REGIONAL PRODUCTION RELATIONSHIP AND DEVELOPMENTAL IMPACTS:

A COMPARATIVE STUDY OF THREE REGIONAL NETWORKS

by

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Abstract

This article assesses contending regional perspectives on Pacific-rim division of labour based on a comparative study of production networks organized by three electronics firms (from Japan, US and Hong Kong) for manufacturing in the subregional context of Hong Kong and Shenzhen (PRC). The author argues that the flying geese model rightly discerns the possibility of upward mobility of late industrializing countries. This model, in combination with network analyses on the characteristics of Japanese firms, makes the developmental role of Japanese capital distinctive. However, the model has a disregard for the specific roles of US and overseas Chinese capital. The filling of this gap can benefit from the regional rivalry perspective. The negative impact of foreign investment is reflected in the regional dependence argument. Nevertheless, its exogenous bias needs to be avoided and the analysis of the endogenous factors, particularly the role of state, can draw on the statist approach. As the regional economic reality is changing rapidly, future regional research will need to investigate how governments and firms develop strategies to cope with the continued Asian economic slow-down and political changes and to reshape the regional political economy.

Pacific-rim cities have been increasingly incorporated into the regional production networks of transnational corporations (TNCs) from not only the traditional industrial center of the US, Canada and Japan, but also from the Asian newly industrialized countries, specifically the overseas Chinese capital[1]-dominated economies of Taiwan, Hong Kong and Singapore (Hobday, 1995). Various perspectives have been put forward to characterize the changing regional division of labor and its impact on the economic and industrial development not only on the quantitative issues of economic growth and job creation, but also on the qualitative issues of technology transfer and skill formation.

This article attempts to assess the contending perspectives based on a comparative study of three regional production networks for the manufacturing of standardized electronics products. In this study, a regional production network refers to the totality of the external linkages created by contracting relationships (such as parent-subsidiary, joint venture, supplier-customer, buyer-vendor, etc.) among firms in different countries in the Pacific-rim context that involves a technical and spatial division of labor to develop, manufacture and market specific commodities. The production networks center around a hub firm from Japan, US or Hong Kong, which coordinates the production in the subregional context of Hong Kong and Shenzhen special economic zone (PRC). The assessment of the contending perspectives represents a step towards the search for a more comprehensive perspective to account for the changing regional division of labor.

THE CONTENDING PERSPECTIVES

Global Perspectives

The world system theory and international division of labor theory explain the core-periphery relationship in the global economy. The structural inequality is seen in the transnationalization of assembly processes from the TNCs to peripheral countries with limited technology transfer and skill formation (Fröbel, Heinrichs & Kreye, 1981; Wallerstein, 1979). Gereffi (1994), however, sees the space for change within the world system by differentiating two types of "commodity chain", a concept borrowed from Hopkins and Wallerstein (1986).

According to Hopkins and Wallerstein, a commodity chain refers to "a network of labor and production processes whose end result is a finished commodity". Gereffi extends the concept of commodity chain beyond production to include the flow of products to consumer markets. He observes that many brand name companies in light consumer goods industries (electronics, garments, footwear and toys) have given up manufacturing and shifted to focus on marketing and distribution. They buy the finished products manufactured by firms in the newly industrialized countries and sell them under their own brand name. The brand name companies become the buyers for these firms which work on an original equipment manufacturing (OEM) basis to manufacture the finished products based on the specification and design from the buyers. The firms in newly industrialized countries compete for contracts based on low fee, and often pursue cost-cutting strategies by relocating the manufacturing processes to nearby peripheral countries with cheap labor and land supply. Such a network of labor and production processes constitutes the “buyer-driven” commodity chain, By taking on the role of merchant in this type of commodity chain, own brand name companies allow space for firms in newly industrialized countries and peripheral countries for trade-led industrialization. The traditional “producer-driven” commodity chain (capital-and technology-intensive industries of automobiles, computers, aircraft and electronics machinery) leaves little space for industrialization of the periphery. As compared to the world system theory and international division of labor theory, the global commodity chain perspective is more dynamic in discerning the emergence of the subregional industrial centers and the possibility for industrialization in the periphery.

However, the commodity chain perspective has three weaknesses. First, its sectoral classification is biased towards the US experience. The commodity chain of many products such as electronics products, in fact, can be either producer- or buyer-driven (Henderson, 1994). Even for a standardized product such as radio, many Japanese (and Western European) brand name companies have not given up all the manufacturing processes, but have maintained the assembly of the finished products in newly industrialized countries and/or peripheral countries in order to penetrate the local market. Hence, the national characteristics of firms need to be taken into consideration. Secondly, the commodity chain perspective identifies the significant role of the firms from newly industrialized countries primarily in the buyer-driven commodity chain. In fact, in the producer-driven commodity chain, firms in newly industrialized countries do perform both the manufacturing function of the finished products and the regional coordination function by working as subsidiaries or joint venture partners. Thirdly, as with the world system theory, the commodity chain perspective regards the role of the TNCs as central and the role of the state as marginal and that is debatable.

Three sets of perspectives can help fill the gap left by the global commodity chain perspective. They are: (1) regional perspectives, (2) network analyses, and (3) the statist approach.

Regional Perspectives

The regional perspectives can be distinguished into regional developmentalism, regional rivalry and regional dependence, according to Hill & Fujita (1997, forthcoming). The regional developmentalism perspective is clearly seen in the flying geese model advocated by some Japanese academics, policy analysts, and government officials (Kojima, 1977; Inoue, Kohama & Urata, 1993). The model suggests that Japan and Asian countries are linked by innovation and catching up product cycles, and by process and product specialization. Japanese firms practice a complementary regional division of labor with Asian firms. The Asian newly industrialized countries (ANICs) specialize in assembly processes for Japan and obtain technology transfer in return. The ANIC firms learn to develop full manufacturing capacities for low- and medium-end products, and shift the lower value-added processes to the regional periphery. China and ASEAN-4 are performing these processes for Japan and the ANICs, and acquiring production know-how in return. In the Asian division of labor in industries such as electronics and automobile, Japanese firms remain the center of product and process innovation, as well as knowledge-, technology- and capital-intensive production. They export machinery and components to Asian countries and import finished products from them in return (Hill and Fujita, 1996, 1997). The flying geese model supporters acknowledge the existence of an unequal division of labor among nations. Nevertheless, they argue that the Japan-led regional division of labor offers the best hope for rapid industrialization of late industrializing nations.

The flying geese model, however, is criticized for overestimating the developmental role of Japanese corporations, and for underestimating the regional rivalry from the US and overseas Chinese firms (Hobday, 1994). Hobday acknowledges the fact that Japan has become an obvious role model for the other Asian economies, and that Japan contributes substantially to the region through foreign direct investment, aid, joint ventures, and the transfer of organizational practices. However, he points out that the US has been a larger contributor in both capital formation and technology transfer (of production hardware and knowledge through education provided to overseas students). Furthermore, the flying geese model ignores the importance of the US economy as the largest importer of Asian products, and understates the weakness of Japan as an export market.

The flying geese model also fails to reflect the significant role of overseas Chinese firms in capital formation and their innovative system, argues Hobday (1994). He points out that foreign direct investment from overseas Chinese exceeds that of the Japanese in the region. He argues that Hong Kong, Singapore and Taiwan have not totally imitated Japan, and their firms preserve their own distinctive styles of management and industrial structure, based on small- and medium-sized enterprises, family loyalty, and personal connections. Hobday predicts that the overseas Chinese model will rival Japan in East Asia in the future, with the incorporation of the special economic zones of China into the Hong Kong-Taiwan nexus of growth. He suggests replacing the flying geese model with a broader framework of East Asian development which accounts for the overseas Chinese and US involvement (and Western European and Korean as well). With a similar perspective of regional rivalry, Moon (1991) argues that the ANICs have narrowed the technology gap with Japan, thanks to the increased access to advanced technology, strong industrial base accumulated in the past regional division of labor, and integration of international financial markets. The progress of the ANICs (individually rather than collectively) has started to reduce the dominance of Japan, suggests Moon.

Despite the differences in identifying the major agents in facilitating development, the above-mentioned perspectives recognize the occurrence of regional development. The regional dependency perspective, however, takes the opposite view. Critics contest the possibility of realizing genuine development as TNCs follow the profit imperative, exploiting cheap labor and subjecting local firms to technological dependence (Bello & Rosenfeld, 1990; Schryen, 1992). They point out that Asian firms depend on the US market, Japanese components, and Chinese or South-East Asian labor, and are not more liberal in transferring technology as compared to the TNCs of industrialized countries. Furthermore, the dominance of TNCs continues to weaken the state´s capacity to perform its regulatory and developmental role.

The regional perspectives reveal the overall structure of production, distribution, and the flow of capital, technology, knowledge and skills among countries. However, they illuminate little the organizing and networking processes by firms, which shape the depth of technological development and skill formation. The understanding of the structure of regional production hierarchy is necessary but not sufficient to discern the consequences, since structure and process are only "loosely coupled". To understand the processes of organizing and networking, one can turn to the network analyses.

Network Analyses

Some studies of production networks illuminate the role of institutional factors and cultural orientation in shaping the organizing of networks. It is suggested that Japanese networks reflect the societal trust-based relationship and network economy (Fukuyama, 1995). The networks are characterized by a hierarchical structure, high trust, tight coupling in customer-supplier relationship, and mutual adaptation and responsibility. Suppliers enjoy security in terms of stable contracts and technological support, and pursue quality, constant improvement and innovation together with customers (Imai & Itami, 1984). The US networks are different, reflecting the cultural orientation of "rugged individualism" (DiBella, Nevis & Gould, 1996) and the institutional factor such as the anti-trust legislation. The networks are characterized by decentralized structures, low trust, loose coupling in customer-supplier relationship, and strong price competition (Kogut, Shan & Walker, 1993). Nevertheless, some studies indicate that the US firms (e.g. Motorola, Xerox and Ford) have shown some features of Japanese network organizations and moved away from the arm´s length relations (Imrie & Morris, 1992). Yet, trust remains a more elusive property in the US networks than the Japanese networks (Arrighetti, Bachmann & Deakin,1997).

According to the researchers at the Berkeley Round Table for an International Economy (Borrus, 1994; Ernst, 1994; Sturgeon, 1997), Japanese networks are closed and rigid, relying more on their affiliated suppliers than on the other Asian suppliers, whereas the US networks are open and flexible to local suppliers competing on the basis of fee and quality. The US networks are decentralized and fast in decision-making, while Japanese networks concentrate their power in the headquarters and are slow in decision-making. The US firms are willing to give up lower value-added product lines and buy products from Asian OEM subcontractors. Hence, the US network relations are more conducive to technology transfer to their Asian partners. Despite the difference in ideological orientation, this argument resembles the global commodity chain perspective. Critics, however, point out that the US firms, by engaging in the merchant role and fostering severe price competition, in fact export their short-term investment perspective and volatile labor relations to Asian firms. Hence, they are less conducive to the technological upgrading and long term development of Asian firms. By contrast, Japanese firms have increasingly been willing to accept minority equity relations, transfer appropriate technology in incremental pace, and work within the industrial policy framework of developing countries (Hill & Lee, 1994; Fujita & Hill, 1997; Hill & Fujita, forthcoming).

Studies on overseas Chinese networks suggest that Chinese firms present distinct networking and organizing practices, which are different from Western or Japanese systems (Hamilton,1991). The formation of the networking strategy of Chinese firms has been a reaction to volatile historical and political-economic contexts. Firms tend to keep small firm size and rely heavily on "network efficiency" to compensate for their limited in-house capacity (Tam, 1990). Their network efficiency is built on the relatively free exit and entry in networks, constant fusion of firms, and dependable suppliers based on personal trust. This makes it difficult for firms to keep new business formulae secret, and hence enhances a quick flow of knowledge. The governance structure of small- and medium-sized enterprises is often dominated by a single individual, usually the owner, and such a structure enhances the speed of response toward market changes. Lee (1997) considers the Hong Kong way of doing business (keeping size small, pursuing quick profit, maintaining high flexibility in managing the labor process and different product lines, and relying on personal trust and informal channels) a "guerrilla tactic". It is generally agreed that the over-reliance on personal connection and inadequate capital confine small- and medium-sized overseas Chinese enterprises to limited sources for knowledge inputs. As compared to Western and Japanese firms, overseas Chinese firms are slow in technological upgrading, capital deepening, and exploiting the economics of scale (Fukuyama, 1995).

The Statist Approach

The pursuit of comparative advantages and regional integration are not the main causes for rapid industrialization, according to Amsden (1989). If these arguments were sound, Latin American countries could have developed based on their complementarity with and the technology transfer from North Americas. Why countries like Korea and Taiwan have succeeded while the others have failed depends on the role of the state. The statist approach attributes the success to the developmental state which provides state subsidies for supporting R&D and strategic industries, strengthens education and investment environment, and imposes local content rules on TNCs (Lall, 1994; Wade, 1990). However, whether the state can or should play an active role in the current world economic restructuring has increasingly been questioned in view of the growing demand for greater autonomy by capital from within, the intensifying pressure for deregulation from without (World Bank and IMF), and the fear of inherent inefficiency of government intervention and corruption as revealed during the Asian economic crises (Kristof, 1998, MacIntyre, 1995).

THE PRODUCTION NETWORKS IN CONTEXT

In this study, the regional-industrial context is confined to three production networks of standardized electronics products in the Pacific-rim context. More than in any other industrial sector, the competition in the global electronics industry had been dominated by the US and Japan (Ernst and O´Conner, 1992). The electronics industry has been the biggest recipient of foreign direct investment in the manufacturing sectors of many Asian countries (including Hong Kong). The US and Japan have been the largest and second largest foreign investors respectively in Hong Kong since the advent of the electronics industry. In Shenzhen, Hong Kong investors constitute the largest investing group, followed by the Taiwanese, Japanese, and US investors.

Both Japanese firms and US corporations tried to enhance their competitiveness by relocating the labor-intensive processes to Asian countries for cost reduction as early as the late 1950s. Electronics production in Hong Kong began with the subcontracting of radio assembly for Japan in 1959 and then extended to the other standardized products, parts and components (Henderson, 1989). In the meantime, Hong Kong became the principal Asian assembler of semiconductors for the US market, with the establishment of subsidiaries by semiconductor producers (Henderson, 1989).

Since the mid-1970s, however, the electronics industry has been facing structural problems such as rising wage and land costs, a low level of technology, weak supporting parts and components segments, and an over-reliance on the US market and on Japanese supply of critical components. Owing to the fragility of Hong Kong´s political status and the British policy of keeping city-state colonies as entrepot and free trade center, the government was unwilling to subsidize R&D and industrial upgrading, and maintained a highly unregulated, flexible labor market.

Consequently, Hong Kong electronics manufacturers continuously depended on labor-intensive production and avoided taking risks in technological upgrading and capital deepening. Most companies did not develop their own brand names. Instead they remained overwhelmingly dependent on OEM contracts in the buy-driven commodity chain, and/or contracts for the subassembly of parts and components, or partnerships with Japanese and Western market leaders in the producer-driven commodity chain. Japanese and Western firms did not undertake significant technological upgrading and capital deepening either. Instead, most of them relocated their assembly processes either back to their homelands or to China and Southeast Asian countries, and shifted to turn their Hong Kong operation into a regional coordination center (Tsui-Auch, 1998a).

The manufacturers´ need for cost reduction in labor and land was accommodated by the

Open Door Policy of China. Since 1978, the Chinese authorities decided to attract foreign direct investment, expecting that overseas Chinese would be interested in investing in the Qiaoxiang areas (areas from which overseas Chinese and their ancestors emigrated) (IIAS, 1997: 29). Four special economic zones (SEZs) were established, and the first was Shenzhen SEZ. Till 1983, Shenzhen SEZ became a cheap labor haven for Hong Kong-based manufacturers, including Western and Japanese firms (Sklair, 1991). Nevertheless, there were some differences in the aim, form and scale of investment between Japanese, US, and Hong Kong (and Taiwanese) firms. Japanese firms generally aimed at market penetration in the long run. They were willing to transfer technology in exchange for licenses to sell in the China market. US firms were more varied; some aimed also at market penetration whereas many others aimed simply at cheap labor and land supply like what Hong Kong firms did. Whereas the US and Japanese firms tended to establish longer-term contracts and invest on a larger scale, Hong Kong firms took advantage of the processing or assembling arrangement on a very short term basis.

Since the mid-1980s, the SEZ authorities started to put pressure on foreign investors to upgrade their investments from processing and assembling arrangements to joint ventures with Chinese partners or wholly foreign-owned subsidiaries (WFOs) when the foreign investors applied for a renewal of their investment contracts. To avoid the upgrading, many moved out of the SEZ to the Bao'an District of Shenzhen or further north to the other Pearl River Delta cities. Those who remained in Shenzhen had to comply with the new demands. During the same period, an increasing number of smaller US and Japanese firms have partnered with Hong Kong firms to establish joint ventures in SEZ (and in China as a whole). These smaller enterprises did not have the same political clout to get advantageous terms from the Chinese authorities as the brand name companies. Their Hong Kong partners could provide vital shortcuts around the often-laborious process of establishing connections in China (Goldstein, 1988).

The local manufacturing capability of Shenzhen was weak with underdeveloped basic industries and a shortage of both skilled and semi-skilled workforce. The expanding service sector attracted local young people away from blue-collar work. Thus, manufacturers resorted to employing low-skilled, migrant workers. The local authorities were lax in enforcing labor regulations. The inflow of migrant labor, however, strained the already inadequate infrastructure. Hence, the authorities increasingly imposed various items of social infrastructure fees on manufacturers. Manufacturers found it difficult to estimate the production expenses and tended to skirt laws and regulations and to cut wages and welfare in order to prepare for the "rainy days" (Tsui-Auch, 1998b). This, in turn, reinforced the high turnover of (migrant) workers, which was unfavorable to local skill formation.

It is in this subregional-industrial context that the three production networks[2] were identified. They engaged in the manufacturing of standardized electronics products, which was largely labor-intensive. Three dimensions in each case are reported, including: (1) regional division of labor, (2) organizing and networking, and (3) technology transfer and skill formation.

Company J: A Japanese Consumer Electronics Producer

Regional division of labor

Company J (HK) was established as a wholly foreign-owned subsidiary (WFO) in 1960 first for the production of radio, and then for the manufacturing of some other standardized electronics products to be marketed under the brand name of the parent company. With the opening of China, Company J established one WFO, four cooperative joint ventures and two equity joint ventures[3]. The manufacturing processes of all products were shifted to Shenzhen, except that of batteries, for which 300 workers continued to be employed in Hong Kong. Company J (HK) was responsible for procurement, overseas marketing and fund-raising to support the Shenzhen plants. The management of Company J (HK) was not fully localized; its president and some top management personnel were filled by Japanese sent from the headquarters. Its management in Shenzhen reflected the coordination and control jointly by the Japanese, Hong Kongers, and Mainland Chinese, as seen in one of the equity joint ventures under study.

The equity joint venture was established in 1984 on a 15-year contract. The partner for Company J (HK) was a state-run Chinese enterprise, which contributed 50% of the capital. In exchange for technology from the Japanese corporation, the Chinese authorities granted the joint venture licenses to sell in the China market.

Organizing and networking

The Japanese partner was responsible for supplying production machinery, supervising manufacturing and arranging exports. The Chinese partner was responsible for worker management and domestic sales. The position of general manager was allocated to a Japanese and the position of deputy general manager was allocated to a Chinese. To sustain the continuity in individual departments, the position of departmental chief was allocated to the Chinese partner and that of the deputy chief was offered to Company J (HK). At the senior level of management, the joint venture had 10 from Japan, seven from Hong Kong and 40 from China.

The joint venture had a high in-house backward integration and a large capacity for assembly. Nevertheless, Company J was required to increase the local content of the products in return for licenses to sell in the China market. Over the years, Company J had reduced its reliance on Japanese suppliers and increased local sourcing from about a hundred suppliers in the Guangdong Province, which amounted to 30% of its total procurement. Despite the low quality and delayed delivery, the company did not dismiss suppliers but tried to strengthen its technological guidance by visiting firms more frequently, providing production instructions in advance and increasing the training of suppliers.

Technology transfer and skill formation

Over the years, Company J has increased its level of automation by importing modernized assembly lines, precision instruments, automatic testing equipment and semi-automatic insertion machines from Japan. To ensure an adequate supply of high quality parts and components, the company set up a plastic injection and coating factory in 1985, and imported eight large injection machines and four coating robots from Japan. It also established an automatic insertion factory in 1991, equipped with 14 fully-automatic insertion machines for printed circuit board (PCB) units. Both workers and supervisors were offered on-the-job training. Partly to comply with the labor regulation and partly to maintain a more stable, skilled workforce, the joint venture employed as many male direct operators as female direct operators and recruited locally whenever possible (by offering higher wages). The joint venture employed 1,600 workers, and provided them contracts on either one-year or three-year basis. Due to the low productivity of labor (as compared to Hong Kong and Japan) and job hopping of engineers, the company achieved only 60% of its production capacity.

Company J also transferred technology to its suppliers, by renting production equipment to them, and paying regular visits to inspect their operation and to provide technical guidance. The company insisted on high product quality; it occasionally rejected products of high defect rate, and demanded improvement. Nevertheless, it tried to strive for a longer term relationship with the suppliers.

Company U: A US Electronic Component Producer

Regional division of labor

Company U (HK) was established in 1985 as a WFO by its parent company for the production of DC-DC converters. To cut cost, the company started to establish WFOs in

Shenzhen for assembly in 1988. Nevertheless, it continued to employ 100 direct operators to do pilot runs and testing of products in the Hong Kong plant. The finished products in Shenzhen were transported back to the HK plant for testing before distribution to Asian customers. The Hong Kong office was responsible for the coordination and control of Shenzhen plants, Asia-wide marketing and distribution, and procurement, while the US headquarters specialized in design and development, worldwide marketing and distribution, and finance management. The additional profit (generated by the low production costs in China) had to be channelled back to the US headquarters. The Hong Kong branch office was not allowed to invest any of the profit in the design and development process, which was centralized in the US. The Hong Kong branch was run completely by local Hong Kong personnel. Ten Hong Kong managers were sent to reside in Shenzhen to supervise the WFOs, the management of which excluded Mainland Chinese.

Organizing and networking

Company U relied heavily on concurrent subcontracting. The company assembled the final products in-house at its four WFOs and subcontracted about 30% to four contract assembly houses in the SEZ. They all engaged in similar work and were mutually competitive by nature. The establishment of four WFOs and the employment of four subcontractors were not planned in advance but in reaction to market expansion.

The reliance on the network of rather than expanding its plants was to enhance the company´s flexibility. The company found it easier and faster to get approval from local governments to establish smaller operations and to get around the Chinese bureaucracy in tax payment and labor recruitment. It enabled the company to avoid size expansion, and hence lay-offs of its employees during market downturn. It could avoid a total breakdown in production in case of strikes at one particular plant or government intervention. The contract assembly houses, which are owned and operated by Hong Kong manufacturers, were overwhelmingly dependent on the orders of the company. They, too, tried to avoid size expansion, and imitated Company U´s strategy to encourage workers to work overtime during market expansion for a reward in Hong Kong dollars. (HK dollar is better received among Chinese workers in Guangdong than Renminbi, the Chinese currency).

Company U did not purchase parts and components from Chinese suppliers due to the limited availability, poor quality, unstable supply and a lack of after-sales service. It procured largely from Hong Kong suppliers in Shenzhen, and packing materials from local suppliers.

Technology transfer and skill formation

Manufacturing was labor-intensive, requiring only simple tools and manual labor. The WFOs had a total workforce of 6,000. 70% of the workers were migrant workers from inland China, and 80% were female. The WFOs employed 50 engineers for technical support. Temporary contracts were given only to engineers but not to direct operators. The company set up a training department to provide new workers on-the-job training for two-to-three weeks, and annual retraining for the first two years of employment. The training department kept record of the attendance of workers. It provided training also to the line supervisors of contract assembly houses. The company also transferred technology (equipment for assembly, testing and quality control) to contract assembly houses. The presence of Hong Kong contract assembly houses, in fact, reduced the chance for local firms to compete for contracts.

Company H: A Hong Kong Audio Products Producer

Regional division of labor

Company H worked as an OEM supplier of audio products for about ten US customers. Its business was rather unstable, and had to compete with many other OEM subcontractors for contracts. It had to cope with the high costs of critical components purchased from Japan and South Korea which constituted 60% of its production cost. To maintain its competitiveness, the company practiced two strategies: (1) to adjust to changing consumer taste by adding new features to its products, often through "cloning" of similar products in the market, and (2) to cut cost through relocating the manufacturing processes to Shenzhen.

In 1984, the owner started to subcontract the assembly processes to a contract assembly house in Shenzhen recommended by his relatives there. When its processing and assembling contract expired in 1992, the Shenzhen authorities demanded that Company H upgrade its investment. The owner decided to set up a cooperative joint venture, for which he could get a quicker approval from a lower level of government authority. The Chinese partner contributed only land for a factory building and played no role in running the joint venture. In the meantime, Company H closed its small sweatshop in Hong Kong and laid off all the 50 workers. It then turned the Hong Kong plant into an office for regional coordination and control of the Shenzhen plants, finance management, procurement, and customer relations.

Organizing and networking

The owner worked at the Hong Kong office from Monday to Thursday, and supervised his Shenzhen plant from Friday to Sunday. He sent two Hong Kong managers to stay in Shenzhen to supervise the day-to-day production. The company used to subcontract surplus orders on an *ad hoc* basis. However, in view of the increasing demands of customers for high product quality and timely delivery, the owner began to develop a longer term relationship with several Hong Kong subcontractors with whom he had cooperated for years. He provided them critical components for the assembly, and at times rented the production equipment to them.

Company H rarely purchased parts and components from local suppliers due to limited availability, low quality and unstable supply. Instead, the company continued to rely on Taiwanese and Hong Kong suppliers from whom the owner had procured for years. These suppliers set up manufacturing plants in Shenzhen since most of their customers had relocated there.

Technology transfer and skill formation

Company H relocated all the assembly equipment (stone ovens and wire cutting tools) and semi-automated testing equipment from Hong Kong to its Shenzhen plant. The level of automation was low. Even for a standardized product such as radio, each customer aimed to differentiate his or her product from the others by specifying the details on its function and appearance. The small scale production for each specific radio product rendered high automation cost-ineffective. Company H employed 600 workers. Most of them were migrant workers from inland provinces, and 85% were women. Unlike the managers and engineers, workers were not on contract. The workers were offered only a few days' on-the-job training, and their skill was not upgraded. The owner tried to cut costs whenever possible, say, in training. He had to frequently pay various kinds of social infrastructure fees without notice and therefore had to budget for such unexpected expenditure. At times, he evaded the regulations. When caught, he could avoid trouble by resorting to personal connections and bribery.

ASSESSING THE PERSPECTIVES

The three cases illustrate different regional production relationships and developmental impacts between production networks organized by hub firms from different countries. Yet, the author does not intend to generalize the relationship between national capital and regional development impacts. Whereas the industrial structure (of small- and medium-sized manufacturing enterprise) of Hong Kong is rather homogenous, that of Japan and the US is varied with respect to firm size, technology, and position in industrial pecking orders. The cases are explored only to provide some materials to assess the contending perspectives.

The Structure of the Regional Production Hierarchy

The hierarchical governance and wide technology gap in each production network lends support to the perspectives of regional dependency and regional developmentalism which acknowledge the persistence of unequal power relationship, rather than the regional rivalry perspective which sees the "multiple catch up" or the narrowing of gaps in technological and economic capability. Disregarding the types of commodity chains, the brand name and/or technology leaders controlled largely the highest value-added functions of design and development and world-wide marketing and distribution. The Hong Kong partners coordinate subregional procurement, finance management, marketing and distribution, and material purchase, and/or perform pilot runs and testing. The lowest value-added manufacturing processes concentrated in Shenzhen. That means the traditional industrial core keeps a firm control of the distribution of added values. The new industrial, semi-peripheral, subregional centre remains heavily dependent on the industrial core for contracts, parts and component supplies, and world-wide marketing and distribution. The periphery depends on foreign direct investments that contribute to economic growth, job creation, skill formation and technology transfer.

Yet, the regional developmentalism perspective provides a more convincing account of the changing regional division of labor than the regional dependence perspective. The Hong Kong partners emerge as subregional coordinators both in the buyer-driven commodity chain as OEM subcontractor (in the case of Company H) and in the producer-driven one as subsidiaries (Company J and Company U). As an OEM subcontractor, Company U manufactures the finished products by coordinating its manufacturing network as a hub firm. As subsidiaries, the Hong Kong unit jointly coordinates the local networks with their parent-companies, and the degree of autonomy depends on the national and cultural characteristics of the partners and the capability of the locals. These can be explained by the regional development perspective. The regional dependency perspective, however, perceives a rigid dominance-dependency relationship, and hence fails to analyze the changing regional division of labor.

Processes and Agents of the Regional Division of Labour

Judging from both the processes of organizing and networking, technology transfer and skill formation, the regional developmentalism perspective provides a better analysis than the regional dependency perspective. Despite the persisting technology gap, there is evidence of technology and skill transfer. Especially in the case of the Japanese network, there is evidence of joint management, technology upgrading, a deepening of local sourcing, and stable subcontracting relationship. These cases indicate some possibilities for the strengthening of the local manufacturing capability in the long run. Similar conclusions are seen in a number of recent studies (Fujita & Hill, 1997; Hill and Fujita, 1996, forthcoming; Hobday, 1995). The dependency theorists, however, dismiss completely the contribution of assembly processes and the incremental improvement in process and product technology, and hence fail to capture the space for change.

Among the agents of development, the Japanese firm plays the most positive role. The argument that Japanese firms are closed to local suppliers is not supported in this study. The Japanese firm has increased local sourcing whereas the other two have not. The openness of a network seems to depend on local regulation and capability in the basic industries. Another argument that Japanese firms have a centralization of power in the headquarters is also not supported in this study. The procurement, finance management and subregional distribution of the Japanese corporation, as with the US firm, are decided by the Hong Kong regional office. The degree of decentralization seems to depend on the national characteristics of the hub firm, the product, local regulation and local capability reflected in the quality of the engineers and managerial personnel and business infrastructure. The Japanese firm seems to be more rigid than the US firm in the localization policy of managerial staff. Yet, it is probably due to this rigidity that it is relatively immune from the guerrilla tactics of the Hong Kong style in operating in China.

The US firm, instead, shows a "hybrid culture" in managing the labor process--as seen in a mixture of guerrilla tactics of the Hong Kong style and the US tradition of mass production and industrial culture. In line with the guerrilla tactics of the Hong Kong style, the US network focuses on cost reduction and risk avoidance. In consistent with the US tradition, the US firm develops institution, mechanisms and rules for on-the-job training. This is probably related to its industrial culture toward training, stronger financial capability and larger scale of production. The prevalence of the Hong Kong guerrilla tactics in the US firm but not in the Japanese firm points to the factor of national characteristics of firms. The US network and Hong Kong network pursue quick profit, price competition and high flexibility whereas the Japanese network stresses long-term development, quality competition and mutual adaptation. Nevertheless, culture and practice are embedded in social relations, and they do change over time with changing social relations. Hong Kong firms are increasingly developing more stable subcontracting relationships with their subcontractors. The US firm´s reliance on and tight coupling with a limited number of subcontractors (as their only customer) reflects its learning from the Japanese. Given an improvement in the local capacity of basic industries in the future, the local authorities are likely to attract more local sourcing from the US and Hong Kong networks as well. Thus, a higher degree of regional developmentalism for mutual benefit can be achieved.

Hong Kong (and overseas Chinese) firms remain far from being a distinct force for development of the periphery, in contrast to the prognosis of the regional rivalry perspective. As shown in this study, the Hong Kong firm contributes the least in technology transfer and skill formation. The ethnic and cultural ties do not enable Hong Kong personnel to engage in a more congenial working relationship with local partners and workers. Instead, they serve as a "natural" advantage for them to spot opportunities, build personal connections, and get around laws and regulations. In addition, the relocation of Hong Kong´s basic industries has hindered the development of the local supporting industries in Shenzhen. In general, Hong Kong networks are good at coping with market fluctuation and constant renewal, but are weak in capital deepening, technological upgrading and joint product development and innovation. Hong Kong manufacturers are cognitively locked into guerrilla tactics and fail to perceive alternative strategies for longer-term development. Unless the Chinese business community devotes more effort to upgrade its technology, manufacture higher value-added production, and pursue product development and innovation, it cannot rival Japanese capital. Hobday correctly draws attention to the need to construct a broader framework to account for not only the Japanese but also the US and overseas Chinese involvement. Nevertheless, he ignores the characteristics of US networks and the penetration of guerrilla tactics which are less conducive to long term development. He overestimates the overseas Chinese innovation system (largely in terms of high flexibility and constant renewal) and the contribution of small- and medium-sized overseas Chinese enterprises in the development of the periphery, and understates the shallow industrial base and the negative social impacts of the investment.

The role of the state in the changing regional division of labour

This comparative study lends support to the Japan-centred flying geese model of regional development with respect to the role of Japanese TNCs in strengthening the local manufacturing capabilities of Shenzhen. However, what deviates from the flying geese metaphor is that the Hong Kong plant had not attained full production capabilities (including product development and innovation). The Japanese company´ s lack of action to upgrade the Hong Kong production, however, was in line with the policy adopted by most other foreign producers in Hong Kong. Yet, many Japanese electronics firms (and US and Western European firms) undertook technological upgrading in Singapore, thanks to the policy of selective intervention effectively implemented by the government. That indicates a policy of selective intervention carried out by effective and clean government can foster technological upgrading in the "catching up" Asian economies. This argument is supported by the statist approach which attributes the rapid industrialization of late-industrializing countries to the role of the state. As shown in this study, the Chinese authorities had the institutional clout to negotiate technology transfer with the Japanese firm and to demand the Hong Kong firm to upgrade its form of investment. Unfortunately, the Chinese authorities have not devoted effort to nurture a strong basic industry, a skilled workforce, and local capital for industrialization. What makes it worse is the prevalence of corruption and the disregard of law.

Conclusion

The comparative study of production networks reveals different regional production relationships, and processes, agents and institutions shaping developmental impacts. At present, no single perspective can provide a comprehensive account of such complexity. The flying geese model rightly discerns the possibility of upward mobility of late industrializing countries. This model, in combination with network analyses on the characteristics of Japanese firms, makes the developmental role of Japanese capital distinctive. However, this model remains Japan-biased and provides no account of the rivalry from the US and ANIC/ overseas Chinese capital. This gap needs to be filled by an account of the competition among regional players and their specific roles in shaping regional production. The perspectives of regional developmentalism and regional rivalry, however, do not account for the negative impacts of foreign investment. One can, instead, draw on the regional dependency perspective to discern such impacts, but needs to avoid its exogenous bias which precludes the role of endogenous factors in enhancing or hindering development. The analysis of endogenous factors, particularly the role of state, can benefit from the statist approach. In the 21st century of rapidly changing Pacific-rim regional economies, regional research will need to take into account how governments and corporations of the reviving economic power of the US, crisis-ridden Japan, and the less negatively affected PRC (including Hong Kong), Taiwan, and Singapore develop strategies to cope with the regional economic slow-down and reshape the regional political economy.

Endnotes:

1. Overseas Chinese firms refer to enterprises owned by people of Chinese origin but live outside Mainland China, including Hong Kong people. Politically, Hong Kongers are no longer seen as overseas Chinese with China´s takeover of Hong Kong since July 1997.

2. The research was done in summer 1994. To retain the confidentiality, I use J to represent the Japanese company, U to represent the US company, and H to represent the HK company. The respondents of the three firms were the highest ranking personnel in each company. For company J, I interviewed the President of the HK operation, and the General Manager of the equity joint venture. For company U, I interviewed the managing director of the Hong Kong operation (a week before he resigned and emigrated to Canada). For company H, I interviewed the owner.

3. In an equity joint venture, a foreign partner must contribute a minimum of 25% of the equity, and most contracts last for 10 to 20 years. This is the only form of foreign investment in China which is guided by a relatively detailed legal framework. Another form of joint venture is the "cooperative joint venture" which can be approved by a lower level of authority than that of a wholly foreign owned venture or equity joint venture. This form of investment is extremely flexible. The Chinese side can contribute nominally, leaving the foreign partner to run a virtually 100% foreign venture. Many existing local companies in the SEZ were units set up by the party officials in the North to "fish" foreign partners. They are not keen on technological learning but obtaining hard cash from foreign partners and gaining prestige by succeeding in "fishing" foreign partners, especially those from the West. They leave the operation totally in the hands of the foreign partners.

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Table 1: A summary of company data

Companies / Data	Japanese Company (J)	US Company (U)	Hong Kong Company (H)
Products	radios, cassette recorders, TVs	DC-DC converters	radios, Walkman
Regional division of labour			
Headquarters	in Japan: personnel (assigning chief management to regional centres)	In the US: design and development, world-wide marketing and distribution, finance management	in Hong Kong: co-ordination and control of Shenzhen plant, finance management, customer relations, procurement,
subregional center in HK: functions and degree of localization at senior management level	co-ordination and control of Shenzehn plants, procurement, overseas marketing and distribution, fund-raising, small-scale manufacturing; not fully localized	co-ordination and control of Shenzhen plants, procurement, Asia-wide marketing and distribution, pilot run and testing of products; completely localized	same as the above; completely localized
assembly processes in Shenzhen	in-house	concurrent subcontracting	basically in-house and subcontracting surplus orders
Basic facts of Shenzhen plants			
types of contract	equity joint venture	wholly foreign owned subsidiary	co-operative joint venture
sales	export and local sales	export	export
Organizing and Networking			
Senior management at Shenzhen plants	Japanese, Hong Kong and Mainland Chinese	Hong Kongese	Hong Kongese
local sourcing of parts and components	increased to 30% of total procurement	only packing materials	rarely
subcontracting relationship	stable, tightly coupled, longer-term based	stable, tightly coupled	getting more stable
Technology transfer and skill formation			
level of automation	getting higher	low	low
technology upgrading	yes	no	no
in-house backward integration	high	low	low
training	systematic	systematic	ad hoc and limited
number of direct operators	1,600	average: 1,500	600
temporary contract offer to direct operators	yes, 1-3 year based	no	no
backgrounds of direct operators	rather even gender distribution, proportionally few migrants	largely female migrants	largely female migrants