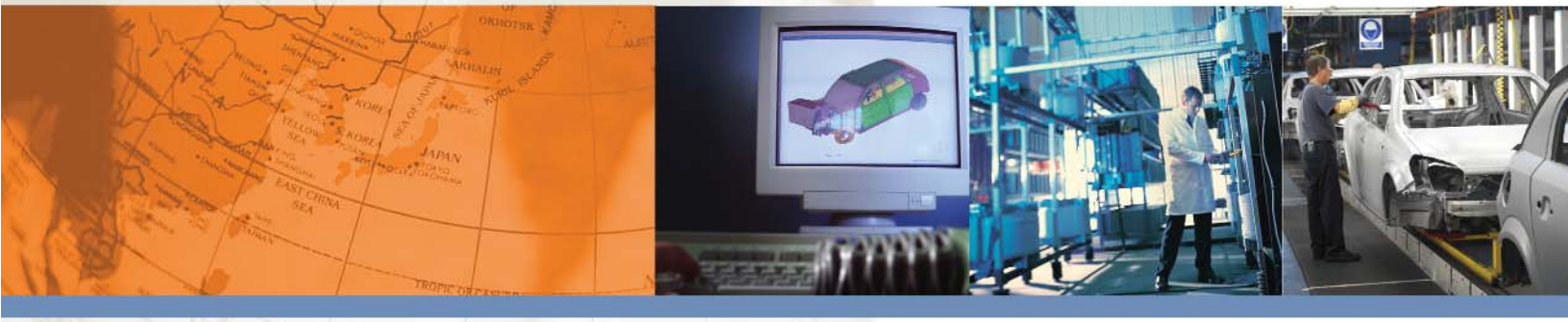
McKinsey Global Institute



Increasing Global Competition and Labor Productivity: Lessons from the US Automotive Industry

November 2005

McKinsey&Company

The McKinsey Global Institute (MGI) was established in 1990 as an independent think tank within McKinsey & Company, Inc., to conduct original research and reach a better understanding of the workings of the global economy. From time to time, MGI issues public reports. These reports are issued at the discretion of MGI's director, Diana Farrell, and its McKinsey Advisory Board when they conclude that MGI's international perspective and its ability to access McKinsey's knowledge of industry economics enable it to provide a valuable fact base to policy debates. The McKinsey Advisory Board is made up of McKinsey partners from Europe, Asia-Pacific, and the Americas.

MGI's staff members are drawn primarily from McKinsey's consultants. They serve 6- to 12-month assignments and then return to client work. MGI also commissions leading academics to participate in its research.

The McKinsey Global Institute is based in San Francisco and has a presence in Washington, DC, New York and Shanghai. MGI research fellows are based around the world as needed for individual research projects.

Increasing Global Competition and Labor Productivity: Lessons from the US Automotive Industry

Martin Neil Baily
Diana Farrell
Ezra Greenberg
Jan-Dirk Henrich
Naoko Jinjo
Maya Jolles
Jaana Remes

Preface

"Increased Global Competition and Productivity Growth in the US Auto Industry" is the result of ongoing research by the McKinsey Global Institute aimed at understanding the process of global economic integration and its implications. It examines in depth the response of US auto manufacturers to increased competition from overseas-based competitors in the fifteen years from 1987 to 2002. Building on MGI's many country and sector productivity studies, this research examines in detail how company-level actions translate increasing competitive intensity resulting from global market integration into accelerated growth in sector productivity.

Martin Baily, Senior Advisor to MGI and Senior Fellow at the Institute for International Economics, MGI Fellows Jaana Remes from McKinsey's San Francisco Office and Ezra Greenberg, from McKinsey's Washington DC Office, worked closely with me to provide leadership to this project. The project team also included MGI Fellows Jan-Dirk Henrich from McKinsey's Cologne Office, Naoko Jinjo from McKinsey's Tokyo Office, and Maya Jolles from McKinsey's Benelux Knowledge Center.

We have benefited enormously from the extensive input received from McKinsey's global network of industry and functional experts. We would like to extend a special thanks to Glenn Mercer, a Senior Expert with McKinsey's Global Automotive and Assembly Practice, who provided invaluable and active guidance throughout the project. We also benefited from conversations with McKinsey practitioners Tom Dohrmann, Matt Jauchius, Hiroshi Hayakawa, David Henderson, Hans-Werner Kaas, Stefan Knupfer, Stephan Kriesel, Guntram Nöth, Aurobind

Satpathy, Lothar Stein, and Andreas Zielke. In addition to our internal experts, we benefited from conversations with many external experts including Chris Benko, Lance Ealey, James Kondo, Sean McAlinden, and Michael Robinet.

Tim Beacom, MGI's dedicated Senior Analyst, Abhishek of McKinsey's North American Knowledge Center, and Julie Cook, Lutz Gläser, Tomoko Hibino, Tom Pepin, and Karen Victory of the Global Automotive and Assembly practice provided essential research support, and numerous helpful conversations. Susan Lund and Gina Campbell provided thoughtful input and editorial support. Moreover, Deadra Henderson, MGI's Practice Administrator, Terry Gatto, our Executive Assistant and Rebeca Robboy, MGI's External Relations Manager, supported the effort throughout.

As always, the findings and conclusions draw from the unique perspectives that our colleagues bring to bear on the sectors and countries researched here. These perspectives are a product of intensive client work with the world's leading firms. They are supplemented by in-depth analytical work and extensive interviews and dialogues with executives, government officials, and other leading thinkers.

Our aspiration is to provide a fact base to the public debate on the impact of global competition and productivity growth to enable policy makers and business leaders to make more informed and better decisions.

As with all MGI projects, this work is independent and has not been commissioned or sponsored in any way by any business, government, or other institution.

Diana Farrell
Director, McKinsey Global Institute

November, 2005

Executive Summary

Numerous studies by the McKinsey Global Institute (MGI) and others have shown that when new, more productive players enter a sector previously sheltered from global competition, the sector's overall level of productivity rises. Less well understood, however, is what companies actually do to link this cause and effect.

In increasingly global markets, it is important to understand how firms and policymakers can best respond to increasing competitive threats. To that end, we have studied the US automotive manufacturing sector between 1987 and 2002 as representative of an industry exposed to significant pressure from global competition. In particular, we have looked at the effects on company and sector productivity of decisions taken by the "Big Three"—Ford, Chrysler and GM—in response to competition from Japan-based Original Equipment Manufacturers (OEMs) and also competitors based in Germany and Korea.

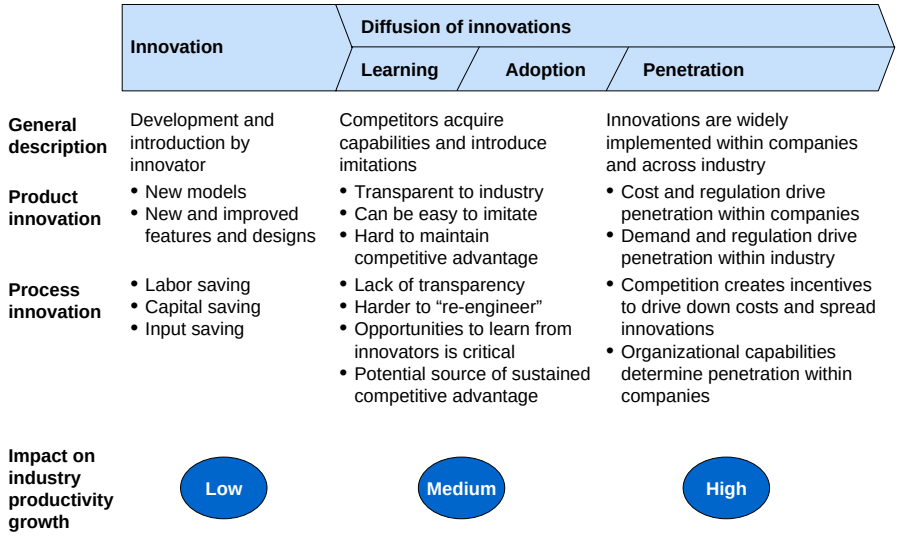
The Big Three's responses to these competitive threats were largely responsible for increases in sector labor productivity over this period. Rising by 3.3 percent a year, productivity performance in the US production of new vehicles was substantially faster than the 2.1 percent growth rate achieved by the non-farm business sector.[1] However, the three companies responded to the new competition at different rates and in different ways, depending on their perception of the seriousness of the threat, their understanding of the new players' sources of advantage, and the scale and speed at which they could introduce and emulate innovations.

1 Our sector definition includes the assembly and production of parts for new vehicles. Productivity is defined as real value added per hour.

Innovations are essential to pushing out the productivity frontier in every sector. Our study shows that the source of the innovation is often less important than companies' capabilities in recognizing the significance of other firms' frontier-shifting inventions, and understanding and adopting them. Furthermore, we show that far more important to overall sector productivity than the innovations themselves are companies' capabilities in rolling out process innovations company wide and product innovations into the market. It is the widespread diffusion of innovations that drives significant improvements in industry productivity rather than innovation by itself (Exhibit 1).

Exhibit 1

DIFFUSION OF INNOVATION DRIVES TOTAL INDUSTRY PRODUCTIVITY GROWTH



Source: MGI

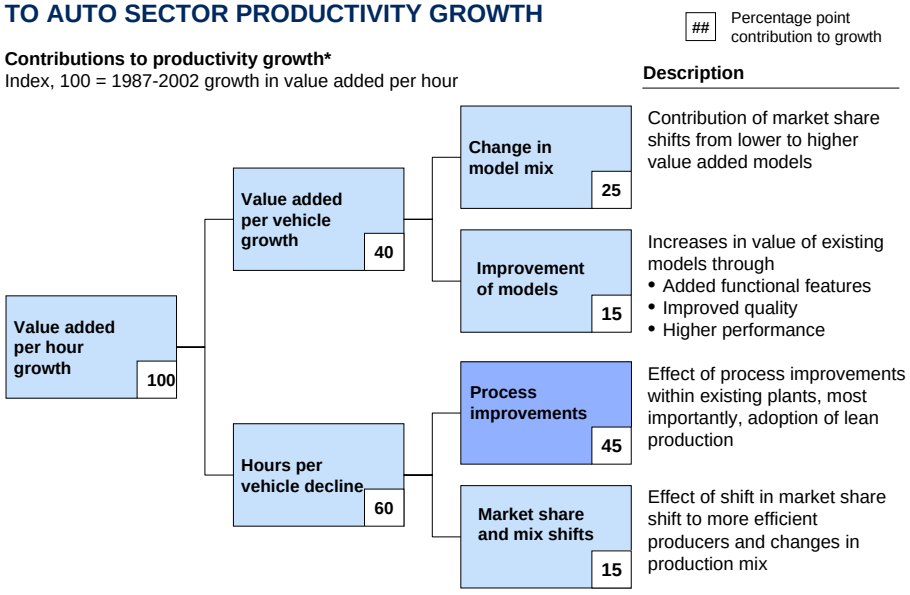
The diffusion of innovations in the US auto sector between 1987 and 2002 sheds light on some pressing questions facing players in increasingly global sectors: How does global competition change domestic sector dynamics and productivity growth? How quickly do these changes occur? What factors determine the speed of adjustment? What will be the impact on stakeholders? This summary outlines our key findings and conclusions from the study, presented in more detail in subsequent chapters of the report.

KEY FINDINGS

In the auto sector, labor productivity improves when it takes fewer hours to produce a vehicle because of process improvements, and when value-added per vehicle rises because of product innovations. The diffusion of process improvements made the greatest contribution to the increase in US auto manufacturing productivity between 1987 and 2002, accounting for 45 percent of the total increase. The introduction and popularity of higher value-added light trucks explains 25 percent of the increase, the second most important contributor. Improvements in existing models, shifts in market share to more efficient producers and changes in product mix accounted for the remaining 30 percent improvement (Exhibit 2).

Exhibit 2

PROCESS IMPROVEMENTS WERE LARGEST CONTRIBUTOR TO AUTO SECTOR PRODUCTIVITY GROWTH



* Contributions rounded to nearest five percentage points

Source: MGI

Process innovations contributed most to productivity growth

The leading Japan-based OEMs were clear leaders in hours per vehicle for the majority of the 1987 to 2002 period. The Big Three improved process efficiency largely by adopting the lean production techniques pioneered by the Japan-based OEMs, rather than developing wholly new process innovations of their own. The

impact of lean production in improving process efficiency is exemplified by GM, who was responsible for 60 percent of the total improvement in hours per vehicle over the period (Exhibit 3). However, catching up proved difficult: it took ten to fifteen years for the Big Three to learn, adopt, and implement lean production techniques and they succeeded at different rates (Exhibit 4).

A number of factors influenced their rates of catch-up:

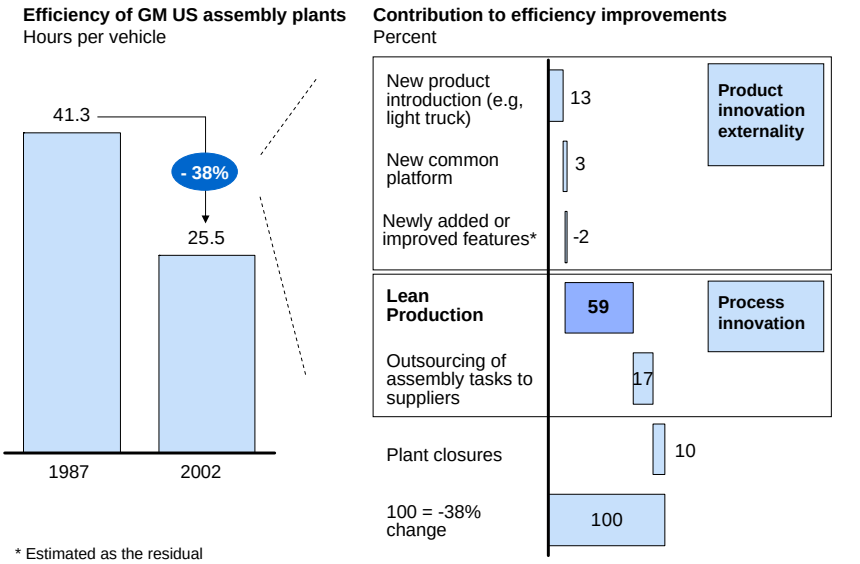
Perception of the threat. The weaker the company's financial position at the outset, the more keenly it felt the competitive threat, and the faster and more comprehensive its response. Ford's serious financial troubles after the 1981-82 recession had prompted it to focus on lean production before 1987, while the more financially comfortable GM did not see the need for process transformation until 1992, when the Gulf War recession hit its performance.

Understanding of new sources of competitive advantage. The effectiveness of each company's response depended on how well it understood the sources of the Japan-based OEMs' advantage. Ford realized early that lean production was a multi-functional system encompassing the entire value chain (including design,

Exhibit 3

LEAN PRODUCTION MADE LARGEST CONTRIBUTION TO GREATER OEM EFFICIENCY

GM EXAMPLE

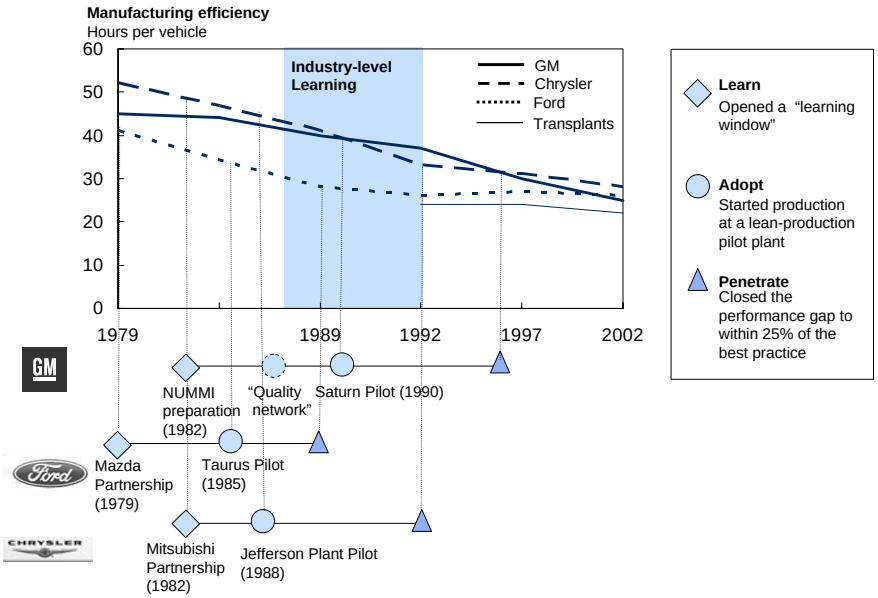


* Estimated as the residual
Source: Harbour Report, Literature Search, MGI Estimates

parts, assembly and organization), while Chrysler and GM initially had a narrower focus on assembly operations. They consequently lost time in catching up. Moreover, Ford knew from its practice of studying external benchmarks how far ahead the new competitors were on a range of fundamental performance measures.

Exhibit 4

BIG THREE TOOK 10-15 YEARS TO MATCH TRANPLANTS' EFFICIENCY



Source: Harbour Report, Literature search, MGI

Scale and speed of response. The quicker a company can learn and roll out process innovations, the faster it will catch up with competitors at the new productivity frontier. Ford's early success depended on implementing process improvements as part of a company-wide transformation program, and also on the good relationship between the autoworkers' union and management. It took four years for Ford to go from a pilot program to widespread adoption of lean production.

Chrysler moved more slowly at first but was able to speed the transformation once CEO Lee Iacocca realized its importance, because he wielded effective top-down control. On the other hand, GM's decentralized organizational structure impeded its ability to carry out process transformation, when it eventually realized the need.

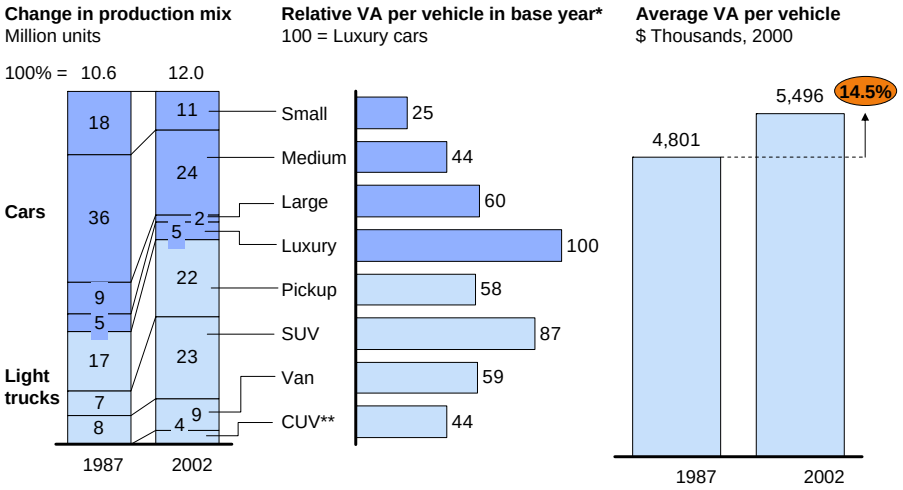
The shift to light trucks increased industry value added

Companies find it easier to research and copy new products than new processes, which are harder for outsiders to understand. Consequently, productivity advantages conferred by product innovations are far more difficult to sustain. The introduction of the Ford Explorer in 1991, kicked off the growth of the SUV market, but GM and Chrysler followed quickly with their own models leaving little competitive advantage to Ford. In contrast, Chrysler's investment in the minivan did pay off for the company, as competitors did not successfully field competitive models for some time.

The Big Three lost more than 10 percentage points of their overall light vehicle market share from 1987-2002, and their share of the car market plummeted by 21 percentage points. But these losses were to some extent offset in the late 1990s by their success in the light truck market with SUVs and minivans. These new products had higher value-added per vehicle, which helped to boost sector productivity (Exhibit 5). The explosive growth of the SUV market meant that SUVs played an important role in sector value added and productivity growth. Given the small size of the minivan market, this did not have as large an impact on the overall sector, although it was very important for Chrysler.

Exhibit 5

SHIFT TO LIGHT TRUCKS RAISED AVERAGE VALUE ADDED PER VEHICLE BY NEARLY 15 PERCENT



* Relative magnitudes estimated based on 1999 reference year
** Cross-utility vehicle assumed to have VA per vehicle of a small SUV
Source: Ward's Automotive yearbook; Goldman Sachs; BEA; MGI Analysis

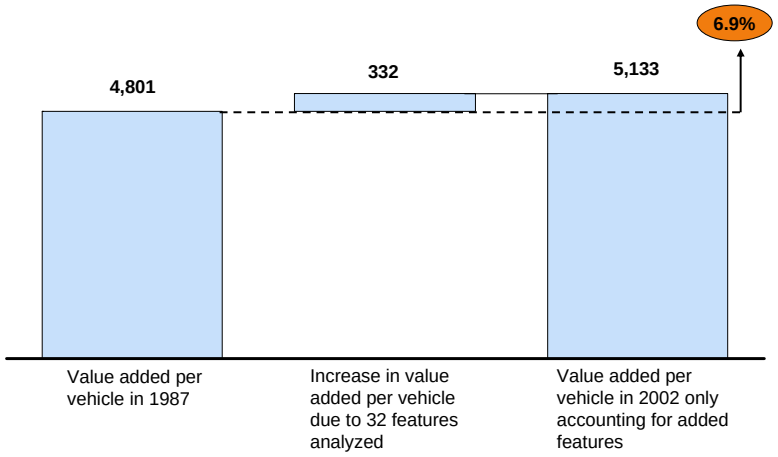
Combined with their gains in manufacturing efficiency, the Big Three's leadership in the SUV and minivan markets enabled them to reap substantial profits in the second half of the 1990s. But by 2000, the Japan and Germany-based OEMs were challenging their dominance in light trucks, materially eroding their profit margins.

Vehicles improved, and more efficient producers gained share

In additions to improvements in process efficiency and the popularity of higher value added light trucks, the features contained in new vehicles increased significantly between 1987 and 2002 (Exhibit 6). From leather seats and better audio equipment, to anti-lock brakes, four wheel-drive systems and airbags, many features were becoming standard equipment. There has also been a steady improvement in the overall quality and durability of vehicles (Exhibit 7). The main drivers of these improvements have been improved manufacturing of vehicle components and the more precise assembly of vehicles—a direct by-product of lean production. Both of these changes have raised value added per vehicle, and boosted industry productivity.

Exhibit 6

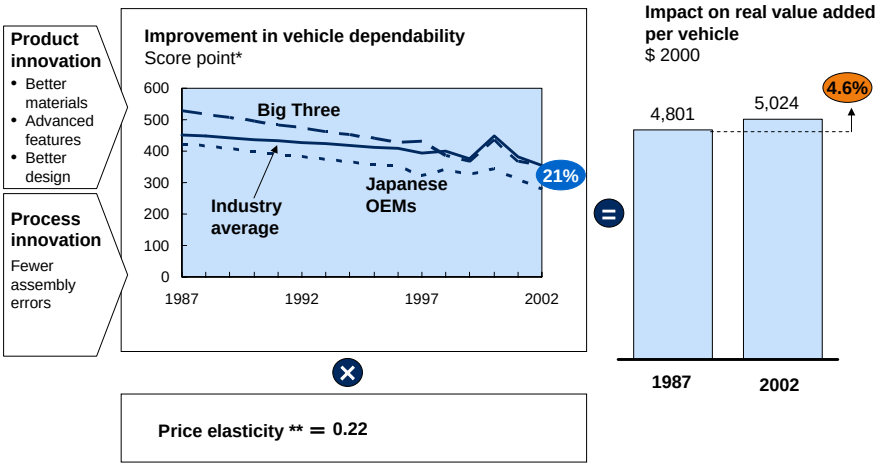
NEW FUNCTIONAL FEATURES RAISED AVERAGE VALUE ADDED PER VEHICLE BY 7 PERCENT
$ 2000



Source: Ward's Automotive yearbook; BEA; MGI

Exhibit 7

IMPROVED DEPENDABILITY RAISED AVERAGE VALUE ADDED PER VEHICLE BY NEARLY 5 PERCENT



* Includes initial quality and durability. Scores before 1996 were estimated based on improvement ratio from 1997-2002
** Models considered for price elasticity estimation were: Upper small cars (Ford Taurus, GM Impala, GM Grand Prix, Toyota Camry) and middle SUV (Ford Explorer, Chrysler Jeep Grand Cherokee, GM Blazer, Toyota 4 Runner)
Source: JD Power, Ward Automotive Yearbook, MGI

The final factors boosting productivity were other changes which increased industry efficiency and reduced hours per vehicle. As the efficient transplants from the Japan-based and other non-US OEMs gained share between 1987-2002, average hours fell. Furthermore, the change in production mix to easier to produce light trucks also drove down average hours.

THE IMPACT ON STAKEHOLDERS

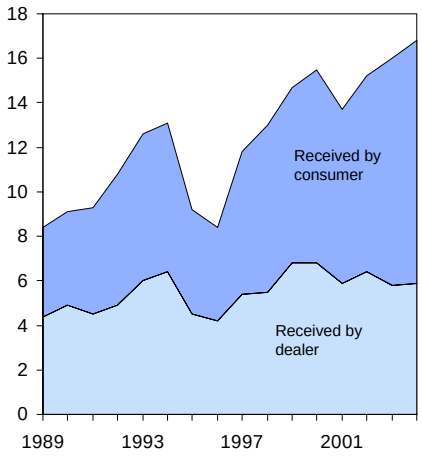
Consumers have been the largest beneficiaries of increased global competition. They have enjoyed falling inflation-adjusted prices for light vehicles, partly because the Big Three had to offer large incentives to make up for their quality shortfall against the new competitors (Exhibit 8). They have also benefited from the increase in features of new vehicles, and the overall improvement in the safety, quality, and durability of vehicles over our period of analysis.

Shareholders in the Big Three have fared less well, with returns underperforming the market (Exhibit 9). This performance was not only because of the strength of the competition, but also because the Big Three face significant pension and health care liabilities that are much higher than their competitors'. Partly as a result, their productivity increases have not yet translated into sustained profitability improvements.

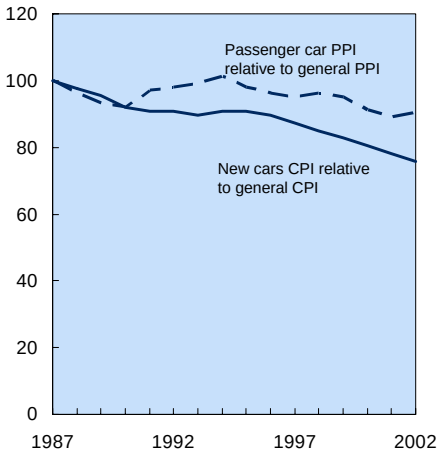
Exhibit 8

DISCOUNTS OFFERED BY BIG THREE CONTRIBUTED TO FALLING REAL PRICES

Average incentives for Big Three*
Percent of manufacturers suggested retail price



Real prices for passenger cars
Index, 1987=100



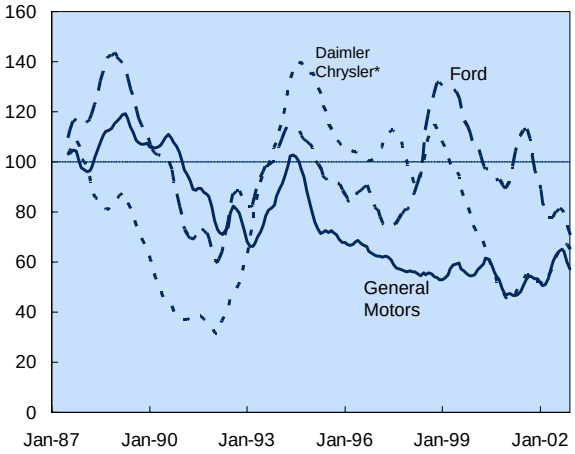
* Includes rebates, discounts or subvention finance rate incentives, lease incentives to customer, dealer discount

Source: CNW Marketing Research

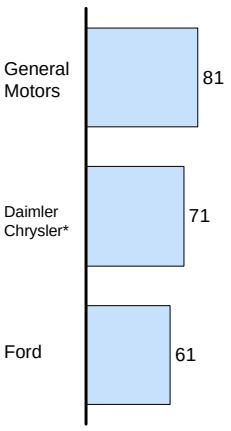
Exhibit 9

BIG THREE RETURNS GENERALLY UNDERPERFORMED S&P 500

TRS of Big Three relative to S&P 500
6-month moving average, S&P 500 =100
(Indexed January 1987)



Months TRS underperforms S&P 500**
Percent, 1987-2002



* Chrysler 1987-1996; DCX 1997-2002

** Based on actual TRS indexed in January 1987, not 6-month moving average

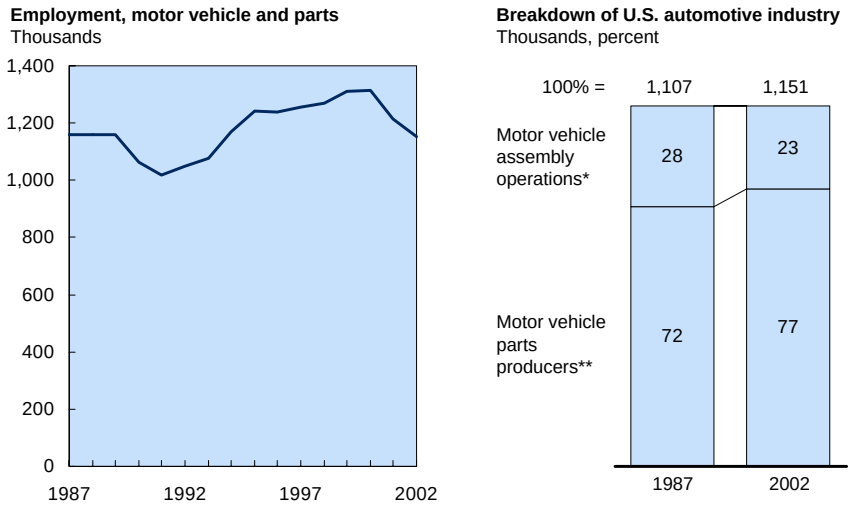
Source: Datastream as of 01/01/2003, MGI

Workers, however, have on average benefited—perhaps contrary to expectations. Levels of employment in the industry have remained relatively stable (Exhibit 10). Even so, there have been large shifts in employment between companies, displacing workers. Big Three employment in assembly operations fell by about 190,000 while parts employment increased. Transplants nearly doubled their employment from 15,000 to 29,000 workers albeit largely in locations different from where the Big Three plants were located.

In addition, workers' purchasing power has also remained stable (Exhibit 11). Although an average of only 38 percent of workers in the sector belonged to the autoworkers' union between 1987 and 2002, the non-unionized transplants have paid wages comparable to those commanded by union members. Toyota matched union wages in 2004. Only non-union parts suppliers pay substantially lower wages.

Exhibit 10

TOTAL EMPLOYMENT REMAINED FLAT, WITH SHIFT FROM ASSEMBLY TO PARTS MANUFACTURING



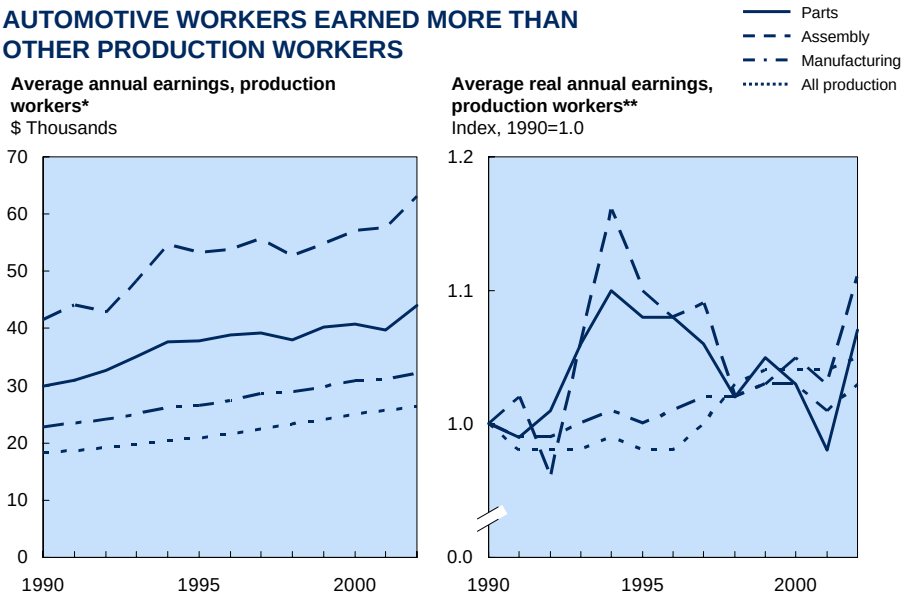
* Parts employment for the Big Three and other assembly operators (e.g., Delphi and Visteon in 1987) are classified by the BLS as parts employment

** Include companies that manufacture part, motor vehicle bodies and trailers

Source: BLS

Exhibit 11

AUTOMOTIVE WORKERS EARNED MORE THAN OTHER PRODUCTION WORKERS



* Based on average weekly earnings
** Deflated using CPI, all urban consumers

Source: BLS

IMPLICATIONS FOR POLICY MAKERS

The rapid diffusion of innovations within companies and across markets drives productivity upward. It is also likely to involve significant changes in market shares among companies and an associated migration of jobs. So while economies will as a whole benefit from policies promoting diffusion, there is also a case for policies to help stakeholders adversely affected by the resulting adjustments.

Expose domestic companies to competition from global best practice players. The evidence from the US auto sector and numerous other case studies confirms that opening markets to external competitors is a powerful way to introduce innovations, initiate the diffusion process, and raise productivity growth. Although the automotive industry in the US is strongly affected by regulation for safety, fuel economy and emissions, the most important feature of the US regulatory environment between 1987 and 2002 was that the market was open to global competition, despite the sometimes adverse impact on the domestic players.

Support stakeholders who lose out. Policymakers should consider measures to help dislocated stakeholders manage the transition. For example, they could offer job-retraining credits to employers, giving them an incentive to hire displaced workers, or provide continuing education grants for workers, giving them a chance to build skills in demand particularly from growing areas of the economy, such as healthcare, education, and social services. Severance packages can help, while portable medical insurance plans and pension benefits are essential to a workforce changing jobs more frequently.

Use regulation to promote rather than hamper diffusion. Governments should remove barriers to the spread of new products or processes, such as regulations imposing domestic content quotas on producers, and preventing them from buying higher quality parts if foreign companies make them. Regulations can also directly promote the diffusion of innovations: in the auto case, we found that federal environmental and safety standards led to the rapid spread of vehicle features that would otherwise have diffused more slowly.

Promote the sharing of key information. Governments can do a lot to help companies identify and emulate the most important innovations in their sector. In the auto sector, for instance, government research grants helped companies to study lean production techniques and understand that higher productivity was the root cause of Toyota and Honda's competitive advantage. The government can also encourage private sector players to help break down information barriers. The introduction of OEM and car model quality rankings, enabled both OEMs and consumers to make objective comparisons of their performance. Once consumers were able to compare the quality of different OEMs they could make more informed choices, so that market shares better reflected the underlying performance of manufacturers.

IMPLICATIONS FOR COMPANIES

Companies should not focus exclusively on developing their own innovations, but learn as well how to recognize, understand and adopt the significant innovations of other companies. To that end, the primary source of long-term, sustainable competitive advantage lies in achieving higher productivity than competitors.

Understand the drivers of relative strengths. Traditional financial benchmarks may not reveal the real source of competitors' productivity advantages.

Companies should also use a productivity-based diagnostic tool that can provide insight into the differences in company operations and capabilities that drive productivity, such as superior products or processes.

Recognize the importance of process innovations to productivity. Since product innovations are relatively easy to copy, isolated innovations cannot offer a long-term response to a new competitive challenge. Toyota's enduring strong performance in the US market demonstrates that competitive advantage derived from process innovation lasts longer: its roots are harder to understand and take longer to copy. Companies that want to differentiate themselves through product innovations need to excel in the process of product development—an organizational skill that is harder for competitors to emulate than copying a specific product.

Be flexible and ready to change. Responding to new global competition will often involve radical upheaval, including reworking of product development, process technology, supply chain management, marketing and distribution. Successful companies with a strong position in their domestic market will find it particularly difficult to recognize the seriousness of a new competitive threat. Why should they bother to make such profound operational changes in response? But in globally competitive markets, there is no room for complacency, even for market leaders.

From an organizational standpoint, strict rules-based relationships with employees and suppliers can be a significant barrier to implementing changes, because buy-in from all stakeholders is required to reap the advantages of rapid diffusion. Getting top management to focus on change makes organisations evolve faster. Companies need to ensure that their incentive structure recognizes and rewards the adoption and diffusion of best practices at every level, whether these originate from within or beyond the organization.

McKinsey Global Institute
05/11/11

www.mckinsey.com/knowledge/mgi
Design by New Media, McKinsey & Company, Sydney

McKinsey&Company