

Chicago Fed Letter

After the perfect storm: What's next for the auto industry?

by Thomas H. Klier, senior economist, Martin Lavelle, associate economist, and James M. Rubenstein, professor, Miami University

Amid the global recession in 2008–09, the U.S. auto industry experienced its worst downturn in recent memory. While conditions have improved in 2010, questions about which factors will shape the industry's competitiveness remain. The Chicago Fed hosted a conference on May 10–11, 2010, at its Detroit Branch to explore the industry's past, present, and future.

The conference brought together auto industry leaders, analysts, academics, and policymakers to discuss the challenges and opportunities facing the industry as it emerges from the global recession. The program was organized around three questions: What did we learn as the industry went through its “perfect storm”? What is the status of ongoing efforts to regulate vehicle performance and stimulate innovation in the auto sector? What are the competitive challenges facing the industry in the decade ahead?

Recap of the past two years

Steve Rattner, former counselor to the Secretary, U.S. Department of the Treasury, opened the conference with a keynote speech on the intervention by the federal government to save General Motors (GM) and Chrysler. He argued the government had little choice but to intervene at the time. An uncontrolled bankruptcy for these two companies was not a viable option, economically or politically. Rattner, who was one of the two senior advisors in President Obama's auto industry task force, explained that the initial proposals of the two automakers for restructuring their businesses came up short, so the Obama administration imposed a series of “extraordinarily tough” conditions. If the companies could not meet those, they were told they would have to file for bankruptcy.¹ Ultimately, the government committed \$81 billion

in total to the auto industry, of which \$50 billion went to GM. The balance went to Chrysler, the two automakers' financing companies (General Motors Acceptance Corp. and Chrysler Financial), and insurance of obligations to suppliers and of customer warranties. While it is still early to judge the success of that intervention, Rattner said that GM and Chrysler have been given a fresh start and every tool they need to become profitable again.

Related to the government intervention, the Detroit Three (Chrysler, Ford, and GM) were able to bring hourly labor costs in line with those of their foreign-based counterparts, according to Sean McAlinden, chief economist and vice president, Center for Automotive Research. An important step on the way to regaining competitiveness for the Detroit Three was their 2007 labor contract agreements with the United Auto Workers (UAW). The 2007 contracts established a two-tier system of salaries and benefits, significantly lowering the automakers' costs for new hires; transferred retirees' health liabilities to separate entities (voluntary employees' beneficiary associations, or VEBAs) in 2010; and eliminated the post-retirement health benefits and defined pension benefits for all future hires. The Detroit Three and the UAW subsequently renegotiated these contracts to adjust for the industry's downturn, as Chrysler,

Materials presented at the conference are available at www.chicagofed.org/webpages/events/2010/automotive_perfect_storm.cfm.

Ford, and GM shed nearly 120,000 workers, representing a 40% decline from their 2006 employment levels. McAlinden pointed out, however, that as the industry recovers, significant hiring of second-tier workers by the Detroit Three would have to wait until the overhang of laid-off workers with recall rights has been accommodated.

To put the current downturn in context, Thomas Klier, senior economist, Federal Reserve Bank of Chicago, compared the most recent auto industry recession with the one experienced in 1979–80.

time). In addition, he stated that if there is one thing we learned during the crisis, it has been how interconnected the auto industry supply chains are. For example, fewer than 10% of parts plants supply only one automaker. By the same token, nearly all of the suppliers to the foreign-based automakers in North America also supply the Detroit Three.

Tom Stallkamp, industrial partner, Ripplewood Holdings, shared some lessons from his previous long tenure at Chrysler. According to Stallkamp, adversarial relationships in the auto industry

rooted in the company's byzantine organizational structure. Changing a business culture takes time, but Howes said he was encouraged by the speed at which GM and Chrysler have adapted over the past two years.

Regulation, policy, and innovation

Brent Yacobucci, energy specialist, Congressional Research Service, described efforts that are under way to regulate fuel efficiency and emissions of light motor vehicles (passenger cars and light trucks). In early May of this year, revisions to the CAFE (corporate average fuel economy) standards for light vehicles became effective. Prompted by the Energy Independence and Security Act (EISA) of 2007, these new standards require a 30% increase in the fuel efficiency of newly produced vehicles by 2016. Unlike the first set of standards of the late 1970s, the new rules include regulations on the emissions of vehicle greenhouse gases (GHGs). Now that GHG standards have been added, the U.S. Environmental Protection Agency (EPA) will serve as a regulator in conjunction with the National Highway Traffic Safety Administration (NHTSA), which regulates vehicle fuel efficiency.² According to Yacobucci, EPA modeling shows that over the next six years there will be far greater market penetration of direct-injection gasoline engines, dual-clutch manual transmissions, and start–stop technologies—all of them fuel-efficiency-boosting technologies that are currently available.³ Yacobucci also stated that the new fuel efficiency standards for light vehicles will likely have different effects on different manufacturers, based on how costly it is for them to bring their current product offerings into compliance with the new requirements.

The U.S. government recently committed significant resources to foster innovation in the area of fuel efficiency because light vehicles consume 60% of transportation fuel, accounting for 42% of total U.S. petroleum use. Edwin Owens, supervisor of hybrid vehicle systems and advanced materials, U.S. Department of Energy (DOE), discussed the current relationship between the DOE and the auto industry. The DOE's vehicle

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While similar in severity, the two downturns played out against very different industry backdrops. Auto manufacturing has become more fragmented in the past 30 years, in large part because foreign-based producers have established a significant presence in North America. Detroit has lost one-third of the U.S. market in terms of sales, as well as over 40% in terms of production, during this time. Nonetheless, the Detroit Three are more concentrated in the Midwest today than they have been for many years—e.g., half of the Detroit Three's production capacity in the U.S. and Canada is located in Michigan and Ontario.

James Rubenstein, professor, Miami University, discussed recent changes to the auto parts supply base, where about 79% of industry jobs reside. Using a detailed plant-level database, he produced evidence that illustrated the continued strengthening of auto alley—a narrow corridor, roughly 700 miles long and less than 100 miles wide, between the Great Lakes and the Gulf of Mexico. It increased in importance as plants located outside auto alley experienced a disproportionate share of closings. He also pointed to a much more modest decline in supplier establishments (down less than 10% between the end of 2006 and the end of 2009) than in supplier employment (down 37% during the same

have been the norm for many years—this is true not only for relationships between management and labor, but also for those between automakers and suppliers, as well as others involving auto producers and their customers and dealers. He recommended further cooperation and collaboration to improve these relationships. He also argued that Detroit is still too insular and should look to other industries for best practices. He warned of the looming competitive threats from India and China, which in his view were not being addressed sufficiently.

The auto industry's business culture and its effects on competitiveness were examined by Dan Howes, business columnist and associate business editor, *Detroit News*. He stated that Detroit's "culture of conflict" had resulted from an attitude of entitlement in the industry. With no other industry prominent in Detroit, the auto industry's business culture became pervasive and, in hindsight, corrosive. Real change in that context was only possible during times of crisis. Howes pointed out that problems with business culture did not only affect Detroit-based auto companies. He cited the botched merger between Daimler and Chrysler, which he attributed chiefly to the difference in business culture between the German and American companies. He also suggested Toyota's quality problems that surfaced earlier this year were

technology budget, which has grown 70% from 2007, stands at \$311 million in 2010. This budget is dedicated toward the development of advanced engines and materials, automotive fuel cells, and hybrid electric drivetrains (engines and transmissions). The DOE has also allocated \$2.8 billion of federal stimulus funding to vehicle technology development; \$1.5 billion of this has been solely designated to accelerate the manufacturing and deployment of the next generation of electric vehicle batteries in the U.S. In addition, the DOE administers

the world. Its core competitive capability is engineering. In focusing on development (as opposed to research) as well as timely production, Kotagiri said, Magna has come up with a successful model for innovation. For example, by applying the technique of hydroforming—bending metal by means of water pressure as opposed to stamping—Magna was able to build a 45% share in automotive frames from scratch in a relatively short time. Kotagiri also addressed the roles of government and the private sector in innovation. He suggested that government

Pennsylvania, addressed the importance of production flexibility for automakers. As markets continue to fragment and product life cycles continue to shorten, the capability to be flexible in terms of what model combinations can be sequenced on a given assembly line will continue to be an important factor in more effectively using an automaker's existing production capacity. Based on his study of assembly plants around the world, MacDuffie reported that the degree of production flexibility varies considerably among auto manufacturers.

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the \$25 billion Advanced Technology Vehicle Manufacturing Loan Program. Included in the 2007 EISA and funded in September 2008, this program provides low-interest loans to firms to help them establish or upgrade manufacturing facilities producing advanced technology vehicles in the U.S. Nearly \$9 billion in loans had been awarded by the end of 2009.⁴

Jim Brockbank, vice president, Export Development Canada (EDC), explained the relationship between EDC and the Canadian auto sector supply base. As an export credit agency wholly owned by the Canadian government, EDC acts as a financial intermediary that supports and develops Canada's export trade. For many years the EDC has assisted the auto sector by offering risk-management products, such as accounts receivables insurance (protection against customer defaults); it also provides working capital guarantees and other financing to Canadian exporters. EDC's programs targeting the auto parts supply base, including the tool and die sector, amounted to CAD \$4.5 billion in 2009.⁵

A private sector perspective on auto research and development was provided by Swamy Kotagiri, executive vice president, Cosma International of Magna International. Magna is a large global auto supplier company that does business with all the major automakers around

efforts, in cooperation with universities or national labs, work best for basic research that establishes the foundation for applied research later on. Automakers and suppliers in the private sector are focused on innovating specific products and applications. Furthermore, he stated that for an automaker, the innovative capability of its supply chain is a crucial factor for success in the marketplace.

Challenges ahead

Conference participants discussed several factors likely to influence auto companies' competitiveness over the coming decade. Front and center was the question of how future vehicles will be powered, particularly in light of more-stringent fuel efficiency regulation as well as uncertainty about gasoline prices. Dan Hancock, vice president of global powertrain engineering, General Motors Co., discussed the range of powertrain technologies—from improvements to the conventional internal combustion engine (powered by gasoline and diesel) all the way to complete electrification of vehicles. The key dilemma with electrification is the considerably lower energy storage density of batteries relative to liquid fuels. Automakers will need to work simultaneously on many approaches to increase fuel efficiency, said Hancock.

John Paul MacDuffie, associate professor, Wharton School of the University of

Doug Szopo, executive director of global product planning and strategy, Ford Motor Co., illustrated Ford's efforts to integrate products on a global basis. In cutting back on the number of distinct models and the need for individual assembly platforms (sets of design, engineering, and production characteristics), the company has significantly increased its volume per platform (the volume on core platforms has risen from 29% in 2007 to 50% in 2009, and it is projected to increase to about 90% within five years). This strategy allows for scale economies in procuring parts, as well as the sharing of development and engineering costs across a higher production volume. Szopo highlighted the ongoing rollout of the globally integrated Focus

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and Fiesta models, which will result in significantly higher volume per platform.

Susan Helper, professor, Case Western Reserve University, argued that automakers need to focus on their relationships with suppliers because the majority of a car's value added originates in the supply chain and supply chains are shared across automakers. The idea is to align incentives between the producers of vehicles and of parts to share innovations and reduce costs. Helper also emphasized the importance of complementary policies within an automaker's organization. For example, during the 1990s Chrysler built a much admired program for sourcing parts. Yet Chrysler could not obtain competitive prices

for parts because of a lack of coordination between its engineering and purchasing departments.

Bob King, vice president (elected president in June 2010), United Auto Workers, said that the past several years have been highly unusual for the U.S. auto industry. Since the 2007 agreements, labor and management have been in almost constant negotiations to adjust the existing contracts to account for the deteriorating conditions in the auto industry. These negotiations have led to additional cost-saving measures. King emphasized that high product quality is paramount to ensure the continued viability of the Detroit Three and urged them not to fall back into bad habits once conditions improve.

Conclusion

Nearly a year after Chrysler and GM had filed for bankruptcy, participants at this conference reflected on the remarkable events that had occurred in the U.S. auto industry over the past few years and what they meant for the industry today and tomorrow. The speakers also explored the key competitive challenges facing automakers, most notably the large uncertainty surrounding innovations in powertrain technologies. Both the private and public sectors are currently devoting great efforts to further research and development in this area. The stakes are high as many companies and countries compete for technological leadership in this industry.

¹ For a comprehensive summary of government actions related to the rescue of Chrysler and GM, see Congressional Oversight Panel, 2009, *September Oversight Report: The Use of TARP Funds in the Support and Reorganization of the Domestic Automotive Industry*, Washington, DC, September 9, available at <http://cop.senate.gov/documents/cop-090909-report.pdf>.

² The basis for the EPA getting involved in the regulation of vehicle emissions is an "endangerment finding," which it issued in December 2009. This EPA finding states

that GHG emissions from automobiles negatively affect public health and welfare. Light vehicle GHGs represent 65% of all transportation sector GHG emissions; that sector as a whole accounts for 24% of all U.S. GHG emissions.

³ For further discussion, see Taft Foster and Thomas H. Klier, 2009, "Raising automotive fuel efficiency," *Chicago Fed Letter*, Federal Reserve Bank of Chicago, No. 266, September.

⁴ The loan recipients were auto producers Ford (\$5.9 billion), Nissan (\$1.6 billion),

Tesla (\$465 million), and Fisker (\$529 million), as well as component manufacturer Tenneco (\$24 million).

⁵ In 2009, the EDC, on behalf of the governments of Canada and the province of Ontario, also provided direct loan support to GM Canada and Chrysler Canada, as well as accounts receivables insurance to Canadian suppliers. The EDC took these actions while working in concert with the U.S. Department of the Treasury.