

Chicago Fed Letter

Challenges to the U.S. auto industry

by Thomas Klier, senior economist

What will the auto industry look like in the future? Will domestic producers continue to lose market share? How will the industry's geography change? A recent conference brought together industry experts and economists to discuss the challenges facing this industry concentrated in the Midwest.

On November 3, 2003, over 80 industry insiders, academics, analysts, and policymakers gathered in Detroit at the second in a series of conferences sponsored by the Federal Reserve Bank of Chicago on the current landscape of manufacturing in the Midwest. This conference addressed the challenges facing today's U.S. auto industry and what these challenges imply for the Midwest.¹

In his welcoming remarks, Chicago Fed President and CEO Michael H. Moskow illustrated the importance of the auto sector. The sector employs more than 1.3 million workers nationwide, and gross motor vehicle output alone represents more than 3% of the U.S. economy. At first glance, the industry did rather well during the most recent recession. Light vehicle sales continued to advance instead of following their usual pattern of slowing down sharply. However, the sales data mask a number of challenges. Moskow referred to the fact that the Big Three automakers have been using sizable sales incentives to spark vehicle sales, which in turn has significantly reduced their profit margins. Yet, faced with high fixed costs for labor, plant, and equipment, it was less expensive to produce vehicles and sell them with heavy incentives than it was to shut down plants. Contributing to the high fixed-cost structure of domestic automakers have been soaring health care costs,

which also increase the automakers' so-called legacy costs, or benefits paid to retirees.

Furthermore, the traditional Big Three have experienced sizable losses of market share to foreign nameplates. Moskow pointed out that this trend was partly driven by exchange rate movements, which have contributed to a rise in import sales since the mid-1990s (up from 12% of U.S. light vehicle sales in 1996 to 20% in 2003). In addition, foreign automakers successfully introduced new products to compete with the Big Three in the surging light truck market. In the process, foreign automakers added significant production capacity inside the U.S. This represents two challenges. First, the spatial pattern of newly added production capacity has altered the geography of the auto region, extending it further south. Furthermore, it has raised the level of excess capacity in the industry. In response, the new contracts agreed upon between the United Auto Workers and the domestic car companies included agreements on near-term plant closures, affecting approximately 12,000 jobs that are primarily located in the Midwest.

In light of all these changes, it is useful to take stock of how these challenges might affect U.S. manufacturing at large and the auto industry in particular. What will the industry's structure look like

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in the future? Will domestic producers continue to lose market share? How will the industry's geography change? Will the Midwest continue to be the hub of the industry? And how do these issues relate to the broader question of whether the recent downturn in manufacturing is cyclical or structural?

Location trends and issues

Thomas Klier, Chicago Fed senior economist, discussed location trends for the U.S. auto industry. Using a series of maps, he illustrated how the auto industry is currently tightly clustered along the so-called auto corridor. The corridor extends from Detroit west to Chicago and south to Tennessee, with fingers reaching into Canada and Mexico. Detroit remains the hub of this industry. For example, a 400-mile radius drawn around the Motor City includes virtually the entire Canadian auto sector and about 60% of all U.S. light vehicle assembly plants, as well as the vast majority of supplier plants.

However, a number of trends challenge the Midwest's position as the nation's auto hub. First and foremost is the declining market share of U.S. auto manufacturers. Because the domestic auto assembly plants, as well as parts plants, are heavily concentrated in the northern end of the auto corridor, possible further market share losses by the Big Three would disproportionately affect this region. Second, in the post September 11 environment the auto sector faces heightened security rules and procedures with regard to border crossings. As a result, supply chain costs have increased, especially since the industry now uses seamlessly linked supply chains, connecting, among others, U.S. and Canadian plants.

Mareen Molot, professor at Carleton University in Ottawa, Canada, presented her findings on incentives used to attract auto assembly plants in the U.S. and Canada. She discussed two so-called locational tournaments, using 12 foreign-owned assembly plants built in the U.S. and Canada during the 1980s and six plants during the 1990s. A lack of comparable data makes it hard to assess the financial return across individual

location incentives. One would need a much richer information set in each case that would include, for example, the number of suppliers attracted to the vicinity in the wake of the initial assembly plant investment, as well as the opportunity costs of the initial government incentive package. But on the basis of a simple comparison of location incentives awarded, Molot concluded that "bidding for plants" has become standard procedure. In her presentation she demonstrated that the average incentive, calculated on a per job basis, was noticeably higher during the 1990s and suggested that at least part of the increase could be explained as learning by the auto companies. Going forward, she asked the audience to ponder whether there are reasons to stop the incentive game. At the same time, Molot emphasized the need for government and public agencies to better assess the economic value of such incentive packages.

Ellen Hughes-Cromwick, director of corporate economics and strategic issues for Ford Motor Company, presented an overview of longer-term trends affecting the auto industry. She argued that an important driver of the increasing global nature of the industry will be growth in the emerging markets. As a group, these markets are likely to account for

to keep up with growing local demand. She cited a forecast on the distribution of global automotive production capacity to be added between 2002 and 2008. It sees Asia excluding Japan adding 82% of the net addition of 8.4 million units of production capacity.

Industry structure

Iain Carson, industry editor of *The Economist* magazine, provided a rather discouraging assessment of the U.S. car industry. He sees an industry plagued by sizable excess production capacity, which he quantified at about 20%. In addition, a string of very profitable years experienced by the Big Three during the second half of the 1990s came to an end in 2001. Carson relates that to the fact that a number of foreign automakers started offering a full range of models in America, including full-sized trucks and sport-utility vehicles. Despite rapidly increasing sales incentives—they had more than doubled since 1999 to almost \$4,000 per vehicle by the end of 2003—the combined share of traditional domestic makes has fallen off quite steeply since 1996 (from 73% in 1996 to 60% by the end of 2003). Furthermore, Carson suggested that adjustments of production capacity offer no quick solutions for domestic automakers,

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90% of vehicles sales growth over the next decade, as local incomes rise and populations grow in Asia and elsewhere. While the North American market will continue to grow, emerging markets such as China are just beginning to reach what is referred to as the "take-off" stage, when per capita incomes are sufficiently high to support accelerating vehicle sales growth. This underlying dynamic is also expected to shape the distribution of global automotive production capacity. While historically a large share of production capacity has been located in mature markets, over time Hughes-Cromwick expects capacity growth in emerging markets to increase in order

as their labor costs are quite fixed. In addition, the health care liabilities of both employees and retirees represent a significant competitive disadvantage relative to the Japanese carmakers with their younger, non-unionized work force. He noted that GM, which has two-and-a-half pensioners for every employee, estimates that pensions and health care benefits add \$1,000 to the cost of each car it makes. A structural issue like that is not easily remedied.²

Sean McAlinden, director of the Economics and Business Group at the Center for Automotive Research, questioned Carson's bleak outlook, arguing that

the pending demise of the large U.S. automakers has been foretold many a time since the 1970s. What are the real issues this time? McAlinden agreed that the industry has undoubtedly been moving southward, with one-third of supplier plants and one-fifth of assembly capacity currently located in southern states. Over the last 30 years, domestic makers have also lost significant share to foreign brands in their own market. And they probably could have invested

share has dropped noticeably from 51% just eight years ago.⁴ Led by Kentucky and Tennessee, southern states now host 33% of the auto parts plants.

Rubenstein also reminded the audience how fast widely shared views can change. According to the conventional wisdom of five years ago, the outlook for the Big Three was good: They had closed the quality and productivity gaps with foreign producers and were

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the profits from a booming truck market during the 1990s in a better way than buying offshore brands and expanding abroad. According to McAlinden, the biggest challenge is the sizable growth in health care costs for both active and retired employees. As a global competitive matter, this becomes important as health care systems are set up differently across countries. Yet he suggested that the Big Three were not headed toward the exit. To the contrary, McAlinden said, vehicle quality and durability, as well as manufacturing productivity, all benchmarks in which the Big Three lagged behind the Japanese during the 1980s, have been vastly improved. He argued that the U.S. market will continue to grow and will regularly achieve sales of 20 million units by 2012. By 2007, he added, the Big Three will have nearly 100 new models on the road, putting them in a very favorable position to compete in a growing market.

Jim Rubenstein, professor at Miami University in Ohio, commented both on the current geography of the auto industry and on the longer-term perspective. His research tracks individual plants of the 150 largest automotive supplier companies doing business in the U.S. and Canada.³ In that analysis he clearly picks up a southward movement of the auto supplier sector. While the states at the heart of the auto corridor, i.e., Michigan, Indiana, and Ohio, retained the lion's share of auto supplier plants in 2003, that

very profitable. At the same time, the foreign producers faced a number of difficult issues. For example, Honda was seen as too small a company to remain independent in an increasingly global industry. In addition, at the time foreign producers such as Honda were still specializing in making cars, while light vehicles, such as minivans and sport-utility vehicles, were the segments that experienced most of the growth. Meanwhile, Nissan was not profitable in an industry that was doing very well and needed to be rescued by Renault, a French car company. Toyota was concerned about both the demographics of its customers and a quality control system that seemed to have gotten very unwieldy. In offering a flash-back on what was seen as the industry reality just five years ago, Rubenstein suggested that U.S. automakers might yet be quite successful in addressing the challenges facing them today.

Next, David Cole, chairman of the Center for Automotive Research, shared his views on the future of the auto sector. Cole began by highlighting the auto industry's importance to the U.S. economy. The leitmotiv of his outlook, however, was that of change. He argued that the old business model for the industry was broken, as illustrated by a break in the fairly close relationship of industry profits and capacity utilization during the most recent recession. Unlike in the past, this time the industry's capacity

utilization dipped only slightly, yet profits declined rapidly. The business model Cole sees emerging is best described as "lean." Companies will need to be flexible. Instead of devoting one assembly line to the mass production of one model, companies need to be able to produce several widely different models, based on different platforms, on the same assembly line. Companies themselves and their processes need to become lean. That means substantially shorter time for development of new product, as well as assembly facilities that require less space and fewer employees. These developments are occurring against a background of changes in product technology, such as advanced gasoline, clean diesel, and hybrid cars, combining a gasoline-powered combustion engine with a battery powered electric motor, as well as fuel-cell powered vehicles. In addition, Cole sees the industry undergoing further consolidation through mergers and alliances, both at the assembly and the supplier company level. Add the current product offensive by the domestic automakers, which are launching around 100 new models in the U.S. over the next few years, and you have the ingredients for a very competitive industry, he said.

Policy discussion

The conference concluded with a far-reaching panel discussion on policy implications and choices. Jim Donaldson,

Michael H. Moskow, *President*; Charles L. Evans, *Senior Vice President and Director of Research*; Douglas Evanoff, *Vice President, financial studies*; David Marshall, *Vice President, macroeconomic policy research*; Daniel Sullivan, *Vice President, microeconomic policy research*; William Testa, *Vice President, regional programs and Economics Editor*; Helen O'D. Koshy, *Editor*; Kathryn Moran, *Associate Editor*.

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vice president at Michigan's Economic Development Corporation, reported on ongoing efforts to retain auto industry employment. He pointed to a broad strategy, ranging from plant location incentives to supporting the Michigan Manufacturing Technology Center, an organization established to direct technical assistance to small- and medium-size manufacturers in the state, as well as including partnerships and round tables to foster communication in this industry. Donaldson suggested that Michigan's role in the industry was unique, not only due to its large share of auto manufacturing jobs, but also as the location of the vast majority of industry R&D activity. Among policies currently being fashioned, he mentioned a program designed to streamline the approval of environmental permitting.

Bob Seguin, deputy minister in Ontario's Ministry of Economic Development and Trade, suggested that the current challenges to Ontario's auto sector were not insurmountable. Located at the northeastern end of the auto region, Ontario's industry is strongly tied to the fortunes of the Big Three. In addition, border infrastructure issues have been placed front and center on the policy agenda since September 11, 2001. In response, Ontario has created a strategic investment program, designed to promote R&D, skills training, and infrastructure in the industry.

Steve Crosby, president and publisher of *Small Times*, focused attention on the growing automotive applications of what he calls "small tech," i.e., the use of micro- and nano-technology. Examples he cited are tire sensors and roll-over sensors. Crosby stated that Michigan, with its existing research and entrepreneurial capabilities, was well positioned to lead in this technology. He encouraged policymakers to actively position Michigan to become a world leader in small-tech auto applications.

Dan Luria, vice president and acting CFO of the Michigan Manufacturing Technology Center, reported results from an ongoing survey of a large number of small- and medium-size Michigan manufacturing companies. Luria documented the manufacturing decline of the last few years along various dimensions. Referring to the most recent contract agreements between the UAW and the Big Three, he suggested that Michigan was particularly vulnerable to plant closings in the auto industry. His prescription was to improve the industry mix by attracting foreign supplier companies to invest in the state.

David Fasenfest, associate professor at Wayne State University, reported on findings of a survey of households in the Detroit metro area on employment status, work experience, and skill needs. Against the background of a changing industry, he argued that policymakers should focus on targeted worker training.

Conclusion

As different scenarios of the auto sector's future were debated, there was little doubt among conference attendees that Michigan would remain the hub of this industry for some time. However, the key players, their modes of operation, and their locations are continuing to shift. A big driver of this industry's future and especially the Midwest region's part in it will be how well the Big Three fare in the marketplace going forward. Less appreciated, but equally important, are the vast and changing roles of automotive suppliers that now serve both the Big Three and transplant automakers alike.

¹ Here, the Midwest refers to the five states in the East-North-Central region, Illinois, Indiana, Michigan, Ohio, and Wisconsin. For more detailed information, visit the bank website at www.chicagofed.org/news_and_conferences/conferences_and_events/research_conferences_past.cfm for conference presentations.

² See Carson, 2003, "Extinction of the car giants," *The Economist*, June 14–20.

³ His data represent about 1,500 supplier plants.

⁴ Led by Michigan with 24%, the three states jointly account for 44% of the parts plants of the largest supplier companies in 2003. In the case of Michigan, the attrition since 1995 translates into a loss of about five or six plants a year.