

CASE STUDY / Maquiladoras in Mexico

Edi Bencomo is a factory worker in Chihuahua, Mexico. Her job is to clip together several color-coded wires for Alambrados y Circuitos Eléctricos, a factory that is owned by Delphi Automotive Systems. Bencomo migrated to Chihuahua 4 years ago, at age 16, from Madera, a village in the Sierra Madre Occidental, a mountain range 250 kilometers (150 miles) to the west. One of seven children, Bencomo saw no future for herself in remaining on her parents' corn farm. Had she remained in Madera, Bencomo probably would have been unemployed, along with 25 percent of the villagers.

In Chihuahua, Bencomo lives with her husband in a two-room shack more than an hour from the plant. They can afford to rent a somewhat better dwelling, but none are available in this rapidly growing city. She leaves home each weekday at 4 A.M. to battle hordes of workers who crowd onto buses that serve the factory area.

Bencomo earns about \$4 an hour. She also receives two important benefits by working for Alambrados—a bus pass so that she can reach the plant at no cost and two meals in the cafeteria, paid for almost entirely by the company. She considers her job to be superior to that of her husband, who makes piñatas; both are paid minimum wage, but he receives no benefits.

Delphi's Chihuahua plant is known as a **maquiladora**, from the Spanish verb *maquilar*, which means to receive payment for grinding or processing corn. The term originally applied to a tax when Mexico was a Spanish colony. Under U.S. and Mexican laws, companies receive tax breaks if they ship materials from the United States, assemble components at a *maquiladora* plant in Mexico, and export the finished product back to the United States. More than 1 million Mexicans are employed at over 3,000 *maquiladoras*. Delphi has more than 50 *maquiladoras* employing 75,000 people and is one of Mexico's largest employers. ■

The title of this chapter, "Industry," refers to the manufacturing of goods in a factory. The word is appropriate because it also means persistence or diligence in creating value. A factory utilizes a large number of people, machinery, and money to turn out valuable products.

In the previous chapter, we looked at agriculture, practiced throughout the inhabited world because the need for food is universal. Industry is much more highly clustered in *space* than is agriculture. In this chapter, we look at the *regions* where factories are located and *why*. A particular *place* may be well suited or poorly suited for industry, depending on the distinctive characteristics of land, labor, and capital there.

Geographers also recognize that *connections* with the rest of the world are critical in determining whether a particular place is suitable for industry. Two connections are critical in determining the best location for a factory—*where* the markets for the product are located and where the resources needed to make the product are located.

A generation ago, industry was highly clustered in a handful of communities within a handful of MDCs, but industry has diffused to many communities in many LDCs. The United States lost one-third of its manufacturing jobs during the first decade of the twenty-first century. Americans alarmed by this loss heard "a giant sucking sound" of manufacturing jobs being "sucked" into other countries from recently closed U.S. factories. The future of manufacturing in the United States was "now in jeopardy," according to the National Association of Manufacturers, a leading industry group.

Government officials everywhere recognize the powerful role of industry in the economic health of a community. Manufacturing jobs are viewed as a special asset by communities around the world and they mourn when factories close and rejoice when they open. To attract and retain them, officials offer financial support that, when scrutinized by independent analysts, is considered excessive.

Americans' fears of manufacturing job losses were echoed elsewhere in the world. A former president of the European Union warned against the "deindustrialization of Europe." Japan's loss of manufacturing jobs to overseas locations was called a "hollowing out" by Japanese politicians. In Mexico, the loss of manufacturing jobs during the early twenty-first century led to "a wave of soul-searching."

Transnational corporations operate at a global *scale* of concern for the distribution of markets and resources. Raw materials may be collected from many places, sent to factories located in several other places for a succession of specialized manufacturing procedures, and shipped to consumers located in yet other places.

With *globalization* of competition to attract new industries—or, in many places, to retain existing ones—each place possesses distinctive location characteristics. Geographers identify the *local diversity* in assets that enable some communities to compete successfully for industries, as well as handicaps that must be overcome to retain older companies.

KEY ISSUE 1

Where Is Industry Distributed?

- Origin of Industry
- Industrial Regions

The modern concept of industry—meaning the manufacturing of goods in a factory—originated in northern England and southern Scotland during the second half of the eighteenth century. From there, industry diffused in the

CONTEMPORARY GEOGRAPHIC TOOLS

Honda Selects a Factory Location

When Honda decided that it needed another assembly plant in the United States, it applied situation and site factors to select a location for the factory. Situation factors were considered first in the decision-making process, then site factors.

The most critical situation factor for Honda was minimizing the cost of shipping finished vehicles to its customers around North America. That led Honda to look for locations within auto alley, where its other U.S. assembly plants, as well as nearly all of its competitors, are located (Figure 11-11).

The other situation factor, minimizing the cost of shipping its inputs, was also important. Honda's most important inputs were the engine and transmission, which were to come from existing factories in western Ohio. Other parts would come from factories already shipping to Honda's two assembly plants in central Ohio. That guided Honda to the portion of auto alley encompassing Illinois, Indiana, and Ohio.

Site factors helped Honda find specific locations within auto alley. Principal site factors were land and labor, though these pointed Honda to different locations. The land site factor suggested a rural location. Honda wanted a large tract of land in order to construct a spread-out one-story factory. It needed to be near at least one interstate highway because most parts would arrive and finished vehicles would leave by truck. It also needed to be next to a rail line because some parts would come from Japan by boat and train, and finished vehicles would be shipped to the west coast by rail. An assembly plant hires several thousand workers, so Honda needed a large labor supply within a 1-hour commuting range. But it didn't want to compete for workers with existing assembly plants. That could lead to a shortage of skilled workers and push up

wages. So Honda looked for areas outside the 1-hour commuting range around existing assembly plants.

Honda's short list of locations included Decatur in eastern Illinois, Greensburg in southwestern Indiana, and unnamed communities in west-central Ohio. The third site factor, capital, helped Honda make its

final pick. The state governments of Illinois, Indiana, and Ohio were all willing to provide Honda with financial support for roads, utilities, and worker training. But Honda considered Indiana the safest choice: The governors of the other two states at the time were involved in financial scandals. ■

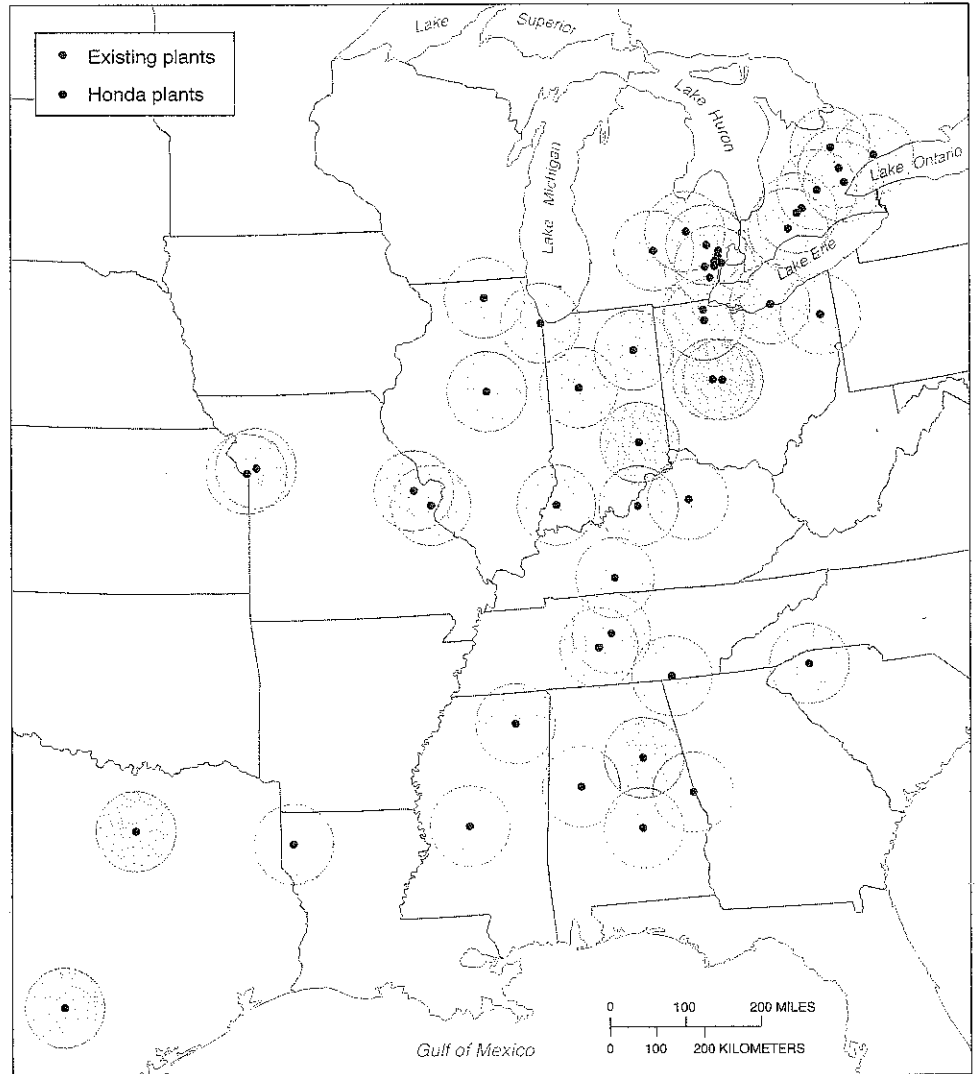
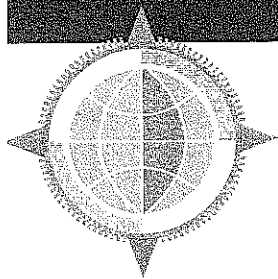


FIGURE 11-11 Labor markets around motor-vehicle assembly plants. Assembly plants draw their workforce from within a roughly 1-hour radius. New plants have been located outside the labor market areas of existing plants.



GLOBAL FORCES, LOCAL IMPACTS

What Is an American Car?

Distinctions between “American” and foreign” motor vehicles have been blurred for the past three decades. Popular media have delighted in showcasing examples of “American” vehicles produced by the Detroit 3 (Chrysler, Ford, and General Motors) that have lower U.S. content than those produced by “Japanese” carmakers such as Honda and Toyota. The U.S. government distinguishes between domestic and foreign vehicles in three ways:

- For measuring fuel efficiency, the U.S. Environmental Protection Agency considers a vehicle domestic if at least 75 percent of its content comes from North America, originally defined as the United States and Canada, and, after enactment of the North American Free Trade Agreement (NAFTA), including Mexico.
- For setting import tariffs, the U.S. Department of Treasury Customs Service considers as domestic a vehicle having at least 50 percent U.S. and Canadian content.
- For informing consumers, the American Automobile Labeling Act of 1992 considers a vehicle domestic if at least 85 percent of the parts originate in the United States and Canada; a part is counted as domestic if at least 70 percent of its overall content comes from the United States and Canada.

According to data derived from Labeling Act reports, vehicles built by foreign-owned carmakers at assembly plants located in the United States had around 60 percent domestic content in 2008. Domestic content for the Detroit 3 in 2008 was 76 percent (Figure 11-30, top). The lower domestic content for foreign carmakers masks differences among individual companies. Honda and Toyota have a level of U.S. content comparable to that of the Detroit 3. German-owned carmakers such as BMW and Daimler have much lower percentages.

The gap in domestic content between the two sets of carmakers narrowed during

the 1990s primarily because the foreign-owned companies bought more North American parts. After opening assembly plants in the United States during the 1980s, Japanese-owned carmakers convinced many of their Japanese-owned suppliers to build factories in the United States. During the first decade of the twenty-first century, the gap in domestic content narrowed further because the Detroit 3 bought more foreign parts. More than one-fourth of all new vehicle parts are imported. Mexico has become

the leading source of imported parts, and China has been increasing its share rapidly (Figure 11-30, bottom).

In the United States, one-half of vehicle parts are made in the United States by U.S.-owned companies, one-fourth are made in the United States by foreign-owned transnational corporations, and one-fourth are made overseas and imported into the United States. As variations in situation and site costs continually shift from one country to another, these percentages are bound to change. ■

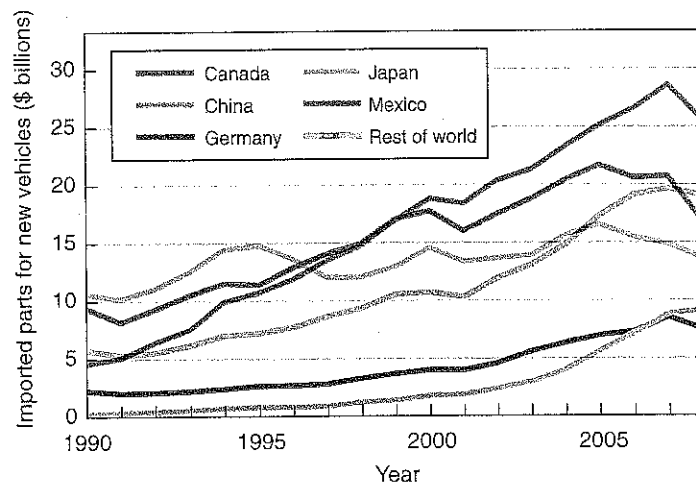
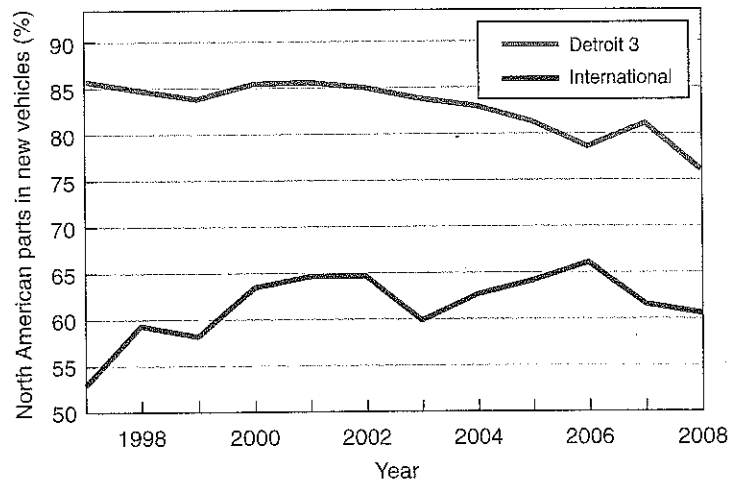


FIGURE 11-30 (top) Motor vehicles sold in the United States by the Detroit 3 contain a higher percentage of U.S.-made parts than do vehicles sold by the internationals (carmakers with headquarters in Japan, Korea, and Germany). (bottom) Mexico is the leading source of imported motor vehicle parts.

CASE STUDY REVISITED / Throwing BRIC at NAFTA

NAFTA has joined the United States with its neighbors to its immediate north and south to form one of the world's three main industrial regions. Motor vehicles sold in the United States may be assembled in Canada with many Mexican parts.

Integration of North American industry has generated fear in the United States and Canada:

- Labor leaders fear that more manufacturers will relocate production to Mexico to take advantage of lower wage rates. Such labor-intensive industries as food processing and textile manufacturing may be especially attracted to a region where prevailing wage rates are lower.
- Environmentalists fear that NAFTA encourages firms to move production to Mexico because laws governing air- and water-quality standards are less stringent than in the United States and Canada. Mexico has adopted regulations to reduce air pollution in Mexico City; catalytic converters have been required on Mexican automobiles since 1991. But environmentalists charge that environmental protection laws are still not strictly enforced in Mexico.

Mexico faces its own challenges: It has lost a quarter million *maquiladora* jobs since 2000. Electronics firms are especially likely to pull out of Mexico. The reason: At \$2 an hour, Mexican wages are higher than in other LDCs, although much lower than in the United States. Many firms are moving to China, where wages are only \$1 an hour.

Meanwhile, some analysts believe that industry in North America, as well as in Europe, will be challenged in the coming decades by a new industrial alliance called BRIC. This is an acronym for our countries—Brazil, Russia, India, and China. The four BRIC countries together currently control one-fourth of the world's land and two-fifths of the world's population, but the four combined account for only one-sixth of world GDP (Figure 11-31). In alphabetical order, their economies rank tenth, eighth, twelfth, and third in the world.

The BRIC concept is that if the four giants work together, they will become the world's dominant industrial bloc in the twenty-first century. China and India have the two largest labor forces, whereas Russia and Brazil are especially rich in inputs critical for industry. The four BRIC countries could possess four of the six largest economies in the world by the mid-twenty-first century. However, as an industrial region, BRIC has the obvious drawback of Brazil's being on the other side of the planet from the other three. China, India, and Russia could form a contiguous region, but long-standing animosity among them has limited economic interaction so far. Still, a generation ago, few would have predicted that industry in Mexico would be highly integrated with industry in the United States and Canada. ■

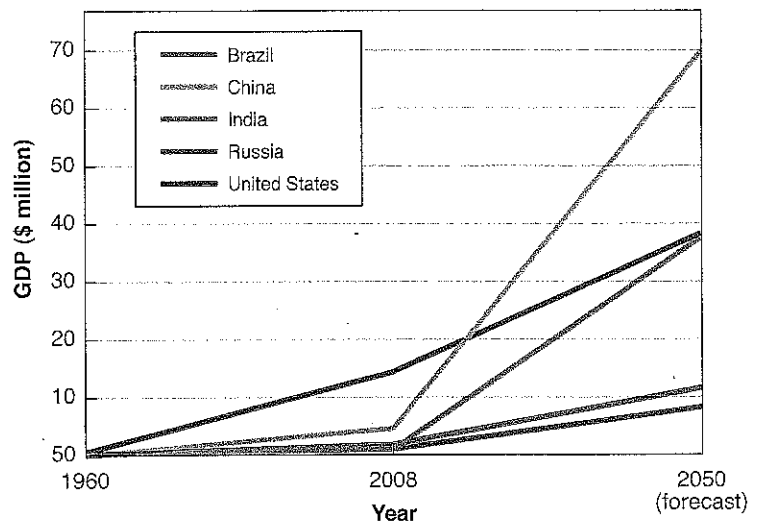


FIGURE 11-31 GDP for BRIC countries and the United States.

KEY TERMS

break-of-bulk point (p. 355) A location where transfer is possible from one mode of transportation to another.

bulk-gaining industry (p. 352) An industry in which the final product weighs more or comprises a greater volume than the inputs.

bulk-reducing industry (p. 350) An industry in which the final product weighs less or comprises a lower volume than the inputs.

Cottage industry (p. 345) Manufacturing based in homes rather than in a factory, commonly found prior to the Industrial Revolution.

Fordist production (p. 368) Form of mass production in which each worker is assigned one specific task to perform repeatedly.

Industrial Revolution (p. 345) A series of improvements in industrial technology that transformed the process of manufacturing goods.

Labor-intensive industry (p. 356) An industry for which labor costs comprise a high percentage of total expenses.

Maquiladora (p. 344) Factories built by U.S. companies in Mexico near the U.S. border, to take advantage of much lower labor costs in Mexico.

New international division of labor (p. 365) Transfer of some types of jobs, especially those requiring low-paid, less skilled workers, from more developed to less developed countries.

Outsourcing (p. 365) A decision by a corporation to turn over much of the responsibility for production to independent suppliers.

Post-Fordist production (p. 368) Adoption by companies of flexible work rules, such as the allocation of workers to teams that perform a variety of tasks.

Right-to-work state (p. 362) A U.S. state that has passed a law preventing a union and company from negotiating a contract that requires workers to join a union as a condition of employment.

Site factors (p. 356) Location factors related to the costs of factors of production inside the plant, such as land, labor, and capital.

Situation factors (p. 350) Location factors related to the transportation of materials into and from a factory.

Textile (p. 356) A fabric made by weaving, used in making clothing.