How Japanese industry is rebuilding the rust belt

By: Kenney, M. and Florida, R.

Technology Review (00401692), 00401692, Feb/Mar91, Vol. 94, Issue 2

Japan is transplanting a modern manufacturing infrastructure into America's industrial heartland--right beside the one abandoned by US companies.

Not long ago, American manufacturing was in sharp decline. Industries that once brought prosperity began to abandon an entire region. Big Three carmakers closed dozens of plants, mostly in Michigan and surrounding states, eliminating more than 250,000 jobs. Another 250,000 were lost in related industries-steel, rubber, and auto parts. Companies blamed the decline on high-wage union workers and an undesirable business climate. American workers in turn lashed out at foreign competitors, smashing Japanese goods in anger and frustration, and their representatives in Congress occasionally vented similar anger. The experts offered a bleak prognosis.

Now, less than a decade later, U.S. manufacturing is making a comeback. But in a telling irony, the agents of this revitalization are Japanese. Armed with a new way of organizing production, a different corporate strategy, and a new logic for where to locate plants, Japanese corporations are transplanting an extensive industrial complex into the United States.

They have already come far. Japanese-owned plants in the United States now include 66 steel works, 20 rubber and tire factories, 8 major automotive assembly plants (with 3 more in Canada near the U.S. border), and more than 270 auto-parts suppliers. Through such transplants, the Japanese have invested more than $25 billion in U.S. heavy industry and created more than 100,000 jobs.

The enormous scale of this Japanese investment punctures the myth that unions, overpaid workers, and a poor business climate have caused the decline of U.S. manufacturing. Many of the transplant facilities that are remaking the nation's industrial landscape pay high wages and employ union workers, yet they boast much higher productivity than native U.S. operations.

There is an underside to the transplants. Some Japanese manufacturers are hostile to unions, and some saddle their employees with dangerous working conditions. The pace of work is often faster than in U.S. companies. And transplants sometimes use unseemly methods of intimidation and surveillance to enforce company loyalty. Nevertheless, the Japanese companies are making long-term commitments where U.S. business leaders had seemed to give up hope.

Japanese manufacturers are thriving in the United States because they have formed an efficient industrial infrastructure. The best way for government to encourage this beneficial investment, therefore, is by promoting cooperative efforts between U.S. companies, workers, and their unions-helping indigenous industry rise to the standards needed to be globally competitive.

Why It Works for Them

How can a set of industries--and an entire region--that U.S. companies turned their back on reemerge economically viable? The answer is rooted in differences between American and Japanese attitudes and their approaches to manufacturing. As we have heard time and again, U.S. corporations sink their capital into buying other companies, often in other industries, or into casinolike financial speculation, rather than into modernizing their own plants. Japanese corporations, on the other hand, see maintaining state-of-the-art manufacturing as the cornerstone of industrial competitiveness.

U.S. industrial production is based on a fine-grained division of labor, an extensive system of job classifications, and a strict separation of mental and manual labor. Because of this specialization, technological innovations often arise at R&D centers hundreds or even thousands of miles from the production site. The offshore migration of U.S. manufacturing follows directly from this arrangement: U.S. companies put a low priority on having their factories near their R&D and design centers.

The Japanese have succeeded with a very different kind of production organization. Their system requires close linkages among manufacturing, management, and R&D, with three or more tiers of suppliers surrounding central hub companies. The famed just-in-time production system moves supplies in as they are needed, reducing downtime and inventory costs and encouraging interaction between vendors and customers. In a classic example, suppliers' trucks drive right inside Honda's plant in Sayama, Japan, and deliver parts directly to the work station where they are needed.

The Japanese are recreating this kind of production on U.S. soil, building a "transplant complex" encompassing the entire production chain. Japanese companies operating in this country are providing the steel, parts, tires, glass, and even some of the machines used to manufacture automobiles. And while U.S. firms continue to move manufacturing to low-wage areas of the Sun Belt or Third World, the transplants have located virtually all elements of the production spectrum in a concentrated geographic space--namely, the traditional Rust Belt states of Ohio, Indiana, Illinois, and Michigan, extending southward into Kentucky and Tennessee. They are now bringing in their R&D and design units to solidify this complex.

Consider the following example from Michigan. Mazda assembles cars in Flat Rock. Finished fenders, quarter panels, hoods, roofs, and dashboards are shipped "just in time" to Mazda from a Japanese-owned metal-stamping plant 40 miles away in Howell. The steel is processed in stamping presses produced by a Michigan branch of Hitachi Zosen. The steel coils come from ProCoil, a joint venture of Japan's Marubeni and the U.S. company National Steel located just outside Detroit. ProCoil, in turn, gets its raw steel from a nearby mill owned 70 percent by another Japanese company, NKK. Both Mazda and NKK have set up R&D centers in the Detroit area.

The Japanese also show a willingness to harness workers' mental as well as manual abilities. Instead of chasing after big "breakthroughs," Japanese firms favor a process called kaizen: all employees, from production workers to research scientists, are expected to contribute ideas for continuously improving products and production methods. At Honda's Marysville, Ohio, plant, for example, engineers are required to listen to shop-floor workers; in some instances shop-floor workers actually supervise college-educated engineers. One former GM employee who now works at the NUMMI plant in Fremont, Calif.--co-owned by GM and Toyota-- describes the difference: "The group leaders are now right there helping" on the production floor. 'At GM, they couldn't do that or the union would get mad." A Mazda worker echoes this sentiment, saying his Japanese supervisors "listen to my advice or opinion" on how to solve problems.

Restructuring agreements between management and unions have paved the way for Japanese work organization at some transplant ventures. One target for these efforts is job classifications. Workers and their unions see job security tied to numerous individual jobs and classifications. The manager of one U.S. steel mill told us that it would take the industrial engineering department a couple of days to figure the exact number of job classifications, but he estimated that it was between 300 and 400.

Several Japanese-owned or joint-venture enterprises have struck deals with the unions to reduce the number of job classifications in return for greater job security. In steel, for example, the joint venture between NKK and National Steel has agreed with the United Steelworkers of America to cut job classifications from 86 to 16, and has instituted a no-layoff policy. Sumitomo's Cleveland-based joint venture with LTV Steel, called LS Electrogalvanizing, instituted work teams and eliminated job classifications, put all workers on salary, and established various worker-run committees to oversee the plant, which both management and labor say runs smoothly. I/N Tek, a joint venture between Nippon Steel and Inland Steel, has reached an agreement with the United Steelworkers to implement just a few job classifications and put production workers on salary. At NUMMI, Mazda, and Diamond-Star (a Chrysler-Mitsubishi joint venture), the United Auto Workers have agreed to a small number of job classifications, the use of work teams, and job rotation in return for greater job security.

While Japanese companies are investing in a number of industries, the most important to the U.S. economy are the big-muscle industries of automobiles, steelmaking, and tire production. Over the past two decades, these related sectors have all undergone a prolonged decline in which employment has fallen steeply.

Auto Assembly: The Core of the Complex

During the late 1970s and the 1980s, the U.S. auto industry started to set up a global production system. Beset with sagging profits and increasing foreign competition, General Motors, Ford, and Chrysler sought to reduce wages and avoid unionization by constructing non-unionized Sun Belt plants and Mexican "maquiladoras." Chrysler is even planning to move production of the K-cars that once saved the company to a factory outside Mexico City. In addition, the Big Three automakers have since the late 1970s

directly imported small cars from foreign joint-venture partners, mainly Japanese. By next year, according to United Auto Workers estimates, Ford and Chrysler will import as many as 27 percent of the cars they sell, while GM could import 11 percent. And a growing number of cars are being assembled in the United States from foreign-made parts.

This "global car strategy" has weakened the U.S. auto industry. Transportation costs rose, administrative layers multiplied, and production was slowed by international bottlenecks. Labor relations worsened as workers grew justifiably anxious about their jobs.

Over the past five years, Toyota, Nissan, Honda, Mazda, Mitsubishi, Subaru, and Isuzu have all built major U.S. plants. They have done so both to gain access to the huge U.S. market and to circumvent growing U.S. protectionist measures, such as the 1981 Voluntary Restraint Agreement, which limits exports of Japanese cars to the United States. The U.S. market also affords a major growth opportunity. Some smaller Japanese automakers, particularly Honda, see transplant investment as an opportunity to expand outside Japan's fiercely competitive domestic car market.

The 11 major Japanese-owned auto assembly complexes in North America represent an investment of roughly $8 billion. They now produce more than 20 percent of all U.S.-made cars, including the most popular car in the country, the Honda Accord. By the mid-1990s, the North American transplants are expected to employ more than 35,000 workers and produce more than a third of all cars made in the United States. These thriving transplants put the lie to the notion that the supposedly inhospitable U.S. manufacturing environment was to blame for the decline of the Big Three.

Transplant assemblers are located in a well-defined corridor that drifts slightly south of the more traditional American auto belt. No state hosts more than one transplant assembler except Ohio, which has Honda and the Ford-Nissan joint venture. This dispersion may reflect a deliberate attempt to maximize political benefits, since legislators are reluctant to support protectionist trade measures when the Japanese have brought thousands of jobs to their constituencies. Says one city planner who consults for a Japanese company, "Japanese carmakers recognize that every state means two votes in the U.S. Senate."

Transplant automobile assemblers pay wages similar to Big Three plants. NUMMI workers, for example, average $36,000 a year--just under the industry high of $37,400 at Ford but ahead of the $35,000 average for GM and Chrysler. NUMMI's unskilled hourly rate of $16.81 is the highest in the industry. And while Honda, Nissan, Toyota, and Subaru-Isuzu have worked vigorously to keep unions out, successful plants operated by NUMMI, Diamond-Star, and Mazda use UAW workers.

One way to state the success of the auto assembly transplants is simply to note that they keep coming. Honda started the influx by opening a motorcycle plant in rural Ohio in 1979. This foray was followed by its Marysville, Ohio, automobile assembly plant in 1982. Nissan began making trucks in the United States in 1983, and cars in 1985.

NUMMI opened its doors in 1984. The success of these ventures brought a second wave of Japanese companies: Mazda in 1987, Toyota and Diamond-Star in 1988, and a Subaru-Isuzu joint venture (SIA) in 1989. A Ford-Nissan joint venture is set to open this year. Japanese truck manufacturers such as Hino, Nissan Diesel, and Fuso may also open U.S. factories.

Having established successful beachheads, the Japanese carmakers are expanding their U.S. operations. Honda added an engine and transmission factory in 1986 and a second assembly plant in 1988, and is rumored to be considering yet another plant to assemble either luxury Acuras or an inexpensive new subcompact. Nissan has added an engine and transmission facility in Smyrna, Tenn. Toyota is building a similar facility in Georgetown, Ky., and will also open a second assembly plant in the same area. The company has also announced a joint venture to produce forklifts with Toyoda Automatic Loom near Columbus, Ind. Toyota plans to increase output at NUMMI and more than double production at its Georgetown plant. Honda will set up a 500-person R&D facility in a test center the company bought from the State of Ohio for $31 million. This development is in keeping with the Japanese practice of locating R&D close to production facilities to improve interaction and communication.

A number of transplant producers expect to grow beyond the U.S. market. Honda and Nissan already "reverse export" vehicles to Japan. Honda plans to begin selling its American-made cars in Korea, a country that excludes Japanese imports. Toyota recently announced plans to ship 5,000 automobiles to Taiwan. Japanese companies would like to export U.S.-made automobiles to Europe as well, to overcome that market's tight restrictions on Japanese cars. In February 1990, U.S. officials stood behind transplant automakers, cautioning European leaders not to restrict entry of Japanese cars made in U.S. factories.

Parts Suppliers: Building a Just-In-Time Complex

In coming to the United States, Japanese carmakers quickly discovered that American parts suppliers could not adapt to just-in-time quality and delivery requirements. Even obtaining basic inputs like high-quality steel or glass proved difficult. Unfamiliar with the just-in-time system and deeming Japanese quality demands unreasonable, many U.S. parts suppliers simply chose not to sell to the transplants.

The shortage of qualified parts suppliers left Japanese auto assemblers little choice but to build a new parts industry in the United States. Today, Japanese companies own wholly or in part more than 270 automotive parts suppliers in this country. Having conducted a detailed survey of 73 of these Japanese-owned and joint-venture parts suppliers, we estimate that they employ more than 30,000 American workers and represent an investment of $5.5 billion.

Most of these organizations supply glass, brake systems, seats, and other components directly to the production plants. Nippondenso, Japan's leading automobile parts supplier,

makes air conditioners, heaters, clutches, filters, fuel pumps, and other components for transplant automakers at plants in Michigan, Tennessee, South Carolina, and California.

A second group of companies makes replacement parts for Japanese imports. Japan's two leading battery companies, Storage Battery and Yuasa Battery, recently launched a Memphis-based joint venture that produces 6,000 car batteries a day. A third group provides manufacturing equipment to transplant assemblers. For instance, 16 Japanese machine tool companies, including Yamazaki Mazak, now operate in the United States, along with two conveyor-belt makers and two makers of automotive painting machines.

According to our survey, two-thirds of the transplant supplier companies came to the United States on direct request from a major Japanese automaker. Most are non-unionized, and they pay lower wages than U.S. parts suppliers-between $7.20 and $8 an hour for lowskill workers and around $11.50 for high-skill workers. More recently, Japanese parts suppliers have started coming on their own to tap the growing market for their products. Many of the first tier of Japanese suppliers to Honda, Nissan, Toyota, and Mazda have now opened U.S. branches-which are also low-wage, nonunion operations.

Spread throughout the lower Midwest, these transplant suppliers are well situated for rapid deliveries to their customers. According to our survey, 40 percent are located within a two-hour shipping radius of the transplant auto assembly plants they serve, and all are within an eight-hour radius. Eighty percent of them deliver according to just-in-time requirements.

This proximity is helping transplant automakers create a Japanese-style production complex in the United States. More than two-thirds of the suppliers we surveyed participate closely with assemblers in developing new products, 86 percent work with engineers from assembly plants to overcome production problems, and 97 percent get a phone call immediately when they deliver defective products. Honda engineers, for example, developed new production techniques for a small Ohio plastics firm that became a Honda supplier.

While the transplants have successfully formed a ring of first-tier suppliers, they lack the dense layers of second- and third-tier suppliers found in Japan. For example, just 43 percent of the suppliers surveyed receive just-in-time deliveries from their own suppliers.

Transplant assemblers are forging links to U.S. producers in an effort to increase domestic content and to build multitier supplier complexes. But U.S.-owned companies who want to supply the transplants must be willing to radically improve their quality standards and delivery practices and bring their production methodology into line with the Japanese model. Johnson Controls' plant in Georgetown, Ky., has made such a turnaround, and is now the exclusive supplier of car seats to Toyota's assembly plant in the same town. Johnson Controls has worked closely with Toyota to set up teams, rotation, quality-control circles, kaizen, and other elements of Toyota's production system. Toyota's mainframe computer transmits orders to the Johnson Controls computer;

four hours later, the seats reach Toyota. Boasts a Johnson Controls executive, "We are now a true just-in-time facility."

Steel: Rescuing a Fallen Industry

It takes good steel to make good cars. But while US. automakers have merely slumped, the steel industry has verged on collapse. Between 1960 and 1987, seven major U.S. steel corporations--USX, Bethlehem Steel, Armco Steel, National Steel, LTV, Inland Steel, and Allegheny Ludlum Industries--closed more than 100 plants. The result was the decline of the traditional steel region of western Pennsylvania, Ohio, West Virginia, Indiana, Illinois, and Michigan.

Virtually all new investment in U.S. steel production now comes from Japan. There are now 66 Japanese-owned or joint-venture steel plants in the United States, employing some 30,000 workers and valued at nearly $7 billion (see the table on page 33). It has been decades since anyone in the United States built an "integrated" steel mill--one that turns raw iron into steel. (Many companies have built so-called minimills, smaller plants that make steel products from scrap metal.) By 1988, the president of Inland Steel admitted that Nippon Steel--Japan's leading steelmaker as well as Inland's joint-venture partner--possessed the technological capability of the whole U.S. steel industry put together.

The Japanese have invested in the United States to open up new markets, partly in hopes of bolstering sagging profits. In recent years, Japan's mighty steel industry has seen domestic profits fall because of stiff challenges from low-cost Korean and Brazilian producers. As with transplant automakers, direct investment in the United States could also give Japanese steel companies a political wedge against U.S. protectionism. But the main reason Japanese steel companies have come here is to serve their most important customers: the Japanese automakers, who have had difficulty getting high-quality steel from U.S. producers.

Much Japanese investment in steel has gone toward building state-of-the-art plants for coating and preparing steel coils that carmakers--both transplants and the Big Three--used for body parts, frames, and mufflers. Typically, these plants use either hot-dip or electrogalvanizing technology to coat steel with zinc or nickel and thus make it more corrosion-resistant. (Electrogalvanizing in particular is a technology that the Japanese have refined well beyond its stage of development in the United States.) Like U.S.-owned processing plants, they are unionized, but they pay lower wages than the integrated steel mills--$10 to $15 an hour.

Because high-quality coated steel requires highquality steel from the mill, Japanese companies are also paying to modernize large integrated U.S. steel plants. Most of these efforts involve joint ventures with U.S. companies. NKK, for example, joined forces with National Steel to upgrade two of the U.S. company's mills. Nippon Steel, which owns 15 percent of Inland Steel, has built a $500 million cold rolling mill with Inland called I/N Tek. Kobe's joint venture with USX has brought new technology and production

organization to the old U.S. Steel integrated bar and pipe mill in Lorain, Ohio. These joint ventures pay around $22 to $25 an hour-wages comparable to those earned by union workers at U.S. steelmakers. The U.S. partners gain access to state-of-the-art Japanese technologies such as continuous casting and continuous flat rolling, as well as to the burgeoning market for supplying the Japanese transplant automakers.

A third part of American steel that the Japanese have entered is steel service centers, which warehouse col 'Is and do some cutting and forming. Many of these plants are wholly owned by Japanese trading corporations. Mitsui, for example, operates seven processing plants under the name Steel Technologies in Tennessee, Kentucky, Indiana, and Michigan. Mitsubishi, Marubeni, Nissho Iwai Machining Company, C. Itoh, and Toyo Menka also run steel service centers in the lower Midwest. These centers are ideally located to supply the Big Three as well as transplant automakers.

Japanese involvement in U.S. steel will broaden. USX has put its steel business up for sale, and a Japanese company will likely buy a significant portion of it. Sumitomo Metal is considering purchasing its joint-venture partner, LTV Steel, which continues to operate after filing for chapter 11 bankruptcy. And according to a former Inland executive who is now a top manager of I/N Kote, Nippon plans to help rebuild Inland's huge integrated steel complex at Indiana Harbor, Ind. He adds: "Inland does not yet know what is going to hit them."

The transplant steelmakers pose a dilemma for U.S. automakers. To buy steel from transplants helps ensure that Japanese steel companies will grow at the expense of American ones. But to refrain from buying steel from the Japanese-owned plants means sacrificing quality, because Japanese steel remains the best available.

Japan Moves into Tires and Rubber

Like steel, tire making is an integral part of the automobile production complex. And like U.S. steelmakers, the country's rubber and tire companies have suffered from the dual blows of changing technology and surging competition from Europe and Japan.

Since the mid-1970s, most U.S. tire and rubber companies have formed mergers and sold themselves to foreign competitors. In the mid-1980s, General Tire transformed itself into GenCorp, and then sold its General Tire unit to the German tire company Continental AG. In 1986, Uniroyal merged with B.E Goodrich; two years later, Uniroyal-Goodrich was Dunlop was swallowed by Sumitomo and Firestone by Bridgestone, the largest Japanese tire maker. Today, Goodyear is the only major U.S.-owned tire company.

This consolidation closed more than 30 plants, mainly old bias-ply tire factories in the Midwest. In 1980 alone, Firestone shut down long-standing plants in Akron, Dayton, and Barderton, Ohio, and in Pottstown, Pa. Firestone cut its workforce in half between 1960 and 1985, from 115,000 to 55,000. The tire companies opened their new, radial-tire factories in the Third World and in the non-union areas of the Sun Belt; all but one of the 17 plants built in the United States between 1967 and 1984 were sited in the South. By

1982, Akron, once the self-proclaimed "tire capital of the world," could claim not a single operating tire plant.

The Japanese presence began in 1983, when Bridgestone bought a Firestone tire plant in LaVergne, Tenn., which it upgraded for radial production. But this was just an appetizer. In 1988, Bridgestone bought Firestone's nine other plants for $2.6 billion, becoming the second largest tire maker in the United States. The Japanese company now employs 28,000 U.S. workers--15,000 in manufacturing--and is investing another $1.5 billion to upgrade Firestone's U.S. operations. In 1986, Sumitomo Rubber bought Dunlop's U.S. tire operations for $350 million. Sumitomo has already spent more than $100 million turning Dunlop's Buffalo belted-tire plant into a sophisticated producer of radial truck tires and another $100 million to retool Dunlop's Huntsville, Ala., plant. Two other Japanese tire companies, Yokohama Rubber and Toyo Tire, have opened U.S. plants. Yokohama recently purchased Mohawk Rubber, a small after-market producer with plants in Virginia. Toyo is involved in a joint venture with both Yokohama and the German tire maker Continental, under the name GTY Corp.

In addition to rubber and tire investments, Japanese corporations have expanded their holdings in the closely related plastics industry. Okamoto Industries, a Japanese rubber and plastic goods manufacturer, recently bought Uniroyal Plastics, an Indiana-based automotive plastics supplier, for $400 million. Sumitomo Chemical has formed a joint venture with an Ohio firm that will also produce automotive plastics. All in all, Japanese companies have invested more than $5 billion in U.S. tire and rubber production.

The Japanese rubber and tire companies are cooperating with the United Rubber Workers. Both Bridgestone and Sumitomo are unionized, high-wage employers. In 1988, Bridgestone paid an average of over $12 an hour to start and over $14 an hour after one year-wages comparable to those of auto assembly plants. Working with the union, Bridgestone has established quality circles, instituted a policy requiring managers to listen to workers, and cut the number of job classifications to five. The company makes just-in-time deliveries to its major customers and has worked closely with its suppliers to get similar service from them. One worker says the transformation from Firestone to Bridgestone "was like going from hell to heaven." Sumitomo, meanwhile, instituted flexible work rules in return for job security provisions and a pledge to upgrade plant technology.

The tire transplants are more far-flung than the Japanese-owned steel and automobile works. In fact, only 7 of the 20 rubber and tire transplants are located in states with assembly transplants. The main reason is that the Japanese purchased most of their tire plants from U.S. companies instead of building new ones.

There are signs that the Japanese may eventually concentrate their tire companies closer to the automotive transplants. Bridgestone, for example, has already moved Firestone's headquarters back to Akron from Chicago. And the Toyo-Yokohama-Continental joint venture is building its new plant in the Midwestern industrial town of Mt. Vernon, Ill.

But close proximity to auto assemblers is not as crucial for a tire company as it is for a steelmaker or an auto parts supplier. One reason is that tires are a relatively standard product that can be transported over longer distances and stored in larger inventory lots than other production inputs can. Another reason is that a major share of the tire business comes from supplying the after-market. In fact, in buying out U.S. tire companies, the most important prize may have been the companies' long-standing dealer networks.

The Underside of Transplants

The Japanese-owned factories are not workers' paradises. Some automotive transplants have been prone to cause worker injuries while rapidly ramping up production. Mazda, Nissan, and Suburu-Isuzu in particular tried to get production started quickly, leading to a high incidence of wrist and hand injuries. Employees are required to remain in jobs using high-impact torque guns for one to four weeks, contributing to repetitive-motion injuries. When hurt, these workers are sent to a company doctor and returned to the same job. The high rate of injury at Mazda led to the election of a new union local, which is taking a less conciliatory stance toward management.

Repetitive-motion injury is not a result of Japanese-style manufacturing, though. In fact, Mazda seems to have incurred its high injury rate because it did not fully implement Japanese production organization, which emphasizes continuous rotation among different jobs to reduce repetitive-motion injury as well as to crosstrain workers. At Mazda plants in Japan--and at other transplants, including Toyota and Honda--workers rotate as often as once an hour.

Japanese companies try to exert strong social control over their employees. Workers are expected to devote themselves selflessly to the firm and refrain from criticizing the company. A former Honda employee reports that workers are afraid to speak out against the company for fear of being branded troublemakers. The employee recounts being called in for mandatory counseling after complaining to a secretary about working conditions and management procedures. Nissan, too, has disciplined workers for expressing dissatisfaction, and it ran a vicious anti-union campaign. At Mazda, union representatives shared the same office with company labor-relations staff, so many workers could not tell who was who. A number of workers unwittingly complained to managers, thinking they were union representatives; some were fired.

Transplants typically attempt to extend their influence beyond the workplace into community life. Some of their means are seemingly benign. Toyota, for example, has an extensive community relations program in Georgetown, Ky., which sponsors trips to Japan for the mayor, county executive, school superintendent, and other officials. But Toyota also collects "intelligence" on Georgetown residents, conducting annual surveys and financing private studies of worker and resident attitudes.

Transplant assemblers are able to apply such pressures in part because they prefer to settle in rural areas, where unions are weak or nonexistent. Honda's original assembly plant, for example, is located in Marysville, Ohio-population 7,500. Similarly, Nissan,

Toyota, Diamond-Star, and Subaru-Isuzu have all settled in towns with fewer than 50,000 people. Honda managers explain that they wanted to be able to hire workers who had not picked up "bad habits" in U.S. factories.

Rural sites have also allowed Japanese companies to avoid hiring large numbers of blacks and other minorities. In fact, Honda settled a suit brought by the Equal Employment Opportunity Commission charging that the company discriminated by locating outside of areas with significant minority populations. A top executive of another automotive transplant says his company picked its site because the community is "union-free" and to "avoid blacks."

Nevertheless, some Japanese transplants seem to be learning the rules. Honda increased its minority work force from 2.8 percent in 1987 to 10.6 percent in 1990. Toyota's Georgetown, Ky., plant has boosted its proportion of black workers to 15 percent-in a county where minorities compose less than 3 percent of the population.

What Policymakers Can Do

Contrary to the views of some alarmists, Japanese investment in steel, rubber, and automobiles will not undermine the U.S. economy. Transplant producers provide jobs, investment, and productive capacity in an era when most U.S. companies continue to move off-shore and diversify out of basic industry.

Japanese corporations will continue to displace U.S. ones only to the extent that U.S. companies are unable to make themselves competitive. If present trends continue, most of our steel industry will be in Japanese hands by the year 2000, as U.S. companies sell their remaining operations. Only Goodyear, in a shrunken form, will be a major U.S. player in the global tire business. Japanese automakers will gain strength as U.S. firms retreat, and the Big Three may well become a Big Six, comprised of GM, Ford, Toyota, Honda, Nissan, and Chrysler (in order of size). And similar scenarios will come about in other automobile-dependent industries, as badly managed, financially drained U.S. companies fall.

One way that state and local development planners can help to halt this trend is to assist U.S. companies that wish to serve the booming transplant market. This is already starting to happen. Ohio, for example, is funding various companies to upgrade their steel production for the Honda plant. And the Michigan Modernization Service helps that state's companies improve their manufacturing processes.

Such efforts must focus on organizational restructuring, helping local companies trim their numbers of job classifications, and, most important, empowering workers so they can contribute their ideas. The transplants might even help with these efforts. Toyota has already invited U.S. suppliers to meetings in Las Vegas and Tokyo and has formed an organization of U.S. local suppliers-the Bluegrass Automotive Manufacturers Association-to help develop better suppliers.

Both the federal government and the states must also be more diligent in ensuring that Japanese firms conform to rigorous health and safety practices. This task may be less difficult than it first seemed; Japanese companies tend to be publicity-shy and image-concious, and so simply focusing attention on their transgressions may encourage them to mend their ways. State and local governments should also try to guard against the creation of company towns, in which the rights of ordinary citizens are stifled in the interest of a single Japanese firm.

At the same time, however, states need to scale back their extravagant financial incentives to Japanese companies. These subsidies have escalated dramatically over the past few years. When Honda built its Marysville, Ohio, plant, the state gave it tax breaks and direct aid totaling about $2,500 per job created. Kentucky has given Toyota $42,000 per job created, while Indiana paid $90,000 to Subaru-Isuzu (see the chart on page 30). In both cases, these incentives became major issues in the gubernatorial election-with opponents charging that the state had given too much, and engaging in Japan-bashing. And in both cases, the party that gave the incentives lost.

This level of subsidy is unnecessary. The transplant complex is the main lure for Japanese investment. Japanese corporations will continue to place most of their investments there, perhaps moving into neighboring states. "Incentives were never part of what has drawn us to this area [Marysville, Ohio] or caused us to expand," says Honda vice-president Roger Lambert.

Instead of engaging in costly bidding wars with each other, states should work cooperatively. One possibility might be to create a multistate regional task force that could develop a united front for dealing with Japanese investors. In the long run, the federal government should establish regulations that prohibit, or at least restrict, state and local subsidies to foreign investors. Those who would regard such regulation as an infringement on a state's right to attract investment might note that the the European Community strictly limits the amount of money its member countries can spend to attract foreign corporations. And these are sovereign nations, not states in a single federal system.

The transplants serve as a model of a powerful new method of economic development, one based on integrated production networks. Even the Big Three carmakers have learned this, and are reconcentrating production in the lower Midwest and upper South as they try to develop their own versions of just-in-time production. Development planners can help organize local production networks by showing large companies the value of local supply sources, familiarizing small and medium-sized companies with just-in-time principles, and providing information on market opportunities.

Here lies an opportunity for state funding that is far more productive than conventional incentives. Toyota, after all, has $20 billion in cash and is not likely to be enticed by a state's financial lure. Companies like Toyota are more apt to be attracted to a state that has pumped money into its supplier industries, bringing them into conformity with Japanese just-in-time practices. States would then generate investment and jobs by

modernizing their native manufacturing infrastructure and helping to restructure indigenous firms.

Given the new realities of heavy industrial production, this means teaching both managers and unions the value of the continuous improvements that shopfloor workers can make. In cases where existing management is disinvesting or closing plants, states might consider providing technical and organizational assistance to form enterprises owned and run by workers. The lessons gained at these experiments could diffuse to other manufacturing plants. That is a strategy that will pay off for decades to come, regardless of what the Japanese do.

JAPANESE COMPANY	LOCATION	PROJECTED CAPACITY (CARS PER YEAR)
Honda	Marysville, OH	500,000
Toyota	Georgetown, KY	200,000
Nissan	Smyrtia, TN	40,000
Mazda	Flat Rock, Mi	240,000
Diamond Star	Normal, Il	240,000
Nissan/Ford	Avon Lake, OH	130,000
Subaru-Isuzu (SIA)	Lafayette, IN	120,000
NUMMI	Fremont, CA	300,000
TOTAL		2,510,000

THE TRANSPLANT COMPLEX: STEEL

JAPANESE COMPANY	U.S. PARTNER	JOINT VENTURE NAME
Nippon Steel	Inland Steel	I/N Tek and I/N Kote
NKK	National Intergroup	National Steel
Kawasaki Steel	ARMCO	
Kawasaki Steel	CVRD (Brazil)	California Steel
Kobe Steel	USX Corp.	Lorain Works and Aztec Coating

Sumitomo Metal	LTV Corp.	LSE I and LSE II
Nisshin Steel	Wheeling-Pittsburgh	Wheeling Nisshin

JAPANESE INVESTMENT ($MILLIONS)
1,100
2,100
1,650
275
500
280
200