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**GROWING UP AND MOVING OUT:
GLOBALIZATION IN THE TAIWANESE
TEXTILE/APPAREL AND AUTOMOTIVE SECTORS**

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No matter what the stage of development, every country worries about its place in the international division of labor. States that are early on the development path, on the one hand, seek to develop industrial sectors whose impact will be both broad and long-term. The challenge for these countries is to learn from those countries that developed earlier, while avoiding dependency. The fear is being cut-out (or even worse, left-out) of the dynamic sectors that power the global economy. Advanced industrialized countries, on the other hand, already have companies that are global players--often the sort of powerhouses that developing countries so longingly eye--but both their established nature and the very "globalness" of their nature inspires insecurities at home. The former leads to the fear that leading sectors and firms will not adjust rapidly enough to changes in the world economy; the latter leads to fears of hollowing-out at home as companies move operations to countries where labor is less expensive and regulations more lax.

The Republic of Taiwan is unusual in that it confronts the challenges of both the developed and the developing world: until quite recently it was one of the classic cases of "late" development; it now confronts the questions of adjustment that are so familiar to the advanced capitalist countries. It fears both being cut-out and hollowed-out. Sectors that not long ago it was struggling to develop are now in a mature stage of development, and decisions must be made whether to retain a manufacturing capacity in these sectors, shift resources out of these sectors, or move manufacturing facilities offshore. If the latter decision is made, as is often the case, particularly in traditional sectors for which Taiwan is no longer a low-cost production site, the proper relocation strategy must be chosen. Unlike many developing countries, Taiwanese firms have the skills necessary to relocate operations offshore in the manner of a powerful developed nation, but because of their late-development history, they confront challenges that other developed nations might not.

This paper analyzes the process of adjustment and relocation in two industrial sectors in Taiwan, the auto sector and the textile/apparel sector, and argues that the choice of relocation strategies must take into account two factors. First, although the pressures

driving relocation (e.g. shortage of workers for low-end manufacturing; increasing labor costs; increased regulation) in Taiwan and advanced industrialized countries may be similar, the strengths and weaknesses of the Taiwanese firms will not be the same, and relocation strategies must recognize this. In many cases these strengths and weaknesses can be traced back to how these sectors were initially developed, and consequently the strategy for moving manufacturing capabilities out of Taiwan must take into account how these capabilities came into Taiwan.

In the auto sector, for instance, technology was acquired primarily through licensing agreements and joint ventures with Japanese firms, and even after several decades of development, Taiwanese firms are still dependent on these relationships. The major OEM firms continue to be part foreign-owned. Because domestic OEM firms had neither a large enough domestic market nor the capability to move beyond the domestic market, they could never achieve production volumes that allowed them to develop an independent capabilities. In the textile and apparel, by contrast, where the technological hurdles of the industry were not as high, the Taiwanese firms quickly moved from a domestic orientation to export-oriented growth, and firms were able to develop independent capabilities. While OEM auto firms are forced to a certain extent to play into the broader strategy of their foreign partners, the textile and apparel firms have developed a globalization strategy that allows them both to compensate for weaknesses at home and protect their core operations by smoothing variability in demand.

Second, relocation strategies must take into account both the nature of the value chains within a sector, and the place (both current and potential) of Taiwanese firms in them. Although there is nothing new about relocating factories offshore, the strategies of relocation are influenced by advances in information and manufacturing technologies, and these changes are sector specific. In the textile/garment sector, although sometimes pointed to as a classic sunset industry, the trends within the industry have been in a direction that makes the skills of Taiwanese firms increasingly valuable. Information technologies have

made the value chain highly divisible, Taiwanese firms are very effective at managing the manufacturing end of these chains, and the industry (e.g. use of information technology, lean retailing, emphasis on labor standards) has been moving in a direction that to a certain degree increases the leverage of Taiwanese firms in the overall chain.

In the auto industry, however, trends within the sector have been moving away from the skill-set of Taiwanese OEM firms. The trend is towards a smaller number of global players in both the assembly and components industry, and because an increasing degree of the design work is out-sourced to the components firm, it has become more difficult to delink parts of the chain geographically or in terms of the companies involved. Consequently, when an assembly firm begins operations in a new location, it often forces suppliers to co-locate with it. Because of the tight linkages between these global operations--actors and processes are remarkably constant across locations--it is possible to build world-class manufacturing facilities in remote locations. The Taiwanese OEM auto sector, developed largely through technology-licensing agreements and joint ventures with Japanese firms, is not well integrated into global value chains and it does not have independent design capability. When firms within the sector have created offshore facilities, rather than tie into existing manufacturing chains (or even attempt to complement the capabilities of its home base in Taiwan), they have simply reproduced manufacturing facilities and supply networks in a new location (in this case, mainland China). Although this strategy may have worked two decades ago, when all the cars being produced in China were old models, it will be difficult to compete over the long-term with global competitors that have the capability to change and update models on a regular basis. Rather than try to compete head-on with the international auto firms, Taiwanese OEM auto firms would do better to carve a niche in the manner that the textile and garment firms have.

I. Theoretical Approaches to Relocation

Just as there are different approaches to development, there are different approaches to the stage that comes immediately after successful development, when the comparative advantage that has been acquired through such great effort begins to wane. What should be moved offshore and when? One of the most influential models of relocation in the study of East Asian political economy has been the product-cycle theory. Bruce Cumings points to Japan, Korea, and Taiwan as a perfect illustration of the theory. "The cycle in given industries--textiles, steel, automobiles, light electronics--of origin, rise, apogee, and decline has not simply been marked, but often mastered in Japan; in each industrial life cycle there is also an appropriate jumping off place, that is, a point at which it pays to let others make the product or at least provide the labor. Taiwan and Korea have historically been receptacles for declining Japanese industries."¹ In the first stage of the process, Taiwan and Korea imported Japanese products; they then began to import technology and capital goods in order to establish their own industries; and finally, having mastered a particular manufacturing process or product, they themselves began to export. The logic is the same for both firms and leading sectors in a national economy. Both will initially export from home to meet foreign demand for a new product, but as the product matures and competition intensifies, cutting production costs becomes increasingly important. Production is gradually moved to those locations with lower labor costs.² The expectation is that countries on the receiving end of this investment will be able to gradually replicate the industrial structure of the "geese" flying ahead of them in the formation.

Although the product-cycle captures a key dynamic driving the outward flow of investment from a mature economy, it necessarily simplifies a complicated process, and in doing so, confuses the issues facing mature late-developing countries. As Mitchell Bernard

¹ Bruce Cumings, "The origins and development of the Northeast Asian political economy: industrial sectors, product cycles, and political consequences," *International Organization* 38 (Winter 1984), p. 46.

² The national level version of the product-cycle model, also known as the "flying geese" model, has been attributed to a Japanese economist, Akamatsu Kaname, writing in the late 1930s; the product cycle of individual products and the relationship to firm competitiveness was the focus of Raymond Vernon's work in the 1970s. Mitchell Bernard and John Ravenhill, "Beyond Product Cycles and Flying Geese: Regionalization, Hierarchy, and the Industrialization of East Asia," *World Politics* 47 (January 1995), p. 172-173.

and John Ravenhill argue in their development of a regional hierarchy approach, an attempt to move beyond a product-cycle approach, neither Taiwan nor Korea were able to develop exact replicas of Japanese production structures. To the contrary, not only did local context (e.g. politics, history, institutional structures) affect the form of new production structures, it was also difficult to develop a single commodity in isolation. "Rather than an 'ahistoric' flow of a single commodity," Bernard and Ravenhill write, "contemporary production needs to be seen in terms of interrelated complexes of industrial activity involving networks of firms, and continuous innovation of a key range of inputs in a multitude of related industries."³ The problem is twofold. First, the process of product and technological maturation that is predicted by the product-cycle model appears to be less and less common. "More complicated production processes, the increasing rapidity with which products are being introduced, and more complex embodied technologies that result from research and development ... have all reduced the efficacy of reverse engineering as a catch-up production strategy."⁴ Second, it is not an entire production system that an advanced country such as Japan simply boxes up and ships to a low cost labor site, it is part of the system, and in most circumstances it is the labor intensive part of final assembly. The forces of innovation and the backward linkages remain behind. Rather than industries being transferred from one goose to another, it is a piece of an industry, and not all pieces are equally advantageous. The expectation is that the partial diffusion of technology will create an intraregional hierarchy of production, with the depth of the industrial foundation growing weaker at each stage.

The commodity-chain approach in many respects follows a similar logic, particularly the emphasis on production networks, but extends it further: the nation-state as a unit of analysis drops out completely, and is replaced by the global commodity chain, defined as "a network of labor and production processes whose end result is a finished

³ Bernard and Ravenhill, p. 184.

⁴ Bernard and Ravenhill, p. 177.

commodity."⁵ Rather than attempting to determine the power of different nations within a production network, this approach argues that there are different "nodes" in a commodity chain--pivotal points in the production process (i.e. supply of raw materials, production, export, marketing)--and the objective should be to understand how control of various nodes translate into power and profit. The nature of the chain becomes a key variable. Gary Gereffi identifies two distinct types: the producer-driven chain and the buyer-driven chain. While in a producer-driven chain large, integrated enterprises play the key role in controlling forward and backward linkages, in a buyer-driven chain large retailers, brand-named marketers, and trading companies control a decentralized production network often located in the developing world. The auto industry is a classic example of the former; the garment industry is a classic example of the latter. The expectation is that in the latter, buyer-driven chains, profits and power "derive not from scale, volume, and technological advances as in producer-driven chains, but rather from unique combinations of high-value research, design, sales, marketing, and financial services that allow the buyers and branded merchandisers to act as strategic brokers in linking overseas factories with evolving product niches in their main consumer markets."⁶

How do these approaches help us think about the challenges facing the Taiwanese textile/garment and auto industries? It is possible to outline some preliminary hypotheses. With respect to the textile/apparel industry, a product cycle approach would lead us to believe that Taiwan is in a situation much the same as Japan was three decades earlier. Garments is often used as a classic example of a sunset industry.⁷ In 1984, Martin

⁵ Richard P. Appelbaum and Gary Gereffi, "Power and Profits in the Apparel Commodity Chain," in Edna Bonacich, Lucie Cheng, Norma Chinchilla, Nora Hamilton, and Paul Ong (eds.), *Global Production: The Apparel Industry in the Pacific Rim*, (Philadelphia: Temple University Press, 1994), p. 43.

⁶ Gary Gerrefi, "The Organization of Buyer-Driven Global Commodity Chains: How U.S. Retailers Shape Overseas Production Networks," in Gary Gereffi and Miguel Korz eneniewicz, (eds.), *Commodity Chains and Global Capitalism*, (Westport, Conn.: Praeger, 1994), p. 99.

⁷ In fact, when Akamatsu Kaname first used the term "flying geese" in the 1930s it was in a study of the Japanese textile industry. The "Made by Hong Kong" project challenged the notion of textile /apparel being a "sunset" industry. See Suzanne Berger with David Gartner and Kevin Karty, "Textiles and Clothing in Hong Kong," in Suzanne Berger and Richard K. Lester, (eds.), *Made By Hong Kong*, (New York: Oxford University Press, 1997).

Feldstein, then chairman of President Reagan's Council of Economic Advisors, explained this view in testimony before the U.S. Congress:

The labor intensive [U.S.] apparel market cannot and should not compete with much lower cost labor elsewhere. The stuff depends on somebody sitting at a sewing machine and stitching sleeves on; it is crazy to hurt American consumers by forcing them to buy that at \$4 or \$5 an hour of labor. We ought to be out of that business.⁸

The very same argument, of course, can be made in Taiwan: given the rising labor costs in the industry, firms should move resources out of mature industries that are prone to rising labor costs in Taiwan in order to create space for more profitable sectors. And as I will explain below, this is exactly what has happened. But a product-cycle approach would expect that these same firms would then move on to the next product, and begin a new cycle. This has not happened. To the contrary, the Taiwanese firms are moving parts of the industry abroad--based on a complex set of calculations that will be explained in detail below--but retaining overall control (and often some manufacturing) in Taiwan: it is only the nationality of the workers that is different.

From a regional hierarchy or commodity chain perspective, this is not a surprising outcome. Both would expect Taiwanese garment industries to move labor intensive operations offshore, but to remain in control over the decentralized manufacturing network. The result is the creation of "triangle manufacturing" networks. "Taiwan's erstwhile exporters," according to Gary Gereffi and Mei-lin Pan, "are being transformed into intermediaries between foreign buyers and new producers in low-wage nations that have sufficient quotas to supply protected developed-country markets."⁹ The Taiwanese remain in control of the manufacturing end of the chain, but utilize the low-cost labor of less developed countries--exactly what has happened. A commodity chain approach, however,

⁸ Cited in Frederick H. Abernathy, John T. Dunlop, Janice H. Hammond, and David Weil, *A Stitch in Time: Lean retailing and the transformation of manufacturing--Lessons from the apparel and textile industry*, (Oxford: Oxford University Press, 1999), p. 11.

⁹ Gary Gereffi and Mei-lin Pan, "The Globalization of Taiwan's Garment Industry," in Edna Bonacich, Lucie Cheng, Norma Chinchilla, Nora Hamilton, and Paul Ong (eds.), *Global Production: The Apparel Industry in the Pacific Rim*, (Philadelphia: Temple University Press, 1994), p. 127.

predicts that this is an unstable outcome for two reasons: first, because garments is a buyer-driven chain, the manufacturing portion controlled by Taiwanese companies is inherently unstable; and second, it is only a matter of time before the country that is receiving Taiwanese investment will improve its own capabilities and seek to cut out the Taiwanese middle-man. "When that happens," Gereffi and Pan argue, "[Taiwanese] employers as well as workers in Taiwan's garment companies will be looking for new jobs."¹⁰

Predictions with respect to the auto industry are not as clear-cut. In many respects, Taiwanese auto firms face an uphill challenge because they are attempting to globalize not from a position of strength at home, but from a position of weakness. As mentioned previously, the Taiwanese auto market simply cannot support the production volumes necessary to be a world-class auto manufacturer. Consequently, the auto firms see the reproduction of their manufacturing capabilities to the mainland (in order to broaden their market) as the only viable long-term strategy. From a theoretical perspective, there might be reason for hope. A product-cycle approach might note that the auto sector is a relatively mature industry in Taiwan, and although it has been hampered by relatively low production volumes, it has strong manufacturing skills that have been mastered over the period of several decades. Furthermore, the auto industry is a sector in which Taiwanese firms are not hampered by simply being the manufacturing link in a long commodity chain. In Gereffi's terms, autos is a "producer-driven" rather than a "buyer-driven" chain. Assuming that Taiwanese OEM auto manufacturers are given the authority by foreign-owners, they could potentially have some advantages. Not only is there no danger of being ultimately cut-out of the chain by lower-cost labor sites and the brand-name buyer, there is also some reason to believe that a Taiwanese firm will have a better "feel" for the mainland marketplace than an MNC from Europe, Japan, or the United States. Furthermore, they have experience with a Taiwanese market that is only a few decades ahead of the mainland

¹⁰ Gereffi and Pan, p. 144.

market, and they have hard-earned experience at operating profitably at low volumes--still a key characteristic of the mainland automotive market, much to the chagrin of foreign auto firms who have made huge investments with highly optimistic growth projections.

II. The Taiwanese Textile and Garment Sector: Divided They Stand?

During the 1980s, not only did the cost of labor and government regulation of the labor market (i.e. Labor Standards Law of 1984) sharply increase the cost of manufacturing in Taiwan, but because the value of the New Taiwan dollar vis-a-vis the U.S. dollar fell from forty in 1985 to twenty-six in 1990, exports from Taiwan became correspondingly more expensive.¹¹ These two changes were the primary drivers of outward investment in the Taiwanese textile and garment industry. Over the course of the next decade, the percentage of apparel and accessories exports from Taiwan--the most labor intensive part of the sector--declined, while the percentage of textile fiber exports increased. Taiwan's exports of apparel and accessory represented 55% of overall textile exports from 1975 to 1986, while exports of yarns and fabrics represented just over 40%. By 1992, however, exports of apparel and accessories had fallen to one-third of overall textile exports, and exports of yarns and fabrics had increased to 61%. In absolute terms, Taiwan's apparel and accessory exports peaked in 1987 (at US \$5 billion), and have lagged well behind exports of yarn and fabrics since 1988.¹²

Textile production in Taiwan has increased relative to apparel because Taiwanese firms have relocated garment production to regions where labor costs are lower. It is the triangular manufacturing system described by Gereffi and Pan: foreign buyers place orders with a Taiwanese firm with which it has had a long-term relationship, this firm then issues the manufacturing orders with offshore factories (that it either owns or contracts), and the

¹¹ Gereffi and Pan, p. 129.

¹² Gereffi and Pan, p. 130-131.

final goods are then shipped to the foreign buyer. This system is possible because the parts of the textile/apparel value chain are relatively distinct. Although information must flow between the parts of the chain, these parts are not integral in the sense that one is dependent on a particular relationship with another. But this also creates a degree of vulnerability for the firm that occupies the manufacturing parts of the chain because the brand-name retailers will ultimately have little loyalty when lower cost manufacturing sites are available. In a triangular manufacturing system, Gereffi and Pan argue, the Taiwanese firm increasingly becomes little more than a middleman between the foreign buyer and the overseas contractors, and there is little other than the trust accumulated over the course of a long-term relationship to prevent this role from ultimately being completely eliminated.¹³

Will Taiwanese firms ultimately be cut out of global apparel commodity chains? Although the danger is certainly real, two changes have the potential to actually increase the leverage of Taiwanese manufacturing operations in the overall textile/apparel value chain: the importance of information linkages between the various parts of the value chain and the increasing focus in final markets on labor conditions. Both have the potential to increase the "stickiness" of the relationships within the value chain.

The first change is driven by "lean" retailing and the sophisticated information linkages that this approach requires. Until the mid-1980s, relations between firms within the textile and apparel sector were arm's length relationships between relatively autonomous firms.¹⁴ In the mid-1980s, however, technological and market changes led giant retailers such as Wal-Mart to transform the relationships between the production, distribution, and retailing parts of the commodity chain. As Abernathy, Dunlop, Hammond, and Weil describe, Wal-Mart, among others, insisted "that suppliers implement information technologies for exchanging sales data, adopt standards for product labeling, and use modern methods of material handling that assured customers a variety of products

¹³ Gereffi and Pan, p. 136.

¹⁴ Abernathy, Dunlop, Hammond, and Weil, p. 2.

at low prices.... These new practices--which [the authors] call *lean retailing*--have compelled apparel producers to reorganize the manner in which they relate to retail customers, undertake distribution, forecast and plan production, and manage their supply relations."¹⁵

The impact of information technologies on certain segments of the apparel industry is profound primarily because of retailers desire to develop supply relationships based on a rapid replenishment system. Firms in many sectors hold the objective of keeping inventories low, but it is particularly important in the apparel industry because of the risk associated with fashion trends. A particular fashion item must be developed and manufactured months before the season in which it is sold, and if it does not sell, the retailer is forced to gradually decrease the price until the inventory begins to move. In 1985, the cost of markdowns in the U.S. apparel industry was estimated to be \$25 billion.¹⁶ If, on the other hand, an item does prove to be popular, the retailer wants to be able to replenish its stocks as rapidly as possible so as to take full advantage of an all too fleeting fashion trend. The objective of lean retailing is to reduce the risk of selling a perishable good by continuously adjusting the supply of products offered to consumers at retail outlets so as to match the actual level of market demand.¹⁷ Abernathy, Dunlop, Hammond, and Weil describe the process:

The lean retailer collects information from its stores on sales of particular products at the style, size, and color level [using bar codes at the check-out counter], compiling that information at the end of the week--usually on Sunday night after weekend sales are known. It then transmits an electronic order to the appropriate supplier on the same night. On Monday or Tuesday, the supplier ships the products ordered in containers that can be electronically scanned at the retailer's distribution center. The shipment, unloaded at this center, moves through an automated sequence of scanning, weighing, and routing. At another bay of the distribution center, a truck is loaded, destined for the store requiring replenishment. By Wednesday or Thursday, shipping clerks at the store unload the truck and stock their shelves. Apparel items move without being touched by human hands from the time they are loaded into a container by a supplier to unloading at a specific retail store.¹⁸

¹⁵ Abernathy, Dunlop, Hammond, and Weil, p. 3.

¹⁶ Abernathy, Dunlop, Hammond, and Weil, p. 48.

¹⁷ Abernathy, Dunlop, Hammond, and Weil, p. 55.

¹⁸ Abernathy, Dunlop, Hammond, and Weil, p. 57.

By utilizing bar codes, enabling computer technologies, modern distribution centers, and the promulgation of standards across firms, lean retailing transforms the relationships between firms within the textile/apparel sector. Where there were once arms-length relationships, with suppliers being close to interchangeable, the relationships are now highly integrated by both information technologies and standards. In many respects the boundaries between firms become blurred: sales information at the retail store go directly to a garment factory that produces clothing ready to place on the shelves at the store. The ideal is to have a system operating so smoothly that it is almost as if the factory is hidden away in a back-room of the retail store.

The increasingly high-tech nature of the textile/apparel industry creates opportunities for Taiwanese firms because the emphasis of the entire chain shifts from achieving cost reductions through savings on labor costs (a primary weakness at home) to more effective management of the chain and the consequent ability to more effectively match supply to market demand (a potential strength). Effective value chain management has the capacity to produce savings that dwarf the gains to be had by cutting labor costs by a few cents--or even dollars--an hour.¹⁹ Taiwanese garment production will inevitably relocate to regions with lower labor costs, but the home firm, rather than becoming a middleman that is expendable in time, has the potential to become the key force behind a smoothly operating, high-tech commodity chain. Because the parts of this chain are more highly integrated than they ever were in the past, the costs of switching suppliers becomes more costly for the lead retailer. A local firm in Southeast Asia or mainland China will quite likely be able to undercut even offshore Taiwanese operations, but they are far less likely to be able to handle electronic orders from buyers, and in response effectively forecast, plan, track production, and manufacture apparel quickly and flexibly. In short,

¹⁹ Abernathy, Dunlop, Hammond, and Weil, p. 11.

these skills are a far more enduring form of comparative advantage for Taiwanese firms than constantly scouring the globe for the lowest cost labor.

Many textile/apparel firm in Taiwan have been moving to exploit this trend. In visits to headquarters in Taiwan and factories in mainland China and Mexico, the picture that emerges is one of an industry trying to transform itself, with some firms farther along than others. For both textile and apparel firms the challenge is to shorten the lead time from order to delivery. In the past, the manager of a textile firm commented, importers ordered fabric in large quantities--volume was king--but the movement towards rapid response has led them to pressure textile companies to reduce prices, produce in smaller batches, deliver with shorter lead times (monthly), and to develop new fabric designs on their own.²⁰

The calculations of apparel firms are more complex because they must take into account labor costs, quotas, and proximity to market. Labor costs generally leads firms to mainland China and Southeast Asia. Firms that have multiple manufacturing locations--and most large firms do--keep careful comparative records of both labor costs and labor productivity in each of their factories, and the differences between locations are huge.²¹ The labor costs of one firm, for instance, were reported (in US \$) to be \$800/month per worker in Taiwan, \$100 in a coastal province of China, \$30-40 in Indonesia,²² and \$50-60 in Cambodia.²³ Quotas and proximity to the U.S. market, however, lead firms to Mexico and the Caribbean basin. As another manager explained, not only is his Mexican factory within NAFTA, but he can calculate delivery time to the American buyer in terms of hours. Because the same delivery from China would take weeks, U.S. buyers were exerting more and more pressure for manufacturers to utilize Mexican factories.

²⁰ Firm interview, November 16, 1999. Similarly, the manager at another textile firm said current time between order and delivery was 75-90 days, and the objective for the near future was to cut this time in half. Firm interview no. 011700.

²¹ Some described conducting careful time and motion studies on their workers in the hope of achieving further productivity gains. Firm interview no. 111899.

²² Prior to the financial crisis this figure was closer to \$120.

²³ Productivity also varied. Using the Taiwan productivity rate as an index of 100, China was a 95, Indonesia 40-45, and Cambodia 55-60. Firm interview no. 111899.

No matter what the reason for relocating, however, managing a network of widely dispersed factories effectively requires the utilization of advanced information technologies. A company with operations in Taiwan, China, and Mexico, for instance, receives orders from U.S. buyers in the New York office, and decides what factory will fill the order by calculating quality ratings for the factory (provided by the Taipei office), quota availability, costs, and delivery time. Like many companies, it retains one factory in Taiwan (used for new customers and rapid turnaround), owns several factories overseas, and has the ability to outsource to additional overseas factories. Using technology purchased from Oracle, the company is in the process of developing a Web-based system that will allow better communication between New York-Taipei-China-Mexico, and will allow the customers to track the progress of their orders. In fact, the size of the companies investment (currently 80 people) in software development has led it to start doing software work for other Taiwanese companies.²⁴

In numerous cases, buyers are forcing the Taiwanese manufacturers to develop computer links that would enable the buyer to track their orders electronically. Another firm, for instance, was in the process of installing a SAP system that would allow the "live" tracking of orders. A CAD design system allowed the buyers in the U.S. to send the master garment patterns to the Taiwan headquarters via the internet, the production pattern would be set in Taiwan (numerous sizes) and then sent on to the manufacturing facility where they would finally be printed on paper using a plotter.²⁵ At each step of the way, the buyer has the ability to check on the progress of the order. Although the Taiwanese firms sometimes were reluctant to open up their operations in this way, many believed that in the end, the improved logistical flows which resulted allowed them to significantly improve their own operations. The sophistication of these technology linkages provide Taiwanese firms with an important edge over local companies in countries such as China and

²⁴ Firm interview no. 011700.

²⁵ Firm interview no. 111899.

Cambodia. Each individual factory may be fairly traditional--and not too different from the locally owned factory next door--but the network of factories is distinctly high-tech.

Political trends, like information technologies, have been reinforcing the closer integration of the individual parts of the textile/apparel commodity chain, and again this can work to the advantage of Taiwanese firms. In particular, the focus on labor conditions among student organizations in the United States and labor organizations has forced brand-name retailers to concern themselves with the conditions in factories that previously were only the distant parts of a long commodity chain.²⁶ This trend gathered power with the reports in the early 1990s concerning working conditions in Nike factories in Vietnam. Scrutiny then began to focus on other highly visible brands such as the GAP and Kathie Lee Gifford. In effect, the brand power of these companies--the very element which the traditional commodity chain literature believes should give these companies great power within the commodity chain--becomes a vulnerability, and the more famous the brand, the more attractive the company became for protesters. Just as the desire for lean retailing has led many retailers to move away from arms-length relationships with suppliers, fear of political controversy has also led them to sponsor the monitoring of working conditions in factories that previously would have only been distant names on a shipping crate.

It is the approval process that can create an opportunity for Taiwanese firms. In the late 1980s, the GAP had a waiting list of "tested" potential factories, and production could be shifted at any time between factories that had the requisite mix of labor, quality, and turnaround time.²⁷ The intense focus on labor conditions a decade later, however, has made the process that factories must go through in order to become suppliers for a brand-name retailer longer, more complicated, and more expensive for the retailer. Consequently, the cost of switching away from approved and proven suppliers has increased. The manager of one Taiwanese firm, a major supplier to the GAP, described how the GAP

²⁶ See, for instance, Liza Featherstone, "The New Student Movement," *The Nation*, May 15, 2000.

²⁷ Appelbaum and Gereffi, p. 58.

monitored every aspect of labor and living conditions in the factory complexes of its suppliers. Because it is not easy for the GAP to build this sort of relationship--often the approval process takes 2 to 3 years--they want to maintain long-term relationships with suppliers, and they are willing to pay well to do so.²⁸ If Taiwanese firms can prove that they are more reliable on providing the type of factories that the politics of the final market necessitate, they will have an advantage over less reliable suppliers, even when these alternatives are less expensive.

In these instances, the comparative advantage of Taiwanese firms is managing a network of firms for retailers who are willing to pay a premium when it is done effectively. Not only do the Taiwanese firms become less likely to be cut-out of the value chain, but they gain an extremely useful method of smoothing variability of demand. When they own factories both at home and abroad in addition to having contract relationships with other overseas factories, they have the ability to move orders around the network, and if work begins to dry up they can cancel the contract relationships while protecting the wholly-owned factories. The global network allows them to protect the home base.²⁹

III. The Taiwanese Automotive Sector: Head-to-Head or Team Player?

The automotive industry plays an important role in the Taiwanese economy--it represented 5% of industrial output in 1996 and generated 100,000 jobs directly and many more indirectly³⁰--but OEM growth is limited by the small size of the vehicle market. In 1992, local demand was 450,000 and this was divided between 11 assembly plants. By

²⁸ Firm interview no. 111899.

²⁹ Of course, the home base is considerably smaller than it once was due to the shortage of workers and labor costs. But as the president of one of Taiwan's top apparel companies explained, they may be forced to further reduce the number of workers in Taiwan, but they would not eliminate the home factories (like some of their competitors have done). If the "mother" company dies in Taiwan, he said, so will the "child" companies abroad. Firm interview no. 111899.

³⁰ Francisco Veloso and Jorge Mario Soto, "Incentives, Infrastructure and Institutions: Perspectives on Industrialization and Technical Change in Late Developing Nations," forthcoming in *Technological Forecasting and Social Change*.

1999 this figure had grown to only 500,000. Although two firms, Yulon Motors and China Motor Company, had a combined market share of 47% in 1999, the production volumes of each individual plant were still too low to capture economies of scale, and this has limited their ability to become internationally competitive. In addition to the OEM firms--all of which have foreign partners--and their first tier suppliers, there are over 1,500 small supply firms, and they play a key role in the Taiwanese automotive sector. These are often family-owned businesses that either do dedicated work for one or two first tier clients, or focus on the aftermarket. Taiwanese auto firms are a major exporter of aftermarket parts.³¹ When discussing strategies of globalization in the auto sector, it is important to distinguish between the OEM firms in Taiwan and the aftermarket firms. The analysis that follows focuses primarily on the OEM firms.³²

For the OEM firms in Taiwan, the primary objective was expand their market, and the obvious strategy was to go to mainland China--not an uncommon strategy among foreign firms. When the first foreign auto makers established operations in China during the mid-1980s, the intent was to take advantage of high tariff walls to gain a foothold in a potentially critical future market. As auto firms have usually done in emerging markets, an older model was manufactured at first using imported components, and through the gradual development of local suppliers, the process was gradually localized according to the dictates of Chinese law. Both quality problems and high costs (in part a result of operating at low volumes) effectively precluded exporting cars manufactured in China. Many manufacturers were content to carve out a regional niche--usually with the help of the protectionist policies of a local government--and because the sale price of these vehicles was set at an artificially high level, some could do so quite profitably. Shanghai Volkswagen, the dominant player in the market, reported total profits of over 3.5 billion

³¹ In 1996, Taiwan exported US \$2.5 billion of autoparts. It was the second largest exporter of autoparts in Asia (after only Japan). Veloso and Soto, "Incentives, Infrastructure and Institutions: Perspectives on Industrialization and Technical Change in Late Developing Nations," forthcoming in *Technological Forecasting and Social Change*, p. 7-8.

³² As of the writing of the first draft of this working paper, the IPC research team had not yet visited the Taiwanese aftermarket firms. These interviews are scheduled for July 2000.

renminbi (just under US \$500 million) in 1996.³³ Market potential was enormous in the long-run, but in the short-term most manufacturers had to content themselves with being the beneficiaries of a protected market.³⁴

It was the potential for higher volumes--even if in the distant future--and the artificially high profits of a protected market that attracted one of the largest Taiwanese auto firms to the mainland. In 1994, explained a manager at the firm, executives at his company decided that only through foreign investment would the firm be able to achieve the threshold volume of 300,000 vehicles per year that it believed was necessary to be a viable independent auto firm.³⁵ If China had been an open market, he commented, his firm would not be able to compete, but hopefully continued protection would allow them to get their foot in the door. Only 50/50 joint venture (JV) assembly projects are allowed in China, so the Taiwanese firm searched for a local partner that would give them 100% operational control in exchange for the investment capital. Ultimately, a coastal province in the south was chosen which had virtually no local auto industry. Aware of how much money regions such as Shanghai were making, the provincial government was eager to develop a local auto firm.

The relocation strategy utilized by the Taiwanese firm was simply to reproduce its supply network in the new location. This was necessary both to conform to Chinese domestic content regulations and to lower costs--importing a part increased the price by 40% (30% duty, 10% transportation).³⁶ The firm "persuaded" its Taiwanese supplies to co-locate with it, primarily by making future contracts in Taiwan contingent upon the

³³ *Qiche Gongye Guihua Cankao Ziliao* (Tianjin: Zhongguo Qiche Jishu Yanjiu Zhongxin, 1997), p. 80-81.

³⁴ Protection existed at both the international and the local level. Local protectionism created an incredibly fragmented market. In 1995, total vehicle production in China was 1.45 million, but because this volume was spread over some 122 assembly plants, the annual average volume per firm was only 12,000 vehicles. While only 15 of these firms were producing passenger cars, because total output in 1995 of passenger cars was 326,000, the average output per firm was only 21,726. Yasheng Huang, "Between Two Coordination Failures: Automotive Industrial Policy in China and Korea," Harvard Business School Working Paper, 1998, p. 3.

³⁵ Specifically, he commented, it was only at this level of production that the firm could afford to carry out design work on new models. Interview no. 012500.

³⁶ Information in this paragraph is from interviews no. 012500 and no. 011900.

supplier investing in a plant in the industrial park alongside the new China assembly plant-- a common practice in the global auto industry today. Headquarters believed that it was necessary to bring their own suppliers to China not only to assure quality, but also because it would allow them to launch production of other models more quickly and easily. Managers at many of the supply firms made it clear that they were less than enthusiastic, but had little choice. Between 1997 and 1998, 30 Taiwanese component firms built wholly-owned factories in an industrial park next to the assembly plant. By 2000 these firms were supplying the JV with 80% of its parts (by value), while the remaining 20% came from 56 Chinese firms, 30 of which are Shanghai Volkswagen suppliers in Shanghai. Production began in 1996 with a few hundred cars, and by 1999 production volumes had reached 5,000 vehicles per year. The objective was to achieve volumes of 150,000 vehicles per year by 2005.

Will this relocation effort be successful? It is, of course, too early to come to any firm conclusions, but it is possible to draw out a few scenarios. There is some reason to be optimistic. In some respects, the Taiwanese firm will be doing what it has done for many years at home: taking a model from abroad, adapting it to local taste, and operating successfully at very low volumes. This experience could give the Taiwanese a perspective and a flexibility that larger international automakers might lack. In 1999, the market demand for automobiles in China was 946,800, and according to some projections this could almost double within four years.³⁷ If such market projections are realized, the Taiwanese will only have to capture a small percentage of the market to be successful, and it should not be difficult to establish a niche that is being neglected by the larger players-- potentially a relatively low-priced vehicle that does not need frequent model changes.

But there are also strong reasons for pessimism, many of which highlight the contrast between the Taiwanese automotive and textile/apparel sectors. Unlike in the global

³⁷ Wang Chengtao, Chen Ming, Dennis Schuetzle, and Weiping Zhu, "An Engineering Study for the Development and AMrketing of Personal Use Cars (PUCs) in China," Ford Motor Company, 1999, p. 12.

textile/apparel industry, the trends in the OEM segment of the auto sector are moving away from the comparative advantage of Taiwanese assemblers. In the past, globalization in the international auto industry looked very much like what happened in China during the mid-1980s: global players built assembly operations in an emerging market, and used a combination of local suppliers and imported parts to build a model that was obsolete in more advanced markets.³⁸ In the last decade, however, the shape of globalization in the auto industry has changed considerably. "More than any other characteristic, it is the simultaneous geographic spread of the supply-base--alongside newly established assembly plants--that differentiates the current wave of geographic expansion from those the automotive industry has seen in the past," conclude Timothy Sturgeon and Richard Florida.³⁹ First tier global suppliers, those with the capability to coordinate and deploy component manufacturing on a global-scale, are increasingly being asked by assemblers to provide complete modules, and often they are responsible for design as well. This trend has led towards consolidation in the supply chain, as first tier suppliers seek both to broaden their geographic reach and to gain systems capability (i.e. capabilities that will allow them to provide an entire module rather than just a particular component).⁴⁰ These suppliers are often encouraged to serve multiple customers so as to maximize their production volumes. "In the long run," write Sturgeon and Florida, "it may well be suppliers, not automakers, that generate the vast majority of the industry's future foreign direct investment (FDI)--and associated economic and social benefits (e.g. employment)."⁴¹

³⁸ It was the need to use local suppliers and the uncertainty over future viability of the market that led auto companies to traditionally assemble older models in emerging market operations. Old equipment could easily be transferred from the home country, and it was generally easier to find local suppliers in the host country for parts that were not as technologically advanced.

³⁹ Sturgeon and Florida, "The World that Changed the Machine: Globalization and Jobs in the Automotive Industry," Final Report to the Alfred P. Sloan Foundation, May 5, 1999, p. 6.

⁴⁰ Sturgeon and Florida, p. 68.

⁴¹ Sturgeon and Florida, p. 2.

This move toward global suppliers gives auto assemblers several advantages when they relocate production facilities. First, assuming that the suppliers co-locate with them, they can increase the quality of production at offshore sites more quickly than in the past. Rather than go through the laborious process of developing local suppliers, they simply have to wait for the global suppliers to begin production, and they are then assured of quality and service at a consistent level. It is also easier to rapidly develop new models. Increasingly, a primary criteria for becoming a global supplier is to have a design center close to the design facilities of the assembler. The supplier becomes involved at the earliest stages of the design process, and this highly cooperative relationship can both speed up the design process and facilitate the customization that may be necessary to make a particular model more appropriate for an overseas market. Finally, in contrast to the past, when offshore manufacturing sites often struggled to meet the standards of the home company, assemblers currently are able to develop their most advanced plants abroad--often in the developing world. Without the restrictions of unionized labor and existing infrastructure these operations provide opportunities to experiment with new and innovative production techniques.

Although the strategy of international auto firms in China has not completely changed, the environment within the China market is becoming more competitive. First, the Chinese government has continued to leverage market access in exchange for increasingly sophisticated technology. In the auto sector this meant that new entrants--General Motors and Honda being the most prominent--had to bring their most recent models and technology. Manufacturers still had the cushion of high final sale prices relative to world markets, but they were forced to manufacture cars at a new level of quality and technical sophistication. To find components that were up to this standard they either had to force local firms to meet their standards, persuade their global supplier to relocate to

China, or import the particular component that they were having trouble localizing.⁴² No matter what the approach, the end result was an automobile far more sophisticated than any previously manufactured in China. The second major change is the prospect of Chinese entrance to the World Trade Organization (WTO). Chinese tariffs on imported components will be reduced from the current 28% to 10% by 2005; Chinese tariffs on imported vehicles will be reduced from the current 80-100% to 25% by 2006. Local content regulations will also be eliminated. The MNC assemblers operating in China will most likely use suppliers operating in China (whether local or foreign) when they are competitive, but if they are not, they will import. The result should be a gradual degree of convergence with international standards, both in terms of quality and price, that was not possible in a closed system.

In this new game, Taiwanese firms have a severe disadvantage: technological dependence. Each of the major assemblers in Taiwan produce cars that were developed through either joint venture agreements or technical assistance contracts with foreign automakers (in most cases Japanese), and these relationships are reproduced at the supply level.⁴³ If the Japanese partner is Nissan, for instance, many of the suppliers will have relationships with Nissan suppliers because the technology must be compatible as the model produced in Taiwan evolves. The technical capabilities of these Taiwanese supply firms vary, but the R&D divisions are invariably small in comparison to their Japanese counterparts upon whom they must heavily lean.⁴⁴ At many of the supply firms interviewed, when the assembler required a major new component to be designed, the initial design and approval process took place in Japan, and the finished component was

⁴² Because local content rates must be increased only gradually, assemblers can selectively choose which parts they would like to continue importing.

⁴³ It is also important to point out that the Japanese partners (Nissan and Mitsubishi) are not the most competitive Japanese auto firms either.

⁴⁴ At one components firms, which was a joint venture with a Japanese company, the R&D section consisted of 23 people, and was directed by a Japanese manager. In Japan, the partner had a 900 person design group. Interview no. 011800.

then sent back to the assembler in Taiwan for approval. Minor modifications could be made in Taiwan, but the components would often be sent to Japan for testing.⁴⁵

The technical dependence of a late-developer, particularly one that does not have a large market that can be used as bargaining leverage with potential foreign partners, is nothing new. This is the essence of Bernard and Ravenhill's critique of the product-cycle theory: it is not complete industries that are moved offshore as they mature, it is only those portions that are labor intensive or relatively lower value added. The result is a production hierarchy in which Taiwan is one step down. What has not been focused on to the same extent is the degree to which the manner in which a certain manufacturing capability has been acquired affects the way it leave. Relocation, in other words, is more difficult when you are technologically dependent. A primary problem is the supply chain. The rationale for persuading suppliers to invest in mainland facilities is to enhance the assemblers ability to quickly develop new models. When this involves global suppliers, the supplier will have a design center located near the design headquarters of the assembler, and they will cooperate from the earliest stages of product development. Taiwanese suppliers, as well as assemblers, that relocate to the mainland usually do not have design capability at home, let alone at their offshore facilities, and shifts to new models ultimately have to be approved in Japan. While this weakness on the design side would not have been a problem in the Chinese auto market of the 1980s and 90s, when the best-selling Santana was essentially a model from the 1970s, it may be a problem when they are competing against networks of global suppliers who are technologically more advanced. In that they cannot compete with these global players in their home market, it will be even more difficult to do so in a foreign setting.

There is an alternative strategy for the Taiwanese automotive sector: an emphasis on autoparts. As I pointed out at the beginning of this section, Taiwanese firms have already had considerable success with aftermarket parts, and although it is not a focus of

⁴⁵ Interview no. 011800.

this paper, this success can be built upon. This strategy is less applicable to the larger OEM firms, however. For these larger Taiwanese auto firms, one potential strategy is to integrate more closely into the regional production networks of the foreign firm with which they are either owned or partnered. Rather than reproduce facilities in an offshore location, they would work in concert with factories that are in the network of the foreign partner through means of a "regional complementarity" scheme. ASEAN, for instance, has had formal "complementarity" schemes since 1983, all based on the idea that the only way to generate and exploit firm and industry level economies of scale is to institute programs of resource-pooling and market-sharing among member states.⁴⁶ Given the small size of member countries, complementarity schemes are developed that allow components manufactured in one country to supply assemblers in any other member state at favorable terms of trade as long as inter-ASEAN trade among the trading companies remains balanced overall. These schemes can also be informal in nature, involving trading between the various facilities of one company. An engine manufactured by a plant in Vietnam, for instance, might be traded for a transmission manufactured at a plant in Indonesia. Both plants would achieve higher economies of scale than if they were producing for the local market alone. Japanese firms have been the most active participants in complementarity schemes in Asia, but American participation has been increasing.

Rather than trying to compete head-to-head with the major global auto companies, Taiwan has the potential to be a key link in the Asia strategies of these companies. Ford, for instance, has new plants in Thailand, Vietnam, and the Philippines, and owns a minority share in a Malaysian plant. Not only are there abundant opportunities for complementarity schemes, but the Taiwan operations can in many respects be a model for the region. The "high complexity, low volume" production methods of Taiwan, where 4 or 5 different models can be built on the same assembly line, are more appropriate for small

⁴⁶ This discussion of complementarity schemes draws on Tim Sturgeon, Appendix to November research notes.

markets than the American methods, and in many cases the styling of Taiwanese models is more appropriate than the American models. The Japanese firms are, of course, even more active in Southeast Asia, and the recent financial troubles in Taiwan could potentially create a window of opportunity for Taiwanese firms. Many of the Taiwanese firms--both OEM and components--that have linkages to Japanese companies are contractually obligated to have the approval of the Japanese partner before exporting. While the financial crisis has not changed the fundamental strategy of Japanese firms in Asia, it has given Taiwanese firms an opportunity to team with Japanese firms in investment in production facilities in ASEAN countries. Although Taiwanese firms might not have the skills necessary to become an independent force in the global auto market, they do have the skills to be an extremely valuable team player.

IV. Conclusion

At this stage of the research process, conclusions must be preliminary, but it is possible to offer a few initial thoughts. Although the textile/apparel and automotive sectors are often thought of as "traditional" industries, presumably in contrast to the innovative and fast-moving technology sectors in which Taiwan has had such success, it is important not to make too much of this label. The products that are produced by firms within this sector may be traditional, but to think of the manufacturing processes as traditional is to risk obscuring both the opportunities and the dangers that Taiwanese firms face as they seek to relocate manufacturing facilities off-shore.

In the textile/apparel sector the danger is in thinking exclusively about labor costs. Rising labor costs and labor shortages in Taiwan may be a primary driver of Taiwanese relocation in the textile and apparel sector, but this does not mean that finding cheap labor is

the answer.⁴⁷ While relocating to regions where labor costs are lower has to be part of the answer, this only provides a temporary advantage.⁴⁸ Not only will labor costs rise over time, but as Gereffi and Pan argue, there is nothing to prevent a Taiwanese firm from ultimately being cut-out of the commodity chain. The role of a middle-man in a triangular manufacturing system is an unstable one. Very untraditional changes within the industry, however, create opportunities to strengthen the Taiwanese position in these manufacturing networks: both the trend toward more intense information linkages between the parts of the value chain and the need for brand-name retailers to carry out careful inspections of labor conditions at factories has heightened the cost of switching suppliers. Rather than being an easily replaceable commodity with arms-length relations to the rest of the chain, manufacturing has the potential to be a closely integrated and critical link in the chain. Taiwanese firms are well positioned to take advantage of these changes within the sector, and those that do will build a far more durable form of comparative advantage.

In the auto sector, the driving force behind relocation is not labor costs, it is the need for a larger market. There is the same danger of misunderstanding the nature of the sector and the place of Taiwanese firms within it, however. Most importantly, it should be recognized that the method by which Taiwanese OEM firms acquired their capabilities in the auto sector, licensing contracts and joint ventures with foreign firms, affects their ability to later reproduce these capabilities in offshore locations. Some of the OEM firms believe they have no choice but to move to China. Volumes must be increased if they are to be competitive, and if they cannot compete in China, they are unlikely to succeed anywhere outside of Taiwan--as in the textile/apparel sector, China seems to perfectly complement the

⁴⁷ In this respect, it is interesting to note that China, with its seemingly unlimited supply of cheap labor may obscure the need for Taiwanese firms to focus on other factors. In interviews with Taiwanese firms in Mexico, it became apparent that the reference point of China made it difficult for Taiwanese managers to adjust to the problems of a Mexican workforce. Rather than focus on the advantages of being in Mexico--the possibility of rapid response--and attempt to find new ways of managing Mexican workers, some managers were simply in despair (one going so far as to claim the only solution was to fly in Chinese workers).

⁴⁸ This is a point that was made by the "Made by Hong Kong" study team as well. See Suzanne Berger with David Gartner and Kevin Karty, "Textiles and Clothing in Hong Kong," in Suzanne Berger and Richard K. Lester, (eds.), *Made By Hong Kong*, (New York: Oxford University Press, 1997).

weakness of the home market. But the dependence of these firms on their Japanese partners (both at the OEM level and supply level) limits their ability to compete with international assemblers such as General Motors, Volkswagen, and Honda and their global suppliers. Furthermore, China's accession to the WTO will increase the ability of these foreign firms to reach Chinese consumers (through the liberalization of auto financing, leasing, trading, and distribution rights). Taiwanese firms have often believed that cultural and linguistic similarities give them an advantage in their China operations, but the playing field within China will become increasingly even as a result of WTO liberalization, and Taiwanese auto OEM firms will not bring the same resources to the field as their competitors. Regional complementarity schemes and an emphasis on the aftermarket may prove to be far more viable strategies. In autos, as in textiles and apparel, it is important not to let the "traditional" nature of the industry obscure the changes that are occurring within the sector, and the opportunities and dangers that these changes create for Taiwanese firms.