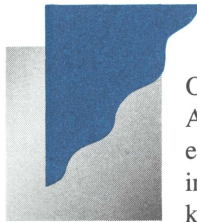


# Realignment in the auto supplier industry: the rippling effects of Big Three restructuring

Paul D. Ballew and Robert H. Schnorbus



Over the past fifteen years, American industry has experienced unprecedented changes in production processes, markets and market share, and organizational structure. As this transformation has unfolded, observers have focused on the large finished-goods producers, from capital goods to autos, that dominate their respective industries. In steel, for instance, analysts have studied the impact on USX, Bethlehem, and Nucor; in autos, on the Big Three (GM, Ford, and Chrysler) and, to a lesser extent, their foreign competitors. Studies of these industries and their major companies have yielded valuable insights into the evolving industrial economy. But the massive adjustments underway in the U.S. and world economies go far beyond the large finished-product firms; indeed, they are affecting downstream suppliers at least as much.

Suppliers can in fact serve as important indicators of conditions in the finished-good industries they supply as well as in the regional economies in which they are located. Furthermore, U.S. manufacturing is likely to continue changing rapidly. By studying the effects on downstream industries, we can sharpen our understanding of the underlying factors that are reshaping American industry. To illustrate these points, this article reviews past and recent developments in the auto supplier industry.<sup>1</sup>

## Adjustments in the market for automobiles

As the demand for all supplier industries is derived from the demand for finished goods, the auto supplier industry is shaped primarily by

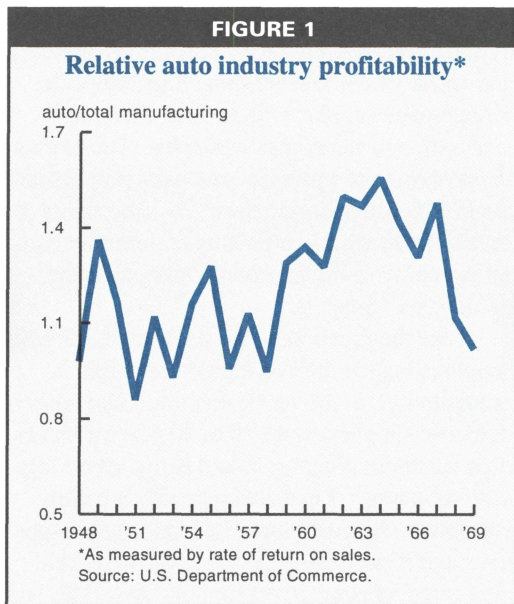
changes in the market for automobiles. As a result, the auto supplier industry has experienced the highs and lows of the immediate post-World War II boom and the adjustment period that followed.

When automotive production resumed after the war, sales of autos led a consumer-driven economy. Sales growth from 1946 through the late 1960s was robust. The mushrooming market was dominated by domestic firms, specifically the Big Three, whose market share exceeded 90 percent of the U.S.-Canadian vehicle market for much of the period.<sup>2</sup> Because of the oligopolistic nature of the Big Three, competitive pressures to reduce costs and improve quality were minimal and profits were solid.

A robust auto market and limited competition produced high rates of profit for the industry. As figure 1 shows, in almost every year between 1949 and 1969, automakers were more profitable than the average manufacturing firm, that is, the ratio of return on sales in the auto industry to that of all manufacturers was greater than 1. Auto shareholders enjoyed high rates of return and employees received high compensation, which in turn boosted the Midwest as a whole. Income levels and manufacturing wages in auto-producing states such as Michigan and Ohio were substantially above the national averages. Not surprisingly, the auto industry expanded substantially in these years. Employ-

---

Paul D. Ballew is Economist and Coordinator at the Detroit Branch of the Federal Reserve Bank of Chicago. Robert H. Schnorbus is Senior Business Economist and Research Officer at the Federal Reserve Bank of Chicago.



ment in the industry more than doubled, while capacity increased by almost 300 percent.

The 1970s saw fundamental change in the auto industry. Automakers faced slower domestic growth, declining market share, and profitability troubles in large segments of the industry. Manufacturers as a group—but especially automakers—began making profound structural adjustments. The changes included radically new operational processes, organizational downsizing, and notable technological shifts.<sup>3</sup>

The initial shock that precipitated this transformation was the oil embargo of the early 1970s. This event disrupted the macroeconomic growth pattern of the 1960s and altered conditions in core sectors, such as the market for automotive products. Additionally, domestic automakers were overly exposed to higher gas prices, since their product line almost exclusively contained energy-inefficient automobiles (“gas guzzlers”). Higher gas prices eroded Big Three consumer loyalty and prompted rapid changes in auto technology.

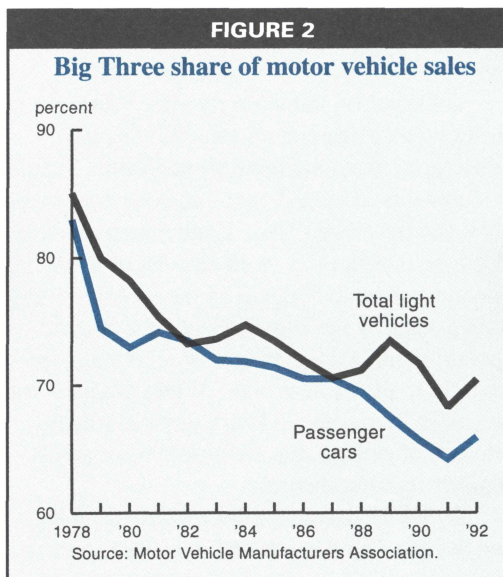
Equally important were the structural changes occurring in the auto market. Through the 1960s, certain foreign nameplates such as Toyota and Volkswagen had increasingly crept into the U.S. market. By the early 1970s, foreign competitors accounted for approximately 12 percent of all car sales annually, and that share grew throughout the decade. During the vehicle slump in the early 1970s, the Big Three lost four percentage points of market share to foreign competitors. Accordingly, the Big Three

accounted for a disproportionate share of the sales decline of that decade.

Eventually, a sales recovery did take shape—a long and sustained one, even by the robust standards of the 1950s and 1960s. By the mid-1980s, sales hit historic highs, bolstering the bottom line and the viability of the domestic auto industry. These years were strong for the Big Three, at least in terms of profits. Yet even as sales hit new highs and automakers’ fortunes seemed to turn, the recovery generated no euphoria. Worker rolls continued to be cut, factories were closed, and operations were streamlined; in short, the pace of restructuring quickened. This was a radical departure from the past, when sales jumps typically pushed up employment along with production.

The difference was largely due to U.S. automakers’ loss of market share, due in part to the strengthening dollar. During the peak of the recovery, Japanese competitors increased their market share by nearly 10 percentage points. This fact substantially diluted the benefits of the recovery to domestic automakers, especially GM. The Big Three’s share of passenger car sales slipped to approximately 65 percent by late in the decade, their combined vehicle share to almost 70 percent (see figure 2). By the mid-1980s, Big Three share of the retail market had sunk even lower.<sup>4</sup>

Lower price tags and fuel efficiency were not the only reasons for the growing popularity of foreign autos. By the mid-1980s, they were of higher quality and, increasingly, aimed at the





upscale market as well. Through the use of nontraditional methods, including different production processes and organizational structures than U.S. automakers used, Japanese automakers increasingly set the standard for quality and value.

In response to these competitive pressures, U.S. automakers undertook a radical restructuring in the way they conceived, designed, manufactured, and sold motor vehicles. By the mid-1980s, this transformation was well underway. As a result, terms that were once unknown have become buzzwords of the auto industry—lean production, just-in-time inventory, and worker-management teams.<sup>5</sup>

The ongoing changes in the auto industry are important to the nation, since the industry sets trends for much of manufacturing and the economy as a whole. But the auto industry is of special concern to the midwestern states of Illinois, Indiana, Michigan, Wisconsin, and Ohio, which continue to produce over 60 percent of all vehicles manufactured in the U.S. Between the Big Three, foreign nameplates, and parts facilities, more than 500,000 Midwest workers are employed in the auto industry. When suppliers and related industries are added, the number rises to over 1.25 million. Not surprisingly, given the magnitude of the changes, the Midwest has been disproportionately affected by the adjustments in the auto industry. Between 1979 and 1991, when employment in the industry fell sharply, Michigan lost 150,000 jobs at the Big Three and 100,000 at suppliers. These figures do not include other jobs supported by the industry, especially in the service sector.<sup>6</sup>

### Restructuring at the supplier level

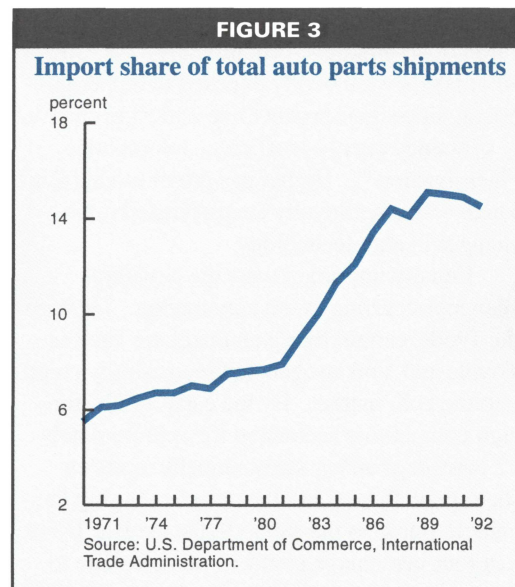
In the period immediately after World War II, strong auto sales and profitability caused robust growth among industry suppliers. Supplier shipments increased over 400 percent between 1950 and the early 1970s. Employment levels also rose substantially, with auto supplier employment close to 500,000 by the early 1970s. Strong sales by the Big Three and the general upward trend in the auto market allowed suppliers to keep their prices high. While products and processes in the auto industry evolved steadily, the pace of change was not unsettling, and the supplier industry thrived.

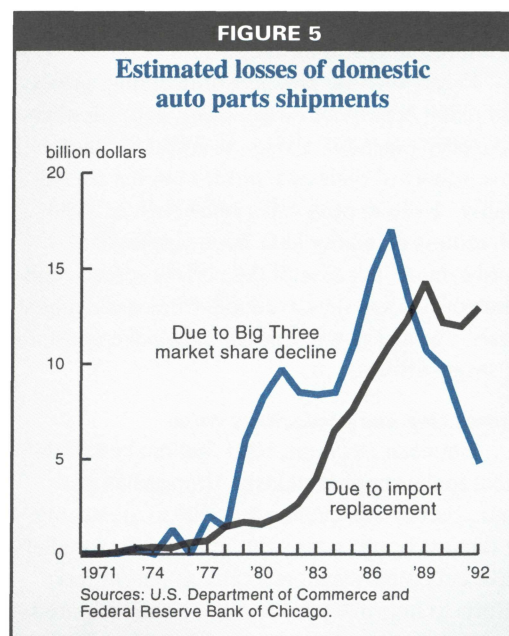
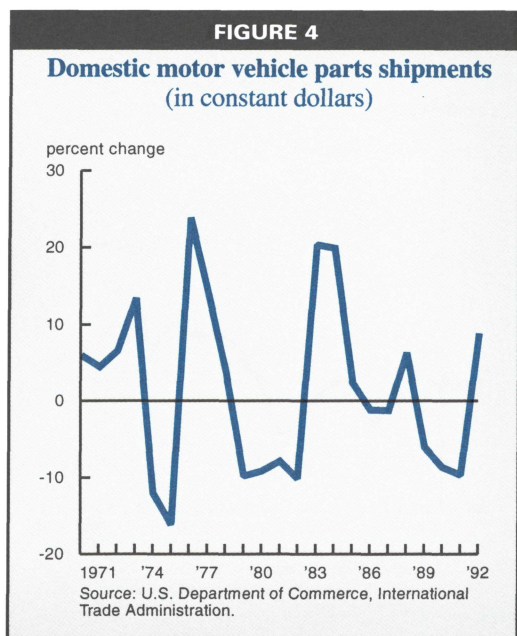
By the 1970s, auto sales growth declined and the Big Three began losing market share to foreign competitors. Suppliers followed the lead

of the finished-goods producers and responded by adjusting their production processes, capacity, and employment. At the same time, however, foreign parts suppliers began their own rapid penetration of the domestic market. The market share of imported parts to total parts purchased in the U.S. doubled during the 1970s (see figure 3). In real dollar terms, shipments of domestic parts showed only sporadic growth throughout the decade (see figure 4).

Like the finished-goods producers, domestic suppliers lagged their foreign competitors in productivity. In the 1970s, the unit labor costs of domestic suppliers were 20 to 30 percent higher than the international standard being set by Japanese suppliers.<sup>7</sup> Yet domestic product quality was lower. In an attempt to address these problems and those of overcapacity and weak margins, suppliers began reorganizing processes and technology and cutting employment.

Compounding all of these problems were the slow market growth of the late 1970s and the severe recession of the early 1980s. Domestic parts shipments declined by 43 percent between 1977 and 1982. Import penetration was responsible for much of this decline—and not just imports of finished vehicles. By the early 1980s, imported parts made up more than 10 percent of all parts purchased in the U.S. Even the advent of transplant assembly facilities of foreign companies in the U.S. did not fully offset these trends, since it was accompanied by a proliferation of transplant parts facilities and increased importation of parts.<sup>8</sup> (In the last few years,





transplants have increasingly been using domestically-produced parts.)

Additionally, domestic parts shipments grew slowly during the mid-1980s even when vehicle sales were peaking. The impact of imports and falling market share gradually began to lessen later in the decade. Nevertheless, by 1987, domestic auto parts suppliers were losing an estimated \$12 billion annually because of import penetration of foreign-made parts, and another \$17 billion because of the reduction in Big Three market share (see figure 5).<sup>9</sup> These problems were exacerbated by declining vehicle sales after 1990. As a result, a number of radical adjustments occurred in the domestic auto supplier industry during the 1980s. The sections that follow describe the most notable ones.

#### ***Reduction in the number of first-tier suppliers***

In response to overcapacity in the industry, the number of domestic auto suppliers declined by almost 25 percent between 1970 and 1990. At the same time, suppliers diversified their activities. For instance, many that formerly produced only auto parts began producing components used to manufacture those parts and, in some cases, components for other manufacturing industries.

Because of the heightened emphasis on quality, price, and customer satisfaction, the relationship between the Big Three and their suppliers also changed. Most noticeable was the reduction in the number of first-tier suppliers—

those that interact directly with the finished-goods producers. Ford, for instance, cut back from 2,400 major suppliers in 1980 to fewer than 1,400 by the early 1990s. Some models now have fewer than 200 first-tier suppliers those who interact directly with the finished-goods producers.<sup>10</sup>

#### ***Margin/price pressures***

Until the 1970s, price constraints were not a major concern of American automakers. In the current competitive environment, they are. Automakers now expect price decreases from their suppliers as well as increased quality and reliable supply. In fact, the Big Three have been known to request price reductions of between 1 and 5 percent annually, with the expectation that any reductions will extend indefinitely into the future.<sup>11</sup> Internationally, such reductions are not unprecedented. During the 1980s, while U.S. supply prices generally remained flat, Japanese suppliers experienced annual price decreases of up to 5 percent. Of course, the continuing excess capacity of suppliers makes it easier for automakers to extract price concessions from them. Automakers discussed building permanent ties with suppliers in the late 1980s, but they commonly pressured suppliers to lower prices during those years, bidding suppliers against each other and using market buying power. As GM's recent financial disclosures indicate, this approach has enabled the company to elicit price reductions sometimes greater than



10 percent, although the practice may abate as conditions at GM improve.

Faced with the prospect of declining prices and rising benefit and wage costs, auto suppliers have been placed in a vise. In response, they have squeezed their own profit margins considerably. Even in peak sales years such as 1984-88, returns on equity have been substandard. Furthermore, because of the narrow spreads and limited cash supplies available from more robust years, cyclical downturns can now have unusually strong effects.

#### ***Downsizing and productivity gains***

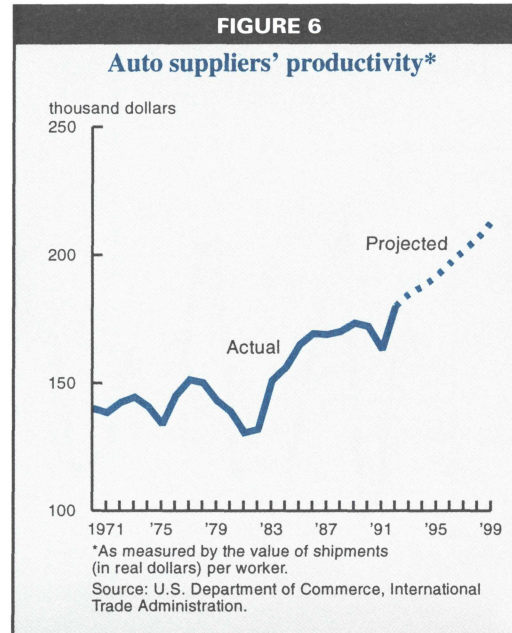
Between 1979 and 1991, national employment in the supplier industry dropped 54 percent. Part of this decline was due to the decline in domestic auto sales. But in addition, suppliers have cut employment radically as part of their efforts to improve productivity, a shift required by the demands of the new marketplace. This trend is still continuing, and suppliers are likely to cut employment even further in the coming decade as they continue transforming their production processes.

Corresponding to these employment cuts have been relative declines in wage rates in the supplier industry. The U.S. Department of Labor estimates that wages in unionized supplier companies have fallen from almost 80 percent of Big Three wages in the early 1980s to about 65 percent by 1990. In nonunion plants, the ratio has fallen from 60 percent to about 50 percent.<sup>12</sup>

Despite employment cuts, the value of domestic suppliers' shipments actually grew slightly in constant dollar terms over the 1980s and now exceed the levels of the 1970s. In combination with employment cuts, this growth indicates impressive productivity gains among suppliers over the period. As figure 6 shows, output per worker rose in excess of 40 percent over the last twenty years, and particularly in the 1980s.<sup>13</sup> By the late 1990s, productivity as measured by the shipment-to-labor ratio may have risen further to \$210,000 per worker, or 50 percent above the 1970 level of \$140,000.

#### ***Operational and functional realignment***

In an attempt to improve productivity and quality at the same time, auto suppliers followed the lead of the Big Three and introduced lean production techniques into their production processes. Features such as just-in-time inventory and statistical quality control have increasing-



ly become the norm. This transition was complicated by the fact that at the same time, the Big Three were moving away from the production of parts they had traditionally made in-house. By the early 1990s, Ford and Chrysler had reduced in-house parts operations to 50 percent or less of the entire manufacturing process in terms of value added. GM still produces a majority of its parts in-house but has also begun shifting this task onto suppliers.

As the Big Three passed parts production on to suppliers, they also pushed the design and engineering of parts downstream. Unfortunately, they have not always raised their compensation rates to suppliers to cover the additional costs and risks. Consequently, suppliers have had to accept increasingly more responsibility at increasingly declining compensation rates. In this environment, suppliers had no choice but to realign their production processes further in order to do more with less.

#### **Problems at GM complicate restructuring**

Throughout the early 1980s, GM lacked the overwhelming financial burdens that Ford and Chrysler bore. GM remained confident of its position in the North American market and thus was less aggressive about cutting costs, jobs, and excess capacity. Eventually, the company fell behind its two domestic competitors, not to mention its Japanese counterparts.

Even when auto sales peaked in the mid-1980s, GM continued losing market share, especially in some core product lines such as mid-size sedans. Over the decade, the company lost over 10 percentage points of market share.<sup>14</sup> This erosion became a crisis by 1990, when the recession and a weak economy dampened the overall vehicle sales market and further eroded GM's position.

In this crisis, it finally became clear that GM was (as it still remains) less competitive than other automakers by most measures. Productivity levels at GM lagged those of all its competitors, domestic and foreign. One study estimated this differential at perhaps \$800 per vehicle, and even higher for specific segments of the market. Combined with perceived quality deficiencies, these cost differentials were major factors in the erosion of the company.<sup>15</sup>

Since late 1991, GM has been trying to make up for lost time. It has closed facilities, reduced employment, and substantially altered its parts divisions and supplier network. The company is still highly integrated, with at least 70 percent of its parts produced in-house.<sup>16</sup> Announced closings and division sales will reduce this number somewhat. Additionally, GM has reduced its number of outside suppliers and elicited price concessions from those remaining. More internal streamlining is on the way, with a significant portion of parts facilities and activities slated to be closed or sold. In fact, GM plans to be involved only in "core" parts operations by the mid-1990s.

### **Current operating environment**

In the current operating environment, it is important to differentiate between cyclical and structural change. Sluggish sales over the last five years have clearly required the Big Three and the supplier industry to accelerate their pace of adjustment—especially GM. Yet even if sales bounce back to some "normal" level, the domestic auto industry can never return to some former condition. International competition, restructuring at the Big Three, and technical change have permanently changed the rules of the game. The relationship between the Big Three and their suppliers has especially changed. Pricing issues dominate it more than ever before, and pricing concessions and reductions have become the norm. The industry may continue to consider long-term contracts, but such agreements are meaningful only if they clearly specify

any eventual price concessions. Moreover, at least at present, the Big Three continue to exert considerable leverage over suppliers by canceling agreements.

Still to be addressed is the continuing problem of overcapacity in the North American marketplace. Although this is largely confined to the Big Three, it remains an issue with suppliers as well, especially if auto sales do not rebound back to some level of normalcy. Partly in response to this overcapacity, some suppliers are taking on increasing responsibility for designing and engineering parts and components. Others have shifted to producing components instead of parts.

The present outlook for market growth for domestic auto suppliers is somewhat uncertain. If sales remain weak and if the current trends in the structure of the market continue, suppliers are likely to adjust capacity further and speed up their downsizing. Apart from Mexico, the potential for export offset may be minimal, since the barriers to foreign markets are high. Therefore, local sourcing (using supplies produced locally) is the preferred mechanism for permeating new and expanding markets.

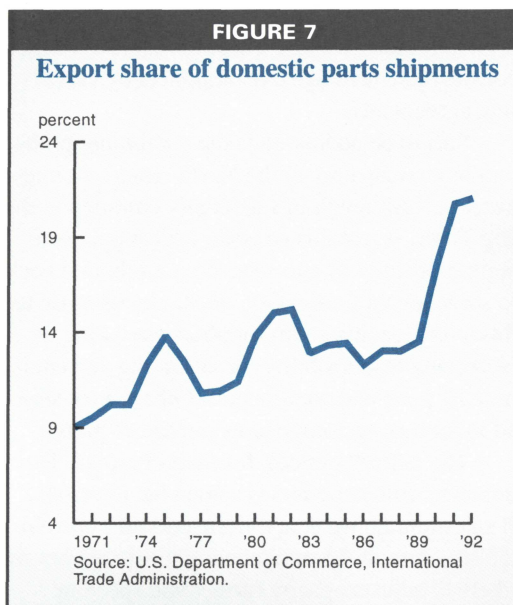
### **Bright spots in the changing market**

In spite of the painful restructuring, several factors do suggest some bright spots in auto suppliers' future. First, their primary customers—the Big Three—are much better positioned today than ten years ago. Ford and Chrysler have recaptured market share, and GM has stabilized its slide. More importantly, domestic automakers are closing in on the productivity and product quality of their foreign competitors. The popular new models being rolled out by the Big Three reflect this new vigor.

Suppliers will continue to face price constraints and other burdens associated with industry restructuring. But suppliers' improved productivity, quality, and responsiveness should help cushion these shocks. Moreover, political persuasion and a weakening dollar against the yen have renewed suppliers' competitiveness and slowed the penetration of foreign transplants. In addition, transplants are increasingly using parts produced in the U.S. While some of these parts are coming from other foreign transplants, domestic parts producers are beginning to reach beyond the traditional market of the Big Three.

Auto suppliers have also become more export-oriented in the last few years. As figure 7 indicates, over 20 percent of total shipments of





domestically-produced parts is exported, at a value of over \$18 billion annually. A significant portion of this trade is with Canada, but growth in non-North American markets has also been robust. The North American Free Trade Agreement should enhance the prospects for further export growth. The Mexican domestic market has been sheltered from international competition for many decades and is likely to experience

robust growth in the future. These factors bode well for certain portions of the supplier industry.

Overall, because of the ongoing restructuring and productivity gains made by suppliers over the last decade, surviving auto suppliers should be lean and well-positioned to increase their market share domestically and internationally in the years ahead. Although there will be new challenges as the auto market continues evolving, even potentially adverse trends, such as the shift of design and engineering onto suppliers, may represent opportunities to the supplier industry.

### Conclusion

The auto industry, including its supplier network, is a bellwether of the nation, an important industry in the global trading environment, and the foundation for much of the Midwest's manufacturing economy. For these reasons, changes in the auto industry can affect much of the rest of the U.S. manufacturing base.

As the nation moves further toward flexible manufacturing and other new production processes, firms throughout the production chain in other industries will be struggling to keep pace with rapid change. By understanding how auto suppliers have adjusted to changes in the auto industry, we may see a blueprint of what lies ahead for many other industries.

### FOOTNOTES

<sup>1</sup>The U.S. Department of Commerce defines the auto supplier industry to include standard industrial classification (SIC) 3465 (automotive stampings), 3592 (carburetors, pistons, piston rings, and valves), 3647 (vehicular lighting equipment), 3691 (storage batteries), 3694 (electrical equipment for internal combustion engines), and 3714 (motor vehicle parts and accessories).

<sup>2</sup>Dominance of this market was important, since even by the late 1960s, half of all production and sales in the world occurred in North America.

<sup>3</sup>Womack et al. (1990).

<sup>4</sup>The relative dominance of the Big Three in total world vehicle sales eroded substantially after 1965. In 1965, the Big Three accounted for 61 percent of all sales worldwide. By 1975 the level was below 40 percent; by 1990 it was 31 percent. During this period, GM lost over 16 percentage points of world market share, and Chrysler's world market was cut in half. At the same time as the Big Three were failing to penetrate the expanding markets abroad, they were also losing market share at home. Throughout the 1980s, annual domestic shipments of domestically produced vehicles never exceeded the pre-1980 high of 12.6 million units.

<sup>5</sup>See Klier (1993).

<sup>6</sup>The American Automobile Manufacturers Association (1992) estimates that approximately 3 million jobs in the Midwest are motor-vehicle related. This level does not include the impact the industry has on jobs in the service sector. Studies on the impact of plant closings indicate that the linkage between the industry and area service activities is extremely strong.

<sup>7</sup>Ibid.

<sup>8</sup>Transplant facilities also helped diffuse some of the trade friction due to the level of foreign investment and an eventual leveling off of import levels.

<sup>9</sup>Figures represent a comparison of actual sales with what the domestic auto producers and suppliers' share of total industry sales would have been if they had retained their earlier market share.

<sup>10</sup>Fleming (1993).

<sup>11</sup>GM's demands on suppliers in the early 1990s were even more extreme, requesting price cuts between 15 and 20 percent.

<sup>12</sup>U.S. Bureau of Labor Statistics (1993) and University of Michigan, Institute of Public Policy Studies. These wage declines are partly explained by a shift of auto parts employment away from the Midwest toward the Southeast U.S., which has encouraged additional growth of nonunion facilities.

<sup>13</sup>Other studies have confirmed these productivity gains. For instance, Boston Consulting Group (1993) and Economic Strategies Institute (1991).

<sup>14</sup>The numbers are somewhat deceiving because of GM's aggressive program (fleet) car plan; the actual erosion was worse.

<sup>15</sup>See Harbour and Associates (1990).

<sup>16</sup>Ward's Communications (1991).

---

## REFERENCES

**American Automobile Manufacturers Association**, *Motor Vehicle Facts and Figures: 1992*, Washington, DC, 1992.

**Boston Consulting Group**, "Context of U.S.-Japan automotive issues," March 1993.

**Economic Strategies Institute**, "The future of the auto industry," January 1991.

**Fleming, Al**, "Ford to cut 400 more suppliers," *Automotive News*, November 15, 1993, p. 1.

**Harbour and Associates**, *The Harbour Report a Decade Later: Competitive Assessment of the North American Automotive Industry, 1979-1989*, Berkley, MI, 1990.

**Klier, Thomas H.**, "Lean manufacturing: understanding a new manufacturing system," *Chicago Fed Letter*, No. 67, March 1993.

**U.S. Bureau of Labor Statistics**, *Compensation and Working Conditions*, January 1993.

**Ward's Communications**, *Ward's Automotive Year Book*, Detroit, 1992.

**Womack, James P., Daniel T. Jones, and Daniel Roos**, *The Machine that Changed the World*, New York: Rawson Associates, 1990.