

# Multinationals and the “Maquila Mindset” in Mexico’s Silicon Valley

By Lyuba Zarsky and Kevin P. Gallagher | October 12, 2007

**From the Mexican vantage point, foreign direct investment was at the center of the 1994 North American Free Trade Agreement (NAFTA). Mexico hoped that liberalization would bring an influx of U.S. investment which, in turn, would fuel its emergence as the continent’s manufacturing platform. In addition to industrial transformation, foreign direct investment (FDI) was expected to bring environmental benefits through the growth of cleaner industry sectors, transfer of technology, and better management practices. It didn’t turn out that way.**

At the top of Mexico’s wish list was FDI in the information technology (IT) industry. Beyond benefits common to all FDI, such as jobs and foreign exchange, the IT industry offered the prospect of industry upgrading through the capture of cutting edge technology, new skills, including business and environmental management from multinational corporations (MNCs), and integration into the world’s fastest-growing industry. This process would move local firms and workers up the global IT value chain, from low-wage assembly and sub-assembly to knowledge-intensive complex manufacturing and design. A vibrant IT hub could also be the foundation for broad-based, sustained growth in local employment. Moreover, the IT industry was considered a “clean and green” alternative compared to traditional smoke-stack industries.

## From Hub to Enclave

With its geographic proximity to the huge American IT market, Mexico was well-positioned to evolve into an IT manufacturing hub for North America and the entire Western Hemisphere. Under import substitution industry policies from the 1940s to the 1960s, Mexican firms had developed substantial local IT manufacturing and design capacities. In the early 1990s, about 50 Guadalajara firms were producing computers and components sold on both domestic and global markets.

Fuelled by U.S. foreign investment, Guadalajara’s small but promising IT industry boomed after the signing of NAFTA. Between 1994 and 2000, FDI in the electronics sector grew by five times and the value of exports quadrupled. An influx of “flagship” multinationals expanded or newly located in Guadalajara, including Hewlett Packard, IBM, Intel, Lucent Technologies, and

NEC. They were soon followed by U.S. contract manufacturing companies, including Flextronics, Solectron, Jabil Circuit, and SCI-Sanmina. By 1998, Guadalajara—newly dubbed “Silicon Valley South”—exported nearly \$8 billion of IT products.

It was a short-lived triumph. During the industry shake-out of 2001-2003, the flagship MNCs shut down all but sales and service operations of computers and peripherals in Guadalajara, relocating to China or elsewhere in East Asia. Exports dropped by 60%, FDI fell by 123%, and 20,000 jobs were lost. The contract manufacturers remained, surviving on more diversified product orders.

While global industry shake-outs are difficult for any country to withstand, Mexico was especially vulnerable: there was little to keep the MNCs in Guadalajara. Rather than a hub, the industry evolved as an enclave, with few linkages between foreign IT companies and local firms or markets. Instead of evolving into a supply base for the MNCs, most local firms went out of business.

Since 2003, MNCs in Guadalajara have recouped to some extent through industrial upgrading from “hard” to “soft” tooling that entails greater worker skill. However, the IT sector in Guadalajara continues to operate in a virtually complete foreign enclave that has few connections to the domestic economy.

## Environmental Benefits

The global IT industry presents significant environmental challenges for sustainable industrial development. Given its “clean and green” image, the IT sector is typically a low priority for regulation or monitoring in developing countries. Occupational health standards in particular



tend to be sketchy or non-existent. However, there are significant occupational and community health and environmental problems associated with IT manufacturing and assembly. Most important is the wide variety of highly toxic chemicals—solvents, acids, alcohol—used in the manufacture of IT products.

In Mexico, the IT industry was largely left to self-regulate. The most important regulation—the requirement to not store toxic waste on site—was not well enforced. Available evidence suggests that MNC affiliates may have been less than diligent in the 1990s in managing toxic waste. Although all of the flagship companies interviewed by the authors said that their hazardous wastes were sent back to the United States by certified waste handlers—as required by Mexican regulation—none filed notices with Mexican authorities.

### Policy Recommendations

To Increase Benefits of Foreign Direct Investment:

Set national development goals that integrate FDI into overall development policy.

Adopt policies to build the capacity of domestic firms to form part of supply chains.

Link local supply base and markets to MNC production processes to encourage long-term commitments.

Develop pro-active environmental policies that ensure compliance and adoption of “best practices.”

Encourage development of domestic IT capacity-building rather than relying exclusively on FDI and technology transfer, both of which have proven to be weak instruments for effective developing country entry into the global IT industry.

The enclave character of IT growth meant that FDI failed to generate much in the way of environmental benefits since diffusion of clean technology and best practice is accomplished largely through MNC supply chains. Moreover, Mexico made regulation of the IT sector a low priority, leaving firms largely to self-regulate.

Why did FDI fail to promote a dynamic IT hub? In the new book *The Enclave Economy: Foreign Investment and Sustainable Development in Mexico's Silicon Valley* based on extensive field investigations and quantitative analyses, we find that the absence of linkages stemmed from the intersection of two factors: 1) a shift in the global strategy of IT multinationals towards outsourcing to large contract manufacturing firms; and 2) the Mexican government's passive approach to FDI.

## Global Production Networks

In the early 1990s, IT multinationals embraced a new strategy of outsourcing their manufacturing functions, reconfiguring the industry into a three-tiered “global production network.” At the top are the global “flagships”—companies like HP, Dell, IBM—who have brand name and global marketing and design capacities and who earn the highest profits. Next are the contract manufacturers (CMs) who assemble components into a variety of electronic products under contract to global flagships. On the third rung are components suppliers—from large companies to mom-and-pop outfits—who sell inputs mainly to the CMs and operate on razor-thin margins.

Rather than a “regional” strategy—outsourcing to companies located in the countries where the flagships already had a presence—the flagships embraced a “global” strategy, turning to California-based firms like Flextronics, Solectron, Jabil Circuit, and SCI-Sanmina. Relatively small at the outset, these contract manufacturers (CMs) soon swelled to become large multinationals in their own right, largely by developing a highly efficient, very low-margin global supply base.

Under the new strategy, the flagships bypassed Mexican IT manufacturers and invited “their” CM assemblers to co-locate in Guadalajara, driving local IT firms out of business. By 2004, more than 37 of the domestic firms that were vibrant through the 1990s were wiped out of business. Both the flagships and the CMs also bypassed other potential downstream supplier firms: over 95% of all the products and services used by both flagships and CMs were imported.

## Government Policy Failure

Following the passage of NAFTA, the Mexican government adopted a passive stance toward FDI. Industry promotion policies were dismantled and there was little government support for technical and management training, research and development, or domestic investment by small and medium size firms.

Mexico's trade policies favored foreign investors and imports. Essentially, the government put its faith in market forces: Mexico's low manufacturing wages and proximity to the U.S. market.

But relying on market forces alone—what we call a “maquila mindset”—to upgrade industry has major pitfalls. First, the IT industry is highly concentrated both

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geographically and in terms of industry structure. Asia and the United States account for the bulk of manufacturing, creating barriers to entry for newcomers.

Second, intense cost pressures inside the industry undermine the sustainability of low-wage assembly work. CMS tend to rapidly shift assembly operations to lower-cost locations when global conditions change. While wages are low in Mexico relative to the United States, they are much lower in China.

Third, there is little skill acquisition in assembly work. Fourth, thin profit margins mean that supplier firms have little capital for investment in technology upgrading.

Countries that have successfully built up knowledge assets that allowed them to move up the value chain—Taiwan, Korea, China, Brazil—have done so with the help of aggressive, pro-active industry policies to overcome market failures: worker and management training; support for scientific research and education; access to credit for domestic firms. They have also promoted and leveraged access to their domestic markets, while Mexico focused only on promoting exports.

## Lessons for Developing Countries

The Guadalajara IT experience offers five policy lessons about how governments may increase the benefits of FDI for sustainable industrial development. First, taking advantage of the benefits of FDI requires governments to explicitly set development goals and to integrate FDI into their achievement.

Second, policies also need to increase the capacities of domestic firms to fully integrate and move up the value chain. Mexico's experience shows clearly that treating FDI as an end in itself rather than as part of an overarching development strategy is more likely to generate enclaves than broad-based growth.

Third, relying on low wages alone to attract FDI leaves developing countries vulnerable to pull-out by MNCs.

Developing a local supply base and markets enhancing the likelihood that MNCs will stay through crisis times and make additional investments.

Fourth, garnering environmental benefits requires proactive environmental policy. The expectation of MNC "best practice" was not borne out in Mexico. As a result, Mexican-based firms do not meet the new, high environmental standards of the European Union and will be locked out of that market.

Fifth, the benefits of FDI in IT manufacturing are limited for developing countries. Significant barriers to entry, even at the level of third-tier suppliers, suggest that it will be very difficult for developing countries to gain a foothold in the global IT industry in the absence of strong government policy and simultaneous changes in MNC strategic interests. Even with pro-active industry policies, it may not be possible for late industrializing countries to move much beyond assembly and semi-skilled manufacturing.

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This brief outlines the arguments in their new book *The Enclave Economy: Foreign Investment and Sustainable Development in Mexico's Silicon Valle* (MIT Press).

## RESOURCES

*The Enclave Economy: Foreign Investment and Sustainable Development in Mexico's Silicon Valley*, Kevin P. Gallagher and Lyuba Zarsky, 2007.

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