Who Really Made Your Car?

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Conclusion: Surviving the Car Wars

[Consumers and investors] are looking at Detroit and saying . . . get real . . . quit your crying, work together to fix your problems or get out of the way.¹

This book was written to shed light on the manufacturers of motor vehicle parts. Parts suppliers employ far more people and add much more value to the vehicle than do carmakers. Yet our understanding of the parts makers is quite limited.

We know much more about the identity and struggles of the companies whose names are on the vehicles. Much is written about the histories of the companies and their leaders, the features of their brands, and the distinctive assets and the challenges of each. But vehicles are made of thousands of parts about which we know relatively little. Who are the companies that made all of these parts? How do they relate to one another and to their customers, the carmakers? And where are these parts made?

The U.S. auto industry through most of the twentieth century consisted of three major carmakers responsible for making most of their own components, supplemented by thousands of mostly small parts suppliers. In the twenty-first century, the number of major carmakers competing in the United States has increased with the addition of foreign-owned carmakers, and many suppliers have become major players in the vehicle production process.

Thus, the relationship between carmakers and suppliers has been transformed from a hierarchical one, with a steep pyramid shape, to a complex Venn diagram of interrelations among many competitive carmakers and many competitive suppliers. “Those are very difficult relationships to manage . . . People within the OEMs just are not trained to manage these relationships” (McKinsey & Company Automotive & Assembly Extranet 2005, p. 4).
The role of parts makers has evolved as substantial changes have occurred in the motor vehicle industry as a whole. Some of the most important changes include:

- a shift from in-house production of parts by carmakers to outsourcing to independent suppliers;
- a smaller number of Tier 1 suppliers working directly with the carmakers;
- a complex supply chain of Tier 2 suppliers working with Tier 1 suppliers, Tier 3 suppliers working with Tier 2 suppliers, and so forth;
- an increase in the demand for just-in-time delivery of parts to the final assembly plant; and
- a quickening pace of technological change, especially in areas of energy conservation, reduced emissions, and enhanced safety, partly driven by regulatory requirements.

“‘Relentless’ and ‘brutal’ are the two words most often used to describe competitive pressure in the automotive supply chain. Battered by global over-capacity, shorter model lifecycles and seemingly permanent rebates of up to $5,000 per car, automakers are passing the pain—with interest—on to their suppliers” (Murphy 2004). Given these competitive pressures, a good relationship with its supply base represents one of the most significant competitive advantages a carmaker can have.

A good relationship with suppliers is a central element of the competitive advantage in the U.S. market held by Japanese carmakers, especially Toyota. Most succinctly, SupplierBusiness.com cites two basic models for carmaker–supplier relationships: the command and control contract (or adversarial) model preferred by the Detroit 3 and the collaborative (or partnership) model preferred by Japanese automakers (Snyder 2005).

Time and time again during the course of this study, suppliers have repeated in private that relations with the Detroit 3 are poor, especially in comparison with their Japanese customers. Supplying the Detroit 3 calls for “testosterone games to see who can squeeze more, pay more slowly, or demand extortion—uh, excuse me, productivity.”

The Detroit 3 model of supplier relationships has been one of “exit” and the Japanese model one of “voice,” according to economists Susan
Helper and John Paul MacDuffie. The Detroit 3’s exit model has been characterized by “short-term relationships, limited amounts of collaboration, and the willingness of either party to ‘exit’ the relationship for short-term gain.” The Japanese model has been characterized by “lots of collaboration (with supplier ‘voices’ being heard)” (McKinsey & Company Automotive & Assembly Extranet 2005, p. 1).

Differences in quality and efficiency between Japanese and U.S. carmakers observed in the twentieth century have narrowed if not disappeared altogether in the twenty-first century. The principal measure where the gap between Japanese and U.S. carmakers has widened in the twenty-first century is in supplier relations.

SUMMARY OF FINDINGS

This book set out to document the existing structure of the North American motor vehicle parts industry. The key to the analysis was creating a database that allowed us to describe and analyze the industry at an unprecedented level of detail. The ability to draw on a database of 4,268 individual parts-making plants in North America, including plant-level geography and product information, allowed us to analyze a little-known industry at a rich level of detail. We have identified several major trends currently shaping this industry.

• Role of the Midwest. Most parts for motor vehicles were once made in and near southeastern Michigan. The area has lost its dominance in parts production, but it is still home to the largest number of plants. Most of the parts for the powertrain and exterior continue to be made in the Midwest because the parts are relatively bulky and are most efficiently produced near sources of both inputs (especially steel) and customers.

• Carmaker–Supplier Networks. Most parts need to be produced within a one-day delivery radius of the customer in order to ensure arrival at the final assembly plant on a just-in-time basis. Only a handful of parts, though, need to be produced right next door to the final assembly plant. The seat is the single most prominent example of a major module that is invariably made within one
hour of the final assembly plant. Carmakers and suppliers depend on logistics specialists to coordinate the flow of information and goods within a network.

- **Auto Alley.** The U.S. motor vehicle industry is still highly clustered, but it is now located in a narrow north–south corridor known as Auto Alley. The industry’s traditional Midwest core now forms the northern end of Auto Alley. It is still home to most facilities operated by the Detroit 3 carmakers. But newer plants have headed south within Auto Alley, especially those operated by foreign-owned companies. The primary reason for selecting a southern location within Auto Alley has been to minimize the likelihood of a unionized workforce. Southern plants have somewhat lower wage scales, but the principal benefits have been much lower benefit packages and more flexible work rules.

- **Global Shifts.** The percentages of parts made outside the United States and inside the United States by foreign-owned companies have increased. Production of relatively bulky, low-value interior and exterior systems has been less likely to leave the United States. Instead, motor vehicle parts imports have grown for both high-value powertrain modules (e.g., complete engines and transmissions) and low-value, high-labor-content routine electronics parts.

**OUTLOOK AND UNCERTAINTIES FOR PARTS SUPPLIERS**

On paper, the U.S. auto industry looked set to prosper in the twenty-first century. New vehicle sales in the United States remained at historically high levels through the 1990s and into the twenty-first century. Despite globalization of the industry, most vehicles sold in the United States were still being assembled in the United States from parts made mostly in the United States. In 2008, news stories suggested that a Chinese automaker is planning to assemble cars in North America (Ying 2008).

The supplier sector of the industry looked to be prospering as well. As this book has shown, suppliers were already responsible for adding
two-thirds of the value to vehicles in the early twenty-first century, and the share was expected to rise. Having been given more responsibility by carmakers, suppliers have evolved into providers of complex manufacturing tasks that required their own research and development.

**Buffeting Headwinds**

Though the overall industry conditions appear favorable for parts producers, in reality individual motor vehicle parts producers had to navigate a challenging course to survive in a competitive environment. The parts industry based in North America has been buffeted by what billionaire investor Wilbur Ross (2006) has called “the perfect storm.” Key elements of what could be more modestly described meteorologically as strong headwinds include:

- **Shifting Market Shares.** Parts suppliers live and die by the fortunes of the carmakers. Suppliers dependent for their business primarily on the Detroit 3 carmakers have had to quickly adjust to a sharp decline in volume, more than 3 percent annually in the first decade of the twenty-first century. Conversely, suppliers dependent on foreign-owned carmakers have had to quickly respond to a corresponding increase in volume.

- **Globalization of Supply Chains.** Suppliers producing commodity or generic parts are facing increased competition from producers located in low-wage countries such as China. On the other hand, suppliers producing high-tech and research-intensive parts face increased competition from European and Japanese suppliers with close ties to foreign-owned carmakers.

- **High Cost of Inputs.** The motor vehicle industry is the major manufacturing destination for steel, glass, aluminum, rubber, and a host of other materials, not to mention petroleum. Rising costs for these materials have been borne primarily by suppliers. As carmakers expect suppliers to lower the price of their product annually over the life of the contract, passing on cost increases to carmakers is next to impossible.

- **Technological Changes.** In many instances technological changes are driven by regulatory requirements, such as safety and emission standards. Some technological improvements, such as
more efficient internal combustion engines, are incremental and are being pursued by existing suppliers. New technologies, such as hybrids, electric, fuel-cell, and other alternative-fuel vehicles, are potentially much more disruptive to the existing supply chain. New suppliers will compete to provide new technology. A technological breakthrough can therefore have major implications for Auto Alley because it is not certain that new suppliers will feel compelled to locate in the traditional production region.

Supplier Restructuring

The consequences of Ross’s “perfect storm” have been severe for some parts suppliers.

Bankruptcy

Twenty-five suppliers ranked among the 150 largest filed for Chapter 11 bankruptcy protection between 1999 and early 2008. Suppliers dependent on the Detroit 3 have been especially vulnerable. “As Detroit’s auto makers struggle with slowing sales, a slew of the parts manufacturers who depend on them have skidded into financial trouble. Several already have sought bankruptcy protection and others are racing to fix debt-laden balance sheets” (Pacelle 2005). “The lenders are very leery of people in the automotive parts business. They think the car companies are killing the suppliers.” Filing for Chapter 11 can serve as a backstop for a beleaguered company, providing some breathing room for its restructuring. In the case of Dana, it worked out that way. The case of Collins & Aikman illustrates, however, that restructurings can’t always be pulled off. Having filed for bankruptcy and unable to emerge with a workable business plan, the company went out of business.

Private equity investment

Equity investment firms owned 25 percent of industry revenues in 2007, according to management consultancy firm AT Kearney, and the figure was expected to rise to 36 percent in 2010 (Simon 2007b). Major players have included Blackstone Group LP, Carlyle Group, Cerberus Capital Management, Heartland Industrial Partners, and Questor Management Group. They have specialized in applying state-of-the-art management practices to struggling undervalued and underperforming
suppliers. Capital is provided to fix these struggling parts makers, usually in order to generate quick profits. In some cases, the massive investment is designed to be recovered by a public sale of shares to investors. “The growth of control by investment firms is bound to raise concern at the Detroit 3, which have traditionally been uneasy with such deals. Automakers worry that financial returns for these owners will take priority over quality and delivery, said a spokesman for one car company” (Sherefkin 2001).

**Restructuring labor contracts**

With a rising share of motor vehicle production undertaken by non-union labor, both at home and abroad, owners of unionized plants have argued that their labor costs need to be reduced. For their part, union leaders have accepted the argument that protecting jobs and pensions required them to offer concessions. Suppliers have introduced two-tier wage structures, placing newly hired employees on a lower scale than veterans. Buyouts have been offered to entice voluntary retirement by long-term employees. Especially intractable has been the desire of employers to reduce their legacy costs, that is, their responsibility for retiree health-care and long-term disability benefits. Establishing a union-managed voluntary employees’ beneficiary association (VEBA) was one way to shift responsibility from the company to separate management, such as the UAW.

**Survival Strategies**

Successful suppliers are adopting one of three business models: systems integrator, high-tech module developer, or low-cost parts provider. “Trying to combine all three in one corporate structure will be futile.” Two of these three business models are typical of many industries: companies often choose between trying to be the most efficient low-cost producer or the most advanced high-tech producer. In the auto industry, carmakers have also opened the door to the systems integrator.

**Systems integration**

Systems integrators benefit from having relatively low manufacturing and research and development costs. As they bring together modules and components provided by other suppliers, they add value through
efficient management and cost control. Magna International, an especially exuberant proponent of systems integration, started calling itself a Tier 0.5 supplier, and even trademarked the term Tier 0.5. Ignoring Magna’s trademark, other suppliers began to call themselves Tier 0.5 to promote their ability to design and manufacture entire vehicle systems (Chappell 2002).

Becoming a systems integrator has attracted many suppliers, who have been encouraged by carmakers wishing to deal with fewer larger suppliers, but some financial analysts have questioned the model’s logic. A study by Booz Allen Hamilton compared the returns on investment of highly specialized suppliers and broad-based system suppliers with the industry average. For many companies, the time and effort invested in becoming a system supplier failed to produce the desired effect. “All too often, activities are merely transferred from automaker to supplier with no gain in efficiency. In fact, some tasks of system integration can be handled far more efficiently by the automaker. The automaker, after all, is responsible for the vehicle concept” (Ziebart 2002).

**High-tech suppliers**

The second survival approach for suppliers is to develop unique technologies. Especially attracted to this business model are technology-oriented suppliers. Increased electronics content is especially important to high-tech suppliers. “Companies that develop features their customers will pay a premium price for will win. For example, there are more and more sensors and actuators. The whole market in the developed countries has gone nuts relative to driver features such as power sliding doors in minivans. You’ve got this huge motors market.”

Examples of high-tech module specialists are Autoliv and Freudenberg-NOK. Freudenberg-NOK was the largest supplier of engine seals and the world’s largest producer of molded rubber products other than tires. The company prides itself on its “laser-sharp focus on the core competencies of sealing, vibration control and elastomeric technologies” (Freudenberg-NOK 2007). Autoliv was the leading supplier of airbags in the United States and worldwide. Their first product was located inside the steering wheel to protect the driver. Additional airbags have been located in the instrument panel in front of the passenger, at a lower level to protect knees, and as “curtains” along the sides of the interior. Each successive airbag system developed has generated revenue...
for Autoliv and its competitors. “[D]river and passenger airbags have become a commodity. But extra airbags, such as side curtains or knee bolsters, are promoting growth for companies such as Autoliv Inc.”

**Low-cost suppliers**

Meanwhile, some contrarian suppliers are finding success by following the industry’s traditional model of producing generic parts and components. “It’s hard for a supplier to survive just building to the automaker’s design. There’s nothing setting you apart. You’re just competing on price, and that’s really hard.” Even though it is “really hard,” the strategy is working for some suppliers. They gain contracts through low-price bids, build revenues through large-volume production of specific parts and components, and earn profits through lean management and efficient operations. Suppliers with revenues between $50 and $200 million “are poised to emerge as industry stars” (Kosdrosky and Snavely 2005).

Many of the parts makers adhering to the “efficiency” model have moved down the supply chain to lower tiers. A thriving practitioner of this model, Illinois Tool Works, made door handles, seat latches, and hundreds of generic “bin” parts for motor vehicles, as well as a wide variety of parts for consumer and industrial applications. The company has earned a profit through efficient management practices, notably de-centralizing operations to several hundred autonomous business units while maintaining an exceptionally lean central staff.

**OUTLOOK AND UNCERTAINTIES FOR COMMUNITIES**

The twenty-first-century auto parts industry in the United States is concentrated in a region known as Auto Alley, a 700-mile-long north–south corridor through the interior of the United States between the Great Lakes and the Gulf of Mexico, with extensions into Canada and Mexico. This book presents the contemporary Auto Alley as the sum of a complex web of relationships between carmakers and their suppliers.
Changing Shape of Auto Alley

Within Auto Alley are situated most of the country’s final assembly plants, but the shape of Auto Alley has been evolving in the twenty-first century.

Traditional clustering in Michigan

For most of the twentieth century, the motor vehicle industry was highly clustered in and near southeastern Michigan. The area’s preeminence in the auto industry derived from the emergence of Ford, GM, and Chrysler, which were all based there. For most of the twentieth century, the Detroit 3 produced nearly all of their parts in and near southeastern Michigan, although they assembled most of their vehicles elsewhere. Thus, the preponderance of Michigan’s Detroit 3 auto jobs have traditionally been in parts-making facilities.

Geographical implications of market shifts

Into the twenty-first century, the declining fortunes of the Big 3—now more modestly known as the Detroit 3—have brought declining fortunes to Michigan’s economy. Michigan was losing 6 percent of its auto industry jobs annually in the first years of the twenty-first century. During the twentieth century, Michigan’s motor vehicle employment frequently declined, but with very few exceptions, these were all temporary or cyclical declines: workers were laid off during slow-selling years and hired back during boom years. In contrast, Michigan’s job losses in the early twenty-first century were structural in nature. Because of the changes discussed in this book, the jobs lost during this time period were not going to return. This represented a stunning reversal of the late 1990s during which the auto industry was booming. Michigan had to adjust to this harsh new reality. Its implications for future vehicle employment in the state have been difficult for Michigan’s citizens and policymakers to recognize and accept.

Management and technical operations have remained in the Detroit area, but the growth in production employment has been further south in Auto Alley. Ironically, as the Detroit 3 made the necessary capacity reductions at plants at the periphery of their footprint, they were more concentrated at the northern end of Auto Alley at the beginning of the twenty-first century than they had been for many decades.
Carmaker–supplier networks

The tightness of an assembly plant’s network of suppliers determines that plant’s regional economic footprint. Surrounding each of these assembly plants is a supplier network extending, for the most part, to within a one-day shipping distance as a result of widespread adoption of just-in-time delivery. However, just-in-time does not mean that suppliers must be located immediately next door to final assembly plants. In fact, most of the supplier networks extend far beyond the immediate vicinity of an assembly plant.

Location by type of part

Just-in-time doesn’t mean the same geographical arrangement for each type of part. Rather, the specific geography of the supplier relationship is heavily influenced by the nature of the part being produced. Parts can be classified as those that need to be made within an hour or so of the final assembly plant, those that need to be within a one-day drive, and those that can be made further away. Seats are nearly always produced within an hour of an assembly plant. Sequencing and kitting operations are also located in a very close vicinity. At the other end of the distance spectrum, most electronics parts are produced outside the United States.

Attracting New Plants

States within Auto Alley have provided incentives to entice carmakers to locate in one of their communities. Financial incentives have included tax breaks, training programs, and site improvements.9

To attract Toyota, the state of Kentucky agreed in 1985 to provide $147 million in incentives. The package included $10.3 million for land acquisition, $20 million for site preparation, $10.3 million for water and gas lines, $7.2 million for a training facility, $12.2 million for a wastewater treatment facility, $32 million for highway improvements, and $55 million for training and education. The state also took on an obligation estimated at $168 million to assist in paying interest on debts that Toyota could incur in conjunction with plant construction.

Kentucky’s commitment of at least $147 million to Toyota represented a substantial escalation in the subsidies being offered to inter-
national carmakers at the time. Less than a year earlier, Illinois had attracted Mitsubishi with subsidies totaling only $86 million, and $86 million was sufficient to entice Subaru to Indiana a year later. Honda, the first Japanese carmaker to build an assembly plant in the United States, received only $24 million from Ohio five years earlier (Molot 2003; Rubenstein 1992).

The University of Kentucky concluded that the Georgetown plant would generate $632.6 million in property, sales, and income taxes during its first 20 years. Other economists offered differing views on what benefits to measure and how to measure them. For example, economist Larry Ledebur calculated expected benefits to be only $267.5 million and therefore concluded that Kentucky had overpaid for Toyota (Fiordalisi 1989).

In hindsight, Kentucky may have paid more than its neighbors for an assembly plant during the 1980s, but the Bluegrass State appreciates thoroughbreds, and in Toyota it backed the company that subsequently proved to be the Triple Crown winner in the global automotive industry competition. For its $147 million subsidies, Toyota promised Kentucky in 1985 that it would spend $800 million to build and operate the Georgetown facility and employ 3,000 workers with a $90 million annual payroll in order to assemble 200,000 vehicles per year. All figures soon climbed to substantially higher levels than Toyota had promised. In 1997, Toyota’s investment in the plant had reached $4.5 billion, 7,689 workers were employed, 435,000 vehicles were assembled, and payroll was $470.4 million (CanagaRetna 2004).

Between 1986 and 2005, [a 1998 University of Kentucky Gaton College of Business and Economics] study noted that Kentucky would collect over and above the costs of the incentive package, approximately $1.2 billion in tax revenues, attributable to the direct and indirect effects of Toyota’s operations in the commonwealth.

In terms of state revenue collections, discounted cash flow analysis in 1985 indicated an annual rate of return of 8.5 percent from increased revenue collections attributable to the direct and indirect effects of the plant’s operations. A 1992 economic impact study, also carried out by the University of Kentucky, revealed that the projected rate of return had increased to 16.8 percent per annum. These projections were revised upward again in the 1998 study which indicated that the updated annual rate of return stood at 36.8 percent. (CanagaRetna 2004, p. 74)
A generation later, the lesson other states seemed to have learned from Kentucky was the value of subsidizing assembly plants. During the 1990s, incentives averaged about $100 million per assembly plant. Incentives increased because carmakers “learned to bargain” (Molot 2003). That Kentucky had backed a winner was the real point. States that had subsidized also-rans were getting much less value for their money. Earlier subsidies paled in comparison with the $409 million package provided to Kia by the state of Georgia in 2005. To attract an assembly plant projected to employ 2,900, Georgia offered Kia a whopping $141,000 per worker. How could such a figure be justified?

The stakes are high. West Georgia badly needs Kia’s jobs as the textile industry has flagged in recent years.

Georgia’s prestige as an economic center is on the line, too. Car factories in neighboring states like Alabama are churning out paychecks by the thousands, while the Peach State stands to lose its only plants, Ford’s and General Motors’. (Woods 2006)

It was not just that Kia’s assembly plant would arrive. Georgia officials argued that an assembly plant always brings along supplier plants.

As we documented earlier in this book, “just-in-time” does not translate into “right next door.” Many suppliers only need to be within one day’s drive of an assembly plant. In Kia’s case, Georgia was unlikely to see many supplier plants materialize because much of Kia’s supplier base had already built plants within the one-day radius of the Georgia site to support the nearby Hyundai plant in Alabama. “Hyundai (Kia’s corporate parent) is supported by 78 suppliers in the U.S. and Mexico, 35 of them located in Alabama. Kia has promised Georgia there will be at least five suppliers in the state” (Columbus Ledger-Enquirer 2006).

The spatial characteristics of assembler–supplier networks presented in this book call into question the logic of providing enormous subsidies to carmakers. States have been providing generous subsidies, especially to final assembly plants, in part not because of jobs generated inside these plants but primarily because of the multiplier effect, that is, the number of supplier jobs that are expected to come along with final assembly. The number of suppliers within close range of the assembly plant rarely exceeds 30, suggesting that the supply chain of an individual assembly plant is regional in nature. Furthermore, within
a given supplier network, many supplier operations count among their customers more than that one assembly plant.

Consider the fate of the Greensburg, Indiana, site of an assembly plant opened by Honda in 2008. Greensburg has seen the arrival of several thousand new jobs at the Honda plant as well as in such services as grocery stores and restaurants. The community, though, has not seen a boom in parts makers other than the inevitable seat plant plus a few trim producers. Southeastern Indiana is strategically placed between the southern end of the traditional auto production region centered in the Great Lakes and the northern end of the recent growth in Kentucky and points south. Most suppliers to Honda are already capable of delivering to Greensburg within one day from existing sites in Auto Alley.

Greensburg also demonstrated the strategy of infilling within Auto Alley. As Auto Alley has extended fully between the Great Lakes and the Gulf of Mexico, manufacturers have been taking a second look at sites that were passed over during the push south in the late twentieth century. Trying to avoid competition for labor with existing plants will increasingly take precedence in selecting specific sites within Auto Alley.

**CONCLUSION**

The analysis presented in this book is intended to provide a framework that helps put in context ongoing developments in the motor vehicle parts industry. We demonstrated that underneath the robust cluster that characterizes this industry in North America lies a complex web of very dynamic relationships. We suggest that it is at that level of detail one has to assess the impact of ongoing changes, be they in trade or technology.

Based on our analysis, we believe that the fundamental geography of auto assembly in North America is not likely to change anytime soon: most vehicles sold in North America will continue to be assembled in North America. But more parts will be coming from elsewhere in the world. And the parts made in North America and vehicles assembled in North America will increasingly be produced by corporations with global headquarters outside North America.
Conclusion: Surviving the Car Wars

All of this means that there will be more turmoil ahead for suppliers. Surviving companies will have picked a winning strategy of either low-cost supplier, high-value supplier, or systems integrator. Survivors will have selected winning customers, those that are gaining market share, while reducing exposure to those that are losing market share. Surviving suppliers will also have selected a winning global strategy.

Notes

4. In their 2007 labor contract, the union and each of the Detroit 3 agreed to establish a VEBA.