Automobile Retail and Production in the Age of E-Commerce

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Executive Summary

The Internet is the basic tool of the new economy. Firms can use it to reduce the costs associated with gathering and disseminating information, and also to aggregate buyers and sellers, thereby creating new, and improving existing, markets. As such, the Internet can enhance productivity, reduce costs, increase competition, and improve the functioning of price mechanisms. Managers are quickly reorganizing value chains to exploit these commercial advantages.

In the automobile industry, Goldman Sachs estimates that the full exploitation of the Internet could reduce production costs for the average $26,000 new vehicle by over $3,600, representing industry savings of nearly $62 billion per year. Furthermore, the estimated gains from business-to-consumer (B2C) e-commerce alternatives are also substantial: Goldman Sachs estimates e-tailing alternatives could generate savings of between $1,048 and $2,579 per vehicle, or between $18 and $44 billion annually.

Before those gains can be realized, however, policy impediments must be addressed. Most significantly, incumbent franchise dealers have successfully lobbied state legislators to strengthen laws limiting the sale of vehicles directly over the Internet. Such franchise laws, however, needlessly sustain costs, inhibit competition, hinder innovation and, as a result, harm the interests of both consumers and the broader American economy. There is, therefore, a national interest to rationalize, if not overturn completely, these anticompetitive laws.

Toward this goal, the Federal Trade Commission (FTC) can play a natural role. In February 2000, General Motors, Ford and DaimlerChrysler co-founded Covisint, a business-to-business (B2B) exchange for automobile production. Within weeks, FTC officials initiated an investigation of Covisint to consider its anticompetitive implications, with a wider view on B2B exchanges in general. By September 2000, the FTC announced that it would monitor, but not interfere with, the Big Three's innovative proposal for organizing their commercial transactions.

The FTC should complement its investigation of Covisint with a thorough review of recent changes to state franchise laws in the new-vehicle retail sector. Congress, moreover, by virtue of its oversight of interstate commerce, has an important role to play in countering such laws. That is, if state legislators are adopting restrictive laws to protect dealers at the expense of competition, Congress must respond with laws to protect consumers at the expense of protected franchise dealers.
Such steps would encourage modular manufacturing, in which manufacturers would develop a built-to-order capacity for vehicles, similar to that which Dell Corporation pioneered for personal computers. Before establishing such capacity, however, manufacturers will have to achieve greater accommodation with unions that have heretofore viewed modularization with deep suspicion. While headlines during the 1990s conditioned most to equate technology itself with competitive advantage, competitive advantage among old economy industries will need to be a function of harmonious management-labor relations, with management working to earn the trust necessary to facilitate the diffusion of productive technology.

For their part, unions will have to accept new roles and accommodate new methods for accomplishing the familiar task of producing automobiles. If they do not, North American autoworkers may face the prospect of continued movement of manufacturing jobs overseas, where many of the initial experiments with modularization have taken place. Unions will be better served if they embrace the innovations afforded by new economy tools in order to strengthen the manufacturing capacity on which their continued livelihood depends.
CHAPTER 1:

Introduction

The Internet advances two basic commercial mechanisms associated with the new economy. First, it reduces the transaction costs associated with gathering and disseminating information. With just a few mouse clicks, individuals can acquire substantial information online about most products and services. Consumers can comparison-shop and seek out the lowest available price among substitutes. Similarly, businesses can seek new suppliers offering superior products of greater value. It makes sense, therefore, that analysts at Warburg Dillon Read coined the term “nude economy” to describe the transparency that characterizes the new economy.1

Secondly, the Internet facilitates the aggregation of buyers and sellers, and consequently creates new, or improves existing, markets. This capacity is popularly represented by eBay.com. Individual possessions that would have otherwise lingered in a closet or been sold through the limited market of a yard sale, can now be offered for sale on eBay.com’s truly global exchange.

These two Internet mechanisms are reducing costs, increasing competition, and improving the functioning of price mechanisms – effects that go some distance to approximate more closely the theoretical assumptions of complete information and perfect competition, which form the foundation of neoclassical economic theory.

The Growth and Significance of the Internet

During the past half-decade, Americans have been becoming familiar with, comfortable with, and even dependent upon, the Internet. Individuals use it to shop, to seek employment, and to share interests through online communities. Students use it to conduct research, pursue course work, and even earn degrees. Businesses mount Intranets (secure networks for use among a company’s employees), Extranets (secure networks that unite portions of two companies’ Intranets, facilitating commercial transactions between them), and public websites that disseminate information and allow customers to place orders. The Internet,

1 See “A Thinkers’ Guide,” The Economist, April 1, 2000, pp. 64-66.
therefore, is changing the way individuals conduct otherwise familiar and routine transactions, and has become the new economy’s tool for transforming existing, and establishing entirely new, industries.

The rapid adoption of the Internet is the basic factor underpinning the emergence of a new economy. As of November 2000, there were already an estimated 407.1 million regular users of the Internet worldwide. Exhibit 1.1 provides estimates of the worldwide growth in Internet use, while Exhibit 1.2 provides estimates of the geographic distribution of current users. According to NUA.com, the 136.9 million users in North America constitute a disproportionate share of the Internet’s early adopters.

**Exhibit 1.1. Estimated Growth of Internet Use, by Geographic Region.**

Source: NUA.com
Exhibit 1.2 Location of Internet Users, by Geographic Region (January 2001).

Source: NUA.com

Rubber Meeting Road: Old Economy & New Economy in the Automotive Industry

In the late 1990s, when a wave of investment mania engulfed the Internet, some observers questioned the ability of old-economy industrial manufacturers to adapt to the lightening-quick cycles associated with “Internet time.” In doing so, however, some of the more enthusiastic ignored an essential point: even in a new economy, physical goods, such as automobiles, still require production, delivery and service. And while the Internet is capable of improving the efficiency of familiar commercial transactions, or enabling the pursuit of innovative commercial activities, it cannot itself produce, deliver or service an automobile, nor render obsolete the need for personal transport.

While dot-com enthusiasm was overdone, it is nonetheless impossible to imagine that any old-economy business will escape the impact of new-economy tools that can be used to reorganize industrial value chains. They create innovative alternatives for purchasing raw materials,
communicating with suppliers, producing goods, and distributing product; and even for product servicing and customer retention.

This study explores how the Internet is transforming the automobile industry, considers preliminary estimates of the savings available from such transformation, documents the political impediments that inhibit such transformation, and offers recommendations for overcoming the latter. Although it focuses specifically on the automobile industry, it is instructive of the general challenges and opportunities confronting managers of most old-economy manufacturers.

Chapter 2 focuses on the potential for business-to-consumer (B2C) e-commerce in automobile retailing. Associated with B2C e-commerce is a variety of approaches to marketing and selling vehicles over the Internet, some of which circumvent the incumbent franchise dealership system. Despite the obvious appeal of B2C automobile e-commerce, political efforts have served to dilute the innovative advantages available from technology: seeing their commercial position threatened, franchise dealers have successfully petitioned state legislatures to limit the ability of others to sell cars online. This has had the unfortunate consequence of inhibiting innovation, limiting competition, and forestalling the benefits from B2C automobile e-commerce.

Chapter 3 explores how the Internet can transform vehicle production. The past several years have witnessed a rapid proliferation of business-to-business (B2B) e-commerce initiatives. For their part, the Big Three founded Covisint, a unified B2B exchange for the entire automobile industry. This effort worried some automotive suppliers and inspired investigation by the Federal Trade Commission (FTC). Suppliers feared their already-thin profit margins would come under assault, while the FTC expressed concern for the possibility of anticompetitive abuse. Thus, while the B2B episode displays a similar interplay among technology, commerce and policy, this aspect of the story has a positive ending. After conducting its investigation, the FTC announced in September 2000 that it would monitor, but not interfere with, the manufacturers’ innovative proposal for organizing their commercial transactions. If Covisint succeeds as its founders intend, generating productivity gains throughout the entire automotive supply chain, American consumers will share in the resulting benefits.

Chapter 4 considers the promise of modularization, the reorganization of manufacturing and production around "modules" that can be easily interchanged, thus facilitating vehicle assembly. Its proponents hope that modularization will yield important savings through reduced
inventory requirements and compressed vehicle-production cycles. It may also serve as the organizational cornerstone for establishing an online built-to-order system for vehicles, like that which Dell Corporation pioneered for personal computers. It would thereby link the B2C and B2B components into a single system. To realize this possibility, however, will require important accommodation between management and organized labor. While technology may grab the headlines, cooperative management-union relations will remain an important source of competitive advantage in the new economy.

Finally, a brief conclusion completes the study, reviewing recommendations that seek to secure the benefits available to the automobile industry from the Internet.
CHAPTER 2:

B2C: Reshuffling the Relationship with the Consumer

One of the earliest expectations for the Internet was that it would facilitate more direct and efficient transactions between consumers and the manufacturers of goods. Online retailers were believed to possess important advantages over the fixed costs of traditional brick-and-mortar retailers. From the consumer's perspective, shopping online is both convenient and less time-consuming. Given these characteristics, investors assigned spectacular multiples to the shares of e-tailers who appeared poised to capture market share and reap enormous profits with extremely light business models. New-economy enthusiasts predicted that the bulk of those retailers that execute a commercial exchange in old-economy “brick and mortar” businesses would either have to go online or face going out of business.

While e-tailing has thus far failed to supplant traditional retailing, it continues to grow, and it holds important implications for established industries and sectors. In automotive retail, the Internet is driving change as profound as the sector has likely ever witnessed. It is not only the extent of change that is striking, but also the pace at which events have moved in just the past few years. Manufacturers, incumbent dealers, and a host of Internet startups have driven this change, with each seeking pole position in the race to dominate the future of online automobile retail.

The commercial stakes are enormous. According to the most recent survey by the National Automobile Dealers Association (NADA), American franchised new-vehicle dealers enjoyed revenue of approximately $608 billion dollars in 1999. New vehicles represented nearly 60% of total dealership sales. Meanwhile, an increasing percentage of Americans intent on purchasing a new car are using the Internet to conduct research,

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3 For a valuable historical overview of automobile retail, see George E. Hoffer, Michael D. Pratt, and David J. Urban, An Analysis of the Economic Implications of Manufacturer-Owned Motor Vehicle Dealerships, Center for Public Policy, Virginia Commonwealth University, December 1999.
compare models, select vehicle options, check available inventory, contact dealers, negotiate price, secure financing, seek insurance, place down payments, close deals and even arrange for home delivery. Such activities could become as routine a part of the new car retail experience as has been haggling on the dealer’s lot in the past.

Amid this upheaval, two points are clear. First, substantial savings are available from online automobile retail; consequently, this shift should be both welcomed and encouraged. Even in the highly unlikely event that consumers fail to share any of the financial gains available from automotive e-tailing, consumers are nonetheless better served through e-tailing alternatives. Such a system provides convenience, saves time, encourages price-transparency, and enhances the acquisition of specific models rather than leaving consumers to choose among the limited stock on a local dealer’s lot.

Second, to secure the totality of savings will require a reconsideration of existing state franchise laws. These laws previously served to protect dealers and consumers from the commercial strength of manufacturers, but today, the laws serve increasingly to protect dealers from the effects of technological innovation.

The Franchise Dealership System

The system for distributing automobiles is geographically fragmented among highly diffuse franchise dealers. This system largely emerged to support the highly centralized “push” model of automobile manufacturing as it developed decades ago. With roots in Henry Ford’s application of the assembly line, the push model maximizes production in order to cover the high fixed-costs associated with manufacturing (e.g., factories and capital equipment). At the same time, however, the current push system serves manufacturers by providing inventory storage and distribution buffers. U.S. dealerships store enormous inventory on their lots; Goldman Sachs estimates the figure to be near $74 billion. This has allowed manufacturers to shield themselves from temporary dislocations in demand, and to distribute risk among a large number of dealers. In turn, the franchise dealership system has permitted individual entrepreneurs to capture the profits associated with such risk-taking, and to leverage their private capital – a scarce resource among early manufacturers investing enormously in factories and equipment.
The automotive retail sector has not been static. Two changes stand out. First, dealerships have expanded into broad service centers that offer financing, insurance, maintenance and warranty coverage. These services provide dealers important revenue sources. Second, the sector has become increasingly concentrated among fewer and larger dealerships. During the past two decades, the loss of dealerships has been largely confined to those with smaller volume. In 1980, there were 20,228 dealerships with new-unit sales of less than 400 vehicles per year; by 2000, there remained only 10,235 such dealerships. At the same time the number of smaller-volume dealerships decreased, the number of larger-volume dealerships increased. In 1980, there were only 7,673 dealerships with new-unit sales of more than 400 vehicles per year; by 2000, there were 12,015 (see Exhibit 2.1).

Despite such concentration, the automobile retail sector remains a large component of local and state business activity. According to NADA’s most recent figures, at the beginning of 2000 there were over 22,000 car dealerships in the United States, employing over a million people, with annual sales volume of $608 billion. Growing concentration and continued economic clout have made franchise dealers better able to organize in support of their political and commercial objectives at both the state and local levels. As the discussion below reveals, this lobbying capacity has helped determine the path that B2C automobile retailing has taken, a path that serves neither American consumers nor the broader American economy.

**Exhibit 2.1. Number of Dealers According to the Number of Units Sold per Year**

![Exhibit 2.1. Number of Dealers According to the Number of Units Sold per Year](image)

Source: NADA
Purchasing a New Car − the Experience, the Costs and the E-tail Alternative

There is sufficient anecdotal evidence to suggest that the traditional dealer franchise system underserves consumers. Purchasing a new car is time-consuming. Furthermore, the lack of price-transparency often leaves consumers wondering whether they received a fair price or whether more aggressive negotiating tactics may have resulted in a lower price. Finally, consumers must frequently settle on what is available on the dealer’s lot, rather than securing a preferred model. Given the size of the purchase, it is remarkable that the average consumer is willing to endure such limitations.

The existing automobile retailing system is also expensive, contributing an important percentage to the gross cost of an average vehicle. Exhibit 2.2 presents estimates from Goldman Sachs of the distribution costs associated with a $26,000 vehicle. According to their estimates, the current retail distribution system contributes approximately $6,245 (or about 24 percent) to the gross cost of an average vehicle. Of this amount, the consumer absorbs an estimated $3,086 (or nearly 12%), covering transport, dealer overhead and manufacturer sales-support. The difference between these two values represents so-called phantom costs, opportunity costs associated with year-end close-outs, sales lost due to having the right model in the wrong geographic market, or lost sales related to the sub-optimal mix of specifications for a vehicle.⁴

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Exhibit 2.2 Estimated Costs of Incumbent Automobile Retail and Distribution System.

<table>
<thead>
<tr>
<th></th>
<th>Cost per Vehicle ($)</th>
<th>Vehicle Cost (in percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manufacturer Costs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Field Service</td>
<td>604</td>
<td>2.3</td>
</tr>
<tr>
<td>Freight</td>
<td>250</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Manufacturer Subtotal</strong></td>
<td>854</td>
<td>3.3</td>
</tr>
<tr>
<td><strong>Dealer Costs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inventory</td>
<td>431</td>
<td>1.7</td>
</tr>
<tr>
<td>Sales Commissions</td>
<td>381</td>
<td>1.5</td>
</tr>
<tr>
<td>Dealership Overhead</td>
<td>570</td>
<td>2.2</td>
</tr>
<tr>
<td>Advertising</td>
<td>350</td>
<td>1.3</td>
</tr>
<tr>
<td>Price Discounts</td>
<td>500</td>
<td>1.9</td>
</tr>
<tr>
<td><strong>Dealer Subtotal</strong></td>
<td>2,232</td>
<td>8.6</td>
</tr>
<tr>
<td><strong>Total Distribution Cost</strong></td>
<td>3,086</td>
<td>11.9</td>
</tr>
</tbody>
</table>

Source: Goldman Sachs

Given both the limits and the costs of the incumbent dealership system, it should come as little surprise that a number of entrepreneurs have sought to develop innovative online B2C alternatives. Initially, Internet entrepreneurs centralized consumer information about competing models at automobile portals, some of which also provide sales referrals to local dealers. Other Internet entrepreneurs offered themselves as "virtual brokers," who, for a fee, “shop” for a vehicle on a consumer’s behalf. The success of these strategies alarmed both manufacturers and their incumbent franchise dealers. In response, manufacturers have sought to organize their franchise dealers into large online networks, complementing the effort of dealers to mount their own individual "clicks & mortar" strategies. The occurrence of overlapping strategies (i.e., bricks & mortar, clicks & mortar, and the Internet pure-play) reflects a sector in transition.

While the emergence of new-economy tools is driving this change, such tools alone determine neither the specific response of participants nor the “winners and losers” within the sector. Of equal importance with the technology is the political battle waged for control of state automobile franchise laws, which limit the activities of those seeking to sell automobiles. Incumbent dealers have exploited such laws to shield themselves from the full impact of technological change. Consequently, for
this sector to realize the Internet’s full potential will require that these laws be rationalized or, better yet, discarded. If such laws continue to impede the application of available technology and superior commercial practices, both American consumers and the broader American economy will bear the associated costs.

**Dealer Referrals**

The Internet is host to many websites that provide automobile information. Early Internet entrepreneurs developed business models linking such information portals with sales referrals to local dealers. Among the early pioneers of this strategy were Autobytel.com, CarPoint.com, and Autoweb.com. Such websites offer consumers valuable information (including detailed pricing, factory sticker, specifications and available options on competing models) from the convenience of a personal computer. In some cases, consumers can also select specific vehicles for purchase, learn of model-availability at a local dealership, or initiate purchase of a car. Such purchase requests are routed via the Internet to a local dealer, who contacts the potential customer by telephone or email. In the event of a successful transaction, the website receives a bounty from the dealer. Alternatively, some websites charge dealers a flat-fee to participate in a referral network.

Success in the referral business depends heavily on the quality of information: to consumers, with regard to vehicles, and to dealers, with regard to productive referrals. Information alone, however, has not provided a sustainable competitive advantage, and referral sites have had to adapt quickly to a changing business environment. While they may have been "first-movers," referral sites have seen individual dealers, additional Internet startups, the manufacturers, and NADA all establish websites that seek to leverage consumer information into leads, sales and profits. In addition to benefiting those dealers, early indications are that it also benefits consumers: a recent study by the National Bureau of Economic Research concludes that consumers who used a referral service saved about 2% on their average new car purchase.

Internet Brokers

The Internet quickly evolved from a tool for generating referrals to one for conducting actual purchases. Selling vehicles over the Internet has an obvious appeal, and in the late 1990s, a number of Internet companies secured substantial venture capital to pursue this strategy. Among the high-profile efforts were those by CarsDirect.com, CarOrder.com and Cars.com. Such sites allow consumers to identify and place orders for models with preferred options. Representatives from the website then search for an available model among local dealers. A representative negotiates the price with a dealer, and either pockets the difference, or charges a service fee. In most cases, brokers do not acquire title to the vehicle but, instead, conclude the transaction through a preferred dealership, which in turn delivers the vehicle directly to the consumer. In addition to new participants, some referral portals have also moved in this direction, Autobytel.com, AutoWeb.com and CarPoint being examples. Analysts forecast online vehicle purchasing will swamp the referral market in the next few years.

The Big Three manufacturers have expressed their concern over the activities of such Internet brokers. In Spring 2000, Ford sent letters to its U.S. dealers reminding them of prohibitions in their franchise agreements against selling vehicles to third-party intermediaries. GM and DaimlerChrysler quickly followed suit, sending similar letters to their franchisees discouraging further commercial contact with online brokers.

The reason for the prohibitions lies chiefly in the manufacturers' desire to protect their automotive brands. Online brokers possess neither

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7 One exception is CarOrder.com, which “actually takes title to the vehicles it buys from dealers and then resells them to customers online.” Dennis Fisher, “Big 3 Rev E-Engines,” EWeek, May 29, 2000, p. 14.
9 “Last year, 1.2 million cars were sold via Internet-generated lead referrals out of 16.9 million cars sold nationwide, according to Jupiter Communications. In that same period, 17,000 cars were sold directly online, according to Jupiter, which expects that number to grow to 1.3 million by 2004, or nearly 8 percent of new-vehicle sales in the U.S.” Ben Hammer, “Driving Buyers to the Web,” The Industry Standard, June 19, 2000, p. 100.
an interest in upholding the integrity of the vehicle brands in which they deal nor the necessary infrastructure for servicing such vehicles or providing warranty coverage. Reflecting the measure of their concern, manufacturers indicated that those dealers who continued to cooperate with Internet brokers could face consequences in the form of the withholding of cash incentives on vehicles sold to brokers, a refusal to replace vehicles sold through brokers, and even franchise termination.

**Strengthening State Franchise Laws - Mounting Competitive Barriers**

Efforts by online entrepreneurs to establish a retail presence have been even more strongly resisted by the nation’s automobile dealers.\(^{11}\) The dealers responded by lobbying successfully for a strengthening of the state franchise laws that limit who can sell automobiles and how they may go about it. Given the large role that new car dealerships play in state economies – representing, on average, 20% of total state retail sales and 10% of total state retail payroll – it is hardly surprising that they received a sympathetic hearing in state legislatures around the country.\(^{12}\)

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\(^{11}\) “Auto dealers are confronting two perceived threats: manufacturers that could bypass them to sell vehicles directly to consumers on the Internet, and Web sites such as Autobytel and Microsoft’s CarsDirect.com, which offer auto sales services that help consumers locate and purchase cars.” Tim Wilson, “Auto Dealers Take Web Offensive,” *Internet Week*, February 7, 2000, p. 51. Tom Reed, “Big Fights Over the Little Guy,” *Houston Chronicle*, September 24, 2000, p. 1.

\(^{12}\) These estimates appear in *NADA Data 2000: Economic Impact of America’s New-Car and New-Truck Dealers*. “In state legislatures, car dealers, whose sheer numbers ensure that they are among the most influential lobbies in most states, are pushing to bolster the bulwark of so-called franchise laws to prevent car makers from using the Web – or any other means – to sell directly to consumers. In September 1999, 32 states had laws restricting manufacturers from competing with their dealers. Since then, 12 states have passed such rules, including some that toughened regulations on their books....” Jeffrey Ball, “Auto Dealers, Fearing that Detroit Will Hog the Web, Are Fighting Back,” *The Wall Street Journal*, May 10, 2000, A1. “Politicians jump for good reason when dealers pull up to the statehouse. In Florida, sales of car accessories and tires represented 17 percent of sales tax collected last year.” David Altran, “Reflecting a Retail-Sales World in Transition, Carmakers, Dealers and Dot-Coms are Riding the Web.... On a Collision Course,” *Sun-Sentinel Ft. Lauderdale*, June 4, 2000, F1.
State franchise laws were originally enacted to limit the market power of manufacturers by prohibiting their control of dealerships.\textsuperscript{13} The laws generally fall into two categories. One set limits manufacturers from establishing their own direct-to-consumer retail effort, by either precluding manufacturers from making direct sales, or allowing only licensed dealers to make sales. The second set limits the circumstances under which a manufacturer may own an interest in a licensed dealership. These laws usually limit ownership to temporary periods when a dealership is for sale, or in so-called “dealer development” circumstances, when the manufacturer shares an interest with an independent dealer pursuant to an agreement foreseeing the eventual sale of the manufacturer’s interest.

Their supporters argue that state franchise laws prevent the excessive accumulation of market power in the hands of manufacturers. William Newman, NADA's COO for Public and Legal Affairs, for example, expressed this view in response to a \textit{Barron's} editorial critical of state franchise laws. Newman argued that opponents ignore “the public policy rationale for the state laws, which is to protect consumers.... The sale of a motor vehicle is probably the most heavily regulated transaction in the marketplace. Federal and state laws govern virtually every aspect of the transaction. It is heavily regulated because government at the federal and state levels has concluded that such regulation is in the public interest.”\textsuperscript{14}

That argument is weakened, however, by the broad inconsistency across states as to the appropriate method for “protecting” consumers. In point of fact, there is little consistency in state franchise laws, with some states restricting Internet sales, others restricting Internet advertising, and others restricting delivery by non-franchised dealers.

It has been not only the dot.coms, but also manufacturers, that have been discouraged from entering automobile retail. In a high-profile case in Texas, Ford was forced to cease its effort to market previously owned cars through the Internet. The U.S. District Court ruled that Ford violated a Texas state law barring manufacturers from selling directly to consumers. In court, the State of Texas argued that Ford controls, and therefore makes, the sale because it owns and sets the price on listed used vehicles. Ford argued that state laws prohibiting it from selling directly to consumers via the Internet were unconstitutional.

\textsuperscript{13} For a discussion of these developments, see Keith Bradsher, “Pushing for a Crackdown on Auto Sales Done Directly Online,” \textit{The New York Times}, January 25, 2000.


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The argument of constitutionality pivots on the challenge that state regulation of e-commerce – and these specific state franchise laws – impede the protections afforded interstate commerce by the U.S. Constitution. While of immediate interest to those seeking to compete in automobile retail, such lawsuits ultimately may set precedents for e-commerce efforts in other sectors. U.S. District Judge Sam Sparks, however, rejected Ford’s claim that the Texas statute violates the Constitution, and found that the Internet did not make legal those sales that were otherwise outlawed in different media.15

In another ongoing case, in July 2000, the Alliance of Automobile Manufacturers sued the state of Arizona claiming that its newly revised franchise law was unconstitutional. The law prohibits manufacturers from offering sales, leases, financing, accessories or services that compete either directly or indirectly with dealers. Such restrictions appear to limit manufacturers from offering roadside assistance services, or even mailing drivers replacement keys, unless such services are offered through franchise dealers. In April 2001, U.S. District Judge Paul Rosenblatt rejected the manufacturers’ arguments that such laws are unconstitutional, thereby lifting a temporary injunction against the provisions of the law and permitting the restrictions to come into effect. The manufacturers may still pursue their case through the federal courts.16

Despite the nuisance of such legal challenges, dealers celebrated 2000 as a successful year of lobbying for restrictive franchise laws. Figure 2.3 shows the increasing protection that state legislatures have afforded franchise dealerships during the last three years, and more campaigns are

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15 After Judge Spark’s ruling, The Wall Street Journal opined, “In the language of stone-age contempt for the New Economy, he ruled last month that if Ford were allowed to sell cars directly over the Web, ‘all state regulatory schemes would be nullified’ as they ‘fall before the mighty altar of the Internet.’ We can only be glad Judge Sparks wasn’t around to rule on the invention of the wheel.” “Tire-Kicking on the Web,” August 31, 2000, A20. See also, “Texas Judge Rules Against Ford in Bid For Web-Based Sales,” The Wall Street Journal, August 1, 2000, B4.

planned for the future.\textsuperscript{17} Competition and innovation, however, can only flourish where new participants with new commercial methods can enter a market. Artificial barriers to entry ensure inefficiencies that both the individual consumer, and the national economy, must ultimately bear.

\textbf{Exhibit 2.3 Growth of Prohibitions against Manufacturer-Owned Dealerships (January 2001)}

(Note: In general, in all states a manufacturer may operate a dealership under certain circumstances: (a) temporarily for a reasonable period of time; (b) if the dealership is for sale to an independent party; and/or (c) if an independent party has made a significant investment subject to loss, and can acquire full ownership.)

Source: Ford Motor Company

Most state franchise laws regulate according to relevant market areas (RMA), geographic locations of commercial exclusivity, where direct

\textsuperscript{17} “This year, 20 state legislatures passed dealer-supported bills placing restrictions on factory stores or tightening existing constraints, according to an Automotive News study. That leaves only six states – Alaska, Hawaii, Mississippi, North Dakota and New York – without restrictions…. The 20 bills passed this year is double the number of similar bills passed last year when factory stores were more of a threat…. Factory-owned provisions have become a must. Twenty-seven states now prohibit factory ownership in all but a few circumstances, though even the strictest states allow temporary ownership when there are no independent dealers to take over a location. State dealer associations that lost battles in Massachusetts, Mississippi, New York and Pennsylvania are likely to revive proposed restriction on factory-owned dealerships next year.” Donna Harris, “Dealers Halt Threat from Factory Stores,” \textit{Automotive News}, November 6, 2000, p. 1.
competition is prohibited between same-make franchise dealerships. Of course, one of the Internet's key advantages is that it transcends geographic boundaries. Geographic fragmentation of the automobile retail sector may have made sense years ago, as a method to: (1) prevent manufacturers from dominating both franchisees and consumers, (2) encourage the viability of rural dealerships, and (3) assure that the sector enjoyed some measure of order and predictability. These rules make increasingly less sense, however, in an era when Internet companies can provide consumer B2C retail service on a national scale.

Alarmingly for proponents of competition, innovation and consumer choice, NADA representatives are hoping to use the new Arizona law (among the most restrictive in the nation) as a template for state laws around the nation. In fact, some suggest that an unintended consequence of Arizona's new draconian law is to prohibit manufacturers from offering 24-hour roadside assistance. This is both patently absurd and potentially dangerous to a stranded driver.

The travails of CarOrder.com are symptomatic of the impact that state franchise laws have on commercial alternatives. CarOrder.com attempted to circumvent restrictive state franchise laws through a strategy of buying up rural dealerships. They then hoped to turn those geographic

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18 For a treatment, see George E. Hoffer, Michael D. Pratt, and David J. Urban, *An Analysis of the Economic Implications of Manufacturer Owned Motor Vehicle Dealerships*, December 1999, Center for Public Policy, Virginia Commonwealth University.

19 “The dealers most sweeping victory in the franchise squabble came last month in Arizona, where they persuaded lawmakers to beef up the law specifically to restrict makers' ability to sell directly online. Among other things, that law bars manufacturers from circumventing local dealers when passing along the name of potential customers – or 'leads' – including those gotten on the Internet.... Dealers hope to replicate it in other states as soon as next year.” Jeffrey Ball, “Cutting In: Auto Dealers, Fearing That Detroit Will Hog the Web, Fight Back,” *The Wall Street Journal*, May 10, 2000, A1. “US and foreign automakers banded together Wednesday to challenge a new state franchise law in Arizona aimed at preventing manufacturers from encroaching on the traditional turf of dealers.... [The Alliance of Automobile Manufacturers and the Association of International Automobile Manufacturers] are asking for a temporary injunction and ultimately that the law be ruled unconstitutional because it unfairly restricts interstate commerce and limits consumer choice. The law, for example, makes it illegal for auto companies to post average sales price of cars and trucks on the Internet – a practice Ford Motor Co. began testing in Arizona last year – or to provide 24-hour roadside assistance.” Mark Truby, “Automakers Fight Arizona Dealer Law,” *The Detroit News*, July 13, 2000, p. 1.
assets into virtual assets, using them as a base for selling automobiles directly to consumers over the Internet. Their innovative efforts appeared to fail when, in May 2000, they announced plans to lay off one-third of their workforce. Reports emphasized the contribution of state franchise rules to CarOrder.com's difficulties. Soon thereafter, CarOrder.com stopped accepting new orders for cars and shut down its website as it reconsidered its options.

The Internet Strategies of Franchised Dealerships

While initially slow to respond, incumbent dealers have come to appreciate the commercial imperative of the Internet, and have made up ground lost early to Internet startups. One measure of their effort is the proliferation of individual dealer websites. A NADA survey in 2000 found that the share of new-car dealerships with websites currently stands above 80 percent. In addition, 93 percent of those dealership-websites are interactive, allowing customers to send dealers e-mail, place orders, or even seek online financing. The survey also found that 62 percent of the dealers with websites had completed sales over the Internet.

To encourage its dealers to get online, NADA organized DriversSeat.com, a website where thousands of participating dealers nationwide post their available inventory, which totals more than 900,000

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20 "The Internet car seller CarOrder.com Inc. has laid off 100 workers, nearly one third of its workforce, as it struggles with competition in the online auto-sales industry.... The company has also been frustrated by state regulators in Texas who have used anti-brokering laws to block it and other Internet car dealers from selling cars to residents." “Austin Internet Car Seller Lays Off 100 Workers,” The Associated Press, May 13, 2000.

21 "While other consumer Web sites also are struggling with too few sales and too high costs, analysts said CarOrder.com’s retreat highlights the roadblocks dealers have put before online challengers.” Gary McWilliams, “CarOrder.com Backs out of Online Auto Retailing,” The Wall Street Journal, August 21, 2000, B5.

22 “Dealers are beginning to understand the business world is operating on Internet time. In 1997, dealers answered Web queries with the plodding pace of a Yugo. By 2000, the average response time had been sliced by two thirds to less than 24 hours.” Mark Truby, “Car Dealers Finally Embrace Internet Shoppers,” The Detroit News, April 28, 2000, p. 1.

new and used cars. There, consumers can configure a vehicle and then learn whether it is in stock at any of the three dealers closest to their home. In its recent study defending state franchise laws, however, NADA implies rather disingenuously that most consumers are not interested in purchasing cars online, all the while encouraging its own members to improve such capacity. In response to specific consumer demand, NADA announced that its Web site would even post invoice prices, bringing further transparency to vehicle pricing. Eventually, all 19,500 NADA dealers are expected to participate on DriversSeat.com. Meanwhile, the more successful that dealers are in establishing an online presence, the less they appear to rely on referrals from Internet startups.

The Internet Strategies of the Manufacturers

The automobile manufacturers would ideally prefer to retain a direct commercial relationship with consumers. While the Internet offers that possibility, the manufacturer’s tentative efforts to consider such

25 The NADA study would appear to equate the consequence of state franchise laws, with consumer preference: "According to an independent study by Taylor Nelson Sofres Interserch… the vast majority of consumers who use the Internet as part of their car-buying process actually buy their cars through the traditional method of visiting a dealership: ‘Forty seven percent of Internet users who bought new-cars gathered information over the Internet, but 96 percent ended up buying their cars in the dealer showroom.’ In contrast, other less expensive and less complex products, such as books, CDs, and cosmetics apparently sell fairly well over the Web. But an automobile is still viewed by consumers as too costly a product to buy sight unseen.” David F. Hyatt, Franchise Laws in the Age of the Internet, NADA, January 2001, p. 6.
26 “After months of debate, the top brass has agreed to uncloud the mystery: Starting later this spring, the NADA will post invoice prices on the organization’s Web site. ‘We have to do this,’ says Frank McCarthy, NADA’s president. ‘Consumers want pricing, and they want to get it over the Internet…’ Others can post their inventory of new and used cars for $150 a month. To push the site, the NADA plans to spend up to $1 million on a national advertising campaign.” David Welch, “Car Dealers Say: Follow That Mouse,” Business Week, April 10, 2000, p. 106.
capacity have upset their franchisees.\textsuperscript{28} There remain several other complications for manufacturers (and Internet startups) seeking to participate in the retail sector, among which are: (1) providing warranty service, (2) serving rural communities, and (3) providing vehicles for test driving. While solutions exist for these, the reality is that present state franchise laws require amendment before anyone but franchise dealers can realistically sell new vehicles.

Excluded by law from establishing their own presence, Ford (and subsequently, GM) announced plans in the fall of 2000 to organize their respective franchise dealerships into cooperative online networks. Ford joined with its 4,200 member Ford Dealer Council to establish an Internet service, FordDirect.com, permitting customers to buy Ford vehicles online. Customers will take delivery at a franchise dealership. Prices posted on the site will be fixed, based upon a regional average (versus the familiar nationwide and negotiable “manufacturer-suggested retail price”), and will limit the need to negotiate. In a testament to the continuing clout of dealers, Ford will be an investor in the new venture, but dealers will retain an 80% controlling stake.\textsuperscript{29}

Similarly, GM established a new venture in cooperation with its dealers. The new GM/dealer Internet site, GMBuyPower.com, offers information about models and pricing, access to GM vehicle inventories, and a capacity to configure and purchase vehicles online through participating dealerships. The terms of the deal foresee GM funding and


\textsuperscript{29}“The enterprise will start doing business next month in California, where customers have shown the greatest interest in online shopping, and then gradually expand to cover the entire country by sometime next year, Ford said. Dealers selling other Ford brands – Lincoln, Mercury, Volvo, Mazda, Jaguar, Land Rover and Aston Martin – will be invited to join the business, but Ford-brand dealers will have 80 percent voting control of the company.” Keith Bradsher, “Ford and Dealers Start Net Retailer That Will Focus on Fixed Prices,” \textit{The New York Times}, August 26, 2000. Will Novosedlik, “Branding and the Web,” \textit{National Post}, September 7, 2000, C7. Mary Connelly, “Ford Joins Dealers in Online Sales Plan,” \textit{Automotive News}, August 28, 2000, p. 49.
possessing half of the venture, while participating franchisees will provide and enjoy the other half.30

Also joining in the trend is DaimlerChrysler, which, in July 2000, upgraded its consumer Web site to improve access to vehicle price. But the main thrust of DaimlerChrysler's strategy centers on its Five Star dealers, a group that meets strict customer service criteria. Of the nation's 4,500 DaimlerChrysler dealers, only 2,400 enjoy Five Star status. This select group has pledged to respond within 24 hours to Web leads and requests by email for pricing information, and will also allow consumers to negotiate price online.31

The Potential Savings from B2C Automobile E-Commerce

The Internet can serve to reduce the manufacturer and dealer costs associated with automobile retailing. Manufacturer costs consist primarily of support for sales staff in the field, and shipping. Goldman Sachs estimates that manufacturers could reduce costs by as much as $199 per average vehicle, by using the Internet to rationalize sales support in the field. In addition, they estimate that freight costs could be reduced by as much as $50 dollars per vehicle, through the elimination of inter-store shipments and a decrease in the number of ship-to points. The resulting reduction in retail and distribution costs by $249 per average vehicle would amount to annual savings of nearly $4.3 billion.

Further consumer gains from e-commerce are available on the dealership side. The greatest potential savings take the form of sales commissions, worth $381 per vehicle, which might be entirely eliminated in a B2C system. In addition, a more rationalized system would permit dealers to incur fewer inventory costs as they reduced their stock-on-hand from the current level of 75 to approximately 35 days: Goldman Sachs estimates that

30 Lee Copeland, “GM Teams With Dealers to Sell Cars Online,” Computerworld, August 21, 2000, p. 6. “In addition to purchasing and information capabilities, the site could offer GM financing and insurance services, accessories, and automotive products that can be mixed and matched with GM and non-GM vehicles....” Eugene Grygo, “GM Fights Back in Online Car Sales,” InfoWorld, August 21, 2000, p. 10.
such inventory reductions could generate additional savings of $230 per vehicle. Finally, as the dealership system is transformed, associated elements of dealer overhead would be subject to streamlining, with additional savings of $188 per vehicle. In total, estimates are that, when compared to the current system, a B2C alternative might generate savings of $799 per vehicle, or annual savings of $13.7 billion. Exhibit 2.5 summarizes the estimated savings – associated with both manufacturers and dealers – from a modest automobile e-commerce system.

Exhibit 2.5 Available Savings from a Modest Automobile E-Commerce Capacity.

<table>
<thead>
<tr>
<th>Source</th>
<th>Dollars Per Vehicle</th>
<th>Industry-Wide (in $ Millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Support</td>
<td>199</td>
<td>3,429</td>
</tr>
<tr>
<td>Freight</td>
<td>50</td>
<td>860</td>
</tr>
<tr>
<td>Manufacturer Subtotal</td>
<td>249</td>
<td>4,289</td>
</tr>
<tr>
<td>Sales Commissions</td>
<td>381</td>
<td>6,554</td>
</tr>
<tr>
<td>Inventory</td>
<td>230</td>
<td>3,952</td>
</tr>
<tr>
<td>Dealer Overhead</td>
<td>188</td>
<td>3,236</td>
</tr>
<tr>
<td>Dealer Subtotal</td>
<td>799</td>
<td>13,742</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,048</strong></td>
<td><strong>18,031</strong></td>
</tr>
</tbody>
</table>

Source: Goldman Sachs

Some might challenge the assumption that sales commissions can be eliminated, arguing that it may be the case, instead, that a portion would simply be transferred elsewhere. If, for example, Internet portals serve an important function in an eventual automobile e-commerce system, it seems fair to expect that such portals will capture some of that current cost. Regardless, the main conclusion to draw is that even a modest B2C capacity creates the possibility for substantial savings for the American consumer.

While these initial estimates depend on the establishment of some B2C capacity, the establishment of a more ambitious built-to-order system, along the lines pioneered by Dell Corporation for personal computers (discussed at length in the chapter 4), would yield even greater savings. Importantly, it would encourage a greater approximation between consumer demand and vehicle supply, further reducing both the costs of
year-end discounts associated with less popular models and the opportunity costs of a system that results in unfavorably equipped or geographically misallocated vehicles (phantom costs). It would also generate increased savings through smaller inventory-carrying requirements and provide for the more productive redeployment of advertising dollars from year-end promotions to brand-building. Goldman Sachs’ estimates for the source and scope of these additional gains are summarized in Exhibit 2.6.

Exhibit 2.6 Additional Savings from an Advanced Automobile E-Commerce System Organized around a Built-to-Order System.

<table>
<thead>
<tr>
<th>Source</th>
<th>Dollars Per Vehicle</th>
<th>$ Billions, Industry-wide</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Support</td>
<td>199</td>
<td>3,429</td>
</tr>
<tr>
<td>Freight</td>
<td>50</td>
<td>860</td>
</tr>
<tr>
<td>Inventory</td>
<td>345</td>
<td>5,928</td>
</tr>
<tr>
<td>Sales Commission</td>
<td>381</td>
<td>6,554</td>
</tr>
<tr>
<td>Dealer Overhead</td>
<td>188</td>
<td>3,236</td>
</tr>
<tr>
<td>Advertising</td>
<td>235</td>
<td>4,042</td>
</tr>
<tr>
<td>Price Discounts</td>
<td>700</td>
<td>12,040</td>
</tr>
<tr>
<td>Phantom Costs</td>
<td>831</td>
<td>14,293</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>2,929</strong></td>
<td><strong>50,382</strong></td>
</tr>
<tr>
<td>B2C Investment</td>
<td>-350</td>
<td>-6,020</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,579</strong></td>
<td><strong>44,362</strong></td>
</tr>
</tbody>
</table>

Source: Goldman Sachs

Based on these figures, one can generate a range of potential savings available from greater reliance on B2C e-commerce, for automobile retail and distribution, of between $1,048 and $2,579 per vehicle, or between $18 and $44 billion annually. While there is some debate about how these gains might be eventually distributed, few can argue that the consumer will fail to enjoy a healthy portion of them. Such gains, however, can only be captured to the benefit of both consumers and the national economy after clarification and elimination of the inconsistent state.
franchise laws, which inhibit the full implementation of B2C e-commerce alternatives.

Conclusions

The Internet allows for a variety of innovative strategies for selling cars, strategies that present a challenge to the decades-old dominance of franchise dealers, and that have also injected the sector with a dose of innovation and competition. The consumer can now approach the purchase of a new car better informed and in an environment with increasing price-transparency.

While some observers initially expected well-funded and nimble Internet startups to bury franchise dealers, the reality has been quite different. Dealers have shown an ability to shield themselves commercially by working the process politically and strengthening state franchise laws across the country, thus derailing many of the innovative business plans advanced by Internet startups. This has stymied the introduction of alternative methods for automobile retail and distribution. Rather, developments have been excessively dictated by state regulations that exclude Internet startups and manufacturers from entering the automobile retail sector.

These regressive state laws limit competition, hinder innovation, and forestall progress. They make as little sense at the dawn of the Information Age as did those preferential laws protecting guilds at the dawn of the Industrial Age. In fact, they truly belong to another era, when independent dealers and American consumers felt threatened by the fear that vertically-integrated manufacturers would capture the retail and distribution system. Such scenarios of anticompetitive commercial abuse are tenuous in an era when consumers can make purchases from retailers located thousands of miles away, with just a few keystrokes and mouse clicks. It is particularly ironic that laws originally intended to protect consumers are now used to protect incumbent dealers from technological progress – at the expense of consumers.

Reform, or disposal, of anachronistic state franchise laws is in the national interest. They are being used to limit competition, inhibit innovation, and forestall the development of cost-saving alternatives for the retail and distribution of automobiles. Consumer groups and supporters of new technology should strongly encourage the Republican administration and Congress, with its oversight over interstate commerce, to review the unnecessary restrictions and commercial legislation being implemented. Without intervention, franchise dealers will be free to seek additional
restrictions on manufacturers and Internet startups attempting to compete in the sector.

Ultimately, these laws must be reformed, if not entirely abolished. Recent victories in Texas, Arizona and elsewhere suggest to dealers that their resources are best devoted to lobbying state legislatures willing to segment the market along noncompetitive turf lines. Meanwhile, so long as they are afforded a grip on the system of automobile retail and distribution, dealers will have less of an incentive to invest in new-economy alternatives. A better approach is being considered by regulators in Wisconsin, who would grant Internet entrepreneurs a license to sell vehicles in their state, regardless of whether or not they maintain a local franchise. If successful, such an approach will undoubtedly expand consumer choice in that state.  

Recent developments and current conditions provide entrepreneurs little, if any, incentive to risk investing in innovative online alternatives that can be undermined by capricious legislative fiat. Without such investment, the estimated savings available from development of B2C e-commerce alternatives will be postponed or forfeited. Accordingly, the costs of such laws should be viewed as running into hundreds of dollars per vehicle, and billions of dollars per year. This should be unacceptable to individual consumers, to those groups that claim to defend their interests, and to those responsible for regulatory stewardship of the national economy.

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32 "Other states are watching Wisconsin.... [The National Association of Motor Vehicle Boards and Commissions] is drafting a model Internet law that would spell out how to regulate out-of-state businesses selling cars online. Wisconsin's rule could have a strong influence over what the group adopts as a model." Donna Harris, "Dot-coms may require licenses in Wisconsin," Automotive News, December 4, 2000, p. 1.
CHAPTER 3:
B2B: Reconfiguring Manufacturer-Supplier Relationships

The Automobile Supply Chain: Manufacturers and their Vast Army of Suppliers

Much as automobile retailing is currently organized around a vast number of dealerships, automotive production is organized around a vast number of suppliers. While any given vehicle will possess a specific manufacturer's brand, vehicles in large part consist of components produced by thousands of individual suppliers. These suppliers have traditionally been organized into "tiers" (commonly, four separate tiers) based on their proximity to the manufacturers. Thus, a number of large Tier 1 firms are the main suppliers to a manufacturer. These Tier 1 firms, in turn, receive their own supplies and parts from Tier 2 companies, and so on.

Automobile production, therefore, approximates a logistical pyramid (Exhibit 3.1), with the manufacturer at the pyramid's apex. Arranging such production hierarchically provides many logistical benefits, but at the same time, it can make commercial relations routine and impose high costs of switching from one supplier to another. Furthermore, businesses can remain unaware of commercial opportunities presented by other suppliers (represented in Exhibit 3.1 by the absence of links between participants in separate tiers).

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33 The major Tier 1 suppliers are Arvin, Borg-Warner, Dana, Delphi, Federal Mogul, Johnson Controls, Lear, Magna, Tenneco, and TRW.
Exhibit 3.1. The Current Logistical Pyramid of Automobile Manufacturing

In contrast, an alternative organizational network (see Exhibit 3.2) is now possible, thanks to the Internet’s unique capacity for creating virtual marketplaces. Covisint, an online marketplace for the automobile industry, facilitates transactions among all qualified participants, using a system of public bidding on commercial contracts. Rather than a pyramid of
incomplete links, Covisint permits organizational links among all participants in production. There are two advantages to such a system. First, the network scales effortlessly, allowing the entry of additional participants, and enhancing competition. Second, the costs of switching are reduced, allowing for productivity gains throughout the entire automotive value chain.

Gains Available from B2B Automotive E-Commerce

According to Goldman Sachs, a typical light vehicle with a gross cost of $26,000 will contain purchased materials costing $11,285 (or 43 percent).\textsuperscript{34} Unsurprisingly, there is enormous commercial activity associated with the flow of parts both from suppliers to manufacturers, and among suppliers themselves. The estimate for direct purchasing by the Big Three from Tier 1 suppliers in 2000 is $240 billion. Additionally, an estimated $500 billion in commercial activity related to vehicle manufacturing is conducted among suppliers themselves.\textsuperscript{35}

With component costs contributing nearly half of a vehicle’s production cost, North American automobile manufacturers have long viewed the supply chain as an obvious target for cost savings. The Internet can serve in their efforts – for example, by improving inventory control. Goldman Sachs estimates that North American automotive suppliers carry approximately $49 billion of work-in-progress (WIP) inventory. The benefit is that such inventory introduces some flexibility into production runs and provides the means to accommodate unforeseen demand or inaccurate forecasting, but the carrying costs associated with this upstream inventory amount to nearly $310 per vehicle. Virtual supply-chain management is expected to reduce the necessary number of days of inventory carried at each tier and, therefore, generate savings throughout the supply chain. Goldman Sachs envisions a reduction of supply for manufacturers, Tier 1 and other suppliers (currently estimated at 16, 20 and 30 days, respectively) to 11, 13 and 20 days, respectively. Exhibit 3.3 provides their estimates of the distribution of such work-in-progress inventory within the North American automobile industry, and the available savings.

\textsuperscript{34} Goldman Sachs’ estimates are largely consistent with the frequently cited figure that purchased materials represent “half” the cost associated with a vehicle.

### Exhibit 3.3 Work-in-Progress Inventory Costs and Estimated Savings from B2B.

<table>
<thead>
<tr>
<th>Supply Chain Location</th>
<th>Current Cost Estimates</th>
<th>Estimated Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dollars</td>
<td>Total Value ($ millions)</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>109</td>
<td>17,059</td>
</tr>
<tr>
<td>Tier 1</td>
<td>68</td>
<td>10,635</td>
</tr>
<tr>
<td>Tiers 2-4</td>
<td>133</td>
<td>20,827</td>
</tr>
<tr>
<td>Total WIP</td>
<td>310</td>
<td>48,521</td>
</tr>
</tbody>
</table>

Source: Goldman Sachs

Procurement represents another target for production savings. Procurement refers to the broad range of activities – usually labor-intensive and additive of modest value – that support the acquisition of material and services (e.g., vendor selection, ordering, review and approval). For the North American automobile industry, Goldman Sachs estimates that procurement costs (excluding inventory costs) are in the range of $8.3 billion, or $484 per vehicle. Such procurement processes contribute an estimated 2.4 percent to the cost of the systems, components and materials used to assemble a new vehicle. Goldman Sachs estimates that reliance on B2B procurement alternatives might reduce these costs by 33% across the board.

In addition to the procurement costs, there are net savings expected from the costs of material throughout the automotive value chain. These materials run a spectrum from commodity products (e.g., glass and rubber) to highly engineered components with strict specifications (e.g., brakes and airbags). Rather than simply shift costs on these items, the use of B2B auctions are expected to reduce costs throughout the supply chain, for at least the commodity segment, and provide additional productivity.

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36 The following description provides some indication of the time and paperwork currently required: “...much of the industry’s procurement is still done in ways that have changed little in a century. An automaker’s purchasing representatives call suppliers that have bid on similar contracts in the past, telling them to send sales representatives to a meeting in the Detroit area to discuss the contract. Preliminary engineering specifications are exchanged, and suppliers are given a deadline for sending in bids and detailed blueprints. Further meetings are then held to work out the details and award the contract.” Keith Bradsher, “3 Automakers Plan Private Online Purchasing System,” The New York Times, February 26, 2000.
gains. Furthermore, parts-quality is expected to improve, thereby reducing the warranty costs that manufacturers currently absorb. Goldman Sachs estimates that the tally for available savings from diminished costs of carrying inventory, purchasing, warranty and supplies, when combined with expected productivity gains, approximates $1,063 when B2B alternatives are utilized (see Exhibit 3.4).

### Exhibit 3.4 Costs of Inventory and Procurement and Estimated Available Savings from B2B Alternatives.

<table>
<thead>
<tr>
<th>Current Cost Estimates</th>
<th>Estimated Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dollars</strong></td>
<td><strong>Total Value ($ millions)</strong></td>
</tr>
<tr>
<td>Per Vehicle</td>
<td>Per Vehicle</td>
</tr>
<tr>
<td>WIP Cost (Mfg.)</td>
<td>109</td>
</tr>
<tr>
<td>WIP Cost (Suppliers)</td>
<td>201</td>
</tr>
<tr>
<td>Purchasing Process (Mfg.)</td>
<td>230</td>
</tr>
<tr>
<td>Purchasing Process (Suppliers)</td>
<td>254</td>
</tr>
<tr>
<td>Product Costs</td>
<td>10,829</td>
</tr>
<tr>
<td>Warranty Costs</td>
<td>450</td>
</tr>
<tr>
<td>Additional Productivity Gains</td>
<td>206</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>12,073</td>
</tr>
</tbody>
</table>

Source: Goldman Sachs

One might ask why the automobile industry does not simply reorganize its production along the lines of the Dell model\textsuperscript{37} The foremost reason is that assembling the most complicated personal computer is a

\textsuperscript{37} The Dell Model refers to the system pioneered by Dell Computer Corporation, whereby components are assembled into computers in response to specific and unique consumer orders.
much easier task than assembling the most basic passenger vehicle.\textsuperscript{38} The Dell model, therefore, requires a limited number of modules. Despite this difference, the Dell model serves as the explicit goal that automobile and other manufacturers seek to achieve. Toward that end, they have organized a B2B marketplace for the automobile industry and have initiated experiments in modular manufacturing (the subject of the next chapter) that may eventually allow consumers to purchase an automobile the way one currently can purchase a personal computer.

**Establishing an Automobile B2B Exchange**

To the surprise of those who insisted on the irrelevance of old-economy manufacturers, North American automobile companies have mounted an impressive effort since the fall of 1999 to adopt the Internet to their commercial advantage. In November 1999, both Ford and GM announced plans to mount individual online purchasing exchanges, where the bulk of their commercial transactions would be conducted. Within three months, in February 2000, Ford and GM merged their two private exchanges and invited DaimlerChrysler to participate in the development of a single, industry-wide B2B exchange, to be called Covisint. DaimlerChrysler agreed, and in ensuing months, other – but not all – automobile manufacturers joined Covisint.

The formation of Covisint raised concern among some suppliers, who feared that an industry-wide B2B exchange would serve mainly as a vice for squeezing their already-thin margins. Concurrently, in March 2000, the Federal Trade Commission initiated an investigation into the antitrust implications of an industry-wide B2B exchange. Both concerns dominated the second half of 2000 and raised doubts about Covisint's fate, but by year's end, both these complications appeared to be resolved largely in Covisint's favor. An increasing number of suppliers agreed to participate,

\textsuperscript{38} “When a customer orders a personal computer online, Dell can pull a limited number of variations using about 30 components off the shelf, snap them together and ship the computer via two-day ground delivery. A car company, meanwhile, has to intricately choreograph the delivery of 3,000 or more parts, sometimes from hundreds of miles away. Components are too big and expensive to stockpile in warehouses, and there are too many possible combinations to anticipate. Painting cars, not an issue with PCs, consumes a huge amount of time, and many parts have to be color-coordinated. Then there is shipping....” Robert L. Simison, “GM Retools to Sell Custom Cars Online,” *The Wall Street Journal*, February 22, 2000, B23.
and the FTC wisely provided Covisint its conditional endorsement. By the beginning of 2001, automotive manufacturing appeared poised for a period of substantial innovation, increased competition, and a fundamental reorganization that should substantially benefit American consumers.

Before those benefits could be fully realized, however, a host of remaining issues required resolution. For instance, Covisint functioned for many months with three co-leaders, each from one of the Big Three manufacturers, and executives from those three rivals are more accustomed to competition than cooperation. The search for a permanent CEO took much longer than expected and generated doubts about Covisint’s future success. Only in April 2001 was it announced that Kevin English, an executive whose background is stronger in technology than automobiles, would be Covisint’s chairman, president and CEO.

**Covisint Auctions**

On October 3, 2000, ArvinMerit, a supplier of drivetrains and exhaust systems, became the first company to execute a transaction on Covisint. The company held a two-hour auction to identify “a supplier for an injection-molded plastic part.” This first transaction represents a “reverse” auction, during which a company solicits bids on a contract for some good or service. Reverse auctions are a simple mechanism for reducing costs, and the Internet itself reduces the cost of organizing them. As a result, such auctions are expected to generate savings throughout the entire supply chain.

The fact that Covisint invited a supplier to mount the first reverse auction is important, because it suggests that Covisint offers the same advantage to suppliers seeking to trim costs as it does to manufacturers.

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42 ArvinMerit was selected because of its early participation in the exchange, and many other suppliers had sought that distinction. The description of this inaugural auction, as well as other functionalities for Covisint, appears in Gail Kachadorian, “Covisint is Up and Running,” *Automotive News*, October 9, 2000, p. 4.
This view has gradually displaced the initial fear among suppliers that they were merely to serve as the “victims” of Covisint.\textsuperscript{43} It signals that gains will be available throughout the entire automobile value chain. Although initial expectations are for a ceaseless hunt for the lowest price, participants have emphasized that price is only one consideration: quality, fulfillment, and reliability are also critical characteristics. Some participants have indicated they will track the quality and delivery records of those making the lowest bid on a contract, suggesting the continuing importance of a corporate reputation for quality.\textsuperscript{44} Thus, Covisint’s benefits will extend beyond mere cost to product quality and, ultimately, to superior vehicle quality.\textsuperscript{45}

In addition to reverse auctions, participants can use Covisint to mount “seller’s auctions.” Online seller’s auctions, familiar to users of eBay.com, are an efficient means to liquidate surplus inventory. While surplus inventory is an obvious target for such auctioning, obsolete or excess equipment is also an attractive target – the first transaction executed through GM’s TradeXchange, for example, was a $400,000 auction for used

\textsuperscript{43} Not all suppliers need to be sold on the advantages of online auctions. “Delphi has moved fast in one particular area of new technologies - electronic auctions to reduce costs and improve efficiency of purchasing. Delphi partnered with Free-Markets of Pittsburgh in 1997 to conduct the auctions and has seen significant results…. Since then, Delphi has held 77 online auctions, for transactions totaling more than $800 million, and has identified $114 million in savings.” Ralph Kiesiel, "Radecki: Covisint isn't the Answer to Everything," \textit{Automotive News Europe}, December 18, 2000, p. 19.

\textsuperscript{44} “The auction will be used as a way to find the lowest bid,” said Ann Macrino, a manager in Delphi’s supplier relationship group. However, Delphi will do a ‘deeper dive’ on the three lowest bidders to make sure that are no quality issues after the online auction is complete.” Gail Kachadourian, “Covisint is Finally Real,” \textit{Automotive News Europe}, October 9, 2000, p. 4.

\textsuperscript{45} According to Jean-Baptiste Duzan, Renault vice president for purchasing, “[Covisint’s benefits] will come more from supply chain management and product development than from purchasing operations alone…. They include inventory reduction, better information regarding quality control, a quicker response to customers demand and less paper.” Renault’s chairman, Louis Schweitzer, has also been more sanguine about the total savings available: “Fantastic figures, savings of $1,000 per car or so came out. The savings are difficult to estimate, but we think they could reach $200 to $300 per car for European carmakers.” Stephane Farhi, “Renault Stays Calm about Online Savings Estimates,” \textit{Automotive News Europe}, October 9, 2000, p. 4.
stamping equipment. Online reverse and seller’s auctions are two simple mechanisms for enhancing productivity throughout the entire value chain.

**Real-time Collaboration**

Covisint will also serve as an online platform for engineering and product design. A week after its first auction, Covisint hosted another milestone: the first use of the site for an exercise in collaborative online product development. This function allows business partners to collaborate real-time over the Internet on blueprints and documents. Covisint also possesses a sophisticated three-dimensional graphics capacity for advanced design projects. It is expected that a system that allows participants to share real-time design data will reduce the occurrence of costly surprises that can accompany the engineering and production processes. Other savings are suggested: Delphi Automotive Systems Corporation has estimated, for example, that if it could use such a system to eliminate just

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47 “The centerpiece is a 3-D ’visualization tool’ to let engineers and designers develop and revise automotive components from different facilities around the world at the same time…. ‘You can zoom in, rotate it, everyone sees the same view,’ [according to Sam Sharan, a Covisint product-marketing representative]. But the tool is not limited to components. It can be used to make changes in exterior vehicle styling as well. With this tool, project team members from inside and outside the company can conduct interactive online conferences on two-dimensional and three-dimensional product data. They can view and mark up data and documents and watch the changes being made in real time, saving valuable time. And they will be able to view computer-aided design files from CATIA, IDEAS, ProEngineer and other systems.” Ralph Kiel, “Covisint Dreams Up Tools, Treats for Users,” Automotive News, September 18, 2000, p. 1.
48 “For example, if Freudenberg-NOK [a supplier] gets an engineering change from an automaker through Covisint on an engine mount, the change information can be sent instantly to engineers throughout Freudenberg NOK’s own supply chain [which] will reduce the time it takes to make the change.” Ralph Kiel, “Some Suppliers See Few Advantages from Covisint,” Automotive News, August 28, 2000, p. 17.
one annual trip per engineer, it could save $15 million dollars a year.\textsuperscript{49} Participants will have to be appropriately “wired” to exploit these more sophisticated applications, a process that proceeds apace.\textsuperscript{50}

\section*{Conclusion: The Economic Advantages of Oversight vs. Intervention}

As this review of automotive B2B e-commerce makes abundantly clear, events move swiftly. At the beginning of 1999, few, if any, observers foresaw that automobile manufacturers would move aggressively to recast themselves as potential new-economy powerhouses. Furthermore, few expected the Big Three – who otherwise spend their days in fierce commercial competition – to cooperate on a unified B2B venture. It was perhaps myopic to have assumed that something as "mundane" as automobile production could never compete with the excitement of the dot.com mania during the late 1990s.

The Internet has inspired a torrent of commercial change, and it is difficult in such an environment to forecast with great accuracy the eventual result and implications of such change. It is a tribute to FTC authorities that, amid this change, they acknowledged the potential of B2B exchanges and chose not to intervene prematurely or unnecessarily. The decision to allow innovation to flourish, rather than to impose bureaucratic “solutions” where, in fact, no problem exists, is to be lauded.

The FTC’s preference for observation, as opposed to intervention, contrasts sharply with the indiscriminate protection that state legislatures afford incumbent franchise dealerships. Whereas new-economy tools present both suppliers and franchise dealers with unique challenges and opportunities, only one of these groups enjoys a blanket of regulatory protection. This makes no sense. Rather, it serves to highlight the fact that

\textsuperscript{49} Ralph Kisiel, "Radecki: Covisint isn't the Answer to Everything," \textit{Automotive News Europe}, December 18, 2000, p. 19. According to Kevin Prouty, senior research analyst at AMR Research in Boston, "I think two to three years down the road [procurement] will probably be a secondary function to some of the collaborative tools - especially the supply-chain collaboration tools - that I know Covisint is working on." Ralph Kisiel, "2 Roads to Covisint," \textit{Automotive News}, January 1, 2001, p. 10.

incumbent dealerships should be forced to accommodate the demands of the new economy.

On the B2B side, automotive manufacturers and suppliers are pursuing innovative methods for organizing their transactions, which will permit participants to seek out and rely on lower cost, higher quality, and more reliable commercial partners. While such competition will inevitably produce losers, it will also create winners who will participate in a more productive value chain. This promises a future of more affordable, higher quality, more highly desirable vehicles, produced by a more globally competitive and secure industry – to the benefit of U.S. consumers, autoworkers and the nation's economy.
Chapter 4:
The Promise of Modular Manufacturing

To establish the automobile industry along the Dell model will require substantial modification of manufacturing. Differing specifications among models offered by the same manufacturer limit the ability to customize vehicles within a reasonably short period of time. A modular manufacturing system, by contrast, would impose greater compatibility among a number of sub-system alternatives that could be substituted for one another rapidly along an assembly line. These sub-system alternatives (read: “modules”) would facilitate rapid assembly of a variety of vehicles as “variations on a theme.”

Currently, the complexity of the average vehicle precludes the ability to respond to specific customer orders. Those consumers that choose to order a specific model must frequently wait months before their built-to-order vehicle can be scheduled for production, completed, and shipped to the dealer. Broader reliance on modular manufacturing systems, however, may permit sufficiently wide-scale production as that required by the economics of automobile manufacturing while also facilitating timely delivery of built-to-order vehicles. Such a capacity would unite the two developments thus far considered – B2C and B2B e-commerce – into a seamless purchasing system. Consequently, modular manufacturing is probably a precondition for the emergence of a built-to-order capacity, although the gains from B2C and B2B will remain significant even in its absence.

In addition to facilitating custom production, modular manufacturing promises other advantages. It should allow a further compression of production cycles, with additional savings. Reducing the time and complication associated with assembly should further reduce the costs of carrying inventory and also improve the quality of production forecasts.

Each of the Big Three manufacturers have mounted pilot projects – mostly in foreign countries – to experiment with modular techniques. In Brazil, GM unveiled a sophisticated plant, the so-called Blue Macaw plant, that is a showpiece for modular production methods; Ford and

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51 For a treatment of integral vs. modular manufacturing, see Susan Helper and John Paul MacDuffie, “Evolving the Auto Industry: E-Commerce Effects on Consumer and Supplier Relations,” Case Study Draft 1.5, April 24, 2000, pp. 8-9.
DaimlerChrysler also have their own projects. All three, however, have been slow to introduce modular manufacturing in their North American facilities, largely because of the suspicion and resistance of organized labor. Concurrently, some Tier 1 suppliers have already established reputations as module providers. These developments are discussed in turn.

**Blue Macaw - the Promise of Modular Manufacturing**

In the summer of 2000, GM unveiled a new Brazilian plant to produce the Celta, a variation of the Opel Corsa. The so-called "Blue Macaw" plant is drawing broad attention from the entire industry, not necessarily for the subcompact car itself, but rather the method of its production and assembly. Experimenting with assembly systems that rely on modular manufacturing, GM works with seventeen suppliers located in close proximity to the GM plant. Each morning, the GM plant managers provide those suppliers with a list of requested modules, which the suppliers, in turn, are committed to deliver in short order (frequently within two hours) under a carefully choreographed schedule. As these pre-manufactured modules arrive at the GM plant, they can be readily assembled into the final product in record time.

The Blue Macaw plant demonstrates two important elements of modular manufacturing. First, modular manufacturing requires intimate commercial contact between the automobile manufacturers and participating suppliers, from vehicle conceptualization forward. As such, it distributes greater design and engineering responsibility to supply

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53 “GM is not the only big car maker playing with the modular approach in Brazil. Ford is intent on developing a similar system in the northern state of Bahia. Volkswagen has already dabbled, though not altogether successfully…[at] its Brazilian truck plant in Resende…. The consensus is that car companies everywhere will increasingly follow the idea behind Blue Macaw.” “Car Manufacturing: Latin Leap,” *The Economist*, July 29, 2000, p. 64.
partners. Significantly, Covisint’s capacity for collaborative three-dimensional design represents a particularly valuable platform for automotive modules development. Second, in addition to rapid production, the suppliers at the Blue Macaw facility contribute an estimated 85% (as opposed to half) of each vehicle’s final value, demonstrating the extent to which modular manufacturing can reorganize commercial relations between participants.

Project Yellowstone - Union Complications from Modular Manufacturing

Given the above, it is fair to ask why the Big Three have not been rushing headlong to retool North American plants for modular capacity. First, it is no coincidence that most of the initial effort to experiment with modular manufacturing has occurred in the context of new factories, because it is frequently easier to establish the infrastructure, plant design and commercial relationships from scratch than it is to develop them in

54 “Modular manufacturing is sharing production and product design with suppliers. Economists call this co-production or coordination among owners of the assets needed to produce a product or service.” John E. Ettlie, “The Co-Production Challenge,” Automotive Manufacturing & Production, December 1, 1998, p. 16.

55 As an example of the potential, BMW along with its suppliers employed similar software to prepare the assembly site for its new X5 “sports activity vehicle.” It was able to move from concept to production in 35 months, approximately half the time previously required. To accommodate this schedule, it developed a virtual 3-dimensional shop floor, and emphasized modular production. Thus, despite having many more parts than its other models, the X5 parts arrive as modules that can be assembled on a line built for a different BMW model. For a discussion, see Robert W. Walton, “Clean Slate: BMW’s Hurry-Up Schedule for X5 Spawned a New Factory Environment in South Carolina,” Automotive News, August 7, 2000, p. 41.

56 “According to John Caseca, an analyst at Merrill Lynch & Co. in New York, Blue Macaw ‘pushes the concept of the modular car further along than anywhere else in the world.’ In fact, GM’s suppliers had a hand in designing the Celta as well as the Gravatai complex…. In a process [that] is unheard of in the industry, the suppliers team up to build a single module comprising the motor, transmission, fuel lines, rear axle, brake-fluid lines, and exhaust system, which is then installed as one piece.” Jonathan Wheatley, “Super Factory—or Super Headache?” Business Week, July 31, 2000, p. 61.

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established facilities. Second, capacity expansion is largely proceeding in developing markets abroad.

At the same time, if Blue Macaw demonstrates the advantages of modular manufacturing, GM’s experience with Project Yellowstone demonstrates the complications that may be encountered when trying to adopt modular manufacturing in North America. Project Yellowstone was conceived as a means to regain competitiveness in the market for compact cars, where GM has struggled in recent years. The company hoped that modular manufacturing would contribute to a solution, by facilitating mass customization and greater brand affiliation between GM and its customers, as well as greater levels of productivity in plants that were less expensive to build and operate.57

Initially, in January 1999, UAW representatives expressed “guarded optimism” about Project Yellowstone, which included plans for plants in Lordstown, Ohio and Lansing, Michigan.58 By April 1999, however, union leaders had turned against the project, expressing reservations with a production system that seemed to diminish their number and threaten their job security. Union leaders expressed particular concern that greater production would be performed upstream at non-unionized suppliers. In the run-up to important contract negotiations with the UAW, GM quietly abandoned the Yellowstone project.59

Many observers have emphasized that the precondition for successful modular manufacturing is close attention to manufacturer-

57 Marjorie Sorge, “Modularization: Key to Small Car Profits,” Automotive Industries, February 1, 1999. “GM can build assembly plants for $400 million each – significantly less than a traditional plant…. GM expects to employ 2,000 workers in each assembly plant, significantly fewer than work in Lansing and Lordstown [the site of proposed Yellowstone plants] today…. GM also wants to reduce the number of ‘noncore’ workers. That means fewer janitors and maintenance staff for such jobs as cutting grass and removing snow.” David Sedgwick, “GM Seeks UAW Deal for New Plants,” Automotive News, January 11, 1999, p. 3

58 “GM promises to avoid layoffs. The company believes it can cut the payroll through attrition, retirements and buyouts. ‘As long as our membership is taken care of, we don’t have a problem with it,’ said Jim Graham, president of UAW Local 1112 in Lordstown. ‘As long as every member is taken care of, that’s our goal.’ The UAW also would have a chance to organize suppliers to be located in an industrial campus adjoining each plant.” David Sedgwick, “GM Plan to Reinvent Factory Gets Cautious OK from UAW,” Automotive News, January 18, 1999, p. 22.

supplier relations. While this is true, the lesson of Project Yellowstone is that management must also accommodate the continuing role of labor, without whose cooperation the best-laid production plans will suffer. Unfortunately, Project Yellowstone sufficiently alarmed labor that the Canadian Auto Workers (CAW) negotiated a commitment from Ford not to rely on any nonunion suppliers in its pursuit of modular manufacturing, despite the fact that Ford had no plans for modular manufacturing during the period covered by the three-year contract. This highlights organized labor’s suspicion of modular manufacturing, as well as the need to gain the cooperation of labor, because competitive advantage from modular manufacturing will ultimately prove to be a function of the quality of labor relations as much as the quality of relations with suppliers. For this reason, GM has been soliciting the cooperation of local union leaders as it institutes some of the elements of modular manufacturing in plants around the United States.

At the same time, however, while manufacturers will need the cooperation of labor, union leaders must also recognize that, should they impede efforts to reorganize production, successful foreign experiments in modular manufacturing will only encourage a greater shift of manufacturing capacity abroad.

60 See for example, Mitchell Fleischer, “Can GM Handle Yellowstone?” Automotive Manufacturing & Production, March 1, 1999, p. 28.
61 “The CAW has created a pattern labor agreement with Ford that favors unionized suppliers when automakers adopt modular techniques. The pact also puts pressure on nonunion suppliers to unionize or else forgo business if the automakers adopt modular assembly.” Mary Connelly, “Ford Pact May Help Union Drives,” Automotive News, September 27, 1999, p. 6.
63 “Like Blue Macaw, the new Lansing Grand River plant, set to build the next-generation Cadillac Catera, will adopt GM’s so-called one-piece flow setup, where body welding, painting and general assembly are connected without interruption. Grand River will adopt the T-shaped assembly line seen at Blue Macaw. And like Blue Macaw, the Lansing project will work with its supply base to co-design components and simplify production processes.” Amy Wilson, “GM: Blue Macaw Will Fuel Change,” Automotive News, August 21, 2000, p. 3.
64 For a useful review of GM’s efforts in the United States, as well as the success of its modular assembly facility in Mexico, see Joe Miller, “Mexican Modules: In Ramos Arizpe, GM is Taking a Dramatic Leap into Modular Assembly,” Automotive News, June 5, 2000, p. 1.
Lear and Dana - Preparing for Modular Manufacturing

Modular manufacturing requires close commercial cooperation between manufacturers and suppliers, and just as it demands some reconsideration of the traditional system of manufacturing, it also demands some reconsideration of the roles performed by suppliers. Those suppliers that present themselves as reliable “module providers” will presumably capture the bulk of business related to the new production method. Some suppliers recognize this opportunity and are working to master new processes, acquire new competencies, and prepare for the future.

For example, Lear Corp., the fourth-largest automotive parts supplier in North America, has contracted with GM to provide whole interiors for the latter’s vans. To develop this capacity, Lear acquired firms with competency in interior trim, overhead consoles, cockpits and electronics. Now, GM ships Lear nearly-completed vehicles, to which Lear provides any number of various interior configurations, depending on the required specifications. In doing so, Lear is strengthening its reputation as a module, rather than simply as a parts, supplier.65

Lear is not alone. Dana Corp. has also actively pursued modular assembly efforts during the last decade, and has established its own

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65 “[Lear] was one of the first to see the trend by automakers to outsource large chunks of the car. Top suppliers would be responsible for the design, engineering and development of an entire vehicle system, such as interiors…. When the vehicles arrive at Lear, they will…do the vehicle wiring and install components such as a Bose sound system, the GM OnStar navigation system, a VCR and overhead-mounted monitors…seats, door panels, the headliner, flooring and acoustics.” Arlena Sawyers, “Interiors Contract is Coup for Supplier,” Automotive News, June 26, 2000, p. 52.
 Demand from the Big Three for further modularization will accelerate the differentiation among suppliers according to their capacity to deliver modules. In turn, Tier 2 suppliers will have to integrate their own production ever more closely with the manufacturers of modules. Any shift to modular manufacturing, therefore, presents new opportunities for innovative suppliers to differentiate themselves from their competition.

**Conclusions: Reconfiguring Both Factories and Relationships**

Modular manufacturing could unleash further productivity gains in automobile production beyond those already considered. Not only does the system provide substantial advantages over traditional integrative manufacturing, but also, to the extent that the Big Three can adopt modularization, they also move closer to the day when they can offer a built-to-order service like that offered by Dell.

In fairness, not everyone is persuaded by the promise of modular manufacturing. Some critics maintain it is just another manufacturing fad or, worse, an opportunity for the automobile industry to commit enormous resources to an unproven system of production. Further, some have argued that, rather than serve as the glue binding the automotive B2B and

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66 “Dana has been developing modular systems for well over a decade and is now pre-eminent in the field of just-in-time delivery of major sub-assemblies to vehicle manufacturers. For example, its Rolling Chassis module for light trucks distills over 250 components from 78 suppliers into a single part number from one supplier…. As the OEMs dispose of their peripheral activities to concentrate on core strengths of vehicle and engine design, they are increasingly searching for partners who willingly assume the responsibility of designing, developing and producing major sub-systems such as a complete four-wheel drive chassis. Dana has the capability to contract Tier Two and minor suppliers with a guarantee that the delivered system meets the specification and quality demanded by the OEM.”

“As Easy as 1, 2 3…” *Automotive Engineering International*, February 1, 2000, S8.

67 “Beginning with its 2003 model range, Ford will source its transmission components on a modular, rather than individual-part basis. It will require suppliers of such items as clutch packs, torque converter units and control systems to ship them as complete, ready-to-install sub-assemblies, or risk losing the automaker’s business. The move is part of Ford’s so-called Powertrain Modularity Strategy, which also involves engine supply.” Lindsay Brooke, “Powertrain Braces for Modular Supply Assault,” *Automotive Industries*, September 1, 1999, p. 19.

68 For an example, see Colleen Dejong, “Assembling the Assembly System,” *Automotive Manufacturing & Production*, January 1, 1999, p. 58.
B2C e-commerce efforts, modular manufacturing will actually be antithetical to the goal of increasing reliance on virtual auctions.69 Despite the skeptics, manufacturers are conducting pilot projects that signal the seriousness with which they view the promise of modular manufacturing, and if their pilot efforts bear fruit, manufacturers will increasingly seek to rely on it in the decade ahead. Modular manufacturing promises vehicles that better satisfy consumer demand, by allowing consumers to choose and equip a specific model without having to wait the months currently necessary for delivery. To develop such capacity in North America, manufacturers, suppliers and labor will have to achieve some measure of compromise. This requires participants to accept new roles and to accommodate new methods for accomplishing the familiar task of producing automobiles. It may seem mundane amid the digital revolution to argue the continuing importance of industrial relations, but they are certain to remain an important and continuing source of competitive advantage for those seeking to employ the tools of the new economy.

69 “Modularization will be hard to implement under any bidding plan. Tier 1 suppliers will create different modules whenever they assemble different parts and components produced by many different Tier 2, 3 and 4 suppliers. Who will manage the process if the auctioning process filters down below the Tier 1 supplier level?” Ron Harbour, “The Conflicts of E-Bidding,” Automotive Industries, April 1, 2000, p. 9. Others argue that greater attention needs to be paid to the products themselves, not the method of their production: “Mass customization’ is what we called this last decade, and we have used and abused many, many other terms since then in order to demonstrate that at last we really do care how product is made and delivered. But you have to have a product upon which to focus your factory.” John E. Ettlie, “Words to Remember,” Automotive Manufacturing & Production, April 1, 2000, p. 34. See also, Michael Woodyard, “Modules No Cure-All for Productivity,” Automotive News, June 21, 1999, p. 8.
Chapter 5:  

Conclusion: The False Divide between the Old and New Economies

This study has explored the Internet’s impact on the automobile industry. Change is creating opportunities and challenges throughout the entire automobile value chain, from suppliers far upstream to the manufacturers’ factories, and into the dealers’ showrooms. Commercial innovations are establishing the basis for new competitors in existing markets, new forms of competition among existing participants, and considerable potential for both benefits and savings.

For decades, consumers have traveled to the dealer’s lot to haggle over the price of a limited selection of vehicles. Model availability has frequently proven a function of the economics of heavy industry, which seeks to maximize capacity-utilization rather than maximize individual preference. Too often, consumers have driven away wondering whether they received a fair price on a vehicle that does not quite match their specifications. Further contact with manufacturers has been largely limited between new-car purchases.

The future promises a different organization of the market for new cars. Rather than visit a lot, consumers likely will turn increasingly to the Internet. There, they will select and configure their preferred models to their own specifications and then transmit their requests directly to the manufacturers. Their orders will initiate a series of automated purchasing requests and contract bids through the industry’s B2B exchange. Based on those orders, suppliers will prepare modules for assembly by the manufacturers. The time required for the specific vehicles to roll off the line, ready for delivery, will be measured in weeks rather than months.

While the technology to achieve this future is becoming available, it remains to be seen whether the industry will achieve its potential. This review concludes that the scorecard is mixed. Thus far, the foresight of FTC authorities and the paternalism of state legislators have generated very different applications of new-economy tools in the automotive B2B and B2C spaces, respectively.

Both automotive production and automotive retail are composed of a diffuse base of public and private firms, all of them facing a future when business will be increasingly conducted through a variety of online B2B exchanges. This appears to be the direction in which old-economy
manufacturing is moving, and firms that ignore the changes associated with the new economy will probably fail within the coming decade. While such change will cause some deep commercial pain, it will also leave a base of suppliers capable of exploiting the gains available from new commercial methods. The result will be more affordable vehicles of higher quality, a stronger manufacturing base with greater employment security, and a more internationally competitive automobile industry.

On the other hand, imagine for a moment what would happen if state authorities were to enact legislation prohibiting the use of B2B exchanges in automotive production. While technological laggards might welcome such protection, there would be substantial costs associated with the unnecessary perpetuation of inefficient enterprises and inferior business practices. American consumers would absorb the costs associated with more expensive, lower-quality vehicles, while the industry's competitiveness would suffer. Meanwhile, the technological laggards would possess little incentive to upgrade their practices.

As counterproductive as that scenario sounds, it is precisely the result state legislators encourage through the extension and strengthening of automobile franchise laws. It is highly inconsistent that state legislators should afford automobile retailers protection against technological innovation, while not giving equal protection to the suppliers who add nearly half the value to a new automobile. The solution to such inconsistency, of course, is not the extension of further protection to suppliers, but the elimination of protection from the retail sector.

The Bush administration and Congress should find ample common ground, with broad support from business and consumer groups, to diminish the effects of these capricious laws. The administration has frequently emphasized its philosophical commitment to deregulation, and has expressed faith in the idea that benefits accrue to both consumers and the national economy when markets are permitted to flourish.

With this in mind, it would prove a simple act for the FTC to initiate an investigation of B2C automotive e-commerce rules. Such a study would be a natural extension of the agency's spring 2000 investigation of Covisint and industry-wide B2B exchanges. If FTC authorities are concerned with the abusive potential of anticompetitive practices using the Internet, they certainly should take interest in the anticompetitive implications of state laws that restrict its use.

To support this view, one need not assume that the franchise dealership system is obsolete, nor that franchise dealers are incapable of adopting the tools of the new economy to the benefit of both themselves
and consumers, nor that automobile manufacturers will prove superior retailers, nor that the business models advanced by Internet startups during the late-1990s mania were without flaw. None of these need be true for the fact to remain that the broad – and growing – protection afforded automotive franchise dealers is patently retrogressive. Denying the participation of both Internet startups and manufacturers limits competition within the sector. The simple textbook consequence is that the automobile retail sector will attract less investment, remain less innovative, and remain more costly a system than would otherwise result if competition were permitted to flourish.

If state legislators insist on defending automobile franchise dealers from the exigencies of the new economy, then it falls to Congress to defend consumers against contravention of interstate commerce. Without such action, the available gains from greater reliance on new-economy tools in automobile retail will remain hypothetical, to the detriment of both American consumers and the American economy. In this regard, it bears repeating that manufacturers report substantial savings from the use of online auctions on Covisint. The gains from automotive B2B are being realized; the potential gains from B2C e-commerce should also be unleashed.

Modular manufacturing promises better consumer satisfaction through built-to-order vehicles. The possibilities are being gradually revealed through proof-of-concept projects, which have mainly taken place abroad. In North America, however, organized labor has resisted tentative efforts to experiment with modular manufacturing alternatives. There is a need for frank consideration of what these developments mean for participants. Project Yellowstone suggests that manufacturers will be hard-pressed to implement modular manufacturing in North America against the will of the UAW. At the same time, if modular manufacturing generates substantial advantage, manufacturers will be hard-pressed not to implement it, especially if foreign competitors move quickly to deploy the advantages of remote collaborative design that the Internet affords.

Finally, beyond the specific case of the automobile industry, the broader implication of this study is that no old-economy business is immune from the impact of new-economy tools. Wherever there exist value chains, industrial organization, commercial transactions, and an effort to fulfill consumer demand, one will find a capacity of the Internet to transform, facilitate and improve. Those firms that rise to the challenge and learn quickly to exploit the commercial opportunities available from the Internet will survive and thrive, while those that do not will run the risk of
stagnation, acquisition, or extinction. Amid this process, any distinction between the new and old economies will diminish, as traditional manufacturing industries adopt the advanced tools of information technology.