Regionalization of Networked Producton: Taiwanese Manufacturing Capital in Southeast Asia and China

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This paper examines the trajectory and characteristics of Taiwan's outward capital flow in the past two decades toward Southeast Asia and China to show its impact on the regionalization of the global economic system. It illustrates the experiences of cross-border capital flow from the newly industrializing economies (NIE's) and their potential effects on the transformation of the global economic system. It is found that Taiwan's foreign direct investment has been carried out mainly by manufacturing-based entrepreneurs to establish transnational production networks with multi-national investment sites in the second-tier industrializing economies of the same region since the mid-1980s to sustain their exported-oriented production. A dynamic and evolutionary viewpoint is noted for Taiwanese manufacturing firms as they reproduced and reconfigured production networks at the foreign production sites.

Keywords: *Taiwanese FDI, transnational corporations, production networks, regionalization of production, newly industrialized economies.*

INTRODUCTION

Cross-border capital flow from the newly industrializing economies (NIE's) has had great impact on the global economic system. The NIE's, such as Taiwan, are no longer major areas of capital inflow. Their contribution to globalization via outward foreign direct investment and international trade has begun to play a far more important role than before as they successfully integrated into the international division of labor in the 1960s and 1970s (Fröbel et al, 1980; Dicken, 2003). Under this trend, transnational corporations (TNCs) from the NIEs are joining those from advanced economies to become the primary shapers of the contemporary global economy (Dicken, 2003; Yeung, H. W. C., 1999). Those companies' paths of inter-

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nationalization collectively at the country level, as sources of FDI, as well as their impacts on the reorganization/restructuring of globalization, raise the question of whether there is a unique model for these newly developed TNCs in processes of internationalization. Following these lines of inquiry, this paper aims at understanding the key processes by which Taiwanese manufacturing firms became competitive and sustainable enterprises in the age of globalization.

Taiwanese FDI in Southeast Asia and China was initiated by the need to accommodate the deterioration of the domestic production environment in Taiwan. It is largely 'defensive' in nature, seeking to protect their competitiveness in export markets (Chen and Ku, 2004). Taiwanese firms' offshore production activities are characterized by partial transplanting or reproducing their production system at foreign production sites. Networking production is still the main feature of Taiwan production capital involving cross-border investment (Chen et al, 2004; Chen and Ku, 2004; Jou and Chen, 2001a; Chen and Chen, 1998). In addition, in the past two decades, cross-border investment did to some extent enhance Taiwan's global competitiveness for some industries, although whether it is economic integration or hollowing out for Taiwan's economy needs careful investigation.

There are several purposes for this paper. The first is to describe the general trend and paths of outward foreign investment for Taiwanese manufacturing capital. The second is to reveal the major processes by which Taiwanese manufacturing firms become new transnational corporations, particularly how they efficiently reproduce their production activities, characterized as networked production systems at offshore manufacturing sites, in order to sustain their export-oriented production in both the global market and at home. Finally, the paper discusses how Taiwanese manufacturing capital takes advantage of multiple production sites and how this influences Taiwan capital's position in the regionalization of the Asian economy.

SOME THEORETICAL CONSIDERATIONS

With regard to research on TNCs from Asian developing countries, 'Dragon Multinationals' from the periphery is a term used by Mathews (2002) to describe the characteristics of these global latecomers. How they build sustainable competitive advantages in the process of internationalization has been seen as a critical part of recent dynamics of globalization in the late twentieth century. How those firms create advantages in technology innovation and organizational networks are essential parts of analysis in Mathews' work. However, it is not well recognized by him that these companies' competitiveness has also been greatly enhanced by their cross-border investment, though those activities are usually related to offshore production of lower value-added parts. Moreover, the international process of significant numbers of global latecomers, especially those with Chinese connections, is highly networked in terms of organization, and to a great extent differs from multination-

als from advanced economies (Hamilton, 1991; Yeung, 1994, 1998). This is not only true for many 'dragon multinationals' subsidiaries but also for their suppliers as invested abroad. Therefore, their internationalization can also be viewed through the spatial reorganization of the whole production system in their global reach.

Empirical and theoretical works in the name of 'global production networks (GPNs)' (Dicken et al., 2001; Henderson et al., 2002) provide some conceptual and methodological efficacy and relevance for studying the characteristics of those TNCs from developing countries, not only for their networked nature in running business, but also for their manufacturing-oriented foreign investment. Their experiences in building global production networks mostly at the lower value-added end in foreign sites are a critical part of the internationalization process for those global latecomers. This approach also highly emphasizes the importance of empirical studies to capture the heterogeneous and diversified experiences of TNCs from different countries or regions to build their GPNs. However, the underlying research interest for GPNs approach is to reveal the new picture of international/global division of labor based on the globally organized, networked production system, with a more sophisticated explanatory framework to explain the formation of heterogeneous and diversified patterns of GPNs contributed by the TNCs from developing countries.

In addition, FDI (in general) or TNCs (more specifically) from the first-tier of NIEs have also played a significant role in promoting and affecting economic performance of second-tier industrializing economies in the same economic region since the mid-1980s. That is to say, for the past two decades the 'regionalization of FDI' has become another significant geographical trend of outward FDI as a part of the global economic system (Dicken, 2003; Yeung, 1999). In the Asian context, the TNCs from the first-tier NIEs, such as Singapore, Hong Kong, Taiwan and South Korea, in addition to TNCs from advanced countries, are major contributors of foreign capital for the industrialization and globalization of Southeast Asia and China. That is, they are essential agents in producing the regionalization of the Asian economy. Furthermore, there are spatial variations in capital inflow toward the second-tier NIE's, which has induced significant spatial differentiation for regional development among different countries as well as different regions within a certain country.

Based on the above literature, this paper focuses on the pattern and trajectory of Taiwanese capital flow in the past two decades toward Southeast Asia and China, to evaluate its contribution to economic regionalization based on how Taiwanese firms organize and reorganize their production networks within the Asian Pacific region. There are some benefits for using the Taiwan case to evaluate the contribution of FDI from the first-tier NIE's toward the second-tier NIEs in the regionalization of the global economy. First of all, the heterogeneity of patterns of internationalization for TNCs from different countries or regions has been well recognized by empirical and theoretical works, whether it is the contrast between those from advanced countries and developing countries or the contrast among those in de-

veloping countries themselves. However, one of the major lines of differentiation that has received theoretical attention is the effects of 'relational capitalism' on the spatial (re)organization of the global economy. Ethnic connections, such as guanxi ("connections") networks have become an important research agenda of empirical as well as theoretical investigations. Owing that Taiwanese capital is an indispensable ingredient of Chinese networks in the Asian Pacific region, it is important to have cumulative works on Taiwan experiences to provide further comparison and theoretical generalization.

Secondly, the research is grounded in the reorganization of the global economy toward post-fordist capitalism. However, for the first-tier NIE's, especially those with Chinese connections, long before the global economy was mainly governed by the hierarchical organization of fordism, their endowment in the international division of labor relied on networked and flexible production systems. It is important to trace how this kind of endowment and competitiveness in the world economy has been enhanced and transformed, as they became new shapers of the global economy with outward FDI. Again, whether there are similarities and differences among 'dragon multinationals' (with Chinese connections), as their trajectories of economic development have been diversified for the past two decades, are important research questions. Similarly, the reasons the above phenomena were neglected before may be related to insensitivity to the interaction between foreign and local capital.

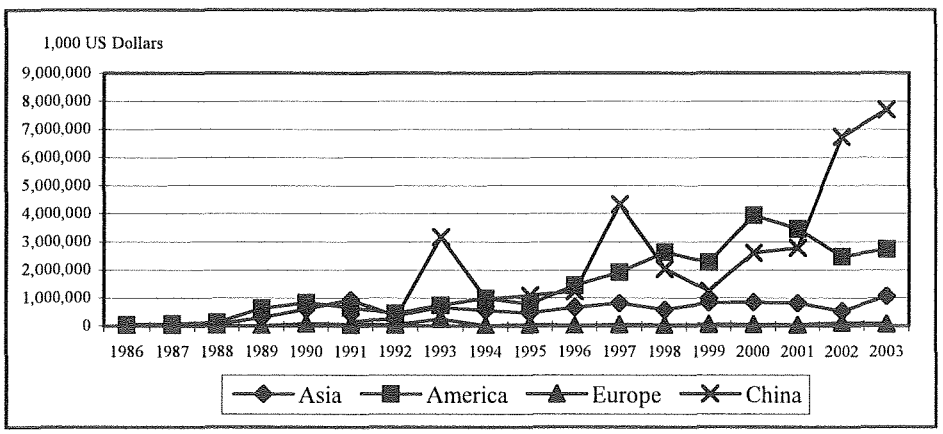
Thirdly, it is necessary to give credit to the great number of small and medium enterprises (SMEs) that have contributed significantly to form the flexible and networked production systems and to achieve the EOI mode of development in Taiwan since the late 1960s. Transnationalization of SMEs is also an essential part of the internationalization processes of Taiwanese TNCs. Low-tech SMEs have seldom attracted academic attention in studying TNCs, nor is their role fully recognized in these new trends of globalization and regionalization. In fact, many of the Taiwanese SMEs have been benefited and upgraded under this trend of outward investment since the mid-1980s, though far more have been facing difficulties and phasing out, as they could no longer exploit the lower costs of production factors at the offshore production sites.

GENERAL TREND OF TAIWANESE FDI

Since the mid 1980s, the share of FDI originating from developing countries to that of the world total has been increasing. This indicates that the first-tier NIEs have become visible sources of FDI in the global market. According to Dicken (2003), there was only less than one percent of FDI from developing countries in 1960 and three percent, respectively, in 1985. By 2000, however, the number had quadrupled to12 percent of the world total. East Asian NIEs have contributed significantly to this trend since the mid-1980s.

Coincident with this global trend, Taiwanese FDI started to grow in the second half of the 1980s as well (Figures 1). Not surprisingly, similar proportions of Taiwanese FDI went to developed countries, such as the United States, and to less developed countries, especially Southeast Asian countries and China, the so-called second-tier NIEs (Figure 2). As many studies have indicated, such investment is due to Taiwan's successful development of information and high-tech industries. Taiwanese FDI to the United States has been mainly to enforce the connections between the Taipei-Hsinchu high-tech corridor and Silicon Valley in California (Hsu and Saxenian, 2000; Mathews and Cho, 2000; Jou and Chen, 2001b), leading to an enhancement of the competitiveness of Taiwan's high-tech industries in the global market. Some FDI in the second tier NIEs was prompted by rising wages and currency values in Taiwan to trigger the processes of offshore production for Taiwan firms and is mainly in response to the deterioration of the domestic production environment for labor-intensive industries that accounts for most Taiwanese SMEs.

Figure 1: Taiwan's approved outward direct investment by continent, 1985-2000.

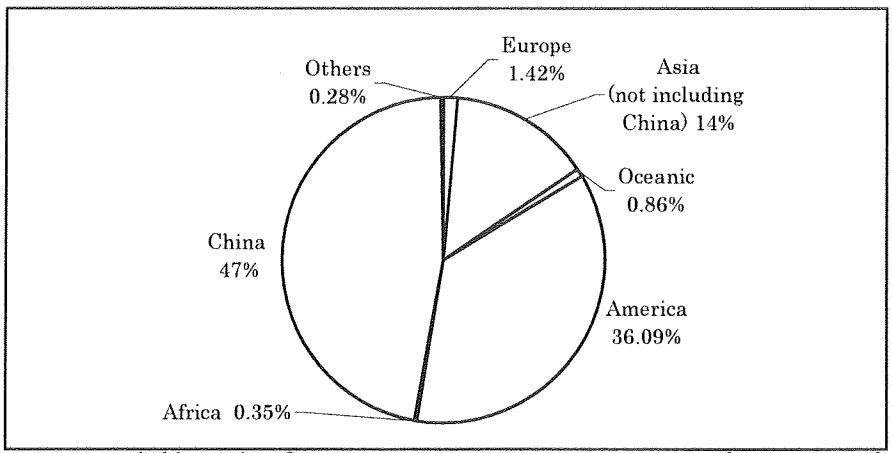


Source: compiled by author from: Investment Commission, Ministry of Economic Affairs, ROC, Statistics on Overseas Chinese and Foreign Investment, Technical Cooperation, Outward Investment, Outward Technical Cooperation (various years).

The first wave of Taiwanese FDI started around the mid-1980s to the early 1990s, which was in response to the rising production costs for many Taiwanese manufacturing plants. It was undertaken by SMEs and then followed by investment from larger firms. During this time period, outward Taiwanese FDI is underestimated because relocations of many small firms to offshore sites were not documented. At the same time, based on limited resources and capability of internationalization, they could only move to nearby less-developed countries and regions with cultural affinity and geographical proximity. The surge of outward FDI to China in 1993 was partially due to the Taiwan government officially legalizing direct invest-

ment to China in 1991, and the reassurance of China's open door policy after Deng Xiaoping's 'Southern Excursion' to Guangdong in 1992. Along with the open door policy of China, Taiwan and China began cross-strait informal talks from April 1993. From then on, the amount of outward FDI to China significantly outran that to Southeast Asian countries.

Figure 2: Proportional distribution of Taiwan's approved outward direct investment by continent, 1952-2003 accumulated.



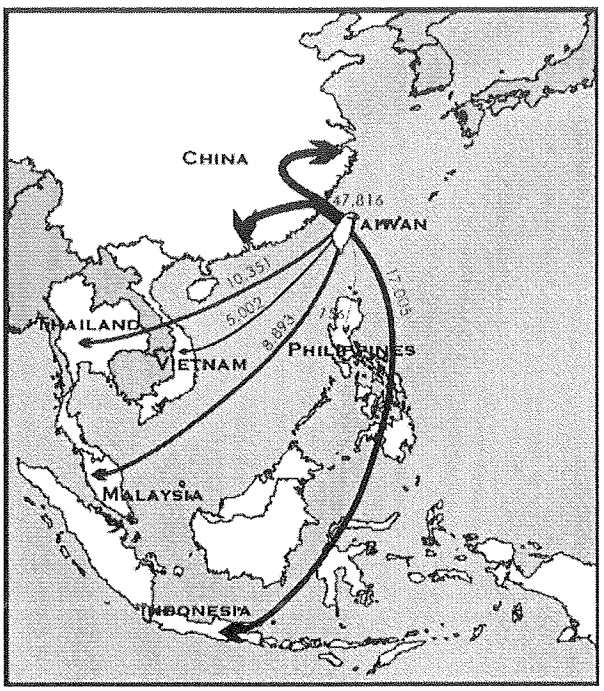
Source: compiled by author from: Investment Commission, Ministry of Economic Affairs, ROC, Statistics on Overseas Chinese and Foreign Investment, Technical Cooperation, Outward Investment, Outward Technical Cooperation (various years).

In responding to this trend, the Taiwan government officially launched a *southbound* policy to cool down the rising westbound outward direct investment. The *southbound* policy to channel more investment to the ASEAN countries was also utilized by the Taiwan government to enhance her international diplomatic status. It was also a response to Beijing's insistence on starting talks on reunification, while Taipei was determined to restrict the talks to 'low politics' (Nordhaung, 2001). The friendly atmosphere of cross-strait relationship deteriorated dramatically after Taiwan's President Lee Teng-Hui visited the United States in June 1995, and the cross-strait talks were suspended then by Beijing. The situation became worse with Beijing's provocative missile tests and military exercises in and around the Taiwan Strait. The Taiwan government under President Lee's leadership began to implement the "no haste, be patient" (*jie-ji yueng-ren*) policy for Twain's outward direct investment to China in September, 1996. This policy required that all investment to China had to be reported to the government and could not exceed US$50 million without first receiving special governmental approval (Wang, 2002).

Irrespective of the policy of outward direct investment proposed by the Taiwan government and the deteriorating cross-strait relationship, Taiwan's outward direct

investment toward China kept on growing. Starting from the mid-1990s, Taiwanese FDI went into another phase to play an 'expansive' role rather than a 'defensive' one (Figure 1). Taiwanese firms accelerated their foreign investment to exploit their assets, such as patents, other technological assets, reputation in production skills, or marketing and advertising in advanced economies (Hsu and Liu, 2004). Medium and large firms began to play a far more significant role for Taiwanese outward FDI than before both in developed countries and less developed ones. At this time, the cross-border investment in Southeast Asia was stable while that in China kept growing. However, increasing production costs and political and social instability in some sites, plus the Asian financial crisis, did hinder the growth of Taiwanese FDI in Southeast Asia and created another surge of direct investment toward China. However, extending the scale of production to enhance Taiwan firms' competitiveness for export remained the major feature for Taiwanese FDI in Southeast Asia and China (Figures 3 and 4).

Figure 3: Taiwan's approved outward direct investment to Southeast Asia countries and China, 1959-2000.

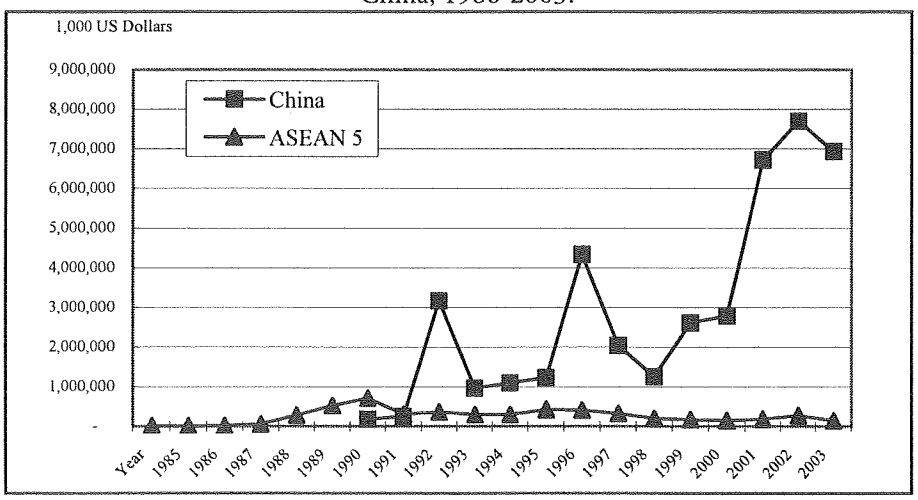


Note: All data are on an approval basis.

Source: The data in respect of Thailand data are taken from the Board of Investment; Malaysian data are from the Malaysian Industrial Development Authority (MIDA); the Philippines data from the Board of Investment; data on Indonesia from the BKPM; Vietnam data from the Ministry of Planning and Industry (MPI); and data on China from the Ministry of Foreign Trade and Economic Cooperation.

The continued investment in China indicates that the "no haste, be patient" policy was ineffective. After 2000, in order to relieve economic recession and to react to the request of the business community, the newly elected president, Chen Shui-bian from the DPP (Democratic Progress Party), proclaimed a principle of "proactive liberation with effective management" to Taiwan's *westbound* direct investment. From then on, Taiwanese FDI to China entered a new phase, surging dramatically (Figure 1), while the growth rate of overall inward FDI from the world to China began to stabilize. By contrast, Taiwanese FDI to China exceeded that to the advanced economies and the accumulated proportional share reached 47 percent (Figure 2). The expansion in the China market became a major strategy of investment for Taiwanese firms, even though expanding production for export in the global market was still important.

Figure 4: Taiwan's approved outward direct investment to Southeast Asia and China, 1986-2003.



Note: ASEAN 5 refers to Philippine, Indonesia, Thailand Malaysia and Vietnam
Source: compiled by author from: Investment Commission, Ministry of Economic Affairs, ROC, Statistics on Overseas Chinese and Foreign Investment, Technical Cooperation, Outward Investment, Outward Technical Cooperation (various years).

TRAJECTORY OF TAIWANESE FDI IN SE ASIA AND CHINA: REGIONALIZATION OF CROSS-BORDER INVESTMENT

From the mid-1980s to early 1990s, the first wave of Taiwanese FDI was undertaken by SMEs and then was followed by investment from larger firms to transplant partially or estab'ish new production networks at foreign sites (Jou and Chen, 2001a; Chen and Ku, 2004). Production sites in Southeast Asian countries played

an important role for Taiwan firms with networking strategies to cope with the escalation of production costs in the home country (Chen and Chen, 1998; Chen and Ku, 2004). Although it is not shown by officially approved data, during this time many SMEs had, nevertheless, established their operations in China, mostly in the form of consigned manufacturing. According to Chen and Ku (2004), during that time period small firms' FDI from Taiwan in China was a result of overwhelming concern for psychological distance. They also think that after 1992, China began to change its network position for Taiwanese firms owing to quick growth of inward FDI which helped them to more effectively organize their local production networks than before. But this was not necessarily the case. The ban and control of direct investment for different industries, as the policy of promoting *southbound* and discouraging *westbound*, did influence the character of offshore production networks and the spatial division of labor for different industries in Southeast Asia and China. This effect began to show a clear picture, especially in the second half of 1990s, as many medium and large Taiwanese firms began to diversify their production sites across countries and regions to multiple sites.

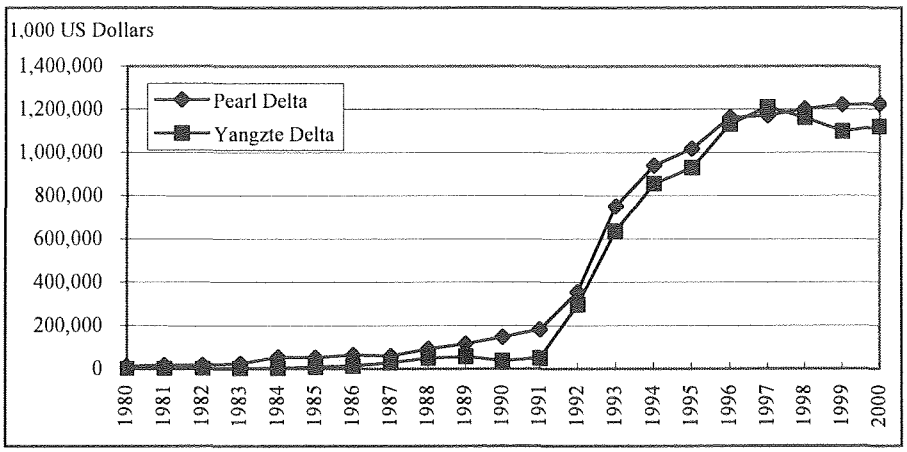
If we look at Taiwanese industries that kept significant networking strategies abroad as well as at home, we can find that there were different trajectories. For example, footwear, bicycle and motorcycle industries, which are relatively more labor-intensive than others, moved to China first and then diversified production sites toward Southeast Asia around the 1990s. The electronics and textile industries were the other way around. For sure, most companies of different industries have far more large scale production in China.

Although the amount of outward FDI to China significantly exceeded that to Southeast Asian countries after 1992, the path and effect of the earlier *southbound* or *westbound* can not be ignored. This also indicates the general picture of Taiwanese FDI to Southeast Asian countries under the strong tendency of China's magnetic effect on attracting foreign capital, including Taiwan's. In overall terms, Taiwanese capital toward Southeast Asia started to grow from 1987. Except for the slight drops in 1992-1993 and 1998, which are coincident with surges of 1993 and 1997 toward China, it is quite stabilized. Though we do not have comparable data, the pattern is similar to that reported by Wu et al. (2002), where ASEAN has not been losing out in attracting FDI with regard to China's disproportionately large share of global FDI. Nevertheless, in terms of attracting Taiwanese capital, countries in Southeast Asia do vary significantly at different time periods, owing to each country's production conditions for Taiwanese firms.

The significance of China's magnetic effect on Taiwanese capital can also be seen in Figure 1. From 2002, the total amount of approved outward FDI from Taiwan to China significantly surpassed that to America, which mainly went to the United States (Figure 1), although we are not sure whether it was just another surge or not. FDI toward coastal regions of China, invested in all kinds of special development zones, accounted for around 90 percent of the total FDI in China. Among them,

the Pearl River Delta and the Yangtze River Delta were the most important targets of inward FDI in China (Figure 5). These two regions are also the most significant concentrations of Taiwan's electronics and information industries.

Figure 5: Inward FDI to the Pearl Delta and the Yangtze Delta in China since 1980.



Source: Compiled from China Statistical Yearbooks (various years).

In brief, Taiwanese firms with the above endowments greatly enhanced their capabilities in their later investments in China to look for the opportunities of economies of scale at each production site and to utilize the advantages of division of production at different industrial sites.

TRANSNATIONAL PRODUCTION NETWORKS IN THE MAKING

Since Taiwan's economic development was based on export-oriented industrialization (EOI) in the earlier days, Taiwanese firms' global competitiveness depended greatly upon their ability to control production costs and to maintain flexibility of production systems. Although the lower costs for some production factors, especially land and labor costs, could be provided in Southeast Asia and China, how to maintain production systems as efficient and flexible at the host countries as those in the home country was one of the most important tasks for Taiwanese firms collectively. To observe the transnational supply chains by examining the procurement order sharing of overseas firms is usually the most convenient way to know how Taiwanese manufacturing firms arrange their production networks in general by cross-border investment. This is definitely not relevant to the methodology by GPNs perspective, because it is highly dependent on firm-level analysis (Dicken and

Malmberg, 2001; Yeung, 2000, 2001). At any rate, statistics of procurement orders still could provide a general picture of how Taiwanese firms organize their production activities based on their raw material and component inputs after more than a decade of transnationalizing their manufacturing activities.

Regionalization of production

Tables 1 and 2 are complied from data based on annual surveys of Taiwanese manufacturing firms' foreign investment. Data in these two tables cannot be used for year, industry, or country comparisons, but can only give us a general idea of how Taiwanese firms coordinate their manufacturing activities at foreign sites in overall terms by industry and by country. Data in Table 1 show that the mother country's component inputs and local sourcing play important roles for Taiwanese firms in foreign countries for all four industrial groups. For some industries, information and electric industries in particular, component inputs from Taiwan are still quite critical for their procurement. The reliance on Taiwan sourcing is expected to be gradually reduced, but is still quite significant. Even for local sourcing, Taiwanese firms at the local level are still major suppliers. Owing that most Taiwan manufacturing firms have investments in Southeast Asia and China, regionalization of production is far more important for Taiwanese manufacturing firms.

Table 2 also gives us a picture of how Taiwanese firms in each foreign country rely on Taiwan's material inputs, that is, their degree of localization of production from the viewpoint of local sourcing. Although Table 1 gives us an impression that Taiwan connections still dominate Taiwanese manufacturing firms' offshore production, from Table 2 we find that in Thailand, Malaysia and Indonesia, where there are longer histories of investment, local suppliers play a more significant role in the supply chains than the countries with a shorter history of Taiwanese investment. In China, if we compare with the data of 1998, we find that the proportion of Taiwan sourcing decreases significantly. In addition, local sourcing from Taiwanese firms and from local firms share similar proportions of procurement orders.

The extension of networked production of export oriented industry

Continuing the above discussion that Taiwan connections dominate offshore production, it is misleading to conclude that Taiwanese firms are all networked as they invest abroad. Table 3 provides information on the total amount of approved outward investment by industry from 1952 to 2003; those ranked at the top are more prone to export to global markets. Industries of 'Electronic & Electronic Appliances' and 'Basic Metals & Metal Products', which ranked first and third in terms of total amount of outward investment, are in fact highly related to the transnational production of Taiwan's information industry that has the most competitiveness in the world. Their production systems are highly networked, at both home sites or at offshore sites. However, the industries of 'Chemicals', 'Textiles', 'Food &

Beverage Processing', which ranked second, fourth and fifth, are larger-scaled investments and their industrial organizations are more prone to vertical integration than vertical or horizontal disintegration. The industries of 'Non-metallic', 'Garment & Footwear', 'Lumber & Bamboo Products', that in the past were also export-oriented and mostly small to medium sized factories, relocated to offshore sites due to the escalation of production costs in Taiwan. They are certainly network-oriented. Social networks play an important role in their business.

Table 1: Procurement order sharing of Taiwanese firms at offshore sites, 1998-1999.

Industry	Sourcing	Taiwan	Local Taiwanese companies	Local companies	Other countries	Samples
1998 (Total samples = 1468)						
Metal & Machinery	Raw Materials	46.82%	17.25%	25.02%	10.91%	326
	Components & Semi Products	55.48%	15.20%	22.99%	6.33%	301
Information & Electric	Raw Materials	59.85%	17.92%	11.06%	11.17%	448
	Components & Semi Products	60.66%	19.15%	12.08%	8.11%	406
Chemistry	Raw Materials	46.36%	14.79%	20.93%	17.91%	329
	Components & Semi Products	49.43%	19.88%	19.52%	11.17%	227
Food, Textile & Other	Raw Materials	42.02%	14.10%	31.39%	12.48%	365
	Components & Semi Products	47.07%	16.10%	28.57%	8.26%	272
1999 (Total samples = 1558)						
Metal & Machinery	Raw Materials	39.86%	20.64%	28.01%	11.49%	341
	Components & Semi Products	47.92%	19.12%	27.02%	5.94%	318
Information & Electric	Raw Materials	52.40%	22.43%	13.13%	12.03%	488
	Components & Semi Products	55.03%	21.89%	14.87%	8.21%	440
Chemistry	Raw Materials	43.05%	16.74%	22.04%	18.17%	347
	Components & Semi Products	46.22%	22.01%	20.59%	11.18%	237
Food, Textile & Other	Raw Materials	37.42%	16.02%	32.12%	14.44%	382
	Components & Semi Products	43.08%	18.52%	30.01%	8.39%	283

Source: Annual Report of Manufacturing Foreign Investment Survey (2000), Department of Statistics, Ministry of Economic Affairs, ROC.

Table 2: Taiwanese manufacturing firms' procurement order sharing in Southeast Asian countries and China, 1999.

Country	Sourcing	Taiwan	Local Taiwanese companies	Local companies	Other countries	Samples
Thailand	Raw Materials	38.91%	13.61%	27.33 %	20.15 %	46
	Components & Semi Products	42.13%	9.27%	42.10%	6.50 %	30
Malaysia	Raw Materials	31.69%	20.39%	31.43%	16.49%	51
	Components & Semi Products	44.49%	15.63%	32.47%	7.42%	43
Philippine	Raw Materials	44.82%	5.91%	20.00%	29.27%	33
	Components & Semi Products	59.48%	6.80%	16.60%	17.12%	25
Indonesia	Raw Materials	35.71%	6.06%	38.57%	19.66%	35
	Components & Semi Products	53.60%	9.00%	29.60%	7.80%	51
Vietnam	Raw Materials	54.57%	9.12%	17.61%	18.71%	37
	Components & Semi Products	60.54%	14.19%	13.16%	12.11%	1079
China	Raw Materials	43.23%	22.56%	22.11%	12.11%	858
	Components & Semi Products	45.80%	25.15%	21.67%	7.38%	

Source: Annual Report of Manufacturing Foreign Investment Survey (2000), Department of Statistics, Ministry of Economic Affairs, ROC.

For industries or companies that rely heavily on production networks, how they effectively reorganize the manufacturing activities across borders of different countries is quite important. However, from the previous discussion on the sourcing of components, it can be seen that the localization of production is quite a critical part owing to cost-saving and flexibility of production. Owing that industrial bases at the foreign sites of second-tier NIEs are usually insufficient to support the competitiveness of Taiwanese firms on price, quality, and delivery, reproducing the production networks for export-oriented products becomes the essential task for Taiwanese manufacturing capital.

Localization of networked production

Based on a multi-year research project on transnational production networks for Taiwanese firms, several patterns of how Taiwanese capital reproduced production networks in Southeast Asia and China were observed (Jou and Chen, 2001a). The first one is that Taiwanese firms adopt the strategy of "industrial transplantation". This pattern is rare, but a very famous case did occur in Penang in 1989, when a

large electronic company persuaded around 50 collaborative suppliers to come with it. The firm transplanted almost the entire production network from Taiwan, and became more spatially concentrated than at home.

The second, and most common pattern, is to partially reproduce Taiwanese production networks. While investing abroad, large-sized companies will encourage their suppliers of important parts and bulky products to go with them. These parts are critical for just-in-time delivery and sensitive to transportation costs. At the overseas manufacturing site, these production networks will extend their production networks later by including Taiwanese firms that are usually other's suppliers. This pattern has occurred at industrial districts that are near large cities or have already had some manufacturing bases of related industries.

Table 3: Taiwan's total amount of approved outward investment by industry, 1952-2003 accumulated (1,000 US dollars).

Industry	1952-2003 accumulated	Rank
Food & Beverages Processing	513,708	5
Textiles	853,941	4
Garment & Footwear	299,273	7
Leather & Fur Products	54,914	14
Lumber & Bamboo Prod Products	245,639	8
Paper Product & Printing	236,731	9
Chemicals	1,763,150	2
Rubber Products	237,554	10
Plastic Products	103,776	12
Non-metallic Minerals	425,596	6
Basic Metals & Metal Products	984,825	3
Machinery Equipment	83,387	13
Electronic & Electronic Appliances	6,583,322	1
Precision Instrument	228,486	11

Source: Investment Commission, Ministry of Economic Affairs, ROC, *Statistics on Overseas Chinese and Foreign Investment, Technical Cooperation, Outward Investment, Outward Technical Cooperation* (2004).

The third pattern is more for SMEs that were requested by their foreign buyers to invest abroad. Production networks for these Taiwanese firms would be more open than those in Taiwan to connect with other local or foreign firms at the investment site. There were also cases that the Taiwanese firms were requested by buyers or traders to establish plants at some areas, and finally attracted more Taiwanese firms to come over. As a result, these places became industrial clusters based mostly on Taiwanese networks.

The fourth pattern is the Taiwanese production network that was largely based

on local industrial districts and production networks rather than reproduced from Taiwan. Taiwanese textile production networks in Bandung, Indonesia were typical cases. These networks were established locally, and mainly by small and medium Taiwanese firms and start-up factories of former black-hand Taiwanese employees. It is a spin-off pattern of network expansion, though occurring in the foreign sites with significant locally social embeddedness, which is very similar to what has happened among SMEs in Taiwan.

For all the above cases, the *guanxi* network with strong ethnic and personal ties played an important role for re-establishing the networked production system for Taiwanese firms at foreign sites, though they are always supplementary with or even replaced later by other formal organizational networks (Chen et al., 2004; Chen and Jou, 2003). Besides, the processes of reconstructing the production networks to maintain Taiwanese firms' global competitiveness involve relatively more clustered and territorialized production networks than those at home.

Even so, these cannot be seen as static processes. In one way, localization of Taiwanese production networks is evolutionary at each industrial district in the host country.

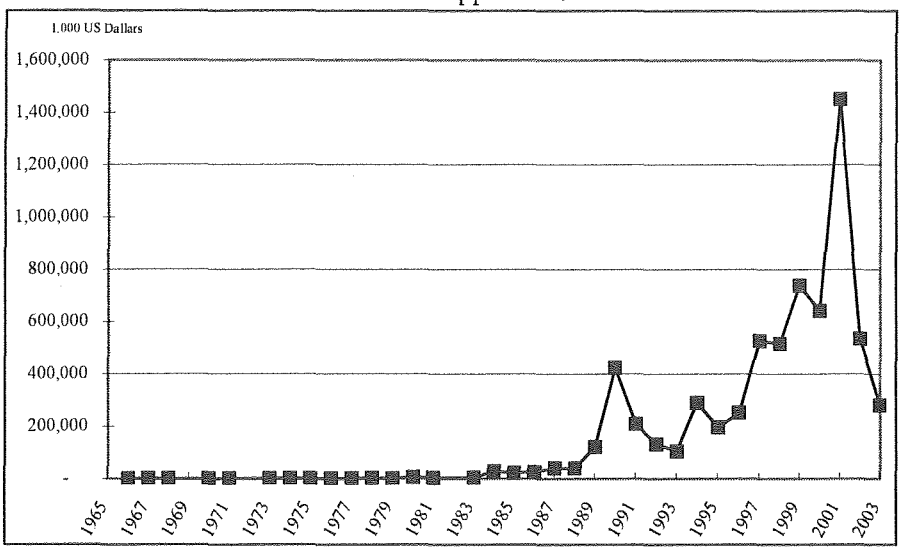
SPATIAL AND TEMPORAL DYNAMICS TOWARD THE REGIONALIZATION OF PRODUCTION

Reconfiguration of production networks for the 'electronic and electric appliances' industry

This section focuses on a case study of the Electronic & Electric Appliances industry, characterized by a significant network-production system that has been invested both in Southeast Asia and China over the past two decades. The goal is to show the evolution and transformation of production networks in three waves of Taiwan's cross-border investment. The discussion is based on observations from continuous firm interviews for more than 300 companies in the areas where Taiwanese firms concentrated the most in Southeast Asia and China between 1998 and 2003.

The information industry accounted for the largest proportion of total approved outward direct investment of all from Taiwan to the second-tier NIEs (Table 3). Its total amount exceeded other industries to a great extent as well. The temporal trend of outward direct investment for this industry gained its first peak in 1990 and then kept growing, with fluctuations, to reach its second peak in 2001 (Figure 6). After 2001, the amount began dropping significantly, even though the total amount of Taiwan's outward direct investment kept growing steadily (compared to Figure 1). This latest trend of dropping needs to be confirmed with other data to make sure whether Taiwanese information industry firms have adopted the strategy to invest in China via third countries in response to the Taiwan government's policy of setting investment barriers to China.

Figure 6: Trend of Taiwan's approved outward direct investment for the industry of Electronic & Electric Appliances, 1952-2003.



Source: Investment Commission, Ministry of Economic Affairs, ROC, Statistics on Overseas Chinese and Foreign Investment, Technical Cooperation, Outward Investment, Outward Technical Cooperation (2003).

The spatial patterns of direct outward investment by the 'Electronic & Electric Appliances industry to Southeast Asia and China are shown in Table 4 and Figure 7. Table 4 indicates that the proportions of investment by the 'Electronic & Electric Appliances industry to those of total amounts invested in each host country are quite significant except in Indonesia and Vietnam. The major countries/regions that received capital are the Philippines (Subic Bay), Malaysia (Penang), Thailand (Bangkok) and China (Dongguan and Suzhou, including Kunshan and Wujiang) (Figure 7). The territorial agglomeration of the Taiwanese information industry in those regions (industrial districts) is quite significant. The first wave of Taiwanese capital went to those areas in Southeast Asia in the late 1980s and early 1990s. Those are industrial districts that had already had some industrial bases contributed by advanced countries since the 1970s. The investment of Taiwanese electronic and electric manufacturing capital in the more labor-intensive part of manufacturing did make a significant contribution to the local economy, since foreign investment from developed countries tended to decrease at that time.

Penang in Malaysia and Subic Bay in The Philippines were then the favorite investment sites for electronic and electric industries owing to their agglomerated industrial bases established by American and Japanese investments. In Penang, we find the most significant example of how the Taiwanese information industry reproduced its production networks (Jou et al, 2001). Taiwanese capital in the electronic

and electric appliance industry invested in Penang was mainly from SMEs. Some were suppliers encouraged by their focal companies to invest there, but most were just relocated or extended their factories due to the escalation of production costs in Taiwan. The networked nature of the Taiwanese information industry quickly reorganized local Taiwanese production chains and partially reproduced Taiwan's production system centered in some large Taiwanese companies in Penang. The initial investment at the offshore production sites greatly enhanced the growth of Taiwanese companies to increase their economies of scale. The quick growth of the large electronic companies, though, was achieved by their scale of production, and also by vertical disintegration and flexible ways of production. Therefore, the spatial proximity was quite important for the focal company and its suppliers. In the whole production system, major suppliers of key components and bulky materials were Taiwanese companies in the first-tier and second-tier of the supply chains. In-house production was even provided by some key suppliers for the focal company to achieve partial vertical integration.

Table 4: Taiwan's approved outward direct investment to Southeast Asia and China by selective industries, 1953-2003 (1,000 US dollars).

Year	China 1991-2003	Asean 5 1952-2003	Philippine	Indonesia	Thailand	Malaysia	Vietnam
Electronic & Electric Appliances	10,999,893 (32.06%)	1,400,157 (27.94%)	285,645 (40.39%)	81,340 (13.60%)	482,879 (43.31%)	494,310 (31.90%)	55,983 (5.37%)
Total FDI	34,308,569	5,011,047	707,181	598,134	1,114,785	1,549,228	1,041,719

Note: Figures in prentices represent proportions of investment in 'Electric & Electronic Appliances' industry to total Taiwanese FDI in each country shown by column.

Source: *Investment Commission, Ministry of Economic Affairs, ROC, Statistics on Overseas Chinese and Foreign Investment, Technical Cooperation, Outward Investment, Outward Technical Cooperation* (2003).

However, owing to the open door policy of China, as well as the rapid increases in production and labor costs, and the Asian financial crisis, many Taiwanese companies did not extend their scale of investment in Malaysia. Some even relocated to China. Therefore, the production networks in Penang changed to a great extent in the late 1990s. There were crossings of production networks among focal companies and suppliers in order to maintain their company incomes and market shares. Some suppliers even tried to extend their customers to foreign companies to increase their profit margins and gain capability of a running international business on their own, not through Taiwanese customers as before. This helped Taiwanese SME's to build up their own experiences of internationalization without relying on large focal firms. This also broke the ethnic ties of Taiwanese and Chinese connections in the production networks for the SMEs at the foreign production sites.

As for Subic Bay in the Philippines, though quite close to Taiwan in geographical distance and once ranked first as an offshore production site for Taiwanese information capital, the country's political instability hindered it to develop into a major Taiwanese offshore production site as China's magnetic effect on attracting foreign capital appeared.

Figure 7: Major areas of Taiwan's investment by the electronics & electric appliances industry.

Investment of the Taiwanese electronic and electric appliance industry in Bangkok became more prominent in the mid-1990s, the second wave of Taiwan's outward investment, and stead ly increased. Although the total investment dropped significantly after 1998 due to the Asian financial crisis (see Table 2), Taiwan ranked in

seventh place for inward foreign direct investment in Thailand and became fifth in 2000. Investment of the electronic and electric appliance industry ranked at the top of all industries and accounted for 55 percent of total Taiwan investment in 1998. Their production activities are mainly concentrated in the outskirts of Bangkok, such as Smut Prakan, Chon Buri, Chachoengsao, Prachin Buri, Ayutthaya, and Phetcha Buri. The spatial dispersion surrounding the Bangkok area is because large Taiwanese electronic and electric appliance companies tend to partially reproduce their production networks at different industrial districts. It is one way to enhance relationships with their own suppliers and to avoid major suppliers providing parts to business competitors. Therefore, there are strong business networks among Taiwanese companies, though they are oriented to a certain large focal company.

Production networks of two companies, Delta Electronic (Thailand) and Cal-Com Electronics (Thailand), are the most representative cases for Taiwanese production networks in Bangkok. These two companies were established in Thailand in 1988 and 1989, at the same time as other large electronic companies invested in Penang as discussed earlier, but were more successful later on than those located in Malaysia. These two companies expanded rapidly in the second half of the 1990s to achieve economies of scale. This provided the conditions for them to maintain strong relationships with their suppliers by geographical proximity located within the same industrial district or even provide in-house space for their supplier to achieve vertical integration.

The second-half of the 1990s was also the time when many large Taiwanese electronic and electric appliance companies started to set up their plants in China, especially in Dongguan in the Pearl River Delta. According to Yang's study (2005), the low labor cost and closeness to Hong Kong for export are the most important location factors that attracted Taiwanese companies there. In addition to tax reduction, investment incentives and lower costs of other production factors, the relative completeness of the parts supply system is another key factor for Taiwanese electronic and electric appliance companies that rely on the collaborative production system. The Dongguan area became an important industrial cluster of the information industry that has been developed by the intensive concentration of Taiwanese and Hong Kong companies of the electronic and electric appliance industry.

The local production networks for Taiwanese companies in Dongguan are different from those around Bangkok. At the level of individual company, not many have successfully achieved economies of scale in production in Bangkok, while quite many have in Dongguan. Owing to the rapid growth of the Dongguan area, both focal companies and suppliers have expanded their production to a great extent. However, unlike those in Bangkok, the prosperous economic condition does not necessarily enhance the production ties between the focal companies and their suppliers. Focal companies have more sourcing and the suppliers have opportunities to extend their new customers as well. Therefore, the networks become more crossed with each other and more complicated. Besides, the Taiwanese networks have been

relaxed to some extent. Focal companies extend their local sourcing to local Chinese companies and are not necessarily limited to Taiwanese networks any more.

This phenomenon was further strengthened in Suzhou in the Lower Yangzi River Delta in the early 2000s. Our field interviews had similar findings to those of Yang (2005). Even though many of the suppliers followed the focal companies to set up plants in the Suzhou area, the production networks in Suzhou are more open than those in Dongguan. Large Taiwanese electronic and electric appliance companies continue using the externalized production networks for the global market in this area to help the formation of this newly emerged industrial district. Small and medium companies do not rely on one focal firm for business, either.

Taiwanese companies have rapidly reproduced their production networks from Taiwan and Dongguan in the greater Suzhou area (including Kunshan and Wujiang), since Suzhou has provided better operation of customs and more relevant research institutions for exported-oriented industries since the late 1990s. Production scales for many companies in the Suzhou even outreach those in Dongguan. The completeness of the production system for electronic and electric appliance industries in Suzhou has been accelerating the transformation of those companies' Taiwan headquarter functions and pushed the closure of Taiwan plants to form a new map of global deployment. This, in turn, strengthened the formation of Suzhou as a globally competitive industrial district.

CONCLUSION

This paper focused on examining the tracks of Taiwanese firms' cross-border investment in Southeast Asia and China. At the very beginning, Taiwanese manufacturing capital moved to Southeast Asia and China in search of low production costs to accommodate the deterioration of the production environment in Taiwan. This was intended to sustain its export-oriented industrialization (EOI) for the global market. Along with the above first wave of Taiwanese outward investment, Taiwanese manufacturing capital not only contributed to the regional/local development for some areas in the second-tier NIEs in Southeast Asian and China, but also enhanced the continuous growth of their domestic companies in Taiwan and further built up their capability of internationalization.

The above tendency of cross-border investments by Taiwanese companies toward areas where cultural and geographical proximities existed, to build up their transnational linkages of production networks, was part of the forces making the "regionalization" of the Asian economy in the global market. Owing that many of Taiwan's manufacturing activities with global competitiveness have been significantly characterized by efficacy of their networked production systems, successfully reproducing production networks from home to foreign sites became critical tasks. Successfully achieved localization or reterritorialization, in Neil Brenner's term (1999), of pro-

duction networks helped many Taiwanese manufacturing firms accomplish internationalization as well as economies of scale in production. These processes were continuously sustained and significantly contributed to the second wave of Taiwan's outward investment to become "expensive" in nature rather than "defensive".

At the second stage of Taiwan's outward investment, China's magnetic effect of attracting foreign investment appeared and Southeast Asian countries were greatly influenced by the Asian Financial Crisis. The localization of Taiwanese networked production systems did not hinder the footloose character of Taiwanese manufacturing capital in search of new investment sites to fulfill their regional deployments of production. In order to accommodate the continuously changing global and regional economic environment, their local production networks in foreign production sites were responsive and evolutionary in nature. To use the information industry as an example, the networked production systems were all transplanted from the mother country and reproduced at the very beginning on foreign sites, and adjusted by experiences in previous waves of investment in foreign cluster(s), so as to adapt to the production environment at the new investment sites, which were usually newly emerged industrial districts.

Taiwan's third-wave outward investment has been characterized by the westbound tendency, even though the investment toward Vietnam is quite significant as well, and by a dramatic increase in the total amount of investment. The rapid integration of cross-strait economy and the impact of Taiwanese capital on the emerging industrial districts of the Pearl River Delta and the Yangtze River Delta in China have been in part the current processes of the restructuring of the international division of labor in global as well regional economies.

NOTES

1. Delta Electronics (Thailand) is the world's leading switching power supplier manufacturer and a major supplier of video display and electronic components.
2. Cal-Com Electronics (Thailand) is the subsidiary of Kinpo Inc., which started with manufacturing electronic calculators and is now competitive in producing advanced calculators, fax machines, printers, and electronic dictionaries. Kinpo has a 20 per cent share in the calculator markets of the world to date.

REFERENCES

Brenner, N. (1999) Globalisation as reterritorialisation: The re-scaling of urban governance in the European Union. *Urban Studies*, 36:431-451.

Chen, D.S. and Jou, S.C. (2003) Weakening transplanted production networks: The cases of Taiwan's motorcycle production networks in Vietnam and Indonesia.

Asia-Pacific Research Forum, 19:51-58.

Chen, D.S., Jou, S.C. and Hsiao, S.H.M. (2004) Interfirm networking by Taiwanese enterprises in Malaysia and Indonesia. In: Gomez, E.T. and Hsiao, S.H.M. (eds.) *Chinese Enterprises, Transnationalism, and Identity.* London: Routledge, pp. 272-202.

Chen H.M. and Chen, T.J. (1998) Network linkages and location choice in foreign direct investment. *Journal of International Business Studies*, 29:445-467.

Chen, T.J. and Ku, Y.H. (2004) Networking strategies of Taiwanese firms in Southeast Asia and China. In: Gomez, E.T. and Hsiao, S.H.M. (eds.) *Chinese Enterprises, Transnationalism, and Identity.* London: Routledge, pp. 151-171.

Dicken, P. (2003) *Global Shift: Transforming the World Economy* (fourth edition). New York: Guilford.

Dicken, P., Kelly, P., Olds, K. and Yeung, H.W.C. (2001) Chains, networks, territories and scales: Towards a relational framework for analyzing the global economy. *Global Networks*, 1:89-112.

Dicken, P. and Malmberg, A. (2001) Firms in territories: A relational perspective. *Economic Geography*, 77:345-363.

Fröbel, F., Heinrichs, J. and Kreye, O. (1980) *The New International Division of Labor.* Cambridge: Cambridge University Press.

Hamilton, G. (1991) *Business Networks and Economic Development in East and Southeast Asia.* Hong Kong: Centre of Asian Studies, University of Hong Kong.

Henderson, J., Dicken, P., Hess, M., Coe, N. and Yeung, H.W.C. (2002) Global production networks and the analysis of economic development. *Review of International Political Economy*, 9:436-464.

Hsu, C.M. and Liu, W.C. (2004) The role of Taiwanese foreign direct investment in China: Economic integration or hollowing-out? *The Journal of Korean Economy*, 5:207-231.

Hsu, J.Y. and Saxenian, A. (2000) The limits to guanxi capitalism: Transnational collaboration between Taiwan and the US. *Environment and Planning A*, 32:1991-2005.

Jou, S.C. and Chen, D.S. (2001a) Latecomer's globalization: Taiwan's experiences in FDI and reproduction of territorial production networks in Southeast Asia. *City and Planning*, 28:421-459. (in Chinese)

Jou, S.C. and Chen, D.S. (2001b) Keeping the high-tech region open and dynamic: The organizational networks of Taiwan's integrated circuit industry.

GeoJournal, 53:81-87.

Jou, S.C., Chen, D.S., and Kung, I.C. (2001) *Transnationalization and overseas investment: The case of large Taiwanese electronics firms in Malaysia.* PROSEA (Program for South-East Asian Area Studies) Occasional Paper No.50, Taipei: Academia Sinica.

Mathews, J.A. (2002) *Dragon Multinationals: A New Model for Global Growth.* Oxford, NY: Oxford University Press.

Mathews, J.A. and Cho, D.S. (2000) *Tiger Technology: The Creation of a Semiconductor Industry in East Asia.* Cambridge: Cambridge University Press.

Wang, T.Y. (2002) Lifting the 'No Haste, Be Patient' policy: Implications for cross-strait relations. *Cambridge Review of International Affairs*, 15:131-139.

Wu, F., Siaw, P.T., Sia. Y.H. and Keong. P.K. (2002) Foreign direct investments to China and Southeast Asia: Has ASEAN been losing out? *Economic Survey of Singapore* (Third Quarter 2002).

Yang, Y.R. (2005) *The Cross-border Production Networks of Taiwanese Firms of Information Industry and China's Local Development: A Comparative Studies of Suzhou and Dongguan.* Unpublished PhD dissertation, Institute of Building and Planning, Taipei: National Taiwan University.

Yeung, H.W.C. (1994) Transnational corporations from Asian developing countries: Their characteristics and competitive edge. *Journal of Asian Business*, 10:17-58.

Yeung, H.W.C. (1998) *Transnational Corporations and Business Networks: Hong Kong Firms in the ASEAN Region.* London: Routledge.

Yeung, H.W.C. (ed.) (1999) *The Globalization of Business Firms from Emerging Economies* (two volumes). Cheltenham, UK: Edward Elgar.

Yeung, H.W.C. (2000) Organizing 'the firm' in industrial geography I: networks, institutions and regional development. *Progress in Human Geography*, 24:301-315.

Yeung, H.W.C. (2001) Regulating 'the firm' and sociocultural practices in industrial geography II. *Progress in Human Geography*, 25:293-302.