

ECONOMIC COMMENTARY

Federal Reserve Bank of Cleveland

Realignment in the U.S. Motor Vehicle Industry

by Michael F. Bryan and John B. Martin

In December 1987, GM closed five auto assembly plants in the United States, including one in Norwood, Ohio. What made the Norwood closure notable from an economic perspective was not the plant's size — which at roughly 140,000 cars per year was moderate by automotive standards — but its location. Approximately 100 miles to the south, Toyota was about to open an auto production facility in Georgetown, Kentucky. And at the same time, 100 miles to the northeast, Honda announced plans to expand its U.S. operations with a plant in East Liberty, Ohio.

Against the backdrop of flat motor vehicle sales, the U.S. expansion of Japanese-owned production facilities ("transplants") has intensified the already fierce competition among manufacturers. The increasing number of domestic auto plant closings, coupled with only moderately reduced car imports, suggests that the native domestic producers have yielded the most so far. And unless the U.S. demand for motor vehicles grows substantially (a doubtful prospect), additional plant closings are a virtual certainty in the coming years.

The economic health of the motor vehicle industry is of particular importance to the Fourth District economy.¹ Motor vehicle and vehicle-related production accounts for at least 20 percent of Ohio's manufacturing output and roughly 15 percent of the state's manufacturing jobs. Moreover, the District is in the heart of the so-called "transplant

corridor," where a preponderance of the Japanese facilities are located. The District is also home to many native U.S. auto plants, which may be subject to sharp cutbacks and closings over the next few years.

This *Economic Commentary* reviews the developments that have led to chronic excess capacity in U.S. motor vehicle manufacturing and considers the prospects facing this industry in the decade ahead.

"Is there going to be enough business to go around? The short-term answer is no."

E. Michael Mutchler,
Vice President, GM, 1988

During the past 12 years, and particularly since 1986, the growth rate of U.S. auto (and light truck) capacity has outpaced the nation's demand for these vehicles (table 1). At the production peak in the late 1970s, total new car/light truck capacity was roughly 14.5 million units per year, against actual production of 12.6 million—an idle capacity of about 13 percent. By the 1986 model year, idle capacity in the industry had risen to about 19 percent. Although seven major auto and light truck plants were closed between 1980 and 1985, predominantly by Chrysler and Ford, 10 plants were also opened over this period (six by GM and three by the Japanese). And despite nine more plant closings between 1987 and 1989, idle capacity in auto/light truck manufacturing reached 28 percent in the 1990 model year.

The expansion of Japanese motor vehicle manufacturing in the United States, combined with flat sales, has doubled the amount of idle capacity in this industry since the late 1970s. As a result, continued belt-tightening and plant closings can be expected over the next several years.

One important reason for the imbalance between our ability to produce autos and light trucks and our demand for these vehicles has been the proliferation of Japanese transplants. In 1982, Honda opened the first such facility in this country, in Marysville, Ohio. Initially capable of manufacturing only about 150,000 cars per year (less than 2.5 percent of the U.S. total), the plant flourished and today can turn out more than 500,000 cars annually.²

Over the next eight years, seven more Japanese-owned assembly plants were established in the United States. By early 1990, the transplants were capable of producing about 1.6 million vehicles annually, approximately 12 percent of the U.S. new car/light truck potential. The production capacity at these plants is expected to expand even further over the next few years.³ Indeed, potential Japanese transplant production is likely to exceed total Japanese imports to this country by 1994.

"Consumption is the sole end and purpose of all production"

Adam Smith, *Wealth of Nations*, 1776

As the Japanese auto companies were increasing their U.S. production capabilities, the growth of the domestic motor vehicle market leveled off. In the 1950s and 1960s, total U.S. auto and truck sales (including imports) grew at an average annual rate of nearly 4.6 percent. But since reaching 14.6 million units in 1973, motor vehicle sales here have risen an average of only 0.5 percent per year.

Several developments have softened domestic motor vehicle demand over the past decade, and because many of these are demographic in origin, they are likely to continue to depress sales during the 1990s. For example, after rising nearly 2 percent per year from the late 1960s through the 1970s, the average yearly growth rate of the driving-age population slowed dramatically in the 1980s and is projected to increase only about 0.8 percent per year this decade.

The rate of increase in the number of U.S. households also decelerated over the last 10 years, a trend that is expected to continue during the 1990s. The growth in motor vehicle purchases has been further dampened by a more moderate inflow of women into the labor force over the last decade.

In addition, there has been a substantial drop-off in the replacement demand for vehicles. Simply put, cars and trucks are now more durable. For example, despite an increase in the annual number of miles traveled per automobile, the average age of autos on our nation's highways rose from 6.4 years in 1979 to 7.6 years in 1985, where it has since stabilized. The aging of the U.S. auto stock may have resulted in part from a combination of factors responsible for the decline in household savings over the same period.⁴ But it is also likely that quality improvements have significantly prolonged cars' life expectancy.⁵

The flat U.S. vehicle market has not measurably affected the transplants, which have been operating at nearly

TABLE 1 ANNUAL U.S. AUTO/LIGHT TRUCK CAPACITY AND PRODUCTION
(Millions of units)

Model Year	Domestic Capacity	Domestic Production	Percent Idle
1979			
Total ^a	14.5	12.6	13
1990			
Native producers	12.1	8.5	30
Japanese transplants	1.6	1.4	15
Total	13.7	9.9	28

a. Includes a Volkswagen plant in Westmoreland, Pennsylvania, that closed after the 1988 model year.

NOTE: Total domestic capacity estimates are taken from unpublished Federal Reserve Board data. The methodology used to calculate these estimates is described in Richard D. Raddock, "Recent Developments in Industrial Capacity and Utilization," *Federal Reserve Bulletin*, vol. 76, no. 6 (June 1990), pp. 411-35.

SOURCES: Board of Governors of the Federal Reserve System; Federal Reserve Bank of Cleveland; and *Ward's Automotive Reports*.

full capacity since the facilities were opened.⁶ And while transplant car and light truck sales have been increasing since 1983, this phenomenon appears to have caused only a small decline in the U.S. market share commanded by Japanese imports. Rather, it is the native manufacturers who have lost the greatest share of the domestic vehicle market (figure 1).

We estimate that each percentage point rise in the market share of transplant vehicles has been accompanied by a two-thirds percentage point drop in the market share of native producers and a one-third percentage point reduction in the market share of imports. GM appears to have been the principal casualty.⁷ In 1980, when five companies were producing cars and light trucks in the United States, GM accounted for almost 44 percent of total sales. By 1990, with 10 companies manufacturing vehicles here, GM's market share had fallen to 36 percent.

"And I say that Your Highnesses ought not to consent that any [other] foreigner does business or sets foot here"

Christopher Columbus,
Journal of the First Voyage,
November 27, 1492

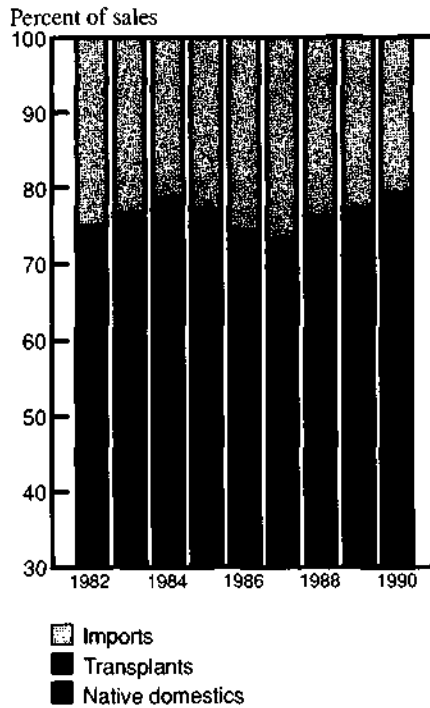
A number of factors account for the rising popularity of Japanese cars and trucks, including the surge in gasoline prices in the 1970s and the resulting preference for smaller, more fuel-efficient models. Japan's motor vehicle industry also pos-

sessed price advantages stemming from lower labor costs, higher productivity, and a strong dollar relative to the yen.

Nonetheless, several political and economic turns encouraged the Japanese to move some of their production facilities to this country. For one, the growing popularity of Japanese imports created a political backlash here in the early 1980s, when domestic motor vehicle sales began to founder. A number of parties in the industry sought protective legislation, and in 1981, the two countries agreed upon "voluntary" restrictions, or quotas, on the number of cars Japan could export to the United States each year. Because these quotas were based largely on each company's then-current U.S. auto sales, they were particularly limiting on the smaller, more growth-oriented Japanese automakers, such as Honda and Mazda.⁸

Since 1985, moreover, there has been a significant realignment of exchange rates. Between 1985 and 1989, the dollar plummeted more than 40 percent against the yen, substantially reducing the production cost differential between the United States and Japan. Furthermore, the fluctuations in the dollar-yen exchange rate complicated the production and marketing decisions of the Japanese exporters by creating uncertainty about future exchange values. To minimize the associated risks, the Japanese may have been prompted to diversify their production mix between nations.⁹

FIGURE 1 U.S. MOTOR VEHICLE MARKET SHARES^a



a. Includes automobiles and light trucks.
SOURCE: *Ward's Automotive Reports*.

Taken as a whole, the voluntary export restrictions, the threat of additional protectionism, and the low and volatile dollar-yen exchange rate were compelling reasons for the Japanese manufacturers to expand their production facilities into the United States. However, by relocating, these companies have risked losing their production cost advantages.

Yet, the Japanese seem to have successfully transplanted their production technology, such as few job classifications, frequent job rotation and training, worker "teams," and worker quality control.¹⁰ Moreover, their U.S. facilities have adopted the Japanese approach to dealing with suppliers, including outside sourcing, just-in-time inventory coordination, a tiered supply network, long contracts, and more frequent interaction.

The net result appears to be a relatively high productivity rate at the transplants. In the 1990 model year, cars per hour at Honda (95) led all U.S. auto manufacturers, and the hourly rate was above average at Mazda (63). At the same time, the transplants have kept labor

costs roughly 10 percent below those of the native manufacturers.¹¹

"The size of General Motors is not the cause of its success, but the consequence of success."

James M. Roche, Chairman, GM, 1967-1972

GM has been the primary loser in the competition for U.S. market share during the past decade, implying that the corporation carries most of the idle capacity existing in the industry today. But this is likely to change dramatically over the next several years.

In the September 1990 labor agreement between GM and the UAW, the automaker seems to have positioned itself for cutting its excess capacity and downsizing its work force. After reducing production workers by nearly 50,000 since 1987, GM reported last fall that it may cut payrolls by another 60,000 workers, or more than 11 percent, by 1993. In accepting the contract, the union has apparently traded some of its job security for earlier retirement eligibility, higher retirement benefits, and improved severance pay (table 2).

GM's program will be costly. If the company implements its planned labor force reduction, analysts estimate that the new agreement will cost nearly \$4 billion over the next few years. Yet even this

may not be enough: GM officials recently hinted that more plant closings may be forthcoming.¹²

GM's plan to reduce production capacity is almost certain to impact the Fourth District. Several of the company's facilities fall within the District's boundaries, and one of these plants has already been rumored as a possible target for closure.

"Competition is the keen cutting edge of business, always shaving away at costs."

Henry Ford II, 1949

The expansion of Japanese auto and light truck plants in the United States, combined with flat demand, has created a large surplus of production capacity in the domestic motor vehicle industry. The struggle between an increasing number of producers for a limited population of buyers suggests that only the fittest will survive. The efficiency of our economy depends on this sort of industrial evolution; certainly, consumers stand to benefit.

Realignment is unlikely to occur quickly or painlessly, though. While prospects for an economic recovery appear favorable this summer, the problems in the U.S. motor vehicle industry — and in the local economies that it supports — are likely to persist for several years.

TABLE 2 GM/UAW CONTRACT FEATURES

	1987	1990
Maximum lump sum for voluntary termination	\$65,000	\$72,000
Minimum retirement age, 10-29 years seniority	55	50
Additional benefits for early retirees ^a	\$642	\$879
Annual pension, workers under age 62 ^b	\$18,000	\$21,600
Benefits for workers on temporary layoff ^c		
Less than 10 years seniority	26 weeks	52 weeks
More than 10 years seniority	2 years	3 years

a. Maximum monthly allowance, payable to age 62.

b. Thirty years seniority.

c. Ninety-five percent of pay for indicated period.

SOURCES: UAW press release, September 1990; and *The Wall Street Journal*.

■ Footnotes

1. The Fourth Federal Reserve District includes Ohio, eastern Kentucky, western Pennsylvania, and the northern panhandle of West Virginia.

2. This estimate includes Honda's new facility in neighboring East Liberty, Ohio, which began operations in 1989.

3. In 1993, Toyota is expected to double the new car capacity at its Georgetown, Kentucky plant, raising total annual output at this facility to roughly 400,000 units.

4. Economists often consider the stock of consumer durables as *tangible savings*, inasmuch as it represents a source of future consumption. It therefore seems reasonable to assume that the factors contributing to the lower rates of personal savings over the past decade have also played a role in the aging of the U.S. auto stock.

5. Higher auto prices are not responsible for the aging stock of automobiles: The inflation-adjusted price of new cars actually *declined* 15 percent between 1979 and 1989. Moreover, although auto loan maturities rose over this period (from an average of 44 months to 54 months), this lengthening is more likely a reflection of the aging auto stock rather than its cause.

6. The transplants are not invulnerable to changes in the marketplace. The sharp decline in auto sales since October, for instance, has resulted in some inventory problems at these facilities, necessitating production cutbacks. Nonetheless, according to industry reports, the Honda, Toyota, and Nissan plants in the United States have been operating at nearly full capacity since their inception, with somewhat lesser rates for most other transplants.

7. In fact, the market shares of both Ford and Chrysler have risen slightly since 1980.

8. For a description of the events that sparked the emergence of the transplants, see Michael F. Bryan and Michael W. Dvorak, "American Automobile Manufacturing: It's Turning Japanese," Federal Reserve Bank of Cleveland, *Economic Commentary*, March 1, 1986.

9. For a discussion of plant location diversification and exchange rate risk, see Rachel McCulloch, "Unexpected Real Consequences of Floating Exchange Rates Reconsidered," *Essays in International Finance*, no. 153 (August 1983), pp. 1-28.

10. See Richard Florida, Martin Kenney, and Andrew Mair, "The Transplant Phenomenon: Japanese Auto Manufacturers in the United States," *Economic Development Commentary*, vol. 12, no. 4 (Winter 1988), pp. 3-9.

11. In 1989, for example, the average annual earnings of autoworkers at the U.S. facilities of Honda, Toyota, and Mazda were estimated at \$32,000, compared with more than \$36,000 at GM, Ford, and Chrysler. See Kathy Jackson, "Transplant Wages Will Rise to Match Any Gains at Big 3," *Automotive News*, July 2, 1990, p. 2.

12. See Joseph B. White and Gregory A. Patterson, "G.M. Considers Shutting Plants Amid Losses," *The Wall Street Journal*, April 17, 1991, p. A-3.

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