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# GLOBAL TAIWAN

BUILDING COMPETITIVE STRENGTHS  
IN A NEW INTERNATIONAL ECONOMY



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## 6

## From NAFTA to China?

Production Shifts and Their Implications for  
Taiwanese Firms*Marcos Ancelovici and Sara Jane McCaffrey***Introduction**

At the end of the 1990s, Hong Ho Precision Textile's long-term outlook for production at home looked bleak. Like many Taiwan-based manufacturing companies, the firm saw opportunity in Mexico's low labor costs, duty-free access to the U.S. market, and proximity to the U.S. border. In 1999 Hong Ho launched an ambitious program to build textile and garment production facilities in the southeastern state of Yucatan, with plans to invest US\$60 million and hire 8,000 Mexican workers (EIU 1999, Bow 1999). Early returns were promising, and demand from U.S. customers strong. At the same time that Hong Ho announced a US\$10 million investment in a Mainland Chinese textile factory, the firm continued to plan an expansion of production in Mexico (Taiwan Economic News 2003). But by April 2004, Hong Ho's Mexico strategy had stalled: prices of NAFTA yarn proved too expensive and local subcontractors too scarce and unreliable. Hong Ho halted hiring at 1,500 workers and abandoned its circular knit operation (Just-Style 2004).

Similarly, electronics manufacturers who once viewed Mexico as a land of opportunity also had second thoughts: Hong Kong-based VTech closed its Guadalajara plant, leaving more than 4,000 Mexicans jobless, and relocated production to Guangdong, China. Overall, some estimates claim that since 2001, Mexico has lost about 400,000 jobs to China (Luhnaw 2004).

Hong Ho, VTech, and the many investors that fed the maquiladora industry had bet on the development of the North American regional economy in the 1990s. In fact, during that decade, a consensus of business

managers and academics believed that NAFTA would be one of three important trading blocks in an increasingly regionalized world. Mexico's experience in the past three years suggests a different reality: as one company after another has picked up stakes in Mexico and moved production out of the Americas, the assumption that trade within regions would dominate international exchange seems challenged. What happened to the importance of access to end markets and fast turn? Why are foreign multinational firms relocating parts of their production from Mexico to China? What implications does this production shift have for Taiwanese firms?

The commonly held assumption that regional trading blocks would dominate international trade seemed to dictate a particular locational strategy: Taiwanese firms hoping to compete in lucrative U.S. or European markets would need a production presence within NAFTA countries or the European Union (EU). Once NAFTA went into effect in 1994, Mexico served as the platform from which North American, European, and Asian multinational firms competed for a share of the U.S. consumer market. Manufacturers were drawn by Mexico's low labor costs, proximity to U.S. borders, and duty-free access to U.S. markets. In addition, companies that supplied large multinationals in other regions were often cajoled by their lead firms to co-locate in Mexico. As the Hong Ho example illustrates, Mexico proved to be a difficult production environment for Taiwanese firms. Many managers underestimated cultural barriers and were dismayed by wage inflation. Others complained of basic deficiencies in workers' skills and in infrastructure.

But did Taiwanese firms really need to invest in Mexico in order to access the U.S. market and be successful? Scholars upholding the idea of a world divided into regional trade blocks would answer affirmatively. However, as we show in this chapter, since 2000 most leading multinationals in electronics and textile and apparel have moved part of their operations out of Mexico, and very often to China. Although some of these firms have retained operations in Mexico and tried to upgrade them, lower-end mass production seems to be well on its way to China. Chinese producers have even gained U.S. market share in television sets—bulky, difficult-to-transport products that have long been a stronghold of Tijuana, Mexico (see Figure 6.2 on p. 179). In fact, the deregionalization trend extends beyond North America: firms recently established in Eastern Europe have also considered relocating part of their operations to China.

In this chapter, we assess the implications of the recent production shift from Mexico to Asia for theories of regionalization and globalization. We draw from several data sources, including U.S. import data, trade publications and other secondary literature, and our own interviews with firm managers. First, we discuss the assumptions behind the regionalization and globalization theses of the 1990s. Second, we lay out evidence of the significant transfer of production from Mexico to China that contradicts the predictions of regionalization in two important industries that are considered emblematic of globalization: textile and apparel and electronics. Textile and apparel goods contain very high labor content, which pushes production toward lower-wage locations, but are also regulated by a complex and highly protective international trade regime. Electronics production, in contrast, is more capital intensive but is also highly standardized. Standardization has facilitated an intensive process of deverticalization in the industry. Because the possibility of shifting operations to China is higher in textile/apparel and electronics production, these two sectors are critical cases. Third, we explore the importance of such a production shift for theories of regionalization and globalization. We find that proponents of regional economies have often overestimated the advantages of privileged market access and just-in-time delivery, and underestimated the critical importance of capable local suppliers. Finally, we suggest a few conditions under which proximity, which may be a temporary advantage, can be leveraged into industrial upgrading, and discuss the impact of the recent production shift for multinational producers.

### **Regionalization, Globalization, and NAFTA**

Though both regionalization and globalization suggest the growing importance of cross-border trade, scholars have reached no consensus on the relationship between the two phenomena. Some authors see regionalization and regional trade blocs as part of globalization, insofar as they contribute to the erosion of national borders and may work as a stepping-stone to global free trade (Wei and Frankel 1996). Others, in contrast, present regionalization as a defensive reaction to globalization, “an effort to regain some measure of political control over the processes of globalization that have impinged on national policy” (Katzenstein 2003, p. 105). A third group of scholars stresses that regionalization is neither a first pass at globalization nor a reaction to it,

but a distinct process. Much empirical work emphasizes that the bulk of international trade takes place within regions, particularly North America, Europe, and Asia (Zysman 1996a). In this chapter, we are interested not so much in explaining the origins of regionalization—which all authors agree are often political—as in discussing what fosters its demise or transformation. Although the world economy is still structured around trade blocs, the production shift from Mexico to China challenges the notion that regionalization is, and will remain, the driver behind the restructuring of international production and distribution networks.

Regional producers have an obvious and long-standing advantage over far-flung competitors in transportation costs, which is particularly important for makers of bulky or delicate goods. But scholars have cited two explanations for the recent growth and consolidation of regional economic integration. The first, rooted in politics, emphasized the privileged access to end markets. Free trade areas, like NAFTA, and common markets, like the EU, are designed to favor members by eliminating costly barriers to trade, including tariffs. Thus, NAFTA favored regional sourcing and boosted Mexican exports to the United States. As Mexican producers’ share of the U.S. market spiked in the late 1990s, several observers called for increased attention to the regional production network: “The emergence of an integrated North American regional economy in the latter half of the 1990s constitutes a qualitative change in the dynamics of the apparel industry that requires new forms of analysis” (Gereffi et al. 2002, p. 7).

A second argument for regional organization of production hinges on strategies for the distribution of goods. According to Abernathy et al. (2004), the advent of “lean retailing” in the late 1980s changed the way clothes and other goods are sold in the United States. Rather than placing large orders for merchandise at the beginning of each season, retailers began to hold small inventories, track sales with bar code scanning, and require quick replenishment of only those goods that attracted customers. An ever-increasing range of products enhances customers’ choices, but also multiplies the cost and difficulty of maintaining inventories. As a result, Abernathy et al. argue, supplier responsiveness is central to lean retailing, as lead firms demand the supply of more and more products on a replenishment basis (2004, p. 25). Being close by, as Mexican exporters are to the U.S. border, facilitates quick delivery of re-orders. The fashion component of textile and apparel goods—where much of the value in some segments lies—depends on fast product cycles

and quick time to market. In such cases, large retailers and brand-named merchandisers coordinate the functions that constitute the commodity chain across countries.

Rapid innovation in some electronic product segments, like PCs, also requires quick response to market demands. In other words, the slow boat from China may arrive with merchandise that is already out of style or obsolete. With quick response a key determinant of success in the higher-value segments of the industry, Abernathy et al. (2004, p. 43) suggest, the proximity of regional producers to rich country ports is an important and enduring advantage:

Greater regionalization of textile and apparel production is a natural outgrowth of the competitive forces [created by lean retailing]. . . . Instead of a single international market for apparel and textiles, three regionally based models anchored in the United States, Europe, and Japan may better reflect the realities of post-2005 globalization.

Though these scholars concentrate on textile/apparel, they believe “similar developments can be expected to emerge across other consumer product industries where replenishment is of growing importance” (Abernathy et al. 2004, pp. 44–45). One such industry is electronics: products can be fragile and/or bulky, holding large inventories is expensive, and customizing products is an increasing trend. In fact, as Chase (2003, p. 46) suggests, geography may “naturally” structure production-sharing within regions:

Multinationals tend to focus on region-specific sourcing, manufacturing, and marketing because often there are diseconomies of scale in global production networks. Locations closer to the corporate parent offer a number of benefits: lower transport costs in the movement of goods between home and host countries; easier coordination with components suppliers for firms that maintain low inventories and rely on just-in-time delivery systems; and shorter lead times when firms must adapt quickly to changes in demand or consumer tastes. As a result, production sharing primarily crosses borders between neighboring (or nearby) countries.

Regional producers, according to these theories of regionalization, should beat their distant competitors on tariff/nontariff barrier costs, transportation costs, and time to market. Based on these assumptions, arguments for the continued prevalence of regional economic integration

predict a continued preference of U.S. buyers for suppliers located in Mexico, particularly in higher-value-added product markets.

In the early to mid-1990s, business managers throughout the world found the regionalization logic compelling. Just as U.S. firms moved production south of the border to take advantage of low wages, Asian and European firms built factories in Mexico to benefit from NAFTA countries' privileged access to the U.S. market. Gaining this edge was particularly important to firms in Taiwan. Taiwanese industry, which had been built on low-wage manufacturing, was under threat from lower-cost competition on the Mainland and in Southeast Asia. Capital-rich Taiwanese firms invested in Mexican production sites to skirt tariffs and be nearer to end markets. In fact, Taiwan has been a major source of foreign direct investment in Mexico throughout the NAFTA period (see Table 6.1). For example, in dollar terms, Taiwan was the third-largest provider of foreign direct investment (FDI) in Mexico's textile and apparel sector between 1999 and 2002 (Ferreira 2003, p. 20; see also Table 6.2). Some Taiwanese investors moved to Mexico on their own, attracted by the promise of government subsidies as well as NAFTA markets. Other producers, whose livelihoods depended on their relationships with brand-name multinationals, were encouraged to invest by their customers who had already moved some production into the region.<sup>1</sup>

Did the promise of NAFTA live up to investors' expectations? In the next sections, we will track developments in the two industrial sectors expected to benefit most from NAFTA: electronics and textile and apparel.

### The Electronics Industry in Mexico

Up to the 1970s, Mexico had a large and strong consumer electronics industry: “In 1965, an observer of the global economy easily could have concluded that Mexico, and not Taiwan or South Korea, would become one of the most successful developing countries in establishing a competitive, indigenous electronics and related parts industry” (Lowe and Kenney 1999, p. 1428). Mexico failed to sustain its industry and still suffers from structural limitations that other developing countries like Taiwan were able to surpass. Nonetheless, during the last ten years the electronics industry in Mexico has been going through an extraordinary wave of expansion and transformation.

Table 6.1

## Taiwanese FDI in Mexico, 1995–2002 (in US\$ million)

1995	1996	1997	1998	1999	2000	2001	2002
0.6	2.6	7.2	27.2	19.8	6.6	21.6	6.6

Source: OECD ([www.oecd.org](http://www.oecd.org)), November 8, 2004.

Table 6.2

## Foreign Direct Investment in the Maquilladora Sector Textile and Apparel Industry, 1999–2002 (in thousands of dollars) (selected countries)

Country	1999	2000	2001	2002	1999–2002	% Share of total, 1999–2002
United States	249,725	301,193	117,196	124,541	794,655	79.4
South Korea	6,348	-13,396	7,937	2,002	2,891	0.3
China	626	971	97	231	1,925	0.2
Taiwan	16,755	4,459	8,883	2,947	33,045	3.3
Total	327,888	359,461	172,594	141,095	1,001,039	100

Source: Secretaría de Economía data, published in Ferreira (2003), p. 29. Used with permission of Textiles Intelligence Ltd. [www.textilesintelligence.com](http://www.textilesintelligence.com).

### NAFTA and the Transformation of the Electronics Industry

The Mexican electronics industry was shaped by two waves of investment and development. The first, led mainly by U.S. original equipment manufacturers (OEMs) such as IBM, Hewlett-Packard, and Motorola, began in the 1970s. A second wave began in the mid-1990s, after NAFTA came into effect in January 1994. This time, the firms investing were U.S. and Asian OEMs, like Acer, as well as an increasing number of electronics contract manufacturers (ECMs),<sup>2</sup> such as Solectron, Flextronics, and Sanmina-SCI. These firms are located primarily in four states: the border states of Baja California (Tijuana), Chihuahua (Ciudad Juarez), and Tamaulipas (Reynosa); and in the western state of Jalisco (Guadalajara).

This second wave of investment had a dramatic effect on the Mexican electronics industry. The number of people employed shot up, from 192,000 in 1994 to 382,000 in 2000—a figure that constitutes 9.3 percent of the total Mexican workforce employed in manufacturing industries (see Table 6.3). Similarly, annual FDI grew from US\$257 million

Table 6.3

## Mexican Electronics Industry, 1994–2001

	Employment (thousands)	FDI (U.S.\$ millions)	Exports' value (U.S.\$ millions)	Productivity index (1993 = 100)
1994	192	257	10,791	111.3
1995	197	573	13,181	106.8
1996	226	571	21,097	114.2
1997	271	655	26,404	125.7
1998	305	661	30,464	132.8
1999	331	1,535	36,548	134.2
2000	382	821	46,248	139.5
2001	360	271	42,978	N/A

Source: Secretaría de Economía, "Programa para la Competitividad de la Industria Electrónica y de Alta Tecnología," 2002.

in 1994 to US\$821 million in 2000. At the same time the total value of electronics exports increased from US\$10,791 million in 1994 to US\$46,248 million in 2000; productivity grew by 39.5 percent.

Though the first wave of investment was essentially motivated by low wages, this second wave was also driven by increased access to the U.S. market as a result of NAFTA and of transformations in the organization of production that made geographical proximity even more important than in the past. Indeed, NAFTA brought tariffs for Mexican exports to the United States down from 3.94 percent to 0.27 percent. Producing in and exporting from Mexico became a way for Asian and European producers to bypass U.S. trade barriers or, in the case of U.S. companies, to lower production costs to face Asian competition. Thus, Mexico became "a space where American and Asian electronics industries increasingly compete[d] for a share of the U.S. market" (Dussel Peters 2000, p. 76). This pivotal role allowed Mexico to compete with Asian countries in the battle for the location of production and assembly processes. In addition to NAFTA, the 1994 peso devaluation nearly halved production costs and thereby made Mexico all the more attractive as a place to relocate production (Lindquist 2000).

More important in the long run, changes in management strategies and the organization of production that started in the late 1980s had a significant impact on investment patterns. "Just-in-time" delivery forced firms to move manufacturing closer to end markets in order to meet rapid demand changes and turnarounds. For example, in 1999, IBM's

mobile computing division moved its notebook assembly operations out of Asia and decided to increase its Guadalajara operations. By 2000, 65 percent of all IBM portable PCs were assembled in the capital city of the state of Jalisco. The production of flat-panel monitors underwent a similar trend. In 1999, IBM pressured its suppliers to set up operations in North America. Ken Czarnecki, director of OEM operations for the IBM group, explained that “the transportation cost and time delay in shipping panels back to Asia for repair or alteration was becoming unacceptable. We needed much faster turnaround” (quoted in Robertson 1999). Turnaround time is why most repair centers are actually not even in Mexico but in the United States. Thus, in 1999 Dell moved its assembly operations for its consumer notebooks from Asian ECMs back to the United States. A spokesperson for Dell explained that the firm needed “much quicker turn-around in notebook assembly to cut inventory, shorten delivery times, and react faster to market changes” (quoted in Robertson 1999).

The industry also went through a deep reorganization. Indeed, digitization and standardization of interfaces between business functions facilitated the modularization of production, the fragmentation of the value chain, and the disintegration of vertically integrated firms. When business functions no longer needed to be located in the same place, or in the same company, cross-national production networks emerged. Different value chain functions began to be executed across national boundaries. As a result, brand-name electronics firms increasingly outsourced their manufacturing operations to ECMs in order to concentrate on “core competencies,” such as product definition, design, and marketing, and to track (and respond to) market changes (Borrus and Zysman 1997, Sturgeon 1998, 2002, Lüthje 2002).

This shift to modular and cross-national production networks created a new market for ECMs. U.S. brand-name firms (e.g., Dell, HP, IBM, and Apple) and their complementary ECMs regained dominance of the electronics industry (see Table 6.4). In response to the demands of brand-name firms, ECMs developed a global presence in the 1990s. The top five ECMs (Solectron, Flextronics International, Sanmina-SCI, Celestica, and Jabil Circuit) grew at an average annual rate of 43 percent per year between 1995 and 2003, essentially through the acquisition of competitors and entire plants from OEMs as well as the expansion of existing manufacturing facilities throughout the world (Sturgeon 2002, Lüthje 2002). Most firms that invested in Mexican manufacturing plants during

Table 6.4

**Top PC Vendors and ECMs in 2002**

Top five PC vendors in the United States	Top five ECMs in the world
1 Dell	Solectron
2 Hewlett-Packard	Flextronics
3 Gateway	Sanmina-SCI
4 IBM	Celestica
5 Apple	Jabil Circuit

*Sources:* Olenick 2002, Sturgeon 2002.

the 1990s were leading North American-based ECMs that already had a strong presence in Asia, while most Asian ECMs concentrated on Chinese locations.

In Mexico in 1995, the leading U.S. firm, Solectron, was the first ECM to build a plant in Guadalajara, Jalisco. In 1998, Lucent Technology sold its Monterrey manufacturing facility to Toronto-based Celestica, an ECM that had spun off from IBM in 1996. Before it was acquired by Solectron in 2000, NatSteel (then a Singapore state-owned firm) had also made huge investments in Guadalajara and set up several manufacturing facilities. With its concentration of electronics firms, Guadalajara came to be known as the “Silicon Valley of Latin America.” In 1999 the region produced more than 60 percent of all computers manufactured in Mexico. In 2002 the Guadalajara electronics cluster included thirteen OEMs (such as IBM, HP, Intel, Kodak, Siemens, and Hitachi), thirteen ECMs (such as Solectron, Sanmina-SCI, Flextronics, and Jabil Circuit), one original design manufacturer (ODM), sixteen design centers, and more than 380 specialized suppliers (CADELEC 2003).<sup>3</sup>

Thus, at the end of the 1990s, one could say that NAFTA and changes in the organization of production had deepened the economic integration of North America. Therefore, theories that claimed globalization would entail the consolidation of regional trade blocs (North America, Europe, and Asia), rather than the emergence of an integrated, single world market, appeared to be founded. Moreover, a similar trend seemed to take place in Europe, as the same largest ECMs opened facilities in Eastern Europe at the same time.<sup>4</sup>

However, since 2000–2001, a new trend is emerging. Market access no longer seems to be a crucial factor in location decisions. At the same time, the meaning of geographical proximity is changing, as being close

Table 6.5

**Largest Dollar Amounts of U.S. High-Tech Imports by Country of Origin, 2000–2002**

2000		2002		2000–2002	
Country of origin	Imports (U.S.\$ billions)	Country of origin	Imports (U.S.\$ billions)	Country of origin	%
1 Japan	48	China	35	China	+34.6
2 Mexico	37	Mexico	34	Mexico	–8.1
3 EU	28	Japan	29	Japan	–39.6
4 China	26	EU	26	EU	–7.1
5 Taiwan	22	Malaysia	19	Malaysia	–5.0
6 South Korea	21	Taiwan	16	Taiwan	–27.3
7 Canada	21	South Korea	15	South Korea	–28.6
8 Malaysia	20	Singapore	11	Singapore	–26.7
9 Singapore	15	Canada	10	Canada	–52.4
10 Philippines	9	Philippines	7	Philippines	–22.2
Total U.S. High-Tech Imports		\$271.346b		\$219.975b	–19

Source: American Electronics Association (AEA), "Tech Trade Update 2003," [www.aeanet.org](http://www.aeanet.org).

Note: Percentages are based on our calculations. Other leading countries include Brazil, Costa Rica, Hong Kong, Hungary, Indonesia, Israel, Switzerland, and Thailand.

to key suppliers seems to have eclipsed being close to end-user markets. While Mexico struggles to adapt, China has emerged as Mexico's main challenger for U.S. market share.

### *The Rise of China*

Between 2000 and 2002, more than 500 maquiladoras closed throughout Mexico. In 2001 alone, 250,000 jobs were lost and 253 factories shut down (Moody 2002). A range of macroeconomic indicators—employment, FDI, export value—clearly show a decline after 2000 (see Table 6.3 on p. 173).

A priori, this slowdown in economic activity could be the result of the U.S. recession, given that 85 percent of total Mexican electronics exports typically go to the United States. Indeed, total U.S. high-tech imports decreased by 19 percent between 2000 and 2002, from US\$271.3 billion to US\$219.9 billion (see Table 6.5).<sup>5</sup> In 2003, moreover, the Guadalajara plants of the leading ECMs were operating at only 60 percent

capacity (Smith 2003). However, macroeconomic data indicate not only that U.S. high-tech imports are declining and that Mexico's electronics industry is experiencing a slowdown as a result, but also that China's share of the U.S. market keeps increasing. In 2000, U.S. high-tech imports from Mexico and China represented, respectively, US\$37 billion and US\$26 billion. In 2002, Mexico's share had fallen to US\$34 billion, whereas China's had increased to US\$35 billion. If the U.S. recession were the sole cause of Mexico's woes, China's exports would have been similarly battered.

The largest segment of U.S. high-tech imports is made up of computers and computer parts. While computer imports did not fluctuate significantly, computer part imports (such as motherboards) from Mexico fell after 2001, while those from China increased dramatically (see Figure 6.1). Moreover, Sturgeon and Lee (see chapter 2 in this volume) point out the growing market share of PC-related contract manufacturing by Taiwanese original design manufacturers (ODMs) that have almost all their production in China.

On the one hand, this variation suggests that the production and assembly of bulkier commodities like computers remains in Mexico to limit transportation costs and delivery time, while the production of parts easy to ship is now primarily done in China. On the other hand, however, bulky commodities like TVs are increasingly produced in China even though Mexico still dominates the U.S. TV market (see Figure 6.2).

These macro data help to demonstrate the growing competitiveness and market shares of firms located in China, but they do not tell us whether these firms used to be located in Mexico in the past. In other words, these data do not demonstrate that a shift is taking place from Mexico to China and that the North American region as a trade and production bloc is being transformed. A brief look at firms that recently relocated some of their operations out of Mexico provides a useful complement (see Table 6.6).

### **The Textile and Apparel Industry in Mexico**

Garment assembly is a labor-intensive process, and as a result, the textile and apparel sector seems particularly vulnerable to relocation to low-wage environments. But the fashion component of many apparel products, together with the advent of lean retailing, led many observers to argue for the continued regionalization of textile and apparel chains,

Table 6.6

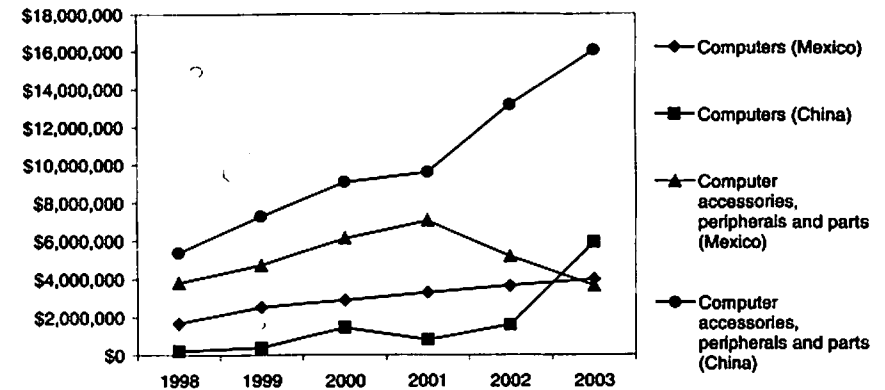
**Electronics Firms Moving Out of Mexico**

Firm	Investment	Future
Flextronics	PCB plant	Closed in 2003, shifted low-skilled production to China.
Emerson Electric	Factory in Monterrey	Closed in 2002.
Motorola	Semiconductor plant in Guadalajara	Closed in 1999.
Hewlett-Packard and Lucent Technologies	Long-time, very big investors in Guadalajara	Moved to China.
Royal Philips Electronics	Computer monitor factory in Ciudad Juárez	Moved to China in 2002. Loss of 900 Mexican jobs.
Canon	Inkjet primer factory	Moved to Thailand and Vietnam in March 2002. Loss of 700 Mexican jobs.
Sanyo	Video components	Moved to China and Indonesia in 2001. Loss of 1,884 Mexican jobs.
VTech	Circuit boards plant	Moved to China in 2001-2. Loss of 6,952 Mexican jobs.
Matsushita	Electronics plant	Seeking to relocate all or part of its operations.
Pioneer	Speaker factory in Tijuana	Transferred part of operations to Shanghai in 2002.

Source: Compiled by the authors from media reports.

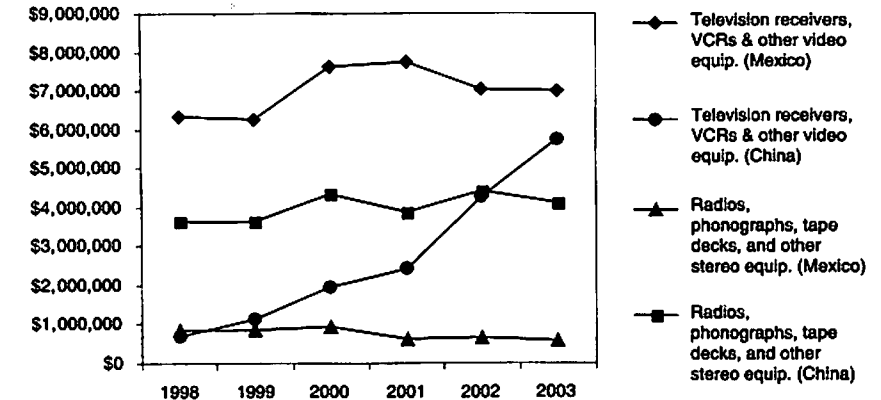
despite competition from much-lower-wage producers overseas. In the 1980s, as competition from low-wage producers in Asia hit the U.S. textile and apparel industry hard, U.S. managers seized on this regional production model as a survival strategy. U.S. textile managers believed that low-wage Mexican garment workers and highly sophisticated U.S. textile mills would be natural partners. A regional production and sourcing strategy was the industry's future: in fact, NAFTA promised a "renaissance for the textile industry," argued the former chairman of Guilford Mills in 1993 (McNamara 1993).

Figure 6.1 U.S. Imports of Computers and Computer Parts, Mexico vs. China



Source: U.S. Census Bureau, Foreign Trade Statistics, www.census.gov/foreign-trade/www, accessed November 2004.

Figure 6.2 U.S. Imports of Televisions and Radios, Mexico vs. China



Source: Same as Figure 6.1.

Indeed, NAFTA brought a dramatic increase in Mexican garment production and exports. By 1995, Mexico surpassed China as the largest exporter of garments to the United States, and the number of garment producers in the maquiladora sector grew from 398 in 1994 to 1,088 in 2000. As apparel production in Mexico boomed, enthusiasm for NAFTA spurred many U.S. textile firms to invest in warehouses in Mexico, and as the decade wore on, many committed serious resources to building



production facilities in the country as well. Of U.S. textile firms competing in the apparel segment, seven of the top ten companies built or invested in Mexican production facilities.<sup>6</sup>

The most ambitious investments, like those planned by Burlington, Guilford Mills, and Delta Woodside, aimed to integrate textile production and garment assembly in one firm, leveraging U.S. management, marketing, and sales talent with low-cost labor in Mexico. These firms intended to offer customers full-package production services, a “one-stop-shop” for apparel brands like Liz Claiborne, Ralph Lauren, or Gap. A vertical strategy would allow the textile firms to ensure a market for their fabrics, and capture a greater share of the end product’s value added, they hoped.

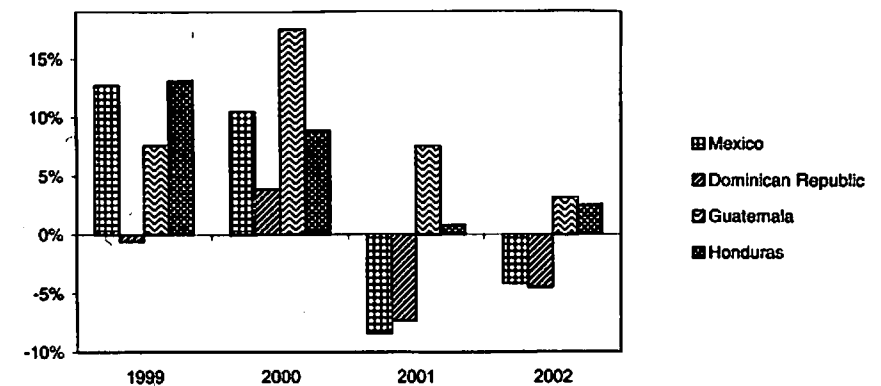
Unfortunately for the U.S. textile managers who bet on a regional economy and for the Mexican workers they employed, NAFTA’s early promise petered out by the end of the decade. U.S. imports of apparel made in Mexico have declined since 2000, at the same time as the number and value of garments China sends to the United States continue to grow rapidly. And Mexico is not the only recent loser—several other lower-wage producers in the Caribbean Basin region, where apparel firms enjoy proximity and favorable access to U.S. markets, have also experienced slowed or negative growth (see Figures 6.3–6.5).

This downturn in intraregional imports is quite recent, and follows the 1997 depreciation of several Asian currencies, a recession in the United States in 2001, and a worldwide dip in trade after the September 11 terrorist attacks. However, the downturn in the Mexican garment sector may signal a structural change rather than a temporary development. First of all, the regional strategies of several lead firms seem to be breaking down: Burlington, Cone Mills, Dan River, and Galey and Lord have all closed or scaled back their investments in Mexico since 2001 (see Table 6.7).

Critics charged that U.S. textile mills, with limited knowledge of apparel markets and even less understanding of garment construction, lacked the retail contacts and the production know-how to jump into the clothing business. However, even firms with solid experience in garment production failed to make a go of a vertical/regional production strategy.<sup>7</sup>

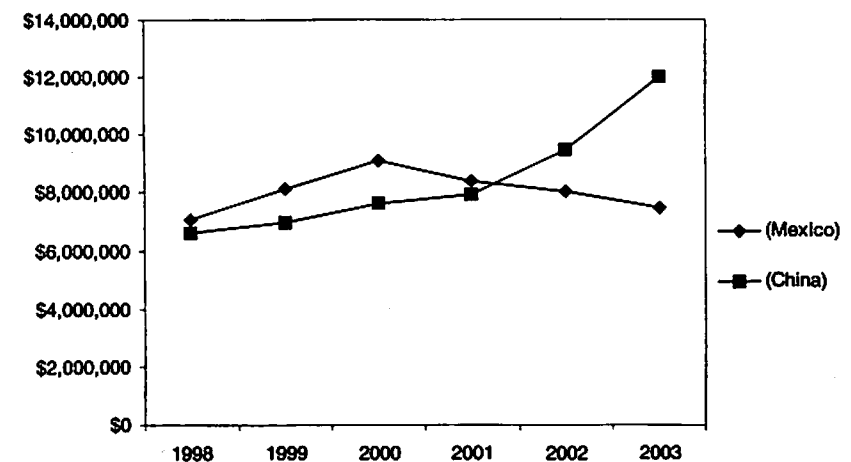
Also, the new competitors of U.S. textile firms have not been from within the region. Textile production in Mexico has improved in the past decade, as foreign sourcing for apparel inputs dropped from 98.2 percent in 1994 to 92.0 percent in 2002, but the expansion of domestic produc-

Figure 6.3 Growth Rates of Apparel and Household Good Imports to the United States from Mexico and Selected CBI Countries



Source: Office of Textiles and Apparel, U.S. Department of Commerce, “Trade Data—U.S. Imports and Exports of Textiles and Apparel,” <http://otexa.ita.doc.gov/msrpoint.htm>, accessed November 2004.

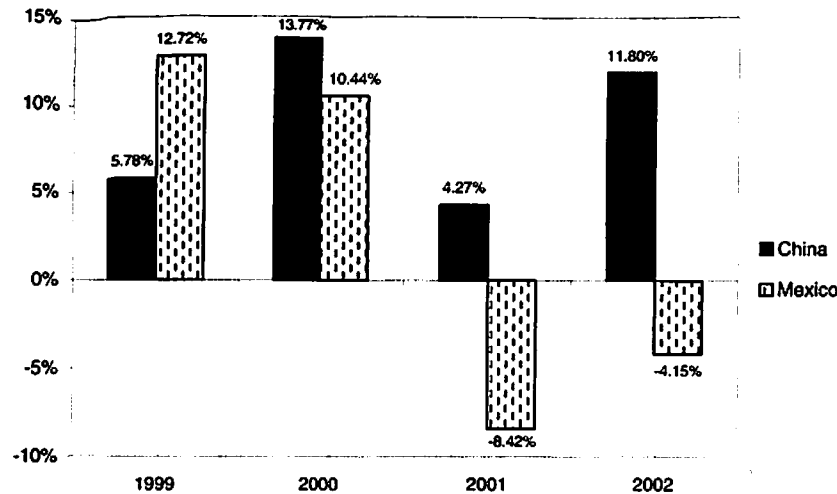
Figure 6.4 Apparel and Household Textile Goods Imports to the United States, Mexico vs. China



Source: Same as Figure 6.1.

tion in Mexico is relatively modest and much is dependent on foreign investment (Ferreira 2003). In addition, all foreign investors’ commitments to the Mexican textile and apparel industry have declined rapidly since 2000 (see Table 6.2). Since January 2001, 325 of 1,122 clothing maquiladoras have shut down (Forero 2003).

Figure 6.5 Annual Growth Rate in U.S. Imports of Apparel and Household Goods, China vs. Mexico



Source: Same as Figure 6.3.

Table 6.7

**Textile Firms Leaving Mexico**

Firm	Investment	Future?
Burlington	Fabric plant, slacks factory, denim mill	Closed 2001. Jobs lost: 1,100.
Galey and Lord	Purchased Dimmit Industries, a Mexican manufacturer of shorts and trousers; set up two textile plants	Closed six Dimmit sewing plants and one textile facility. Jobs lost: 3,500.
Dan River	Joint venture with Mexican apparel firm; planned to invest/send 275 looms	Withdraw February 26, 2001.
Guilford Mills	US\$30 million apparel factory closed after 11 months	Announced closing on March 6, 2002; company plans to reinvent as a U.S.-based auto supplier.
Cone Mills	Large denim plant in Parras, Mexico	Needs US\$18 million in financing.

Proponents of regional apparel markets, like Abernathy et al., argued that shifts in sourcing apparel to Mexico and Caribbean Basin Initiative (CBI) countries would be "very beneficial" for U.S. textile

interests and a potential boon to Mexican fabric producers (2004, p. 41). In fact, a regional apparel sourcing strategy depends on a healthy and competitive textile industry close to garment assemblers. The current crisis in the textile industry is evidence against the regionalism thesis. With fewer local or regional suppliers for fabric, garment factories in Mexico and the Caribbean maintained large stocks of inputs in order to pursue a quick-turn strategy, but this was expensive and risky. Importing fabric from outside the region took time and required garment assemblers to pay tariffs on the non-NAFTA textiles, thus undercutting one of the main advantages of producing apparel in the region.

Do lower labor costs in Asia wipe out the tariff advantages of producing within NAFTA? According to Abernathy et al., retailers should still favor suppliers who can consistently deliver reorders quickly (2004). However, even these findings suggest that many Mexican producers have yet to reach a high level of reliability. Abernathy et al. report that lead times from Mexico can be as short as four or as long as nine weeks; lead times of Chinese factories range from seven to sixteen weeks or more. The best-managed Chinese factories can deliver goods to U.S. distributors faster than the worst Mexican factories. Air freight is far more expensive than shipping over land or sea, but China's lower wage rates could compensate for the higher transportation costs (Watkins 2002).

If, with lower labor costs and high productivity, Chinese producers can beat Mexican garment assemblers on price and almost match delivery times, retailers in search of quick reorders may look to the better-managed factory, rather than the closer one. Falling air freight costs make far-flung suppliers even more attractive. As the director of sourcing for one major U.S. apparel firm said, "If I do it right, I can bring it in by air from Asia, and I can have goods air-freighted from Asia at lower cost than trucked in from Mexico."<sup>8</sup> As shown in Table 6.8, this executive expects an increase in this trend.

Sourcing managers' preference for Chinese suppliers has also been influenced by fashion. In the mid-1990s, one manager said, Mexico built its reputation on replenishment, free of the unpredictability of quota, and the ability to produce large runs efficiently. In 2001, the apparel market moved away from commodity products and toward merchandise with a higher fashion content. Instead of 20,000 units of the same style, customers wanted 5,000 one way, another 5,000 cut differently, and so

Table 6.8

## Shipping Trends at One Large U.S. Apparel Firm

	% of merchandise transported by sea/land	% of merchandise transported by air
1998	88	12
2003	80	20
Future	70	30

*Source:* Sourcing manager's interview with the author, November 2003.

on. "We told our facilities there that we need much shorter runs. They included some of the biggest and best Mexican companies and they couldn't manage the change," said one manager. Though the Mexican plants had talented upper management, good workers, and new equipment, a lack of good midlevel management left them unable to provide consistent delivery of complicated orders.<sup>9</sup> As Mexican plants lost orders, they were "grabbed up by Asia," the manager said.

### *A Shift to China?*

As Mexico's main advantages as a textile and apparel producer, proximity and privileged market access, seem to be eroding, China's competitiveness in a global garment market may be gaining steam. In 2002, China joined the WTO and took back its title as top garment exporter to the United States. According to one textile analyst, China's advantages over Mexico include:

a more skilled workforce; lower electricity and water costs; lower corporate income taxes; higher availability of cheap raw materials, particularly cotton; a more diverse and well-developed network of suppliers; and a higher degree of vertical integration in the industry. (Ferreira 2003, p. 34)

Such advantages should position China well to capitalize on the removal, as of December 31, 2004, of the import quotas that remain on almost 80 percent of textile and apparel products. In fact, many managers in the industry have become so convinced that China will be able to beat competitors after deregulation that they began to increase sourcing

in China as early as 2001 and 2002, in order to establish relationships with Chinese manufacturers in anticipation of a ramp-up of orders as of 2005.<sup>10</sup> The move toward sourcing garments in Asia has already impacted U.S. textile companies. As the manager of a woolen mill (who closed his facility this year and shipped his machines to China) points out, textile sourcing follows sewing.<sup>11</sup>

Despite the attractions and prospect of China as a garment supplier, textile and apparel production within NAFTA and the Caribbean Basin will not disappear. Large retailers do not wish to become dependent on suppliers in one country, or even one region. The outbreak of SARS provides a case in point: several garment managers shifted some orders from Asia to Mexico and the CBI during the height of the 2003 health crisis in China and Hong Kong.<sup>12</sup> Just as garment districts in New York and Los Angeles counties continue to employ upwards of 22,000 and 72,000 production workers (respectively) despite high wage and real estate costs (U.S. Bureau of Labor Statistics 2002), nimble producers with lower costs and privileged access to U.S. markets will find their niche. Only a small amount of the production in New York requires high-skilled tailoring; most of the sewing is quick-turn production for reorders of midpriced merchandise from chain stores and even discount outlets.<sup>13</sup> Some Mexican producers plan to move up-market to find a niche with high-end U.S. retailers. Others will search out small-batch, rush orders (Forero 2003). Despite the bleak overall picture for U.S. sewing plants, these strategies have worked for some garment manufacturers in the United States. Plants in Mexico could capture a greater share of reorders, but to do so will require a reputation for consistent management and reliable delivery.

### *The Changing Nature of Regionalization*

Why are textile and apparel firms leaving Mexico? We need to understand the nature of this shift to China in order to identify its implications for regionalization. Analysts blame Mexico's recent exporting woes on various culprits: the U.S. recession, rising maquiladora wages, an overvalued peso, and a poor climate for business in Mexico. We discuss each of these explanations below and then offer an alternative way to understand the recent transformation of regionalization.

The U.S. recession is one obvious suspect to blame for maquiladora closings. According to Gerber and Carrillo, "a one percent decline in

U.S. industrial production leads to a decline of just over 1.25 percent in maquiladora employment nation-wide. The effect, then, of the slow-down in U.S. industrial production is a eight to nine percent loss of jobs in the maquiladora industry, or about forty percent of the actual job loss" (2002, pp. 18–19). But the drop in U.S. consumer demand in 2001 did not affect all importers equally. The recession in the United States cannot explain why some firms moved to China in order to export for the U.S. market, nor why an increasing number of U.S. buyers looked beyond the region for suppliers, resulting in losses for Mexican-based producers.

In addition to the U.S. recession, many point to the rising wage rate in Mexico as a cause of the drop in exports. In 1995, the minimum wage was US\$2.90 per day; by 2002, it had risen to US\$4.25. Entry-level factory workers in maquiladoras make US\$1.50–2.50 per hour, compared with US\$0.25–1 per hour in China. Clearly, the Mexican production environment is not as "low wage" as it seemed at NAFTA's inauguration. However, the skills and productivity of Mexican workers have improved rapidly during the NAFTA period. In electronics, producers have begun moving away from basic assembly and into midrange and higher-end products, and wages have moved up accordingly. In the textile and apparel sector, the annual value-added per worker hour rose from US\$3.41 in 1994 to US\$5.28 in 2002, a surge in productivity that could explain the surge in wages (statistics cited in Ferreira 2003, p. 21).

Moreover, the wage differential between China and Mexico is only one factor in deciding where to locate production. As Bill Coker, director of sales and marketing for the Dallas-based ECM Elcoteq Americas, explained:

If you just look at the labor side, labor is significant—about a 4-to-1 ratio in favor of China. But if you look at the amount of automation that goes into a small cell phone, there's not a lot of hand assembly. So whether we have a [capital-intensive] surface-mount line set up in Mexico or in China, there's not a lot of cost difference in terms of running those lines. (quoted in Maclellan 2003, p. 40)

In addition, theories of economic regionalization emphasize that the advantages of lower-wage production need to be weighed against the

risks of being far from markets and the costs of maintaining large inventories. According to Borrus and Zysman, cross-national production networks in electronics are more about "the emergence of locations that can deliver different mixes of technology and production at different cost-performance points" rather than about lower wages. "Countries represent particular mixes of capabilities and costs: if a country did not have capability and only had low labor cost, or had a particular capability at too high a cost, firms would seek alternate locations" (1997, p. 153). The same point can be made about textile and apparel: though China's wages are lower than Mexico's, they are 38 percent higher than Bangladesh's, and 81 percent higher than Indonesia's. Yet China's garment industry has grown more rapidly than lower-wage competitors.

In addition to rising wage costs, many commentators blame Mexico's overvalued peso for the recent downturn in exports. With a too-strong currency, all of Mexico's inputs are overpriced, and producers in the region are disadvantaged on world markets. Gerber and Carrillo point out that "While the peso has begun to fall very recently, over the past several years, it has increased about twenty percent in value against the U.S. dollar, and about thirty percent against East Asian currencies . . . the rising dollar cost of Mexican labor may explain another twenty-five–thirty percent of the employment loss" (2002, p. 19). True, Mexican exports surged after the devaluation of 1994 and overvaluation could help explain the shift away from Mexican imports since 2000. However, as David Birnbaum has pointed out, Mexican exports fell with the appreciation of the peso in 2001, but did not recover despite the peso's slide after that year (from P9.3 = US\$1 to P10.52 = US\$1). Devaluation may not lead to an immediate improvement in sales, but should result in lower prices. "In fact," Birnbaum argues, "the opposite appears to be the case. . . . Contrary to perceived wisdom, decreases in the value of the peso correspond closely to increases in the FOB prices as measured in U.S. dollars, while increases in the value of the peso are matched by dollar FOB price reductions" (2003, p. 11).

Business managers claim the Mexican regulatory environment caused the recent losses. Basic infrastructure in some areas is inadequate, and producers complain about high costs for electricity, gasoline, and security.<sup>14</sup> Corporate taxes in Mexico average 34 percent, compared to a 10 to 15 percent rate in China. Though all these factors challenge business

managers in Mexico, they have remained constant throughout the NAFTA period, even during the boom of the late 1990s. For the most part, the business climate in Mexico doesn't help explain the recent shift of production out of the region.

However, a few important regulations have changed since 2000, and may be impacting Mexico's competitiveness in the region. As of January 2000, Mexican president Vicente Fox implemented new income and asset taxes to treat U.S. companies as if they had permanent establishments in Mexico. The ruling requires U.S. firms to pay Mexican income taxes on the share of their income derived from Mexico—a sum that is difficult to calculate—plus a 1.8 percent asset tax on machinery, equipment, and inventories. U.S. firms complain that the policy institutes a system of double taxation, as they pay corporate tax on the same earnings both in Mexico and the United States.

A more onerous new burden on producers in Mexico pertains to tariffs on inputs. Under NAFTA's Article 303, duty-free imports from non-NAFTA countries ended in 2001. This change has been particularly important for the electronics sector. Asian-owned plants in Baja California, for example, import three-quarters of all components from non-NAFTA countries, and fewer than 5 percent of all current maquiladora components are sourced from within Mexico.

Because levying tariffs on inputs is highly disadvantageous to Mexican exporters, the government established the Program for Sectoral Promotion (PROSEC), which allows registered companies to import inputs at lowered tariff rates, usually from 0 to 5 percent (Ferreira 2003, p. 23). However, business owners have contended that the PROSEC application process is complicated and burdensome. Enforcing NAFTA, either through levying tariffs on inputs or excluding products with non-NAFTA inputs from duty-free export to the United States, has made Mexican producers less competitive and increased incentives to shift production to China—all the more so now that China is part of the WTO.

A more powerful explanation for Mexico's recent faltering in apparel and electronics centers on the country's lack of domestic suppliers for these industries. Garment and electronic assemblers are in a weak position because of their limited local supply base. Multinational corporations, as either owners or customers of maquiladoras, have limited linkages to Mexican suppliers. As Dussel Peters argues, the fact that NAFTA has not encouraged an integrated supply chain within Mexico

is one of the main failings of the agreement. Most leading electronics firms never encouraged the development of local component and material suppliers and, even in the Guadalajara cluster, the large majority of components are imported (Dussel Peters 1999, 2000). In textile and apparel, U.S. attempts to establish textile production in Mexico faltered due to poor management and lack of commitment. A lack of embeddedness makes it easier for multinational corporations (MNCs) to leave, and difficult for Mexico to follow the "supplier-oriented industrial upgrading" model that many Asian countries adopted in the past (see Sturgeon and Lester 2004).

Access to a competitive supply base underpins many location decisions. For example, as Leung, general manager of VTech's contract manufacturing division, explained, VTech closed its 60,000-square-foot plant in Guadalajara in 2001 while it expanded its operations in Guangdong, China, because in Mexico it "didn't have enough infrastructure support and . . . had to get components from the United States or Hong Kong" (Serant 2002a). Similarly, Royal Philips Electronics shifted its production of PC monitors from Ciudad Juarez, Mexico, to Suzhou, China, to take advantage of its competitive Chinese supply base (Malikin 2002). In 2002, Microsoft transferred the production of the Xbox video-game console from Flextronics' Guadalajara plant to two Chinese plants. According to Todd Holmdahl, Microsoft's general manager of Xbox hardware, the main reason was that China is closer to their supply base (Smith 2003). Access to low-cost supplies for high-volume products is an important factor insofar as, in the electronics industry, materials and parts make up 80 percent of manufacturing costs (Black 2002).

Locally produced inputs are also vital in apparel production. Large U.S. marketers continue to shave weeks off product development to take advantage of demand for the most recent (and often short-lived) fashions. Some of this is replenishment, for which inputs are predictable. But an increasing share of these quick-turn orders are new, fashion-based designs. Lead times for fabric from the United States are too long, and Mexican textile mills are few and failing (Birbaum 2003, p. 50). The Mexican auto and auto parts industry, which boasts a much-better developed supplier network, weathered the U.S. recession far better than apparel or electronics producers, and returned to record-high exports to the United States by 2002 (see Figure 6.6).<sup>15</sup>

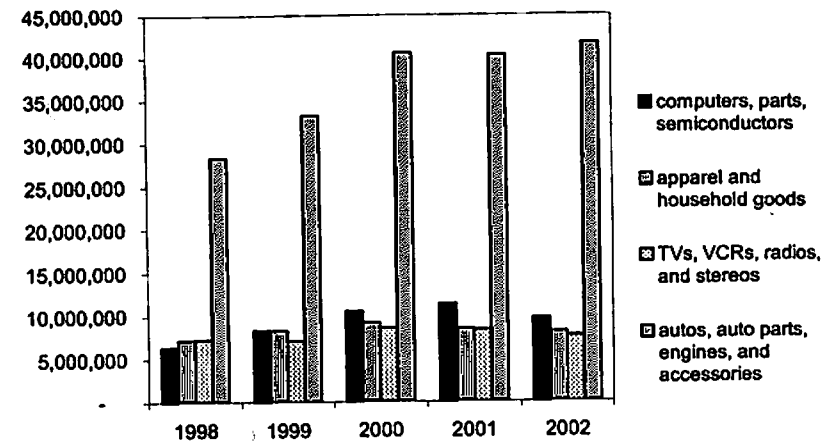
### Conclusion: What Future for Mexico?

Proponents of regionalization argue that distribution dictates location, and that, for many products (like fashion-intensive garments and quick-changing high-tech electronics), assembly needs to be close to final markets. However, for any quick-turn model to work, assemblers need to be close to key suppliers as well. China's comparative advantage is not only its lower wages, but also its development of a local, competitive supply base. Our research indicates that shipping finished goods to far-off markets may not only be cheaper, but may sometimes be quicker than sending rich country inputs for labor-intensive assembly in low-wage environments.

Does this emerging model for electronics and garment production spell doom for Mexican plants? It is certainly not good news for the firms that have been least able to move forward or backward in the value chain. In electronics, leading manufacturers are not abandoning Mexico completely. Instead, even as they move high-volume manufacturing to China, many are trying to upgrade their operations in Mexico and move more complex, low-volume/high-mix products from the United States to Mexico. For example, after losing orders to Jabil factories located in China in 2002, the Guadalajara Jabil Circuit factory managed to turn around by concentrating on more complex products traditionally made in the United States, such as computer routers. In just a few months, the Guadalajara Jabil factory surpassed Jabil firms located in the United States and its technicians developed a spare-parts tracking software that became Jabil's new global standard (Luhnnow 2004). In the same vein, in 2002 Flextronics opened a Technology Center in Guadalajara to offer OEMs product analysis and test characterization services (Serant 2002b). There is thus a production shift or "rotation" at work, as products move from the United States to Mexico and then China and are replaced with other products.<sup>16</sup>

On the other hand, efforts at upgrading are limited, due to a lack of investment in R&D in Mexico compared to China.<sup>17</sup> In textiles and apparel, many of the remaining maquiladoras have tried the same strategies of firms in their sector across the developed world: improve productivity, specialize in smaller-batch production, and try to concentrate on higher-quality, more-value-added products. The problem with this "niche" strategy is that competitors are many and niches are small. However, Mexico will retain the advantage of proximity, and U.S. retail

Figure 6.6 U.S. Imports from Mexico: Apparel, Electronics, and Autos



Source: Same as Figure 6.3.

buyers will want to maintain some suppliers in the region. For instance, in Yucatan, state government officials have begun a comprehensive effort to upgrade local capacities with credit, education, and infrastructure projects. Their goal: a quick-turn, high-quality garment production environment only one day by ship from the Mexican port of Progreso to U.S. ports on the Gulf of Mexico.

After the NAFTA boom, Mexico's electronics and textile and apparel sectors are in the process of a painful transformation. Despite production shifts to China, electronics producers seem clearly committed to maintaining some production and assembly within the lower-wage areas of the NAFTA region. U.S. apparel companies are less committed to regional sourcing, but are cautious of over-reliance on suppliers from any one region (or, in the case of China, one country).

### What Future for Global Producers?

For global producers, including Taiwanese textile and electronics manufacturers, our findings question the assumption that consumer goods producers need a low-wage assembly site close to their end markets. Many Taiwanese textile and garment firms found Mexico to be a difficult production environment. Workers refused to live in dormitories, or to work on Sunday; one firm with a sizable investment in a completely

new plant actually tried to relocate a number of machine operators from Mainland China.<sup>18</sup> Several managers believed that the benefits of a NAFTA production site did not outweigh the costs of establishing and running factories in Mexico. Some managers remained committed to the region, and planned further investment in Central America (which also benefits from a trade agreement with the United States for garments), where labor is cheaper and workers are seen as more quiescent. Other firms have decided to concentrate further investment in Asia, particularly China.

Five years ago, many in the business and academic worlds believed that NAFTA would be the main entry for MNCs into the U.S. market. The crucial barrier to the U.S. market is neither time to market nor tariffs, but may in fact be information. In production sites where managers succeed in controlling the flow of inputs and information through the supply chain, as Taiwanese firms do in Mainland China, firms have a serious comparative advantage.

Many Taiwanese manufacturers, who already have production sites in Mainland China, seem not to need production sites in the North American region to compete in the U.S. market. Indeed, Mainland China remains an attractive location for high-volume, low-end production. The success of Taiwanese manufacturers there suggests that within the East Asian regional production system, Taiwanese managers may be particularly well equipped to exploit the Mainland's comparative advantage in manufacturing. Indeed, much of Asia's recent success cannot be solely attributed either to Taiwanese investors or to Mainland manufacturers. Rather, credit should be given to the Taiwan-China "partnerships" that manage to capture complementarities in the region.<sup>19</sup> The current distress of Mexico can partly be explained by the failure of NAFTA to foster such partnerships.

However, it does not follow that Taiwan should thus simply focus on China and take advantage of its historic and cultural ties with the Mainland. In addition to the inherent political risks of an all-China strategy, Taiwanese firms that move to the Mainland risk losing their competitive advantage. Although Mainland production allows Taiwanese firms to compete on price, a high-volume, low-cost strategy leaves firms vulnerable to innovations and new competitors (many of whom, through their training of Mainland managers, Taiwanese firms have helped spawn). As Berger and Lester explain in the introductory chapter to this volume, another option is to succeed via innovation and branding. This

up-market strategy requires a deep knowledge of the leading world consumer markets (the United States, Europe, and Japan). Rather than production facilities in Mexico, Taiwanese firms could consider investing in distribution and service centers in the United States, which would yield a much greater understanding of their customers. In addition, up-market strategies require high levels of expenditure on R&D in end-user markets. In this respect as well, Taiwan can learn from the failure of Mexico.