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Leveraging Capabilities: Models of Foreign Production in the Taiwanese Automotive Industry[1]

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I Introduction

"Going global" by establishing or expanding foreign production capabilities has long played an important strategic role for firms in the automotive industry. Faced with high costs, falling profits, and loss of domestic market share in the 1970s and 1980s, American automotive firms turned to existing foreign affiliates for parts and finished vehicles, and bolstered production capabilities in lower-cost countries like Mexico and Canada. In the 1980s, the rising yen and growing trade frictions led Japanese firms to establish production sites in North America and Europe in order to protect market share in these regions. When crisis hit German automotive industry in the 1990s, extensive foreign investment allowed assemblers to spread design and development costs over much larger volumes, and spurred the globalization and domestic restructuring of German suppliers (Pries 1999). For automotive firms in each of these countries, expansion of global capabilities helped solve critical problems, and in the German and American cases, was an important component of a larger restructuring effort.

Today, challenged by a small and slow-growing domestic market, tariff reductions with likely accession into WTO, and a tight domestic supply of production and technical workers, firms in the Taiwanese auto industry face similar pressures to restructure domestic activities. Given the important strategic role of foreign investment in the restructuring experiences of automotive sectors in other countries, as well as the flurry of recent offshore investment across a range of Taiwan's manufacturing sectors, it is worth considering the relationship between foreign investment and domestic restructuring of Taiwanese automotive firms.

In this chapter, I examine foreign production patterns of Taiwanese automotive firms and find evidence of a dual pattern with regard to the relationship between

[1] An early version of this paper was presented at the conference, "Japanese Foreign Direct Investment and Structural Change in the East Asian Industrial System: Global Restructuring for the 21st Century" at Hosei University, Tokyo, October 31-November 1, 2000. Thanks to Momoko Kawakami of the Institute for Developing Economies, JETRO, who provided detailed comments on that paper.

foreign investment and domestic restructuring. One type of investment, which is evident among assemblers, as well as some suppliers, is aimed at maintaining or increasing overall production volumes given adverse conditions in the domestic market and expected reductions in tariff levels. For these firms, offshore investment represents an attempt to transfer skills and capabilities that have been developed within the (protected) domestic environment to new and in some ways, more hospitable market settings. Although many of the investing firms are concurrently reconfiguring domestic operations to lower costs, domestic adjustment and foreign investments do not constitute an integrated strategy, but appear to be distinct parts of a dual strategy in which domestic adjustments serve to maintain domestic market share, and foreign investments act to secure overall firm output levels in the event that domestic sales or margins collapse. In short, these offshore investments are aimed at market diversification, thus reducing firms' vulnerability to changes in the Taiwanese market.

These market-diversifying investments differ from typical market-seeking investments in the automobile industry. Unlike market-seeking investments, where market access *per se* is the primary goal, market-diversification strategies appear aimed as much at securing new regulatory environments as at gaining access to new customers. In addition, market-diversifying investments provide different benefits than typical market-seeking investments, which generate cost advantages by spreading design and development costs over higher volumes. Because Taiwanese assemblers and suppliers tend to produce vehicles and parts designed by their foreign partners, higher production volumes will not necessarily generate cost savings. Instead, these investments provide an opportunity to take advantage of foreign market structures that provide some protection for local producers.

A second type of foreign investment is also evident among Taiwanese automotive firms. These investments are not driven by specific changes in the domestic environment, such as likely WTO accession, but reflect on-going attempts to restructure domestic activities as Taiwan's comparative advantage within the region changes. As conditions in domestic product and labor markets change, these investments enable firms to move low value-added or labor-intensive products to foreign sites, creating opportunities for domestic plants to shift to new product lines without abandoning existing customers or markets. In some cases, these investments are accompanied by the transfer of some lower-end engineering and design tasks to foreign sites, thus reducing costs and freeing domestic staff to focus on higher-end engineering and design tasks. In contrast to market-diversifying investments, which largely reproduce domestic operations, these upgrading

investments often yield a complex division of labor between offshore and domestic sites.

These two distinct patterns have interesting implications for examining patterns of globalization and "hollowing out" of employment and capabilities in industrial economies. For firms that have pursued only market-diversifying strategies, the dichotomous nature of foreign production and domestic restructuring means that the level and types of future activities at domestic plants is likely to be largely independent of the success or failure of globalization efforts. However, because of the overlap in product lines at home and host sites, it could appear that firms have in effect transferred production from domestic to foreign plants. As a result, if domestic plants were to be less competitive after WTO accession, subsequent declines in domestic production and employment might appear to have been caused by the transfer of production to from domestic to foreign sites. In fact, though, because of the independent strategic role of these investments, foreign activities and domestic economic outcomes will be largely independent (but coincident) phenomena.

For firms that have integrated foreign investment and domestic restructuring strategies, though, levels and types of domestic activities are strongly linked to the role foreign sites in absorbing price-sensitive product lines and providing access to lower-cost engineering and technical workers. In these cases, because foreign and domestic plants manufacture different products, it could appear that success or failure at domestic plants is independent of foreign activities. In fact, though, these investments allow firms to continue to exploit their experience and expertise in product areas in which Taiwan has lost its comparative advantage, and create space for domestic plants to move into new product areas. In these cases, what appear to be distinct or even independent foreign activities can, in fact, have real implications for the level and characteristics of output and employment at domestic plants.

These findings call into question the reliability of macro or aggregate approaches for understanding the causes and consequences of foreign investment. As these patterns illustrate, even when home country, host country, and sector are identical, multiple investment strategies, each with different implications for domestic economies, can exist. In the case of Taiwanese automotive firms, this duality is due in part to the unusual attributes of the primary host country, China, which has attracted vast amounts of foreign investment because of its promising market, but also because of its abundance of qualified, low-cost production and technical labor. As such, it might not be easy to generalize from this case. That said, the findings still suggest that understanding the linkages between foreign and domestic production requires disentangling the multiple pressures that underlie foreign

investment decisions, and identifying the specific roles that foreign investments play in firms' market and production strategies.

2 Domestic Problems

Measured by some key indicators, Taiwan's auto industry seems reasonably healthy. In contrast to the rapid decline in output and employment in other traditional sectors, like textiles and garments, the automotive sector has actually grown over the past decade. Between 1989 and 1999, output increased from $4.7 to $9.1 billion US and employment from 66,000 to almost 76,000 (Directorate-General of Budget 2000; MOEA various years). Even relative to other auto-producing countries, the assembly and supply sectors continue to make significant contributions to national output and employment, accounting for 1.3% of total employment in 1998, compared to, for example, 1.0% in the U.S. in the same year (Directorate-General of Budget 2000; US Department of Labor 2000).

Despite its relatively strong recent showing, the Taiwanese automotive industry faces a number of challenges, some the result of the large number of producers, others the result of a small and slow-growing domestic market. Despite the small internal market, there are currently ten assemblers in Taiwan, five of which account for virtually all of the island's vehicle production. Each of the top assemblers is owned in part by large foreign assemblers: Mitsubishi owns 21percent of China Motors Corporation, Nissan owns 25 percent of Yulon, Toyota and Hino own 49 percent of Kuozui, Honda owns 13.5 percent of San Yang, and Ford owns 70 percent of Ford Lio Ho (TTVMA 2000).

Although the commercial and personal vehicle market in Taiwan grew rapidly between the early 1980s and mid-1990s, when sales rose from about 100,000 to almost 600,000 units annually, it has actually shrunk in the last few years and future market growth is expected to be modest (Noble 1996; TTVMA 2000). These problems are compounded by the large number of assemblers, which contributes to low capacity utilization rates and kept any single firm from producing 100,000 vehicles in recent years.

Industry observers expect the number of assemblers to decline to four or five in the next few years. The surviving domestic producers, however, could face greater competition from imports. In the latter half of the 1990s, despite vehicle tariffs of 30 percent, imported vehicles accounted for between about 15 and 25 percent of domestic sales (TTVMA 2000). And although industry observers disagree about the likely degree of import penetration when tariffs fall from 30 to 17.5 percent with

(expected) WTO accession, there appears to be a consensus that the import ratio will rise significantly from its current level of 15 percent (see, e.g., Taipei Times 1999; EIU 1998). The full effect of WTO accession, though, will not be immediate, as tariffs reductions and rising import quotas will be phased in as part of a negotiated transition period (Barnes 1999).

The supply sector is also likely to be strongly affected if tariff or local content rates are reduced or eliminated as part of WTO accession. Despite a core of strong firms, there are significant gaps in domestic supplier capabilities, a situation that has contributed to low average domestic content of vehicles. Current regulations require domestic assemblers to achieve 50 percent local content and some models, like China Motors' Varica, which uses a Taiwanese-produced engine, and the Freeca, with a local content rate near 90 percent, rely almost wholly on locally-produced parts (Noble 1996; FT Asia Intelligence Wire 1997). Still, the overall local content ratio of domestically produced vehicles is only between 50 and 60 percent, with most of the remaining parts coming from Japan.[2] In 1999, Taiwan imported US $1.25 billion in components from Japan, the equivalent of about one-third of total Taiwanese consumption of parts that year (TTVMA 2000; Veloso, et al. 1998).[3] Many of these imports were drivetrain parts, reflecting continued Taiwanese dependence on foreign partners for most engines and some other critical parts and components (TTVMA 2000; Jiji Press Ltd. 1997; EIU 1995).

Despite these challenges and constraints, the past decade has witnessed the emergence of new capabilities and strategies at some of Taiwan's leading automotive firms. Two of the largest assemblers have established some independent research and design capabilities, and both appear to be taking on more important roles in the Asian strategies of their Japanese partners. One has emerged as an important source of complete knock-down (CKD) kits for its partner's assembly sites in ASEAN; the other hopes to design six new passenger, van, and heavy-duty models in the next few years, and recently helped remodel a vehicle for production and sale on the mainland (Taipei Times 2000; AFX News Limited 2000). Both

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[2] Veloso, et al. (1998) report that average local content is 50%; TTVMA (2000) suggests local content is about 60%. Trade data confirm that actual local content is somewhere between these estimates. See footnote 2.

[3] In 1998, Taiwanese components firms produced about $4B US, of which about $2.1 B was exported. Assuming that parts and components produced domestically but not exported are for OEM sales, as are the $2B in imported parts and components, then total domestic OEM consumption is about $3.9 billion. Of this, $1.9B, or about half, is produced locally. (Trade data from TTVMA 2000.) Actual vehicle assembly will add additional local content. In addition, some assemblers might make parts in-house that are consumed domestically but not counted in estimates of domestic parts production.

companies are also committed to aggressive foreign investment strategies and, as will be discussed, have begun to secure new production sites outside of Taiwan.

3 Domestic Solutions?

Like many firms around the world, Taiwanese automotive firms are facing imminent challenges associated with liberalized markets, greater competition, and regional and global overcapacity. Often times, these types of pressures will spur firms to reduce costs in order to compete in existing product areas, or to move into new product areas and markets. However, the standard prescriptions that accompany these strategies, for example, improving price-quality ratios of goods or increasing sales in regional or international markets, could be difficult for Taiwanese firms to implement given current domestic labor market conditions and the larger political economy of auto production in Asia.

Some managers report that price pressures have been intense for the past few years and one noted that assemblers already require his firm to meet expected post-WTO prices.[4] However, the domestic production environment might not be amenable to further cost reductions. Like other firms in so-called traditional industries in Taiwan, many components manufacturers have difficulty finding and retaining domestic workers at current wage levels and must bring in foreign workers to fill low-skilled positions, a practice that also saves on labor costs. There are legal limits, though, on the number of foreign workers firms can use, as well as on-going domestic debate regarding the desirability of using these workers. Given these conditions, Taiwanese automotive firms are likely to find it difficult to reduce labor costs and could even face further upward pressure on domestic wages.

Another option, increasing sales in regional and international markets, is likely to be difficult to achieve and at best, would provide only a partial solution. Despite policies specifically aimed at increasing exports to Japan (Noble 1996), Taiwan's major export market in Asia, absolute levels remain low. Some Taiwanese suppliers report that the on-going recession in Japan has led to more outsourcing and dual sourcing, as well as greater willingness of Japanese firms to utilize technological capabilities in lower-cost countries such as Taiwan. These changes, though, have not (yet) translated into a greater presence in Japanese supply chains. While exports to Japan now account for about 6 percent of Taiwanese components exports, compared to only 2 to 3 percent in the mid-1980s, Taiwan's share of total Japanese

[4] This particular managed commented that, "For us, WTO happened three years ago" (interview 2000).

parts imports actually dropped slightly during the 1990s and Taiwan's imports from Japan remain about ten times higher than their exports (Tomisawa 1987; TTVMA 2000).[5,6]

Taiwan's parts suppliers currently do not have a strong foothold in regional markets outside of Japan, in part because of only modest integration of sourcing channels across east Asia. Despite earlier hopes that Taiwan would emerge as a regional center for parts production, only three of Taiwan's fifteen largest export markets are in Asia. Exports to two of these countries, Philippines and Indonesia, are concentrated in high-end OEM parts for "Asian" cars like Mitsubishi's Freeca, but combined exports to these countries totaled less than $100M US in 1999 (FT Asia Intelligence Wire 1997; TTVMA 2000). Given the changing political economy of automotive production in east Asia, especially the on-going shift in investment and production to promising markets in lower-wage countries, room for increased production and exports from Taiwan might be limited.

Buoyed by expectations that Asia (outside of Japan) would be the site of the highest growth in vehicle production in the medium-term, automakers invested heavily in ASEAN, where vehicle assembly doubled in the first half of the 1990s, and China, which has attracted investments from most of the world's major assemblers (Sturgeon and Florida 1999; Sako 1996). This trend gained momentum in the latter half of the 1990s when Japanese automotive firms invested heavily in the region: between 1995 and 1999, 21 percent of all contracted Japanese investment in the transportation sector was destined for China or ASEAN, compared to just 11 percent in the 1989-1994 period. (See Table 1.) Despite the crisis-induced drop in automotive demand in ASEAN, Japanese firms, which hold a 80 to 90 percent market share, remain committed to a long-term presence in these markets; where possible, some firms have attempted to bolster depressed production levels by exporting from these sites (Legewie 2000a; Mori 1999). This has contributed to rising vehicle exports from more developed production locations, like Thailand.

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5 JETRO (1999) data indicate that in 1998, Taiwanese parts imports from Japan were about 7 times greater than exports; TTVMA (2000) data indicate that imports were 12.5 times greater than exports in 1998 and 9 times greater in 1999.

6 The proportion of Japanese parts imports originating in Taiwan dropped from 8.2% to 7.6% between 1993 and 1998 (JETRO, various years).

Table 1. Japanese Foreign Investment in Transportation Sector, 1989-1999

	1989-99	1989-94	1995-99
Average Annual Investment, 100M Yen	2,749	2,164	3,452
Destination			
Europe	25.9%	28.6%	23.8%
North America	35.3%	40.0%	31.8%
Other	16.7%	15.5%	18.2%
Asia	21.2%	15.0%	25.9%
Low-wage east Asia	16.9%	11.3%	21.1%

Notes: 1) Figures represent contracted investment; 2) "Low-wage east Asia" includes ASEAN and China

Source: Calculated by author from outward investment data compiled by Ministry of Finance, Japan (2000).

The surge in investment and production in ASEAN and especially China could present a number of problems for Taiwanese automotive firms. These investments likely signal that earlier hopes that Taiwan might serve as an export platform for the China market are unlikely to materialize,[7] and open the possibility that Taiwan could become a target for future vehicle exports from China, a situation that could arise if vehicle demands falls on the mainland and assemblers there are committed to running plants at high capacity.[8] Because export patterns from the mainland are likely to be driven by the overall Asian strategies of international assemblers that have invested there, it is difficult to predict if assemblers will look to export from the mainland and whether Taiwan would present a likely market for these vehicles. Given rising overcapacity in Asia and the world, though, existing production and trade patterns are likely to come under pressure in the near future.

The dominance of Japanese firms in Taiwan's auto sector—and indeed, throughout Asia—has had the effect of limiting Taiwanese suppliers' exposure to European and American assemblers and has contributed to Taiwan's limited presence in OEM supply chains outside of Asia. Although half of all parts and

[7] See, e.g., Noble 1996.

[8] A shift to an export strategy seems likely given regulations against laying off workers because of economic conditions.

components produced in Taiwan are sold in foreign markets, most are for the aftermarket, with approximately 30 percent of all exports going to the US aftermarket alone (Veloso et al. 1998). These exports tend to be concentrated in generic parts and components, rather than higher-quality replacement parts for specific models or OEM sales. In fact, only a few Taiwanese firms have broken into even lower tiers of the supply chains of European and American assemblers.

Some observers suggest that Taiwanese firms have difficulty breaking into international supply chains because required volumes strain or exceed the capacities of all but the largest firms. Others add that an increase in firm size is unlikely because Taiwanese customs and culture place a high value on firm ownership, thus inhibiting merger and acquisition activity and encouraging successful entrepreneurs to start new businesses rather than grow existing ones (see, e.g., Biggart and Guillen 1999). Regardless of whether firm characteristics can be explained by cultural factors, it is certainly true that firm size has an influence on strategy and performance. As the data in Table 2 show, there is a strong relationship between firm size and sales in foreign markets; OEM suppliers with high levels of exports tend to be significantly larger than those with lower export ratios.[9,10] Some of this relationship, of course, is definitional: high levels of exports will drive up sales and output figures. Still, firms in this group seem to be qualitatively different than those with lower export ratios: they represent some of the few Taiwanese firms that have broken into foreign OEM supply chains and as will be discussed, seem more likely to utilize foreign production sites as part of larger restructuring efforts. Thus, it appears that the dominance of small firms in Taiwan's automotive sector does, in fact, have real implications for export and foreign production strategies.

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[9] It is likely that some, if not most, of the exports of OEM suppliers in Taiwan are in aftermarket products.

[10] Firms in the data set were chosen on the basis of having received QS-9000 certification. Original data are based on surveys by China External Trade Development Council (CETRA), Taipei, Taiwan. Minor modifications were made by the author based on data available in individual companies' websites and/or annual reports. For one firm, a large 1st-tier supplier, QS-9000 certification could not be confirmed. Some of the 79 firms originally in the data set were excluded because their primary business was deemed to be in a sector other than automotive components, usually electronics or motorcycle parts production, and estimates of their automotive-related production or employment were not available. Many of the remaining firms in the data set also sell in sectors other than automotives but either data on the proportion of auto-related business were available or the proportion of non-automotive was judged to be fairly small.

4 Foreign Solutions?

Given the structural impediments to wholesale domestic upgrading, foreign investment seems like a natural solution to the problems facing Taiwanese automotive firms. By establishing foreign plants, Taiwanese firms might alleviate demand side problems created by the small and saturated domestic market, low volumes, and falling tariffs; and supply side problems associated with rising wages, high land costs, and tight domestic supply of production and technical workers. Moreover, in cases where Taiwanese firms were to invest on the mainland, they would gain access to a market that is currently four times larger than Taiwan's and is expected to undergo rapid growth in future years (see, e.g., Shimokawa 2000).

Among Taiwanese assemblers, only two have invested or are likely to invest in foreign production capabilities. One reason for this, naturally, is the power of foreign partners to shape trade and investment patterns of Taiwanese assemblers: reliance on foreign partners for basic model designs, as well as key drivetrain components, forces them to negotiate export and investment initiatives with their partners (Noble 1996). As Noble notes, "Control over engines [gives] Japanese mother firms effective veto power over any Taiwan export or investment plans" (1996, p.20). Still, as evidenced by recent offshore investments by Taiwanese assemblers and what appears to be growing roles in their Japanese partners' strategies, control over design *per se* might not be the critical factor in dictating the ability of firms to shape the levels and types of foreign activities.

Taiwanese assemblers will face greater competition from imports when tariffs fall with likely WTO accession. Although domestic output levels could be reduced, those assemblers with offshore investments could compensate with higher production volumes elsewhere in east Asia, where investments have been concentrated. One leading assembler began investing outside Taiwan in the mid-1990s, when it purchased five percent of an assembly operation in southern China (Nobles 1996). In late 1999, the same assembler purchased a share of its partner's operations in the Philippines and soon after, assumed management control (Moises 2000); and in late 2000, it purchased a 25 percent share of another Chinese assembly operation, where it will oversee production of 20,000 vehicles. This last investment followed on a May, 2000 agreement by its stockholders to earmark 20 percent of the company's value for investment in China (Agence France Presse 2000).

A second assembler has followed a similarly aggressive offshore investment strategy. In the mid-1990s, the company signed a 50/50 JV agreement with a provincial government in southern China to establish assembly operations and proceeded to build a plant with potential capacity of 150,000 vehicles per year, on a

site that can be expanded to accommodate production of 300,000 vehicles. In 1996, the company began small-scale production; output levels have increased steadily and are expected to reach 25,000 in 2000 and 60,000 in 2001 (China Economic Review 1996; AFX News Limited 2000).

Aggressive offshore investment strategies of these Taiwanese assemblers appear to contribute to two objectives. By investing in other sites in east Asia, these firms greatly increase their production capacities and perhaps more important, gain direct access to promising markets that will remain protected for at least a few more years. If Taiwan joins WTO, import taxes on vehicles will decline from their current 30 percent to 17.5 percent by 2007, by which time import quotas will also be phased out (Barnes 1999). Although mainland tariff reductions would be more rapid under WTO, dropping incrementally from the current 80-100 percent to 25 percent in 2006 (Zachary 2000), the absolute levels of protection will remain higher on the mainland for at least the next five or ten years. Similarly, the ASEAN Free Trade Agreement (AFTA), which is scheduled to go into effect in 2002, caps tariffs at 5 percent, but only for intra-regional trade. And as some observers suggest, even after 2002, "there is a strong possibility that non-tariff barriers will grow in importance and continue to hinder the free flow of goods and thus a deeper integration of the automobile industry" (Legewie 2000a, p. 241).

With investments outside Taiwan, then, these assemblers can potentially offset any losses in the domestic market share and help ensure their survival—or even growth—regardless of domestic demand and the extent of post-WTO import penetration in Taiwan. These investments provide access to more hospitable market structures, diversify the markets and production sites of the investing firms, and reduce vulnerability to changes in the domestic market. In addition, by taking lead roles as investors and managers at foreign sites, these Taiwanese assemblers can potentially increase their power or even independence vis-à-vis their foreign partners.

At the same time, these investments seem unlikely to mitigate domestic problems or strengthen domestic capabilities, and could eventually displace some production at home plants. Some observers have noted that if production costs prove lower at new offshore sites, vehicles could be exported back to Taiwan (Taipei Times 1999), an outcome that could cannibalize production from plants in Taiwan. Similarly, although offshore investments could help assemblers increase total production volumes, unless Taiwanese-designed vehicles or engines are produced at new sites, Taiwanese brands might not be strengthened or independent technological capabilities greatly enhanced. As such, offshore investments might not significantly improve the long-term viability of Taiwan as a production site. Instead, these

investments offer individual assemblers the opportunity to diversify the markets in which vehicles are produced and sold, and to assume larger roles in their partners' regional strategies.

Interestingly, a similar market-diversification strategy appears to drive investment strategies of some Taiwanese suppliers, including some that have followed Taiwanese assemblers to new production sites. For these suppliers, offshore investments tend to reproduce domestic operations: foreign plants often make the same products as home plants, and output from these plants is often sold to other Taiwanese firms or is exported back to the home plant. For some of these supplier investments on the mainland, geographic isolation from major auto-producing regions like Shanghai and the (currently) closed nature of mainland supply networks mean that opportunities to develop new customers are likely to be limited. Thus, these investments do little to expand the customer bases of firms and have not (yet) generated a strong division of labor between mainland and home operations. (For examples, see firms 1 through 5 in Table 3.)

As currently configured, these foreign plants seem unlikely to contribute to domestic cost-cutting or upgrading efforts. Despite labor costs on the mainland that are one-tenth to one-third of those in Taiwan, low volumes, high duties, and in some cases, low productivity, mean that overall production costs can be higher than in Taiwan. While some costs will decline as volumes increase and workers gain experience, other costly practices, such as importing basic raw materials, are likely to be required across the mainland for some time. Because these plants are dedicated to producing the same or similar parts as the home plants, they currently offer few opportunities to create divisions of labor between home and host sites or otherwise contribute to upgrading of product lines in Taiwan.

These investments, though, provide a type of insurance: by providing direct access to some of the world's most promising markets, they represent an opportunity for firms to maintain or even increase overall production levels regardless of future conditions in the domestic market. Perhaps not coincidentally, new production sites on the mainland, as well as in ASEAN, resemble the current (i.e., pre-WTO) environment in Taiwan, where production volumes are relatively low and tariffs offer some protection against imports. More important, perhaps, is the strong likelihood that these new production sites are likely to remain somewhat protected, at least in the medium-term. Even with accession into WTO, China's vehicle tariffs, for example, will drop only to 25 percent by 2006 (Zachary 2000), which is just below current tariff rates (30 percent) in Taiwan.

A second type of foreign investment is also evident among Taiwanese automotive firms. These investments do not appear to have been motivated by expected

changes in the domestic trade and regulatory environments, but are part of a nearly constant upgrading of domestic operations. These investments often contribute to domestic restructuring by providing lower-cost sites from which to export and manufacture labor-intensive products, and in some cases, perform engineering and design tasks that are costly to perform in Taiwan or for which domestic engineers and technicians are difficult to find. These plants also provide lower-cost export bases to third countries, such as Japan, thus extending the life or increasing the profitability of existing product lines. (For examples, see firms 6 through 10 in Table 3.)

With these investments, Taiwanese firms are able to exploit what many see as their natural advantages on the mainland, including their ability to communicate with Chinese workers, firms, and local officials, and their experience in establishing and running plants with low break-even points. At the same time, these investments can provide an opportunity for Taiwanese firms to gain exposure to major international assemblers with JV projects on the mainland. Although only a few wholly-owned Taiwanese firms are part of the supplier network of SAIC--the largest Chinese automotive firm and the JV partner of VW and GM—some Taiwanese firms have used joint ventures with foreign partners as an entrée into this and other supply networks on the mainland. And by teaming with foreign partners, these firms often secure additional export channels--for example, partners' home plants—that allow them to produce at high volumes without relying on exports back to Taiwan.

Despite the stark differences in the characteristics of these two types of investments, they share some interesting similarities. Both types of investments are motivated by changing conditions in the domestic environment. In the case of market-diversifying investments, the salient factors are related to product market conditions, including domestic demand and likely changes in tariff and other regulatory structures; in the case of upgrading investments, changes in factor prices, especially rising land and labor costs, are more important. Interestingly, the organization of supply relations at new sites is also similar. Foreign plants of both investment types report reliance on other Taiwanese firms as suppliers. In some cases, this reliance is in the form of imports from Taiwan; in other cases, firms source directly from mainland plants of other Taiwanese firms. For some Taiwanese automotive firms, then, offshore investments reproduce and reinforce supply arrangements developed in the domestic arena.

5 Emerging Patterns, Open Questions

The existence of (at least) two distinct patterns of foreign investment in the Taiwanese automotive sector illustrates the potential of globalization to shape domestic firms and economies in complex, and even contradictory, ways. The first pattern, which involves the reproduction of capabilities and production of existing product lines at new sites, provides an opportunity for firms to reduce their dependence on an increasingly competitive domestic market and diversify markets in which they sell and produce. These investments could help ensure the survival or even growth of firms in the post-WTO period and thus avert a situation in which firm capabilities and human capital developed over decades are made obsolete by changing product markets and regulatory conditions.

The second pattern of investment, which is characterized by transfer of existing product lines and functional tasks to new sites, provides opportunities for firm growth, development of new customers, and upgrading of product lines at domestic plants. As such, these investments directly shape the types and levels of production and non-production activities and employment at domestic plants. By providing lower-cost sites from which to export to third countries, as well as exposure to European, American, and Japanese firms, these investments help firms broaden their customer bases. Interestingly, then, both types of investments act to reduce dependence on the small and competitive domestic market, but in fundamentally different ways.

Not surprisingly, some firms utilize both types of investments in their globalization strategies. Data from a sample of Taiwanese automotive firms show that of the roughly one-third of firms with some type of foreign investment, about 40 percent have invested in multiple sites. In addition, almost half of firms with plants in Fujian Province, where Taiwanese foreign assembly is concentrated, have also invested in other sites, usually on the mainland or in ASEAN. (Although some of these other investments could be in non-automotive sectors, like motorcycle parts, they suggest, in any case, a diversified approach to foreign production.) However, firms with a diversified foreign investment strategy seem to represent only a small portion of all Taiwanese suppliers: of the 64 firms represented in the sample, only 23 have foreign plants and of these, only 10 have two or more plants outside of Taiwan. (See Table 4.) Thus, while it is clear that foreign production plays a key role in the competitive strategies of some Taiwanese automotive firms, the future of a large number of suppliers is likely to depend on their ability to adapt to changes in the domestic environment.

Across the Taiwanese automotive sector, future activities could be shaped as much by developments in the larger east Asian automotive complex as by the domestic and foreign production strategies of individual firms. One key factor, of course, will be the evolution of sourcing patterns of Japanese firms and in particular, the extent to which east Asian countries, including Taiwan, are further integrated into sourcing networks. Shimokawa (2000) suggests that the regional division of labor within east Asia is likely to deepen as the region continues to emerge from the financial crisis. A second critical issue involves the extent to which Taiwanese plants will be utilized to complement or support their Japanese partners' plants in ASEAN by, for example, increasing their supply of parts and CKDs to these sites.

The most important influence on the future direction of the Taiwanese auto industry, though, is likely to be the development of the auto industry on the mainland, and the challenges and opportunities this will create. One crucial question is whether and how China's automobile capabilities will be integrated into the existing east Asian production network. One possibility is that Japanese assemblers will continue to pursue regional complementarity schemes in east Asia, and American and European assemblers will use mainland plants only to serve the China market. In this case, mainland production capacity would be used to serve only the local market and production capabilities currently being developed in China would be only marginally integrated into existing regional arrangements. Under these conditions, events on the mainland would have only limited effect on trade and production levels in other countries in east Asia.

A radically different approach, though, is suggested by the integration of Spain and Mexico into the regional production systems of American assemblers. Development of production capabilities and capacities in these countries came at the expense of existing automotive plants in the regions (see, e.g., Lynch 1998). In order to support high and steady levels of production at new plants in Spain and Mexico, these sites began to export vehicles and as a result, displaced production at existing plants in the regions. If the major assemblers were to integrate Chinese production sites into existing regional arrangements, the potential for a significant re-shuffling of market and production arrangements across east Asia could be high.

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Table 2. Trade Patterns of Taiwanese Components Firms, 1998

Group	Average Output ($US M)	Exports as % of Output	Major Export Destinations	Destination of Exports (%) Asia	Japan	Other	N.America/Europe	US
OEM-low	$21 M	3%	Southeast Asia, US, Japan, China	69%	11%	58%	31%	22%
OEM-med	$25 M	16%	US, Japan, Australia, China	53%	22%	31%	47%	24%
OEM-high	$46 M	50%	US, Europe (UK, Italy), Japan	27%	15%	12%	73%	44%
Aftermarket	$25 M	93%	US	6%[1]	3%	4%	94%	72%

Notes:
Data sources: See footnote 8.
Definitions: OEM-low: firms with Taiwanese OEM business whose export ratios are less than 10%
OEM-med: firms with Taiwanese OEM business whose export ratios are between 10% and 33%
OEM-high: firms with Taiwanese OEM business whose export ratios are greater than 33%
Aftermarket: no OEM sales

[1] Asia does not equal sum of Japan and Other because of rounding.

Table 3. Characteristics of Mainland Plants of Taiwanese Auto Supply Firms

Plant	Type of Firm	Number of Employees	Mainland Customers	Exports	Division of labor between Taiwan and China
1	JV (all Taiwanese partners)	<100	Taiwanese assemblers and suppliers	Some back to parent firm in Taiwan	None; same products made at both sites
2	Wholly-owned	<100	Taiwanese assemblers (80%)	20% to parent firm	Makes some older products no longer made in Taiwan; hope to increase exports to 50%
3	Wholly-owned	<100	Taiwanese assemblers (90%)	None	None, but firm sources technologically-demanding parts from Taiwan
4	Wholly-owned	<100	Taiwanese assemblers; hope to sell to Japanese assemblers future	None; hope to export to Taiwan and Japan in future	Firm hopes to shift lower-technology products to mainland
5	Wholly-owned	<100	Taiwanese assemblers	None	None; same products made at both sites
6	Taiwanese managed; owned by Japanese parent	100 -<250	European, American, and Japanese JV assemblers	Some to Taiwan	Some low value-added products moved to mainland and exported back to Taiwan
7	JV (Japanese partner)	250+	European and American JV assemblers	80% to Japan, US, Europe	Make same products, mainland plants are now export base; in future, Taiwan to focus on design, high-tech products
8	JV (Chinese partner)	250+	Foreign assemblers, Japanese parent of Taiwanese firm	Design work “exported” to Taiwanese parent	Slowly shifting design and engineering tasks to mainland to take advantage of availability and cost of engineers

Table 3. Characteristics of Mainland Plants of Taiwanese Auto Supply Firms (continued)

9	JV (Taiwanese, Japanese partners)	250+	Foreign (e.g., American) suppliers on mainland	80+%, most to Japan	Part of strategy to shift production of lower-skilled products to mainland
10	Wholly-owned	100-<250	Aftermarket	Export (% n.a.)	Mainland plant makes low-end components. Initial designs and pilot projects in Taiwan. Ship parts from mainland and Taiwan to a third production site in North America.

Table 4. Foreign Investment Patterns of Taiwanese Components Firms, 1998

Group	Average Output ($US)	Firms in Sample	Firms with Investments	Total # of Plants	Location of Plants	
					China (total)	Fuzhou
OEM-low	$21 M	28	7	14	11	5
OEM-med	$25 M	22	10	12	10	7
OEM-high	$46 M	14	6	12	9	3
Aftermarket	$25 M	6	1	1	1	0
Total		70	24	39	31	15

Notes:
Data sources: See footnote 8.
Definitions: OEM-low: firms with Taiwanese OEM business whose export ratios are less than 10%
OEM-med: firms with Taiwanese OEM business whose export ratios are between 10% and 33%
OEM-high: firms with Taiwanese OEM business whose export ratios are greater than 33%
Aftermarket: no OEM sales