw material suppliers in the home country move production to that investment location too, causing an industry cluster to take shape, then it is inevitable that the overseas operation in question will become localized.

Early studies of the mainland China operations of Taiwanese companies, such as those by the Chung-Hua Institution for Economic Research (1993, 1994), Kao Hsi-chun and Lin Tsu-chia (1993), and the Chinese Professional Management Association (1995), reported that the vast majority of Taiwanese companies investing in mainland China continued to maintain their Taiwan operations, and that the relationship between the mainland subsidiary and the Taiwan parent company was usually a close one, particularly with regard to the purchasing of important machinery, the provision of production technology support, cultivation of management, and establishment of export marketing systems. The parent companies in Taiwan played a very important role in the operations of their mainland China subsidiaries, and the relationship between those subsidiaries and other divisions of the same company operating in Taiwan was close.

However, with the passing of time this relationship has changed, and there is now a growing trend towards localization. This is partly due to the business strategies adopted by the companies

concerned, and partly due to the mainland government's policies and measures (Kao Charng 2001). For example, recently the mainland China government has been encouraging foreign enterprises to increase the scale of their purchasing in mainland China. Those companies that purchase production equipment made in mainland China can obtain a refund on value added tax, and can also obtain exemption from corporate income tax. In addition, the provisions of the *Law Regarding Sino-foreign Joint Ventures* concerning local content requirements, domestic sales quotas, provisioning of financing to foreign companies by mainland China's financial sector all directly or indirectly affect the choices made by Taiwanese companies with regard to localization. The trend towards localization is raising concerns about the de-industrialization of Taiwan and means that Taiwan's industrial structure will have to change.

2. THE IMPACT OF TAIWAN'S INVESTMENT IN CHINA ON INDUSTRIAL STRUCTURE

Taiwan is a small economy that is highly dependent on its trade with other countries. Adjustments made to the industrial structure could be expected to make themselves felt in changes in comparative advantage and in the structure of the country's imports and exports. Taiwan's industrial structure began to change in the late 1980s, with labor-intensive industries starting to move production overseas while the share of the economy accounted for by capital and technology-intensive industries rose. At the same time, the structure of Taiwan's trade was changing too. If one uses the United Nations' BEC product classification and Hatzichronoglou's trade content R&D density classification method[1] to undertake further analysis of the transformation of Taiwan's import/export structure, traded products can be broken down into three main categories – consumption goods (general and high-end), capital goods (general and high-end), and raw materials. As shown in Table 3, capital goods have always been Taiwan's most important export. In the early 1990s, as the pace of overseas investment speeded up, the changes in the division of labor caused the share of total exports held by capital goods to rise to over 70%. What is more, it was high-end capital goods (i.e., products with high R&D input density) that experienced the fastest growth in exports. However, as localization progressed, demand for Taiwan's capital goods gradually decreased. By 2001, the share of Taiwan's total exports held by capital goods

1. Using the classification outlined in Hatzichronoglou (1997).

had fallen to 50%, although it rose slightly in 2002 to 52.8%. At the same time, as the development of production facilities in mainland China continued, the competitiveness of Taiwanese products was enhanced, and exports of consumption goods continued to grow. In particular, the share of exports held by high-end consumption goods rose steadily, reflecting the ongoing upgrading of Taiwan's export structure.

On the imports side, Taiwan is a processing-oriented economy; as industry has moved production overseas and sought to upgrade itself, demand for the importation of capital equipment has remained high. For more than ten years now, imports of capital goods have consistently accounted for 70-80% of total imports. Over this same period, with income levels rising, imports of consumption goods have also increased.

It can thus be seen that there is a close relationship between Taiwan's trade structure and industrial upgrading. At the same time, since Taiwan relaxed the restrictions on investment in mainland China, trading relations between Taiwan and mainland China have developed rapidly. In the last few years mainland China's economy has been growing at an extremely rapid pace, and since mainland China's accession to the WTO in 2001 there has been a speeding up in the process of market opening. This in turn has caused the speed at which Taiwanese enterprises operating in mainland China are localizing their operations to increase, giving rise to concerns about de-industrialization in Taiwan. The following will attempt to analyze the impact that the trade inducement effect of Taiwanese investment in mainland China has had on Taiwan's industrial structure.

Table 3: Taiwan's Trade Structure, 1990 – 2002

	Raw materials		Capital goods		Consumption goods		Total
	NT$ millions	%	NT$ millions	%	NT$ millions	%	NT$ millions
				Exports			
1990	72	0.01	967,073	77.14	286,548	22.86	1,253,694
1991	61	0.00	1,104,957	76.73	334,975	23.26	1,439,993
1992	88	0.01	1,085,315	75.86	345,213	24.13	1,430,615
1993	153	0.01	1,101,712	71.73	430,698	28.26	1,535,934
1994	275	0.02	1,169,486	69.17	521,014	30.82	1,690,775
1995	440	0.02	1,399,058	68.34	647,816	31.64	2,047,313
1996	423	0.02	1,533,718	69.04	687,196	30.94	2,221,336
1997	459	0.02	1,420,921	59.34	972,993	40.64	2,394,372
1998	461	0.02	1,280,103	50.82	1,238,095	49.16	2,518,659
1999	478	0.02	1,297,940	50.02	1,296,320	49.96	2,594,738
2000	608	0.02	1,419,764	48.94	1,480,382	51.03	2,900,754
2001	492	0.02	1,371,591	50.46	1,345,856	49.52	2,717,938
2002	625	0.02	1,496,847	52.82	1,336,575	47.16	2,834,048
				Imports			
1990	249	0.02	873,285	82.32	187,307	17.66	1,060,841
1991	299	0.02	999,323	81.71	223,342	18.26	1,222,964
1992	355	0.03	1,027,266	82.54	216,906	17.43	1,244,527
1993	509	0.04	1,145,819	83.50	225,858	16.46	1,372,186
1994	625	0.04	1,261,763	83.16	254,855	16.80	1,517,243
1995	812	0.04	1,524,804	82.61	320,154	17.35	1,845,770
1996	803	0.04	1,518,738	80.99	355,600	18.96	1,875,142
1997	1,062	0.05	1,650,822	79.03	436,932	20.92	2,088,816
1998	1,473	0.07	1,612,136	74.57	548,156	25.36	2,161,765
1999	1,340	0.06	1,618,484	69.79	699,222	30.15	2,319,046
2000	1,332	0.05	1,890,148	69.26	837,443	30.69	2,728,923
2001	1,381	0.06	1,648,547	72.49	624,369	27.45	2,274,297
2002	1,273	0.05	1,742,988	72.09	673,619	27.86	2,417,879

Source: Taiwan and HK customs records.

Firstly, let us consider the changes in the structure of cross-straits trade. As a result of Taiwanese investment in mainland China, starting in the 1990s there have been certain changes in Taiwan's exports to mainland China.

Rapid growth in the value of export

According to estimates produced by the Board of Foreign Trade[2] (Table 4), since 1990 Taiwan's exports have been growing extremely rapidly. In the early 1990s the average annual growth rate in exports to mainland China was in double figures. In 1998, due to the impact of the Asian financial crisis, demand for imports in mainland China fell off, leading to negative growth in Taiwan's exports. In 2001, the global economic downturn and the dramatic fall in worldwide demand for electronics products caused Taiwan's exports to mainland China to experience negative growth again. In every

2. Statistics for cross-straits trade are limited to indirect exchange. The customs statistics of both Taiwan and mainland China tend to underestimate the actual volume of trade. However, it is generally believed that Taiwan's customs statistics are somewhat closer to reality. The Board of Foreign Trade estimates are produced by examining the disparity between the value of exports to mainland China as recorded by the customs in Taiwan, the value of goods from Taiwan trans-shipped in Hong Kong for shipment to mainland China as recorded by the Hong Kong customs, and the value of Taiwan's exports to Hong Kong as recorded by the Taiwan and Hong

other year, Taiwan's exports to mainland China have growth quite rapidly.

Export transfer

The growth in Taiwan's exports to mainland China is not merely the result of changes in the division of labor due to investment; it also reflects an export market transfer effect resulting from the growth of a new pattern of trade whereby orders are received in Taiwan but the goods are manufactured in mainland China and shipped from mainland China. In the past, the U.S. market was always Taiwan's most important export market. However, the share of Taiwanese exports going to the United States peaked in the mid-1980s at 48%, and has been falling ever since. By the early 1990s it had fallen to under 30%, and by 2002 it had dropped to just 20.5%, the lowest level since 1965. During this same period, Taiwan's dependence on mainland China (including Hong Kong) was increasing. The share of exports going to mainland China rose from 12.7% in 1990 to 31.2% in 2002. By 2002 mainland China accounted for a higher share of Taiwan's exports than the United States, and had become Taiwan's most important export market.

Studies conducted by the Chung-Hua Institution for Economic Research (1993, 1994, 1998) also showed that a triangular trading pattern had come into existence, whereby Taiwanese companies operating in mainland China purchased semi-finished products and raw materials from Taiwan and then exported the finished products to the United States. Rather than exports going directly to the United States, exports are now going to the United States via mainland China. The Ministry of Economic Affairs *Overseas Investment by Manufacturing Industry* (2003) survey also showed that in the last few years the share of Taiwan's exports being shipped from mainland China has been rising, while the percentage shipped from Taiwan and Southeast Asia has fallen. The fact that mainland China now accounts for a higher share of Taiwan's exports than the US is partly due to this export transfer effect.

The direct investment inducement effect

Liu Meng-chun (2003) used the disparity between the volume of export orders and customs export statistics to analyze the pronounced trend in the Taiwanese electronics industry for orders to be

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Kong customs.

received in Taiwan but for the goods to be shipped from overseas production locations, in light of the stimulus provided by foreign investment (particularly investment in mainland China). His study showed that the share of production for orders received in Taiwan but shipped from overseas production locations has tended to increase as Taiwanese investment in mainland China has increased. It appears that investment in mainland China helps to expand the production network based on the division of labor between Taiwan and overseas production locations; manufacturers have the option of shipping from Taiwan or shipping from mainland China. Taiwanese industry is able to make use of the low production costs and substantial economies of scale that mainland China offers to strengthen its competitiveness in export markets, while at the same time keeping its production facilities in Taiwan as a reserve production capacity.

Table 4: Indirect Trade Relationship Between Taiwan and Mainland China

US$ Million

	Hong Kong customs statistics			Taiwan customs statistics			Mainland China customs statistic			Board of Foreign Trade statistics		
	Exports	**Imports**	**Total**	**Exports**	**Imports**	**Total**	**Exports**	**Imports**	**Total**	**Exports**	**Imports**	**Total**
1990	3,278.3	765.4	4,043.6	-	-	-	2,255.0	319.7	2,574.6	4,394.6	765.4	5,160.0
1991	4,667.2	1,126.0	5,793.1	-	597.5	597.5	3,639.0	594.8	4,233.9	7,493.5	1,125.9	8,619.4
1992	6,287.9	1,119.0	7,406.9	1.1	747.1	748.1	5,881.0	698.0	6,579.0	10,547.6	1,119.0	11,666.6
1993	1,585.4	1,103.6	8,689.0	16.2	1,015.5	1,031.7	12,933.1	1,461.8	14,394.9	13,993.1	1,103.6	15,096.7
1994	8,517.2	1,292.3	9,809.5	131.6	1,858.7	1,990.3	14,084.8	2,242.2	16,327.0	16,022.5	1,858.7	17,881.2
1995	9,882.8	1,574.2	11,457.0	376.6	3,091.4	3,468.0	14,783.9	3,098.1	17,882.0	19,433.8	3,091.4	22,525.2
1996	9,717.6	1,582.4	11,300.0	622.9	3,059.8	3,682.7	16,182.2	2,802.7	18,984.9	20,727.3	3,059.8	23,787.1
1997	9,715.1	1,743.8	11,458.9	627.8	3,915.4	4,543.2	16,441.7	3,396.5	19,838.2	22,455.2	3,915.4	26,370.6
1998	8,364.1	1,654.9	10,019.0	834.7	4,110.5	4,945.2	16,629.6	3,869.6	20,499.2	19,840.9	4,110.5	23,951.4
1999	8,174.9	1,628.1	9,803.0	2,539.5	4,522.2	7,061.7	19,537.5	3,951.7	23,489.2	21,312.5	4,522.2	25,834.7
2000	9,593.1	1,980.5	11,573.7	4,217.5	6,223.3	10,440.8	25,497.1	4,994.9	30,492.1	25,009.9	6,223.3	31,233.1
2001	8,811.5	1,693.3	10,504.8	4,745.6	5,902.2	10,647.8	27,339.4	5,000.2	32,350.0	21,945.7	5,902.2	27,847.9

Note: "Export" refers to the amount exported by Taiwan to Mainland China, and "import" refers to the amount imported by Taiwan from China. Due to the fact that many traders falsely declare their export destination as Hong Kong instead of China, the statistics tallied by Taiwan's Customs department contain much deviation. Import figures also tend to be underestimations, as many restricted products from China may have entered the country through smuggling or with false "place of origin" certificates. However, in recent years, import restrictions on many mainland Chinese products have been lifted, improving the accuracy of the data. In the past, mainland China Customs did not base import-export data on country of origin or of consumption (but instead on the country of transportation). As a result, China often overestimated trading volume with Hong Kong while underestimating the figure with other countries. However, the practice was adjusted in 1993, improving the accuracy of the data since.

Source: Taiwan and HK Customs records and WTA China.

In order to gain a better understanding of the trade effect created by investment in mainland China, we used the BEC classification and Hatzichronoglou's trade product content R&D density classification to divide trade products into the following five categories: raw materials, general capital goods, high-end capital goods, general consumption goods, and high-end consumption goods.

As shown in Table 5, over the period 1990-2002 capital goods accounted for around 60% of Taiwan's exports to mainland China, with general capital goods accounting for the bulk of this. Capital goods' share of total exports to mainland China rose, during the period when Taiwanese investment in mainland China grew fastest (1992-95), then from 1995 to 1999 it remained more or less the same. By late 1999 mainland China had recovered from the impact of the Asian Financial Crisis, and it was clear that it would soon by joining the WTO. As a result, there was another period of high growth in Taiwanese investment in mainland China, and capital goods' share of exports to mainland China rose slightly. With the progress made in economic reform in mainland China, it was now possible to achieve more effective coordination with peripheral industries. This encouraged Taiwanese-invested enterprises to step up the process of localization, so that demand for general capital goods was lower than in the early 1990s. However, high-end capital goods could still not be supplied locally; they had to be supplied from Taiwan, and so their share of total exports to mainland China rose.

Table 5: The Structure of Taiwan's Exports to Mainland China

(Percent of Total Exports to China)

		Capital goods			Consumption goods		
	Raw materials	**Total**	**General**	**High-end**	**Total**	**General**	**High-end**
1990	0.04	56.50	55.49	1.01	43.46	40.37	3.09
1991	0.04	57.89	56.41	1.48	42.07	39.24	2.83
1992	0.03	67.84	66.85	0.99	32.12	30.03	2.09
1993	0.05	68.57	67.06	1.51	31.39	29.39	2.00
1994	0.04	66.50	65.15	1.35	33.46	30.65	2.81
1995	0.05	65.16	64.01	1.15	34.79	31.14	3.65
1996	0.05	67.63	66.21	1.42	32.31	29.86	2.45
1997	0.07	67.69	65.95	1.74	32.24	28.71	3.53
1998	0.07	66.45	64.35	2.11	33.48	28.59	4.89
1999	0.06	66.75	64.91	1.84	33.18	26.81	6.37
2000	0.11	66.03	64.19	1.83	33.87	26.74	7.13
2001	0.05	64.72	62.68	2.04	35.23	24.62	10.61

Source: Calculated from Taiwan and Hong Kong Customs records.

In 2001 the share of total exports held by general capital goods fell. This was partly due to the industry clusters that were starting to take shape in mainland China. Taiwanese-invested companies were now purchasing capital goods from other Taiwanese-invested companies in mainland China

rather than from Taiwan. It remains to be seen whether this rapid increase in localization in 2001 was a one-off event, or whether it will continue. If it does turn out to be a long-term trend, then it could have a substantial negative impact on the future development of those industries in Taiwan producing capital goods. Nevertheless, the fact that the share of exports to mainland China held by high-end capital goods has continued to rise indicates that direct investment in mainland China should continue to stimulate exports of capital goods from Taiwan. Taiwan should be focusing on the development of technology-intensive products.

In the early 1990s, more than 50% of Taiwan's exports of capital goods went to mainland China; there was clearly a close connection here with Taiwanese investment in mainland China. In the late 1990s the scale of Taiwanese investment projects expanded, as did the level of localization. With the mainland Chinese economy continuing to grow rapidly, mainland China continued to account for around 30% of Taiwan's exports of capital goods. Today, mainland China is still the most important market for Taiwan's capital goods. Clearly, Taiwan's exports to mainland China have been stimulated by Taiwanese investment in mainland China. At the same time, the share of total exports to mainland China held by consumption goods has continued to rise. In particular, the share of high-end consumption goods in total exports rose dramatically from 3.09% in 1990 to 10.61% in 2001. In absolute terms, it grew 15.6 times during this 10-year periods, reflecting the dramatic increase in consumption levels in mainland China.

To gain a better understanding of Taiwan's exports to mainland China, we examined the contribution of five categories of exports to total export growth over three time periods: 1990-94, 1995-98 and 1999-2001. Taiwan's total exports to mainland China at period t (E_t) are the sum of exports of raw materials (M_t), general capital goods (GC_t), high-end capital goods (HC_t), general consumption goods (GF_t) and high-end consumption goods (HF_t), or

$$E_t = (M_t + GC_t + HC_t + GF_t + HF_t).$$

Then, we can write the percentage increase in total exports from period 0 to period 1, as

$$\frac{E_1 - E_0}{E_0} = \frac{M_1 - M_0}{E_0} + \frac{GC_1 - GC_0}{E_0} + \frac{HC_1 - HC_0}{E_0} + \frac{GF_1 - GF_0}{E_0} + \frac{HF_1 - HF_0}{E_0}.$$

Rearranging, we can write

$$= \left(\frac{M_0}{E_0}\right)\left(\frac{M_1}{M_0} - 1\right) + \left(\frac{GC_0}{E_0}\right)\left(\frac{GC_1}{GC_0} - 1\right) + \left(\frac{HC_0}{E_0}\right)\left(\frac{HC_1}{HC_0} - 1\right)$$
$$+ \left(\frac{GF_0}{E_0}\right)\left(\frac{GF_1}{GF_0} - 1\right) + \left(\frac{HF_0}{E_0}\right)\left(\frac{HF_1}{HF_0} - 1\right)$$

In other words, each category's contribution to the growth in total exports to mainland China is the percentage change that in that category's exports weighted by its initial share of exports to the mainland.

The results of these calculations are shown in Table 6. It can be seen from Table 6 that, since Taiwan began to relax the restrictions on indirect investment in mainland China, enterprises in industries which no longer enjoy comparative advantage in Taiwan have had to invest in mainland China in order to survive. This indirectly stimulated the growth in Taiwan's exports to mainland China. For the period 1990-94, the category with the largest percentage increase in exports to mainland China was high-end capital goods (375.53%). The next highest increases, in descending order, were for general capital goods, high-end consumer goods, and general consumer goods. As the share of total exports held by each category of goods varied, so did the category's contribution to the growth of exports to mainland China. General capital goods had a smaller percentage increase in exports than high-end capital goods, but general capital goods accounted for a higher share of total exports. Exports of general capital goods increased by a smaller percentage (317.20) than exports of high-end capital goods (375.53), but general capital goods accounted for a initial higher share of total exports. As a result, general capital goods made a significant contribution to the total growth of exports to mainland China during this period, accounting for 68.9% of the total contribution made by all types of goods.

Table 6: Contribution to Growth of Total Exports to Mainland China by Category of Goods

	Raw materials	General capital goods	High-end capital goods	General consumption goods	High-end consumption goods	Total Exports to Mainland China
Value of exports to mainland China						
1990	41.8	53,145.1	967.1	38,663.3	2,955.5	95,772.8
1994	140.6	221,721.3	4,598.8	104,312.2	9,577.2	340,350.2
1999	292.0	291,873.8	8,279.2	120,549.3	28,646.5	449,640.7
2001	223.3	272,049.3	8,852.0	106,834.5	46,049.0	434,008.1
Growth %						
1990-94	235.93	317.20	375.53	169.80	224.05	255.37
1995-98	70.09	17.22	112.75	7.04	56.23	16.60
1999-2001	-23.52	-6.9	6.92	-11.38	60.75	-3.48
Contribution to percentage increase in exports						
1990-94	0.10	176.02	3.79	68.55	6.91	255.37
1995-98	0.03	11.02	1.30	2.19	2.05	16.60
1999-2001	-0.02	-4.41	0.13	-3.05	3.87	-3.48
Share of total export growth %						
1990-94	0.04	68.93	1.48	26.84	2.71	100.00
1995-98	0.20	66.39	7.84	13.21	12.35	100.00
1999-2001	-0.44	-126.82	3.66	-87.73	111.32	100.00

Source: Calculated from Taiwan and Hong Kong customs records.

These results suggest that when Taiwanese companies first began production in mainland China in the early 1990s they tended to lack confidence in the sources of supply and quality of locally-produced raw materials, components, and machinery. In order to keep production going smoothly and minimize operational risk, there was a tendency for the parent company to want to maintain control over the supply of raw materials, components and equipment, even in the case of low-tech components and machinery. During this same early period, general consumption goods share of total Taiwanese exports to mainland China was 26.8% , while the share for high-end consumption goods was only 2.7%. This reflects the preference of consumers in mainland China for general consumption goods, rather than hi-tech consumption goods.

During the period 1994-98 this trade structure was starting to change, however. With cross-straits trade between Taiwan and mainland China entering a period of stable growth, the contribution of each product to the overall percentage increase in exports became less pronounced. In the case of high-end capital goods, the export contribution rate was only 1.3 percentage points, even though exports of high-end capital goods exports had increased 112.8 %. As a result, high-end capital goods' share of total export growth rose from 1.5% to 7.8%. With both Taiwanese and foreign companies moving into mainland China in a big way, Taiwanese companies operating in mainland China found that they were able to secure supplies of good-quality low-end capital goods locally; as a result, there was less need to export these types of goods from Taiwan.

At the same time, Taiwanese investment in mainland China was gradually shifting away from the traditional industries in which Taiwanese companies had invested initially towards the technology-intensive industries in which Taiwan still enjoyed comparative advantage, such as the information and electronics industries. This was partly due to the desire of manufacturers in these industries to reduce production costs, and partly due to the need to meet the requirements of international OEM customers. There was thus an increase in demand for high-end capital goods. However, due to concerns over the quality of the hi-tech components and equipment manufactured in mainland China, Taiwanese companies operating in mainland China were unable to implement procurement locally; they still had to import high-end capital goods from Taiwan, thereby stimulating rapid growth in exports of the types of goods in question. The contribution to the growth of exports made by general capital goods has fallen gradually. From the point of view of industrial development, this explains the formation of the cross-straits division of labor. In order to avoid being overtaken or replaced, enterprises operating in Taiwan itself have been seeking to upgrade their technology, working to increase their export capability for high-end products. Viewed from this point, the concerns over de-industrialization seem over-blown.

During this same period (1995-98), exports of high-end consumption goods to mainland China grew by 56.2%, and their share of the increase in total exports rose to 12.4%. This shows that, following years of high growth, the consumption levels of consumers in mainland China had risen significantly, leading to rapid growth in demand for hi-tech consumer goods. This in turn stimulated growth in Taiwan's exports of high-end consumption goods to mainland China.

Over the period 1999-2001, the reform of mainland China's markets continued, and it became clear that mainland China was successfully establishing itself as "factory to the world", attracting considerable amounts of foreign investment. As a result of this magnetic attraction, not only did the volume of capital flowing into the Southeast Asian nations start to fall off, the existence of the cross-straits division of labor forced Taiwan to speed up the restructuring of its industry and of the economy as a whole. However, in 2001 the global economic downturn led to a dramatic fall in global demand for electronics products. Taiwanese-invested enterprises in mainland China, most of which were in the electronics industry, experienced a substantial reduction in demand for components and

raw materials, and Taiwan's exports to mainland China shrank. As a result, there was negative growth in Taiwan's exports to mainland China for the period 1999-2001 as a whole, a highly unusual phenomenon. Exports of general capital goods and general consumption good fell by 6.9% and 11.4% respectively; in the case of raw materials exports fell by 23.5%.

The falling off in how much general capital goods and general consumption goods contributed to the percentage change in exports to mainland China shows that, once Taiwanese companies have been in mainland China for a certain period of time, they gradually start to transfer low-end technology to local companies. With more and more Taiwanese companies setting up production facilities in mainland China, it is becoming easier to procure capital goods locally. In the case of general intermediate goods and general consumption goods, therefore, investment and trade can be seen as substitutes. By contrast, over this same period high-end capital goods and high-end consumption goods increased their contributions to the overall growth of Taiwan's exports to mainland China. In particular, exports of high-end consumption goods increased 60.8%. In the case of hi-tech capital goods, therefore, the relationship between investment and trade is a complementary, mutually-reinforcing one.

The analysis in this section shows that the changes in the structure of Taiwan's exports to mainland China mainly reflect the trade effect stimulated by Taiwanese investment in mainland China. By and large, the longer a Taiwanese company has been in mainland China, the more likely it is to gradually start buying capital goods that used to be imported from Taiwan locally, thereby reducing the significance of the trade and industry linkage with Taiwan. At the same time, however, localization in mainland China forces those companies operating in Taiwan itself to devote more resources to R&D and to speed up the development of technology-intensive products; this in turn leads to an upgrading of Taiwan's exports.

Overall, it does appear that the localization of the mainland China operations of Taiwanese companies is causing the unemployment rate in Taiwan to rise and is raising the specter of de-industrialization. However, this may just be a natural process of healthy de-industrialization of the kind outlined in Rowthorn and Ramaswang (1997). If Taiwan can maintain the pattern of development that took shape in the late 1990s, speeding up its re-orientation towards the development of high

technology and working to make products more technology-intensive, this will speed up the process of industrial transformation, enabling Taiwanese industry to continue to play an important role in establishing the regional division of labor.

3. THE IMPACT OF REGIONAL INTEGRATION ON THE CROSS-STRAITS RELATIONSHIP

The opening up of the mainland China market led to the first wave of Taiwanese investment in the early 1990s, while the continuing rapid growth of the mainland Chinese economy led to a second wave of investment starting in 2000. With the stimulus provided by this investment, cross-straits trade expanded rapidly, and a cross-straits division of labor gradually started to take shape. Under this division of labor, although the localization of Taiwanese-invested companies' operations reduced their linkages with industry in Taiwan itself, it also encouraged Taiwanese industry to speed up the process of restructuring and transformation. From the point of view of economic integration, therefore, the creation of the division of labor between Taiwan and mainland China was actually an opportunity for Taiwan to further its industrial development. However, following its accession to the WTO, mainland China has been working busily to secure economic integration with the countries of Southeast Asia, and particularly with the member nations of ASEAN. For political reasons, Taiwan is being excluded from this integration; it remains to be seen how this will affect the division of labor for Taiwanese enterprises.

Since mainland China's accession to the WTO, it has made the promotion of regional economic alliances the cornerstone of its trade policy. The idea of a free trade area incorporating mainland China and ASEAN was first proposed in 1999; this was followed by the signing of the Closer Economic Partnership Agreement (CEPA) between mainland China and Hong Kong in 2002, and by negotiations between mainland China, Japan and South Korea. There are several reasons for this burst of activity on mainland China's part. First, although the mainland China economy continues to grow rapidly, exports to the United States are stagnant, and trade friction with Japan is becoming more serious. Mainland China believes that excessive dependence on trade with the United States and Japan will affect its future economic development and that the establishment of economic collaboration with

other nations in the Asia-Pacific region is therefore an urgent task. Second, mainland China's experience with the Great Western Development project and the various measures it has implemented to encourage investment have shown it that economic alliances can help to stimulate capital flows from the signatory nations. (3) Most important of all, mainland China wants to establish itself as the dominant power in East Asia; it wants to exercise more diplomatic and political influence within the region. This is why the formation of a free trade area with ASEAN is so important to mainland China.

Economic integration with ASEAN will facilitate industrial collaboration. The various countries concerned will be able to develop their own competitive advantage, create economies of scale, and expand their markets and their trading opportunities. By specializing in particular areas of production and bringing their production costs down, they will be able to enhance the competitiveness of their products. However, while both mainland China and ASEAN are enthusiastic about the idea of economic integration, in reality the competition between their economies is likely to outweigh the opportunities for complementing one another. It remains to be seen how successful economic integration will be. There are considerable similarities between mainland China and ASEAN in terms of both the structure of their economies and the structure of their exports; in both cases, Europe, the United States, and Japan are their main export markets. Since mainland China's accession to the WTO, its low labor costs and magnetic attraction for investors have made it an even bigger threat to the ASEAN member nations than it was before. Furthermore, there are significant economic, political, and cultural differences among the ASEAN member states, and attitudes towards market-opening vary considerably. Malaysia wants to protect its car industry, while the Philippines is reluctant to open up the petrochemical market; these protectionist tendencies could create obstacles to integration.

Historically and geographically, Taiwan has close relationships with both mainland China and ASEAN. If a free trade zone embracing mainland China and ASEAN does take shape, it is bound to affect Taiwan. A free trade zone of this kind could destroy the equilibrium in the division of labor between Taiwan, ASEAN and mainland China that took shape in the late 1990s; Taiwanese industry would then need to undergo a process of restructuring.

Since the 1990s, trade between Taiwan, ASEAN and mainland China has generally been stimulated by investment. According to studies by the Chung-Hua Institution for Economic Research

and by Ku (2000), for most Taiwanese companies the main motivations for investing in either Southeast Asia or mainland China are low labor costs and access to an expanded market. In the late 1990s a growing share of the Taiwanese investment in mainland China began to be oriented towards the domestic market there, but there was relatively little change in Southeast Asia. This is mainly because the Southeast Asian market is smaller and highly segmented; in addition, Taiwanese companies would find it hard to compete against the big multinationals, which have been developing the domestic markets of the Southeast Asian nations for many years now.

Although the motivation for investment may be similar, the form of Taiwanese companies' investment in production operations differs significantly between mainland China and Southeast Asia. Ku (2000) showed that, while mainland China offers abundant cheap labor, there are also problems relating to government policy and systems. As a result, Taiwanese companies tend to use mainland China as a production location for large-volume production; when they need to produce small volumes of a large number of different products, they usually prefer to locate these production facilities in Southeast Asia. R&D and the pilot production of new products are kept in Taiwan. A division of labor has thus taken shape whereby the choice of production location depends on the nature of the customer and the size of their orders and whereby production facilities in mainland China, Southeast Asia, and Taiwan support one another. However, with the trend towards economic integration between ASEAN and mainland China, given mainland China's advantages in the area of production, the necessity of maintaining this kind of division of labor will be called into question. It is likely that Taiwanese investment will come to be concentrated almost exclusively in mainland China, and that the "Go South" policy adopted by the government to encourage Taiwanese companies to invest in Southeast Asia will fail. Under these circumstances, Taiwan's economic dependence on mainland China would be exacerbated, possibly to the extent that its economic autonomy was threatened. The only way to avoid this would be for Taiwan to aggressively build up its product development and innovation capabilities so as to maintain its lead in technology.

At the same time, although mainland China has an abundant supply of labor, its industrial base still cannot compare with that of the Southeast Asian nations; this is likely to lead to bottlenecks with respect to vertical integration. This is one area where Southeast Asia enjoys an advantage. Furthermore,

multinational corporations have been investing in Southeast Asia for some time; Taiwanese companies operating in the region have established close links both with the multinationals' local subsidiaries and with ethnic Chinese businesses. This situation should help Southeast Asia to maintain its advantage as a production location. Another point is that, as most of the large quantities of foreign investment that mainland China has received in recent years have been concentrated in the coastal regions, wages in these regions have risen rapidly. Labor costs in the coastal regions of mainland China are now too expensive for some labor-intensive industries, but the interior of mainland China has poor infrastructure and transportation links, so there is little chance that companies in these industries will invest in the interior instead; they are more likely to invest in ASEAN member nations such as Vietnam, Laos, or Cambodia. In the re-allocation of resources that will accompany regional integration, the countries of Southeast Asia offer considerable potential for the development of labor-intensive industries and they should provide new opportunities for Taiwanese companies.

The impact of regional integration between ASEAN and mainland China will not be limited to forcing Taiwanese companies to reallocate their resources. On the trade side, the trading relationships that were stimulated by Taiwanese investment in ASEAN and mainland China will also change. In theory, if the relationship between mainland China and ASEAN industry, on the one hand, and Taiwanese industry, on the other, is a complementary one, then by expanding the regional market "ASEAN plus 1" should help Taiwanese industry to grow, although there may be some products for which Taiwan finds itself being supplanted as a producer. If this complementary relationship takes the form of a vertical division of labor, then it should be beneficial to the growth of Taiwanese industry. On the other hand, if the relationship turns out to be a competitive rather than a complementary one, then the impact on Taiwan's industrial development would be a negative.

The impact that economic integration between ASEAN and mainland China would have on Taiwan's trade can be considered from two points:

Complementary relationship between ASEAN and mainland China. If the relationship between the ASEAN nations' industry and mainland Chinese industry is a complementary one, then in the future, as their markets are opened up, they will be able to enter each other's markets at lower cost, thereby creating more trade opportunities. At the same time, if the relationship between Taiwanese

industry and industry in ASEAN and mainland China is similarly complementary, then Taiwanese industry will also have the chance to expand its markets. However, if the relationship between Taiwanese industry and ASEAN or mainland China industry is competitive, then Taiwan is likely to find itself being replaced as a producer of certain products, and the overall impact will be negative.

Competitive relationship between ASEAN and mainland China: If the relationship between ASEAN and mainland China industry is a competitive one, then market opening will force them to undertake integration. Industries that enjoy comparative advantage will be able to increase their scale of production and benefit from economies of scale. Under these circumstances, if the relationship between Taiwanese industry, on the one hand, and ASEAN and mainland China, on the other, is complementary, then Taiwan will benefit from an expanded market; if the relationship is competitive, Taiwanese companies will be forced out of the integrated "ASEAN plus 1" market, and the impact will be severe.

It was noted in the previous section that there has already been a shift in Taiwan's exports to mainland China away from general capital goods and general consumption goods towards technology-intensive high-end capital goods and high-end consumption goods. This trends reflects the existence of a complementary relationship between Taiwan and mainland China with respect to these types of products. In the future, integration between ASEAN and mainland China should create even greater trading opportunities for Taiwan. However, there is a strong possibility of Taiwan being supplanted in the area of general consumption goods and general capital goods; Taiwanese companies will therefore need to focus on upgrading their product innovation and R&D capabilities.

The above discussion of the likely impact of "ASEAN plus 1" on Taiwanese trade is based mainly on the anticipated effects of tariff reductions. However, if one examines the various free trade agreements that have been signed in different parts of the world, it can be seen that their contents are no longer limited to liberalization of commodity trade; they also cover liberalization of the agricultural sector, investment, and services, as well as customs clearance, product standards, and other trade facilitation issues, and also economic collaboration in such areas as e-commerce, manpower cultivation, and energy. If the FTA incorporating ASEAN and mainland China is based on WTO principles, then the agreement will naturally touch on these issues. While the direct impact on Taiwan

might be limited, the cost of entry to these markets for Taiwanese companies would definitely be increased.

Overall, economic integration between ASEAN and mainland China is bound to have an impact on Taiwan, in both the economic and political spheres. However, if Taiwan is able to exploit the market enlargement that would result from such integration, formulating a new strategy for the development of strategic industries and the cultivation of talent, not only will it be able to keep the negative impact of economic integration between ASEAN and mainland China (in terms of exclusion from the newly integrated market) to a minimum, it may in fact be able to improve the efficiency with which resources are allocated and enjoy continuing economic development.

4. CONCLUSIONS

Taiwan and mainland China possess different comparative advantages. Taiwan's electronics industry has been able to leverage its advantages in terms of ownership and internalization to build a division of labor between Taiwan and mainland China; this division of labor now constitutes an important part of the industry's global operations. Broadly speaking, mainland China's advantages in the area of production lie in its low land and labor costs; this is an area in which Taiwan cannot hope to compete with mainland China, so Taiwanese companies have chosen to locate their facilities for large-volume production in mainland China. Where companies are engaged in low-volume production of a large number of different products, or where they are producing high-priced or high-end products, production is kept in Taiwan, as is pilot production of new products and the manufacturing of those products in which Taiwan still enjoys comparative advantage. At the same time, the global logistics management function of the Taiwan parent companies is becoming increasingly important; this function includes finance, business strategy formulation, marketing, and purchasing . As for R&D, the R&D and design of new products is usually kept in Taiwan, while the mainland China subsidiary is given responsibility for R&D and production process improvement for mature products, as well as basic research and the development of products specifically targeted to the mainland China market. In this way, a division of labor between Taiwan and mainland China has gradually taken shape.

As Taiwanese investment in mainland China has increased, the level of integration between

Taiwanese industry and mainland Chinese industry has grown. At the same time, the mainland China operations of Taiwanese companies have become more localized. This localization is most readily apparent in the purchasing of raw materials and semi-finished products, recruitment of managers and technical personnel, and product sales. A high level of localization implies a high level of interaction between Taiwanese-invested companies and the local economy; it also means that the existing linkages within Taiwanese industry may come under threat.

Most studies indicate that Taiwanese investment in mainland China has indeed led to a contraction in the scale of production in some of Taiwan's traditional, labor-intensive industries. However, with the rise of new industries, a clear segmentation has taken shape between the products that Taiwanese companies manufacture in mainland China and those that are produced in Taiwan itself. Investment in mainland China has therefore not had a serious negative impact on Taiwanese industry as a whole. This study's analysis of the products being traded between Taiwan and mainland China has shown that, once companies start investing in mainland China, in order to maintain their competitiveness they tend to place greater emphasis on R&D and innovation. The resulting increase in the technology content of export products helps to speed up the restructuring and upgrading of Taiwanese industry. In theory at least, Taiwanese investment in mainland China should help to promote the transformation of Taiwan's industrial structure, thereby having a positive impact on economic development in Taiwan. From this point of view, mainland China's economic take-off is providing Taiwanese companies with an expanded market to develop.

In terms of regional integration, integration between mainland China and other parts of the Asia Pacific region will lead to further market expansion. Assuming that the regional division of labor continues to operate, integration is unlikely to pose a serious threat to Taiwan and may in fact encourage Taiwanese companies to speed up the upgrading of their technology. However, on the political and social aspect, there is a danger that political factors will prevent Taiwan from achieving economic integration with the rest of East Asia, and that it will become isolated and marginalized. If this strongly affects the willingness of Taiwanese companies to keep part of their operations in Taiwan, then it will threaten the continuing development industry in Taiwan. The government of Taiwan needs to think carefully about how this situation can be avoided.

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