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COMPETITIVE SURVIVAL:
PRIVATE INITIATIVES, PUBLIC POLICY, and the NORTH AMERICAN AUTOMOTIVE INDUSTRY

PREPARED FOR
THE US—CANADA AUTOMOTIVE SELECT PANEL
BY
THE OFFICE FOR THE STUDY OF AUTOMOTIVE TRANSPORTATION (OSAT)
UNIVERSITY OF MICHIGAN TRANSPORTATION RESEARCH INSTITUTE
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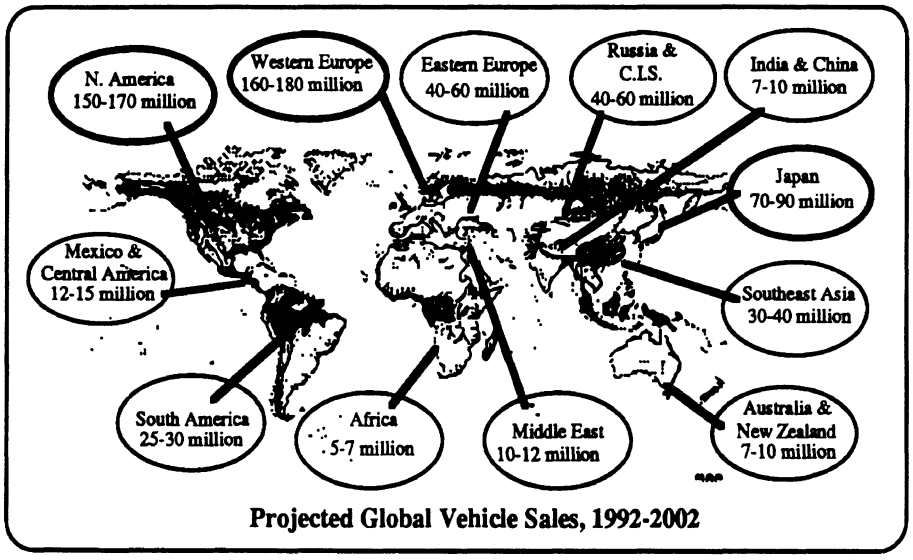
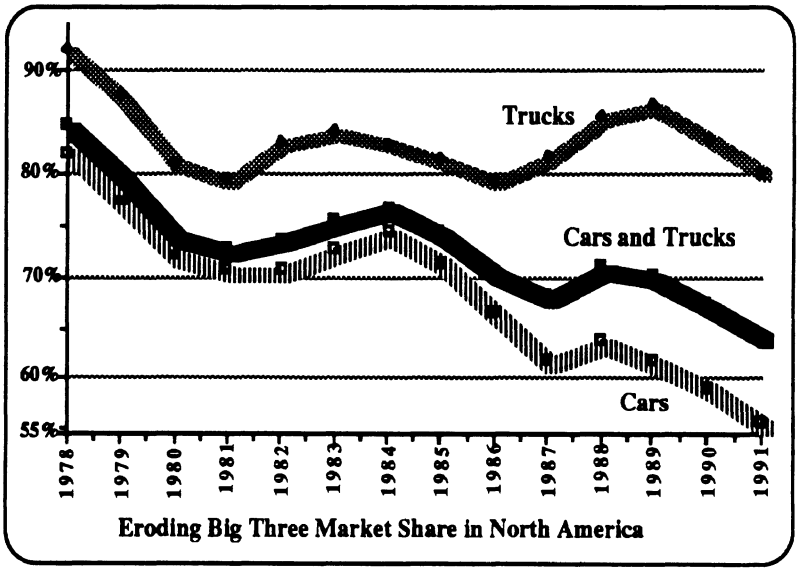


Projected Global Vehicle Sales, 1992-2002



Eroding Big Three Market Share in North America

REPORT # 92-3

UMTRI The University of Michigan Transportation Research Institute

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ACKNOWLEDGMENT

This report combines review, analysis, and original research. No project of this size can be accomplished within one year without significant participation of numerous organizations and people. We wish to recognize and express our appreciation for their significant contribution. At the same time, we must acknowledge that we have been obliged to select, interpret, and integrate those contributions, and we alone bear responsibility for the final use of their work. Projects of this size and scope simply do not yield total agreement among all participants.

First, we thank the governments of Canada and the United States and the Canadian and US Automotive Select Panels, and their respective chairs, W. Darcy McKeough and Peter G. Peterson, for funding and support of this work. Next, the Panels' Subcommittees on Competitiveness, respectively chaired by Roy Bennett and Joseph T. Gorman, gave unstintingly of time and information, guiding this project throughout. In this regard, the Subcommittee's Research Directors, Bernard Jones and Kishor Pendse, performed yeoman service in assisting the completion of this effort. In addition to their overall contribution, Messieurs Jones and Pendse were largely responsible for the section on the North American Free Trade Agreement (NAFTA).

Second, a number of subcontractors to OSAT made critical contributions to this report. Dennis DesRosiers provided analysis of the industry's role in the Canadian economy and policy-makers' views of the industry. He also kept us aware of the differences that still exist between the Canadian and US components of the North American industry. The Economic Strategy Institute provided trenchant analysis of public policy differences in major producing nations, US policy-makers' views of the industry, and Japanese barriers to automotive imports. The consulting firm of Ernst & Young performed the analysis of the industry's changing contributions to government revenues, and helped frame some of the important competitive challenges facing the industry, including its future aspirations. George Fulton and Don Grimes of the University of Michigan's Institute of Labor and Industrial Relations assessed the industry's role in the US economy, the distribution of that contribution, and modeled the effects of its increased competitiveness on the economy. Their work was largely funded by a grant from the US Department of Commerce, Economic Development Administration. Melvin Fuss, Steve Murphy, and Leonard Waverman of the University of Toronto conducted extensive research on the industry's overall cost competitiveness with Japan, and modeled the effects of a variety of competitiveness initiatives.

Third, a large number of automotive industry members offered valuable input into the study via their participation in the Select Panel's Subcommittee on Competitiveness and Working Group. Ellis Nuttall of Ford deserves particular mention for his thorough and consistently insightful comments and suggestions on a broad variety of topics. Other members of the Working Group include Neil DeKoker, James Carter, and Mark Cotter of the APMA; Brian Caldwell of CAJAD; Leslie DesJardin of GM of Canada; Michael Graydon of Toyota of Canada; Sam Guinden of the CAW; David Rehor and Jeff Snyder of Ford of Canada; Hugh Sloan of the Woodbridge Group; David Worts of JAMA of Canada; Steve Beckman of the UAW; Jack Eby of Ford; Alisa Learner Maher of Chrysler; Mustafa Mohatarem and Richard DeRoeck of GM; and Thomas Oakley of Tenneco. In addition to the Working Group, other industry participants provided valuable input to the study. Michael Whinihan of GM and Van Bussmann of Chrysler submitted detailed input into our analysis of the cost of capital. Several individuals provided substantial contribution to the health care section of the study, including Julia Janosi and Thomas Kilarski of Ford, Walter Maher of Chrysler, Jeanne Pryce of GM, Rex Abercrombie of Tenneco, and John McMahon of TRW.

Finally, a number of OSAT researchers made specific contributions that merit recognition. David E. Cole provided overall conceptual guidance and clarified the significance of many of our results. Sean P. McAlinden undertook the analysis of cost of capital, with A. John Steigman, and developed much of the industry performance data, as well as the overall conceptual integration of the project. David J. Andrea guided the health care analysis, assisted by Douglas Rammel. Betsy Folks, Brett Smith, George Bitsakakis, Christopher Lin, and Donald Mills worked long hours identifying sources, gathering and providing an amazing variety of data, and submitting them to analysis. Throughout the project, Rose Kronsperger kept our communications with researchers and the Select Panel flowing smoothly, and Lisa Hart, Wendy Barhydt, Jennifer Darcy, Faustina Jackson, and Cathy Rowe provided the crisis support and resources projects like this always require. This was truly a team effort on the part of the OSAT staff, and a matrix of OSAT personnel by report topic would reveal few empty cells.

Michael S. Flynn, OSAT Project Director
Jack Y. Edelstein, OSAT Assistant Project Director

FOREWORD

This report was commissioned by the US-Canada Automotive Select Panel, which was established under Article 1004 of the Canada-United States Free Trade Agreement (FTA) implemented in January, 1989. The federal governments of Canada and the United States agreed that certain automotive issues which arose during the trade talks warranted further joint investigation by a binational panel representing the full spectrum of industry activities. The governments stated that the mandate of the Panel would be to research the issues and to make recommendations for private initiatives and public policies to improve the global competitiveness of the automotive industry in North America.

The Automotive Select Panel appointed the Office for the Study of Automotive Transportation (OSAT) to conduct an assessment of the industry in order to understand the industry's current status and to identify those private initiatives and public policies that will enhance the industry's global competitiveness. This report summarizes the major findings and key recommendations of that work.

The report addresses a number of public policy issues only in passing, and focuses on those issues that have the most direct impact on automotive competition. The extensive attention already focused on some policy issues in Canada and the United States by other reviews and studies renders any detailed efforts by OSAT superfluous. Such issues are raised only in contexts that are specific to, or especially important in, automotive competition. Thus, for example, we recognize the critical importance to the industry of ensuring an adequate supply of appropriately skilled human resources, but provide relatively little discussion and examination of this issue.

Where appropriate, the report describes and discusses the differing situations of the industry's Canadian and US components. However, since the purpose of this report is to contribute to the improved competitiveness of the combined North American industry, such discussions are meant to reveal the interdependent nature of the industry and the potential for mutually beneficial cooperation between the two countries. They are certainly not intended to suggest that either national industry can or should attempt to gain significant advantage at the expense of the other.

EXECUTIVE SUMMARY

The Traditional North American Automotive Industry —consisting of the Big Three manufacturers and their suppliers—is at a critical cross-roads. By most measures, the industry has experienced an extended period of serious decline and faces a real possibility that it is verging on a performance free-fall resulting in irreversible damage to the industry's viability. The purpose of this report is to assess the current status of the industry, to identify causes of its current difficulties, and to propose actions by the US and Canadian governments as well as by private industry that will help the automotive industry regain healthy competitive performance.

Why the Traditional North American Automotive Industry Is Important

Why should North American citizens and government officials be concerned with the fate of the Traditional North American Automotive Industry ? Why does it matter whether the vehicles sold in North America are produced by the Traditional manufacturers, by foreign producers, or by New Entrants (i.e. new assembly and manufacturing facilities in North America that are owned by offshore auto companies) ?

There are several reasons why the existence of a viable North American-owned automotive industry is critical to the well-being of the North American economy. First, the Traditional Automotive Industry is the largest manufacturing industry in North America, accounting for about 4% of Gross National Product. Second, the industry generates approximately 1.2 million jobs (most of which are high wage) and provides health and pension benefits to employees, retirees, and their families—thereby contributing significantly to the North American standard of living. The auto industry directly supports one million additional jobs in related industries. Many of these spinoff jobs are also high paying and high value added. Finally, the industry supports jobs in non-manufacturing sectors of the economy through its induced level of economic activity.

The automotive industry is linked to and is a major customer of other important industries, accounting for over 25% of sales of iron, stampings, machine tools, and semiconductors, and over 50% of sales of rubber, lead, and textiles. By employing approximately 6% of all scientists and engineers, and by accounting for approximately 11% of North American corporate R&D in 1991 (though it was down from 14% in 1980), the automotive industry is a major source of advanced technologies with a ripple effect to other industries. While New Entrant automotive facilities in North America are

producing an increasing number of vehicles, their contribution to the North American economy is much more restricted than is that of the Traditional industry. The operations of the New Entrants are closely linked to their home countries (particularly in the case of Japan), from which they procure most of their high value-added components and where they locate most of their engineering activity.

The North American Automotive industry generated approximately $11.3 billion in tax revenues in 1990—$7.05 billion in production-related taxes to US federal, state, and local governments, and approximately $4.25 billion to the Canadian federal and provincial governments—consisting of $1.35 billion in production related taxes and an additional $2.9 billion in vehicle sales taxes. Nevertheless, tax payments from the Traditional North American automobile manufacturing industry have fallen sharply since the mid-1970s, in parallel to declining market share and profit. If the Traditional industry's sales and profitability in 1990 were equivalent to those implied by its 1978 market share, the auto industry's total US tax liabilities in 1990 would have risen from $7.05 billion to $13.35 billion, for an increase of $6.30 billion, or approximately 89%. This number is almost 3% of the US federal budget deficit in 1990. Taxes paid by New Entrants are much lower because they have reported less profit than Traditional North American firms from comparable assets and sales.

In sum, the Traditional Automotive Industry makes a significant contribution to the North American economy and standard of living. Should this industry continue to deteriorate, the negative implications for the North American economy will be severe. The full range of jobs that the industry currently provides will shrink as the Traditional industry contracts. Many technical and managerial jobs will be unavailable to North American citizens, but will remain largely concentrated in Japan and other nations, at least for some time. Similarly, tax revenues will continue to contract, and will not be nearly compensated for by the New Entrants.

Current Status of the North American Automotive Industry

The Traditional domestic share of North American automotive sales has markedly declined during the past fifteen years—down from 85% of the passenger car market in 1974 to 56% in 1991. The share of nonfleet North American sales declined to as low as 48% in 1991, as the Big Three lost a total of $6.7 billion—a post-World War II record.

Employment in the automotive industry has fallen sharply since 1978, and real wages have declined. The North American decline in employment, to about 88% of 1978 levels during 1990, involved the loss of over 200,000 jobs.

The Traditional supplier industry has suffered along with the domestic assemblers, as North American suppliers have been relatively unsuccessful in accessing New Entrant operations in North America and Japanese assemblers in Japan. Indeed, the North American auto parts trade deficit with Japan is projected to climb from $13 billion in 1991 to over $20 billion in 1994. Furthermore, New Entrant assembly and parts supplier capacity has created a situation of major overcapacity in the industry, further exacerbating the industry's difficulties. The competitive pressures on the Traditional industry to close capacity create a wide range of social and economic dislocations in North America.

The North American automotive industry has undergone a series of shocks that have fundamentally altered its structure and shape. The basic driver of the industry's competitive challenges is the *internationalization* of the production sources supplying the North American market. The major international competitor to the North American automotive industry has been and will continue to be—at least for the next fifteen years—the Japanese industry. As has been the case in a number of manufacturing areas, such as consumer electronics and machine tools, the Japanese have proven themselves to be formidable competitors, and have been able to gain substantial market share and even a dominant position in some vehicle segments.

The Global Context of the Automotive Industry

The global automotive market continues to expand, growing from 42.3 million units in 1978 to just over 48 million in 1991. North America, Western Europe, and Japan account for over 90% of the world's vehicle production. North America was the world's leading vehicle producer until 1979, but since that year, production leadership has alternated between Japan and North America. Since 1978, North America lost over 10.5 share points, or 5.1 million vehicles at 1991 worldwide production volume. While the North American share of world vehicle production has declined from 32% in 1975 to 24% in 1991, North American-owned companies still account for 33% of world vehicle production.

While the global auto market grows, the North American market has reached saturation, and annual growth levels are expected to reach only 1% or 2% in the coming years. Meanwhile, opportunities for exports of North American-produced vehicles are limited, as most countries require substantial domestic content or enforce various tariff and nontariff barriers to vehicle imports. Moreover, the presence of North American-

owned production facilities in Europe and Latin America further limits exports to those markets of North American-produced vehicles.

Many industrialized countries have adopted an explicit industrial policy aimed at preserving a viable auto industry for their own domestic producers. Most European nations, for example, have instituted import quotas or 'targets' for vehicle imports to their markets. Other nations, such as Japan, enforce a variety of informal barriers which greatly limit foreign auto sales in their domestic markets. The North American market, on the other hand, remains largely open to vehicle imports. Consequently, while imports accounted for approximately 35% of the North American automotive market in 1991, imports from North America and Europe accounted for less than 3% of vehicle sales in Japan that same year.

Furthermore, the recent automotive agreement limiting imports of Japanese-made vehicles into the European Community may indirectly impact the North American market. Japanese manufacturers may well increase their exports to North America to utilize production capacity originally intended for the European market.

Causes of the North American Automotive Industry's Decline

North American automotive manufacturers maintained virtually exclusive control of the North American market from the early 1900s through the late 1950s. Imported vehicles filled niches, competing for the relatively small sales volumes available in the sports, extreme luxury, or budget small-car markets.

North American automotive management bears a large measure of responsibility for the competitive situation the industry faces today. Detroit was not sufficiently concerned about the small import market share in relatively low volume niches. Management was slow in responding to the import threat, resisted recognizing the Japanese as serious and consequential competitors, sought easy and quick fixes to the problems posed by the Japanese competitive challenges, and saw the silver lining in every cloud on the horizon. At the same time, it must be recognized that the industry was, in some sense, a victim of its own success in earlier times. It is no easy task to change the strategies and tactics that made one remarkably successful over a long period of time, nor is it easy to recognize the environmental signals indicating that fundamental change has occurred.

In addition to management's role, it is important to recognize that systemic public policy differences between Japan and North America have had a significant competitive impact. Public policies in Japan have historically been supportive of a manufacturing

base, thereby providing certain competitive advantages to that nation's automakers. By contrast, public policies in North America have often been adversarial or at best neutral toward the automotive industry. For example, Japanese import barriers—both formal and informal—continue to provide that nation's producers a highly profitable sanctuary market, enabling them to offset losses in North America and Europe. The North American market, on the other hand remains the world's most accessible, drawing a large number of global competitors.

Health care policy is another case in point. Japan's national health care system and the absence of a comparable system in the US means that the average health care expense associated with each vehicle produced in Japan is only some $550 compared with nearly $1,100 in the United States. And while Canada does offer a national health care program, its potential cost savings are diluted due to the high content of US-produced components in Canadian assembled vehicles.

Furthermore, increasing regulatory focus on fuel economy, occupant safety and environmental issues in North America is straining the limited resources of the North American industry, which might more effectively utilize its financial and human resources to further close the competitive gap rather than to comply with new regulations.

Performance Improvements by the North American Automotive Industry

The past five years have witnessed significant improvement in the performance of the North American automotive industry. As a result of new management approaches, improved manufacturer-supplier relations, and huge capital investments exceeding $40 billion, the auto industry has made noteworthy gains along several dimensions. Manufacturing productivity in the auto industry has improved at a 2.9% average annual rate during the latter half of the decade. Quality gains have nearly eliminated the gap between the North American and Japanese manufacturers, and North American vehicles currently have a price advantage in almost all segments. Time to market has been shortened, as exemplified by Chrysler's 39-month LH development program.

While there is still much room for improvement, it is important to acknowledge that the industry has made significant strides in closing the gap with the competition by improving the quality and appeal of its products. It is also important to credit the industry with developing and adopting new innovations—including air bags, anti-lock brakes, and the now ubiquitous minivan.

The Imperative of Global Free Trade

The North American automotive industry is committed to free and fair trade. However, to achieve the benefits of free and fair trade, ***all*** participants in the global trading system must believe that trade relations and investment flows are mutually beneficial Perceptions of imbalance and lack of mutual benefit make free trade unsustainable. All participants in the global market must adhere to principles and systems of trade and competition that are relatively uniform and provide equivalent access to each other's markets.

The North American trade imbalance with Japan is large and continues to grow. Of the $43 billion trade deficit the US incurred with Japan in 1991, $32.4 billion—or 75%—was accounted for by autos and automotive components. Canada's deficit with Japan in autos and components amounted to approximately $4.6 billion in 1991. This imbalance has resulted in the perception that there is a lack of mutual benefit. These trends may eventually undermine free trade between North America and Japan, and it may be necessary to create short term corrective measures to achieve a realignment that is more consistent with the concept of free and fair trade. While these short term actions will be viewed by some as *managed trade* or *protectionist*, the intent of the recommendations made by this report is to preserve and protect free trade.

What Lies Ahead for the Traditional North American Automotive Industry

While the North American automotive industry has taken corrective actions, much remains to be done, and the industry's future prosperity is by no means assured. At least two scenarios of the industry's future are possible.

Under the first scenario, the current situation remains largely unchanged, and the Traditional industry continues to lose share of the North American market. As sales and profits erode, the Traditional industry loses its viability, going the way of the consumer electronics and machine tool industries and becoming dominated by foreign competitors. Much of the value-added employment shifts from North America to Japan, and North American operations in effect truly become "Japan's subcontractors."

Under a second, more optimistic scenario, the Traditional North American auto industry meets transportation needs of customers worldwide with manufacturing bases in all major regions. The Traditional industry gradually regains North American market share, capturing 75% of North American vehicle sales by the year 2000. The rise in domestic sales translates directly to increased business for Traditional automotive

suppliers. Employment opportunities rebound and capital investments in North American infrastructure expand. In addition to regaining market share in North America, this scenario envisions that the Traditional North American industry will capture 15% of the Japanese market and substantially increase its R&D investment. Under this scenario, total sales in North America would rise 5.6%, while Japanese market share would fall by just about that amount. The employment gains from capturing market share in Japan more than offset the losses associated with increased R&D investments, as Canada and the United States each gain abut four percent in automotive employment.[1]

In order to realize this second, preferable scenario, the industry must take the lead in regaining its competitiveness. Productivity must be further improved, quality and product value gains must continue, and design cycles compressed. Most importantly, the industry must convince reluctant consumers that North American vehicles are world class in quality, reliability, and value. Even if the private sector accomplishes all this, the automotive industry will not necessarily succeed. In order to increase the likelihood of success, the private and public sectors must forge a cooperative partnership.

Recommended Actions for Improving the Industry's Competitiveness

Numerous reviews and analyses over the past few years have evaluated the competitiveness of the North American economies and specific industries within those economies.[2] This report is the first to consider the competitiveness of a specific industry within the bilateral context of the United States and Canada, recognizing that the competitiveness of the industry is intertwined with the competitiveness of the two economies rather than simply one or the other. Therefore this report focuses its policy recommendations at once more narrowly than is typically the case—in terms of the actions we recommend—and more broadly—in terms of the binational focus of those recommendations.

We strongly support many of the general recommendations offered by these numerous other reports, including many of those that target improved education and training, enhanced savings-to-debt ratios, and more assertive governmental negotiating postures in international trade. The automotive industry is a key element of both the Canadian and US economies, and undoubtedly will benefit from the increasing general competitiveness of those economies, along with other industries. However, we elect not to repeat and specifically endorse these myriad recommendations. We prefer to present a

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[1]For a fuller discussion of various scenarios which the automotive industry may face, see pp. 161-168.
[2]See Appendix A for a list of some of these reports and their recommendations.

shorter, more focused list of recommendations that, in our judgment, will be most effective in ensuring the survival and competitiveness of the North American automotive industry, including its New Entrant component. We adopt this approach to highlight these most critical steps for automotive survival, and because the industry may not survive until such time that many of these more fundamental, longer-term efforts bear fruit.

A number of guidelines have shaped our selection of these recommendations, and it is useful to review them here. First, the recommendations bear on the particular situation of the North American automotive industry, however much they may or may not benefit other manufacturing industries or even other sectors of the two economies. In our view, none of our recommendations involve harm to other constituent elements of the economies. However, they have direct and traceable benefits for the automotive sector. Second, while the survival of the Traditional North American industry is the specific focus of this report, we recognize the important and promising role of the New Entrants in the North American industry, and thus avoid recommendations that unfairly penalize or hamper the competitive development of this emerging industry sector. Rather, we focus on recommendations that strengthen both Traditional and New Entrant components of the North American industry in competition with offshore producers—to the extent they improve the real incomes of North American citizens.

Third, the policies and practices of all world industries are changing and evolving over time, and many, although certainly not all, past policies and practices that distorted international competition were temporary and have been corrected. Nevertheless, the automotive industry is truly strategic, both in the sense of its importance to the North American economies and its relatively long time horizons. We therefore recognize that the competitive damage inflicted by time-bound, specific policies and practices often endures long after those policies and practices are corrected, and assert the appropriateness of steps to remedy such damage. Two noteworthy examples of this emerge in the report. Japan's policies against direct foreign investment in the automotive industry have shifted from an "infant industry" prohibition to a less formal practice of resisting control appropriate to levels of direct investment by foreigners, and an effective insistence on joint ventures for automotive companies wishing to establish a production presence in Japan. The formal policy prohibition may have been eliminated, but it effectively barred the North American industry from pursuing its standard method of participating in foreign markets, and has only eased as the competitive pressure on the North American companies has prevented them from implementing this strategy. Similarly, though the Japanese cost of capital advantage of the mid-1980s may be

virtually eliminated for the present, it afforded the Japanese manufacturers an immeasurable competitive advantage in product development and investment, which are tremendous competitive advantages today.

Finally, we believe that these recommendations must be implemented in a systems fashion, because the underlying competitive problems of the North American industry are themselves systemic in nature. They are certainly neither temporary nor self-correcting. Thus the implementation of one or two of these recommendations may itself do little to improve the industry's competitiveness if the others are ignored. In particular, it is critical that both private and public initiatives be implemented. Thus, our first recommendation to the industry—increased investment—is impossible unless public policy changes support the enormous capital requirements of such efforts, while our second recommendation to the industry—increasing penetration of the Japanese market—is illusory if public policy fails to ensure the fair market opportunity of those efforts to succeed. We have reached a condition such that the industry may not survive—regardless of however successfully it pursues appropriate private initiatives—if the public policy environment does not become more supportive of its efforts. Also, the industry will not survive if it fails to implement effective private efforts, no matter how supportive the public policy environment becomes, short of outright and permanent protection, which this study opposes.

Private Initiatives

The evidence presented in this report clearly establishes the improved competitiveness of the Traditional North American Automotive Industry, both absolutely and relatively, along a number of important operating and product dimensions. Productivity has substantially improved, narrowing the gap with the Japanese industry and increasing the lead over European manufacturers. Product quality has improved enormously, and the Traditional domestic industry now closely trails the Japanese and leads the Europeans. The Traditional industry now has a price advantage over both Japanese and European imports. Nevertheless, this improvement has perhaps come at the expense of company profits and investments, where performance has been poor in the current economy. Moreover, the Traditional industry continues to lose market share to New Entrants, even as Japanese import share somewhat declines, reflecting to varying degrees the Traditional industry's fewer and older model offerings and consumer reluctance to purchase its products.

The Traditional North American Automotive Industry must continue to accelerate its efforts at improving its operating efficiency and results. In particular, it must accelerate capital spending for new product development and achieving production efficiencies, in spite of the difficulties this entails.

The Japanese automotive industry has enjoyed remarkable worldwide success over the past two decades, anchored in a series of competitive advantages. Some of these advantages reflect factors internal to the industry, such as excellent products, superb strategic management, a relentless focus on continuous improvement, and a well-trained labor force. Some advantages reflect accidents of history, such as the initial opportunities in the North American market presented by the two oil shocks of the 1970s. Other advantages reflect the supportive economic and public policy environment in the home market, such as the continuing growth of the Japanese market and the difficulty foreign automotive industries have faced in securing access to that market—the world's second largest national vehicle market and largest auto parts consumption market. The near-total dominance of its home market has afforded the Japanese industry numerous strategic advantages in its competition in offshore markets such as North America, providing a volume production base and options in pricing and profit strategies across international markets. We recognize the numerous and significant barriers to accessing the Japanese markets for vehicles and parts. These include *keiretsu* arrangements and inspection practices, as well as the substantial costs of doing business in Japan, especially in establishing a distribution network. Nevertheless, it is critical that the North American industry visibly expand its efforts to penetrate that market, both for the potential business it promises and to disrupt the secure home base—i.e. the sanctuary market—of its major international competition. It is imperative that these efforts include specific responses to popular explanations for the industry's failure to date, including an increased market development effort in Japan and the export of vehicles particularly suited to the total Japanese market.

It is a fundamental strategic imperative that the North American industry continue to expand its efforts to penetrate the Japanese automotive markets for both vehicles and parts.

The North American industry has made great strides in the capability of its constituent parts to work together, recognizing that changes in the competitive environment have altered the fundamental dynamics of industry competition. In

particular, the often adversarial relationships among the segments of the industry appropriate to earlier times have changed and the basis of coordinated actions widened. Thus the typically adversarial relationships between manufacturers and suppliers and management and labor have changed. While some aspects of these relationships remain appropriately adversarial, the competitive, win-lose approach that often colored the entire relationship has given way to a recognition of the necessity of coordinated, win-win approaches in many circumstances.

International competition no longer permits the inefficiency fostered by the extreme competitive orientation of old, nor does it permit any company to compete without regard to its suppliers or customers, nor management and labor to compete on every issue. Even the Big Three manufacturers can no longer afford to compete in all their activities. In particular, automotive manufacturers and suppliers can no longer afford to pursue a complete research and development program that will meet all their needs for material, product, and process development, while ensuring their ability to meet the increasing regulatory demands of society for environmental improvements ranging from clean air to improved fuel economy. The industry has recognized this, and a number of consortia for pre-competitive research have been established in the United States.

These cooperative efforts should be expanded to include other institutions and sectors of our economies, perhaps especially in the pursuit of research and development. Many Canadian and US universities offer unusual strengths in particular aspects of automotive research and development, and the US national labs offer many such resources that may become available now that the Cold War has ended.

The North American industry must expand its developing nonadversarial orientations, especially in research and development, and begin to draw on the nonindustry resources available in both economies.

There is ample reason to be concerned that the Japanese-owned New Entrants represent more of a parallel industry than an addition to the Traditional industry. This report documents a number of these concerns. These include the preference of New Entrants to source from New Entrant suppliers; their reliance on high levels of imported automotive parts, components, and production equipment from Japan; their selection of greenfield production locations often far from the Traditional North American supply base, and hiring policies that select new workers rather than displaced auto workers; and continued reliance on Japan for high-value components, research and development, and

engineering. If New Entrants wish to become full participants in the North American automotive industry, these practices will have to alter, and more of their activity become integrated into the North American industry. This is not to say that competition between companies should be muted, nor that New Entrants are obliged to pattern their activities and operations after the current Traditional industry. However, they should strive to increase their North American activity levels, including engineering, vehicle and part sourcing, and reliance on the North American automotive workforce, and become more participating competing companies rather than a rival industry.

New Entrant automotive companies should continue to expand their efforts to integrate themselves into the Traditional North American automotive economy as competitor companies, rather than constitute a competitor industry.

Public Initiatives

The North American automotive industry has experienced a challenging two decades, as new competitors have successfully entered the Canadian and US markets, changed the bases of competition in the industry, and made large investments in New Entrant facilities in North America, often subsidized by various governmental agencies. In addition to this competitive turmoil, the industry has faced increased regulatory actions covering safety, vehicle and plant emissions, and fuel economy. These regulatory initiatives often originate in different agencies, with little coordinated consideration of their effects on the industry. There is much debate as to the wisdom of some of these specific regulatory efforts, and even fundamental questions as to the wisdom of using regulatory tools to achieve social goods. However, there is little debate that the net effect of these efforts channeled industry capital into areas of minor and/or temporary relevance to consumer decisions at a time when all available capital could well have been targeted to meeting the challenges of offshore competitors.

Moreover, the fact that these requirements apply to all vehicles sold in each market does not mean that offshore and North American industries face the same requirements and costs of compliance. Thus, plant emission regulations apply only to North American production facilities, and the Japanese and European industries enjoy a substantial lead in fuel economy as a result of the differential vehicle mix sparked by the fuel-taxing policies of the two North American governments compared with Europe and Japan. Reasonable people will certainly disagree as to the costs and benefits of these regulatory efforts, and the appropriateness of shielding an industry from policy

differentials across nations. However, the critical point is that these regulatory burdens were imposed with little concern for the effect they would have on the industry's competitiveness against imports. While such concerns should perhaps not be the only factors governing national policy decisions, they certainly should be major ones if the industry's core role in the two economies—as documented in this report—is recognized.

Both the Canadian and US governments should affirm the strategic importance of the automotive industry to the two economies. Our evidence suggests this fundamental orientation may already be stronger in Ottawa than in Washington. Such recognition requires developing policies and mechanisms to foster the industry's international competitiveness, and developing a repertoire of policy tools that can be deployed rapidly and flexibly to adjust the international bases of competition in response to governmentally imposed advantages and disadvantages. These tools should be available to address three situations: first, in response to policy actions of competitor nations and industries that have adverse consequences for the competitiveness of the North American industry, whether in North American or foreign markets, such as cost subsidies and market closure; second, to adjust policy actions of the North American governments themselves that impose disadvantages on our own industry compared to offshore producers, such as differential regulatory impact; and third, to remedy past policy actions of both North American and foreign governments that impose policy-linked disadvantages that linger even after the damaging policies or circumstance have been eliminated, such as barriers to entry and capital costs, when time itself is a critical factor.

The North American governments should effectively recognize the strategic importance of the automotive industry developing and coordinating the application of policy tools to avoid damaging and to promote the industry's international competitiveness.

The two North American governments are firmly committed to free trade, and this commitment has been frequently demonstrated. An example is the bilateral Free Trade Agreement that gave birth to the Automotive Select Panel. OSAT firmly endorses these principles and affirms the necessity of expanding rather than contracting free trade on a global basis. However, the evidence of this report documents the continuing barriers to free automotive trade, particularly with regard to Japan. We understand the importance of leading by example, and we share concerns that retaliatory market closure actions simply hurt consumers and do little to expand trade.

Nevertheless, the North American automotive industry has paid a great price because of the relatively open North American markets and relatively closed Japanese

market, both in lost sales in North America and lost sales in Japan. Our evidence suggests that capturing even a modest 15% of the Japanese market—well below North American market share in Europe—would have a major beneficial impact on North American sales and employment. Moreover, any consumer surplus North America has enjoyed because of vehicle imports is reduced by consumer loss due to parts imports and may, in any case, be purchased at the eventual cost of a continuing, viable, full-range North American automotive industry.

Few experienced observers deny that there are continuing entry barriers to the Japanese vehicle and parts markets, as there are to markets of other manufactured products. Debate today centers on whether the mechanisms in place to dismantle these barriers are sufficient and whether the rate of dismantling these barriers is acceptable. We support the long-term efforts of the Canadian and US governments to reduce these automotive trade barriers, but we also feel that such efforts will likely succeed too late to preserve the vital North American automotive industry in any semblance of its current activity. We note that the major shift in currency values in the mid-1980s has yet had virtually no effect on automotive trade, although it effectively reduced Japanese investment costs in North America by over 40%, and raised North American investment costs in Japan by over 80%.

Both governments must take more affirmative steps to open both the Japanese automotive vehicle and parts markets to free competition from the North American industry. Ideally, coordinated efforts of the two governments would be preferred because of the integrated nature of the two motor vehicle industries. Evidence in this report suggests that quotas on Japanese exports may protect the industry at consumer expense and provide high profit levels for Japanese producers. However, there are many other policy tools available to accelerate the dismantling of Japan's remaining barriers, and it is important that the North American governments consider and select those that are most appropriate and effective.

The North American governments, either jointly or severally, should pursue free and fair trade by effectively assuring reciprocal access to world automotive markets, especially Japan's, both because of its size and relative closure.

This report documents that the North American industry faces enormous demands for capital over the next five to ten years, both to invest in products and to refurbish facility investments. However, because of the nature of our market economies and the competing demands of industry stockholders, these longer-term investments are difficult

to justify. Tax policies are effective policy tools to influence management behavior, and, unfortunately, some tax provisions in the United States and Canada hinder rather than facilitate investments necessary to industry competitiveness.

A particular problem for the automotive industry is that so much of its research and development activities are focused on product development that does not, or may not, qualify for tax incentives in either country. We believe that the definitions of industry research and development should be modified to recognize the huge cost of automotive product development and the large proportions of those costs that truly represent applied research. We further believe that research and development tax credits should be made permanent, as they encourage critical economic investments across many industries. Such credits will encourage the expansion, rather than contraction, of such investments.

We also believe that both governments should establish a permanent investment tax credit for facility and equipment modernization, subject to investments' qualification as North American under the FTA rule of origin, or 50% value-added, or some other appropriate rule. Finally, there are other tax policies, such as the US Alternative Minimum Tax, that penalize capital intense, cyclical industries like automotive.

Both governments should review their tax codes for adverse impact on automotive versus other sectors, and consider tax policies that compensate the industry for handicaps imposed by the structure of the two economies.

Two components of the *social wage* constitute significant portions of the North American industry's employee costs. These are health care expenditures and pension costs. Both of these cost components disadvantage the Traditional manufacturers compared with New Entrants, and the health care component represents a significant disadvantage compared to importers' health care costs.

Our report documents that the Traditional manufacturers and their suppliers incurred nearly $1100 per vehicle in health care payments for North American production in 1990. While Canada and the United States differ in both their systems and costs of health care, Canadian vehicles carry a large health care cost due to their high levels of US supplier content. Our report estimates that 1990 health care costs per vehicle in Japan were about $550, an advantage of over $525 per vehicle, just about the ratio of total medical expenditures for the two societies. New Entrants' US health care costs were even lower, at about $475 per unit, or an advantage of over $600 per unit.

Pension costs in the Traditional industry are a substantial portion of benefit costs, reflecting the age of the workforce and the high ratio of retirees to active employees,

exacerbated by the shrinkage of the industry employment base over the past decade. These costs are particularly high in relationship to New Entrants, whose recency and young workforces keep these costs low.

The pension and health care cost advantages enjoyed by New Entrants are diminishing advantages: at some point in the future they will be roughly equivalent to the Traditional manufacturers' cost, as their workforce ages and stable capacity yields an age distribution similar to the Traditional industry's. However, the pressures on the Traditional industry are so severe that it is unlikely they can survive until that time. The fundamental challenge of different policies in health care between the United States and the bulk of the automotive-producing world is complex, and the nation will simply have to face the choice of altering its present medical cost funding system, face continued erosion of its manufacturing base as its products carry this cost into global competition, or develop a method of insulating its manufacturers from such social choices.

There are three basic ways to reduce the automotive industry's direct per-vehicle health care and pension costs. First, since these costs per worker are relatively fixed, per-vehicle costs can be reduced through increased volumes. Indeed, 1990 health care costs at 1985 production levels would be some $250 lower. Second, Big Three direct health care expenditures in the United States would be reduced by nearly 50% if the United States adopted a Canadian-style system. Third, the automotive industry could decrease its health care and pension coverage for employees. This third method is inconsistent with improving competitiveness without lowering living standards, while the second method is at best a long-term potential solution. The first solution is only a partial solution, as significant differences in the contained health care costs of Traditional, Import, and New Entrant vehicles will remain.

A fourth possibility is to levy some form of health care and/or pension tax on each vehicle sold in the North American markets, utilizing this fund to compensate manufacturers and suppliers whose costs are excessive due to their long-time contributions to the economy. This strategy would involve some minimal loss of consumer welfare, compensated by the avoidance of such losses should the Traditional Automotive Industry collapse. However, it would involve a shift in consumer welfare between purchasers of Traditional and Import/New Entrant vehicles.

The North American governments must develop policies that prevent components of the social wage from becoming competitive disadvantages for the North American automotive industry or for long-established participants within the industry; this is particularly critical for the United States in the area of health care costs.

The costs of industrial adjustment necessary for the enhanced competitiveness of the North American automotive industry are high. These include such costs as economic dislocation experienced by individuals who lose their jobs or must retire early, communities and provinces/states that lose important parts of their economic and tax base as the Traditional industry closes facilities, and the social costs associated with worker displacement. New Entrant expansion will not compensate for these total losses, and effectively redistributes the automotive manufacturing economy away from its historical base and into new areas. These broader social and economic costs of automotive adjustment are well understood.

The Traditional industry bears heavy and direct costs in this restructuring, and there is a danger that these costs will serve only to hasten the demise of many participants in the Traditional industry. Thus, when companies shed workers as they become more productive and reduce capacity, the costs associated with such terminations and closures must be borne by a smaller remaining base, and pension costs and health care costs for retirees must be supported by a smaller workforce. These costs are currently paid by the company, and the imposition of such costs on specific companies may even differentially handicap those that are most effectively pursuing competitiveness.

These costs are aggravated by New Entrant decisions to locate in greenfield sites and to hire fresh workforces, thus failing to provide new opportunities to individuals and communities damaged by the retrenchment of the Traditional industry. These decisions permit the New Entrants to avoid many of the social components of these costs as well, since their new locations do not share in all the costs associated with layoffs and closings. The Traditional industry continues to bear both direct and indirect costs of these kinds.

The automotive industry historically presented major barriers to entry, primarily reflecting the huge capital investments it entails, the importance of economies of scale for efficient production, and the significant learning curve that characterizes it. Temporary advantages, such as lower social wage costs, public subsidies for investment and training, new facilities, or even the competitively forced closing of some established capacity were offset by these significant entry barriers. However, these traditional entry barriers have little meaning when entry is effected by successful and well-funded offshore industries, such as is the case in North American automotive production today. These temporary advantages may in fact overwhelm the established participants.

It makes no sense for the North American economies to allow temporary company advantages and disadvantages to become the basis of selection for company survival. Thus the New Entrants enjoy a cost of health care advantage that will gradually disappear, but over a sufficiently long time that it may ultimately be the deciding factor in

their survival and the death of Traditional companies. These social and economic costs of job loss due to enhanced productivity and necessary capacity reductions should be distributed throughout the industry and the economy.

The North American governments must adjust the balance of advantages and disadvantages to New Entrants to reflect the international reality that capital barriers are now far lower than in the past, and that the costs of enhanced competitiveness and inevitable employment reductions may destroy the Traditional Automotive Industry .

I. INTRODUCTION

The Traditional North American Automotive Industry faces a crisis and may be on the verge of economic free fall. The industry cannot long sustain the pattern of the past few years: eroding market share, disastrous profit performance, and continual shrinkage in the face of well-supported competition. The choice is clear: the industry can recover and continue to provide North America with the wealth and economic activity it creates, or it can even more precipitously decline. This industry—consisting of the Big Three motor vehicle assemblers and thousands of component suppliers—is one of the most important to the two North American economies, and its loss could well do massive damage to our economies and standard of living. North Americans should understand that they cannot afford to lose this industry, and work to identify ways to solve this problem without a last-minute fall back to ineffective and ultimately damaging rescue attempts.

It is not too late. In the past few years competitive pressures have transformed the industry, resulting in leaner operations, shortened product development times, closer manufacturer-supplier relations, competitive product offerings, and additional productivity advances. Today's North American vehicles have made excellent progress in terms of quality, fuel efficiency, safety, and value. Much has been accomplished, although much remains to be done.

However, the public policy structure of North America places the automotive industry—and other manufacturing industries—at a permanent disadvantage relative to foreign competitors. This structural disadvantage cannot be overcome—regardless of the industry's advances—unless the governments of North America accept the following realities:

- The public policy environment in North American is generally more supportive of New Entrant manufacturers than of the indigenous, Traditional industry.
- The economic benefits contributed to the North American economy by Traditional manufacturers, whether in automotive, machine tools, or other industries, are not equaled by New Entrant manufacturers, since the New Entrants perform much of their value-added activity in their home countries.

Much of this report discusses the damage that the Traditional Automotive Industry has experienced as a consequence of inroads made by the Japanese competitors into the North American market. This is not meant as an attack on Japan, or to imply that Japanese policy has any intention of destroying the North American economy. Rather it is meant to stress that much of Japan's industrial success is due to comprehensive and

systematic public policies that emphasize global manufacturing competitiveness over consumer welfare.

Furthermore, it is of critical importance to understand that while this report focuses on the automotive industry, the arguments made herein are germane to the entire spectrum of manufacturing industry in North America. As the automotive industry deteriorates, so too will North American manufacturing, and along with it North American living standards.

This report assesses the current status of the industry, identifies causes of its current difficulties, identifies areas where progress has been made, and proposes actions by the US and Canadian governments as well as by private industry that will help the automotive industry regain healthy competitive performance.

Definition of Terms

North America

Throughout the report, the term *North America* is used to refer to the Canadian and US industries. This usage reflects communication convenience, and in no way should be interpreted as excluding Mexico from either the continent or from the continental industry.

North American Automotive Industry

The term *North American automotive industry* includes both the Traditional industry and the New Entrants. The New Entrants are the North American production facilities of non-North American automotive manufacturers and suppliers.

Traditional North American Automotive Industry

The *Traditional North American Automotive Industry* consists of three vehicle manufacturers—GM, Ford, and Chrysler—as well as thousands of independent companies that supply materials, parts, and components for incorporation into vehicles. These automotive supplier companies, virtually all of which are North American owned, range from small local operations supplying products such as stampings or fasteners, to very large international companies with global operations, supplying more complex parts and components.

These independent suppliers participate in almost all manufacturing industries and include significant portions of the materials, electronics, metal stamping, and plastics processing industries. In a very real sense, automotive suppliers form a microcosm of

North American manufacturing. They also evidence a wide range of dependence upon the automotive industry, as many rely on the industry for over 85% of their sales, while some of the larger, more diversified companies have much lower, although still substantial shares of their business in the automotive sector. These suppliers contribute well over half the industry's total value-added, and are themselves important sources of technical innovation, jobs, and profits.

In order to better understand the integrated nature of the North American automotive industry, it is useful to compare the relative economic distribution of automotive industry activities in Canada and the US. As table 1.1 portrays, Canada accounts for 9.5% of vehicle sales in North America, while its related activities—including automotive employment and payroll—are substantially greater than this level of automotive consumption. Therefore, the Canadian economy benefits proportionally more from the North American automotive industry than does the US economy. The table also illustrates the integrated nature of the North American automotive economy.

Table 1.1. Comparison of US and Canada Automotive Activity, 1989.

	US	Canada
Total Light Vehicle Sales	91.5%	9.5%
Vehicles Assembled	82.5%	17.5%
Direct Automotive Employment (assembly + parts)	85.5%	14.5%
Automotive Parts Employment	87.1%	12.9%
Automotive Assembly Payroll*	83.6%	16.4%
Automotive Parts Payroll*	89.1%	10.9%
Automotive Payroll (assembly & parts)*	87.0%	13.0%

*Note: Payroll figures measured in $US at 1989 exchange rates.

Competitiveness

The study defines *competitiveness* to mean the ability of the North American automotive industry to produce and sell products and services on a sustainable basis that meets the test of domestic and international markets. From a societal point of view, we assume that national or bilateral competitiveness includes the notion that the auto industry contributes to improving the real standard of living and quality of life of North

American citizens. This definition is quite close to the definition adopted in a recent report by the US Office of Technology Assessment.[3]

Vehicle Production Source

Traditional North American vehicles are manufactured and marketed in North America by the Big Three. *Import* vehicles are manufactured abroad by foreign companies and sold here. Vehicles manufactured abroad but marketed here by the Big Three are *captive imports*. The Pontiac LeMans, made by Korea's Daewoo and sold in North America by GM, is a captive import. *Captive imports* represent a distinct type of vehicle because their sales levels reflect the strategic decisions of the Big Three as well as their manufacturers. Finally, *New Entrant* vehicles are manufactured and sold in North America by foreign companies. Hondas from Marysville, Ohio, and Toyotas from Cambridge, Ontario, for example, are New Entrants.

Industry in Turmoil

The Traditional North American Automotive Industry faces an imminent crisis. It has experienced an extended period of serious competitive decline along many performance measures, and faces the real possibility that it is verging on a free fall that will result in further erosion of North American automotive activity—up to and including the industry's elimination. Most North American citizens are aware of the competitive problems facing the Traditional domestics: anyone driving the North American roads recognizes the substantial portion of the vehicle fleet that now comes from nontraditional manufacturers—primarily of Japanese origin. However, the full extent and complex, multidimensional nature of the damage to the Traditional industry is less well recognized and understood.

Market Share Erosion

The Traditional North American Automotive Industry has experienced substantial loss of market share in North America between 1978-1991, as portrayed in figure 1.1.[4] The slippage in market share has been dramatic. In 1978 the Traditional

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[3]U.S. Congress Office of Technology Assessment. *Competing Economies: America, Europe, and the Pacific Rim.*

[4]For almost all figures, we start with 1978 as a base year, the last record North American production year. While that choice somewhat obscures the dramatic effects on the traditional industry of the oil shock in the early 1970s, it keeps comparison within the recent past for most readers. These sales shares are computed

North American manufacturers accounted for over 85% of North American car and light truck sales. By 1991 this figure had declined to about 64%.[5]

The Traditional manufacturers have lost about 21 points of market share in thirteen years, a rate of just over 1.6 points—or nearly 200,000 vehicles—per year. The rapid loss of market share seriously raises the issue of whether the Traditional companies might not be nearing a level that will necessitate a significant shift in their North American strategies and activities. Some analysts feel that there is already a fundamental question as to whether the Traditional manufacturers can any longer afford to produce models spanning the full range of vehicles in the marketplace.

Other analysts argue that significant shares of their production activity must leave North America if they are to remain competitive.[6] Both these possibilities may be foreshadowed by the Traditional manufacturers' reliance on captives vehicles. Adopting strategic options such as reduced market coverage or sourcing from new locations may be acceptable for regaining competitiveness, but the selection of either strategy involves potentially serious losses to the Canadian and US economies.

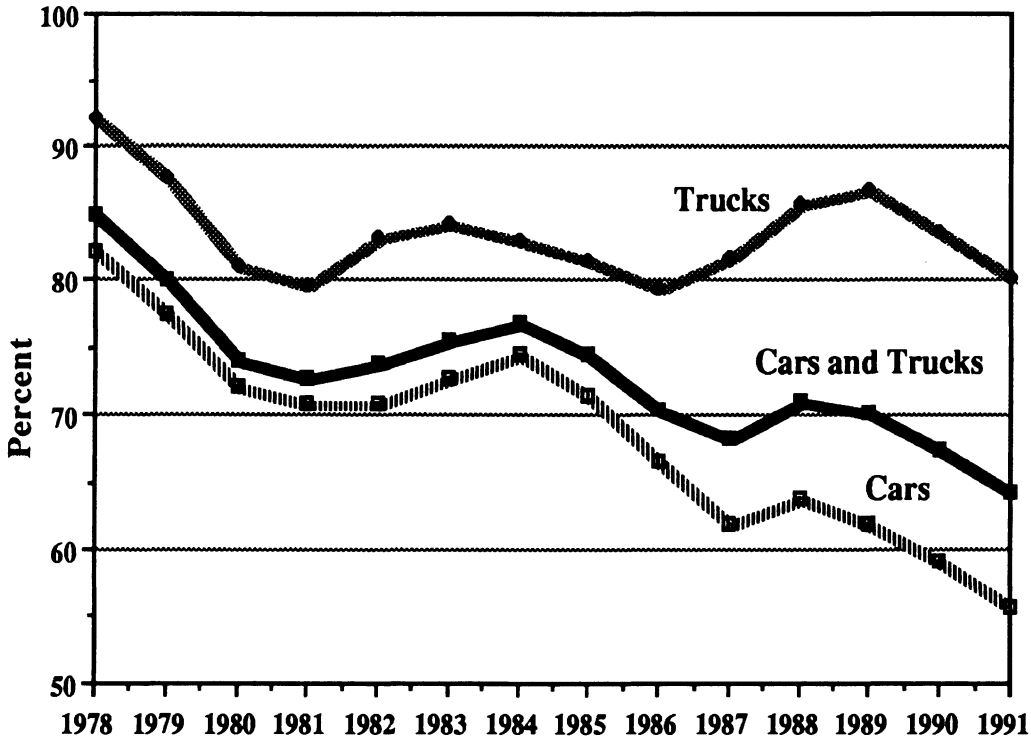

Figure 1.1. Market Share of Traditional North American Industry, 1978-1991

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to reflect the manufacturers' own production activities, excluding their sales of captive vehicles. We exclude captives because of their relatively minor and indirect role in the North American economy.

[5]Motor Vehicle Manufacturers Association (MVMA), World Vehicle Data, 1991.

[6]James P.Womack, Daniel T. Jones, and Daniel Roos. *The Machine That Changed The World.* Rawson Associates, New York. 1990.

Production Levels

Market share loss by the Traditional North American automotive manufacturers has been somewhat offset by market growth since 1978. Consequently, absolute production levels have not fallen as much as they might. Nevertheless, as figure 1.2 reveals, unit North American production by the Traditional manufacturers reached a record level in 1978, and has not reached that level since. In fact, the 1986 record sales year—at approximately 17.8 million units—was the first North American record sales year that did not also yield a new North American production record.

The 1979 and 1990 markets in North America were almost identical in size—at approximately 15.5 million units—yet Traditional North American production in 1990 was only 77% of 1979 levels. Indeed, had 1978 market shares prevailed in 1990, total Traditional production in 1990 would have been some 30% higher than its actual level. Much of the economic activity associated with automotive production occurs at supplier companies, and the manufacturers' sales and production levels largely determine the size of the market available to these suppliers. These vehicle sales and production numbers for the Traditional manufacturers, then, represent the traditional market for North American automotive supplier companies. As the Traditional manufacturers' production levels have declined, the business levels, opportunities, and potential economic activities of suppliers have also receded. In 1991, production levels of the Traditional industry continued to decline, as shown in figure 1.2.

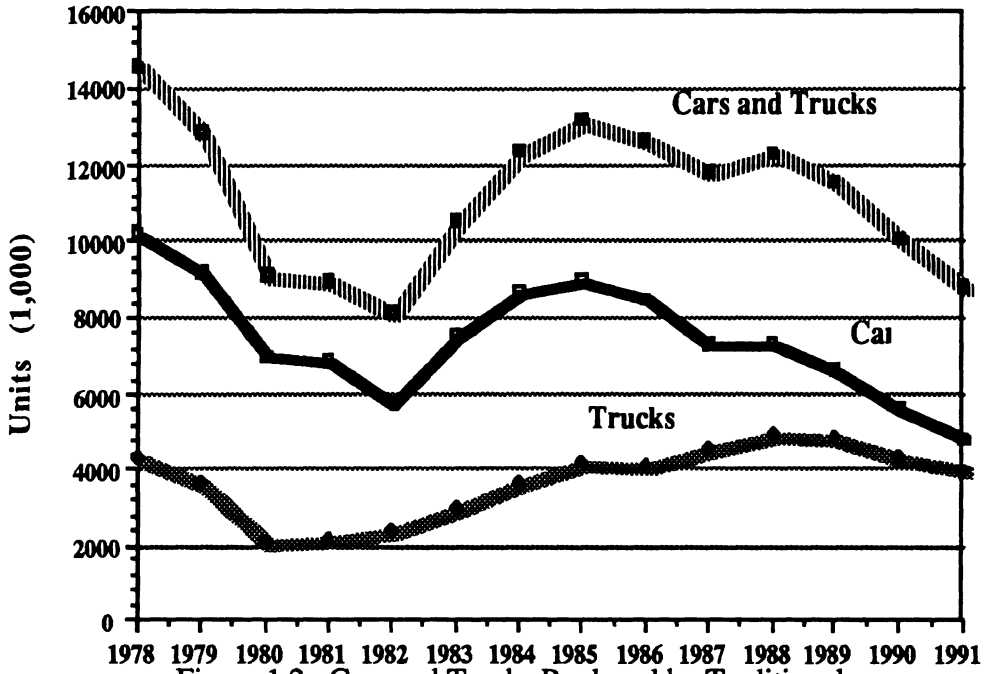

Figure 1.2. Cars and Trucks Produced by Traditional North American Assemblers, 1978-1991

Profits

The profits of the Traditional industry have sharply declined, as shown in figure 1.3.[7] This has damaged shareholders, as the decade of the 1970s produced six years that were more profitable (in pretax, constant dollars) than was 1984—the most profitable year in the 1980s. The steady decline in profits since 1984 is alarming, especially in view of the relatively strong rates of capacity utilization.

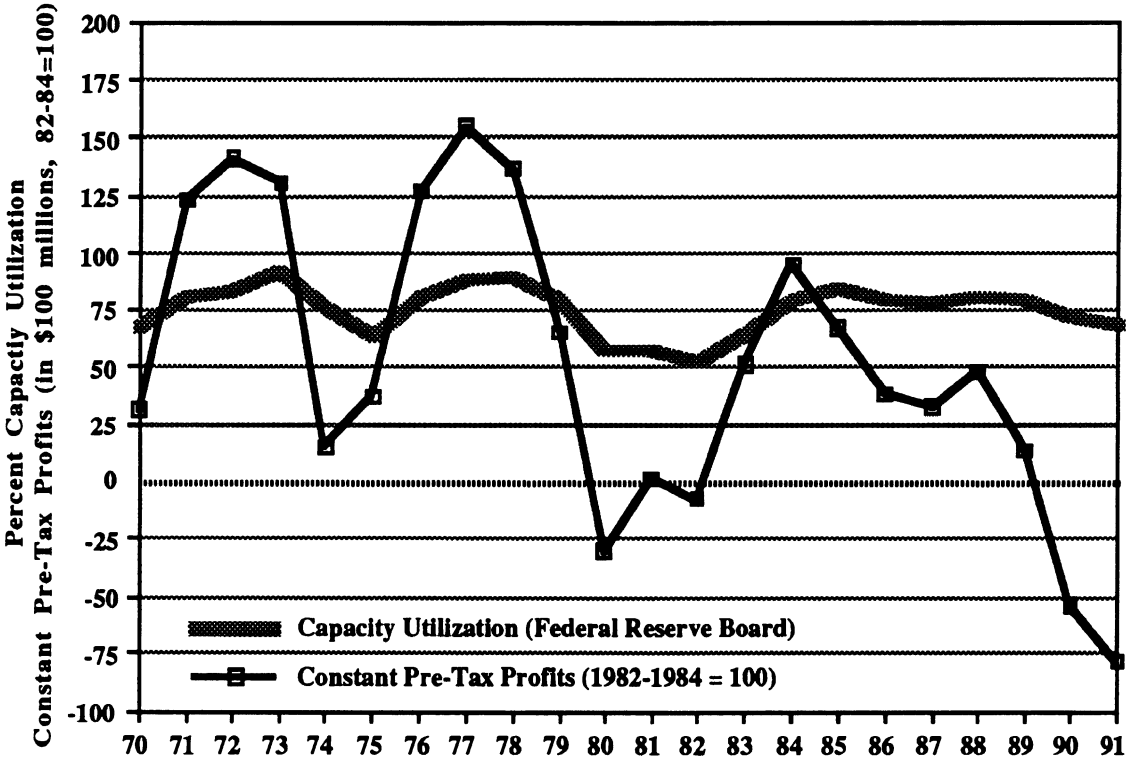

Figure 1.3. US Motor Vehicle Manufacturing Capacity Utilization Versus Pre-Tax Profits, 1970-1991

Automotive production involves huge fixed costs and relatively high break-even points. That means that manufacturers must sell large numbers of vehicles before they become profitable, and additional sales beyond the break-even points have major impact

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[7]Bureau of Economic Analysis (BEA), US Department of Commerce (DOC), Federal Reserve Board. The North American automotive industry is broadly defined to encompass fifteen separate industrial activities or sectors, including two core industries: motor vehicle manufacturers and motor vehicle parts and accessories. This definition includes the North American production activities of manufacturers owned outside North America. These figures include estimates for automotive suppliers categorized as such by the two governments. Many companies that consider themselves automotive suppliers are not so categorized in industrial classification codes. For example, a supplier of mirrors or window glass would typically be included in the glass industry, even though some companies only manufacture glass for automotive use. While it is difficult to estimate precisely how much of an underestimate of automotive industry activity this introduces, it probably has little effect on comparisons across time.

upon their profit levels. It is particularly worrisome that the automotive companies may no longer be profitable at 80% capacity utilization, an historic standard that permitted them to facilitize for the wide market swings associated with the economic cycle.

If this is the case, then the pattern of weak profits or small losses in bad years, offset by robust profits in good years, may change. That pattern may be replaced by one of small or large losses in bad years, which cannot be offset by weak profits or even small losses in good years. The structural remedy for this is further reductions in capacity, but that involves large losses and transition costs for the North American economy.

Investment

Increased inroads by the foreign competitors have pressured management to reduce investment levels to offset declining profitability. To be sure, absolute investment levels remained high, averaging over $10 billion a year for the decade of the 1980s. However, total automotive investment in plant and equipment, as a percentage of all manufacturing investment, fell in the 1980s compared with the 1970s. This occurred in spite of the large investments made in North America by the Japanese industry during that former period.[8]

Profit pressure has also resulted in the delay and even cancellation of vehicle programs, model freshenings, and powertrain programs—and that places the Traditionals at a marked disadvantage in the marketplace. Traditional North American manufacturers already offer fewer passenger car models and platforms (basic structure supporting multiple models) than imports and New Entrants. While they will invest an estimated $139 billion in product development between now and 1996, they will rely more heavily on minor rather than major facelifts and introduce fewer new models.

By 1996, the Japanese manufacturers will introduce over three times as many new models as the Traditionals. While some may see this as a failure of competitive will on the part of the Traditional manufacturers, it is more a question of capital availability and allocation. To be sure, the Japanese industry consists of nine manufacturers, so it might be expected to support larger capital investment and a broader range of product offerings. Whether it is one company or nine, it represents the same competitive dilemma for the Traditional North American manufacturers, and raises the same concerns as to its effect on the North American automotive economy.

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[8]Motor Vehicle Manufacturers Association (MVMA), Facts and Figures '91, p. 63. Steven Hertzenberg, *The Internationalization of the Auto Parts Industry: 1958-1987 and Beyond.* Table 19 estimates Japanese investment for assemblers alone in the United States at $6.4 billion, and in Canada, at $1.5 billion.

Research & Development

Declining profits also encourage companies to restrict research and development (R&D) expenditures. The Traditional North American automotive industry invests heavily in R&D activities. While absolute R&D spending levels increased throughout the 1980s—74% in the US and 107% in Canada—the industry's share of total industrial R&D fell. In 1980, the US automotive industry accounted for 14% of such spending, but only 11% in 1989; the Canadian industry's share fell from 3% to 2%.[9]

Employment

Employment in the automotive industry has also fallen since 1978, as have real wages.[10] The US decline in employment involved the loss of over 240,000 jobs between 1978 and 1990, as shown in figure 1.4. The US decline has been somewhat offset by an increase in Canada, where 1990 levels are at 139% of 1978 levels, and more than 44,000 jobs have been gained. This reflects the shift in assembly activity from the United States to Canada during the 1980s. Some of this shift reflects the market success of particular vehicles, but some is driven by a substantial increase in Canada's share of Traditional assembly capacity.

While US assembly workers have seen an hourly increase of $0.15 in 1990 dollars since 1978, workers in the parts industry have seen their hourly wage decrease $2.34. Over the same period, Canadian production workers have gained $0.23 in 1990 Canadian dollars. Employment and wage shrinkage damages the many individuals who depend, or depended, on the industry for their livelihood. It also severely damages some local communities, by virtue of the industry's historic concentration in the US upper Midwest and the Province of Ontario.

It is important to note that the employment decline of 12% shown in figure 1.4, has occurred in spite of the expanded direct investment of the Japanese automotive industry in Canada and the United States. If Traditional market share in 1989 were the same as it had been in 1978, we would expect to see some 22% higher Traditional employment in Canada and the United States.[11]

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[9]Michael S Flynn, *Automotive Research and Development in Canada.* A Report Prepared for The Science Council of Canada. January 1991, p. 47.

[10]US Employment levels based on OSAT calculations; Canada employment and wage data from Hertzenberg, op.cit., tables 20, 23B and 25.

[11]These projected increases cannot be applied directly to the employment levels of figure 1.4 because those estimates include employment created by the New Entrants.

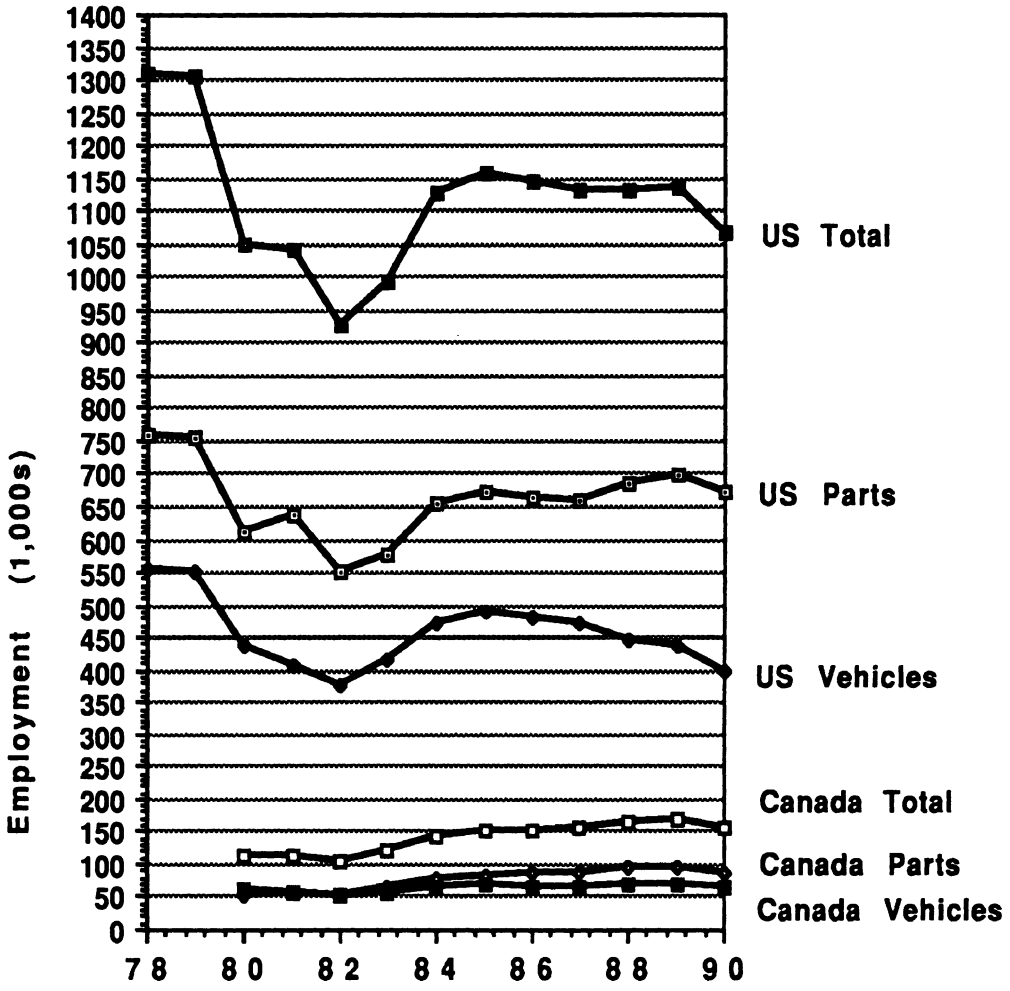

Figure 1.4. North American Automotive Employment, 1978-1990

A Competitive Crisis

By any of these four measures—sales share, production, profits, or employment—the Traditional North American Automotive Industry has endured a dreadful dozen years. Nontraditional manufacturers have captured share, in turn restricting Traditional production, slashing profits, and lowering industry employment—resulting in declining real wages. It is no exaggeration to describe the industry's current situation as a competitive crisis. The direct source of this competitive crisis is well known: the industry has been buffeted by severe competition from imports over the past two decades, and has lost the confidence of many consumers. The most significant offshore competitor has been the Japanese industry, and its success in North America has come largely at the expense of the Traditional North American industry.

Some might raise the question of whether recent developments in the North American industry are not simply another example of the working of fundamental economic laws. After all, new products, new producers, and new national sources are constantly emerging, and industries and nations must sometimes reallocate their investments wisely, minimize the transition costs, and seek new areas of comparative advantage.

Does concern for the Traditional industry simply reflect an unwillingness to recognize the benefits of economic revitalization through the successful entry of new competitors—namely the Japanese manufacturers? To be sure, levels of North American assembly activity have declined less since 1978 if we include the production and sales of the Japanese New Entrants, as shown in figure 1.5. However, the decline in passenger car production is still substantial.

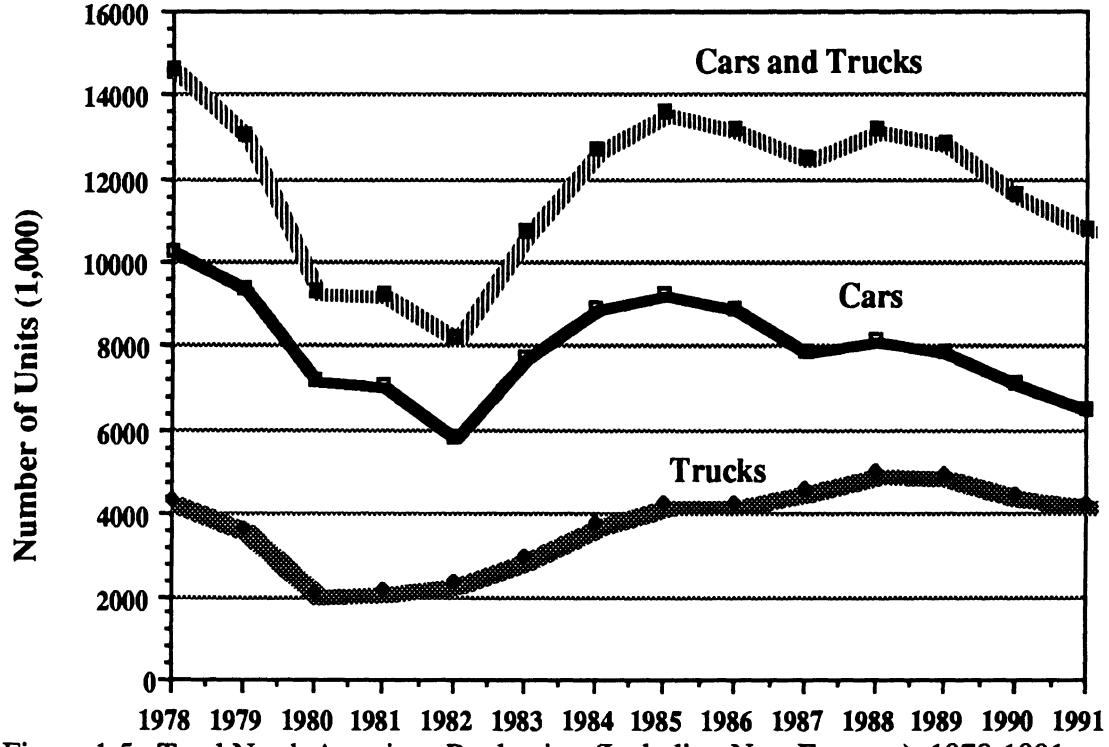

Figure 1.5. Total North American Production (Including New Entrants), 1978-1991

Furthermore, Japanese direct investment in North America certainly has its parallels in the strategies and business decisions of the Traditional North American industry at both the manufacturer and supplier level. After all, both General Motors and Ford maintain significant broad-based participation in other countries' automotive economies, most notably in Europe. Moreover, they are ultimately US corporations, and some see little difference between their activities in Canada and Japanese direct investment in Canada. Many North American suppliers are themselves large

multinational corporations with production and sales activity dispersed throughout the world rather than concentrated exclusively in North America.

However, the expansion into Europe by the North American automotive industry came at a time when the overall European market was growing, between 1910-1930. In contrast, today's stagnant market in North America renders the Traditional North American industry much more sensitive to the timing, levels, and focus of Japanese direct investment. The transition occurring as a result of Japanese direct investment creates opportunities and threats in the possible future direction of the North American industry.

Possible Future of the North American Industry

Should North America abandon automotive production by the Traditional industry and simply put its resources to more effective economic use in other sectors? That argument is appealing to many, but faces an important empirical barrier in the case of the auto industry. Figure 1.6 displays the relative labor efficiency of a range of US manufacturing industries. Note that most manufacturing industries are more efficient than the economy as a whole, and that the automotive industry is the fourth most efficient manufacturing industry, generating about $100,000 value-added per employee. The strategic reasons (i.e. sustained domestic growth, high value-added employment, etc.) that have motivated Japan and other countries to target the auto industry are the same motivations for their announced targeting of other high value-added industries.

The problem with the argument that the economy simply shift resources to other sectors is that only the chemical industry, of the more efficient manufacturing industries, is of comparable size to automotive: tobacco products and petroleum combined support only 160,000 workers. There really is no reasonable manufacturing target for resources shifted out of the automotive industry. North America should perhaps view the situation as so many other economies do—automotive as a target to shift to, not away from!

There is a risk that North American automotive activity may well change in important ways if the new Japanese entrants increasingly replace the activity of the Traditional industry. These changes will include a decline in the level of North American supplier activity that local motor vehicle assembly supports. Japanese manufacturers, across all manufactured goods, accounted for about half of all imports by foreign direct investors in the United States for 1988, even though they accounted for only a quarter of all direct investment sales. Furthermore, 93% of Japanese direct investors' imports came

from Japan, while European investors sourced only 70% from all of Europe.[12] It may well take longer to substitute North American sourcing when the importer is also an established supplier in Japan. In fact, many North American suppliers are told by New Entrants that business really is not available because of the close cooperative relationship that obtains between the parent company in Japan and the current Japanese supplier.

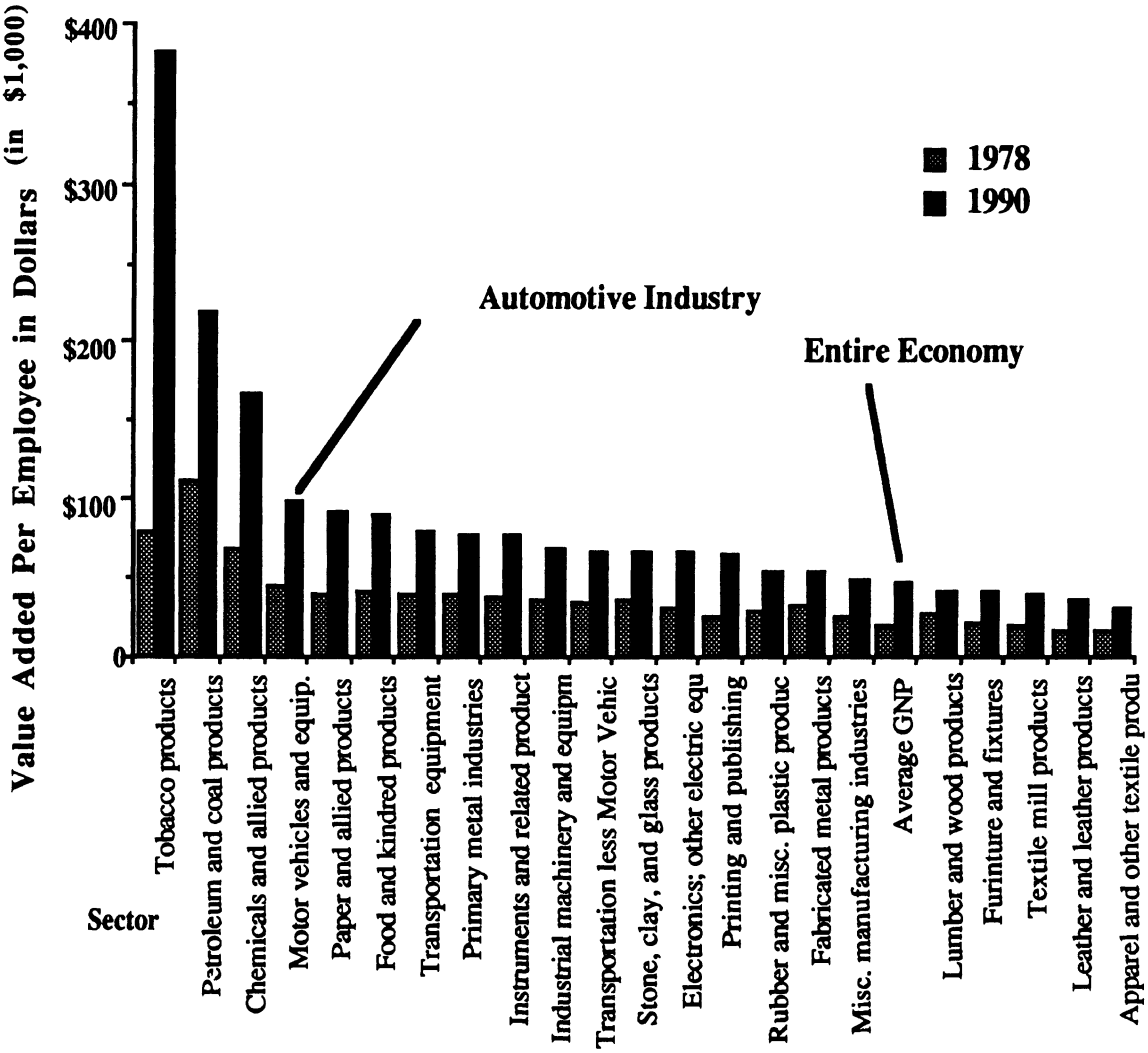

Figure 1.6. Average Value Added Per Employee in Various Industrial Sectors

There is also concern that the full range of jobs the industry currently provides will shrink as the Traditional industry contracts. Certainly many technical and managerial jobs will be less open to North American citizens because the headquarters

[12]Congress of the United States. Office of Technology Assessment. *Making Things Better—Competing in Manufacturing*. Summary, 1990, p. 25.

and R&D functions will remain largely concentrated in Japan. Just as the Traditional North American industry has provided those jobs in North America, sometimes to the resentment of foreign nationals, the Japanese industry will undoubtedly keep most of those jobs in Japan. Finally, the benefits the industry confers as both a source of and a spur to technical innovation here in North America will surely diminish. If technical R&D is largely performed in Japan, and key suppliers are also located in Japan, then it is Japan, and not North America, that will be the initial and primary beneficiary of the automotive industry's technological push and pull. While some Canadians may feel that there is little to chose between a US-owned or Japanese-owned industry in Canada, in fact it is highly doubtful that the Japanese and Canadian industries will ever become as fully integrated under Japanese ownership as they have become under US ownership. In sum, we believe that North American ownership of this critical industry is crucial because we cannot afford to lose control of it.

These questions are important ones that, unfortunately, admit of few clear and certain answers. However, the context for asking them is crystal clear, as the motor vehicle industry remains the single largest manufacturing industry in North America, as it is in both Canada and the United States. The importance of the context requires that we attempt to answer these broad questions, and develop information that contributes to the preservation of automotive manufacturing in North America to the extent possible under free marketplace competition. The purpose of this report is to contribute to that effort.

Structure of Report

What might the future hold? Will the automotive economy in North America maintain its recent course, characterized by reduced activity levels in the Traditional industry, enhanced activity by the New Entrants, and perhaps higher ratios of imports in the market? Or might the Traditional North American manufacturers and suppliers regain market share and activity, as they become more successful in meeting the competitive challenges from abroad and from New Entrants into North America? If there is a continued shift of North American production to New Entrants, how do the two governments ensure that North America does not face eventual competitive decline in automotive activity, and increase the likelihood that national ownership and control has little effect on the types and levels of that activity, and the benefits it confers?

These and other significant issues are addressed in the report. Chapter II describes the economic significance of the North American auto industry, including its impact on other industries, its contribution to North American tax revenues, and other

related measures. The chapter also presents a model of the impact on the US and Canadian economies of increasing domestic motor vehicle production by 500,000 units.

Chapter III opens with a brief overview of the global auto industry, comparing the three major vehicle producing regions and vehicle markets—namely Europe, Japan, and North America. Also included is a discussion of two emerging automotive participants—South Korea and Mexico. The chapter concludes with a discussion of emerging automotive markets.

Chapter IV presents a competitive assessment of the North American industry vis-a-vis the Japanese industry along several dimensions, discussing several related competitive issues, including product development cycles, capital investment levels, market size, consumer demographics, quality, manufacturer/supplier relations, and human-resource factors. The chapter concludes with a discussion of the future structure and likely trends of the North American industry.

Chapter V discusses the impact that differing public policies have on industry performance in several nations, with a particular emphasis on trade, cost of capital, and health care. The chapter includes an assessment of the perception that policy officials in North America have about the automotive industry. The chapter concludes with a discussion of the proposed North American Free Trade Agreement (NAFTA).

Chapter VI presents a general summary of the competitive status of the Traditional North American Automotive Industry . A conceptual framework utilizing a break-even model is employed to compare fixed and variable costs of the North American and Japanese industries. Sources of these costs are allocated to either public sector policies or to the private arena. The chapter closes with several conclusions about the contribution of these costs to the higher break-even point of the Traditional North American industry.

Finally, Appendix A presents a compendium of policy recommendations related to industrial competitiveness proposed by a variety of studies and reports published by various organizations and agencies during the past several years.

II. ECONOMIC SIGNIFICANCE OF THE AUTOMOTIVE INDUSTRY

Why does is it matter whether or not the Traditional North American Automotive Industry remains viable? What difference does it make if automotive production facilities in North America are owned by the Traditional North American manufacturers—i.e., the Big Three and their suppliers—or by Japanese vehicle producers? Is it not the case that Honda's operations in Ohio are as beneficial to the US economy as are GM's operations in Detroit? Similarly, are Toyota's operations in Canada not as beneficial to the Canadian economy as are Ford's operations in that country? After all, GM and Ford claim that their operations in Germany are just as beneficial to the German economy as are those of Volkswagen.

Before answering these questions, it is important to understand the magnitude of the contribution by the Traditional Automotive Industry to the North American economy, and to recognize that this beneficial contribution has diminished in the past decades as a result of declines in vehicle production and sales by the Big Three. It is equally important to note that the New Entrant manufacturers currently make a significantly smaller contribution to the North American economy than their proportion of production in North America might suggest.

Differences Between the Traditional Industry and the New Entrants

To fully appreciate the importance of the Traditional North American Automotive Industry , it is necessary to understand the considerable differences between that industry and the New Entrants, as well as the differences between the European operations of Ford and GM compared with the North American operations of the New Entrants.

Vehicles produced in North America by the Traditional manufacturers reflect overwhelmingly North American economic activity. In spite of increased offshore sourcing by the Big Three, the traditional vehicle is assembled in North America, using parts and components that are themselves manufactured and assembled here, with materials that are processed and fabricated here. This North American chain of value-added represents jobs and profits at each stage of production and sale.

While New Entrants provide local assembly jobs, their vehicles have lower levels of North American-sourced materials, parts, and components than traditional vehicles. The domestic content of Big Three and New Entrant vehicles is not the same, so their respective effect on the domestic economy is quite different. We estimate that New Entrants sourced over $3,200 in Japanese parts for each vehicle they built in North

America, thereby accounting for nearly 32% of the automotive parts deficit with Japan. The Big Three, by comparison, sourced only $150 in Japanese parts for each vehicle built, so that even with their high volumes, the Big Three accounted for only about 12.4% of the parts deficit.[13] Moreover, the comparative tendency of Japanese direct investment to rely on imports from the home country suggests that this pattern will not shift dramatically over time.[14]

Imports—whether true imports or captives—represent value-added chains of production abroad, with a serious loss of jobs and profit to the economies of Canada and the United States. The pattern of Japan's automotive foreign investment parallels the pattern of Japanese foreign investment in electronics and other industries. American affiliates of Japanese electronics companies mostly employ Japanese managers, while American electronics affiliates in Japan mostly employ Japanese managers.

To be sure, imports provide jobs and profits in the retailing and servicing sectors of the industry, but the manufacturing share is eliminated. Further, the aftermarket opportunities of Traditional parts manufacturers shrink as the relative ratio of the foreign operating fleet increases. Captive imports, of course, provide somewhat greater shares of final sale profit, and often some participation in manufacturing profit when the source of such vehicles is offshore operations of the Big Three, or a foreign nameplate partially owned by one of the Big Three. Such is the case with General Motors in its sales of Suzuki and Isuzu vehicles. Some of the multinational suppliers, such as Allied-Signal and Kelsey-Hayes, also participate to a limited degree in profits from the sale of some captive and true imports.

Finally, it is noteworthy to compare the different characteristics of Ford and GM operations in Europe with the practices of the New Entrants in North America. Ford and GM operations in Europe are generally indistinguishable from those of the indigenous European automotive manufacturers in terms of their contribution to and integration in the European economies. In contrast, the New Entrant operations in North America have generally chosen to import virtually all major components from Japan or to bring their own affiliated suppliers from Japan, rather than to source from the Traditional North American parts industry.

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[13]Sean McAlinden, David Andrea, Michael Flynn, and Brett Smith. *U.S.-Japan Automotive Bilateral 1994 Trade Deficit*, OSAT, University of Michigan, Report for The Automotive Parts Advisory Committee. May,1991.

[14]Congress of the United States. Office of Technology Assessment. *Making Things Better—Competing in Manufacturing*. Summary, 1990.

Employment and GNP

The Traditional Automotive Industry is the largest manufacturing industry in North America, accounting for nearly 4% of Gross National Product. The industry generates approximately 1.2 million high wage jobs and provides health and pension benefits to employees, retirees, and their families. Furthermore, the auto industry directly supports an additional one million jobs in related industries. Thereby, the North American automotive industry directly accounts for approximately 2.2 million high paying and high value added jobs—contributing significantly to the North American standard of living. It is especially important to note that automotive jobs are relatively high value added—approximately $98,000 per employee as compared with an economy-wide average of $46,000. Only three other manufacturing sectors have higher value added per employee performance than does automotive.

The number of jobs created by the New Entrants in North America does not offset those automotive jobs lost by the Traditional industry—either in assembly or components.[15] As a result of extensive use of parts imported from Japan, cars made and sold in North America by the New Entrants support many fewer jobs than do cars made by the Traditional industry. Even after the North American industry's current downsizing is completed, the Traditional North American produced car will support considerably more jobs than will current New Entrant production.

Finally, the scope of job opportunities provided by the New Entrants is more limited, characterized primarily by production jobs. The full range of jobs that the Traditional industry currently provides will shrink as the Traditional industry contracts, and many technical and managerial jobs will be unavailable to US citizens, but will instead be largely concentrated in Japan.

It is possible that over time the New Entrants will become more closely integrated into the Traditional North American economy, as GM and Ford have done in Europe. However, it is unlikely that this process will occur without strong pressure from the North American governments, as well as from the Traditional industry itself. While the New Entrants often state that they intend to become truly North American companies, and while they have made some progress in this direction, that progress has been quite limited given the length of time that some New Entrant operations have been in North America.

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[15]Testimony of Professor Candace Howes before the Joint Economic Committee hearing on "The Future of US Manufacturing: Auto Assemblers and Suppliers," December 10, 1991. Professor Howes estimates a net loss of 150,000 jobs in the US industry due to the transfer of sales from the Traditional industry to New Entrants between 1982 and 1993.

Linkage to Other Industries—the Multiplier Effect

The automotive industry is linked to and is a major customer of other important industries, accounting for over 25% of the sales of stampings, glass, machine tools, and semiconductors, and over 50% of the sales of rubber, lead, and iron. By employing approximately 6% of all scientists and engineers, and by accounting for approximately 11% of North American corporate R&D in 1991 (though it was down from 14% in 1980), the automotive industry is a major source of advanced technologies and has a ripple effect to other industries. While New Entrant automotive facilities in North America are producing an increasing number of vehicles, their contribution to the North American economy is much more restricted than is that of the Traditional industry. The operations of the New Entrants are closely linked to their home countries (particularly in the case of Japan), from which they procure most of their value-added components and where they locate most of their engineering activity.

The Traditional industry's contribution to the North American economy in terms of GNP, employment, and other variables has diminished in parallel to its reduced North American market share and declining profits.

Minority Opportunity[16]

The Traditional Automotive Industry has an impressive record in providing employment and business opportunities to minority citizens. The Big Three and their suppliers are a major source of jobs and income for minority Americans. A recent study reports that black Americans represent a larger proportion of the workforces at the Big Three than in other sectors, reaching some 17% in 1984, compared with 11% of the national workforce. Moreover, because of the high wages these jobs pay, General Motors alone accounted for 1.7% of all wages and salaries paid to black Americans in 1987, almost three times the proportion of jobs it provided. Further, many minority-owned businesses depend on the automotive industry. In both 1989 and 1990, General Motors alone purchased over $1 billion dollars in goods and services from minority suppliers, and all vehicles built by the Traditional industry contain components from minority

[16]Most of the data in this section are drawn from "Minority Businesses: The Opportunity Structure of the Domestic Automotive Industry," Testimony by Michael S. Flynn before the Commission on Minority Business Development's Hearings on International Competitiveness in Detroit, MI, May 30, 1991.

suppliers. Black-owned automotive suppliers account for nine of the largest 100 black-owned industry and service companies.[17]

Minority dealerships account for over 5% (295) of Ford's 5,500 outlets, and Chrysler has committed to increasing its Hispanic dealerships by 10% a year. Big Three programs to expand minority dealerships have benefited from a serious commitment of funds, personnel, training, and business assistance. Nevertheless, the failure rate of black-owned dealerships over the past 20 years has exceeded 55%, while the rate for all other dealerships has been about 20%.[18] Black dealerships are a central business activity for the black community: four of the eight black-owned businesses with sales in 1990 exceeding $100 million were dealerships, and the 100th largest black dealership would rank 79th in sales among all black-owned industrial and service companies.[19]

If the Traditional Automotive Industry has been a major avenue of opportunity for minority Americans, in both the employment and business arenas, New Entrants and imports have not. The siting and employee selection policies of New Entrant plants make them less likely employers of minority Americans than the Traditional Big Three plants they are displacing. Minority suppliers' location, recency, and, in some cases capital weakness all make them less likely to secure business at New Entrants than with the Big Three.

The proportion of Import/New Entrant dealers who are minority Americans is extraordinarily small, representing well under 1% of all Import/New Entrant outlets. Only 10 of the 100 largest black dealerships carry Japanese-badged vehicles, and only five carry Nissan, Toyota, or Honda products. None of these dealerships is an Import/New Entrant exclusive, and all carry at least one of the Big Three lines.[20]

So while the decline of the Traditional North American industry in the face of Import and New Entrant competition raises economic concerns for all North American citizens, minority citizens are likely to suffer disproportionately from this decline, and that should be a serious concern for all citizens.

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[17]*Black Enterprise*, vol. 21, no. 11, June, 1991, pp. 107-114. This estimate may be low: some companies may have significant automotive business in addition to the reported lines.

[18]"NAACP to probe black dealer's loss of Chrysler point," *Automotive News*, 12/2/91, p. 8.

[19]*Black Enterprise*, op. cit., pp. 107-114 and 117-124; and OSAT calculations.

[20]*Black Enterprise*, op. cit., pp. 117-124.

Contribution to Government Revenues

The North American automotive industry generated approximately $11.3 billion in tax revenues in 1990—$7.05 billion in production-related taxes to US federal, state, and local governments, and approximately $4.25 billion to the Canadian federal and provincial governments—consisting of $1.35 billion in production related taxes and an additional $2.9 billion in vehicle sales taxes. The automotive industry's annual level of tax payments closely reflects the size of the market in a given year, and the Traditional industry's market share. Tax payments from the Traditional North American automobile industry have fallen sharply since the mid-1970s, in parallel to declining market share and profit.[21]

Tax payments for four years are compared below—1978, 1979, 1986, and 1990. North America saw a record production year in 1978, reaching approximately 14.4 million units. In that year, the Traditional industry accounted for 85% of the North American market. In 1979 the production figure dipped slightly to 14.1 million units, and continued to drop through the early 1980s, but climbed back to slightly over 13 million units in 1986—a new record sales year. Production by the Traditional North American industry dropped to around 12 million units by 1990, capturing a 65% market share in a market with the same size as in 1979.

US Tax Payments

Total tax payments to US governments, including income, payroll, sales, and excises, are estimated to have been $9.21 billion in 1978 and $7.05 billion in 1990, a decline of 23%, as shown in table 2.2. (Federal liability is negative in 1986 because of an unusually large net operating loss reported by one company in that year which dominated the positive liability of the rest of the industry.)

Total tax payments by the Traditional North American automobile industry to US state and local governments declined from $2.1 billion in 1978 to $1.7 billion in 1990, a 17% reduction. Income taxes comprised the largest share of that decline, followed by property taxes. From 1978 through 1986, state and local income taxes fell 73%, but they recouped nearly half that loss by 1990, registering an overall decline of 43%. Real estate and property taxes declined by 12%. Sales and excise taxes rose sharply, but the amounts involved were still quite small in comparison to the other taxes.

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[21]Comparable and separate tax liability figures for the New Entrants are not available.

Declining employment in the Traditional North American automobile industry imposed additional expenditures on US federal and state governments, mostly in the form of unemployment benefits. These expenditures have ranged from a low of $41 million in 1978, to a high of $120 million in 1990.

Table 2.2. Total Tax Payments to US Governments ($ million)

Calendar Year	1978	1979	1986	1990	1978 Market Share in 1990[1]	Potential Increase
Federal Liability						
Income	$3,848	$2,546	-$217	$1,174	$5,968	$4,794
FICA	1,344	1,708	2,700	2,724	2,932	208
FUTA	66	67	80	55	60	5
Excise	1,857[2]	2,036[2]	1,559[2]	1,367[2]	1,367	-
Total Federal Liability	7,115	6,357	4,122	5,320	10,327	5,007
State & Local Liability						
Income & Franchise	538	255	145	306	1,556	1,250
SUTA	374	349	616	356	374	18
Sales & Use	106	62	173	157	172	15
Real Estate & Property		842	640	805	805	-
Excise	26	26	37	41	41	-
Other	211	152	142	134	134	-
Total State & Loc. Liability	2,097	1,484	1,918	1,733	3,016	1,283
Total US Liability	9,212	7,841	6,040	7,053	13,343	6,290

FICA = Social Security and Medicare payroll taxes. FUTA = Federal unemployment insurance
SUTA = State unemployment insurance.
1. Does not include offsetting decline in transplant and foreign manufacturer tax liability.
2. Adjusted to Federal Highway Administration Total

Although corporations enjoyed a substantial tax reduction under the 1981 Economic Recovery Tax Act, most of those benefits were removed by subsequent tax increases in 1982, 1984, and 1986. According to the Internal Revenue Service, North American automobile industry income tax after credits declined by 64% between 1978 and 1986. Income subject to tax, before deductions, declined by 55%. This demonstrates that declining income was responsible for approximately 86% of the decline in tax payments.

Increased US Tax Payments if 1978 Market Share Were Restored

If the Traditional North American Automotive Industry 's sales and profitability in 1990 were equivalent to those implied by its 1978 market share, total US tax liabilities in 1990 would have risen from $7.05 billion to $13.35 billion, for an increase of $6.30 billion, or approximately 89%. Taxes paid by New Entrants would have declined with their associated decrease in market share, but because these firms have reported less profit than Traditional North American firms from comparable assets and sales, that reduction likely would have been only a fraction of this estimated increase. This would leave a net increase for US governments of approximately $4.6 billion in 1990 dollars. Even if New Entrants replace the levels of Traditional activities in the future, the short-term costs in employment and lost government revenues are enormous.

Canadian Federal and Provincial Income Taxes

The Canadian motor vehicle and parts industry (including New Entrants) has incurred increasing federal and provincial income tax liabilities as shown in Table 2.3. Federal liability for motor vehicle and parts manufacturers jumped from $183 million in 1978 to $508 million in 1986, a 178% increase. Provincial liability rose by an even larger 250%. While figures for 1990 are not yet available, the direction of change in Canadian income taxes in 1990 is expected to be up slightly. In contrast to US tax payments, then, Canadian tax payments have increased. This largely reflects a shift by Big Three assembly activities to Canada since 1978.

Table 2.3. Canadian Federal and Provincial Income Tax Liabilities (Millions of $ Canadian)

	1978	1979	1986	1990
Motor vehicles and parts manufacturers				
Federal	183.1	195.6	508.4	NA
Provincial	81.0	92.3	283.6	NA
Truck bodies manufacturers				
Federal	9.8	14.6	19.6	NA
Provincial	4.6	7.3	9.1	NA

Source: Statistics Canada

In 1991, retail vehicle sales and servicing accounted for a little over one-third of total Canadian retail trade. The federal and provincial governments in Canada (except Alberta) collect substantial consumption taxes on the retail sales and use of vehicles. The largest taxes in revenue terms are the federal goods and services tax (GST), which is applied at a 7% rate, and the provincial retail sales taxes, which have rates ranging to over 10%. (The federal GST on vehicles sold at retail replaced the federal sales tax levied on

manufacturers in January 1991.) In Ontario, for example, the combination of the federal GST at 7% and the provincial tax at 8% produces a combined sales tax burden of 15%.

In 1991, new motor vehicle sales in Canada totaled almost 1.3 million units. Assuming an average retail sale value of $15,000, and using a 15% tax rate, it is estimated that the sales tax revenues generated for the federal and provincial governments by vehicle sales was on the order of $2.9 billion. If sales in 1991 had remained at 1990 levels, revenues would have totaled an estimated $3.5 billion.

Potential Economic Impact of Increased Vehicle Production in the US

The preceding sections of this chapter have assessed the diminished contribution of the automotive industry to the economies of North America, resulting from declining production volumes by the Traditional industry. This final section assesses the potential economic contribution of increases in vehicle production of 500,000 units by the Traditional industry in the United States and Canada, respectively.

Table 2.5 shows the results of a sustained annual production increase of 500,000 units in the United States by the Traditional industry (substituting for imported vehicles). As the table indicates, a 500,000 annual unit production increase in the United States will result in a number of positive economic benefits by 1995, including:

• Creation of 119,000 high-paying jobs in the US. Of these 119,000 jobs, about 15,000 (13%) will be in vehicle assembly, and 72,000 (60%) in related supplier industries—including automotive parts and components, engineering and support services, and related nonmanufacturing businesses. Finally, 32,000 jobs (27%) will be created through increased consumer spending and business investment.

• An increase in labor income and company profits of $4.3 billion, or $8,600 per vehicle.

• An increase in net local, state and federal revenues of $2 billion or $4,000 per vehicle.

• A reduction in the trade deficit of $7 billion.

• A decrease in government transfer payments, such as welfare and unemployment compensation, of approximately $1 billion.

• An increase in personal disposable income of $2.3 billion.

Table 2.5. Impact on the US Economy
of Annual Increase in Domestic Production by 500,000 Vehicles.

ASSUMPTIONS:	1993	1994	1995	1996	1997
Additional domestic vehicle production	500,000	500,000	500,000	500,000	500,000
Reduced import vehicle sales	500,000	500,000	500,000	500,000	500,000
Additional shipments ($billions 1990)	7.012	7.012	7.012	7.012	7.012
Estimated Change in net exports ($billions 1990)	7.012	7.012	7.012	7.012	7.012
ESTIMATED IMPACT:					
Employment					
Direct Employment	15,599	15,547	15,336	15,116	14,840
Total Private Employment	125,031	122,172	119,094	116,734	113,859
Private Employment Multiplier	8.0	7.9	7.8	7.7	7.7
Income($billions current)					
Labor & proprietor's *	4.18745	4.24628	4.32146	4.47865	4.61828
Transfer payments	-.29383	-.96710	-1.00659	-1.05750	-1.11316
Employee Soc. Sec. Taxes	.29999	.30435	.30991	.32333	.33563
Federal, state, & local personal income taxes	.69476	.70691	.71912	.75397	.78662
Disposable personal income	2.26953	2.26758	2.28564	2.34424	2.38281
Real disposable personal Income ($billions 1982)	1.49585	1.43945	1.39355	1.36279	1.32129

*Includes Residence Adjustment. Source: University of Michigan REMI Model

Table 2.6 provides a breakdown by industry of the 119,094 jobs that would be created by 1995 through increased annual US production of 500,000 units. The 119,094 jobs include 15,336 direct jobs for motor vehicles. A *direct* job is one immediately related to building and assembling a vehicle. An *indirect* job is one that results from increased purchases by domestic suppliers, while an *induced* job results from the additional purchasing activities of consumers and business investors.

Table 2.6. Employment by Industry Division and Source of Demand, 1995[22]

Industry division (1977 SIC code)	Employment impact		
	Indirect	Induced	Total
Total private nonfarm employment	71,813	31,945	119,094*
Manufacturing	31,918	4,423	51,676*
Durables	22,066	3,305	40,707*
Stone, clay, glass (32)	1,242	24	1,266
Primary metals (33)	2,336	13	2,349
Fabricated metals (34)	6,422	147	6,569
Nonelectrical machinery (35)	1,681	991	2,672
Electrical equipment (36)	2,526	642	3,168
Motor vehicles (371)	6,348	377	22,061*
Rest of durables	1,511	1,111	2,622
Nondurables	9,852	1,118	10,970
Textiles (22)	1,057	98	1,155
Apparel (23)	1,886	315	2,201
Printing (27)	1,520	112	1,632
Chemicals (28)	1,282	75	1,357
Rubber (30)	3,163	71	3,234
Rest of nondurables	944	447	1,391
Private nonmanufacturing	39,895	27,522	67,417
Construction & mining (10-17)	2,108	2,483	4,591
Trans., communication, & public utilities (40-49)	4,764	1,012	5,776
Trucking (42)	2,075	241	2,316
Other	2,689	771	3,460
Wholesale trade (50-51)	7,960	1,692	9,652
Retail trade (52-59)	3,593	9,220	12,813
Eating & drinking (58)	2,459	2,253	4,712
Rest of retail	1,134	6,967	8,101
Finance, insurance, & real estate (60-67)	3,487	2,616	6,103
Insurance (63-64)	1,042	577	1,619
Rest of finance, insurance, & real estate	2,445	2,039	4,484
Services (70-89, 07-09)	17,983	10,499	28,482
Personal services & repairs (72, part of 76)	1,346	1,079	2,425
Business services (73, part of 76)	10,012	148	10,160
Professional services (81, 89)	3,017	382	3,399
Other services	3,608	8,890	12,498

*Includes the direct effect of 15,336 for motor vehicles.

Estimated Regional Impact of Increased Vehicle Production

The geographic distribution among major economic regions of the short-term employment impacts resulting from 500,000 additional vehicles produced in the US is shown in table 2.7.

[22]Institute of Labor and Industrial Relations, University of Michigan, and Regional Economic Models, Incorporated (REMI).

Table 2.7. Short-Term Regional Impact
of Increased Vehicle Production by 500,000 units per year, by 1995.

	Employment Impact	
Region	Total Increase in Private Employment	Employment Increase in Motor Vehicles (SIC 371)
New England	2,441	150
Mideast	8,223	1,477
Great Lakes	80,213	14,388
Plains	6,339	1,353
Southeast	13,270	2,978
Kentucky/Tennessee	6,408	1,044
Balance of Southeast	6,962	1,934
Southwest	2,873	648
Rocky Mountain	623	121
Far West	5,112	946
TOTAL	119,094	22,061

As revealed in the first column of table 2.7, the region that benefits the most from an increase in domestic motor vehicle production, in both an absolute sense and in terms of percentage, is the Great Lakes Region. Two-thirds of the national gain in employment, or 80,213 jobs, will occur in this region by 1995. The regions with the next largest impacts, as a percentage of total employment, are Kentucky-Tennessee and the plains region (the latter due largely to Missouri, where Traditional assembly activity is substantial). However, it is the case that all regions gain some additional employment.

In summary, the short-term economic impact on the US economy of increasing domestic motor vehicle production by 500,000 units is substantial. The benefits of the are realized across many industry divisions, including those in private nonmanufacturing. All regions in the US benefit to some extent in terms of jobs, but the regions with a greater current concentration of motor vehicle activity are the greatest beneficiaries.

Potential Economic Impact of Increased Vehicle Production in Canada

The employment impact on the Canadian economy of increased Canadian production would be somewhat smaller than a comparable increase in the US due to the high level of US-produced components used in Canadian assembled vehicles. Increased

production of 500,000 vehicles in Canada would create approximately 45,000 automotive related jobs—14,164 direct jobs and 30,098 indirect jobs.[23]

Summary

The advent of Japanese production of automotive parts and components as well as vehicles in North America will mean further share loss for the Traditional industry, including additional losses of Traditional supplier business at the Traditional manufacturers, leading to economic dislocation in traditional production regions. Further expansion of the New Entrants can mean more jobs and more plant openings for some communities. Unfortunately, patterns to date suggest that New Entrants and their suppliers are unlikely to locate in the same communities that the Traditional industry may abandon, so some communities will suffer while others prosper.[24]

Moreover, the location patterns of New Entrant suppliers suggest that proportionately fewer "new" job opportunities they provide will go to minority citizens than these citizens lose as the Traditional industry has declined. Since it is likely that the majority of New Entrants have already established their locations, resolution of this problem is neither easy nor readily at hand.[25]

Even if, in the long run, Japanese direct investment were to have little effect on North American automotive activity beyond a flow of profits to Japan, the two North American economies will face significant and substantial transition costs, as new capacity replaces traditional capacity. These costs will fall especially hard on some individuals and communities, as the New Entrants have primarily located in communities distant from those that host the Traditional industry. While we welcome direct foreign investment by the Japanese industry, we think it raises a series of important questions. On balance, the New Entrants cannot replace the activity of the Traditional industry on a one-to-one basis without significant risks and costs for the two economies.

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[23]DesRosiers Automotive Consultants and Statistics Canada.

[24]See, for example, Richard Florida, Martin Kenney, and Andrew Mair, "The Transplant Phenomenon," *Commentary*, Winter, 1988, pp. 3-9.

[25]On racial effects of new entrant siting, see Robert E. Cole and Donald R. Deskins, Jr. "Racial Factors in Site Location and Employment Patterns of Japanese Auto Firms in America." *California Management Review*> Volume 31, Number 1, Fall, 1988, pp. 9-22. Note that the adverse effects may be lower for new entrant suppliers than for manufacturers. On the creation rate of new entrant suppliers, see Brett C. Smith, *Japanese Automotive Supplier Investment Directory, Fourth Edition*, UMTRI, Office for the Study of Automotive Transportation, October, 1991.

III. THE GLOBAL AUTOMOTIVE INDUSTRY

Manufacturing is becoming increasingly internationalized, and the term *global economy* has as much, if not more meaning, in the automotive sector than in other economic arenas. It is useful, therefore, to examine the worldwide activities of the North American industry and assess its competitive position and prospects on a worldwide scale. The global performance of the North American industry—whether Traditional or including New Entrants in North America—is key to its role and economic contribution to the US and Canadian economies.

National and regional automotive industries exist in a world automotive economy and involve numerous relationships, some of which are illustrated in figure 3.1. The automotive industry cannot be understood without some knowledge of the worldwide patterns of production and distribution. This is particularly the case for the North American industry, since it serves at once as the world's largest automotive market and a substantial participant in many other countries' industries through its subsidiaries, joint ventures, and licensing arrangements at both the manufacturer and supplier level.

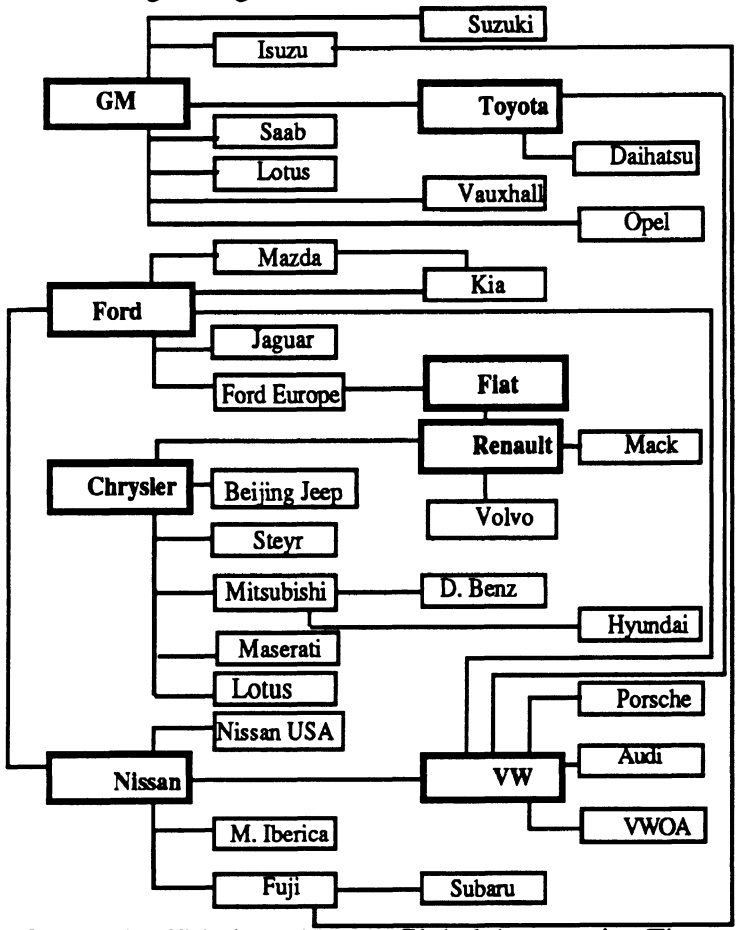

Figure 3.1. Selected Affiliations Among Global Automotive Firms—Includes Equity Interest, Joint Ventures, and Licensing Agreements.

Global Production and Market Share

The global automotive economy continues to expand, growing from a worldwide production level of 42.3 million units in 1978 to just over 48 million in 1990. Table 3.1 presents the production levels of the three major producing regions of the world for 1978, 1986, and 1990: North America, Western Europe, and Japan.[26] These three regions typically account for over 90% of the world's vehicle production. In terms of countries, the United States was the leading vehicle producer until 1979; in 1980, Japan emerged as the leading production source. Since 1978, North America has lost just over 10.5 share points, or 5.1 million vehicles at 1990 worldwide production volume. Modern assembly plants are designed for about 250,000 vehicles a year, so the loss of 5.1 million units is the equivalent of 20 assembly plants worth of employment and supplier business.

Table 3.1. Percent of Worldwide Production for Three Major Sources

Source	1978	1986	1990	% Change '78-'86	% Change '86-'90
Japan	21.9%	27.1%	28.0%	+23.7%	+3.3%
N. America	34.8%	29.1%	24.3%	-16.4%	-16.5%
W. Europe (Including NA owned production)	38.3%	36.9%	38.7%	-3.6%	+4.8%
All Three	95.0%	93.1%	91.0%	-2.0%	-2.3%
World Production (millions of units)	42.3	45.3	48.1	+7.1%	+6.2%

The Traditional North American industry plays a major, if indirect, role in production in Western Europe and elsewhere through the substantial participation in those countries' production by subsidiaries of Ford and General Motors. The North American companies—both in North America and Europe—accounted for 33% of 1989 worldwide production, with a total of 16.0 million vehicles, while Japan accounted for another 30%. The North American companies lost one point compared with 1988, while Japan gained one point.[27]

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[26] Source: MVMA Facts and Figures '91. We mix regions and countries in this comparison for a number of reasons. First, the United States and Canada are linked by the Auto Pact. Second, the integration of Western Europe into the European Economic Community has facilitated inter-European trade in vehicles. The European producers, therefore, do indeed build for a "common market." In neither case, of course, have all issues of national self-interest and concern been resolved.

[27] Ibid., p. 31.

Production capacity in Europe and North America is roughly balanced with regional demand, as shown in figure 3.2. In contrast, production capacity in Japan and South Korea is more than twice that of regional demand, placing great pressure on those nations to pursue aggressive automotive export strategies.

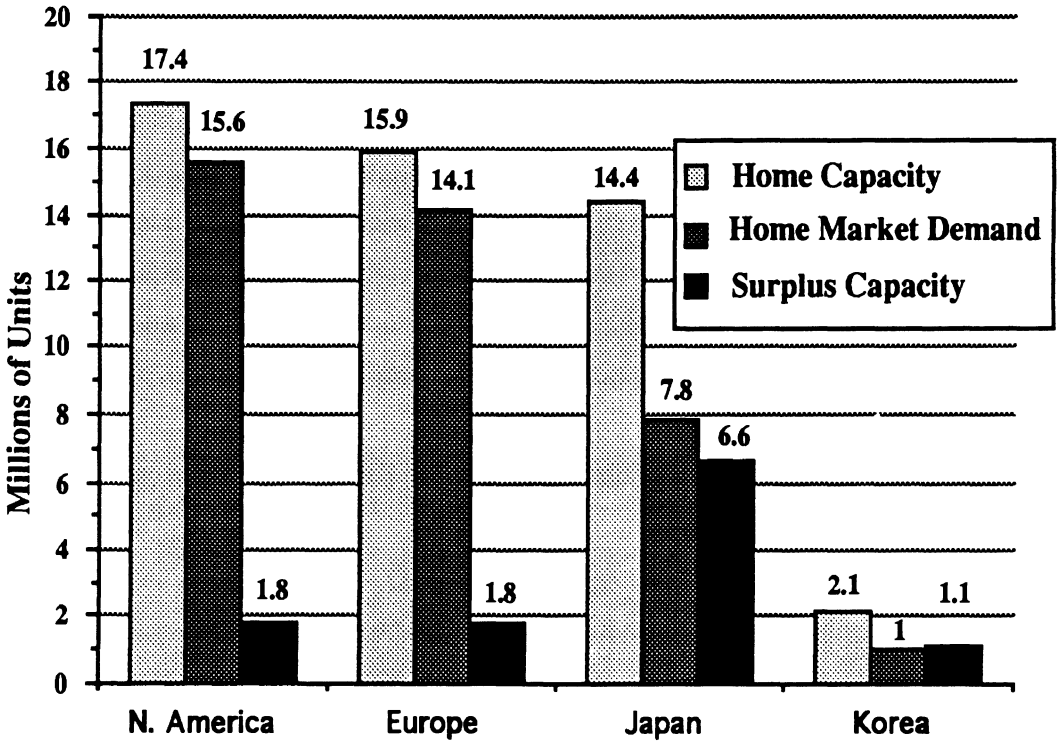

Figure 3.2. Global Automotive Production Capacity and Demand by Region[28]

It is particularly important to recognize that the Japanese vehicle manufacturing industry is advantaged by a secure domestic automotive market—the second largest of any individual country in the world. This domestic market has been virtually immune to foreign penetration in both vehicles and automotive components. (Some reasons for low import penetration in Japan are discussed in Chapter 5.) Table 3.2 shows the import share of the automotive markets of 8 of the 12 largest producing nations in the world for 1978 and 1989. All of these markets have witnessed increased market share for imports—especially Spain as it has become an important production center.

However, Japan's import share today is virtually identical to Spain's in 1978, and is just a small fraction of other major producing nations. While Japan's market may be formally open, it is difficult to accept that it is in fact truly open, when such small market shares accrue to vehicles from other nations.

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[28]Source: Ford Motor Company

Table 3.2. Import Market Shares for Various Automotive Manufacturing Nations[29]

Nation:	1978	1989
Canada*	18.0%	30.6%
France	28.9%	57.0%
Germany	39.3%	49.0%
Italy	46.7%	54.4%
Japan	**1.2%**	**2.7%**
Spain	**2.8%**	**37.7%**
United Kingdom	46.2%	57.9%
United States*	14.8%	22.3%

(*Figures do not include US-Canada trade.)

This secure home market provides numerous advantages to the Japanese automotive manufacturers, including capacity utilization, scale economies, and large profits that afford resources and opportunities to focus strategically on other markets. As figure 3.3 reveals, Japan's automotive companies made profits of $9.9 billion in Japan in 1990, while accumulating losses of $4.4 billion in North America and Europe. The ability to offset financial losses abroad by large profits in the home sanctuary enables the Japanese automotive industry to undertake huge capital expenditures both at home and abroad, with a view toward continued market expansion.

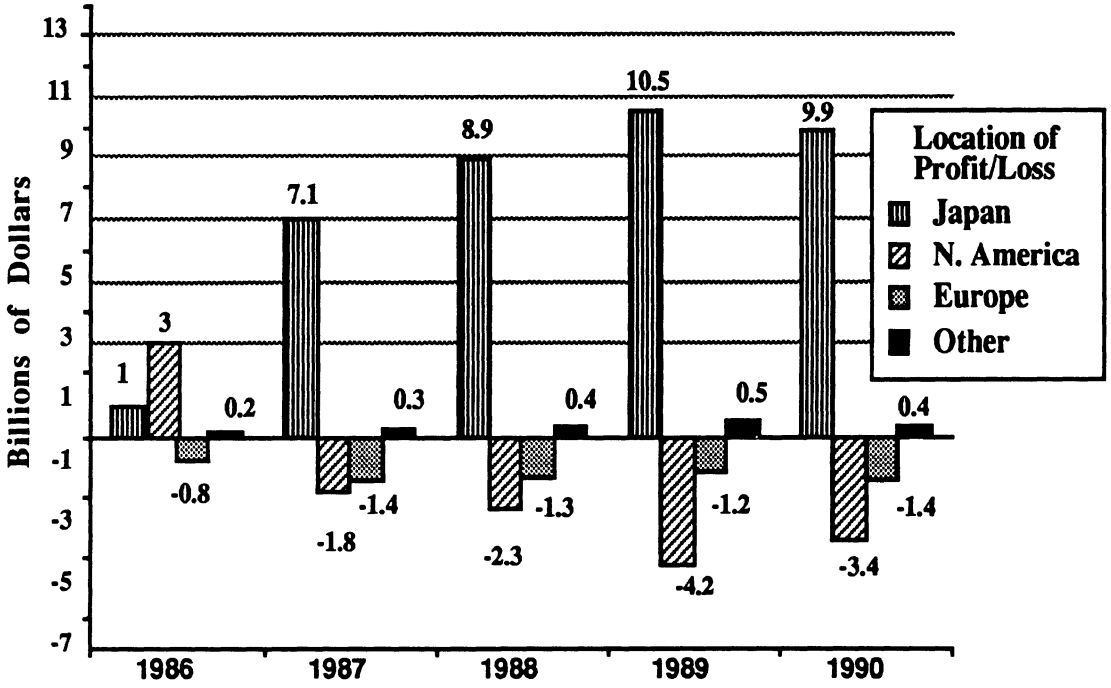

Figure 3.3. Japanese Automotive Profits and Losses by World Regions[30]

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[29]OSAT calculations; data drawn from Ward's Automotive Yearbook, 1991, Fifty-third edition, Ward's Communications, Detroit, 1991. Note that US and Canadian import shares are net of bilateral vehicle trade.
[30] *Forbes*, March 16, 1991, p. 43.

Historical Overview of the North American Automotive Industry

Since 1900, there have been thousands of vehicle nameplates and hundreds of automotive manufacturers in North America. The lion's share of North American production has long been held by the Big Three—ranging from 36% in 1910, reaching nearly 90% just prior to World War II, and staying well above 90% as recently as the early 1980s. Most of these earlier manufacturers were short-lived makers of specialty or niche vehicles, and for the most part struggled along as marginal producers. In that sense, the automotive industry fairly rapidly became concentrated, and by the 1960s the manufacture of vehicles was dominated by just a few companies.

The historical development of the automotive industry in North America has been heavily local. The manufacturers relied on local sources for raw materials, parts, components, and production equipment, built their vehicles here, and for the most part marketed them here. North American manufacturers maintained virtually exclusive control of the North American market from the early 1900s through the late 1960s. The European industry influenced the domestic manufacturers in technical and design areas, but it is still the case that the industry in North America was overwhelmingly domestic.

The use of motor vehicles for personal transport rather than for commercial movement of people and goods developed early and rapidly in North America. Beginning in the postwar period, from the late 1940s through the end of the 1960s, the industry produced vehicles increasingly tailored to the needs, preferences, and pocketbooks of the North American driver. Imported vehicles filled niches, competing for the relatively small sales volumes available in the sports, extreme luxury, or budget small car markets. Detroit was not concerned about the small import market share in these relatively low volume niches.

Lack of concern was the predominant response of the Traditional manufacturers, even to the sharp surge in imports by Volkswagen in the late 1950s and early 1960s. By and large, the importers had little interest in challenging this situation. North American sales of foreign automobiles were small by North American standards, but they were often large and indeed quite profitable by the importers' own standards.

The integration of the Canadian and US industries was ratified by the Autopact in 1965, an agreement that provided for tariff-free trade in automotive goods subject to assured Canadian participation in production activities. Nevertheless, the industry remained under US ownership, and this has sometimes created tensions between the manufacturers and large suppliers with Canada. Some of this tension increased when the Canadian Auto Workers separated from the United Auto Workers in the early 1980s.

The North American companies quite early became active in producing offshore for offshore markets. That, combined with their market-tailored local production, resulted in their North American operations exporting very few vehicles outside of the two countries. Thus, the industry was simultaneously insulated from broad foreign competition and cut off from export opportunities. American automotive suppliers were more actively engaged in export, but the larger supplier companies also followed the strategy of establishing facilities abroad to service European manufacturers, including the offshore production of North American-based manufacturers. This encouraged the transfer of technology and jobs offshore, and provided a profit flow back to North America.

The Industry's Downturn

The North American automotive industry experienced a severe downturn from late 1979 through 1982. Sales, employment, and the market share held by domestically produced vehicles were all dramatically lower in 1982 than their pre-1979 levels. By 1986, the Traditional industry recovered, although production only returned to levels well below good years of the 1970s, and has fallen rather steadily since 1985, as New Entrant production steadily climbed.

The period from 1978 to 1987 witnessed a major shift in the production sources of passenger vehicles sold in the North American market. Sources other than the Traditional manufacturers more than doubled their share of the market in ten years. The loss of market share by the Traditional manufacturers has been precipitous. Two critical developments—the "oil shocks" and the initiation of agreements limiting Japanese access to the North American market—are important to an understanding of the dynamics of the North American market during the period under consideration.

The North American auto industry developed behind a natural protective wall. Consumer requirements and preferences were different from other major markets, especially in regard to preferences for performance over fuel economy. These preferences were supported by low fuel taxes compared with those of either Europe or Japan. When the two oil embargoes of the 1970s hit, North American consumers became concerned about the price and availability of fuel, and turned to import vehicles to allay these concerns. The Japanese manufacturers gained share after each oil shock, and, after the second one, were able to expand that share further. They offered consumers excellent, fuel-efficient vehicles while the North American industry struggled to convert its product offerings to the new dictates of the market and government-imposed fuel economy regulations in both Canada and the United States.

In the early 1980s, the United States and Canada entered into separate voluntary quotas limiting the import of Japanese vehicles. The US agreement was specified in units, and thus failed to protect the Traditional industry from Japanese market share gains as the total market plunged in the early 1980s. Canada set a market share limit, thus providing more effective protection in the developing market. The Japanese government continues these limits unilaterally, perhaps as a way of disciplining its industry, although the raised limits have not been binding for some years. Japanese unit exports to North America have fallen, as the Japanese industry established numerous New Entrant facilities in North America. The pace of this investment was hastened by the rapid rise in value of the yen in the mid-1980s, as the yen costs of North American investments plunged by one-third in a little over a year, and the dollar costs of exporting automotive good from Japan increased by 50%.

The European Automotive Industry

The automotive industry originated in Europe over 100 years ago. France and Germany led the world in initial manufacturing and patent application activity through 1900. In 1885 these countries were producing approximately 150 vehicles per year. The United States produced less than 10. However, in 1900 the United States produced 4,200 vehicles versus France's 3,000 and Germany's 2,312. Detroit, with its concentration of mechanical wizards and machine shops, history of wagon and carriage production, and central location as a transportation hub, quickly overtook Europe in production and innovation. By 1907 more than half of the world's production was located in the United States.

Throughout this period the United States had a 45% tariff protecting its industry while most European countries were in the 3% to 10% range. This changed in the 1920s with tariffs reaching 30% to 50% in Germany, 33% in England, and 45% to 55% in Italy. Production and registrations were growing in Europe and General Motors and Ford Motor wanted to be a part of this growth.

Ford opened its first European assembly plant in England in 1911, followed by facilities in France (1913), Spain (1920), Belgium (1922), Ireland (1923), and Germany (1926). General Motors established an assembly plant in London (1924). However, it primarily pursued an acquisition strategy, acquiring Vauxhall (1925) and Adam Opel (1929). Initially the Ford facilities built knock-down kits while GM quickly pursued a strategy of localized design and sourcing.

The 1920s were a period of rapid expansion by indigenous European producers; Peugeot expanded into Italy and Germany; Citroen into Britain, Italy, Germany, and Belgium; and Renault into Belgium and Britain. As a result, between 1924 and 1938 production grew in Germany from 18,000 to 342,000; in Britain from 147,700 to 445,000; and in France from 145,000 to 227,000. Today, Western European production accounts for approximately 30% of world motor vehicle production or approximately 16 million units (excluding North American owned facilities).

Current Status

The 1990 Western European car market totaled 13.2 million units, and is predicted to expand to 14.7 million units by 1995, while the Eastern Bloc is expected to maintain 2.3 million unit sales.[31] This market is carved up in the following manner:

Table 3.3 Estimated 1991 European Automotive Market Share[32]

Company	Market Share	Company	Market Share
Volkswagen	16.0%	Renault	10.0%
Fiat	12.7	Mercedes	3.4
Total Japanese	12.3	BMW	3.1
Citroen/Peugeot	12.1	Rover	2.6
GM of Europe	12.0	Volvo	1.5
Ford of Europe	11.9	Other	2.6

European auto manufacturer profitability has declined over the last three years, due to pressures from slowing market growth, increasing Japanese market share, regulatory compliance expenses, product development pressures, and aggressive capital investment efforts in emerging countries, as depicted in table 3.4.

Table 3.4. Selected European Auto Manufacturer Profit Margins[33]

Company	1988	1989	1990
Peugeot	12.7%	12.1%	10.0%
Fiat	8.4	8.3	2.3
Ford of Europe	7.8	6.5	1.5
GM of Europe	10.9	10.2	8.7

31 *Financial Times*, September 11, 1991, p. 111.
32 *Detroit Free Press*, February 15, 1992.
33 *Detroit Free Press*, February 28, 1992.

Expected additions of European and Japanese capacity suggest that European overcapacity will rise from 674,000 units in 1989 to 2.5 million units by 1995. These pressures have led to the frequent projection that a restructuring may occur within the top six European producers.

Germany, France, Italy, Spain, and the UK account for the majority of automotive production in Europe and control 90% of the total automotive component production, value added, consumption, and employment.[34] Germany by itself controls 35% of the vehicle production, but accounts for 39% of component production and 44% of total component value added.

European Community—Japan Auto Agreement

The European Community has agreed with the Japanese government to limit annual Japanese passenger car sales. The agreement states that at an industry level of 15.1 million units in 1999, the Japanese would be allowed sales of 2.43 million units for a share of 16%. If the market is less than 15.1 million units, the Japanese would have to absorb 75% of the difference so that their share would fall. On the other hand, if the market is more than 15.1 million units in 1999, the Japanese would be allowed to capture 66% of the difference, for an increased share. The agreement targets 5.3% Japanese share in France (150,000 units), Italy (138,000 units), and Spain (79,000). Great Britain's Japanese share will grow to 7% (190,000 units) and Portugal's to 8.3% (23,000 units). The Japanese share of the German market will grow slowly beyond its current 15% rate. Other nonproducing or nonrestricted European Community members have Japanese shares of more than 40%.

Expanding North American-European Linkages

North American vehicle manufacturers are looking towards Europe for expansion. Chrysler leads the Big Three export efforts, exporting approximately 50,000 vehicles to Western Europe in 1991, and about one-half of these are mini-vans.[35] Chrysler has an expanded export target of 60,000 vehicles for 1992 through its growing 1,000 European dealership base. Chrysler will assemble approximately 25,000 complete mini-van knock-down kits annually in Austria (a 50-50 joint venture with Steyr-Daimler-Puch). General Motors distributes approximately 20,000 North American produced vehicles through 400 European-authorized dealerships. GM expects 1992 exports to grow 10%.

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34 *The Competitive Challenge Facing the European Automotive Components Industry*, PRS and Boston Consulting Group, February 1991.

35 *Wards Automotive Reports*, 9/23/91, p. 2.

In addition to exports, North American manufacturers have significant direct investments in Europe. GM is making the most aggressive eastern European expansion, including the manufacture of vehicles in Poland (initially 35,000 in 1993 expanding to 100,000 to 150,000 units annually). GM owns 50% of Saab Automobile and 100% of Lotus. GM also has a 60% stake in IBC Vehicles, a Great Britain partnership with Isuzu that produces vans. Ford Motor owns 100% of Jaguar and has controlling interests in AC Cars and Aston Martin.

The Emergence of Japan's Automotive Industry

The impressive emergence of Japan as a leading producer of vehicles is probably the most significant development in the world automotive economy in the past two decades. Japan is the first major producing country to rely heavily upon a surplus of exports over imports for the development of its industry—even after its domestic market grew significantly. While it is the second largest national vehicle market in the world (to the United States), it still is exporting almost half of its total production. At the same time, as already noted, imported vehicles represent an unusually small fraction of Japan's domestic market.

While many of the European producer nations rely upon substantial export volumes, these are typically balanced by significant import volumes. Because of Japan's reliance on exports, much of the growth of the world automotive economy in the past two decades has meant growth for Japanese producers. The dual practice of emphasizing exports and minimizing imports has enabled Japan to benefit from the growth of its own domestic market virtually to the exclusion of other producers, while it has simultaneously gained sales from worldwide growth as it exports into other markets.

Early efforts to develop domestic auto producers in Japan date back to the 1930s. The Japanese government offered reluctant domestic producers financial incentives to enter the business against Ford and GM local subsidiaries that assembled cars and trucks from imported knocked-down components. Ford and GM dominated Japan's domestic market until they were shut down during the 1930s by Japan's government, and Japanese production then turned to military purposes.

The industry grew during the 1950s, focusing mainly on trucks. US military demand for trucks, components, and spare parts in Korea helped the industry's early development. By 1959, the industry was producing 350,000 units, all but 50,000 of which were trucks. During the 1960s, Japan's auto industry took off, especially in passenger cars. In 1959, Japan's passenger car production was approximately 50,000

units per year. Ten years later, it was 2.6 million units. Japan became the world's second largest auto producer, including trucks, by 1970. Earlier, passenger cars had not been a priority of the government; producers could get financing for new truck plants but little for cars.

But Japan's growing prosperity stimulated strong car demand in the 1960s. The early 1960s saw four new competitors—Mitsubishi, Daihatsu, Fuji Heavy, and Toyo Kogyo—enter the passenger car business against Toyota, Nissan, and Prince. Honda soon followed.

The 1960s saw Japan become a major exporter of passenger cars and light trucks. In 1961, Japan exported only 11,000 passenger cars, most of them to other locations in Asia. By the end of that decade, Japan exported one million passenger cars. The keys to this dramatic rise to competitiveness were several, including some public policy and some producer-driven influences.

First, Japanese producers invested aggressively in new plant and equipment, and developed deep, technically well-grounded organizations. Japan's auto industry was the first outside Western Europe and North America to prepare itself for true technical independence and innovation. Second, the industry's rate of combined productivity and quality improvement exceeded the rapid rise in wage and salary levels in Japan, so costs came down sharply. Sometime in the late 1960s, Japan became the pure low-cost producer of subcompact cars in the world, eventually opening up the price-driven bottom of the North American market for them. Most of Japan's early auto exports of course were to the rest of Asia and other developing markets, not to North America. Japan's producers generally sold first into less demanding, less competitive markets to build experience.

Third, government policy was pro-industry and aggressively implemented. The classic conventional policies of import substitution and subsidization of exports were used. The Japanese government took unusual measures to make the components industry more cost and quality effective—a major reason for Japan's eventual export success. Also, foreign producers were excluded until late in the industry's production cycle, when weak domestic producers demanded that the government allow them to have minority US partners.[36]

Mitsubishi and Isuzu argued they would be stronger domestically and internationally if they could get additional capital, management and technology input, and access to US producers' distribution networks. Chrysler and GM acquired minority

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[36]For a discussion of Japanese automotive trade barriers, see pages 146-155.

equity positions in Mitsubishi and Isuzu, respectively, and made major contributions, especially in passenger car engineering and styling, in international management systems, and provision of North American marketing outlets. Both companies were made stronger. Later, Ford tied up with Toyo Kogyo (Mazda), and GM with Suzuki.

Today Japan is the leading national producer of motor vehicles. Its 1990 production of nearly 13.5 million vehicles exceeded that of the second place United States by about 38%, and was some 16% higher than total North American production. Although the Japanese industry has made substantial investments in offshore production capacity, and its export share of production has fallen, it still exported some 45% of its 1989 vehicle output, and thus continues to rely heavily on net exports to ensure its volumes.[37]

However, the Japanese industry is not the monolith that many believe, and the capabilities and success of its nine light duty vehicle producers vary substantially. Thus, five of its passenger car assemblers—led by third place Toyota and fourth place Nissan—are among the dozen worldwide manufacturers with 1989 production in excess of one million vehicles, while the remaining four are not. In a recent survey, North American top management identified the Japanese Big Four as more competitive than the Big Three, but Toyota and Honda lead Nissan and Mazda by far more than Nissan and Mazda lead Ford and GM. Moreover, while Toyota and Honda are expected to maintain a shrinking lead through the year 2000, Ford and GM are expected to pass Mazda and to tie Nissan by then.[38]

South Korea's Automotive Industry

South Korea's automobile industry development has been effective by many standards and includes a period of spectacular domestic and export passenger car success. Motor vehicles had been assembled in small numbers in South Korea since the 1950s dating back to the war with the North, but serious efforts at production did not come until the 1960s. Production volume in these early years was small, and total output was as low as 37,000 units as late as 1975. The Korean government acted to sharply limit the number of producers and focused them by vehicle type. The role of foreign capital was highly restricted, especially in the early stages, to enable government to have more

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[37]Data developed from *MVMA Motor Vehicle Facts and Figures 1991*, pp. 30-34.

[38]Ernst & Young and the Office for the Study of Automotive Transportation (OSAT), The University of Michigan, *The Car Company of the Future: A Study of People and Change*, 1991, pp. 15-16.

influence over investment decisions and industry discipline. Government ensured that foreign components critical to exporting competitive vehicles were imported.

By the end of 1979, passenger car annual production capacity was 229,000 units, but only half was used. The government aggressively managed producers' product line focus and scale, and closely watched each producer's financial performance. Part of the government's strategy of conserving scarce industrial resources and foreign exchange was to limit the growth of the domestic market through heavy taxes. In 1979, domestic car demand of 95,000 units, while a peak for South Korea, was still well below what per-capita income levels would have predicted. Demand was held down by several measures. Gasoline prices were twice as high in South Korea in 1981 as in Malaysia, Hong Kong, and Singapore, all similar markets. Car sales taxes were high. Bus transportation was heavily subsidized. South Korea's government tried to apply as many resources to truck and bus vehicles, to support the continued industrialization of the economy.

Exports drove the auto industry's growth in the 1980s, in particular Hyundai's car exports to North America. The export burst was sudden. In 1983, South Korean car exports totaled 16,000 units, compared with 106,000 domestic units. Six years later, in 1989, car exports reached 350,000 units, nearly 40% the domestic demand of 860,000. All this export growth was essentially Hyundai sales to North America.

Three qualifications of Hyundai's export success bear mention. First, all critical engineering and a majority of total component value in the exported Pony and Excel came from Britain, Japan, and the United States. Hyundai assembled and marketed the cars, and made especially good use of Mitsubishi engineering and components. It was a classic global-era partnership around a particular model series. Probably no auto company today can rapidly go alone from initial development to large-scale exporting to advanced economies exclusively using internally developed domestic components. The Excel was a selectively sourced and brilliantly managed package. Second, the Excel was Hyundai's accomplishment, not the South Korean auto industry's. Daewoo and Kia, the other passenger car producers, together exported fewer than 1,000 units in 1986. However, by 1989, exports of these two companies had grown to 150,000, while Hyundai's exports collapsed due to quality and performance problems. In 1989 Hyundai established an assembly plant for its new Sonata in Quebec, but 1991 production of only 30,000 units was far short of its 100,000 unit capacity.

The Ford and GM low-end car sourcing from their south Korean affiliates is characteristically global in pattern. Ford sources the subcompact Festiva from Kia, and more than half of the component value comes directly from Kia, Ford, and Mazda, which codesigned the car with Ford. The Festiva is sold in South Korea through Kia, in the US

through Ford, and in Japan through Mazda. Ford owns 10% of Kia, and Mazda owns 8%. General Motors has Daewoo assembling its Pontiac LeMans, aimed like the Festiva at first-time US car buyers at the $7,000-$9,000 price range. The project involved a $430 million Daewoo capacity expansion in engines, stampings, and assembly. Opel, GM's West German affiliate, designed the car. Initially, an estimated 40% of component value came from outside Korea.

Components

South Korean auto producers are relatively integrated, and each producer manufactures components and has group affiliates that also make components. Hyundai, for example, produces engines, axles, seats, and lighting in addition to doing main body stamping and assembly; and its affiliated companies supply most brake, suspension, steering, and electrical components. South Korea's pattern of strong vertical integration inside the group is somewhat like Toyota's and Nissan's pattern of affiliated Japanese first-tier suppliers, although these two Japanese companies often have only minority positions. South Korean auto producers have closely managed the vertical supply chain, reflecting their modeling of Japan.

South Korea's auto authorities have encouraged foreign technology introduction into the country but have sparingly approved major foreign equity participation until recently. Government wanted the auto producers—rather than foreign component makers—to control component strategy. The government now favors US and European component ventures, trying to reduce dependence on Japan, which is regarded as withholding its most advanced technology from South Korea.

Mexico's Automotive Industry

Mexico's first auto development policies were shaped in the late 1950s and early 1960s, resulting in a major policy decree in 1962. Under the leadership of the state development bank, a brave, if perhaps naive, industry vision was drafted, and parts of it actually became policy and law. The draft was aggressive: no more than four or five vehicle producers with obligatory Mexican majority ownership; and, each producing only one model, with at least 60% local Mexican content and parts standardization across the components sector. Import restrictions were in place, and Mexico aimed to develop this tight industry structure under the hand of the state.

Political forces against the restrictive draft were strong, including existing US Big Three-owned assembly operations that imported knock-down units. The eventual decree

did not limit entry or require Mexican ownership or limit model proliferation. Ten of the eighteen applying vehicle companies were allowed to produce. Ford and General Motors retained 100% ownership. Chrysler owned 33% of Fabricas Auto-Mex. The other seven were wholly or majority Mexican-owned. However, by 1970 these seven were either out of business or foreign-owned by Volkswagen and others. Meanwhile, Nissan and other foreign companies entered. Consequently, Mexico, like Canada, does not have a domestically controlled vehicle industry.

The Big Three's early interest in Mexico was to establish a domestic market position and sell cars and trucks. Mexico was not seen as a source for components or a major market for their US component factories. Mexico was too small even with growth projections to have much operating impact on the rest of the Big Three's systems.

Throughout the 1970s and 1980s, Mexico experienced a cycle of truncated growth and contraction. Total vehicle production reached 351,000 units in 1974, but fell to only 272,000 in 1986. The peak was over 600,000 units in 1990—a full recovery from the oil price collapse and the debt crisis of the mid-1980s. Clearly, these external events handicapped the industry's development. However, even during the economy's strong periods, Mexico's industry did not make satisfactory progress in cost, quality, and design. Mexico, unlike South Korea and Japan, did not design original vehicles. Production cost, in general, remained well above US levels. Auto producers often operated at a financial loss. As late as 1981, vehicle exports were only 16,000 units, or 3% of production. By 1989, exports had risen to 200,000 units, or approximately 30% of total production. In components, Mexico, as late as 1984, was achieving local content in passenger cars of only 50%. Mexico ran a serious components trade deficit until quite recently.

Successful Component Arrangements

Mexico's most successful auto-related activities have been in component product arrangements in conjunction with US auto producers. One is the Border Industrialization Program, begun in 1965. The government established a duty-free export processing and assembly zone within a 12-mile strip along the Mexican-US border. Companies can import materials duty free, process or assemble them, and reexport. The companies are known as *maquiladoras*. In 1985, there were fifty-nine maquiladoras in the auto industry. By 1991, the number of automotive maquiladoras had grown to over 100. Most of these operations produce medium-technology, labor-intensive, and less critical components, and have strong US management and technical input, as well as materials. As a result, they far outperform their purely Mexican domestic counterparts. Some maquiladora plants have achieved quality levels comparable to their US parent's plants

and costs that are lower, especially in labor-intensive processes. Others have been less successful. The border program has helped industrialize several areas of Mexico, but has only indirectly helped the Mexican vehicle industry, which continues to use purely domestic components for the most part.

The second, and larger, component success has been the engine export programs with US and European auto producers. In 1977 and 1983, decrees by the Mexican government developed a program aimed at increasing major component exports by the foreign-owned companies in Mexico back to their own vehicle assembly operations in their home markets. The government recognized that engines made in Mexico for the Mexican market did not meet the cost or quality specifications in US and European markets. It also recognized that Mexican production scale based on Mexican domestic volumes would never allow engines to become competitive. So, the decree gave tariff and financial incentives to foreign producers operating in Mexico to establish large export platforms in Mexico, and the government started more rigorous enforcement of the export-import balancing requirement.

These government initiatives alone would not have generated a successful program had not the US and European auto companies involved found them timely. These auto companies needed to tool production for new fuel-efficient engines. They had developed pockets of technical infrastructure in Mexico, and several knew of high-quality Mexican manufacturing companies outside the auto industry who could be partners in a new world-class engine joint venture. Producing and exporting engines in high volume to support their home US and European assembly plants would allow them to import more components or vehicles into Mexico. The age of specialized global component sourcing was just beginning, and engines looked appropriate for Mexico. Starting in the early 1980s, dedicated engine facilities were built.

The local content of the engine operations varies, but is rising. Most started with the casting of engine blocks, some rough machining and assembly. Gradually, the more sophisticated engine components are being produced in Mexico. Local content progress in these engine programs differs from local content in Mexican domestic market-oriented production because the foreign auto producers making the engines control all the inputs. In Mexico's domestic sector, components are largely supplied by domestic manufacturers of uneven quality. The engine sourcing system is more self-contained, with all inputs coming from foreign auto producers or their closely managed suppliers.

The results have been good in the view of both sides. From the producers' standpoint, favorable economics have taken the pain out of compliance. The large-scale Mexican-based operations with global subcomponent sourcing now produce lower-cost

engines than in their home US plants. Mexico, whose auto-related trade deficit had surged to $2 billion in the early 1980s, developed a new net export source that is worth hundreds of millions of dollars each year. Moreover, the program is upgrading the nation's auto industrial base and raising wages.

In the last few years, this idea of performing large-scale specialized value added on products for import has been applied to assemble cars in Mexico for export, using heavily imported components. General Motors has begun assembling pick-up trucks and passenger cars for export. Mexican-sourced engines are used. Ford has a new advanced assembly facility at Hermosillo, Mexico that Ford's chairman describes as the company's most modern. It assembles passenger cars, with 70% of the components imported from the US, Japan, and Korea.

Global Automotive Markets

As of 1991, approximately 420 million registered motor vehicles constituted the active world fleet. In the 1950s and 1960s the great majority of the world's motor vehicle fleet was found in North America, as shown in figure 3.4. By the 1970s a growing share of all vehicles in use was found in other regions—primarily Western Europe and Japan. Together, these three regions account for over 90% of the world's vehicle fleet in 1992. Increasingly, a larger share of world vehicle sales and vehicle fleet will be found outside of North America.

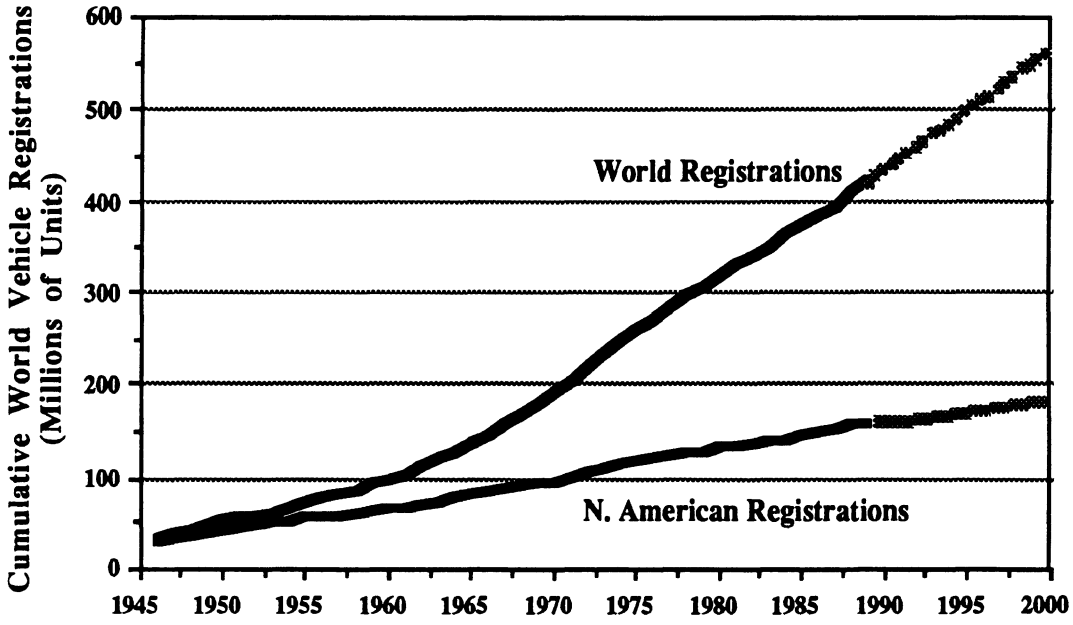

Figure 3.4. Motor Vehicle Registrations Worldwide and North America, 1946-2000.[39]

[39]MVMA *World Vehicle Data ,1991.* 1992-2002 based on OSAT projections.

Original equipment and aftermarket business will move as production bases and operating fleets increase concentration beyond North American borders. Aftermarket parts and service business will expand rapidly outside North America with the corresponding growth in registrations, establishment of dealer and service channels, development of individual as well as commercial markets, and increasing product sophistication. International supplier companies serving the original equipment market in non-North American production bases may have an initial lead on this business. However, corporate economies of scale and profits may exist for companies efficiently serving emerging aftermarkets through local production or trade.

Future Motor Vehicle Sales Patterns

Between 1992 and 2002, approximately 600 million new motor vehicles are expected to be sold world wide, as portrayed in figure 3.5. Consumption increase in the mature markets is expected to be slow, and market growth is unlikely to surpass 1%-2% in the coming decade. By contrast, demand growth rates in emerging automotive markets —such as Eastern Europe, Southeast Asia, and South America—will likely be more rapid, ranging from 5%-15% annually, depending on the specific country and region.

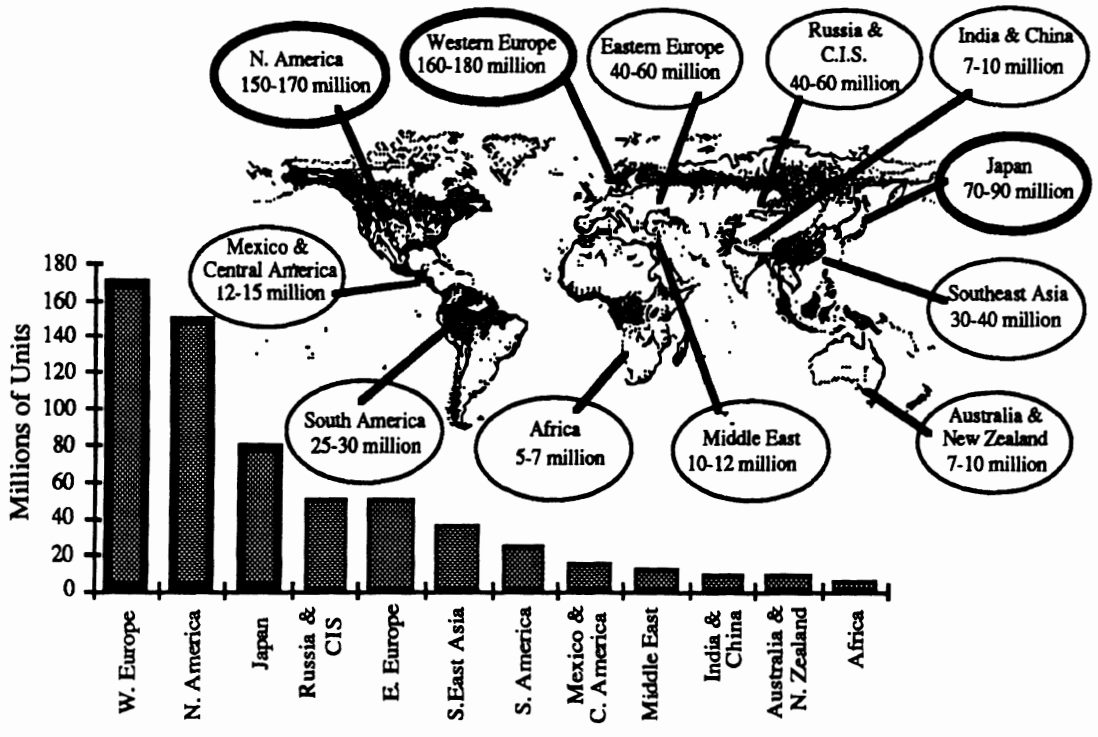

Figure 3.5. Projected Cumulative New Motor Vehicle Sales by Region, 1992-2002 [40]

[40]OSAT estimates.

Nevertheless, because the base level in these emerging automotive markets is so low, the total number of vehicles sold there will be modest, and it is expected that over 75% of the 600 million motor vehicles sold between 1992-2002 will be purchased by consumers in North America, Europe and Japan. Therefore, while the North American industry should aggressively develop and penetrate the emerging automotive markets—in vehicles and parts, in both original markets and the aftermarket—it is equally critical that the Traditional industry regain market share in North America, maintain its market share in Europe, and significantly expand its market share in Japan. This will require substantial investment at a time when there are many other pressing needs for capital.

Summary

Japan and North America are the world's leading producers and consumers of motor vehicles. While the established European automakers, as well as the more recent participants, including South Korea, Mexico, and Brazil are forces to be reckoned with in the global automotive industry, the major international competitor to the Traditional North American Automotive Industry —at least for the next fifteen years—will be the Japanese industry. This report consequently focuses quite explicitly upon the competitive situation of the North American industry with regard to Japan. It is this competitive situation that forms the basic context for many of the decisions and responses that the North American industry will make throughout the next five to ten years.

In terms of market share, the North American manufacturers have performed reasonably well in recent years in only one of the three major automotive markets—Europe. If the North American industry is to regain its global competitiveness, it must not only reclaim lost market share in North America, but must also make inroads into the Japanese market—if not in assembled vehicles then certainly in parts and components. Finally, the North American industry must be cognizant of opportunities in emerging automotive markets and be prepared to nurture and participate in those new opportunities.

IV. COMPETITIVE ASSESSMENT OF THE NORTH AMERICAN INDUSTRY

How competitive is the Traditional North American Automotive Industry in 1992? How does it compare to its major international rivals—the Japanese and European industries? What does the future hold for this critical industry, and what role will the New Entrants to North American production play?

Defining the Competitive Challenge

In the North American view, the Japanese automotive industry represents the most serious competitor now and for the foreseeable future. Because of this, much of the material in the report focuses on the North American industry in comparison to the Japanese automotive industry. These comparisons—some of which determine Japanese advantage in certain areas—are not intended to suggest in any way that the competitive outcomes are fixed, or that the Traditional industry is fundamentally and irretrievably uncompetitive. Rather, the report describe the industry's competitive trajectory, current situation, and possible futures. Further, the report communicates the North American industry's views of its own major competitive challenges, while explaining its current and probable responses to those challenges.

Competitive assessments typically focus on the performance of a particular company, measured against the performance of other companies. As companies compete against each other across national boundaries, the differing economic and policy environments characteristic of their home markets become more than shapers of possible strategies: they become significant sources of competitive strength and weakness.

Many Traditional North American companies will survive in the global automotive industry of the future, no matter where they locate their activities. The real question for North America is how many of these companies will survive and produce *in North America.* A key determinant is whether the North American policy and economic environment sets the survival hurdle higher or lower than other national or regional environments. Setting the survival hurdles higher than those faced by the industry's international competitors means that fewer North American companies will survive—at least in North America. The following chapter addresses the policy environment and its impact on competitiveness.

This chapter of the report reviews the industry's recent performance along a number of dimensions, and assesses its overall competitive strength. The emphasis will

be on comparisons between the Traditional North American industry and the Japanese industry—both in Japan and as reflected by the Japanese New Entrants in North America.

Market Size and Demographics

The sheer *size* of the North American light duty vehicle market is an important determinant of its competitive dimensions and challenges. The North American market for light vehicles was well above $200 billion in 1991. In that year, North Americans logged over two trillion inter-city passenger miles in automobiles—meeting over 80% of their travel demand—and trucks accounted for over 25% of freight ton-miles.[41] Market size has shaped the industry and the kinds of challenges it now faces, accounting for some of its actions that seem, in retrospect, to have been mistakes, and explaining its attractiveness to other national industries.

A motor vehicle is a major purchase for the North American consumer, and its operation and maintenance takes a significant portion of the typical household budget. Vehicles are classic 'big ticket' consumer durables, and sales are cyclical, moving in lagged step with the economy. That poses problems for such a capital-intensive industry. Between 1978 and 1990 light vehicle sales fell as low as 11.5 million in 1982, and rose as high as 17.8 million in 1986, a swing of over 55%. Sales fell approximately 18% from 1979 to 1980, and rose by about the same percentage from 1983 to 1984—wide fluctuations indeed.[42]

Most economists and industry executives expect the balance of this decade to see slow growth in the North American population and economy. A recent survey of top level management in the North American industry forecasts annual vehicle sales for the duration of the 1990s to be below the record year of 1986.[43] There are a number of reasons for these cautious expectations. First, purchasing and operating costs of a vehicle continue to grow as a percentage of slowly growing disposable income, largely driven by regulatory—but not necessarily customer—demand. Technical improvements to secure higher levels of fuel efficiency, lower levels of emissions, and safer vehicles are desirable, but they add cost to the product, and that restricts the size of the market. Second, lower birth rates in the 1970s and 1980s means fewer first-time buyers as well as an aging population characterized by lower vehicle ownership and use rates. Third,

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[41]MVMA *World Vehicle Data 1991*, pp. 55-56.
[42]MVMA *World Vehicle Data 1991*, pp. 16, 18, and 35.
[43]Ernst & Young, *Car Company of the Future.*

vehicles are lasting longer and requiring replacement less frequently. These expectations may be overcome by other factors, but the planning horizon for the industry is cautious.

The Traditional North American industry faces a particular challenge in the demographic profile of the population. Import car buyers are younger, more affluent, and better educated than are the buyers of traditional cars. However, these age differences are concentrated in only two segments of the market: the upper middle and the luxury segment, as displayed in table 4.1. These segments are especially critical to the Traditional manufacturers, because the upper middle segment contains their 'bread-and-butter' vehicles—profitable, reasonably high volume cars—and the luxury segment provides an enormous share of their profits. In the upper-middle, the average age of the traditional car buyer is about 52, while the Import buyer averages 39. For the luxury segment, the ages are 58 and 44 for Traditional and Import vehicles, respectively. Assuming equal satisfaction and loyalty (repeat purchases) for both sets of buyers, imports can look forward to some four or five more sales from current customers, on average, than can the Traditionals. Since conquest sales cost more than repeat sales, this is an important Import advantage. These age differences may also confer an "image" to the vehicles, and in a society that values youth, an older image is not a sales asset.

Table 4.1. How New Car Segments Differ by Age Groups
Age category as a percent of segment purchases[44]

	Age				
Segment	Under 18	18-34	35-49	Over 50	Median
Upper Middle					
Domestic	.1%	17.8%	29.6%	52.5%	51.5
Import	.4%	37.6%	37.9%	24.2%	38.9
Luxury					
Domestic	.1%	7.0%	24.5%	68.5%	58.4
Import	.2%	19.9%	46.9%	33.0%	43.7

Moreover, unless buying patterns shift with age, the population of car buyers will become increasingly composed of people more likely to buy import vehicles. To be sure, there are a number of reasons why buying patterns might shift with age. Older buyers do have somewhat different use requirements for vehicles, and some of these—family size, for example—suggest the purchase of larger vehicles. However, there is no certainty that these factors will outweigh the generally high satisfaction reported by import owners and

[44] Motor Vehicle Manufacturers Association (MVMA). *Facts and Figures 1989*, p. 42.

the customer loyalty it supports. The optimistic expectation of many in the Traditional industry in the early 1980s that customers would grow out of small Japanese cars failed to take into account the Japanese industry's successful upscaling and growing of their product offerings for their loyal customer following.

Bases of Automotive Competition

Because a motor vehicle is a significant investment, consumers take care in selecting a specific product, often seeking detailed product information, recommendations, and engaging in extensive comparison shopping. Competition for sales is fierce, since these sales drive production and profit for manufacturers and their suppliers. The industry has recognized that today's market place requires extreme attention to customer satisfaction, however it is defined, and however it shifts over time. There are simply too many product choices for the customer to accept anything less than total satisfaction from his or her vehicle. But what are likely to be the sources of customer satisfaction in the years ahead?

The automotive market is driven by several key fundamentals. Product price, total manufacturing cost, and product quality are all absolutely essential for competitiveness and survival. However, these factors simply represent the necessary conditions for participation. Success may well be gained by performance along four competitive dimensions, assuming that cost and quality among surviving manufacturers have reached rough parity.

First, minimal lead time fosters closeness to market and customers, satisfying their need for newness and product differentiation, and conferring important advantages. Lead time should approach two years from conception to production for the best performing companies by 2000. For suppliers, that means participating in extremely compressed product development.

Second, selling and servicing—the total purchase experience and relationship—will be critical. The customer will not tolerate less than world-class sales and service experience, even if the manufacturer has low control over dealers. If the numerous vehicles in the market are more similar in their attributes, the customer will partially base the purchase decision on the overall quality of the sales and service experience. The assemblers will also insist on this from suppliers.

Third, consumers increasingly demand a level of style that is more like fashion, the illusive total reaction to the vehicle as the customer 'wears' it. The vehicle is becoming a 'life-style' choice, reflecting—and announcing—the values and views of its

owner. Fourth, product technology will remain important, but, like styling, it is rapidly changing in character. The traditional "bells and whistles" approach is giving way to a concerted effort to provide technology that has immediate and perceived customer value. Anti-lock braking systems and air bags have this characteristic, unlike the talking dashboards of the early 1980s.

Finally, the customer base may be changing from a more materialistic orientation to one that reflects more concern with broader social and environmental issues. This provides a climate that will probably support more regulation of the industry, but also suggests a fifth source of competitive advantage: being a corporate good citizen. With parity of vehicles on many dimensions, a significant portion of the market may choose to buy from a company respected as a good corporate citizen, contributing to a better quality of life through its products, it operations, and its personnel.

Product Quality

There is little question that the quality of the Traditional North American vehicle has improved substantially, although it is less clear that this improvement has markedly assisted sales volumes. Perhaps the broadest measure of quality is the customer's overall satisfaction with the vehicle sales and ownership experience. The J.D. Power organization has tracked one indicator of such satisfaction after one year of ownership. Figure 4.1 shows the comparison of Traditional North American, Asian, and European vehicles from 1986 through 1991. Over that period, Traditional ratings improved by 28%, while European and Japanese vehicles improved by 20% and 15%, respectively. While there is still a gap between North American vehicles and the competition, that gap is narrowing and is expected to be eliminated by the mid-1990s.

In the most recent J.D. Power Consumer Satisfaction survey, three Traditional manufacturing divisions—Cadillac, Buick, and Oldsmobile—performed quite well. Among nonluxury nameplates, Buick (at 137) followed only Honda (146) and Toyota (144), while Oldsmobile tied for fifth at 128 with Nissan and Mazda. Among higher-price vehicles, Cadillac, the 1990 Malcolm Baldridge Award winner, virtually tied with Audi and placed ahead of BMW. The Traditionals are typically rated ahead of European vehicles on the "technical" dimension of quality in these surveys, though lagging them on the "service" dimensions.

The service dimension reflects the important role played by dealers. The typical consumer does not analytically separate the manufacturer and the dealer, and responds to

the total experience of purchasing and owning the vehicle. The dealer almost totally mediates the manufacturer's relationship with the vehicle customer.

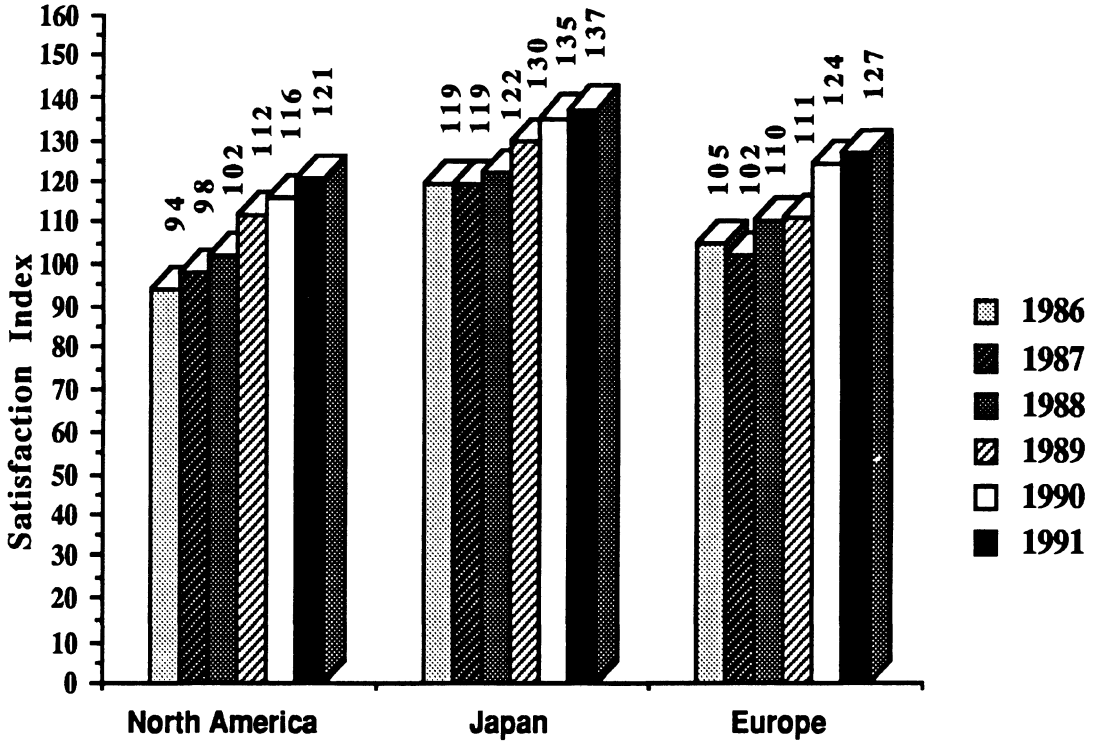

Figure 4.1. Consumer Satisfaction Index, 1986-1991

If we focus on another J. D. Power indicator—defects after 90 days of ownership—the Big Three have also improved substantially. In 1981, the typical passenger car built in North America had about seven customer-reported defects, while the typical Japanese vehicle had but two. Both industries improved by 1991: the Traditional North American product fell to about 1.5 defects per vehicle, while the Japanese nearly reached 1.2, as shown in figure 4.2.[45]

These data suggest that the Traditional industry has eliminated about 95% of its 1981 disadvantage in defects, compared to the Japanese industry. Moreover, it is no longer the case that all Traditional nameplates trail all or almost all Japanese nameplates. Ford, for example, is virtually tied with Subaru, and trails only Toyota and Honda among Japanese nameplates. A popular consumer magazine recently reported much lower overall defect levels, but the same magnitude of narrowing of the gap, as shown in table 4.2.[46]

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[45]Harbour & Associates. *The Harbour Report—A Decade Later*, 1990.
[46]*Consumer Reports*, April, 1991.

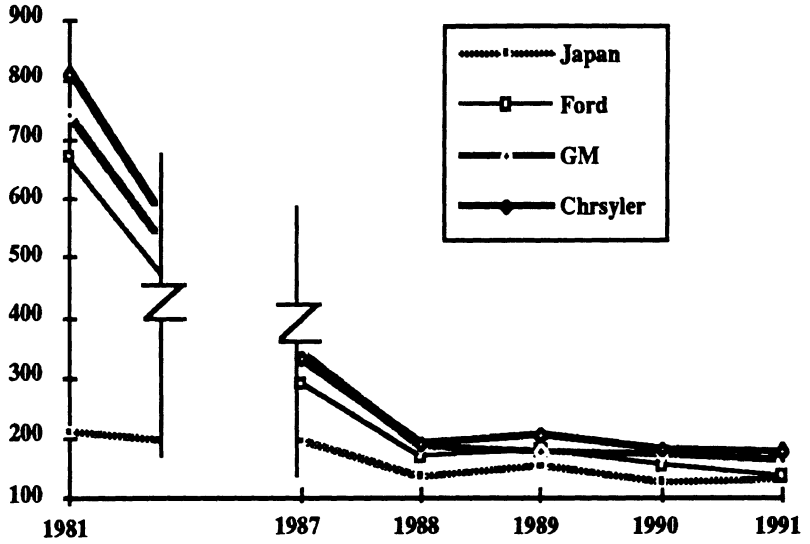

Figure 4.2. Vehicle Defects per 100 Cars: Japan vs. Big 3, 1981-1991

Table 4.2. Eleven Years of Quality Progress:
Customer-Reported Defects per 100 Vehicles

	1981	1991	1991 as % of 1981	Japan-NA Difference
Japanese Average	205	123	60%	NA
Big Three	730	151	21%	28
Chrysler	810	173	21%	50
Ford	670	130	19%	7
GM	740	157	21%	34

If the performance gap in quality has closed to such an extent, why have the Traditional manufacturers been unable to halt their market share erosion? It may be that consumer perceptions and attitudes are lagging the actual situation, that consumers are not yet aware of the closeness of the industries on this important measure. On the other hand, many North American consumers turned away from Traditional vehicles in the late 1970s and early 1980s, when the comparative quality performance of the Traditionals was truly dismal. These consumers may be very reluctant to risk another such experience. It may take many years of good reports to outweigh those memories, or substantial inducements to take such risks.[47] Many consumers remain loyal to brands that meet their requirements. While bad quality will lose a customer, there is no reason to expect equivalent quality to capture a sale.

To be sure, quality is not the only basis of competition, and consumers may fully recognize the vastly diminished quality difference. Other factors in consumer decisions

[47]Economists refer to this form of consumer reluctance as "Ackerloff's Lemon Law."

may explain continued Traditional share erosion. Some of these factors might include styling, image, perceptions that Japanese-badged vehicles are more high-tech and therefore better, and the feeling that buying Japanese is 'sensible' from many perspectives, much as buying Volkswagens was sensible in the early 1960s. Perhaps improved quality has paid a return, but that return is simply the slowing of share erosion due to other factors, and is not itself powerful enough to reverse that erosion.

Krafcik analyzed the *Power Report's* measure of defects during the first 90 days of ownership, and identified those defects attributable to the assembly plant.[48] His findings, presented in figure 4.3 suggest that North American, Japanese-badged New Entrant plants were some 5% higher than Japanese plants, while Traditional plants were about 50% higher than Japanese plants, and 43% higher than New Entrants. All these plants average well below one defect per vehicle, an outstanding performance. It also merits comment that the best Traditional plant is slightly ahead of the best Japanese and New Entrant plants.

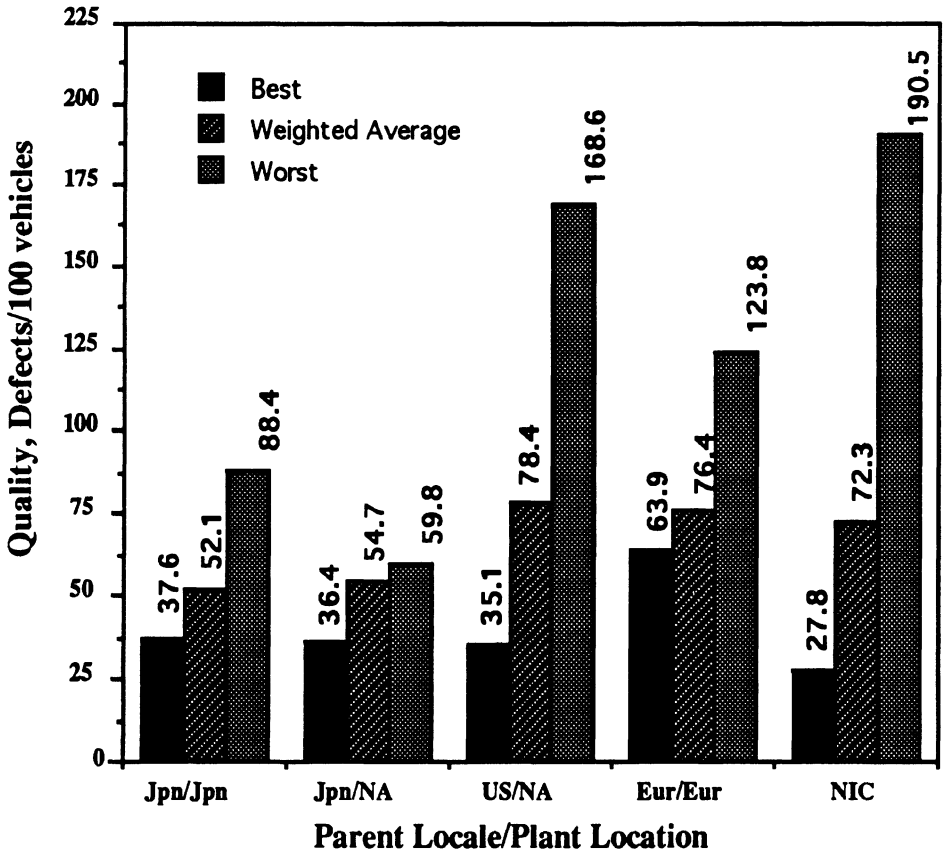

Figure 4.3. Quality Performance by Parent Plant and Location, 1989

[48]Womack, *Machine*, p. 86.

Supplier Quality

Product quality at the supplier level is extremely important, both to suppliers' manufacturing customers and for the suppliers' ability to secure new business and have some chance of success independent of those traditional customers. A recent review reports that Traditional North American suppliers achieve a defect rate below 2%, but well above Japanese and New Entrant supplier rates of 0.01%, as reported by the manufacturers.[49] Interestingly, New Entrant manufacturers reported far fewer defects from North American suppliers (0.1%) than did Traditional manufacturers (1.8%). It is unclear whether this reflects different manufacturer demand or more rigorous and restrictive company definitions. Using J.D. Power data, Nishigushi found Traditional North American suppliers averaged about one-third of a defect per vehicle, less than one-tenth of a defect higher than the Japanese supplier level.[50]

Suppliers' views of their customers' demands are powerful determinants of supplier behavior. Numerous surveys of North American suppliers' views of the Traditional manufacturers' supplier selection criteria report that quality is the single most important criterion in the purchasing decisions of the manufacturers, although it had been a distant third to short-term price and delivery performance in the past. The manufacturers' quality awards suggest substantial quality progress over the past few years. If initial improvement in the quality of shipped parts too often reflected a culling of parts produced, rather than the reductions in scrap and rework required for real cost reductions, Traditional suppliers are now making solid progress on produced as well as delivered quality.[51] Other survey work reveals that the Traditional manufacturers emphasize quality as much as their Japanese and New Entrant competitors.[52]

The Traditional Automotive Industry began making serious efforts to redress fundamental quality problems in the 1980-1982 downturn, rather than just taking temporary measures and waiting for the upturn of the business cycle to carry them along. There is little doubt that the competitive strength of the Japanese vehicle manufacturers

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[49]Cusumano, Michael A. and Akira Takeishi. "Supplier Relations and Management: A Survey of Japanese, Japanese-Transplant, and U.S. Auto Plants." *Strategic Management Journal*, 1991, p. 576. Unfortunately, their sample does not permit complete comparisons between the suppliers because no Japanese plants in Japan reported North American suppliers, while the North American manufacturers had no Japanese suppliers.

[50]Womack, *Machine*, p. 157.

[51] Michael S. Flynn "Supplier Perceptions of Customer Quality Expectations." Paper presented at the American Society for Metals Conference on Customer/Supplier Relationships, Chicago, Illinois, November, 1985; and Michael S. Flynn & David J. Andrea *Capacity and Competition: the 1988/89,OSAT Supplier Survey Respondent Report*, UMTRI, Office for the Study of Automotive Transportation, June, 1989.

[52]Cusamano and Takeishi, "Supplier Relations", table 9, pp. 571-572.

played a major role in these reactions, leading the Traditional North American manufacturers to undertake major efforts in pursuit of cost reductions, quality improvement, and productivity gains. The industry, by all reports, is continuing these efforts. However, some observers have expressed concern that the Traditional industry may note these small remaining absolute differences, declare the quality challenge met, and allow itself again to fall behind the Japanese.[53]

The Traditional North American industry has made a fundamental shift in its thinking over the past few years. That shift was necessary for its survival, but is no less impressive for that. Simple points such as the advantages of defect prevention over defect detection strategies for improving quality are neither simple nor obvious when they challenge an overall production philosophy—a philosophy that was enormously successful under the competitive conditions in North America before 1970. The very complexity of the industry only increases the time required for general acceptance of these new ways of defining problems and seeking solutions.

The remaining differences in customer-reported defects between Japanese-badged and traditional cars are small in an absolute sense. After all, they are about one-third of a defect per car in the consumer's possession, about one-quarter defect per car from the assembly plant, and another one-tenth from supplier plants. However, they are still quite large in percentage terms: about 30% higher at the consumer, 50% at the assembly plant and 38% at the supplier plants. If consumers react to the percentage gap, that may explain why there appear to have been few market returns to the Traditional industry's great improvement in average defect performance.

Productivity and Total Cost Reduction.

Productivity is the efficient conversion of inputs to outputs. It is critically important in manufacturing because the more efficient a company is—that is, the higher its ratio of output to inputs—the lower its cost. If a company has a cost advantage over a competitor it has a formidable competitive weapon, because it can select from an array of competitive strategies. It can compete on price, maximize its market share, restrict its competitors' profitability, and garner higher levels of net revenue itself. That revenue can be used to increase its investments—expand capacity or develop new products—or to support higher levels of returns to its investors. In traditional mass production industries,

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[53]Robert Cole, "U.S. Quality Improvement in the Auto Industry: Close but No Cigar," *California Management Review*, Summer 1990, pp. 71-84.

like motor vehicles, cost advantage serves many competitive purposes, and is a key competitive advantage.

Manufacturing Cost Studies

In the early 1980s, the Traditional North American industry came to believe that it faced a serious cost disadvantage relative to the Japanese industry.[54] Numerous analyses supported this belief, and the industry's conventional wisdom focused on the concern that the Japanese industry could manufacture a small car considerably more efficiently than could the Traditional North American industry. Common estimates placed this Traditional North American cost disadvantage at $1,500 to $2,500 per unit.

While most of the Traditional industry accepted the basic premise that it faced a serious competitive cost gap, there was much less agreement as to what the sources of that cost gap might be. Various members of the industry selected different theories for public presentation and, at least for some time, those theories drove their internal strategies for responding to this competitive challenge.

The various analyses, both public and proprietary, agreed that a serious labor productivity gap existed, and that wage and benefit costs in North America were considerably higher than comparable costs in Japan. Most analyses implicated the general policy and economic environment in one way or another. However, beyond those basic and very general agreements, little consensus existed, as companies initially focused on different factors and selected quite different strategic responses.

The great manufacturing cost difference debate spurred the Traditional industry's first public recognition that the Japanese indeed posed a substantial competitive challenge. The Traditional industry had largely viewed Japanese share gains in the 1973 and 1979 oil shocks as temporary, and their products as inexpensive, unimpressive, entry-level vehicles at best. The cost studies solidified a much deeper concern about the Japanese challenge, and an even more fundamental concern with the long-term implications of a "business as usual" approach to the future. However, these studies focused almost exclusively on assembly labor productivity, often only addressing hourly labor productivity, yet the results were assumed to hold throughout all activities and levels of the industry.

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[54]Robert E. Cole and Taizo Yakushiji, eds. *The American and Japanese Auto Industries in Transition: Report of the Joint US-Japan Automotive Society.* Center for Japanese Studies, The University of Michigan, Ann Arbor, 1984.

Plant Labor Productivity

Those early studies have been updated by a number of authors, and while they reveal possible improvement in Traditional North American assembly labor productivity, they continue to show a competitive gap with the Japanese and New Entrant industries. While short on specific details, these newer studies have challenged some of the assumptions of the earlier work, most notably that the cost gap can be explained by Japanese use of technology or lack of North American worker effort. The most thorough assessment of assembly labor productivity is without question the work of John Krafcik for the MIT International Motor Vehicle Program.[55] Krafcik made every effort to account for differences in levels of vertical integration, technology, and work flow among his sample of assembly plants. His results are summarized in figure 4.4.

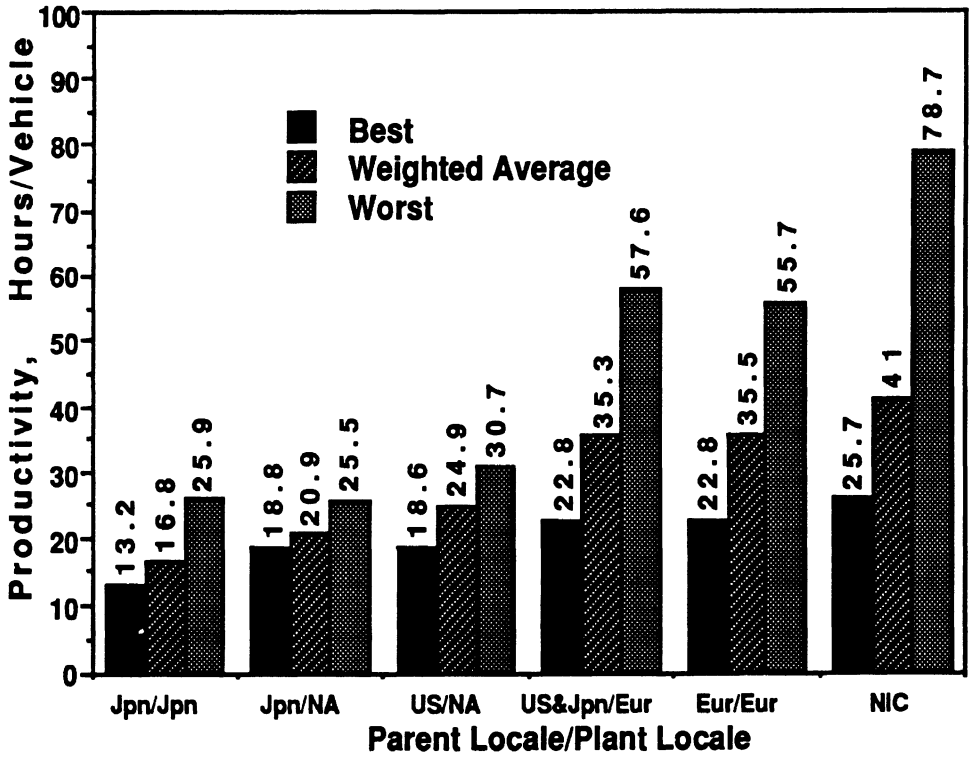

Figure 4.4. Productivity Performance by Parent Plant and Location, 1989[56]

These estimates suggest that Japanese plants, on average, require only two-thirds the labor content, while New Entrants require 84% of the labor content at Traditional North American plants. Even more disheartening is the fact that the best Traditional North American plant requires some 11% more labor content than the average of the

[55]Womack, *Machine.*
[56]Ibid., P 85.

Japanese plants, although it is slightly ahead of the best of the New Entrant plants. On the other hand, the Traditional North American producers expend only about 70% the labor hours required by European producers, whether foreign (primarily North American) or European owned. Finally, Traditional North American labor productivity is well ahead of the NICs, requiring 61% of their levels of labor content.

These results also highlight the variability of Japanese manufacturers' performance. The labor content in the least productive Japanese plant is 96% higher than in the best, while the Traditional North American industry's least efficient plant is 65% higher than its best. Even if these labor content differences obtain across the entire manufacturing chain, they can be overcome and/or compensated. The Traditional North American producers are reducing their labor content, and they have other advantages that can offset these weaknesses.

Another recent report examines the 40 North American assembly plants, and ranks them according to labor hours in the vehicle.[57] While controversial, this report clearly indicates that there are substantial differences among the Traditional North American producers, and suggests that one of them—Ford—is doing quite well in the productivity competition, both against its Traditional rivals and the New Entrant plants. Simply dividing total labor force into production suggests that Ford is the most efficient Traditional North American producer, followed by Chrysler, and then General Motors, operating at about half of Ford's level in both 1989 and 1990.[58] However, recent labor contracts have effectively moved to converting labor to more of a fixed cost, and limited the companies' options to lay off workers in slack times. These comparisons are therefore sensitive to capacity utilization and may be misleading at any given point in time.

One of the important lessons of the work done on manufacturing plant productivity has been that productivity must be assessed comprehensively, and it is necessary to recognize the relationship of all inputs to all outputs across the entire range of activities. Moreover, the industry by and large now recognizes that productivity, even narrowly construed as labor hours in a vehicle, is influenced by a wide range of factors that are themselves highly interconnected: product and process design, worker training, management coordination, and supplier quality and reliability, to list the most prominent.

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[57]Harbour and Associates, *Harbour Report.*

[58]Bernstein Research, *The Automobile Industry*, New York: Sanford C. Bernstein & Co., Inc., 1991, p. 28.

Product Development Cycles

Clark and his colleagues have done excellent work on differences in the product design cycle among the major world motor vehicle manufacturers.[59] While this work suffers from the same focus on labor hours that plagues most productivity comparisons, it also delves much more deeply into the sources of these differences than is typically the case, and, perhaps for that reason, appears to have had more immediate effect on performance. Clark finds that the typical Japanese new design requires 46 months and about 1.7 million labor hours to complete, while the Traditional North American manufacturers and their European rivals invest about three million labor hours and take about 60 months for a new design.

The Japanese advantage of 14 months in lead time is purchased by investing labor hours differently, and by investing fewer labor hours. In fact, the Japanese require 57% of the labor hours required by either the Traditional North Americans or their European rivals, a larger advantage than revealed in assembly plant comparisons. One of the key differences appears to be the Japanese reliance on their suppliers to perform design activities, a finding confirmed by more recent analyses as well.[60] While Traditional North American suppliers have long participated in design work for their traditional customers, this often resulted in duplicate effort, as the manufacturers' virtually performed the design and engineering work over to ensure its accuracy.[61]

Supplier Productivity

Unfortunately, no studies of suppliers comparable to Krafcik's work on assembly plants exist. Moreover, the role of the supplier in industry productivity remains a somewhat contentious issue. Many personnel at the Traditional manufacturers assume that suppliers suffer the same—or greater—disadvantage that is revealed in manufacturer comparisons, while numerous suppliers insist that their own internal studies show them to be much more competitive than their manufacturer customers believe.

Nishiguchi found that Japanese suppliers required about 32% of the time to change dies, and New Entrants about 56%, compared with the Traditional North American suppliers. However, it would be extremely rash to generalize these results across all supplier activity, especially since focusing on reduced die change time has been

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[59]Kim B. Clark and Takahiro Fujimoto, *Product Development Performance: Strategy, Organization, and Management in the World Auto Industry*, Harvard Business School Press, Boston, 1991.
[60]Cusamano and Takeishi, "Supplier Relations", pp. 572-573.
[61]Kim B. Clark and Takahiro Fujimoto, *Product Development*.

a hallmark of the Japanese industry for many years, and a relatively recent effort for the Traditional North American industry.

Labor Productivity

Other data on labor productivity paint a less somber comparison. These data, too, require cautious interpretation, but do suggest that the North American automotive industry may be more robust than do the specific, focused studies. Data from the Japan Productivity Center indicate that the US automotive industry had a labor productivity advantage over the Japanese industry as recently as 1986, the latest year for which data are available. On a labor-hour base, US productivity was 32% higher than Japanese, down from a 36% advantage in 1980. These data reflect value of output rather than units, so they are not directly comparable to the data reported above. These comparisons also indicate that the US productivity advantage in the automotive industry is larger than in two other important manufacturing (and auto supplier) industries: steel, where US productivity in 1986 was 5% higher, evidencing a remarkable turnaround from a 13% disadvantage in 1980; and electrical machinery, where a 43% advantage in 1980 became a 13% disadvantage in 1986. The quick turnarounds in steel and electrical machinery both suggest the instability of these comparisons.[62]

Japan's rate of productivity growth in all manufacturing has been sufficiently higher than North America's to support real wage hikes while closing the manufacturing cost gap. Hourly wages in manufacturing in Japan exceeded those in both Canada and the United States for 1988, but Japan has maintained virtually the same rate of change in its wage cost index from 1985 to 1989 (.951) as the United States (.943) because of its higher rate of productivity growth. Japan clearly has achieved higher wage and productivity growth, while the United States has experienced both lower wage and productivity growth.[63]

The auto industry and its stamping suppliers have both increased their labor efficiency between 1978 and 1988—some 34% for the automotive industry and 30% for the automotive stamping industry. These are healthy rates of growth, especially since 1978 Traditional North American production was some two million units higher than in 1988, and some one million higher than combined Traditional and New Entrant production in 1988. These productivity growth rates were somewhat higher for production workers than for nonproduction workers in automotive stampings (31% vs.

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[62]Japan Economic Institute of America, *Japan-U.S. Business Repory*, Japan Economic Institute of America, Washington, 1991, Table 8-7, p. 71.
[63]Ibid., Tables 8-1, 8-5, & 8-6, pp. 68 & 70.

24%), while the reverse held in the automotive industry (where nonproduction workers achieved a 38% growth compared with 32% for production workers).[64]

Process Technology and Productivity

The Traditional North American companies face a continuing, if shrinking, competitive gap in the deployment and effective utilization of numerous process technologies, especially those that can be termed 'soft technologies'—major sources of productivity and quality improvement. These soft technologies are the techniques and routine behaviors embedded in the patterned activities of humans in the manufacturing enterprise that support and implement machine technologies rather than the technologies that are contained in the machines themselves. The traditional industry has rapidly adopted some of these technologies, such as just-in-time (JIT) manufacturing, statistical process control (SPC), and continuous quality improvement (CQI), although the pace of dissemination is somewhat slower within the supply base than at the manufacturers.[65] Soft technologies that *link* activities, rather than those that *focus* on a specific activity set are especially important, because they promote a broader systems approach to manufacturing, at once spanning the worker/machine interface and crossing activity boundaries within a process.

However, a recent study suggests that the North American industry still lags behind the Japanese in some of the fundamental building blocks of productivity improvement.[66] Thus just over 10% of US companies and just under 20% of Canadian companies always or almost always use process simplification techniques, and about 20% of either regularly use cycle time analysis. Japanese companies are much more likely to make frequent use of each of these two techniques, at 47% and 55%, respectively.

Total Factor Productivity

Winston examined the Traditional US industry's cost competitiveness with Japan, concluding that the Japanese vehicle makers' cost advantage decreased through the mid-1980s, reflecting the strengthened yen and enhanced competitiveness of US manufacturers.[67] In a related paper, Winston estimates that an exchange rate of 152 yen to the (US) dollar would yield cost parity between the US and Japanese automotive

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[64]Hertzenberg, "The Internationalization of the Auto Parts Industry," Table 32A.

[65]Ernst & Young, *The Car Company of the Future*.

[66]Ernst & Young, and the American Quality Foundation, *International Quality Study*, 1991. While published results are for a number of industries, these are reflective of the automotive subsample (personal communication, 2/92).

[67]Clifford Winston and Associates, *Blind Intersection*, Washington, D.C., The Brookings Institution, 1987.

industries as of 1987.[68] Winston finds that production scale and product mix provide a substantial Japanese advantage.

Fuss and Waverman analyzed the productivity of the Canadian, US, and Japanese industries from 1970 through 1984 and concluded that Japanese efficiency improved at approximately three times the rate of the Canadian and US industries, resulting in a 17% efficiency advantage by 1984. Their work assesses total factor productivity, including the price of materials and capital—both financial costs and prices of equipment and facilities—as well as the price of labor, and nets out the effects of capacity utilization. Their similar results for the United States and Canada reinforce the linked fate of the North American industries.[69]

Fuss and Waverman have updated their analyses as a special project for this report. Their results suggest that the US industry may have achieved a slight cost advantage over Japan in 1988, moving from 55% higher costs in 1984 to almost 5% lower costs in 1988, primarily because of the substantial revaluation of the yen-dollar exchange rate. Most of this US advantage is due to 19% lower input costs from supplier industries,[70] and the industry itself still faces a substantial productivity gap. In fact, if all factor prices had been equal in the two countries, production costs would have been over 15% higher in the United States due to lower levels of efficiency. The US continued to face about a 4% disadvantage in the cost of labor in 1988, but enjoyed a 2% advantage in total costs of capital, as lower prices for equipment and facilities overcame a 4.5% disadvantage in the financial costs of funds.

These results appear to challenge a range of studies from the early and mid-1980s that showed Japanese cost advantages as high as 50% for the manufacture of small vehicles. The exchange rate used in these types of comparisons is critical, and these results are quite consistent with those earlier studies when the exchange rate is appropriately adjusted.[71] Similarly, the estimates for efficiency are consistent with Krafchik's results, and their capital estimates are also consistent with other work on cost of capital. However, these are general results for the industry, and may be quite different from the results of cost comparisons of particular US and Japanese companies.

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[68]Ibid., pp. 6-35.

[69]Melvyn Fuss and Leonard Waverman, *Productivity Growth in the Motor Vehicle Industry, 1970-1984: A Comparison of Canada, Japan, and the United States.*

[70] Though these findings are counter to the conventional wisdom, the results are consistent with major studies from the early 1980s showing lower Japanese costs due to changes in exchange rates.

[71]See for example *Industrial Renaissance* by William J. Abernathy, Kim B. Clark, and Alan M. Kantrow, Basic Books, New York, 1983, as well as subsequent work by Ira Magaziner.

Since the exchange rate for 1988 (128:1) approximates the rate current in early 1992 (130:1), these results might seem to represent a best estimate of relative costs as of 1992. However, actual productivity and costs in a capital intensive industry are tightly linked to capacity utilization, and today's US utilization levels are far below those of 1988. Indeed, adjusting these 1988 results to 1991 capacity utilization rates totally eliminates any US advantage, as the industry's efficiency disadvantage grows to 21% and the Japanese industry achieves a one percent cost advantage.

To be sure, industry capacity rates reflect the general performance of the economy, and the weak economy of the past few years has hampered the automotive industry. However, automotive competition also directly influences capacity rates. Beyond general economic circumstances, North American producers are afflicted with lowered capacity utilization rates because such a substantial share of the market goes to imports, captives, and New Entrants. New Entrant capacity has resulted in excess capacity in the Traditional industry, as New Entrant sales have largely represented additional sales rather than substituting for Japanese imports, and that has decreased industry-wide utilization rates. Vehicle importers from Japan benefit from increased capacity utilization rates at home because of these North American sales. Moreover, the exceedingly small share of the Japanese markets that goes to imports protects and supports Japanese utilization rates, while effectively denying sales that could support Traditional capacity in North America.

The US relative efficiency position improved from a 17% disadvantage in 1984 to a 15.6% disadvantage in 1988, a relatively small improvement of about eight percent. On the other hand, the US disadvantage in production efficiency was steadily increasing over the 1975-1984 period, and this erosion appears to have stopped over the 1984-1988 period, and even reversed slightly, as the North American industry has improved its efficiency. It should be stressed that the major roles of the change in the exchange rate on improving US performance is not necessarily disappointing. Many observers believe the yen's low value against the dollar as recently as 1985 distorted underlying competitive comparisons then, rather than that today's exchange rate in some sense 'artificially' distorts them today.

These 1988 results include the performance of New Entrants, suggesting that the New Entrants will not, by themselves, resolve the productivity challenge from Japan. In fact, had the New Entrants not been included, the materials cost advantage for the United States might be somewhat larger, in view of the New Entrants' high levels of sourcing from Japan.

Is North American cost parity—or even advantage—competitively meaningful, even at a viable level of capacity utilization? To date, Japanese manufacturers have been quite successful in passing through less than the full effect of the change in the exchange rate. If they are able to pass through only some 60% of that currency change, then these objective, overall comparisons of economic efficiency have less meaning, especially in determining comparative advantages in the market place.[72] Some of this reduced pass through has been achieved by improved productivity, but much of it appears to be effectively supported by profits in a secure home market.

Total factor productivity analysis shifts the emphasis from an evaluation of hours of labor in a product to a broader comparison of inputs evaluated on the common basis of cost. Whatever the overall comparison at any particular point of time, the Traditional manufacturers still incur significant cost disadvantages in identifiable areas, such as labor productivity and certain fringe benefits, discussed in a subsequent chapter. In particular, New Entrants enjoy many advantages, some passed through from Japan, and others because some North American costs (such as pension and health care costs) are inherently lower for a New Entrant than an established producer. Moreover, cost is only one element of competitiveness—albeit a crucial one for survival. Beyond cost, quality, styling, product coverage, and customer value are all critical to success.

Summary

A number of these factor productivity studies focus on limited sets of activities within automotive production, and the comparative information is of questionable generality, whether across operations or types of companies. However, these limited focus studies have helped the Traditional industry target areas needing improvement, and that has been valuable indeed. It is important to recognize that even the most dire of these analyses do not suggest that the Traditional North American industry has incurred irreversible competitive disadvantage.[73]

This review of comparative productivity between the Japanese, New Entrant, and Traditional North American automotive industries suggests a number of conclusions. First, the Traditional industry continues to suffer an efficiency disadvantage in labor utilization compared with the Japanese or New Entrant industries—at least at the vehicle assembly level. Why this is so is less clear, although it probably is more due to capacity utilization and maintenance/labor deployment practices than to technological, worker

[72]Michael S. Flynn, Sean P. McAlinden, David J. Andrea, *The U.S.-Japan Bilateral 1993 Automotive Trade Deficit*, Office of the Study of Automotive Transportation (OSAT), University of Michigan Transportation Research Institute, September, 1989.

[73]Note that if this is true of North America, the comparative picture in Europe is even more grim.

skill, or worker effort factors. Second, if those differences at the assembly level pervade the manufacturers, then some overall industry performance data suggests that North American suppliers are more efficient than their Japanese competitors.[74] Third, if the North American industry suffered a cost disadvantage in the past, the change in the currency exchange rates has certainly lessened it, and perhaps even provides the North American industry a cost advantage under comparable competitive conditions. However, the conditions of the North American and Japanese industries are not comparable: low North American capacity utilization rates and low pass-through rates by the Japanese industry have effectively countered these exchange rate movements, and the North American Traditional industry may well continue to face an effective cost disadvantage.

The industry clearly needs to continue to address and improve its internal efficiency. However, those who argue that the industry itself is hopelessly behind its Japanese competition—and thus any efforts to sustain or develop its competitiveness are wasted—must now confront contrary evidence. In fact, the industry has substantially closed its cost disadvantage with Japan under comparable market and operating conditions. If this was aided by changes in the exchange rate, other policy-driven circumstances, discussed in a subsequent section, continue to place the industry at competitive disadvantage.

Pricing

Price continues to play a critical role in the North American market, but primarily through influencing consumer choice among different types of vehicles—for example, between a standard-equipped small car and an option-loaded large car. However, it has played a remarkably small role in the consumer's choice of the manufacturer. Throughout the post World War II period, perhaps until recently, General Motors has exercised price leadership in the market. Until recently, the market was largely traditional, and General Motors was the low cost producer. It was reluctant to compete on price for fear that increasing its market share would lead to government intervention on antitrust grounds. Ford and Chrysler were reluctant to challenge General Motors, because, given relative production costs, that strategy involved much more risk than it promised reward.

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[74]New entrant suppliers constitute such a small percentage of North American automotive suppliers that they probably have little effect on these industry-wide performance statistics. No direct evidence of their aggregate performance suggests that they are any more or less efficient than traditional North American suppliers.

As import vehicles captured a larger share of the US market, they closely matched their pricing with the pricing of the Traditional manufacturers, although it may now be less clear that there is one price leader.[75] Rather, importers and Traditional North American manufacturers have chosen to compete on other bases. In particular, imports have chosen to compete on fuel efficiency, reliability, and, in the case of some European, and now Japanese nameplates, on prestige. For those importers with lower manufacturing costs, such as the Japanese (before 1985), matching, rather than undercutting the prices of the Traditionals meant larger profits. While it is somewhat surprising, the North American mass vehicle market has seen little price-based competition between manufacturers. However, the Traditional North American manufacturers may be faced with an extremely difficult challenge in winning back customers they may have disappointed in the past, as well as customers who have always owned imports or New Entrants and find them quite satisfactory.

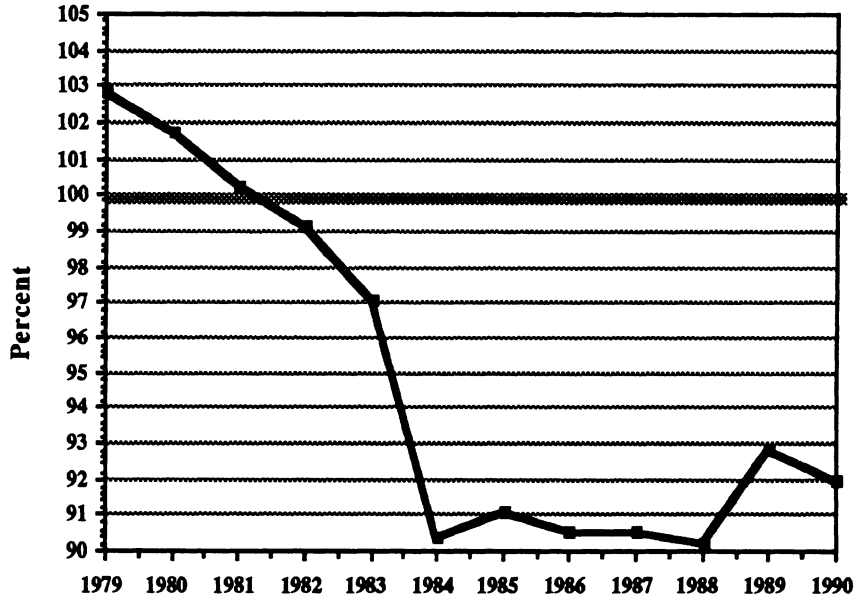

Figure 4.5. Price of North American Vehicles as a Percentage of Import Vehicles, 1979-1990.

From 1979 through 1981, the Traditional and New Entrant vehicles commanded higher prices than Imports, largely reflecting differences in the mix of vehicles offered. As shown in figure 4.5, starting in 1982 and accelerating through 1984, North American vehicles fell behind imports in price. This reflected the changing mix of imports and the voluntary restraint agreement (VRA) that limited Japanese imports in a recovering market, thereby supporting price premiums. North American sourced vehicles, whether New Entrant or Traditional, have sold at a substantially lower price since 1984, as the

[75]Michael S. Flynn, *Bilateral 1993 Automotive Trade Deficit*, pp. 64-65.

strengthening of the yen in 1985 pressured Japanese prices. However, Import vehicles include increasingly higher-priced European cars, North American sourced vehicles include less expensive New Entrants, and the segment mix of sales differs as well. Therefore these data do not clearly establish the competitive pricing relationship between Traditional vehicles and their Japanese-badged competitors.

Price differences between Japanese-badged passenger cars, whether imports or New Entrants, and Traditional North American passenger cars are beginning to emerge.[76] It is still the case that the typical Japanese-badged vehicle is less expensive than either a Traditional North American car or products from other importers. However, that reflects the segment mix of sales, and the comparison is quite different if we examine vehicles within the same segment. Table 4.3 displays these results.[77]

Table 4.3. 1991 Model Year Prices, By Manufacturing Source and Segment[78]

Segments	Traditional North American	New Entrant North American	Japanese Badged
Lower Small	$6,732	$7,370	$7,016
(Ford Escort, Subaru Justy)		+ 638	+ 284
Upper Small	9,942	9,649	10,108
(Pontiac Sunbird, Toyota Corolla)		-293	+ 166
Small Specialty	10,629	11,970	11,828
(Eagle Talon, Hyundai Scoupe)		+1,341	+ 1,199
Lower Middle	11,387	11,989	11,812
(Chevrolet Lumina, Honda Accord)		+ 602	+ 425
Upper Middle	15,507	NA	17,441
(Ford Taurus, Infiniti G20)			+ 1,934
Mid-Specialty	13,290	16,388	15,811
(Chrysler LeBaron 'J', Toyota MR2)		+ 3,098	+ 2,521
Lower Luxury	22,573	NA	22,596
(Oldsmobile 98, BMW 325)			+ 23
Luxury Specialty	29,714	NA	23,820
(Lincoln Continental, Jaguar XJS)		- 5,894	
Luxury Sports	39,705	NA	54,772
(Chevrolet Corvette, Acura NSX)			+ 15,067
All sales, 1990 base	19,982	10,607	14,112
		- 9,375	- 5,870

Note: NA=Not Available. The specific model nameplates are meant to illustrate the types of vehicles in each segment but do not necessarily correlate directly to the listed prices.

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[76]This development may be one of the traditional industry's better kept secrets. The proportion of advertising that mentions these price differences seems quite small. Perhaps the industry's marketing strategies reflect a by-gone era when price differences did not merit much copy or air time.

[77]We use list price for these comparisons. We simply lacked the time and resources to correct these prices for the bewildering array of incentives offered over the past year, although we note that incentives have tended to be more frequent and larger for traditional products. The difficulty of obtaining transaction prices is well recognized, and while these are superior indicators of price, they simply are not available.

[78]OSAT calculations. This table does not display four segments, including three (large, large specialty and mid-luxury) where the traditionals offer 27 models and there are no Japanese-badged competitors; and one (upper-luxury) where there two Japanese-badged and no North American competitors. However, the prices for these segments are included in the totals. Prices are U.S. dollars, and are for the U.S. market. While we do not have data on Canada, we have no reason to expect that its market would be substantially different.

Figure 4.8 (on page 96) also indicates that the decade of the 1970s produced six years that were more profitable—in pretax, constant dollars—for the North American industry than was 1984, the most profitable year in the 1980s. Figure 4.6 reveals one reason for this: vehicle price increases lagged behind the increase in the CPI for nine of the 11 years from 1980 through 1990, and exceeded CPI increases only in 1986. While some have criticized the Traditional industry for raising prices to increase profits during the 1980s, rather than maintaining prices to regain market share, this argument lacks merit. First, constant dollar prices for all vehicles fell over the period. Second, North American prices fell behind imports, as displayed earlier. Third, the Traditional industry by 1990 commanded lower prices than either Japanese imports or New Entrant vehicles, as also shown above. It is difficult to discern a strategy of increasing profit when profits and prices fall, in both real and comparative senses.

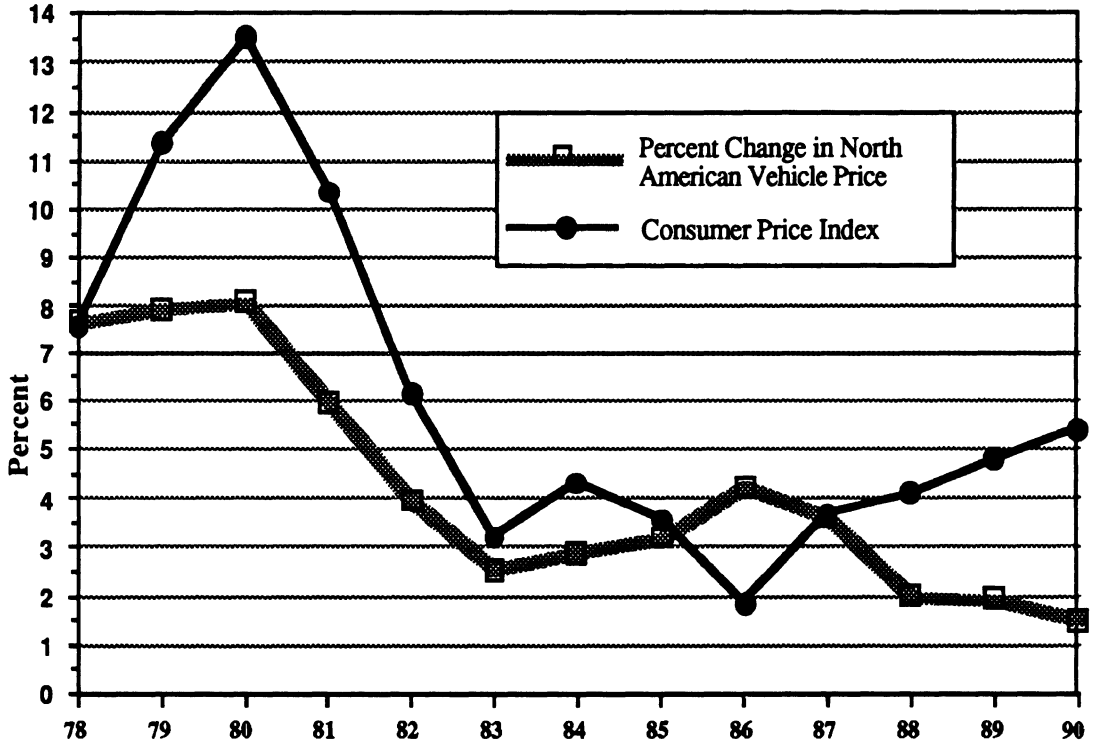

Figure 4.6. Percentage Price Change of New North American Made Vehicles Compared With the Consumer Price Index, 1978-1990.[79]

Traditional and New Entrant vehicles compete in five segments of the market, and in four of those, the traditional vehicles bear a lower average base price. Traditional

[79]US Department of Labor, Bureau of Labor Statistics, US Department of Commerce, Bureau of Economic Analysis.

vehicles compete with Japanese-badged vehicles in nine segments, and in eight are priced lower. New Entrants have a price advantage only in the upper small segment, and Japanese-badged vehicles only in the luxury specialty segment.

The continuing share loss by the Traditionals, in spite of a price advantage—in some segments a substantial one—is puzzling. It may be that consumers are unaware of these direct price comparisons, and believe that the average price difference—uncorrected for vehicle mix—that favors Japanese-badged vehicles, applies across the range. Certainly anecdotal evidence of this point abounds. However, it seems unlikely that consumer perceptions would differ from reality to such a degree, especially for a major purchase like a car. Price variations in large purchases are generally more restricted than in smaller purchases precisely because consumers invest the time and effort required to check prices and compare products when the purchase is large.

It may be that many North American consumers are willing to pay a premium for a Japanese-badged car. It is unclear whether this reflects a willingness to pay for the higher quality levels consumers may attribute to these vehicles, or because their ownership projects a positive image (be it youth or sensible shopper), or because their consumer appeal (styling, comfort) is simply higher. The ability of Japanese imports to command price premiums enabled the Japanese manufacturers to reduce their reported losses in North America during the latter part of the 1980s.[80] It is clear that the Traditionals must identify, target, and overcome that advantage, whatever its source, even if that requires providing consumers a larger price incentive to purchase traditional vehicles.

Parts Pricing

While the prices of vehicles produced in North America and Japan differ somewhat across matching segments, prices of automotive parts in Japan and North America are quite markedly divergent. A recent survey conducted jointly by the US Department of Commerce and the Japanese Ministry of International Trade and Industry (MITI) found that prices of comparable uninstalled parts averaged 87% more in Japan than in the US.[81] For installed parts, the prices were 31% more in Japan.

These price differences indicate that the Japanese parts market is not competitive, and imposes barriers on foreign manufacturers wishing to sell into the aftermarket. Not only are North American parts manufacturers deprived of sales into the Japanese market,

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[80]Fred Mannering and Clifford Winston, "Brand Loyalty and the Decline of American Automobile Firms," *Brookings Papers: Microeconomics* ,1991, pp. 67-114.

[81]US Department of Commerce (DOC)/Japan Ministry of International Trade and Industry (MITI), "Automotive Parts Survey," Washington, D.C., June 27, 1991.

but Japanese consumers must pay significantly higher prices for automotive parts than do North American consumers. The issue of non-competitive pricing is further discussed in the section on export barriers in the next chapter.

Capacity

It is extremely important to understand that the North American domestic automotive industry faces a serious problem of overcapacity in the near future. Many observers see as much as 30% more capacity than demand during the next decade. Production capacity to serve the North American market in 1991 totaled approximately 17.6 million units—about 17% excess capacity during an average North American sales year of 15 million units. Increasing excess capacity will not result from a cyclical downturn in demand—a situation the industry faces every few years. Rather, it appears to be structurally redundant capacity—capacity that will not soon be required to meet market demand. In the view of virtually all observers, most of this excess capacity is targeted at the North American market. Because of North America's problems in exporting, that exerts the most pressure on the Traditional North American industry to reduce capacity.

Three factors produce this excess capacity. First, the level of imports targeted to North America is expected to rise. New manufacturers are targeting the North American market, and the Japanese industry is adding capacity at home. Market sluggishness at home and the recent agreement to limit Japanese exports to the European Community may pressure the Japanese manufacturers to reverse the declining trend in their unit exports to North America. While the Japanese government lowered the level of allowable exports to the United States, this limit can be raised in the future.

Second, the strategies of the Big Three are eroding the utilization of their own traditional manufacturing capacity. Chrysler and GM have both opened new and expanded old North American capacity. The Traditional strategy of building locally rather than exporting led GM to open new capacity in Europe, rather than supporting North American capacity through exports to Europe from North America. The Big Three also continue their reliance on captive imports and New Entrants to service certain segments of the market, and these vehicles displace cars they might have produced themselves. Ford replaced the Lynx with the Tracer, sourced from its Mexican operations for the United States and from Taiwan for Canada, and that brings extra capacity to bear on the market. General Motors is sourcing the Pontiac LeMans from

South Korea. Chrysler continues to source a wide variety of vehicles from Mitsubishi, although in declining numbers.

Finally, the onshore manufacturing activities of foreign nameplate manufacturers have increased markedly since 1986. The New Entrant operations of the Japanese alone have announced capacities to produce roughly three million vehicles in the United States by 1994, as displayed in table 4.4. That is equivalent to the output of 12 Traditional assembly plants.

Table 4.4. 1994 New Entrant Capacity Estimates for North America[82]

Company	Location	Car	Truck	Total
United States				
Honda	Marysville and East Liberty, OH	510,000	0	510,000
Toyota	Georgetown, KY	480,000	0	480,000
Nissan	Smyrna, TN	310,000	150,000	460,000
NUMMI	Fremont, CA	240,000	120,000	360,000
Mazda	Flat Rock, MI	240,000	0	240,000
Diamond-Star	Normal, IL	240,000	0	240,000
SIA	Layfayette, IN	80,000	80,000	160,000
Ford-Nissan	Avon Lake, OH	0	135,000	135,000
United States Total		**2,100,000**	**485,000**	**2,585000**
Canada				
CAMI	Ingersoll, ON	120,000	80,000	200,000
Honda	Alliston, ON	100,000	0	100,000
Hyundai	Bromont, QUE	100,000	0	100,000
Toyota	Cambridge, ON	65,000	0	65,000
Volvo	Halifax, NS	15,000	0	15,000
Canada Total		**400,000**	**80,000**	**480,000**
North American New Entrant Total		**2,500000**	**565,000**	**3,065,000**

All three circumstances result in more vehicles for the domestic market, and none of them is likely to increase the size of that market. The result is overcapacity. Observers are unanimous in expecting the brunt of the overcapacity burden to be borne by the manufacturing facilities of the Big Three, as evidenced by GM's recent announcements of plant shutdowns and layoffs during the next few years.

Overcapacity at the Traditional manufacturers means falling business levels for Traditional suppliers. In addition, there is a burgeoning New Entrant supplier industry, now numbering at least 350 Japanese-owned or joint-ventured operations. There is over 150% supplier capacity available to serve traditional demand through the early 1990s,

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[82]Sean McAlinden et al., *U.S.-Japan Automotive Bilateral 1994 Trade Deficit;* and Economic Consulting and Planning, Inc., "North American Light Vehicle Outlook," New York, 1990.

while available supplier capacity for New Entrant manufacturers may be as high as 190%.[83] If we eliminate import capacity from these estimates, and assume all sourcing will be from North America, suppliers still suggest at least 35% overcapacity for the Traditionals and nearly 50% for New Entrants.

Profit Trends

The vehicle industry was, for many years, the most profitable manufacturing industry in North America. This is no longer the case. The constant 1983 dollar pretax profits for the US and Japanese motor vehicle industries for the period 1970-1990 are shown in figure 4.7.

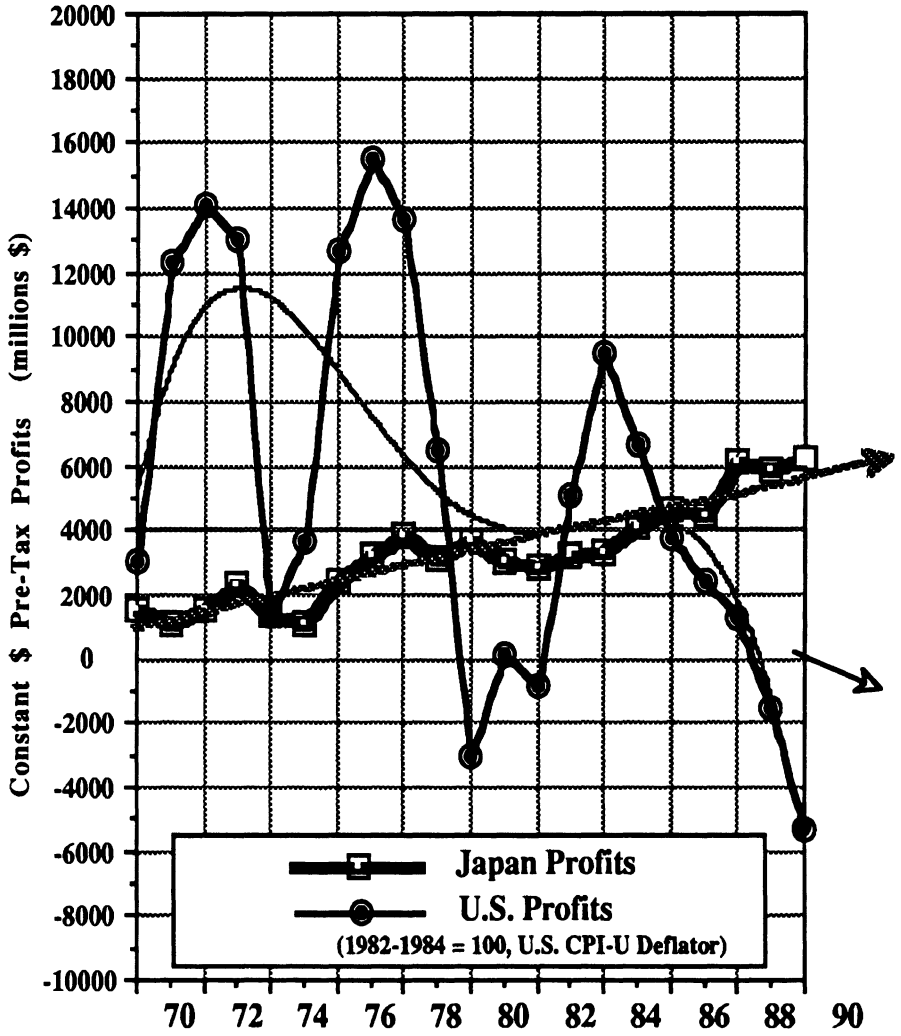

Figure 4.7. US & Japan Motor Vehicle Industry
Constant $ Pre-Tax Profits 1970-1990[84]

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[83] Michael S Flynn and David J. Andrea, *Capacity, Competition, and Change.*

[84] Bureau of Economic Analysis (BEA), US Department of Commerce (DOC), Bureau of Labor Statistics (BLS), US Department Of Labor (DOL), Japan Industrial Development Bank.

US motor vehicle industry earnings have trended down since the early 1970s. Profit troughs have deepened in severity since 1974, while cyclical peaks in real profit may have started to erode in the mid-1980s. While this downward trend in pretax earnings is superimposed over a highly cyclical pattern, it is likely that future profit peaks in high-volume sales years will be lower than in the past.

Figure 4.8 sheds additional light on the reasons for the downward trend in US motor vehicle industry profits: troughs and peaks in capacity utilization are clearly correlated with troughs and peaks in industry earnings until 1984.[85] In the 1985-1990 period, however, US industry profits declined at the same time utilization rates remained generally at a level of 80%. Analysis shows that the US motor vehicle industry clearly experienced a rise in periodic fixed costs in the early 1980s compared with levels that existed in previous years, raising the break-even capacity utilization for the industry from about 62% in the 1970s to about 85% or higher in the late 1980s. The most powerful explanatory variable connected to this shift is the change in the consumer price index on health care services and price incentives—contributing to the burden of industry health care expenditures.

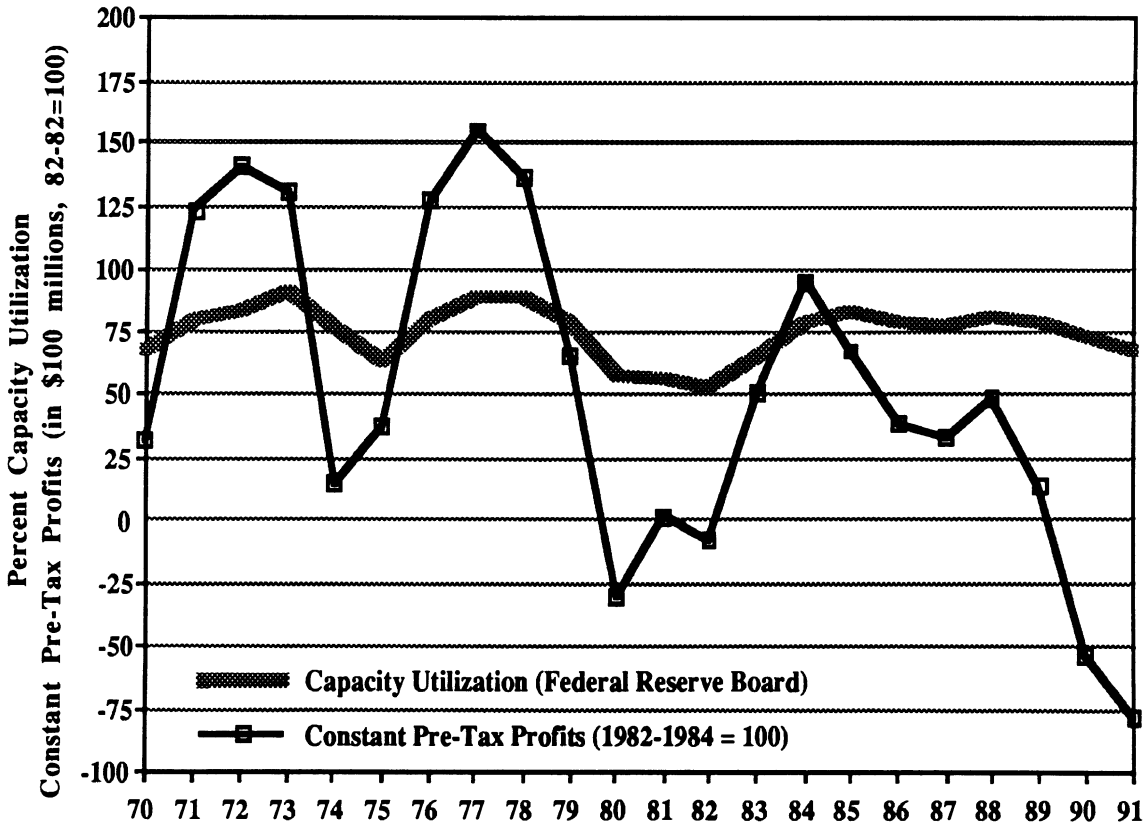

Figure 4.8. US Motor Vehicle and Equipment Manufacturing:
Capacity Utilization Versus Pre-Tax Profits, 1970-1991

[85] Bureau of Economic Analysis (BEA), US Department of Commerce (DOC), Federal Reserve Board.

This severe break in the relationship between industry capacity utilization and pretax profit during 1985-1991 can be partially explained by a transfer of a significant share of the North American passenger car market from the largest Traditional producer (GM) to Japanese transplant producers in the United States. This transfer may have amounted to over one million vehicle sales on an annual basis by 1990. Since GM was for many years the most profitable motor vehicle firm in the industry and since New Entrants have not reported significant profits to date on their US operations, profitable capacity was replaced by unprofitable capacity during the period.[86] This loss of domestic profit by GM is exacerbated by reduced profits contained in its remaining sales of vehicles produced in low utilization plants, and by the loss of profits experienced by its independent suppliers.

The profit performance of the Japanese motor vehicle industry provides a sharp contrast to the US industry in 1970-1990. Japanese industry pretax profit in constant US dollars is shown in figure 4.7. The consistent growth of Japanese industry profits is remarkable, increasing by almost 600% over 20 years. Current dollar levels of Japanese industry profit reached a level of $10 billion in 1989 and 1990.

As shown in figure 4.9, Japanese industry profits measured in constant yen cycled during 1970-1990, with peak profit years in 1985 and again in 1990.[87] Profit troughs are generally shallower over the 20 year period and cyclical peaks generally higher, suggesting falling fixed costs. It is clear that the Japanese industry now possesses a major advantage over its North American rivals in internally generated funds available for capital. This advantage could be made permanent if these profits are largely committed to investment in future competitiveness.

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[86] For example, the Bureau of Economic Analysis (BEA) of the U.S. Department of Commerce reports that foreign owned U.S. affiliates in motor vehicle and equipment manufacturing had negative net income in 1988 and 1989(-$371 million in 1988 and -$669 million in 1989). Some observers charge that transplants use transfer pricing to avoid payment of U.S. federal income taxes on U.S. produced income. Transplant representatives claim their U.S. operations are naturally unprofitable in the current early stage of investment. It is also true that wholesale affiliates of these firms report significant profits in 1988 and 1989 ($2.8 billion in 1988 and $3.3 billion in 1989). It is presumed that these wholesale profits include those earned on import as well as transplant sales. The BEA reported that foreign affiliate automotive manufacturing firms (SIC 371 only) had an employment total of 33,700, and owned total assets of $7.6 billion. See "U.S. Affiliates of Foreign Companies: Operations in 1989," *Survey of Current Business*, Vol. 71, No. 7, Bureau of Economic Analysis, U.S. DOC, Washington D.C., July 1991, pp. 72-93.

[87] Japan Industrial Development Bank.

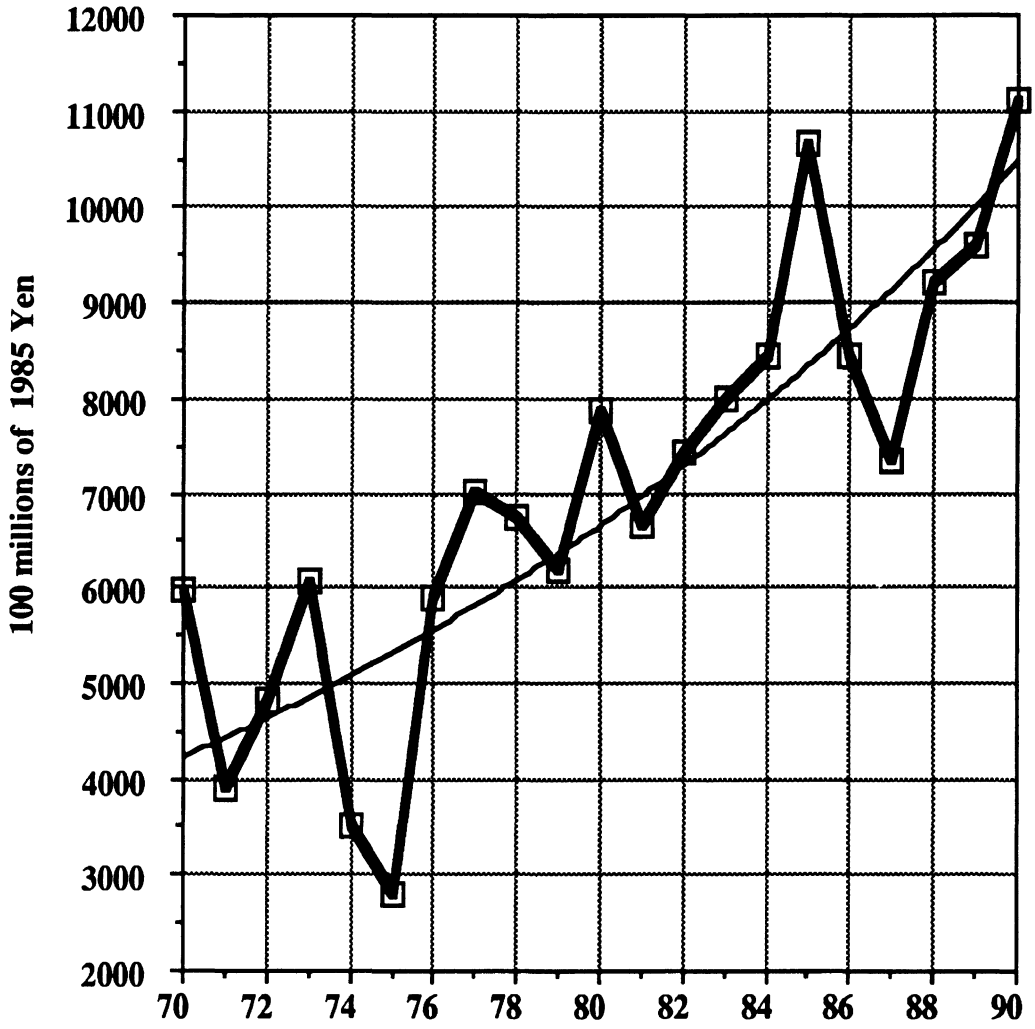

Figure 4.9. Constant Yen Japanese Motor Vehicle Industry Pretax Profits 1970-1990.

Investment Levels

Investments in new product, plant facilities and equipment are critical and traditional determinants of competitiveness in the world motor vehicle industry. Investment becomes even more important if the industry is undergoing a competitive phase characterized by rapid rates of innovation in products and processes. The Japanese motor vehicle industry now clearly exceeds the North American industry in terms of profitability and investment activity. Combined Japanese car and light truck program development projects for North America alone, for 1991-1996, exceed the North American industry efforts by almost $69 billion. If product diversity or process innovation are connected to competitive performance, the Traditional North American industry will likely face continued erosion in domestic market share. The Traditional

industry probably cannot meet the competitive challenge through internal cash financed investment alone because of inadequate profits. This investment challenge becomes even more critical if major demands are placed on the industry for radical improvements in fuel economy or emissions performance, draining money from existing programs to finance nonmarket, mandated product change.

Figure 4.10 presents an 11 year record of both US and Japanese motor vehicle investment in new plant and equipment measured in constant US dollars.[88]

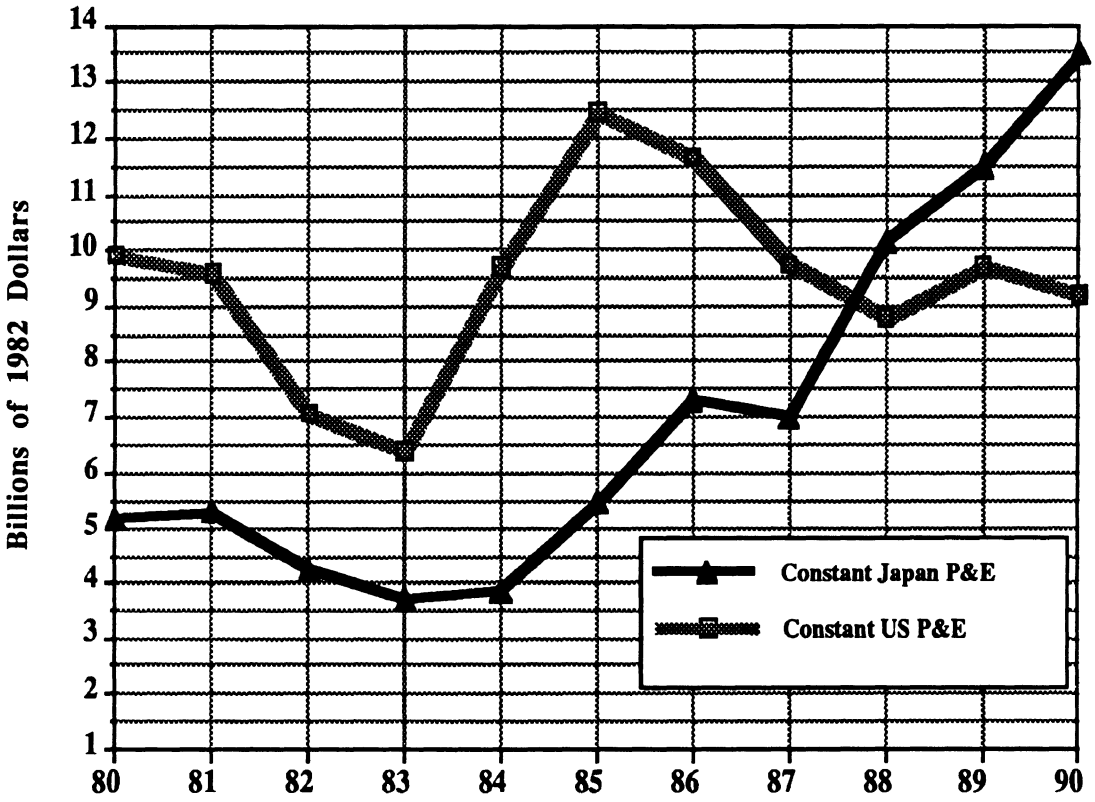

Figure 4.10. Constant $ Expenditures on Plant and Equipment: US Versus Japan Motor Vehicles Manufacturing.

US industry investment peaked in 1985, fell the following three years, and leveled off during 1988-1990. New Entrant investments in the United States are included in the US totals and may have amounted to more than $10.5 billion in current dollars, largely invested during 1985-1990. Japanese industry investment passed US industry spending in 1988 and only recently peaked in 1990, at a record $17.5 billion in current dollars.

Investment in research and development activities is also a critical determinant of competitiveness. Research and development expenditures are combined with industry

[88]Bureau of Economic Analysis (BEA), US Department of Commerce (DOC), Japan Industrial Development Bank.

investment in plant and equipment to produce a total investment series for 1980-1989, measured in constant 1990 dollars, as shown in figure 4.11.[89]

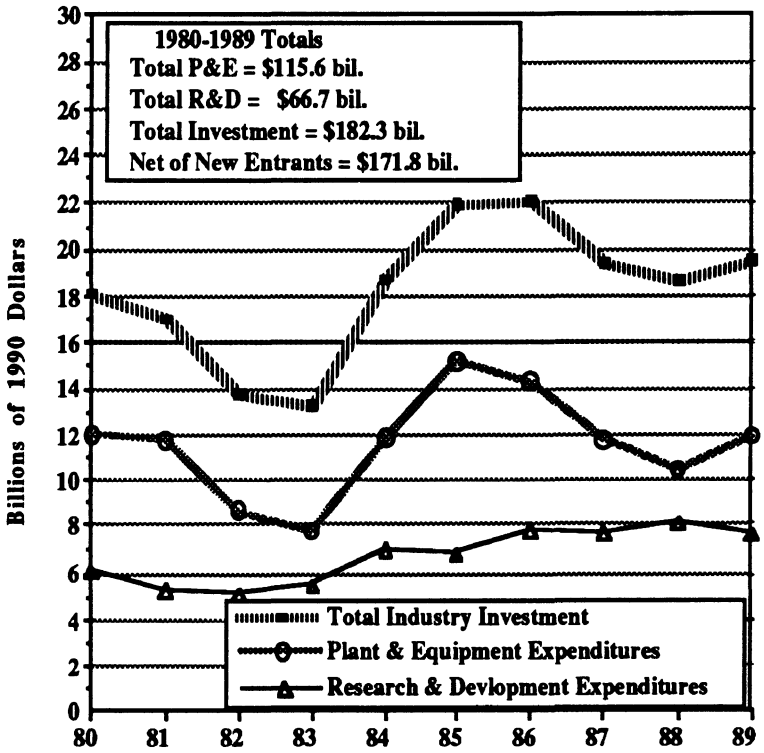

Figure 4.11. Constant $US Motor Vehicles & Equipment Industry Investment, 1980-1989.

Total investment peaked in 1985-1986 at about $22 billion each year, or about 17%-18% of the value of domestically produced vehicle shipments. Total investment then fell to an annual level of about $18 billion-$19 billion by 1988-1989, or about 12%-13% of the value of vehicle shipments. A fall in plant and equipment expenditures from their all time high of almost $15 billion (1990 $) in 1985 to a level of $12 billion by 1989 was only partially offset by gradually increasing expenditures on research and development during the same period. In fact, research and development expenditures rose, on an annual basis, from a level of $6 billion in 1980 to a level of $8 billion in 1988-1989. This larger share of R&D in overall automotive investment reflects both increasing demands for compliance in product performance by government regulatory agencies and increased competition in the product development area.

Data on research and development expenditures by the Japanese motor vehicle industry are not available, but the figures on Japanese plant and equipment expenditures

[89]Bureau of Economic Analysis (BEA), US Department of Commerce (DOC), National Science Foundation.

should be examined in constant Japanese currency. In figure 4.12, these figures are shown together with Japanese pretax industry profits for 1980-1990; the two sets clearly move together.

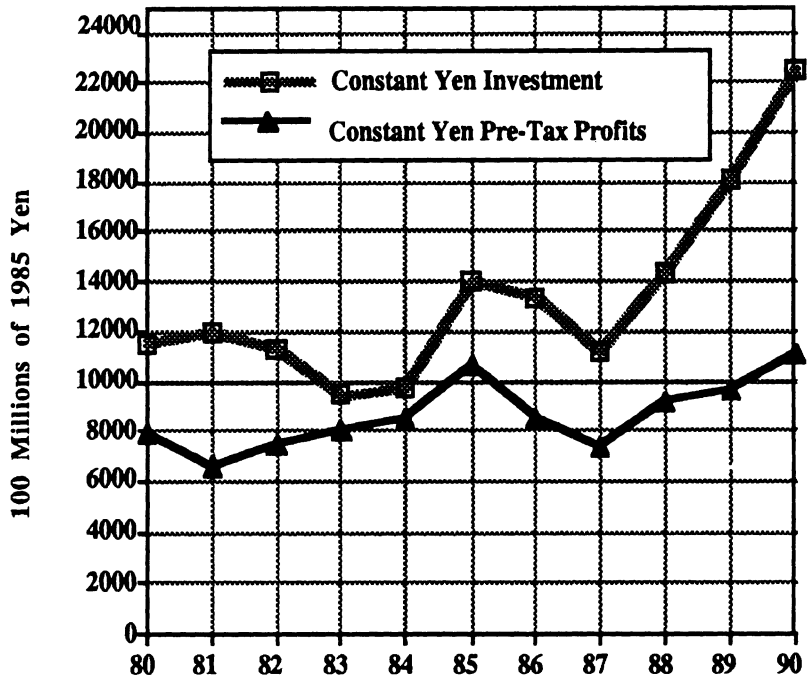

Figure 4.12. Constant Yen Japanese Motor Vehicle Industry Pretax Profits and Investment in Plant and Equipment, 1980-1990.

Future Capital Needs

What are the future capital needs of the North American motor vehicle industry? How is the Traditional industry faring in terms of needed competitive investment in product development or facilities, equipment, and tooling? Examining current product development plans of competitors in the North American motor vehicle market for passenger cars and for trucks and vans provides a partial answer. These plans should be examined in terms of estimated development costs and in terms of the ratio of change of the industries competing in North America. Table 4.5 and table 4.6 display these plans, exhibiting projections on four types of product developments.[90] First, major facelifts—estimated at a level of $625 million—include costs for changes in stamping and assembly, and for engineering development. Second, minor facelifts—estimated at $350 million—include costs for changes in stamping, assembly, and vehicle interior, and for engineering development. Third, new model introduction on an existing platform—estimated at $825 million—includes costs for changes in stamping, assembly, and vehicle

[90]OSAT, *Vehicle Product Planning Directory*, UMTRI, Office for the Study of Automotive Transportation, September, 1991.

interiors, and for engineering development. Finally, a new vehicle platform—estimated at a level of $2.05 billion—includes costs for changes in stamping, assembly, vehicle interiors, one-half the development cost of a new powertrain, and for engineering development.

Table 4.5. Product Development Plans and Associated Cost: Passenger Cars—Traditional Domestic vs. Imports and New Entrants, 1991 to 1996 (estimated costs in current US $ billions)

Product Change	Traditional Domestic	Import	New Entrants	New Entrants & Import	Japanese	Total
Major Facelifts	105	150	21	171	135	276
Estimated Cost	$ 65.6	$ 93.8	$ 13.1	$ 106.9	$ 84.4	$ 172.8
Minor Facelifts	85	91	13	104	69	189
Estimated Cost	$ 29.8	$ 31.9	$ 4.2	$ 36.1	$ 22.4	$ 65.9
New Models	11	27	8	35	34	46
Estimated Cost	$ 9.1	$ 22.3	$ 6.6	$ 28.9	$ 28.1	$ 38.0
New Platforms	17	62	0	62	43	79
Estimated Cost	$ 34.9	$ 127.1	$ 0	$ 127.1	$ 88.2	$ 162.0
Total Estimated Cost	$ 139.4	$ 275.1	$ 23.9	$ 299.0	$ 223.1	$ 438.4

Ratio of Product Development Efforts - Traditional Domestic vs. Imports and New Entrant Manufacturers, 1991 to 1996

Product Change	Traditional Domestic	Import	New Entrants	New Entrants and Import	Japanese	Total
1991 Number of Platforms	35	70	8	78	52	113
1996 Number of Platforms	41	133	8	141	98	182
Number of Platforms 1991 to 1996 Percent Increase	17%	90%	0%	81%	88%	61%
New Platforms as a Percentage of 1996 Number of Platforms	41%	47%	0%	44%	44%	43%
Average Number of Platforms	38	102	8	110	75	148
Average Number of Facelifts per Platform	5.0	2.4	4.3	2.5	2.7	3.1

While evidence indicates that the Japanese can achieve far lower cost levels for this type of product development, we apply the North American rates to Japanese development activity for the purpose of comparison. Table 4.5 projects 79 new platform introductions, 46 models introduced on existing platforms, and 465 major and minor vehicle facelifts during the 1991-1996 period in the North American car market. The cost

of this product development effort is estimated at $438.4 billion. The Big Three are projected to spend $139.4 billion, or 32%, of the total. The Japanese are projected to spend about $223.1 billion (51% of the total) on product development for their New Entrant and imported cars.

These plans suggest that the Traditional North American industry will be heavily outspent in the next five years in terms of product development in the passenger car market. The Big Three are expected to increase their number of existing car platforms by a net 17% during 1991-1996, while the New Entrants and imports will increase their total by 88%. The Big Three vehicle producers clearly intend to maintain a high ratio of model facelifts per platform (5.0), while foreign competitors concentrate on further extensions of their product lines into new segments such as the upper middle. To match this 88% rate of new platform introduction, the Big Three would have to introduce an additional 25 platforms, at an incremental cost of $50 billion. To match the total number of expected competitor platforms in 1996 would require an additional 94 Big Three car platforms, at an incremental cost of $188 billion.

Table 4.6 forecasts product development in the truck and van market. The 1991-1996 truck and van market will see 43 new platform introductions, 12 new models introduced on existing platforms, and 123 major and minor facelifts. The total cost of this product development effort on the part of all competing firms is $160.3 billion. The Big Three will spend $83.9 billion or 52% of the total, while the Japanese vehicle producers are expected to spend $69.0 billion or 43% of total new product development cost. However, the Big Three are expected to increase the number of truck and van platforms by only 2 (7%), although 55% of their 1996 platforms will be new or replacements during 1991-1996.

The Japanese industry, on the other hand, will increase its truck and van platform lineup by 15 (150%), and 92% of their 1996 platforms will have been introduced or replaced during 1991-1996. In other words, the Japanese light truck product line will more than double by 1996, and be primarily composed of platforms introduced during 1991-1996.

Although Japanese development spending on light trucks will still lag behind the Traditional producers, it will reach a new record level, and accelerate the rate of new platform introductions in segments where the Japanese have not yet competed, such as full-size pickup. When this has happened in the car market, it has usually resulted in greater share loss for Traditional producers than from the replacement of existing platforms.

Table 4.6. Product Development Plans and Associated Costs: Trucks and Vans, Traditional Domestic vs. Imports and New Entrants, 1991 to 1996. (estimated costs in current US $ billions)

Product Change	Traditional Domestic	Import	New Entrants	New Entrants and Import	Japanese	Total
Major Facelifts	43	20	5	25	24	68
Estimated Cost	$ 26.9	$ 12.5	$ 3.1	$ 15.6	$ 15.0	$ 42.5
Minor Facelifts	37	16	3	19	17	55
Estimated Cost	$ 13.0	$ 5.6	$ 1.1	$ 6.7	$ 6.0	$ 19.7
New Models	11	1	0	1	1	12
Estimated Cost	$ 9.1	$ .8	$ 0	$ .8	$ .8	$ 9.9
New Platforms	17	23	3	26	23	43
Estimated Cost	$ 34.9	$ 47.2	$ 6.1	$ 53.3	$ 47.2	$ 88.2
Total Estimated Cost	$ 83.9	$ 66.1	$ 10.3	$ 76.4	$ 69.0	$ 160.3

Ratio of Product Development Efforts - Traditional Domestic vs. Imports and Transplants, 1991 to 1996

Product Change	Traditional Domestic	Import	New Entrants	New Entrants and Import	Japanese	Total
1991 Number of Platforms	29	10	3	13	10	42
1996 Number of Platforms	31	30	6	36	25	67
Number of Platforms 1991 to 1996 Percent Increase	7%	200%	200%	176%	150%	60%
New Platforms as a Percentage of 1996 Number of Platforms	55%	77%	50%	72%	92%	64%
Average Number of Platforms	29	20	5	25	18	55
Average Number of Facelifts per Platform	2.8	1.8	1.6	1.8	2.3	2.2

In summary, the Traditional North American industry has experienced declining levels of profitability, while the profit levels of their major international competitors rise. The Traditional industry has invested huge sums, but Japanese investment levels have surpassed this since 1988. Product investment plans for the 1991 through 1996 period suggest that Japanese profits and capital access will support a heavy investment program, further intensifying the competitive challenge to the Traditional industry, and focusing it more in the light truck market than has been the case in the past.

Human Resources

North America is increasingly recognizing that is must develop its human resources if it is to compete in the emerging international economy, and this applies as much—or more—to the Traditional Automotive Industry as to other manufacturers and all economic sectors.

Human resources is a well-reviewed topic in both North American economies.[91] The general problems of the educational system are well documented, as are the international differences in training provided employees after they begin their work career. There is little question that Japanese manufacturers provide higher levels of training for their work force, and this is undoubtedly applicable in the automotive industry. A recent study suggests that Japanese automakers invest more than twice the hours of annual training in employees (80 plus) than do the Traditionais (about 30). The difference is even more extreme for new employees, as the Japanese industry provides over 300 hours of initial training, while the Traditionals provide fewer than 50.[92]

To be sure, the permanent employment system in Japan provides an employer some assurance that it will reap the benefits of these investments, while a North American employer faces the possibility that the trained worker will leave for better employment opportunities. Germany also provides higher training investments, and government funding plays a much larger role than is the case in Japan. Perhaps government funding of these costs is a reasonable option for ensuring that the training takes place while preserving an open labor market.

However, the Traditional industry, at least at the manufacturer level, has increased its expenditures for training the current workforce. In particular, recent contracts with the UAW in the United States have specifically reserved funds to support joint human resource centers at each of the Big Three, and these centers provide a wide variety of job-related training, from very job specific skills to broader human and job capabilities. So, too, the Automotive Parts Manufacturing Association and Canadian Auto Workers are undertaking joint training efforts in Canada. Both these efforts, unfortunately, must often be targeted to areas that the Japanese manufacturer can more readily assume are provided in Japan's general educational system.

A particular concern for manufacturing industries is the supply of technical and engineering personnel. On a per-worker basis, North America has about as many

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[91]For the United States see Council on Competitiveness and OTA; for Canada see Michael E Porter, *Canada At The Crossroads: The Reality of a New Competitive Environment*, A study prepared for the Business Council of National Issues and the Government of Canada, October, 1991.

[92]Krafcik, 1990, as reported in Office of Technology Assessment *Worker Training Summary*, 1990.

engineers as does Japan. However, this parity is somewhat misleading, since a number of factors mitigate against the Traditional Automotive Industry 's current and continuing access to these human resources. First, the extensive US defense and aerospace industries provide attractive alternatives to North American engineers and technical workers; and they are, in fact, more intensive in their use of these workers than is the automotive industry.[93] Japan's automotive industry is not faced with such strong competition for engineering talent. Lessening international tensions and reduced US spending for defense may free up a relatively larger supply over the coming years, but the handicaps imposed by this inter industry competition over the past four decades will continue to be a problem for the Traditional Automotive Industry for some years to come.

Second, engineering entrants and graduates in North America are overwhelmingly white males, and the demographic composition of North America is changing; these individuals are a declining proportion of college—and workforce—entrants. Unless the selection factors that account for the low entry rates of females and nonwhites into engineering are altered, the supply of engineers will likely contract rather than expand in the future. Canada has had notable success in attracting immigrants with production skills, and is continuing to attract experienced workers from Eastern Europe. However, countries that currently export workers would undoubtedly raise serious objections to any concerted targeted program to encourage their engineers to emigrate to North America.

Third, Japan's rate of engineers as a percentage of college graduates is considerably higher than the rate in North America. As Japan's affluence continues to increase, its lower overall college attendance rate will undoubtedly increase. If it maintains its higher concentration in engineering, the ratio of engineers per worker in Japan will sharply increase.

Engineering and technical workers are a critical competitive resource in complex manufacturing industries like motor vehicles. Improving the supply of such workers is a critical competitive challenge for the North American economies, and the long-term solution clearly lies outside the control of the industry itself. The industry must effectively maintain and deploy its current human resources, but, ultimately, the issue of adequate supply rests in the broader economies and societies.

Effective management is a critical human resource, and many critics of the performance of the Traditional industry over the past few years identify it as a major

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[93]Sean P. McAlinden, "The Importance of Motor Vehicle Manufacturing in the U.S. Economy," in Kenneth Lieberthal, Michael Flynn, Kim Woodard, et al., *Paths to Sino-U.S. Automotive Cooperation*, The University of Michigan, 1989.

source of the Traditional industry's competitive decline. Many of these critics decry the development in North America of a generalized management training and career orientation, pointing to the prevalence and even dominance of engineers among top management in the Japanese automotive industry, although no clear evidence exists that a manager's initial training has substantial effect on performance. Defenders of North American management see these problems as less poor management and more due to external business conditions.

Management's role in and responsibility for the decline of the Traditional North American industry and the competitive crisis it faces today is one of the most difficult—and contentious—issues to assess. Some authors assign major responsibility to management's role, analyzing the decline of particular companies as due almost exclusively to management culture and actions.[94] Other analysts portray a management that was, in some sense, hostage to a radically changing business environment and limited to noncompetitive options by the policies and practices of the nation and the companies that blocked necessary change.[95] Still others take a middle ground, portraying management as making decisions that appeared to be reasonable at the time, but were often in fact not good decisions, sometimes reflecting managers' failure to adapt to a changing environment, sometimes subverted by events that could not be anticipated, and sometimes constrained by the business and policy environment.[96]

Nevertheless, Traditional North American automotive management bears some responsibility for the competitive situation the industry faces today. Some management was relatively slow in responding to the Import threat, resisted recognizing the Japanese as serious and consequential competitors, sought easy and quick fixes to the problems posed by the Japanese competitive challenges, and saw the silver lining in every cloud on the horizon. At the same time, it must be recognized that the industry was, in some sense, a victim of its own success in earlier times. It is no easy task to change the strategies and tactics that made one remarkably successful over a long period of time, nor is it easy to recognize the environmental signals that fundamental change has occurred.

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[94]For example see Maryann Keller, *Rude Awakening: The Rise, Fall, and Struggle for Recovery of General Motors*, New York: William Morrow and Company, Inc., 1989.

[95]For example see Davis Dyer, Malcolm S. Salter, and Alan M. Webber, *Changing Alliances*, Harvard Business School Press,Boston, 1987. These authors admire and praise many of the same decisions by General Motors that Keller criticizes in *Rude Awakening*.

[96]David Halberstam, *The Reckoning*, New York: William Morrow and Company, Inc., 1986.

Manufacturer-Supplier Relations

Most of the performance measures reviewed above are appropriate measures of the competitiveness of an individual company, however complex and even external the performance sources may be. There is another competitive performance measure that is extremely important for assessing the position of any complex manufacturer: the nature and strength of the manufacturer-supplier relationship. This is a performance dimension that is often identified as a major competitive advantage of the Japanese industry. Supplier relationships are critical to the final cost and quality of the vehicle. In the long run, a key ingredient in how effectively suppliers contribute to the manufacturers' competitiveness lies in the management of the manufacturer-supplier relationship.

The relationships between the manufacturers and the suppliers that constitute the Traditional industry have often been stormy. The manufacturers have the in-house capability to perform most of the types of work that the suppliers do, and however stable the levels of vertical integration have been, the exact mix of the make-buy decisions by the manufacturers has varied, often from year to year. The supplier, then, is often in competition with the manufacturer itself for the manufacturer's business. The manufacturers have historically preferred maintaining multiple sources for parts and components, partly to assure themselves of uninterrupted supply, but also to reduce piece-prices through direct competitive bidding in an open market.

The Role of the Supplier

The manufacturing and marketing of automobiles involves numerous, complex activities of differing degrees of complexity and sophistication. This activity requires enormous coordination of capital and human resources, tying together thousands of parts from hundreds of locations, so that an affordable, reliable vehicle rolls off the final assembly line. How that activity is structured, and the ways that structure is changing is a key performance dimension of automotive industry competitiveness.

There are five important roles played by companies in the North American automotive industry. First, the manufacturing companies assemble and distribute the finished vehicle. Second, there are the allied or captive supplier divisions of the manufacturing companies. Their role is to manufacture parts and components. Third, there are the independent suppliers of raw materials, parts, and components that are used in the production of the vehicle. Fourth, there is a set of specialty suppliers that provide a range of supporting goods and services, from both product and process engineering to heat treating and plating of traditional parts and components. Finally, there are suppliers

that only serve the automotive aftermarket. The changing role of suppliers and their relationship with their manufacturing customers is a fundamental dynamic of the changing North American industry, and a critical path to its competitiveness.

Factors in Restructuring

Japanese manufacturers and New Entrants are more efficient and more effective in coordinating their own efforts and those of their suppliers than are the Big Three.[97] To compete effectively with Japan, the Traditional industry must continue to improve its performance *as an industry* in addition to the individual efforts of its companies. That will involve numerous changes in traditional business patterns.

Suppliers face excess capacity, reflecting falling production at their traditional customers, and the advent of New Entrant suppliers to serve the needs of New Entrant manufacturers. The establishment of these manufacturing facilities afforded an opportunity for offshore suppliers to enter North American production and over 350 Japanese suppliers have established their own facilities here.[98] These new suppliers represent additional capacity, and compete for Traditional supplier business both at the Big Three and the New Entrant manufacturers.

A recent case study suggests that Honda—perhaps the New Entrant with the highest level of North American sourcing—sources at most 20% of its purchased content from Traditional suppliers, 32% from New Entrant suppliers, and 48% from Japan.[99] This obviously directly hurts Traditional suppliers, who cannot secure business with the New Entrants to replace business lost as their traditional customers have lost production share. While for a time the Big Three had increased their levels of offshore sourcing of parts, components, and raw materials, reliance on offshore sourcing—particularly from the Pacific region—has recently been reduced.

Vertical Integration

The North American automotive industry functioned in a naturally protected market through the early 1970s. Import competition was restricted to a few segments, and there was little price competition. Thus, the cost of manufacturing the vehicle was primarily important in influencing the size of the market and the level of profits, rather than the manufacturer's market share. The automakers pursued a classic strategy for this

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[97]Michael A. Cusumano and Akira Takeishi, "Supplier Relations".

[98]Brett C. Smith, *Japanese Automotive Supplier Investment Directory, Fourth Edition*, UMTRI, Office for the Study of Automotive Transportation, October, 1991; and OSAT estimates for Canada.

[99]Sean P. McAlinden et al., *U.S.-Japan Automotive Bilateral 1994 Trade Deficit*, Table 16.

environment, seeking high levels of vertical integration and manufacturing high percentages of the vehicle's total content.[100]

In the mid-1980s, the Traditional manufacturers rediscovered outsourcing—purchasing parts, components, and even complete vehicles from an outside supplier rather than manufacturing them in-house—as a competitive strategy for meeting the cost and quality challenges of their international competitors. Most observers expected major increases in the level of outsourcing by the early 1990s.

This reappraisal of the value of outsourcing reflected a major difference between the Traditional manufacturers and their Japanese rivals. The Japanese industry is less vertically integrated, in a formal sense, concentrating responsibility for manufacturing and assembling smaller portions of the vehicle's total value within the assemblers. In all probability, Toyota is the least vertically integrated major automotive manufacturer in the world, at perhaps as low a level as 25%. The Traditional manufacturers were persuaded that lower vertical integration played a significant role in the final cost and quality of Japanese vehicles, allowing work to be performed within more specialized and expert producers, typically at lower labor costs than would be required by the Japanese assemblers.

The strong drive towards increased outsourcing has abated, and the evidence suggests that the Big Three have not lowered their levels of vertical integration to the levels analysts expected. Two factors appear to account for this arrested trend. First, recent labor contracts between the Big Three and the UAW have restricted outsourcing by providing workers the opportunity to make a final bid against outside suppliers. Company management and labor appear to be reasonably effective in developing these counter-proposals. Second, many of the in-house component divisions at the Big Three were either not as uncompetitive as they were viewed, or they have evidenced remarkably rapid improvement. Nevertheless, changing levels of outsourcing are a continuing source of tension between Traditional manufacturers and their suppliers.

Evolving Relationships

The Traditional manufacturers see in the Japanese industry a model of an efficient, productive supplier base and healthy supplier relations. The Japanese supplier industry numbers far fewer firms than its North American counterpart, and is structured in a fairly rigid systems of tiers, where each tier supplies the companies in the tier immediately above it. These tiers contain smaller numbers of companies as they near the

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[100]K. Monteverde and D. Teece, "Supplier Switching Costs and Vertical Integration in the Auto Industry," *Bell Journal of Economics*, Volume 13, Number 1, Spring 1982, pp. 206-213.

assembler, the capstone of the pyramid. Further, Japanese suppliers are less likely to supply multiple assemblers than are North American suppliers, just as the Japanese assemblers more often rely on one supplier as the sole source for a purchased part or component. Purchase contracts in North America typically are for one year, whereas in Japan they more typically run the life of the vehicle model. Major or first-tier suppliers in Japan—companies like Nippondenso or Aisen Seiki of the Toyota group—are expected to make significant engineering contributions to their customer, as well as to their own lower-tier suppliers. Japanese suppliers typically commit themselves to shared cost reductions with their customers, and closely adapt their production and delivery schedules to their customers' needs. The Japanese supplier, in turn, is provided with a more secure business environment, and a longer period for planning investments and securing returns. The larger North American supplier industry is far more amorphous, and it is not always clear who does what for whom.

The structure of the Japanese industry, including equity holdings by the manufacturers in their suppliers, transfers of employees from manufacturers to suppliers, and the *keiretsu* relationships common in the industry, fosters a form of vertical *coordination* that provides many of the benefits of vertical integration, without some of its penalties. However, this Japanese-style vertical integration is a complex web of elements, and probably cannot be duplicated by simply copying one or two key aspects. Moreover, there are legal impediments to such practices in North America, where they are often viewed as anticompetitive.

The relationships that developed in the domestic industry between the manufacturers and their suppliers reflected the manufacturers' view that independent suppliers often represented a less preferred alternative, except when suppliers had proprietary technology, and even then they were often viewed merely as necessary evils. Their major value was that they represented flexible capacity—useful when the market was strong and not a burden when the market was weak. Their secondary value was that they provided a mechanism for disciplining the manufacturers' internal, captive, or allied supplier divisions.

From the suppliers' point of view, the manufacturer often treated them as conveniences to be exploited and discarded when a short-term advantage became available elsewhere. Suppliers competed on price, and to a lesser extent, on delivery performance, except those that had proprietary technology. Quality, engineering contribution, innovation, and manufacturing competence were neither consistently nor highly valued by the manufacturers. Even suppliers with proprietary products were often

required to share production volumes with the manufacturer's own allied supplier division or to release their drawings to their own competitors for bids.

The competitive situation that encouraged this structure and permitted these relationships has changed drastically. The domestic manufacturers can no longer afford to support a large, amorphous, uneven supplier industry valued for flexible capacity and piece-price discipline alone. Rather, a smaller, more reliable, and more broadly competent supplier base is required to meet the Japanese challenge in cost and quality. It is increasingly clear that it is not the simple buy-versus-make activity in Japan that matters so much as it is the capability of the suppliers and the nature of the relationship between them and their customers that makes the Japanese assemblers such effective competitors.

Traditional domestic suppliers report changes in both the sourcing criteria used by the domestic manufacturers and their standard business practices with suppliers. While the importance of price has not diminished, numerous other selection criteria, such as quality, delivery performance, engineering competence, and location have all increased in importance. The changes in business practices, such as just-in-time (JIT) manufacturing, earlier supplier involvement in development, supplier self-certification of quality, and increased reliance upon supplier engineering all reflect a greater dependence on the supplier's broad competence.

The Traditional manufacturers have all developed complex and important supplier rating systems. These systems are at once a mechanism for supplier improvement, the development of better relationships with the manufacturers, and evidence of the industry's serious pursuit of more effective and competitive performance.

These changes in the relationship between Traditional manufacturers and their suppliers have been underway since the early 1980s, and are not yet complete. They are, however, moving relatively rapidly, and suppliers expect the remaining differences between the Traditional manufacturers and the New Entrants to largely recede by the year 2000.[101]

Two developments reflect the complexity of these evolving relationships. First, there is a move to system, or modular, sourcing: the manufacturer buys a built-up unit from one supplier, rather than some or all of the discrete parts or components for such a unit from numerous suppliers. The sourcing of built-up modules can provide the manufacturers with enormous benefits in both cost and quality, reducing the

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[101]Ernst & Young, *The Car Company of the Future*.

manufacturers' transaction and coordination costs and avoiding duplication of purchasing and inspection efforts.

Systems suppliers will become the first-tier suppliers. They will be expected to have a high degree of technical sophistication, including good design and manufacturing engineering capability, management skills, and electronic communication capability. They will need to meet rigorous quality and productivity demands, and will in turn have to manage their own suppliers for the module to assure their performance. The higher the tier, the higher the value-added for the supplier, and the more critical the supplier's own sourcing decisions throughout the manufacturing chain.[102]

Second, a key change in sourcing practices will be required for system sourcing to provide its full range of promised benefits. The manufacturers must be willing to transfer the engineering responsibility for the module to the module supplier. The transfer of engineering responsibility has always been a sticking point for the Traditional industry in the past, meeting resistance because of an unwillingness to accept the loss of control and the increased dependence upon suppliers that such a transfer entails. However, many Traditional suppliers are themselves strong in engineering, and suppliers are supported by a competitive and strong independent engineering service sector, including the contract engineering and design houses, largely centered in the Detroit area.

Summary

The structure of Traditional North American manufacturer-supplier relationships is changing in a number of ways. These include a reduction in the number of suppliers (at least direct suppliers) and a tiering of the supply base, with first-tier suppliers required to make substantial engineering and technical contributions to the manufacturers, and coordinate the production of systems/modules, while lower-tier suppliers will be required to achieve true manufacturing excellence. The integration of New Entrants into the Traditional industry is slow at best, and that unfortunately may restrain the rate of the Traditional industry's improvement on some key performance dimensions.

Comparison of North American and Japanese New Entrant Suppliers

New Entrant suppliers have numerous important competitive advantages that they share with New Entrant manufacturers. These include lower labor costs, which are primarily due to lower fringe benefit costs (especially health care) for a younger

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[102]Michael S. Flynn, "Currencies and Competition: Implications for Michigan Suppliers", *Auto in Michigan Project Newsletter*, Volume 2, No. 1, November, 1986..

workforce and the need to support few retirees. While the New Entrant manufacturers have higher assembly productivity levels, the comparison of the North American and Japanese supplier industries, discussed above, suggests that this advantage may not carry over to the supply base. The New Entrant suppliers have had the same opportunity as New Entrant manufacturers to select and carefully train their workforce, they have the financial backing of their Japanese parents, and they benefit from any product and/or image advantages that their parent might possess. Anecdotal evidence suggests that the larger, more capable Japanese suppliers have behaved similarly in North America to the New Entrant manufacturers, and probably have similar advantages. It is less clear that smaller New Entrants have secured these same advantages. Just as the strengths and weaknesses of the Japanese manufacturers vary widely, so too do the strengths and weaknesses of the supplier base, whether in Japan or as New Entrants to North America.

New entrant suppliers have also often received subsidies from local and state governments, including waivers of various taxes and subsidies for training. Local economic developers wish to secure new facilities and jobs for their communities, and it is the New Entrants—not the Traditional suppliers—that are establishing new production facilities.

Traditional North American suppliers are more competitive than often portrayed, yet still face major difficulties in gaining business at New Entrant manufacturers. Certainly the analysis by Fuss and Waverman for this report raises questions as to the often reported high prices of Traditional suppliers as a barrier to securing New Entrant business. On the contrary, those results suggest that New Entrants' offshore sourcing to higher cost Japan is somewhat puzzling. To be sure, the other explanation for this situation is that Traditional North American supplier parts and components are not of sufficiently high quality to meet the standards of the New Entrant manufacturers. The improved performance of the traditional vehicles, discussed above, certainly suggests that this should not be the extreme bar to securing business that it appears to be. Surely the best Traditional suppliers are more than competitive on quality.

As discussed above, Japanese suppliers play a significant engineering and design role in the development of Japanese-badged vehicles, whether imports or New Entrants. This indeed poses a substantial barrier, since an estimated 70% of Japanese parts and components are supplier designed.[103] Because of this, many assert that supplier business is only realistically available during the developmental engineering phase (or *design-in* stage) of the vehicle. This is for the simple reason that the supplier holds the drawings,

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[103]Womack, *Machine*, p. 157; Clark and Fujimoto, *Product Development*, Figure 6.1.

and is unwilling to share them with a potential competitor. This also presents a formidable barrier to Traditional suppliers to the North American aftermarket. These suppliers typically rely on prints supplied by the vehicle manufacturer. For Japanese vehicles, these suppliers report that they are told that prints must be obtained from the supplier, who generally refuses to share them with a competitor for aftermarket business.

However, only 13% of supplier designs in the Japanese industry are proprietary (8% of the total), and most parts and components are dual sourced, although this varies somewhat by manufacturer.[104] That means that those designs are indeed shared, but apparently only within the Japanese supplier community. The requirements for engineering and design contributions to secure major contracts, and the need to establish the credentials for participation in the early development work are indeed major barriers to Traditional North American suppliers securing access to New Entrant business, or to export opportunities in Japan. However, explanations for the low level of success that treat these, combined with alleged low quality and high prices, as the only barriers ring hollow. It is not surprising that North American suppliers feel that supplier nationality is a far more important selection criteria at the New Entrants than it is at Traditional North American manufacturers.[105] This is important, both because of the growing volumes at the New Entrants and shrinking relative volumes at Traditional manufacturers and because Japan itself is the world's largest national producer of automotive vehicles, and therefore the world's largest single supplier market.

The Automotive Industry Future

Hoffman and Kaplinsky directly address the issue of the structure and location of future automotive manufacturing.[106] Their analyses and predictions are cautiously optimistic from the perspective of developed automotive producing regions. They portray the decline of the Traditional North American manufacturers as reflecting changes in the nature of production, but argue that these very changes confer some locational advantages for continued production in developed regions like North America. If some work will inevitably be lost to offshore competitors and offshore sourcing of materials, parts, and components by Traditional and New Entrant North American manufacturers, much work will remain.

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[104]Yoichi Ohta, *Intercompany Relationships in Japanese Manufacturing Industries*, Unpublished Master's Thesis, Trinity College, Oxford University, 1985.

[105]Ernst & Young, *The Car Company of the Future*.

[106]Kurt Hoffman and Raphael Kaplinsky, *Driving Force: the Global Restructuring of Technology, Labor, and Investment in the Automobile and Components Industry*, Westview Press, Boulder, CO, 1988.

They argue that the type of embodied technology employed in the production and distribution of goods, the nature of the labor process, and the nature of interfirm relationships in the production chain reemphasizes production siting near final markets. This is particularly true in the context of a world where productivity and unemployment differentials across economies inevitably foster protectionism. However, the authors question how well the Traditional North American industry understands these new production imperatives, and their implications for production siting. Thus, the Traditional manufacturers continue to seek offshore sources for both vehicles and parts and components, and to close existing North American production facilities. Moreover, even if the industry understands, it feels pressured to meet the immediate Japanese challenge by pursuing low cost offshore sources for vehicles, parts, and components—however risky that strategy may be in the long run. Mexico, in this analysis, may pose a substantial threat to current North American production, as it offers proximity and sufficient skilled labor.

The industry's top management view of its future is the topic of a recent study.[107] It is clear that the Traditional industry sees intense competitive challenges for the balance of the decade. There will likely be further share erosion at the Big Three, and increased offshore competition for supplier business. On the other hand, they see increased competitiveness within some parts of the Traditional industry, perhaps most especially at GM.

The industry clearly recognizes the complexity of the competitive challenge, and is attempting to remold itself to meet that challenge. In particular, it recognizes that competitive survival will require numerous continuing changes in the industry's old business practices, as automotive companies become more knowledge-based competitors and must leverage all their human and financial resources. Most companies are undertaking a wide array of efforts to achieve these higher levels of competitiveness, although there is some suggestion that these efforts may not be as coordinated and focused as is desirable.

While most expect the industry to shrink, the vast majority of companies are committed to continued participation, intending to make sure that other companies are the victims of industrial downsizing and restructuring. It is clear that industry leadership is undertaking myriad efforts to ensure survival into the next century. While survival will be determined by numerous events and factors, there is no evidence that the Traditional industry, at either the supplier or manufacturer level, will fail due to a lack of will.

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[107]Ernst & Young, *The Car Company of the Future*.

Summary

This review suggests that the Traditional North American industry has made impressive strides over the past decade, narrowing a number of serious competitive gaps against the Japanese industry, such as quality and cost. However, serious challenges remain, as the nature of Japanese competition has evolved, presenting the industry with broader-based and North American-sited challenges and threats. A particular threat is the industry's substantial need for investment capital to match new product offerings, and the difficulty the industry faces because of its changing profit performance.

This competitive assessment largely addresses issues that most analysts have assumed are under the industry's control, although we have illustrated that this is often not the case. The next chapter will review some critical challenges facing the industry that are not under industry control, but more reflective of the general business environment and the public policies that shape it.

V. PUBLIC POLICY ISSUES

Many industry observers and participants feel that the globalization of automotive competition—in large part driven by nations' trade policies—has significantly altered the automotive industry's competitive dynamics. The familiar company-against-company competition in a shared business environment and climate of management, labor, and government relations is now past. Today, management relationship with labor and government is critical to success because the management-labor relationship determines how well a company can organize and motivate employees to make low-cost, high-quality products, while the management-government relationship determines the operating environment to pursue competitive activities. Some scholars call this a national enterprise system.[108]

Companies no longer compete within the same fundamental business environment and enterprise system. Now they compete globally, and company level competition may be largely determined by the advantages and disadvantages conferred on a company by its national enterprise system. The national policies that shape national enterprise systems thus become key determinants of a company's competitiveness.

The Japanese national enterprise system is particularly well suited to strengthening that nation's global competitiveness. In Dyer, Salter, and Webber's view, this enterprise system is the key to Japan's competitive success and rise to be the premier automotive industry in the world. It has six key characteristics: 1) legitimate shared authority and responsibility among all three enterprise elements—i.e., industry, labor, and government; 2) all three elements recognize shared as well as distinct interests; 3) decision making is efficient, effective, and emphasizes economic consequences; 4) the system stresses adaptability and flexibility in the face of an environment that is assumed to be ever changing rather than stable; 5) all elements emphasize the strategic aspects of decisions; and 6) these relationships exist at the company level, and focus on the company in world rather than national competition. These characteristics emerged in a trial and error learning process after the War, often marred by serious disputes and confrontations.

In North America and particularly in the United States, the relationship between government and the automotive industry has been significantly anticompetitive in the new global marketplace, in that the actions of government that help or hurt the industry have fluctuated with little regard to the political affiliation or ideology of the incumbents.

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[108]Davis Dyer, Malcolm S. Salter, and Alan M. Webber, *Changing Alliances*, Harvard Business School Press, Boston, 1987.

Many weaknesses of the North American economies that undercut the efforts of companies and industries to compete are well documented and have been extensively covered in other reports. Thus, the effects of the low US savings rate (below 5% since 1985) compared to the much higher rates in Germany and Japan (above 11% and 14%, respectively since 1984) has received ample attention, if little action.[109] Although Canada has a much higher savings rate than the United States, its automotive industry is tied to US policies because of US ownership of much of that industry and the industry's need to draw on the larger US economy to meet its huge capital requirements.

This chapter of the report begins with a broad, comparative overview of the policy environments in Canada, the United States, Japan, and Germany. We review the policy environments of Japan and Germany because these countries currently, and for the foreseeable future, possess the major competitor industries to the North American. Our review of the North American policy environment includes a discussion of government officials' views about and attitudes toward the automotive industry. The chapter then reviews four specific policy arenas of immediate concern to the industry: the comparative cost of capital, the industry's costs of providing health care for its employees, the effect of trade policies on industry performance, and the developing possibility of a North American Free Trade Agreement, expanding the FTA to include Mexico. The final section of the chapter presents and evaluates a series of simulations designed to identify the effects of a range of policy actions on the automotive industry's economic performance.

Comparative Overview of Public Policies

The performance of the automobile assemblers and parts makers is believed by some to be primarily a function of their management and labor practices. While a firm's management decisions and labor skills are indeed crucial for a company to compete, the public policy environment in which it operates can have a significant impact on the performance of a company. The legal, regulatory, social welfare, political, and financial environments in which a company operates can create a friendly or hostile environment. Even a perfectly run company may not survive when pitted against a foreign rival whose overall environment provides substantially lower direct costs for the manufacturer.

The public policy environment for motor vehicle production and trade differs widely among the United States, Europe, and Asia. Much closer business-government

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[109]OECD Economic Outlook, 12/91, Table R12, pp. 202-203.

cooperation is characteristic of both European and Asian economies, with the state taking an active role in the development of certain industries. The reverse is true in the United States, where as a matter of economic belief, market forces are left to decide the fate of individual companies and where there is no close coordinating mechanism to assess and regulate the impact of disparate policies on the competitiveness of US companies.

The development of public policy in Europe and Asia following World War II explains the significant differences in approach to the auto industry as compared with the United States. For European and Asian countries, the automobile industry has tended to represent a strategic industry whose development would foster industrial growth. Market forces alone would not bring about the development of an indigenous automobile industry. In some countries, governments subsidized or granted preferential tax breaks to encourage the growth of a domestic auto industry. Certain industries such as steel and energy received preferential treatment. As a consequence, they could provide the auto industry with lower costs inputs.

Table 5.1 below presents an overview of public policy differences along several dimensions that impact industrial development, including the competitive arena in which the automakers operate.

Policies to promote the auto industry have adopted a variety of approaches. In some nations, such as Brazil, South Korea, and France, there have been considerable direct and indirect subsidies offered to automakers. Japanese policies took a similar approach after World War II. Not only were policies developed to aid in the growth of the auto industry, there were also direct subsidies offered to related sectors, such as steel, machine tools, and computers. The Japan Development Bank and other financial entities played a crucial role in assuring that the emerging Japanese auto industry had access to low-cost capital. With the growth of the auto industry, many of the direct subsidies available to Japanese automakers ended. However, indirect support continues, and the Ministry of International Trade and Industry (MITI) maintains close ties with the automakers. Thus Japan may only now be ending onerous requirements for individual testing and certification of import vehicles. The Japanese *shaken* system of car inspection stimulates demand for new cars among Japanese consumers by requiring frequent upgrading of key—and expensive—auto parts. MITI also plays a role in automakers' foreign lobbying efforts. Support for other sectors, including electronics and computing, has continued.

Table 5.1. A Comparison of Public Policy Impacts on the Automotive Industry

	US	Canada	Japan	Germany
Antitrust law	Most strict and thorough antitrust laws—apply to US companies but not effective with foreign industry.	Less stringent than US laws. Illegal only if they unduly lessen competition.	Keiretsu are the result of an attempt by government to limit excessive competition.	Laws are very weak, allows for the development of cartels.
Tax Policy	Low corporate tax rate but few credit incentives. Promotes consumption, deters savings/investment.	Tax rates comparable with US. Higher corporate rate offset by other advantages.	Tax cuts, tax free reserves and other benefits aimed to help strategic industries.	Generous credit incentives to industry offset high corporate tax rates. Indirect taxes promote savings and investment.
Educational Support Efforts	Praised for academic education systems, criticized for stance on vocational training system. Emphasis on science, not technology.	Province run, mix of vocational & academic. Apprenticeship program. Unemployment benefits geared to retraining	One of the highest percentages of high school graduation in the world. Company sponsored training. Emphasis on engineering	Strong aptitude based vocational training directed by government.
Industrial Relations	Neutral to adversarial. Dependent on state policy. Historically confrontational union-management relations.	Somewhat adversarial, social policy orientation. Strong unions.	Company-based unions replaced independent labor movement in early postwar years. Workers lack independent/ autonomous voice.	*Metbestimmung*— Codetermination. Labor and management have the closest relationship of any industrialized country.
Financial System	Aimed toward private ownership, open markets and free competition. Banks prevented from playing role in industry as they do in other nations.	Privately owned, highly concentrated, strong government control.	Largest banks in the world control the industrial base and in turn are key to the economy.	Banks are universal in their activities, this allows for more control in concentrating industry .
Product Liability Law	Strict liability and large punitive damages contribute to litigious society.	Strict product liability and consumer protection. Low litigation.	Legal system structured to discourage individuals from bringing cases to court. No punitive damages.	Modest damages awards compared to US, also beginning to recognize strict liability.
Industry Promotion	Laissez-faire. Government opposed to industrial policy. Proponent of free trade principles, even if trading partners don't correspond. Support agriculture and consumption.	Tariffs and regulations to force local production. Auto Pact and FTA have lessened restrictions, but maintain certain safeguards.	Active government promotion and guidance of strategic industries. Government support of related industries (e.g., steel machine tools) indirectly boosted auto industry .	Modest use of incentives, often by local governments to help auto industry.
Health Care	No national system. Ballooning health care costs. Political pressure for health care reform.	National health care system administered by provincial governments. Significant advantage from corporate view.	National health care system, with supplemental health care system provided by some large firms.	Extensive universal health care, highly regarded.
Patent Protection	Patent granted to inventor, regardless of filing sequence. Protection for 18 years.	Similar to US.	First filing wins, regardless of original inventor. Limited term of protection.	

German policies have relied upon regional assistance rather than national assistance. This has supported some new plant construction, but has also benefited some

of the smaller, regional supplier firms to the auto industry. However, with the diversification of some auto firms, for example Daimler-Benz's takeover of Deutsche Airbus, the federal government has provided funds to offset currency losses. The German government has also provided infrastructure development and environmental project funds to automakers.

Education policies play a significant role in the public policies of North America's competitors. By providing a sound education, a country can help its citizens compete in the global economy. While the United States has received significant praise for its higher educational systems, it has met criticism concerning its stance on vocational training and is often viewed as providing inadequate general education in elementary and high-school levels. The educational systems of Germany and Japan are highly diverse. Whereas the German educational system provides an excellent vocational training for its nonacademically oriented youth, the Japanese system tends to train its workers at the factory. In spite of the differences, it is interesting to note that only the United States has a large private education system. Germany and Japan have primarily public school systems, and university education in these countries is usually free or requires at most a modest fee, in contrast to North America. Canada's education system combines aspects of both private institutions and public schools, though its higher education is similar to the US model.

As the automobile industry becomes increasingly reliant on more sophisticated, often computerized components and manufacturing equipment, it will require a highly educated and competent labor force. Retraining schemes and technological innovations must be welcomed by management and labor alike if they are to match their competitors.

That labor-management relations have a major impact on a corporation's competitiveness is widely recognized. It is also generally acknowledged that different countries have developed distinct labor union systems that affect their national economic competitiveness in varying ways. Favorable labor-management relations have been an essential factor in many nations' ability to effectively pursue their economic objectives. Germany and Japan are two major cases in point. Yet, the two differ greatly in their labor union systems. Although German workers enjoy genuine participation in management's decision-making process, in Japan, union structures—and particularly the phenomenon of enterprise unions organized on a company-by-company basis, not an industry-wide basis—have lessened, if not precluded, independent representation for workers.

In the United States, relatively adversarial labor-management relations have had serious consequences for the competitive position of American corporations. In 1989, US companies lost more working days due to labor disputes—a total of 16,530 days (per

thousand workers)—than those in any other country analyzed in this report. Comparable figures for Germany and Japan were 100 and 219, respectively.

Perceptions of the Automotive Industry by Government Officials

Separate roundtable discussions among US and Canadian government officials in Washington and Ottawa on a broad array of issues related to the auto industry offered useful insights into officials' attitudes and perceptions, but very little hope that North America is on the verge of a new enterprise relationship between government and the automotive industry. Perhaps that is not surprising, in view of the laissez faire ideology of both governments, but it suggests that the industry will continue to face offshore competition without substantial support from government.

Perhaps the most troubling characteristic of these officials' views, from an industry standpoint, is a pervasive us-versus-them attitude. Government officials tend not to identify with the Traditional North American Automotive Industry , but rather to view it with skepticism and sometimes disdain. In that respect, they do not see the industry—for all its faults—as an integral or indispensable part of the economic landscape. Ownership and constitution of the Traditional Automotive Industry could change drastically without greatly upsetting government officials.

Also notable was the rather detached way in which the officials spoke about the industry's problems. There was no sense of urgency, no sense that one of the major engines driving the North American economy is on the brink of disaster, and finally no real sense that government policies are in any way responsible for the current state of the industry. Officials generally reacted more like consumers than policy makers, viewing the industry as responsible for its current plight and, therefore, as solely responsible for recovering.

Many participants failed to see clearly the links between government policy and industry actions and reactions. They see the main problems facing the industry today as within the companies' control. Quality, responsiveness to consumer demands, management, and executive salaries are not only seen as central to the industry's competitiveness and image, but also as almost totally within the companies' purview, and, therefore, as substantially unaffected by external factors, such as the policy environment. Although they feel that the Traditional auto industry is less competitive than the Japanese, they believe it is in better shape than the European. Asked to rate the North American, Japanese, and European car industries on a scale from 1 to 10, all the

participants agreed that the Japanese industry rated a 9. The North American rates ranged from 5 to 7, and the European rates ranged from 4 to 7.

For people who spend their lives formulating policy, few of these officials have a clear picture of policy impact on the competitiveness of the industry. There is little sense of a systems approach to policy. Most felt that there is something basic lacking in government-industry relations, but there was no general agreement on the problem or its solutions. However, Canadian government officials tend to be both more knowledgeable about and more willing to work with the industry than are US officials, and in fact made a plea for a much closer dialogue with industry.

The Impact of Government Regulations

Policy options, like business decisions, are all too often considered in relative isolation: a problem is identified, a solution mapped out, action taken, and the results evaluated. Unfortunately, policy decisions often lead to unanticipated consequences, sometimes entailing direct costs that outweigh the desired benefits, and frequently incurring indirect costs in other arenas. In both the public policy and private initiative spheres, a systems approach to decision-making will often uncover these unanticipated costs and benefits, and thus improve the decisional outcomes.

Policy demands and constraints upon the North American industry will grow in importance over the coming decade. Companies will find their change efforts often directed by regulatory initiatives and policy choices made with little regard to their effects on the industry. While there are exceptions, such as Canada's requirement for daylight headlamps, the automotive regulatory regimes of Canada and the United States are typically quite similar in the three major regulatory arenas of safety, fuel economy, and emissions. Meeting US regulations in these three areas accounted for some $1600 in price increases for new cars from 1978 through 1991.[110]

Two major environmental concerns face North America today: energy consumption and air quality, and vehicles play an important role in each, both as a partial source and potential remedies. There are ways to make progress simultaneously and more cost-effectively toward the goals of energy conservation and cleaner air, while providing a side benefit of economic growth in the auto industry. Although great strides have been made in automotive fuel economy, the automobile remains the single largest consumer of petroleum in our societies. While the exact contribution of automobiles to

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[110]MVMA, *Facts & Figures, 1991*, p. 76. Additional data from US Bureau of Labor Statistics.

lower air quality is debatable, it does make a contribution, and, in some urban areas, it is a critical contributor.

Policy proposals to address the automobile's role in energy conservation and air quality have been put forward, but typically each problem is addressed by a targeted policy. Few doubt that US Corporate Average Fuel Efficiency (CAFE) standards will soon be raised, while the Clean Air Act calls for more restrictive emissions standards for automobiles. These policies are likely to provide some movement towards achieving the goals of cleaner air and energy conservation, but many analysts are concerned that the environmental actions will have potentially serious negative economic consequences for the industry and for consumers—and thus for the two economies. The potentially disastrous effects of forcing the industry to bring high mileage cars to a market that resists them and the negative economic effects of adding cost to the automobile to improve air quality are clear to the industry, but may not be sufficiently understood by government officials.

CAFE levels are once again the subject of heated legislative debate, and the industry again finds itself facing a truly uncertain future, as this important industry performance constraint is negotiated in a complex and unstable political climate. While industry observers expect major increases in CAFE standards, these are still well below some of the standards currently under debate.[111] However, one can certainly question the wisdom of even less extreme CAFE standards. The marginal benefit of increasing miles-per-gallon performance is quite low, and increasing miles-per-gallon from 30 to 40, at today's fuel prices and travel averages, amounts to about 30 cents a day in savings for the typical passenger car owner. Moreover, there is strong reason to believe that reducing travel through higher fuel prices will conserve fuel more effectively than further increases in vehicle fuel efficiency.[112] Such a strategy also avoids putting the industry in conflict with its market, as CAFE will likely force the industry to impose size and weight limits to meet higher standards, while customers continue to demand larger and more powerful vehicles.

The industry expects to see CAFE standards that exceed the level it can reasonably reach during the remainder of the decade.[113] If CAFE standards require

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[111] David E. Cole and Michael S. Flynn, "The Automotive Industry in Transition," Presentation to the Advanced Automotive Technologies Conference, National Institute of Science and Technology, Gaithersburg, MD, May 5, 1992.

[112] Charles River Associates, "Policy Alternatives for Reducing Petroleum Use and Greenhouse Gas Emissions," September, 1991.

[113] David E. Cole, David J. Andrea, and Richard L. Doyle, *Delphi VI Forecast and Analysis of the U.S. Automotive Industry Through the Year 2,000*, UMTRI, Office for the Study of Automotive Transportation, 1992.

extraordinary effort, they will inevitably take human and financial resources that the industry needs for product and facility investment. Most manufacturers have already fixed their product plans for 1995, and serious increases in CAFE standards cannot be met without enormous expense to revise those plans and bring new plans to market at a much faster than normal pace. Moreover, a longer term planning horizon permits numerous alternative avenues to achieve higher targets that will minimize the cost of the efforts.

While the Traditional North American industry now produces vehicles that are more fuel efficient than Japanese-badged vehicles on a ton-mile per gallon basis, their CAFE performance is lower because of the mix of vehicles the Big Three produce.[114] Experts expect these mix differences to continue, and thus reasonable CAFE targets for full-line foreign automakers are higher than those that are reasonable for the Big Three. Therefore, higher across-the-board CAFE standards will ultimately hinder the domestic industry in competition with foreign manufacturers, as they have in the past. The Traditional Industry will either be burdened by enormous investment requirements and extreme time pressure to attempt to meet the targets, face financial penalties for failure to meet the standards, or find itself forced to adjust its product mix away from its own strengths and toward the strength of its foreign rivals.

The Clean Air Act calls for reduced vehicular emissions, and will lead to significant changes in engine, transmission, exhaust, and fuel systems. To be sure, powertrain developments would be significant in any case because of the pressures of competition and evolving technology. However, the Clean Air Act will likely redirect some of these efforts, and undoubtedly will press the pace of development. There are three major issues in this arena. First, the Clean Air Act presents another policy driver for and decisional constraint upon the industry's already stressed financial and human resources. Second, all manufacturers may not be equally able to develop and deploy the required technologies, and thus such a policy requirement might effectively sort out winners and losers. Third, there is serious question whether the Clean Air Act's automotive requirements will yield much immediate benefit, since they target only new vehicles.

Both environmental policies achieve overall improvement through targeting new cars, and thus depend on a slow process of fleet replacement to provide their full benefits. The operating fleet of passenger cars in North America passed 155 million by 1989, and the average age of that fleet is almost eight years old, tying the 1950 level.[115] Moreover,

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[114]Ibid.

[115]MVMA, *Facts and Figures 1991*.

over one-third of these vehicles are more than 10 years old, thus dating from periods when fuel economy and emission standards were both substantially lower than in more recent times. In fact, perhaps as few as 20% of the cars—those dating from preemission control days and poorly maintained vehicles—may account for as much as 80% of vehicle emissions. Even at record sales levels of some 12 to 13 million cars a year, it will take a very long time to improve the emission and fuel economy performance of the entire fleet. Of course, price increases associated with the costs of meeting higher CAFE and emissions standards are likely to slow sales, damaging the industry and the environment, as owners retain their older, more environmentally harmful cars.

Newer automobiles are both cleaner and more fuel efficient than older cars. A sensible strategy of fleet improvement therefore should target the older and poorly maintained vehicles in the fleet, systematically removing the least fuel efficient and highest emission cars from service. Directing policy actions to these vehicles might be less costly to consumers, permit less adverse effect on the industry, and achieve more reduction in emissions and gains in fuel conservation. The economic consequences of such a strategy for the industry could well be beneficial, as demand shifts upward and provides additional new car sales. The most attractive strategy for targeting the retirement of older vehicles might be the type of incentive program that Union Oil offered, and Ford partially supplemented, in California in 1990. This program simply purchased older vehicles at prices above their market value, and removed them from use.

The automotive industry needs to keep working on improving the environmental performance of newer vehicles, and there must be careful analysis of environmental and economic trade-offs, pricing strategies for vehicle retirement, the distribution of the costs across the population, and the net benefits of differing retirement schedules. However, North America might well meet its short-term environmental goals for the automobile more effectively by shifting the policy targets from new to old vehicles, while continuing to balance this effort with the pursuit of longer-term technical improvement in new cars.

There is another important emerging regulatory area, as social and environmental issues loom large. Recyclability is already a growing issue for the industry as regulations expand and multiply, perhaps imposing some competitive disadvantages on North America as a production location. We expect to see the demand for life cycle management, from manufacture to disposal, to grow, and that may bring major new roles for suppliers and manufacturers. We expect this area will also see the typical interplay between technology drive and business demand, as technical solutions to recycling problems define new business opportunities, and new business opportunities create the pull for technically and economically feasible recycling processes.

Above all, the auto industry is concerned that the Policy-Industry-Market triangle not become imbalanced in ways that are competitively damaging. This happened in the 1970s when CAFE regulations required the industry to make extraordinary and rapid investments in more fuel-efficient cars that consumers then rejected. Even if that imbalance is avoided, policy demands compete for financing with other demands upon the business, such as R&D, facility and product investments, and stakeholder returns, whether in the form of returns to shareholders or income to employees.

The Cost of Automotive Capital

Capital is the financial and physical resource needed to carry out the business activities of a firm. The 1990s will be a decade of capital competition in the world motor vehicle industry, as automotive firms and national industries will compete increasingly on the basis of the effective use of capital. Capital will be required to engineer and build a continually changing product for an evolving, global automotive market. Needed capacity adjustments, whether additions or deletions, will require capital. Higher levels of capital are also required to cover enormous levels of new, fixed costs that are sometimes determined by the maturity of operations and their location. The sources of capital are expected to change in form and in terms of their location. Differences in national savings rates and changing demographics will complicate the traditional patterns of capital formation. Access to needed capital, then, perhaps even more than its cost, may well determine winners and losers in automotive competition.

The most reliable and traditional source of capital for motor vehicle firms is earnings, but earlier sections of this report have shown that the profit performance of the Traditional industry has not and likely cannot support its competitively driven capital needs. Profit is not the sole source of capital, of course, for modern corporations. Firms can raise needed funds for investment through equity or debt financing, the capital markets.

However, a major barrier to the acquisition of such outside capital is its cost—i.e., the cost of capital. Firms cannot justify the funding of investment projects that generate smaller returns than the actual or alternative cost of the required project capital. Thus firms that have access to a lower cost of capital or are more efficient in project performance will out-invest firms with a higher cost of capital or lower productivity in development.

Many economic observers charge that Japanese multinational firms enjoy an unfair cost of capital advantage over their Traditional North American rivals. Japanese

firms may benefit from a special national financial system that channels high rates of personal savings by the Japanese population directly into the investment needs of Japanese export manufacturing firms. Special relationships between these firms, the Japanese banking system, and the Japanese system of equity finance result in a constant flow of low-cost equity and debt capital to Japanese corporations. The Japanese government practices deliberate industrial and monetary policy to assist this effort through special depreciation and tax treatment rules and through their final guarantee of all types of national investment risk. The final result is a Japanese large corporate manufacturing sector where bankruptcy is unknown, and where capital is always available at low cost that allows huge initial losses on market entry and unending investment in new product, plant and equipment.

Other economic observers challenge the hypothesis of a major Japanese advantage in the cost of capital. This side of debate maintains that large North American firms, like the Traditional auto companies, face the same—or even lower—cost of capital as the Japanese. These observers explain lower perceived levels of Japanese cost of capital by differences in inflation rates, as well as higher rates of taxation. Higher rates of investment are explained by higher levels of Japanese efficiency in such investments, including better management practice. For example, table 5.2 shows a major Japanese productivity advantage over North American firms in the number of engineering hours required to develop a new model. This results in a rate of product investment four times greater than Traditional North American firms, and thus a new model for every 504,000 sales compared with a new model for every 2.1 million sales for the Traditional North American industry. [116]

Table 5.2 The Cost of Diversity

	Japan	Traditional North America
Number of Models	73	36
Engineering Hours per Model	1.7 million	3.0 million
Average Age (years)	2.1	4.6
Average Annual Sales Volume/Model	120,000	200,000
Cumulative Sales Volume/Model	504,000	2,116,000
Engineering Labor Cost per Car Sold (at $130/hr. loaded)	$438.39	$184.31

[116] A. Sheriff, "The Competitive Producer Position of Automobile Manufacturers: performance and strategies," International Motor Vehicle Program, MIT, Cambridge, 1988; Clark and Fujimoto, *Product Development;* and NSF estimates of cost of R&D researchers.

The two sides of the debate can be placed on the same conceptual chart. Figure 5.1 relates the level of the cost of capital to several schedules of the *marginal efficiency of investment* (MEI). This schedule of the declining marginal productivity of investment is similar to the corporate practice of ranking development projects in order of the level of their returns. Firms take on projects until the last dollar invested provides the same return as the overall cost of capital. Proponents of a large relative cost of capital difference argue that the Japanese and Traditional North American auto industries face separate costs of capital (labeled N.A. COC and Japan COC), but possess the same MEI schedule—for example, N.A. MEI. A lower Japanese cost of capital would result in a higher level of Japanese investment. Proponents of greater Japanese capital efficiency would argue that the two industries face the same cost of capital—for example, N.A. COC—but two separate MEI schedules. Since the Japanese possess a superior MEI, they would invest at a higher level (Japan Investment) despite facing the same cost of capital as their North American rivals.

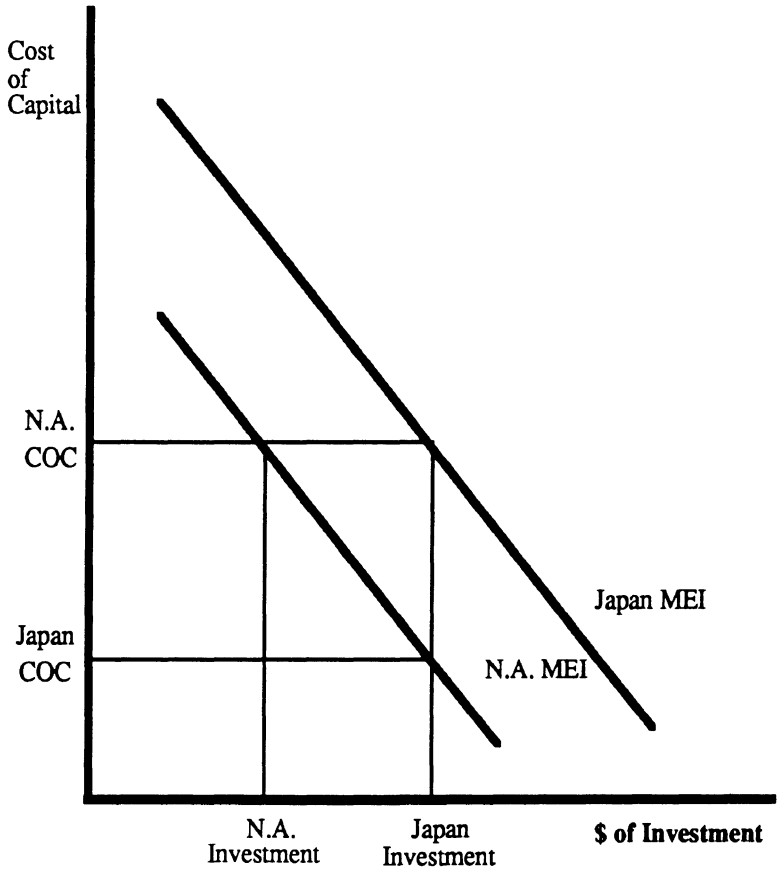

Figure 5.1. Cost of Capital or Efficiency of Investment?

The two sides of this cost of capital debate represent quite different views of the Traditional industry's current situation. If the differences in investment behavior reflect

differences in the cost of capital because of differential access to sources, then policy tools may be required to redress the imbalance. If, on the other hand, such differences in investment simply reflect the differences in efficiency of capital use, then that may be a competitive issue better sorted out in the market.

Research performed by OSAT addresses this issue, providing estimates of the relative costs of capital for the North American and Japanese motor vehicle industries over the 1984-1990 period. We base our estimates on publicly available financial and economic data for four Japanese vehicle manufacturers and four automotive suppliers and three US manufacturers and 24 suppliers. We also collected documentation regarding current Japanese and US corporate statutory tax rates and regulations, and applied them for the entire period because we were unable to collect historical documentation for past Japanese corporate tax rates and regulations.[117] We thus use a combined federal and local tax rate of 37.0% for US firms and a 52.0% combined rate for Japanese firms. Our depreciation assumptions were a seven year double-declining balance method for US firms, and a 10 year declining balance method for Japanese firms.

Inflation is an important determinant of the cost of capital in our models. We used a moving average of actual and forecast (OECD) CPI inflation rates for the United States and Japan to determine expected inflation in each of our analysis years, and note that the differences declined over the test period. We had to define total debt differently for the US manufacturers than for other firms in our sample because of their financial subsidiaries. We defined equity as the product of the historic share price and the number of common shares issued and outstanding. The percentage cost of equity is defined as the ratio of total earnings owed to common to total equity, or earnings divided by total equity. However, there were years in our analysis where large earnings losses reported by a single firm could actually result in negative cost of equity for the sample. There is also reason to treat earnings growth, because of its relationship to growth in dividends, as a superior measure of the required cost of equity. For these reasons, this study decided to compute three-year moving averages for all financial variables, and to use these moving averages in the computation of comparative cost of capital across the four samples.

The financial data was aggregated for each of the four samples for each year. A set of simple three year moving averages was then calculated for the 1986-1990 periods for total interest expense, total debt, total earnings, and total equity.

Three separate cost of capital formulas were used in our analysis, and both nominal and inflation-adjusted results evaluated. Our formulas are standard, and include

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[117]DRI International, *Japan International Tax and Business Guide*, May 1991; Yuji Gomi, *Guide to Japanese Taxes 1991/92*, CCH International, Chicago, 1991.

the Weighted Cost of Debt and Equity, which combines the percentage cost of debt, and the cost of equity. These rates are weighted by the debt to total capital ratio yielding a nominal rate for US and Japanese firms, and inflation adjusted to yield real weighted cost of debt and equity. In 1986, the real cost of capital was nearly 15% for US vehicle firms and 7.5% for Japanese vehicle firms. Second, we examined the Cost of Capital relative to a capital asset: the return required to cover the costs of debt and equity (including tax) used to fund the acquisition of the asset. Our formula reflects the cost of debt and equity, allowable depreciation, and statutory tax rates. In 1986, these real rates were 14.5% for US firms and 11.2% for Japanese firms.

Our third measure, Rental Equivalent, the annuity equivalent of the purchase price of the asset calculated at the above cost of capital, yields a 1986 estimate of 19.0% for US firms and 16.7% for Japanese firms. Tables 5.3 and 5.4 display our results for manufacturers and suppliers.

Table 5.3. The Cost of Capital—Vehicle Firms Comparison
US vs. Japan, 1986-1990
US Big Three: GM, Ford, Chrysler
Japan Big Four: Toyota, Nissan, Honda, Mazda

	Nominal Percent		Real Percent	
	US	Japan	US	Japan
Weighted Cost of Debt and Equity				
1986	18.8	9.2	14.8	7.5
1987	15.5	7.6	12.6	5.7
1988	15.2	6.0	11.5	3.8
1989	14.9	5.0	11.3	2.8
1990	10.8	5.5	7.2	3.3
Cost of Capital				
1986	18.5	12.9	14.5	11.2
1987	14.7	11.0	10.8	9.1
1988	13.4	8.9	9.7	6.7
1989	13.1	8.1	9.5	5.9
1990	9.3	8.9	5.7	6.7
Rental Equivalent				
1986			19.0	16.7
1987			16.4	15.2
1988			15.7	13.7
1989			15.5	13.2
1990			13.1	13.7

A comparison of the results shown in tables 5.3 and 5.4 clearly shows major Japanese cost of capital and rental equivalent rate advantages for the 1986-1989 period, a period that includes financial data from 1984-1989. The Japanese vehicle firm advantage

in the rental equivalent rate was 2.3% in the 1986 period, although this changed to a Japanese disadvantage of 0.6% in 1990. This probably reflects falling Japanese equity prices in recent years, and even more to falling levels of earnings and costs of debt for US vehicle firms. The Japanese firms depend to a far greater extent than US firms on equity as a source of capital. What is striking is that the major source of the improved US position is the decline in US rental equivalents, rather than rising Japanese rates in the latter part of the decade.

Differences in rental equivalent rates for US and Japanese suppliers are not as severe in the early years of this analysis, but broadened in the last two periods to a difference of 1.5% in 1990. Very low rates for the cost of capital are shown in the Japanese supplier example, mostly from actual negative costs of equity in the 1989-1990 period. This difference may not prove minor in a competitive sense since Japanese suppliers produce a larger proportion of total automotive output in Japan than do suppliers in North America, and contribute much more of total product development cost (30% versus 7%).

Table 5.4 The Cost of Capital:
Supplier Firms Comparison, US vs. Japan, 1986-1990

	Nominal Percent		Real Percent	
	US	Japan	US	Japan
Weighted Cost of Debt and Equity				
1986	7.9	4.0	3.9	2.3
1987	7.5	2.9	3.6	1.0
1988	8.8	2.4	5.1	0.2
1989	9.2	2.1	5.6	-0.1
1990	8.9	1.9	5.3	-0.3
Cost of Capital				
1986	8.9	7.5	4.9	5.8
1987	8.5	6.6	4.6	4.7
1988	8.9	5.6	5.2	3.4
1989	9.2	5.1	5.6	2.9
1990	8.9	4.8	5.3	2.6
Rental Equivalent				
1986			12.7	13.2
1987			12.5	12.5
1988			12.8	11.8
1989			13.1	11.5
1990			12.9	11.4

The significant advantages enjoyed by Japanese automotive firms in their cost of capital for long term projects in the middle 1980s certainly can explain their relatively higher rates of product development, compared with US vehicle firms, in recent years and at present. The recent reversal of this advantage has occurred in the main because US

costs of capital have fallen to Japanese levels. If this lower US cost of capital is maintained, then higher rates of investment generally, and product development in particular, should be expected from US firms. However, there is little reason to expect US firms to close the gap in product development that opened in the mid-1980s simply because of the closing of the capital cost gap today. The advantage they now hold is not as substantial as the mid-1980s Japanese advantage, nor may capital be as available to them.

How do the results in tables 5.3 and 5.4 affect the relative cost competitiveness of national motor vehicle industries? Unit capital cost is the joint product of three components. First, the market prices of required inputs of physical and human capital needed to produce output, or prices of needed equipment, plant and engineering services. Second, the relative productivity of these inputs also directly determines unit cost of capital. Finally, the financial cost of required capital contributes to the total unit cost of capital. In the long run, the productivity and financial cost of capital factors are essentially linked, since the wider market for capital will force a firm or industry to employ capital at a level or rate that produces returns equivalent to that generated, on average, elsewhere.

One way to illustrate the importance of cost of capital is to assess two identical projects—at the Japanese and US automotive finance costs of capital—and determine the "pure" financial cost of capital difference in terms of relative unit cost.

Our example is for a vehicle platform development project that costs $2 billion at the outset and produces 200,000 vehicle sales per year for ten years. While some of the assumptions underlying this example—that total project cost is spent entirely at the outset, for example—are unrealistic, it serves to show the type of handicap North American firms faced in the mid-1980s solely due to the differential cost of capital.

The first comparison assumes that vehicle assembly firms bear the entire project cost burden and that their rental equivalent rates alone are relevant. In 1986, US vehicle firms would have experienced a projected capital cost of $900 per vehicle, and the Japanese $670, or an advantage of $230. In 1990, the advantage would have been reversed to reflect a $60 advantage per unit for US vehicle firms.

A more realistic comparison, displayed in the bottom half of table 5.5, assumes that automotive suppliers bear some of the burden of project cost in proportion to their reported share of project engineering effort—30% and 7%.[118] If so, project investment is likely shared at similar percentages and the supplier rental equivalent rates must be

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118 Yuji Gomi, *Guide to Japanese Taxes*, p. 137.

integrated to produce an effective industry-by-industry comparison. The industry comparison results in a $290 advantage per unit for the Japanese motor vehicle industry in 1986 and a disadvantage of about $8 per unit for the US industry in the 1990 period.

The examples shown in table 5.5 are clearly limited in their practical applications. Most vehicles assembled in 1990 do not contain 1990 finance unit costs of capital. It is more likely that 1990 model cars and trucks were planned and costed five to seven years previous to 1990 when the US industry was at a relative cost of capital disadvantage. This could explain to a large extent the relatively higher rate of product development, and hence market share growth, of Japanese vehicle firms compared with US competitors in the 1986-1991 period.

Table 5.5. US versus Japan Project Finance Capital Cost Comparisons: 1986 and 1990 in Constant Dollars

	1986	1990
US Vehicle Firms	$1,800 mil. $900/unit	$620 mil. $310/unit
Japan Vehicle Firms	$1,340 mil. $670/unit	$740 mil. $370/unit
US Industry	$1,711.8 mil. $856/unit	$617.2 mil. $309/unit
Japanese Industry	$1,130 mil. $565/unit	$602 mil. $301/unit

The recent competitive balance between US and Japanese automotive costs of capital is heartening. However, the cost of capital falls into a range of unpredictable strategic factors meriting little confidence regarding future advantage. Such factors also include the yen/dollar exchange rate, future mandated levels of Corporate Average Fuel Economy, and import restraints under Japan's Voluntary Export Restraint program. US cost of capital rates could rise again relative to the Japanese in the middle to later 1990s. If so, relative product development activities by the domestic industry would suffer. Firms are typically guided in forming expectations by their experience. Expectations based on two decades of high US rates and Japanese advantage in the area of the cost of finance capital can hardly be overcome by a few years of lower and relative comparable rates.

While Japanese capital markets are opening to the world, they still provide important competitive resources to Japanese firms. Certainly future equivalence in

capital costs can only assure that the Traditional North American Automotive Industry need not fall further behind. However, in and of itself, it cannot repair the past damage to that industry, nor protect against the continuing competitive advantage today of less expensive capital invested some years ago.

The Cost of Health Care and its Impact on Competitiveness

North America has the most expensive health care system in the world. Health care costs in the United States have increased, on average, at double-digit rates over the past 20 years with similar levels of increases projected for the future. The US annual national health care bill doubled in the last decade to more than $600 billion in 1989. In 1992, health expenditures are projected to reach $817 billion, or almost 14% of GNP. Figure 5.2 displays health care costs as a percentage of GDP (gross domestic product) for a number of automotive producing countries. While Canada's health expenditures account for three percent less of GDP than do those of the US, they are also some 3% more of GDP than is the case in Japan. Moreover, Canadian automotive products contain high levels of US content, and thus bear some burden due to US health care costs. Thus our discussion focuses on the United States because that is where the bulk of the cost problem exists, but its effects damage Canadian automotive competitiveness as well.

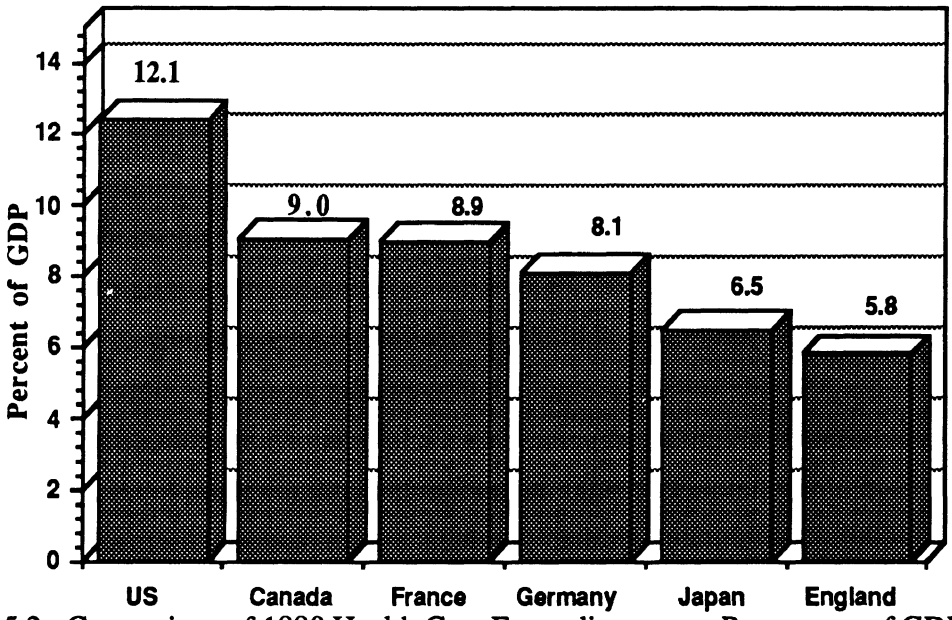

Figure 5.2. Comparison of 1990 Health Care Expenditures as a Percentage of GDP

The United States is the only developed country without an effective ceiling on health care expenditures, because of its open-ended financing. In other countries, national budgets, expenditure limits, or some other explicit method of controlling

spending—such as Japan's fee schedule method—set an upper limit on these expenditures. As the nation's health care spending continues to increase, it pressures the allocation of national, corporate, and personal resources to other priorities such as housing, education, research and development, and rebuilding of the nation's crumbling infrastructure. Since these priorities directly affect long-term competitiveness, excessive health care costs drain national competitiveness.

Despite these high expenditures, the United States has the only health care system where a large percentage (15%) of the population under age 65 is without health insurance coverage. All other industrialized countries (except South Africa) provide universal access for their people even while maintaining lower per capita health care spending than the United States. For US industry, this results in additional expenditures, as privately-funded coverage underwrites some of these costs. Moreover, business, which pays 34% of all US health care expenditures, often cannot price products to offset these health costs because of intense market competition, often from foreign companies. And, unlike other forms of compensation, health care costs, which have been doubling every five years, are neither predictable nor, in most cases, controllable. Higher health care costs require trade-offs that reduce the standard of living. Health benefits have now become a prime factor in labor negotiations, and contribute to strikes that covered 78% of all workers involved in major work stoppages in 1989.[119]

International Comparisons

Most nations' per capita health care costs are significantly below the US's $2,566. For example, in 1990, US health care costs per capita were 43% higher than Canada's $1,795, 99% higher than West Germany's $1,287, and 131% higher than Japan's $1,113. Comparative costs in the United States have worsened dramatically since 1980, as US costs over the decade rose 135%, while Germany and Japan experienced increases of 83% and 113%, respectively. Thus US health care costs grew from 55% above German costs in 1980 to 99% higher in 1990, and from 113% to 131% higher than Japan's.

Despite these high expenditures, the US trails many OECD nations on health care indicators such as infant mortality and life expectancy. Among the 24 OECD nations, the US ranks 21st in infant mortality, 16th in male life expectancy at birth, and 13th in female life expectancy at birth. To be sure, these indicators are a function of a country's demographic mix, lifestyle, level of uninsured, and other standard of living factors, as well as quality and distribution of health care.

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[119]U.S. General Accounting Office, *Health Care Spending Control-The Experiences of France, Germany, and Japan*, November, 1991.

Some have argued that the US economy can afford to spend more than other economies on health care. While there may be some merit to this point, the United States spends some $600 more per capita than would be accounted for by 1989 per capita GDP, based on the data for 23 OECD economies displayed in figure 5.3.[120]

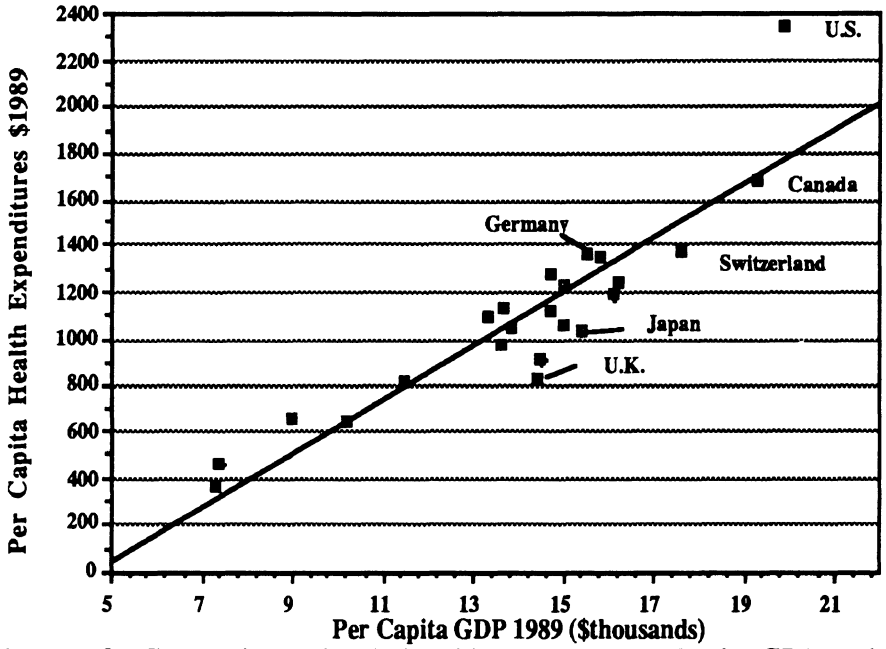

Figure 5.3. Comparison of Relationship Between Per Capita GDP and Per Capita Health Spending, for Selected OECD Nations.

System Comparisons

A recent GAO study found that France, Germany, and Japan provide nearly universal coverage with private physicians, patient choice, employment-based coverage, and third-party payers. However, they differ markedly from the US system in providing wide preventive services, compulsory enrollment, payroll financing but broad population risk ratings, negotiated rates, and targeted limits. In all of these countries, budget controls have moderated spending growth, but have not eliminated all upward pressures on spending, in part because controls are not applied to all segments of health care expenditures, nor have they eliminated the underlying pressures for increased spending. Presently, Canada, Japan, France, and Germany are exploring modifications and supplements to their strategies for controlling health care expenditures and methods of public and private financing. These modifications do not include the elimination of expenditure controls.

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[120]G. J. Schieber and J. P. Poullier, "International Health Spending Issues and Trends," *Health Affairs*, Spring, 1991, pp. 106-116; and OECD Health Data, 1991.

Health Care Costs of the North American Automotive Industry

We estimated automotive health care costs for the Traditional North American industry, including both US and Canadian components. Our estimates may be somewhat conservative, since our calculations exclude the proportion of corporate federal and state taxes that underwrite US health care costs. We employ two methods of looking at North American health care costs: cost per insured and cost per unit. Cost per insured permits tracking overall health care cost increases, while cost per unit captures inherent factors the Big Three cannot avoid, such as high retiree-to-active ratios. Cost-per-unit calculations directly influence the ultimate vehicle purchase price—hence the consumer's perceived value—of an automobile and highlight the effects of overall market volumes and market shares.

We estimate Big Three US health care expenditures of $622 per unit and Canadian expenditures of $30 per North American vehicle produced in 1990. Correcting for vertical integration and the integration of the Traditional North American industry, and relying on known supplier health care costs, yields an estimate of $403 per unit for US suppliers and $31 for Canadian suppliers. Combining manufacturer and supplier costs results in a total unit health care cost of $1086. The much lower Canadian unit cost estimates reflect the averaging of the costs for Canada's lower actual production across all North American production, and Canada's lower health care costs. In fact, if Big Three health care costs in the United States were the same as they were in Canada for 1990, US costs would have been 46% lower. Big Three US health care costs—not including supplier input cost estimates—have risen an average 7.6% per year between 1985 and 1990 versus 4.3% per year for their Canadian costs.

Total Big Three 1990 US health care costs were $5.96 billion, up 7.6% per year since 1985. If health costs of the traditional suppliers are included, that figure rises to $10.42 billion. However, the number of covered individuals fell, and the ratio of retirees to actives increased, so costs actually rose 8.2% on a per contract basis, significantly above the average medical care CPI index rate of 7.5% per year. Moreover, the intermediate materials stage of the producer price index is a useful measure of automotive input expenditures, and that index rose 2.2% from 1985 to 1990. The medical care CPI index thus increased 241% faster (7.5%/2.2%) per year than overall industrial inputs, while the Big Three actual costs increased 245% (7.6%/2.2%) more than their general input costs, and their per contract costs increased 273% (8.2%/2.2%) more. Thus health care in general experienced huge increases, and the pressure on the Big Three to contain health care costs as a component of their total input costs accelerated.

On a vehicle production basis, health care costs per vehicle rose an average 12.4% per year, some 65% higher than the medical care CPI for the same period and 450% higher than the intermediate materials producer price index annual increase. This reflects increases in health care costs, the growing number of automotive retirees, and falling production. If production levels were the same as in 1985, 1990 unit costs would have been $828. Therefore, $258 of the current cost per unit calculation is due to the decline in the overall market demand for vehicles and the Big Three's loss of market share.

Currently, total health care costs account for 6.9% of the average consumer vehicle expenditure—up 35% since 1985. The Big Three thus face a dilemma: they can pass through these increased health care costs to the customer, reducing perceived vehicle value, or accept lower profit levels per unit, reducing dividends and/or investment resources. The difficulty for the Big Three is that they must develop wage and benefit programs, price their product, and develop investment strategies based on local market conditions, policies, and costs but compete against international corporate cost structures. A more difficult question to answer is the proportion of the health care cost per vehicle that is excessive, although it is clear that this cost is influenced by both private and public policy actions. From a competitive perspective, that quantity of the cost that can be considered excessive is that portion which exceeds Import and New Entrant cost.

Japanese and New Entrant Comparisons

International comparisons must be made to estimate the significance of Big Three disadvantages in health care costs. Unfortunately, comparable international data is unavailable, so we estimate these costs under conservative assumptions—i.e., assumptions that avoid minimizing the cost estimates. We developed an estimate for the Japanese industry by starting with a published 1988 estimate for manufacturer's health care costs of $220 per production unit.[121] We first adjusted the North American cost estimates to Japanese levels of vertical integration to estimate manufacturers' share and then total cost. This estimate was updated to 1990 by adjusting it for changes in Japanese national medical care costs (9.1%) and changes in production (6.3%), to yield a total 1990 cost of $552, reflecting manufacturer costs of $226 and supplier costs of $326.

Our estimate, then, is that the Big Three incurred some $534 more per vehicle for health care costs than did their major offshore competitors. Based on 1990 production volumes, if the Traditional North American industry incurred Japanese level health care expenses of $552 per unit, $5.1 billion would have been available for other uses,

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[121]Bernstein Research, *The Automobile Industry*, p. 53.

including additional product innovation, productivity improvement, employee development, and marketing activities. In the event that the Big Three again reached 1985 production levels without adding employees—through increased capacity utilization and productivity, for example—unit health care costs would decline to $828. The Traditional industry would still face a gap of $276 per unit, an extra cost of some $2.6 billion compared with their Japanese competitors.[122]

In estimating the New Entrant costs, we again began with a published 1988 estimate of $85 manufacturer cost per unit. We adjust this for expanded employment, production, and medical care CPI, adding in supplier costs from Japan and North America in a 2:1 ratio. This yields an estimate of New Entrant health care costs per unit of $475, yielding them an advantage of about $75 compared with Japanese production and about $600 compared with the Traditional industry. Indeed, the Japanese-owned motor vehicle industry had an additional advantage in health care costs because over 40% of their North American sales are sourced in the United States or Canada, where their health care costs are lower than in Japan. The reasons for the extremely low costs for New Entrants reflect a mix of their high unit productivity, their young workers, and their few retirees. The last two factors matter because of the method used to construct risk groups.

Pension Costs

Pension costs merit particular mention. A recent analysis reports that Ford and Chrysler, in 1987, paid over $2.50 per hour in pension benefits to active and retired workers, while GM costs were a bit under $1.00 per hour. Pension costs for New Entrants Toyota, Honda, and Nummi were all under $0.50 per hour. To be sure, this advantage may erode with the aging of the New Entrant labor forces, but that will take many years, and now constitutes a substantial area of cost advantage for New Entrants.[123]

Policy Implications

There can be little doubt that the health care policies of the United States place a major burden on North American manufacturers—like the automotive industry—that must compete against offshore producers. Further, that burden extends to Canadian products in industries, like automotive, where North American production is in fact highly integrated. The competitive damage is severe, suggesting that even high

[122]Thus the health care cost difference, even at sustainable capacity utilization rates, by itself accounts for more than the 4% Japanese advantage in labor costs identified by Fuss and Waverman, above.

[123]Ghilarducci, as cited by Candace Howes, "The Future of U.S. Manufacturing: Auto Assemblers and Suppliers," Testimony before the Joint Economic Committee hearing, December, 1991.

production years and no further escalation in medical costs would find automotive producers at a $2.6 billion disadvantage—a significant sum even in this huge industry. Some method of controlling costs must be found if the industry is to survive, and probably some redistribution of even controlled costs is also required.

Retirees currently comprise 44% of the total Big Three insurance contracts. With continued efforts focused on downsizing the industry and promotion of early retirements it is feasible that within five years the Big Three in the United States will have as many retirees as active employees, and many new retirees will not yet be eligible for Medicare. This is a function of the industry's age and not within industry control. The issue of corporate long-term health care liabilities for this older workforce will be highlighted as companies begin to create reserves to recognize estimated future health care liabilities in accordance with Financial Accounting Standards Board ruling number 106—an issue that will certainly affect the ability and cost of raising capital. To meet these requirements, GM has recognized a past service liability for future health care costs of between $16 to $24 billion. Chrysler's reserves may reach $6 billion and Ford's requirements may be in the area of $10 billion. These reserves must start by 1993 and be fully expensed within 20 years.

The burden of retirees is particularly damaging, since downsizing in order to become competitive increases these costs tremendously, and spreads these costs over increasingly fewer vehicles. The health care cost and pension disadvantages grow as the companies shrink, and become a more and more important factor lessening the Traditional industry's chances for survival.

Trade Issues

The automotive trade deficit continues to be a major factor in North America's overall trade deficits. The US bilateral deficit with Japan reached $43 billion in 1991. Of this total, $32.4 billion was accounted for by automotive products—$22.5 billion by vehicles and $9.9 billion by parts. Canada's automotive trade deficit with Japan climbed from $3.9 billion in 1989 to approximately $4.6 billion in 1991.

The trade pattern in automotive products parallels trade in other industries, as shown in table 5.6. The case is often made that any kind of government action undercuts the international competitiveness of an industry. Yet, both steel and machine tools, whose domestic shares are protected, have experienced export growth. The semiconductor industry has been negotiating market share targets with Japan, the largest

market for these devices for some years now, and, in spite of slow progress there, has managed to expand its export ratio.

The share of the trade deficit accounted for by Japan has remained in the mid-to-high-50% range since 1985. For the United States, the 1989 automotive deficit was $56.6 billion, accounting for 61% of the manufactured goods deficit, 52% of the merchandise trade deficit, and 51% of the total current account deficit. The automotive deficit peaked in 1987 at $61 billion dollars, and receded some 13% by 1990, to $53.3 billion. The parts share of the deficit increased sharply in 1986, and remained at about 20% of the automotive deficit in 1990. Japanese imports to the United States peaked in 1986, both in constant dollars and units. However, the unit decline of some 32% was much sharper than the value decline of about 24%, as the Japanese manufacturers moved to an enriched mix of vehicle imports. Parts imports increased some 67% over this same period, peaking in 1989 at $11.6 billion, and falling in 1990 to $11.4 billion. The 1990 bilateral parts deficit alone—at some $10.5 billion—accounted for 99% of the US worldwide parts deficit and almost 37% of the entire bilateral automotive deficit.

Table 5.6 Imports and Exports as Share of Consumption and Production.

	Imports As Share of Domestic Consumption				Exports as Share of Domestic Production			
	1972	1981	1986	1990	1972	1981	1986	1990
Computers	4%	7%	22%	40%	22%	29%	22%	40%
Semiconductors	15%	34%	46%	44%	20%	35%	28%	41%
Machine Tool	10%	27%	48%	46%	20%	20%	16%	33%
Construction Machines	2%	9%	19%	21%	28%	41%	21%	29%
Farm Machines	10%	13%	23%	10%	11%	23%	19%	16%
Motor Vehicles[1]	8%	19%	24%	24%	2%	5%	2%	3%
Passenger Cars (Units)[1,2]	15%	27%	30%	26%	1%	0%	0%	5%
Steel Mill Products	17%	19%	26%	13%	3%	3%	1%	5%
Radio & TV Sets	37%	59%	70%	69%	4%	10%	8%	28%
Leather Shoes & Boots	17%	33%	60%	70%	0%	2%	3%	6%

[1] Canadian imports and exports counted as domestic.
[2] Canadian and Mexican counted as domestic

Table 5.7 examines bilateral automotive trade between the United States and Japan. 1989 data would lead us to expect that similar shares of each other's market—one definition of balanced trade—would lead to about a 2:1 Japanese edge in vehicle

exports. Instead, we find a ratio of almost excess of 64:1, over 30 times the expected ratio. Similarly in automotive parts, we would expect to find a ratio of Japanese to US parts exports of about .8:1, based on 1989 production levels. We actually find a ratio of nearly 13:1, some 15 times higher than the expected. Japanese auto suppliers, then, find themselves in a secure home market too.

Table 5.7 Japanese and US Bilateral Automotive Exports, 1989[124]

Automotive product	Japan to US	US to Japan	Expected Ratio	Actual Ratio
Vehicles (000s)	2,172.3	34.0	2.1	63.9
Parts ($000,000)	11,351	893	0.8	12.7

The low import share of vehicles protects the build level of their customers, and thus the business available to those suppliers. Moreover, the sourcing preferences of those customers effectively shield Japanese suppliers from substantial competition from other producing nations. It is simply not credible that these ratios solely reflect consumer choice in a free market and sound manufacturer sourcing and business practices. If that were the case, the question would not be why the Japanese automotive manufacturers are so successful in North America, but rather why they are so unsuccessful.

There are two major sources of demand for imported Japanese parts. First, they are used in new vehicles, both by Traditional North American manufacturers and the burgeoning Japanese-badged New Entrants, either directly or through their own Traditional and New Entrant suppliers. Second, they are used in aftermarket servicing of the growing fleet of operating Japanese-badged vehicles. The demand for both uses has grown rapidly since the mid-1980s, as the operating fleet has grown, and 1990 New Entrant production more than tripled the 1986 level, reaching some 1.6 million vehicles. Our analysis suggests that the aftermarket, New Entrant production and Traditional production is the order of level of demand.

Particularly disturbing is the high per-unit use of Japanese parts in New Entrant production. If, as most analysts expect, that production continues to grow rapidly, it will exert tremendous pressure on parts imports. We note that four Japanese companies have recently announced targets for substantially increased purchases of North American parts.[125] If these programs are effective, and do not simply result in the purchase of parts that themselves have high import content from suppliers, then the pressure from New

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[124]Hertzenberg, "Internationalization of the Auto Parts Industry."

[125]"Big 3 chiefs return with some gains," *Automotive News*, January 13, 1992, p. 44.

Entrant production will be somewhat alleviated. We also express apprehension that these targets will be met simply by increased production, thus failing to alter the underlying imbalance in any meaningful manner.[126]

Reasons for Automotive Trade Deficit

Various reasons have been proposed regarding the source of this substantial trade deficit. One reason is a "too strong" dollar, driven up in value by US monetarism or by high interest rates brought about by the need to finance the national debt, and by the perception abroad that the dollar represents a "safe haven" currency in an uncertain world. This argument sometimes included a "too weak" yen, accompanied by the implicit or explicit notion that the Japanese government deliberately manipulated the value of the yen in order to foster exports. Nevertheless, the rapid appreciation of the yen in the mid-1980s, increasing some 85% in US dollar terms, has had remarkably little effect on the size of the stubborn bilateral automotive trade deficit.

Some speculate that the real problem underlying low North American penetration rates in Japan is a lack of will on the part of the Traditional North American Automotive Industry to pursue sales in Japan. After all, these manufacturers' historic pattern has been to invest abroad and serve foreign markets from local production, an option denied them in Japan when it was an attractive and feasible business undertaking. However, since the Traditional North American manufacturers have no production base in Japan, there is no local presence that bars them from exporting. In fact, US vehicle exports to Japan, the world's second largest national automotive market, make up only 13% of US vehicle exports, even though the United States is the second leading automotive importer into Japan. Parts exports to Japan, the world's largest national automotive producer, are only 9% of US parts exports.[127] Moreover, the various European industries have had little more success in penetrating the Japanese market, and only Germany held higher import share than the Traditional North American producers in 1990.

Nevertheless, even if this is true, is there not a serious risk that any type of policy intervention will simply serve to protect the Traditional Automotive Industry from the appropriate consequences of its past poor management, and therefore defeat the effective working of market forces? We think not. Such concerns, we believe, are based on an incomplete and inaccurate assessment of the industry's current situation and the

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[126]Max Gates and Richard Johnson, "Big 3 expect little from talks with Japanese in Chicago," *Automotive News*, May 11, 1992, p. 4.

[127]Hertzenberg, "Internationalization of the Auto Parts Industry," calculated from data in tables 5 and 6 for vehicles (quantity basis), and table 2 for parts (value basis). Exports to Canada are excluded from total exports.

explanatory factors that account for it. To be sure, industry management has made mistakes and should not be insulated from the consequences of those mistakes. However, at least some of those mistakes reflect rational behavior in the business climate North America affords, and that suggests that international competition, in vehicles as well as other manufactured products, might require alteration of that climate to provide North American companies the opportunity to compete effectively.

Some analysts highlight the particularly low level of US automotive exports to Japan—about $600 million in vehicles and almost $900 million in parts in 1990—as the root problem. This suggests an export-driven solution. However, many observers feel that Japan engages in a variety of exclusionary, if less formal, trade practices, ranging from barriers, such as product certification hurdles, to restricted access to distribution networks, and the like. It certainly is the case that exports could form an important part of the solution in automotive parts, where a few, key decision makers—the Japanese manufacturers—control an enormous potential market, both for original equipment and aftermarket uses.

It is particularly unfortunate that the aftermarket in Japan has proved so difficult to penetrate, as this has imposed high costs on Japanese consumers and denied business to North American suppliers. One aftermarket supplier has market shares around the world ranging from 23% to 70% and is the world market-share leader, but has only been able to capture 1% of Japan's market, where it has been active since 1973. It is difficult to understand such disparities without investing some credence in the argument that Japan is different, and some of the difference lies in exclusionary practices.

North America has a trade surplus with Western Europe, although it has a deficit in the automotive sector. The European manufacturers have generally competed at the high end of the market, exporting luxury and specialty vehicles. Perhaps because of the lower volumes from Western Europe, the smaller portion of the deficit it represents, and the fact that the European deficit comes from a number of different countries, debate about the automotive trade deficit has not focused on Western Europe to nearly the degree that it has upon Japan.

It is difficult to believe that the efforts of the North American automotive companies in Japan have met with so little success for purely market reasons—i.e., absence of competitive product or lack of initiative. The performance of the North American industry elsewhere in the world simply does not support such an interpretation. Some steps to rectify the policy and practice barriers to the Japanese vehicle and parts market should clearly be a high priority for both North American governments.

Export Barriers to Japan

There are numerous barriers to automotive imports into the Japanese market. Some of these barriers are formal and some are informal, and this distinction underlies much of the dispute between the Japanese and North American Traditional industries, as well as the overall trade friction between Japan and many of its trading partners. Japan compares quite favorably with other major automotive producers in terms of strictly formal barriers, such as tariffs and quotas; less favorably in quasi-formal barriers, such as product standards and certification procedures; and quite unfavorably in informal barriers, such as access to distribution systems. It is probably the case that formal barriers are easier to negotiate and dismantle, simply because there is little dispute as to their existence and effects. On the other hand, there is often dispute about the importance and even the existence of less formal barriers, lengthening the process of identifying them, negotiating their relaxation, and implementing remedial actions.

Moreover, debates on Japanese automotive import barriers often involve participants committed to one side or the other. Thus many defend Japan by first pointing to its low formal barriers, then questioning the suitability of candidate import products, and finally lauding Japan's recent impressive percentage increases in imports. Japan's critics first note its high quasi-formal and informal barriers, argue that there are numerous appropriate potential import products, and then decry the continuing low absolute levels of Japan's imports. Such debates rarely admit of ready and clear resolution, and progress to date on increasing North American vehicle and parts exports to Japan has been disappointing. Nevertheless, OSAT believes that these issues must be addressed and resolved expeditiously, lest automotive trade become more constrained and contracting rather than more open and expanding. While the strategic priorities of the Traditional North American industry appropriately target reducing the share of the North American market held by the Japanese industry, we believe it is also extremely important that the North American industry successfully participate in the Japanese market, and initially that will be through exports to Japan.

Before discussing the current situation, a short historical overview is necessary to explain why North American automakers and their suppliers have such a limited presence in the Japanese market today. The Big Three all established vehicle assembly operations in Japan early, and by 1934, GM and Ford had attained a combined market share of over 90%. In 1936, Japan passed the Motor Vehicle Manufacturing Business Act, placing

severe restrictions on local manufacturing activities of foreign firms, putting tariffs of 70% on imported vehicles, and raising the duties levied on parts. By 1939, all American automotive manufacturing operations in Japan ceased, and all manufacturing assets were seized in 1941.

Following World War II, North American companies were not permitted to revive their manufacturing activity, and, up until 1965, automotive imports were again restricted to allow the indigenous industry to develop. The 1970s witnessed the dismantling of many formal entry barriers, and North American vehicle imports reached a high of almost 22,000 units in 1979, before the second oil shock drastically cut into sales. In the late 1980s, American imports began to climb again, reaching 32,230 in 1991. However, only 15,546 of these were Traditional Big Three vehicles; the balance was from New Entrant facilities. American Big Three sales were about 6% of foreign car sales, which in turn comprised 2.9% of the Japanese market. Traditional North American penetration stood at a dismal 0.17% of overall automotive sales in the Japanese market in 1990.

Japanese government and industry officials often attribute the lack of American market share variously to insufficient efforts to understand the nature of the Japanese market, insufficient investment of time and money necessary to do business in Japan, automobiles that are not designed specifically for Japanese consumer tastes and needs, vehicles too large for the narrow roads of Japan, failure to make export models with right-hand drive, lack of follow-on support by American manufacturers, and general lack of quality in American products. The Japanese side does not typically view restrictive Japanese practices, nor the past actions of the Japanese government as particularly relevant or significant barriers to market entry today. The North American view emphasizes the actions of the Japanese government that destroyed their burgeoning operations in Japan, prevented their reestablishment at a time when such efforts were feasible undertakings, and the continuing barriers they face today, including the processing of import vehicles, the restricted access to established distribution networks, and the extremely high costs of entry.

Numerous aspects of Japanese regulatory policy pose significant obstacles to imports. Perhaps the most important lie in Japan's product standards and the processes for certifying that imported vehicles meet these standards. Homologation—modifications to satisfy these standards—adds time and cost to the importing process, especially for small quantities. Yet the investments required to produce vehicles tailored to Japanese specifications cannot be justified without confidence that large sales are possible. Moreover, many of the standards—and the expenses they generate—contrast markedly with the much more flexible regimes faced by Japanese auto makers exporting to North

America. Although the US and Japanese governments and their automobile industries have been engaged since the early 1980s in bilateral negotiations to harmonize their automobile regulatory regimes, these efforts have produced only limited results, and new Japanese regulations still appear to have important discriminatory effects. In addition, foreign auto makers seeking to sell in Japan are confronted with a national vehicle inspection system that severely disadvantages foreign parts makers, and a taxation system that continues to discriminate against foreign vehicles.

Product Specifications

Like virtually all national governments, the Japanese government establishes criteria that products of all types, including autos, must satisfy. The principal automobile criteria concern vehicle safety, emissions, and noise. However, unlike many national governments, Japan usually requires manufacturers to *pre-clear* products, submitting them for government-sanctioned testing and approval before they are allowed on the market, rather than permitting manufacturers to verify their own compliance. In addition, the Japanese government frequently requires products, including autos, to conform to detailed specifications for product design, rather than the functional standards typical in North America and elsewhere. Finally, Japan is reluctant to recognize alternative international standards and testing procedures.

Japan's general practices clearly reflect genuine health and safety concerns, as well as distinctive characteristics of Japan's geography, social priorities, and traffic environment, such as its limited land area and crowded roads. Nevertheless, in some cases, the health and safety benefits of these regulatory practices are difficult to identify, and have been, in any case, far less noteworthy than their effects on restricting access to the world's second largest national motor vehicle market. More importantly, from a trade standpoint, few comparable barriers exist to Japan's access to the North American market.

North American disputes with Japan over vehicle standards have covered a wide range of products, from side reflectors and windshield wipers to braking systems and emissions levels. The European Community, for its part, is negotiating with Japan over the placement and number of screw holes for license plates. Currently, Japan's Ministry of Transport (MOT) and the US government are focusing on numerous substantive standards-related issues affecting the export of vehicles to Japan. While there has been progress on a number of these issues, that progress has varied from Japan's acceptance of international standards and North American testing results to agreement to undertake technical discussions.

Two especially frustrating issues for the North American industry have been referred for technical discussion, rather than resolved. These are engine exhaust emissions testing procedures and catalyst overheat warning systems. Current US emissions standards are more stringent than Japanese, and the disparity will widen in model year 1994, when the emissions provisions of the US Clean Air Act go into effect. Japan did not accept US emissions tests on US-made vehicles as substitutes for separate tests administered in Japan, unless testing was conducted under observation by a witness appointed by the MOT. Nor would Japan accept US test data, even though US testing is accepted by most of the rest of industrialized Europe, the industrialized Far East, Brazil, and Canada. While the United States requested that Japan accept the US tests and data, Japan has agreed to discuss technical aspects of Japanese testing procedures to be conducted in official test institutes in the United States.

The controversy over catalyst overheat warning systems illustrates how the distinctive Japanese design-centered approach to product regulation has resulted in a safety standard turning into a trade barrier. Japanese regulations require that vehicles contain a dedicated system to warn of overheating in catalytic converters for exhausts, while North American regulations simply require that auto makers address this problem when the vehicle is designed, leaving the method up to the manufacturer. Japan is the only country to require, not only this type of system, but a witnessed heat damage test as well before the vehicle can be approved. Japan's MOT claims that the overheat warning devices frequently detect dangerous conditions in exhausts, and that therefore they can neither drop the requirement nor accept foreign manufacturers' assurances about the efficacy of their vehicle designs. The United States has insisted that North American vehicles' designs have successfully ensured that catalytic converters do not overheat, without adding the sensor, controller, and wiring comprising a dedicated system. MOT has agreed to enter into technical discussions on this issue.

The many Japanese vehicle standards mean that foreign manufacturers must modify vehicles extensively if they are to be sold in Japan, a process called homologation. Homologation for North American vehicles has recently included the addition of a catalyst overheat warning system, new head lamps, breakaway mirrors, side marker lamps, control identification, chassis stamps, engine stamps, wheelbase flares, an emergency signaling device, and Japanese labels. According to the Commerce Department, these homologation measures added $2,168 to the sticker price of an average Big Three car exported to Japan in 1990, and accounted for over 8%of its price. Another US government study found that homologation added $2,900 to the cost of a Chrysler

LeBaron coupe sold in Japan, and accounted for nearly one-third of the price differential in Japan between the LeBaron and the comparable Honda Accord Coupe.

A similar comparison is shown in table 5.8, contrasting the retail prices of a Ford Taurus LX and Honda Accord in North America and Japan. The higher prices in Japan are attributable to homologation, shipping, the need to add unique equipment, and in the case of the Taurus, for profit margins accrued to three levels of distributors.

These numerous issues involving technical standards, testing methodologies, and verification of performance continue to present serious and expensive barriers to North American access to the Japanese market. While some view progress as substantial, because many have been altered or eliminated over the years, many see that same progress as painfully slow, since so many remain.

Table 5.8. Comparison of Retail Prices in North America and Japan[128]

	Ford Taurus LX	Honda Accord
Japan	$28,522	$17,846
North America (in $US)	$22,310	$16,945
Difference	$6,212 (27.8%)	$901 (5.3%)

Import Approval Procedures

Japan's principal process for certifying compliance with safety standards is the Type Designation System (TDS). This process applies to domestic as well as imported vehicles. The TDS imposes no numerical quotas on importers and has the potential of dealing efficiently with large volumes of vehicles by permitting the inspection of manufacturing facilities to ensure that their procedures conform to Japanese standards rather than the inspection of each vehicle. Yet the testing requirements themselves and the preparation and processing they require are considered needlessly burdensome by North American manufacturers, as is the amount of documentation required.

In 1986, Japan took measures to expedite this process by introducing the Preferential Handling Procedures (PHP) system. This import protocol requires far less documentation than the TDS procedures and less extensive testing. Manufacturers are allowed to certify with affidavits that their products meet certain safety and noise standards—those that have been declared by Japan to be functional equivalents of

[128] Ford Motors Corporate Strategy Group.

Japanese standards—but each car must be inspected individually, unlike the TDS procedure. Moreover, a manufacturer could only export 1,000 vehicles of a specific type to Japan each year under PHP. Because foreign producers can take advantage of this program only if they severely limit export volumes to Japan, PHP acts as a *de facto* import limitation. In contrast, North American certification processes permit Japanese self-certification to all safety standards and set no limits on the sales of imported vehicles. While the MOT now facilitates individual vehicle inspections by sending inspectors to the dealer or distributor, it seriously limits the locations and dates and requires advance scheduling. The US government has asked Japan to eliminate both TDS and PHP in favor of North American procedures. Japan has recently agreed to increase the limits on PHP imports to 2,000 vehicles a year, and will permit an extra 1,000 during the time that a TDS application is under consideration. However, the costs of PHP are high, and it is not economical to use this procedure for beyond 500 to 600 vehicles.

Taxation

The structure of Japanese automobile taxes long discriminated against foreign firms, principally through a commodity tax rate based on the size of the vehicle and its engine. Foreign cars typically fell into higher tax categories. Beginning in April, 1989, the Japanese tax system replaced this three-tiered commodity tax with a uniform-rate consumption tax—in effect, a value-added tax similar to those levied in the European Community. It is unclear whether this change was due to the move of Japanese manufacturers into larger cars and engines, a change in environmental concerns, or a concern with the old system's effects on imports.

However, imports are still taxed at a higher effective rate than domestic vehicles because the vehicle tax base for imports includes insurance, freight, and homologation costs. In addition, all vehicles are still subject to other taxes based on vehicle weight and size, such as the acquisition tax, the tonnage tax, and an engine capacity tax that more than doubles for engines displacing more than 2000cc. These effectively leave US-manufactured vehicles subject to higher taxes.

Ironically, a program that was touted as a method to boost imports effectively discriminates against non-Japanese manufacturers. Japanese companies are eligible for a credit against corporate income taxes equal to 5% of the year-to-year increase in the value of their imports, provided such imports rise by at least 10%. Other companies are allowed only a tax deferral for a five-year period for achieving the same import levels. Thus a car imported by a Japanese vehicle manufacturers can generate a 5% tax credit,

even on the Japanese content of the imported vehicle. Cars imported and sold by a non-Japanese company would generate much smaller tax deferrals and interest saving.

Inspections

The rigorous Japanese vehicle inspection system, known as the *shaken* system, presents a substantial barrier to North American automotive exports to Japan. Cars in Japan must be inspected three years after the purchase of a new vehicle, then every two years for the next ten years of the vehicle's life, and every year thereafter. These inspections can be very expensive propositions for car owners. The owner of a three-year old vehicle in excellent condition typically spends more than $1,000 for the minor repairs and adjustments invariably identified by repair facilities as necessary for passing inspection. The repairs and maintenance required to pass second and third inspections are usually even costlier.

This inspection system is the envy of world automakers, since it effectively forces the early replacement and retirement of vehicles. The trade issues it raises stem from the typical repair procedures. Repair facilities in Japan principally use original equipment replacement parts supplied by the vehicle's manufacturer. Such parts are used for two principal reasons. First, affiliates of Japanese automobile makers have dominated the repair system to date. Second, at least until recently, inspectors routinely failed cars that included foreign replacement parts. As part of the bilateral US-Japan Market Oriented Sector Specific (MOSS) agreement on auto parts concluded in 1987, Japan agreed to inform relevant parties that the installation of foreign parts should not in and of itself pose any obstacle to clearing inspection. However, most repair stations are linked to a specific Japanese auto company, and thus carry only Japanese replacement parts, while inspectors harbor lingering suspicions about "nongenuine" parts. The *shaken* system has been and remains a serious direct barrier to the sale of imported parts, and indirectly to the sale of imported vehicles.

Distribution System

The automotive distribution system, for both vehicles and parts, still presents a significant nontariff barrier to foreign companies attempting to sell their products in the Japanese market. In theory, the distribution system for vehicles is similar to that of the United States. The broad outline of the system was copied from the American automobile distribution network, and Japanese literature on the subject stresses this

point.[129] However, the distribution system is marked by restrictive practices, most especially exclusive dealing, making it difficult if not impossible for foreign manufacturers to expand their marketing efforts in Japan by "piggy-backing" on the pre-existing network, as Japanese manufacturers did in North America.

Japanese industry officials maintain that while Japanese dealers generally enter into sales arrangements with one manufacturer, they are not prohibited from handling the products of other manufacturers and are as fully independent as those in North America.[130] The Japanese view the difficulty foreign manufacturers face in gaining access to the dealer network as independent business decisions of the dealer, arguing that dealers—at least for the larger Japanese manufacturers, such as Toyota, Nissan, and Honda—cover all the market niches and thus have no need to carry American products. Moreover, to add foreign products would unduly tax the sales staff, service, and parts procurement.

Japanese dealer-manufacturer relationships have both explicit and implicit features which allow manufacturers to maintain a high degree of control over their dealers' actions. The explicit arrangements fall into three main categories: full ownership and control of the dealership; investment in the dealership; and contractual arrangements through which third parties agree to sell a manufacturer's products through a dealership. Each of these arrangements provides the manufacturer a high degree of influence, if not control, over the dealership's business activities. In addition to these explicit arrangements, low dealer profitability keeps them dependent on the manufacturers for financing and other assistance, providing manufacturers with great leverage. Incentives and rebates offered to dealers also keep the dealers dependent, since many are tied to the dealer's sales of the manufacturer's product in proportion to the dealer's overall sales. Carrying another manufacturer's product would lower such rebates. Finally, historical relationships and mutual loyalty are all-important features of business dealings in Japan. Throughout Japanese industry, if a company is tied to another, then that company does not go elsewhere to expand its business. The net result in automotive distribution is that dealers are highly unlikely to introduce competitors' products.

This dealer dependency effectively prevents non-Japanese manufacturers from utilizing the existing dealer network to market their products in Japan. Since the dealer outlets have accounted for over 95% of sales in recent years, marketing efforts through

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[129]Japan Automobile Manufacturers Association, Inc, *Automotive Distribution in Japan*, Washington, D.C.,1990.
[130]Ibid., p. 14.

importers and independent dealers appears to be of limited value in securing volume sales.[131] In spite of Japanese protests to the contrary, the Japanese automobile industry is a prime example of a distribution *keiretsu* that excludes outsiders. The Japanese Fair Trade Commission found the automotive sector to be almost completely cartelized, with manufacturers exercising a wide degree of control over the actions and fate of their dealers.[132]

The question arises as to why the North American Big Three do not simply set up their own, separate distribution network. A primary reason is the exorbitant price of land in Japan. Since it is such a scarce commodity in Japan, land is not freely traded, and therefore, suitable locations for dealers' outlets are often simply not available even if one were willing to incur the cost. Various estimates place the cost of one new sales outlet in Japan from $10 million to $25 million. Five hundred outlets,—a fraction of requirements for effective distribution—would require from $5 billion to $12.5 billion. As discussed elsewhere in this report, the capital demands on the North American industry are enormous, and it is difficult to make this level of investment in Japan without more promising potential results. The Industrial Bank of Japan recently concluded, "The new establishment of one's own dealership network has reached its limit, due to the difficulties in the after-sales service system and soaring land prices."[133] Thus, access to the already established dealership outlets of the Japanese producers appears to be a necessity for effective penetration of the Japanese market.

In recent years, in light of the exclusiveness of dealer-manufacturer relations in Japan, the Big Three have used a variety of alternative approaches to market their products in Japan, including independent importers and affiliations with Japanese companies. Ford distributes through Autorama, a joint venture with its affiliate Mazda, which provides access to about 300 outlets. GM markets North American vehicles through Yanase & Company and Suzuki. These arrangements give GM access to approximately 700 sales outlets.[134] Chrysler distributes vehicles through J. Osawa & Company at about 47 outlets. In addition, Honda and Chrysler have entered an arrangement in which Jeeps will be sold in Honda's Import Division sales channel, consisting of 110 outlets. To date, Honda has not met the sales targets stipulated in the

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[131]American Embassy, Tokyo, "Japan's Auto Dealer System: Overview and Statistics," Tokyo: US Embassy, unclassified cable, May 7, 1991.

[132]United States International Trade Commission, *Phase I: Japan's Distribution System And Options For Improving US Access*, Washington, 1990, p. 59.

[133] Ibid., p. 9.

[134]Information on outlets, dealer franchises and sales channels in Japan is drawn from a number of sources. See, e.g., *Automotive Distribution in Japan*, p. 8.

agreement. There are also 50 Chrysler Japan Sales Limited outlets through which Chrysler vehicles are sold in Japan, and 23 outlets for minivans and full size vans through Sinwart, a specialty dealer.

While their efforts to establish dealer networks in Japan have yielded some sales results, the number of outlets—about 1,660—that the Big Three has achieved is a mere 9% of the approximately 17,500 total outlets in Japan. Moreover, the North American manufacturers are dependent on the good will and effort of business partners who often have an interest in limiting their sales to preserve higher profit margins, control, or to promote alternative vehicles. Given the costs of establishing an independent distribution network, access to truly independent dealers is a major requirement for North American success in the Japanese market.

In striking contrast to the American manufacturers' inability to become integrated into the Japanese distribution network, approximately 30% of the American Big Three's dealers in the United States are dual dealers, carrying Japanese-brand products in their showrooms alongside their domestic manufacturer's vehicles.[135] By 1990, there were a total of 64,685 US franchised outlets, 34,716 for American vehicles and 29,969 for Japanese and Japanese-made, American nameplate vehicles.[136] Thus Japanese vehicles are sold in approximately 46% of the franchised outlets in the United States—a far cry from the situation that the American manufacturers face in Japan.

The North American Free Trade Agreement (NAFTA)

A trilateral North American Free Trade Agreement (NAFTA) would impact on the competitiveness of the automotive industries of Mexico, Canada, and the United States. NAFTA would affect trade among the three countries, as well as between these countries and the rest of the world. It would affect relative business costs and opportunities, thus impacting potentially on the global distribution of automotive manufacturing facilities and services.

The inclusion of Mexico in a free-trade agreement offers both opportunities and uncertainties for the US-Canada automotive industry. The opportunities arising from a NAFTA flow from the fact that Mexico would add close to 85 million people and $170 billion in total economic output. The addition of the Mexican economy would create a NAFTA economic zone, which exceeds in size the combined zones of the European

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[135]According to a dealer survey by the National Automobile Dealers Association.
[136]*Ward's Automotive Yearbook, 1991*, pp. 219-221.

Economic Community (EC) and European Free Trade Agreement (EFTA), as shown in table 5.9.

This large economic zone has the potential to produce higher levels of automotive employment, production, and sales in North America than would be the case if Mexico remains excluded because:

- The US-Canada automotive markets are mature and will experience lower annual growth in the future than in the past, whereas the Mexican market has much potential for growth
- Removal of tariff and non-tariff barriers would expand trade; and
- Extended scope for rationalization of the automotive industry could produce competitive gains in productivity and cost reductions relative to the competition outside NAFTA, thus displacing imports and encouraging exports.

Table 5.9. World Trade Zones

	Asia	NAFTA	EC+EFTA	World
Population (million)	1,620	360	358	5,206
GDP ($trillion)	3,853	5,864	5,532	19,982
Exports ($billion)	656	509	1,320	2,902

The uncertainties that various stakeholders associate with a NAFTA relate fundamentally to the perceived risks of winning or losing. In the global economy, the knowledge, technology, capital, and skills employed in the automotive industry are highly mobile. What will happen to the geographic distribution of these factors of production and the resulting investment and employment patterns under a NAFTA? Can a trade deal be struck that produces net gains for all three member countries? What would be the essential features of such a deal? Within each country, who would lose and would adjustment policies be warranted and feasible? These are the kinds of questions that underlie the uncertainty surrounding a NAFTA.

US, Canadian, and Mexican Interests and Objectives

The three governments come to the negotiating table with some common interests, concerns, and objectives, but also some different ones. All three governments share an interest in strengthening the North American economic zone. The emergence of strong trading blocs in Europe and Asia raise the prospect of tougher trade rules between North America and these blocs. An economically united and vigorous North America

would be in a stronger position to compete with these trading blocs. Environmental concerns could also benefit from being addressed from a trilateral perspective.

All three governments have common objectives of increased trade, economic growth, rising employment, and increasing living standards. However, the three countries start from different positions. Mexico has a comparatively low standard of living, low wages, poor working conditions, much lower levels of basic public services, a wide gap between rich and poor, low savings and investment, and a developing industrial base and infrastructure.

Mexico's trade policies have been protectionist, although this is changing. The United States and Canada have historically had a close trading relationship. Both nations have high living standards, generally good working conditions, diversified economies, developed industrial infrastructure, established public services, and sizable middle-class populations. Canada has a much smaller market and has relied on trade with the United States for much of its export sales.

Mexico has an automotive industry of growing maturity and diversity. This industry posted its best year ever in 1990 and is poised to prosper. Mexico could become a focal point for new auto industry investment to produce vehicles and parts for sale within the large NAFTA area as well as for export to non-NAFTA countries. Mexico has much to gain from a NAFTA by participating in an integrated North American automotive market.

Automotive Industry Interests and Concerns

The overarching objectives of a NAFTA for the automotive industry, which the US and Canada share, would be:

- The addition of the Mexican market to those of the United States and Canada and the substantial market growth potential that this would create
- The unraveling of Mexico's protectionist automotive policies to take advantage of the market growth opportunities
- Increasing the competitiveness and degree of integration of the North American automotive industry, displacing imports, and stimulating exports
- Avoiding use of Mexico as a platform for non-NAFTA countries to unfairly penetrate the United States and Canadian markets
- Minimizing the disruptive impacts of a NAFTA on existing automotive communities in all three countries

Non-North American-owned companies, including those with production facilities in North America and those without, would share the first two of the above objectives. Some of these companies with production facilities in North America may share objectives three and four.

Concerns about a NAFTA that have been expressed by some groups, including Canadian and US labor, and which would need to be addressed, include:

1. The possibility of a shift of production capacity from Canada and the US to Mexico; large increases in Mexican automotive exports to the US and Canada resulting in job and investment losses for both countries.

2. Dislocations in Canadian and US automotive industry communities; the exploitation of Mexican workers through low wages and poor working conditions.

3. Relatively low environmental standards in Mexican automotive production.

On balance, NAFTA offers the US industry growth opportunities over the longer term, but also threatens some short-to-medium-term disruptions. Growth opportunities for Canada appear smaller, but the risks of disruptions may be greater.

The trade negotiators have the task of coming up with a free-trade agreement that addresses these industry objectives and concerns and paints a "win-win-win" scenario.

The key issues the negotiators must address on automotive trade include:

1. The phase out of automotive tariffs between Mexico, the United States, and Canada.
2. Each country's automotive tariffs with other countries.
3. Mexico's nontariff barriers to automotive trade.
4. North American automotive content performance requirements and calculation methods.
5. Automotive investment policies toward NAFTA members and toward other countries.
6. Dispute settlement mechanisms.
7. The treatment of used cars.
8. Product/process standards.

Some industry stakeholders see a NAFTA as a mechanism for improving competitiveness; others feel uncertain and vulnerable. The three countries involved in the negotiations have some automotive interests that converge and some that are divergent. The negotiators have a range of issues to address and options to select. Mexico may be best positioned to benefit from a NAFTA. Canada appears to have the most

vulnerability. The United States would benefit over the long term, but may face some short-term disruption.

There is strong industry support of the elimination of trilateral tariffs and nontariff barriers, subject to acceptable content rules and some production safeguards. This assumes that the trade package does not open up the possibility of Mexico being used by non-NAFTA countries as a platform for penetrating the North American market. Concerns that must be addressed include whether or not producers already located in Mexico should be given preferential treatment, and the implications of a NAFTA for local employment and working conditions in the three countries.

Impacts of Cost and Policy Changes

Research for this report includes simulations of the major potential effects of seven possible developments on the North American automotive industry and its Japanese competitors.[137] Policy actions are among the major, if not always the exclusive, drivers of these developments. Hence, these results at once portray the importance of the policy arena in determining industry performance and suggest the possible effects of differing policy options. These simulations are based on a three sector model, and describe percentage changes across a range of performance measures compared with a 1988 base case.[138] These measures include, among others, total sales in the United States and Canada; changes in sales share by Japanese Import producers in the United States and Canada; changes in total factor productivity and unit costs in the United States and Canada; and percentage changes in employment in the United States and Canada. The sales results refer to dollar value of sales for both vehicles and parts, rather than the more familiar—and restrictive—unit vehicle sales.

The only major effect of these scenarios on producer performance in Japan occurs if North American producers capture 15% of the Japanese market. Long-term industry employment then falls by 8% in Japan, although permanent employment practices might prevent this and impose additional handicaps on Japanese producers. Therefore,

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[137]We also simulated the effects of dropping the Voluntary Restraint Agreement, which has limited Japanese exports to North America. Since these restraint levels exceeded actual Japanese unit imports since 1986, formulating a reasonable tariff equivalent for modeling purposes was not possible.

[138]Melvyn Fuss, Stephen Murphy and Leonard Waverman, "The State of the US, Canadian, and Japanese Auto Industries: Impacts of Cost and Policy Changes," January, 1992. The three sectors incorporated into the model are 1) an econometric *cost* model; 2) a set of equations converting costs to *prices*; and 3) a set of *consumer demand* functions. The basic cost model reproduces output and sales within 1.5% of actual—a very tight fit.

improved performance of North American producers is not purchased at the price of substantial harm to the motor vehicle industry in Japan.

Exchange Rate

The currency exchange rate is a powerful determinant of comparative costs, and shifts in the exchange rate can have tremendous impact on competitiveness, as discussed in an earlier section.[139] While market factors drive exchange rates, it is clear that government policy also has major effects. Countries take numerous actions to achieve or defend a particular exchange rate, as recently exemplified by the weakening of the US dollar in the mid-1980s due to the Plaza Accord. The Canadian dollar is closely tied to the US dollar, so for convenience, we discuss the yen:US dollar exchange rate.

The 1988 yen/dollar exchange was about 128:1, with the dollar considerably weakened compared with its value in the mid-1980s, when the rate neared 240:1. If the actual exchange rate fell to 110:1, a 16% appreciation of the yen or a 14% weakening of the dollar, our analysis suggests that Japanese sales share would fall by over 12% in Canada and the United States over the long term.

However, strategies to develop international competitiveness solely through weakening North American currencies have significant negative effects, as imports become more expensive, and consumer welfare ultimately suffers as goods produced outside North America become more expensive. While this benefits the overall trade balance, it is purchased at the price of more expensive traded goods.

Exchange rates represent one of the critical, but uncontrollable factors in international competition. If the North American producers benefited from the weakened dollar of the latter part of the 1980s, they were surely damaged by the strengthened dollar of the mid-1970s. Exchange rates can shift in either direction, and it is important to recognize that a weakened yen represents a serious threat to North American producers, one that must be factored into strategic planning. If the yen:dollar exchange rate moved to 150:1, weakening the yen by some 15% or strengthening the dollar by 17%, Japanese long-term sales share in the US and Canada increases by 14.5%. Unit costs fall somewhat in the United States and Canada because of the materials and equipment that are purchased in Japan, but the impacts of total factor productivity are small. The impacts on employment are more substantial, as US employment falling by nearly 3% and Canadian employment by almost that amount.

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[139]See the discussion of total factor productivity on pages 83-86.

Labor Costs

The price of labor reflects numerous private and public decisions, including wage rates, benefit coverage, and the funding method and levels of public programs. Thus our analysis of health care costs, reported earlier, suggests that the differences in funding methods and levels between the United States and Canada result in substantially higher costs for manufacturers in the United States, and this is reflected in the price of labor. Labor costs can be reduced through private initiatives, such as increased productivity, or changes in public policies.

Under this scenario, a 17% reduction in the price of labor in Canada yields improvements in production and employment in Canada, but has little effect on North American total market size. Unit costs in Canada fall by 5.6% and employment rises by 9.4% in the long run. The United States suffers some minor negative effects on its own costs and employment because of this reduction in Canadian labor costs. A reduction in the price of labor by 17% in the United States increases total sales in North America by about 2.5%. Unit costs in the US fall by nearly 6%, while employment increases by 12.7% in the long run. Canada, on the other hand, experiences some minor performance decrements on these measures. These are indeed substantial impacts, with important consequences for the economy and for government revenues.

If labor prices simultaneously fall 17% in Canada and the United States, total North American sales increase nearly 3%, while Japanese sales in North America fall about the same amount. Unit costs fall, and Canadian long-term employment increases 8%, and US employment just over 11%. The simultaneous lowering of labor price yields a higher North American employment gain, as Japanese share falls more than in either of the separate scenarios. However, each nation's employment gain is somewhat lower, since neither nation gains at the expense of the other.

Cost of Capital

Our earlier analysis suggests that the North American industry indeed faced a cost of capital disadvantage in the mid-1980s, and that the current rough parity of capital costs in North America and Japan is unlikely to compensate for the continuing disadvantages imposed by that earlier deficit. What would happen if the North American industry were to develop a cost of capital advantage? We model these results with a 20% decrease in the US and Canadian cost of capital. The impacts are more substantial in the long run than in the short run because the long run permits capacity adjustments, whereas capital is essentially fixed in the short run. This 20% reduction in the price of capital lowers unit

costs in the US by 3% and in Canada by nearly 2%. Total sales in both North American markets increase fractionally, and there is little effect on long-run employment.

Tariffs

Both the United States and Canada impose tariffs on automotive goods, although not on each other's imports under the FTA. The weighted US tariff is some 4.5%, including the tariff of 2.5% on cars and parts and 25% on light trucks, while the weighted Canadian tariff is 9.2%. What would result from raising these tariffs to a common 15%? A common rate of 15% involves a substantial difference in actual tariff increases in Canada and the United States because of the differing current levels, and this results in quite disparate impacts on the Canadian and US markets. Such a common tariff reduces Japanese sales in the long run by over 9% in the United States, whereas in Canada the reduction in sales is just over 5%. The effects of such a tariff on the total market size are negligible, suggesting that consumer loss is not especially high, and each nation gains nearly 2% in automotive employment.

Reduce Japanese Market Share by One-Third

There are two immediate policy options that could effect a rapid and sharp decrease in Japanese import market share in North America. Canada and the United States could impose tariffs sufficient to achieve a lowered market share target or simply establish a quota. Of course, Japan could itself establish a more stringent quota as well. We simulate the effects of a reduction of one-third in Japanese market share, or roughly 20% of the North American market. Such Japanese share reduction adversely affects the size of the two North American markets, reducing the combined markets over 2%. Such actions primarily effect the industry's employment level, as both Canada and the United State reap employment gains of over 8%.

The limiting of Japanese share through tariff and quota mechanisms inflicts some consumer welfare losses, as it drives up prices. However, the effects of the two mechanisms differ in an extremely important way. Quotas restrict supply, permitting the Japanese manufacturers to raise prices and capture consumer losses in the form of larger profits. These profits can support product development efforts and thus convert to a formidable competitive resource when restrictions end, as discussed above.[140] Thus the North American imposed restrictions in the early 1980s may have contributed to funding the explosion in Japanese product development, although it is unclear that they truly were

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[140]See discussions on pp. 80 and 94.

binding. While tariffs also result in higher prices and consumer loss, consumer losses are captured by their own government and thus consumers are somewhat compensated.

Research & Development

There is a substantial, real, efficiency difference between Japanese and domestic North American producers, as discussed above in the section on productivity. Our model suggests that a major method of reducing these cost efficiency differences is to increase research and development (R&D). Our scenario assumes that the stock of R&D—that is, the amount of cumulative knowledge—is increased by 50%, equivalent to a doubling of R&D expenditures in North America over four years. Of course, R&D expenditures are a complex function of company performance, yielding investment funds, the cost of capital, and policy incentives, typically reflected in tax codes.

The effects of this increased R&D investment are substantial. US unit costs fall by 12.7% and Canadian by 6.3% in the long run. These unit cost reductions, reflected in lower wholesale and retail prices, increase sales in North America by 5.5% in the longer term, while reducing Japanese share by nearly 5%. Long term total factor productivity leaps by 14.5% in the United States and nearly 7% in Canada. *This basically wipes out any productivity differential between the United States and Japan.* However, automotive employment in both Canada and the United States falls substantially in the short term, and some 4% over the long term, because research and development typically results in technical improvements that are capital using and labor saving.[141]

Japanese Market

What would the effects on the North American industry be if it were to capture 15% of the Japanese market? Such a level is not unreasonable, assuming serious and rapid steps to open the Japanese market are undertaken, since it is still well below North American shares in Europe. We assume that North American share of the Japanese market would rely on exports, rather than overseas production. This scenario is necessarily speculative because no price change in the model captures such a share gain due to the very low base of US and Canadian model sales in Japan. Moreover, the barriers to such an accomplishment are high indeed. Nevertheless, this level of market penetration has major benefits for the North American industry, raising employment in the United States and Canada substantially—by nearly 9% in the long term. Total factor

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[141] To be sure, the income and employment generated elsewhere in the economy might well compensate for these automotive losses. However, our focus is on the automotive effects of these scenarios.

productivity rises in North America, especially in Canada, where scale effects are more substantial, and Japanese sales share in North America falls by nearly 1%.

Japanese Market Combined with Increased R&D

While the effects of these scenarios differ somewhat across the various performance measures, the final two certainly represent an attractive package. Increased R&D has very positive effects on total market size and unit costs, although only moderate effect on decreasing Japanese share, and it yields long term employment reductions. However, capturing 15% of the Japanese market might more than compensate for any employment losses associated with R&D investments, and lessen the importance of decreasing Japanese share in North America. What would happen if both of these scenarios developed?

Total sales in North America would rise 5.6%, while Japanese share would fall by just about that amount. Unit costs fall over 7%in Canada, and nearly 13% in the United States. The employment gains from capturing market share in Japan do more than offset the losses associated with increased R&D investments, as each country gains about 4% in automotive employment. The gains in total factor productivity still eliminate any productivity differential between Japan and the United States.

However, the very attractiveness of these scenarios raises an important issue. Both efforts are capital intensive, and it is unclear how the North American industry could fund these efforts simultaneously, even ignoring the enormous capital requirements it faces for product development, discussed above. It surely suggests the need for other policy changes to support these investments, so that the capital is available through earnings and/or capital markets.

Summary

Table 5.10 summarizes the results of these simulations on four key US and Canadian performance dimensions: total sales, Japanese share, unit costs for domestic production, and employment levels. The displayed results are for the long run, permitting capacity adjustments to occur, and assuming low elasticities.

Currency shifts have substantial effects, perhaps most notably their effects on the range of outcomes the North American industry might experience, both in Japanese import share and North American automotive employment. Reducing labor costs in either country promises substantial employment gains to the improving country, but imposes some loss on the other, while simultaneous labor cost reductions in both countries afford substantial gains for both. A reduced cost of capital primarily effects

unit costs. Establishing a common tariff of 15% reduces Japanese share, but it requires a substantially higher tariff or quota to achieve a 33% reduction in Japanese share and to yield substantial employment gains. Increasing R&D and capturing 15% of the Japanese market each provide some substantial improvements, but it is the combination of the two that appear to yield the most even gains across these performance dimensions.

Table 5.10. Scenario Effects on Key Performance Dimensions: Percentage Changes Compared With 1988

	Performance Dimensions					
Scenario:	Total Sales		Japanese Share	Unit Costs		Employment
	Can	US	Can/US	Can	US	Can US
Exchange Rate						
110 yen:$US	-1.0%	-1.3%	-12.3%	1.1%	1.1%	2.3% 2.8%
150 yen:$US	1.0	1.3	14.5	-1.0	-1.0	-2.4 -2.8
Labor Cost Falls						
17% in Can	0.6	0.3	- 1.5	-5.8	0.0	9.4 - 1.2
17% in US	2.3	2.5	- 1.6	0.2	- 6.3	-1.2 12.7
17% in Can & US	2.9	2.8	- 3.0	-5.6	-6.3	8.1 11.3
Capital Costs Fall 20%	0.5	0.4	- 0.7	-3.0	-1.8	0.5 -0.0
Tariff at 15%*	-0.2	-0.6	-5.2; -9.2	-0.3	-0.0	1.7 1.9
Reduce Japan 33%: Tariff or Quota	-1.6	-2.5	-33.3	-1.3	-0.2	8.1 8.6
Increase R&D	5.5	5.5	- 4.9	-6.3	-12.7	-4.5 - 3.7
Capture 15% of Japanese Market	0.2	0.2	- 0.8	-1.4	- 0.2	8.8 8.9
Capture 15% Japan, Increase R&D	5.6	5.6	- 5.5	-7.3	-12.7	3.9 4.0

*Because of different current tariff levels, the effects of raising current tariffs differ for the Canadian and US markets even in the long run.

The pursuit of a combined strategy to increase R&D investments and win vastly larger market share in Japan will require tremendous capital investment, since both strategies are very capital intensive. That presents a major challenge to the industry, as discussed earlier, and will necessitate policy support. Capturing 15% of the Japanese market will require serious efforts on the part of the North American governments to

open that market, and on the part of the industry to exploit that opportunity. Perhaps above all, these scenarios reinforce the joint importance of public and private initiatives.

VI. SUMMARY

The conceptual model presented in figure 6.1 presents a framework for considering the results of our comparative assessment of the North American and Japanese automotive industries. This framework consists of a break-even model that has guided much of the review and analysis of both industries. Our initial assumption was that the traditional North American industry requires higher volumes to cover its basic fixed costs, reflecting higher costs due to competitive disadvantages rooted both in private-sector and public-sector decisions and actions. Our analyses and results suggest a more complex comparison than we had initially anticipated.

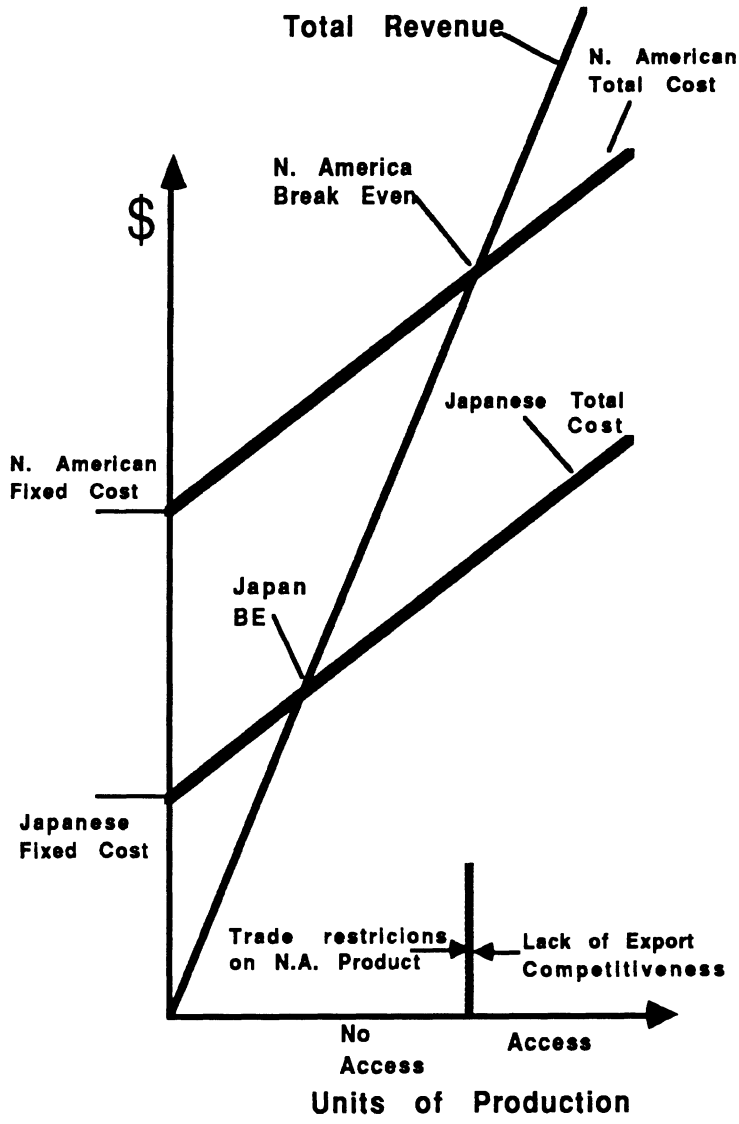

Figure 6.1. Conceptual Model

Fixed and Variable Costs

We distinguish fixed and variable costs in terms of the relatively short run, since in the longer term few costs are truly fixed. Fixed costs are largely insensitive to fluctuations in production volumes, while variable cost levels are more immediately related to changes in production volumes. Public and private practices can impose each of these kinds of costs on a manufacturing company, and it is analytically useful to allocate the fixed costs of the North American and Japanese industries into components that reflect first, the private initiatives largely under the control of management; and second, those costs that are imposed as costs of doing business by the differing socioeconomic environments, and thus largely reflecting differences due to policy decisions at the various governmental levels. Table 6.1 presents some examples of each type of cost.

Table 6.1. Examples of Costs, by Source and Type

	SOURCE	
TYPE	Private	Public
Fixed	Inefficient Practices Labor Deployment Staffing Levels Labor Costs Excess Capacity	Health Care Pension Costs Cost of Capital Regulatory Product Facility
Variable	Overtime Wage Costs Material Cost Inefficiency Product Design Manufacturing Operations	Tax Component of Wage Infrastructure (Highway, e.g.)

This table raises two issues. First, it merits comment that some of these costs have shifted over the past few years, at least at the level of the manufacturers. In particular, labor costs at the manufacturers are now much more fixed, and less variable than in the past. Recent agreements have limited layoffs, expanded supplementary unemployment benefits, and provided higher levels of both job and income security. In effect, the traditional manufacturers now provide their employees with much more

security. In the long run, this can be a major source of competitive strength, as both European and Japanese industry have found that job security is an important basis of worker cooperation, morale, and willingness to wholeheartedly pursue long term productivity improvement. However, in the short run it can be competitively damaging, as layoffs no longer permit management a ready avenue of cost reduction as production falls, and may result in temporary in-sourcing of work that damages suppliers.

Second, many of these costs spring from a combination of public and private sources, and reasonable people may disagree as to their proper location in the table. Thus, health care costs reflect public elements—the method and level of funding—and private aspects—the contractual agreement between employers and employees, and corporations and insurers. In our view, the workforce levels of education and skill required for successful automotive production ensure that the workforce will insist on medical coverage, whether through employer or government plans, or through higher wages to finance coverage on an individual basis. We, therefore, believe the public policy choices in the medical care arena are more important sources of industry costs than the particular private agreements that determine its exact form. Similarly, excess capacity results partly from a set of private decisions and partly from public actions. Thus one may criticize the industry for failure to eliminate capacity in the face of falling market share and to vigorously pursue replacement markets abroad, but should not ignore the critical role of government in providing relatively open access to North American markets while failing to ensure reciprocal openness in foreign markets.

Our analysis of these factors is incomplete, reflecting limited resources, time, and available data. Nevertheless, we have identified a few components of the Traditional industry's costs and estimate some cost differentials between the Traditional North American industry and its Japanese and/or New Entrant competitors. We thereby lay the groundwork for continued consideration of these important issues.

Private Fixed

The US in 1988 still faced a 15% disadvantage in efficiency, although the gap reduced some eight percent since 1984. Finally, the US faced a four percent labor cost disadvantage in 1988, down from 15% in 1984. If the weakening of the dollar contributed to these performance gains, it contributed to reduced North American investment costs for the Japanese industry, contributing to the traditional industry's excess capacity. The costs of excess capacity are high, as illustrated by the conversion of a nearly 5% US total cost advantage in 1988 to a 1% disadvantage at lower 1991 capacity utilization rates.

Private Variable

The US industry converted a 10% disadvantage in material costs in 1984 to a 19% advantage by 1988, a finding supported by price comparisons of parts and components. While the gap is product design efficiency is closing, it still represents a substantial North American disadvantage.

Public Fixed

The traditional North American industry faced a $534 per vehicle health care penalty compared to the Japanese industry, and over $600 compared to New Entrants, in 1990. If volumes increased to 1985 levels, these unit costs would lessen, but the industry would still face a premium of about $275 and $350 above Japanese and New Entrant competitors. These North American costs of $1086 in 1990 reflect the relatively low costs of health care in Canada. The pension cost burden on active workers at the traditional North American manufacturers is some 3.5 times the burden at New Entrants, and this differential will only grow as the traditional industry reduces capacity and employment. Differentials in the cost of capital to the North American and Japanese industries has fluctuated over the 1980s, but the Japanese industry maintained a significant edge in the mid to late 1980s, when companies made product investments for today's market. Thus, the capital costs alone for a new platform project were some $290 per vehicle higher for the traditional industry in 1986, although only some $8 higher in 1990.

Public Variable

This study did not examine any of the costs in this category, although it is clear that decreased infrastructure investments have increased the costs of moving goods in North America.

Of course, we cannot uniquely identify costs with just one of these cells in reality. Thus we find the United States facing a four percent labor cost disadvantage against Japan in 1988 even if all other costs of production were equal. However, labor costs include health care costs, a 'public-fixed' cost in this analysis. We estimate health care costs at $797 a vehicle for 1988 US production, and these costs thus account for 26% of US labor costs and 4.6% of total costs per vehicle. If US health care costs were reduced by approximately 50%, making them comparable to Japanese and Canadian health care cost levels, the US "private-fixed" disadvantage of four percent due to labor costs would surely reduce, and perhaps even convert to an advantage, at least partially offsetting the

efficiency disadvantage. Similarly, the US cost of capital disadvantage of $290 per vehicle accounts for nearly two percent of total US 1988 costs. Eliminating these two differentials would lower the industry's 1988 costs and breakeven point by some four percent, nearly doubling our estimate of the industry's actual 1988 cost advantage over Japan.

Summary

It is analytically useful to separate production costs into sources and types. However, the systemic nature of the complex operations of producing a vehicle prevent such clean separation in reality. The public policy environment sets important constraints upon and provides important assets for private initiatives, and performance dimensions that often appear to lie entirely within the private sector frequently are shaped by public policy choices. The realities of automotive production reinforce the importance of both public and private initiatives in addressing North American competitive deficits.

Our policy simulations suggest that the most important available strategies for improving the overall competitiveness and performance of the North American industry are a combination of increased R&D expenditure by the industry and the capture of a relatively modest 15% of the Japanese vehicle (or parts) market. To be sure, these strategies require both public and private initiatives. However, public policy actions to encourage investment in the face of economic and industry problems, and to secure access to Japan's market probably take priority at the current time.

In our judgment, the larger gap between the traditional North American and Japanese industries exists in the policy arena rather than, as many have assumed, in the private arena. Moreover, whatever the comparison between private and policy arenas today, the gap has closed more in the private arena since 1980 than in the policy arena, where the gap appears to be growing.

Finally, whatever the role of private initiatives in producing the higher breakeven point of the North American industry, the decisions that resulted in this reflect rational management to a larger extent, and culpable management failure to a lesser extent than many in North America have assumed. The private sector decisions of the North American automotive industry that are subject to criticism often reflect the sharply altered automotive environment of the 1970s, and the normal difficulties of change rather than stubborn and ostrich-like management and labor. The Japanese industry has a lower breakeven volume, but that is sustained by growth in a shielded market, permitting price-competitive and profit-driven (e.g. investment) strategies, and that reflects, in part, public policy choices, as well as excellent strategic and tactical management.

Conclusion: Able to Compete—But Will They Survive?

The Traditional North American Automotive Industry has shown that it can compete, and it has demonstrated substantial improvement during the past few years in production efficiency, vehicle quality, consumer satisfaction, and along additional competitive dimensions. Indeed, early results indicate that the Big Three may regain market share in 1992, in contrast to their market share erosion of the past decade.

However, the fundamental question persists as to whether the industry can survive the next few years and be viable in the future. Policy-imposed disadvantages, serious concerns as to capital availability, and Japan's power and competitive resources all constitute severe threats to the Traditional industry's long term viability.

In order to survive, the North American Big Three must continue to focus on a relentless pursuit of excellence in order to catch up with and surpass their stalwart competitors. There is no longer room for complacency or error in the increasingly competitive and hostile global automotive industry. At the same time, the North American governments must recognize the critical economic and social importance of the Traditional Automotive Industry , and work to create a policy environment that will enable the Traditional industry to effectively compete against foreign producers that enjoy formidable support from their own governments.

APPENDIX A. RECOMMENDATIONS FROM VARIOUS REPORTS ON COMPETITIVENESS

The recommendations proposed earlier in this report have been somewhat narrowly focused to address issues of particular concern to the North American automotive industry. Various other competitive studies and reports in recent years have put forth a host of recommendations aimed at improving the overall competitive status of the US economy. Some of these are directed at the automotive industry, while the majority are more general in scope. A number of these proposals are highlighted below. First we present a compendium of public policy recommendations, followed by a list of suggested private initiatives. The sources of these recommendations are listed at the end of the appendix.

Public Policy Recommendations

Training and Education

- Expand the Head Start Program.
- Reaffirm support of "America 2000" strategy for educational excellence and choice.
- Provide income tax deduction for interest expense from student loans, and allow penalty-free withdrawal from IRA's for educational expenses
- Reorganize current job training and employment services into "Job Training 2000", a more effective and market-driven system coordinated through Private Industry Councils
- Provide comprehensive worker adjustment assistance with training, job search assistance, and temporary income support tailored to the needs of the individual
- Increase the emphasis on engineering education to increase the number of engineering graduates from American universities
- Structure work-study programs like those used in Germany and other European countries
- Create financial incentives for business-based and other non-traditional training programs; provide tax credits for businesses offering training in generic skills, and impose a sales tax on those who don't participate
- Use the military's training establishment and existing private vocational schools to train poorly educated civilians
- Promote apprenticeship programs on a nation-wide level, similar to those now in place in Europe and Oregon, Wisconsin, and Georgia
- Change accounting practices to promote investment in education and training; expense their costs instead of capitalizing them
- Relax anti-trust laws to encourage industry-wide education consortia
- Incorporate training into greatly expanded government technology diffusion programs
- Incorporate more and better educational criteria into the Labor Department's LIFT Award and the Commerce Department's Baldridge award
- Promote community colleges as technical interfaces with smaller companies
- Institute a payroll-based training levy
- Institute a crash program to upgrade the skills of today's labor force; create an Education Corps that works in tandem with industry to improve the capabilities of our citizens

- Assure adequate training and support for managerial as well as technical skills (e.g., an industrial/commercial managerial/technological extension service like the existing Agricultural Extension Service)
- Foster an environment where learning is viewed as a lifelong, continuous, process via the availability of ongoing educational programs; provide additional incentives for investment in education — for acquisition of new job skills

Health Care

- Achieve world-class health care for all Americans at a cost that is comparable to the other major industrial countries; a variety of containment strategies could be used (including expenditure caps) both to reduce unnecessary use of medical services and to improve efficiency of the health care payment system
- Require the use of regional reimbursement schedules by hospitals and physicians, and impose national spending targets and improved quality measurement systems
- Endorse a comprehensive systematic reform plan, which addresses access, cost, and quality; incremental, piecemeal changes will not address the systematic problem
- Institute health care legal reform: controlling the costs of health care, litigation, and liability expenses of all kinds and shifting the burden to society at large means a national health care system and new rules limiting both the incidence of and the awards attached to legal suits — including medical malpractice suits
- Address health care costs both in terms of cost containment and burden sharing.
- Develop competitive health care delivery systems that maintain high health-care standards, at world-class cost levels, with funding that maintains competitiveness of the industrial and service base
- Adopt measures to expand insurance coverage to the presently uninsured residents and thus reduce cost shifting to existing health plans

Cost of Capital

- Raise both the national saving and investment rates substantially by the end of this decade
- Consider substitution of consumption-based taxes for all or some of our present income-based taxes
- Consider exempting all interest and dividend earnings from taxation
- Consider tax changes that discourage consumption, such as a VAT, a national sales tax, limitation of home-mortgage tax preference, or other sector-specific actions
- Introduce a sliding-scale capital gains tax that would start with very high rates for short-term gains and decline to zero for gains of ten years or more
- Raise the limits on maximum contributions to IRS's and other tax-deferred or exempt retirement savings plans, and allow limited withdrawals over the course of the plan
- Drop the quarterly report requirement as a symbolic act, and substitute semi-annual reports
- Eliminate tax exemptions for pension funds and other sources of financing for LBO's and hostile takeovers, and do away with tax deductibility of the interest on funds borrowed for such ends
- Change the fiduciary responsibilities of board members so that they are legally charged with taking adequate care of employees and communities, as well as of shareholders
- Establish guidelines that tie executive compensation to long-term performance
- Create tax incentives for a heavily bonus-based compensation system in which bonuses are based on the performance of the entire company
- Promote widespread use of ESOP's

- Reform the banking system by allowing nationwide banking and by allowing banks to own a certain minimum level of shares in corporations; also, permit the creation of European-style universal banks in the US
- Relax the anti-trust laws to permit more corporate cross-shareholding and also to redefine the relevant markets for anti-trust purposes as international rather than domestic ones
- Remove limits on concentrated holdings, and lower tax disincentives for concentrated private ownership stakes
- Adjust tax incentives toward long-term, productive assets, and pass through tax incentives to pension holders
- Allow inside information to concentrated owners under rules that bar trading on it, and expand disclosure to encompass intangible and positional assets
- Provide greater access to management for concentrated owners, loosen restrictions on shareholder communications, loosen restrictions on institutional board membership, and encourage representation by significant shareholders, customers, and suppliers
- Allow lenders to provide both debt and equity capital
- Get companies to think long-term so they can make the strategic investments in equipment, training, and research needed to compete with the Japanese and Germans
- Determine what are internationally competitive tax practices and recognize the short-term/long-term budget trade-offs in becoming competitive, e.g., accelerated depreciation for new equipment, tax credits for R&D, and incentives to hold investments longer to relieve some of the pressure to focus on short-term gains
- Make capital available for industrial development on terms that favor sustained investment in R&D and in improving manufacturing quality and efficiency
- Adopt tax policy to accentuate investment vs. consumption (such as liberalized rules for IRA contributions and withdrawals)
- Revise the Alternative Minimum Tax to reduce its cyclical effects
- Substitute a VAT for some or all of the present corporate income tax
- Balance the federal budget in the long term by:
  - Cutting defense spending by $100-150 Billion. (soliciting payment by host countries for US forces stationed there is one possible avenue)
  - Taxing social security and requiring a means test for entitlements
  - Reducing automatic COLA increases for federal and military retirees one percent below the CPI, and extending the retirement age for new entrants into the military; establishing a rule that federal retirees cannot be paid more in pensions than the salaries of those in active service
  - Reducing interest payments on the federal debt by shifting federal financing to shorter term, lower-interest bonds
- Remove the tax deduction for mortgage interest on second homes
- Eliminate home equity loans and impose stricter criteria for credit card issuance
- Partially replace the income tax with a value-added tax, with appropriate rebates for the poor

Infrastructure

- Develop a 21st-century infrastructure, which entails smart highways, optical fiber networks, digital libraries, mag-lev trains, interactive television, high-speed digital communications, and national-level standard setting
- Place increasing reliance on user fees to fund transportation programs (82% vs. 73% in FY1992)
- Implement the Intermodal Surface Transportation Efficiency Act, a comprehensive package that authorized $151 Billion. over 6 years
- Create a capital budget for the Federal government
- Spur the Baby Bells to upgrade the communications infrastructure:

Establish national standards for advanced communications
  - Give relief from some of the regulations that curb their ability to deliver services over optical fiber links they might install
  - Double the rate of depreciation on existing lines that are replaced with fiber optics and digital switches
  - Permit an experiment involving expansion of services to 10% of current customers to promote new service development
  - Require that the access fee paid to local carriers on long-distance calls be used for upgrading networks to fiber optics and advanced switches
  - Establish government-business working groups to facilitate greater commercial use of the technologies developed in the National Research and Education Network and the National Science Foundation Network
- Appoint a federal infrastructure czar with the authority to coordinate all executive branch infrastructure projects
- Create a mechanism, i.e., a National Infrastructure Bank, to finance certain types of infrastructure projects, especially those on the state and local levels
- Provide a unified national R&D policy for both civilian and military agencies, as part of an overall policy emphasis on commercialization
- Complete deregulation of the air transportation system; build more airports and expand present gate utilization
- Assure an adequate port system and encourage US shipping availability at competitive costs

Fiscal, Monetary, and Trade Policy

- Conclude the Uruguay Round; continue bilateral negotiations; aggressively exercise existing US trade laws, control policies, and export finance programs
- Pursue continued resolution of the Third World debt crisis and encourage greater coordination of economic and monetary policies to promote economic growth
- Simplify the cross-border tax policies to make the US more competitive, and coordinate regulatory policies with other industrial countries
- Increase funding of the Export-Import Bank (from $567 Mil, to $682 Mil.)
- Ensure existing US international trade laws remain truly effective under GATT
- Allow companies aggrieved by unfair foreign trading practices a private right of action in federal court to redress these grievances — especially for illegal dumping and subsidies
- Eliminate by 1995 the deficit in our global trade in goods and services and hence halt the need to borrow abroad with consequent further buildup in the nation's foreign debt
- Work to enhance the US position as an exporter of products based on high levels of skill and high value added, i.e., manufactures that can support high wages
- Consider agreement among the G-7 to maintain the dollar at a competitive level, building on the "reference ranges" that were agreed in 1987.
- Consider agreements with the EC and Japan to coordinate macroeconomic and monetary policies to sustain world growth and thus a hospitable environment for continuing trade expansion
- Consider promoting US trade results through the various international negotiations now underway, including the GATT, NAFTA, and Enterprise for the Americas Initiative
- Expand the Export-Import Bank to match the magnitude and effectiveness of other countries' export programs
- Eliminate or sharply reduce many of the excessive national security controls, foreign policy controls, sanctions, short supply controls, etc. that now curtail foreign sales by US firms
- Reduce staff turnover in the relevant government agencies to improve America's ability to negotiate beneficial trade agreements

- Consider halving of the trade deficit, by doubling Export-Import Bank lending authority and encouraging the Bank actively to seek out new borrowers, doubling the US government export promotion effort, aggressively monitoring dumping and other trade law violations, negotiating with the Japanese industry a concrete plan to raise to 80% the US labor and materials content of Japanese autos and electronics produced in the US, and preventing any short term strengthening of the dollar
- Adopt a new international economic policy that focuses on:
  - Structure, acknowledging that it does matter what the US produces and that the US needs to maintain leadership in industries such as aircraft and electronics
  - Reciprocity, which should be the fundamental basis of trade policy, balancing opportunities in some agreed manner
  - Types of trade, recognizing the essential differences between natural resources, common goods, government goods (like defense products), and high-value-added industrial goods. Use different approaches for each type of trade
  - GATT, which should be remodeled in the form of a true world trade organization
  - Trade blocs, like EC '92 and NAFTA and emerging structures in the Pacific region, may continue to spur the removal of trade and investment barriers.
- Declare an explicit policy of responding aggressively to targeting policies by foreign industries
- Pass an economic stimulus package
  - Consider measures such as a tax credit to consumers for auto purchases
  - Finance it to the maximum extent possible through spending cuts in order to hold down the deficit and maintain stable interest rates
  - Act as quickly as possible to give the economy the needed "shot in the arm"
  - Market it carefully to the public to increase consumer confidence
  - Present GATT "anti-dumping" proposals are unacceptable as unenforceable
  - NAFTA must include strong rule of origin requirements (preferred goal: 75%)
  - NAFTA must protect present industries in Mexico with gradual phase-out provisions
  - Require dislocation plan/provisions and evaluate gains from Mexican market versus loss of jobs in NAFTA negotiations
  - Utilize business/industry representatives on NAFTA negotiation teams
- Convince President and Administration to adopt Mr. Poling's January 9 statement to JAMA as policy in handling US-Japan trade to achieve ultimate balance
- Identify and promote the GAC as spokesperson for the US auto industry in trade matters
- Pursue joint Council trade positions/recommendations and communicate and publish collectively and personally to Congressional members and government agencies; develop a publicity campaign for public consumption, utilize company newsletters to raise employee awareness, and encourage employee letter campaigns to Congressional representatives
- Reorient US policy to emphasize domestic measures to maintain competitiveness rather than negotiations to remove barriers
- Fund export promotion on a par with competitor countries; make export promotion a priority for the whole diplomatic staff, not just commercial officers abroad; use competitive policies on export financing assistance
- Condition US foreign aid on purchase of US capital goods, construction services, etc.
- Limit trade actions to cases where an important US industry is facing substantial harm from foreign market barriers that domestic measures cannot alleviate
  - Increase USTR staffing; create more high-level positions
  - Reduce turnover of government officials and representation of foreign interests by former key government officials
- Reject unilateral free trade; embrace and pursue free trade where there is a strong commitment to and enforcement of free trade for the nations involved

- Base criteria for which foreign companies can participate in government technology and other programs on reciprocity (i.e., how US firms are treated in the other country) and performance (i.e., long-term benefits to the US economy)
- The US Trade Representative should spend less time forcing open the Japanese markets for rice and more time boosting electronics exports
- Coordinate defense R&D more closely with commercial objectives
- Initiate government-to-government negotiations targeted at the automotive trade imbalance:
  - Eliminate the remaining formal and informal barriers to North American vehicle access to the Japanese market, and encourage purchases of such vehicles to levels that will dissipate the cultural bias in Japan to buy Japanese
  - Rapidly increase the level of business with proven North American suppliers by changing the level of expectations of existing Japanese keiretsu suppliers in North American and Japan as regards to growth and business share
  - Within the working levels of the Japanese vehicle manufacturers, increase the desire to purchase components and engineering services from traditional North American suppliers
  - Expand the aftermarket channels for autoparts on Japanese vehicles beyond the existing Japanese-controlled dealership network in both North America and Japan
  - If these steps are not taken or progress is not sufficient, negotiate an agreement similar to the agreement that exists between Japan and the EC that establishes transitional quotas and targets on automotive imports during the remainder of the 1990's

Regulations

- Increase the gasoline tax up to $1 per gallon over 5 years, with appropriate rebates for the poor or severely impacted
- Favor efforts that foster continued evolutionary improvement in fuel economy technology, but oppose congressionally mandated extreme CAFE increases; increase lobbying efforts and develop a joint Council/grassroots program
- Commit to protect the environment for all future generations
- Seek to lead in the setting of regulatory goals for environmental attainment with flexibility in how to meet them
- Encourage the application of sound scientific methodology to the timely solution of environmental issues
- Work in full partnership with the public and government in environmental consensus building
- Work to anticipate the need for environmental legislation or regulation, thereby achieving stable longer-term policy
- Enhance environmental performance by setting standards and milestones, regular measurement of programs and reporting, sharing of solutions, and involve employees in process
- Adopt product liability reform as a priority for 1992; recognize that product liability reform is the first step towards the goal of achieving broader reform of the tort system to gain better balance between the risks and rewards for both parties in lawsuits
- Develop anecdotes to support the need for product liability reform, including: costs borne by the current system; examples of unfair and unbalanced awards or settlements; and examples of depressing effect on product innovation
- Undertake an overall assessment of the regulatory system that currently exists in North America, the economic impact the system has on North American industry, how both the system and its impact compare with North America's global trading partners, and the need to effect changes.

Social Welfare

- Consider an extension and widening of unemployment benefits and increased funding for other safety net programs
- Seek continued progress in social welfare programs, at an efficient and affordable pace, including civil rights progress, problems of poverty, Medicare, crime, and drugs.
- Increase business involvement with key urban study centers that shape long-term policy alternatives for government; enhance industrial funding, exchange programs, and dialogue

Core Technologies

- Make permanent the Research and Experimentation Tax Credit and extend for 18 months the rules governing allocation of foreign and domestic R&D expenditures
- Achieve a growth rate in manufacturing productivity in the 1990's that equals or exceeds Japan's and continues to exceed that of other industrial countries
- Shift the focus of Federal technology policy from scientific breakthroughs to commercial follow-through
- Consider new mechanism for government and industry to work together to develop generic pre-competitive technologies
- Re deploy technological resources freed by the end of the Cold War to support the restoration of American competitiveness; redirect at least part of the National Laboratory system toward commercial ventures
- Develop new programs and institutions aimed at technology diffusion and application, such as a manufacturing extension program on the model of our agricultural extension service
- Establish a full-fledged National Technology Extension Service, modeled after the highly successful Agricultural Extension Service, to encourage small- and medium-sized businesses to introduce new technologies into their operations by offering low-cost leasing or accelerated depreciation options
- Undertake new efforts to glean commercial spin-offs from the national labs; make part of their funding contingent on their formation of cooperative R&D projects with private industry
- Develop targeted tax policies to spur industrial and technological development, using both credits and accelerated depreciation schedules for development of technologies identified as critical to optimum US economic performance; such policies must be highly nuanced
- Use government purchasing power to stimulate technology development, by providing accessible markets for US products incorporating new technologies (within the rules permitted by GATT)
- Revise the anti-trust laws to promote collaborative research efforts and allow these to continue through generic development stages of technology development
- Provide advance certification for certain joint projects as not infringing anti-trust laws (e.g., safe harbor market shares)
- Enlarge information and exhortation to US manufacturers on how to make things better
- Make permanent the IRS rule that allows 64% of a taxpayer's US incurred research and experimentation expenses to be directly allocated to US source income
- Assist small and mid-sized suppliers to improve their product development abilities and incorporate more advanced technologies into their processes with a manufacturing equivalent to the agricultural extension service
- Develop a system for diffusing technologies to small and medium-sized companies
  - Industrial extension services to diffuse new technologies
  - Fund a program to lease modern production equipment at subsidized rates

- Facilitate the commercialization of technology from the national labs to US firms by reducing red tape and funding transfer programs

• Provide speedier enforcement of intellectual property laws
• Use risk-sharing R&D partnerships for development of new technologies of commercial interest on a coherent, strategic basis

Government-Industry-Labor Cooperation

• Adopt synergistic labor-management relations as an important source of productivity
• Revise US labor law with a view to creating more flexible work rules in exchange for greater job security; provide incentives for cooperation and remove incentives for adversarial relationships
• Replace the nation's present captive defense industry with a procurement system dominated by a world-class civilian manufacturing base; eliminate unique laws, regulations and business practices that currently require specialized defense operations, and encourage commonalty of production
• Increase Washington-based lobbying visits, supplemented with grassroots communications
• Identify champions in the Executive Branch as friends of industry
• Support government/industry partnership as personified in recent Asian mission of the president
• The Federal government should focus on varied "experiments" to tap the full capability of government and industry through joint, cooperative efforts — that work together towards common objectives and tap the strengths of each partner
• Work to simplify and make flexible the modes of cooperation between the government and private sector
• Cost-sharing is recommended, but it should not be so burdensome or rigid as to thwart the formation of partnerships, and work-in-kind should be counted as a cost share
• Form government-industry partnerships for technology development and low-cost, quality production
• Adopt a new system of labor law that promotes cooperation rather than conflict

Conclusions—Immediate Public Policy Actions

• Designate an agency, perhaps a substantially strengthened Department of Commerce or the International Trade Commission with its functions greatly expanded, that would raise the nation's awareness of the competitiveness problem and initiate action
• Implement the provisions of the 1988 Omnibus Trade and Competitiveness Act that require preparation of Competitiveness Impact Statements for all new government programs; the Administration should prominently include a Competitiveness Impact Statement with each recommendation or report on legislation that it submits to Congress. The Congress should insist that such Statements be submitted, review them carefully, and take them fully into account in making its decisions on all relevant legislation
• Constitute a Federal Economic Structure Council to analyze current US policies and their impact on economic performance and identify desirable lines along which any necessary restructuring should take place
• Provide Executive Branch mechanisms to coordinate and administer economic structure and technology policies
• Use a major portion of the peace dividend to reduce the cost of capital (through reduced deficits, investment tax credits, revision of the alternative minimum tax, or other changes identified later)

- Review the entire regulatory approach, to assure consistency with world competitiveness, cost-effectiveness, and coherency
- Include more private-sector executives in the next Administration to enhance cooperation among government and industry; consider an executive "exchange Program" between government and industry
- Form a bi-partisan committee with key representatives from the Executive and Legislative branches to establish a competitiveness blueprint for North American manufacturing, to develop key strategies and ensure their implementation

Private Initiatives

Quality and Reliability

- Increased manufacturing focus on total quality systems and productivity
- Increased investment to upgrade manufacturing processes and capabilities
- Improve quality and reliability
  - Streamline the supply chain
  - Increase supplier quality assurance capability and provide expanded training. Ford's quality improved 72% for cars and 76% for trucks from 1980, and now is as good as some of the high-volume Japanese manufacturers, and approaching the best

Productivity and Cost Reduction

- Identification and deployment of world class practices required to continuously improve productivity and quality
- Improve productivity and reduce costs
- Streamline overhead structure and reduce levels of management. The 1991 James Harbour report on assembly plant productivity placed 3 US Ford car assembly plants as having the highest productivity in the US, better than any of the Japanese transplants, and approaching the productivity of the best Japanese plants. The same report placed 3 US Ford truck plants with the highest productivity in the US. Ford had 7 of the top 10 most productive truck plants

Human Resource Effectiveness and Union Relations

- Employee education and training efforts focused on upgrading basic skills and enhancing operational capabilities.
- Continued efforts toward increasing employee involvement, empowerment and responsibility.
- Improve human resource effectiveness and union relations
  - Expand employee involvement, empowerment, and team structures to achieve business goals. Ford is an acknowledged leader in executing these strategies in all its plants and offices.
  - Emphasize employee development and skills training to increase employee competence and commitment. Ford allocates over 2% of payroll for these activities, more than double its expenditures in prior decades. Ford has been recognized as best-in-class for its employee development initiatives and for working to improve public education in its communities.
  - Develop cooperative relations between labor and management to improve business performance and enhance the well-being of employees. Ford and the UAW are highly regarded for the quality of the relationship they have developed, resulting in best-in-class joint programs.

Leading Edge Products

- Use of R&D to improve product design and manufacturing technologies.
- Integration and concurrent performance of R&D, product design and manufacturing processes to achieve greater efficiency and reduce both cycle times and time-to-market.

Other Private Sector Actions

- Increased emphasis on overseas market opportunities and exports
- The entire value chain — from assembler through component supplies — increasingly must be viewed as a competitive unit
- Increased trust and mutualism must occur along each segment of the supply chain
- Relationships must become less adversarial and move toward increased cooperation, mutual dependence and partnering
- Fundamental changes are required in moving toward longer-term supply contracts and earlier supplier involvement in development and design delegation
- To support change, enhanced mechanisms for communication, information flow and cooperation between North American vehicle manufacturers and the supply base must occur
- Industry opportunities for cooperative endeavors in research, development and manufacturing should be identified, sponsored and initiated by industry associations and groups.
- Industry associations and groups also should form partnerships with academic institutions to enhance technology development and provide basic education and employee training
- Industry organizations also can enhance industry competitiveness through improved collection and dissemination of key automotive benchmark data dealing with R&D, trade patterns, manufacturing, production and quality levels, financial measures, investment and related matters

Citations:

Business Roundtable: *Position Paper on International Competitiveness*, submitted to House Ways and Means Committee, Sept. 1991

Council on Competitiveness: *A Competitiveness Assessment of the President's FY 1993 Budget, Public Investment and Competitiveness: An Assessment of Budget Trends in Human Resources, Science and Technology, Transportation Infrastructure, and Export Promotion*, Feb. 1992

Charles A. Corry, Chairman & CEO of USX Corporation, testimony before the House Energy and Commerce Committee, Subcommittee on Commerce, Consumer Protection and Competitiveness, March 1992

Gaining New Ground: Technology Priorities for America's Future, 1991

Competitiveness Policy Council: First Annual Report to the President & Congress, *Building a Competitive America*, 1992

Economic Strategy Institute: *An Economic Strategy for America: A Blueprint for American Revitalization*, 1992

Joint Automotive Supplier Governmental Action Council, Position Papers drafted at January 1992 meeting.

John P. McTague, Vice President - Technical Affairs, Ford Motor Company, testimony before the House Science, Space and Technology Committee, Subcommittee on Technology and Competitiveness, Feb. 1992

Michael E. Porter discussion with the Council on Competitiveness: "Corporate Investment Behavior and Time Horizons", Nov. 1991

Michael E. Porter, "Canada At The Crossroads: The Reality of a New Competitive Environment", A study prepared for the Business Council of National Issues and the Government of Canada, October, 1991.

New York Times, "Attention America! Snap Out of It", by Steven Greenhouse, Feb. 1992

Office of Technology Assessment, Congress of the United States: *Competing Economies*, 1991

Clyde Prestowitz, "America Without Tools: Are We Turning Into a Nation That Can't Make Anything?", The Washington Post, Jan. 1992

Informal proposals made by various members of the Competitiveness Subcommittee of the US-Canada Automotive Select Panel, established under Article 1004 of the Canada-United States Free Trade Agreement.

BIBLIOGRAPHY

A Continental Divide on Auto Content. The Globe and Mail Editorial, Toronto, Ontario. November 14, 1991.

American Embassy Tokyo, *Japan's Auto Dealer System: Overview and Statistics.* (Tokyo, US Embassy, unclassified cable, May 7, 1991).

Andrea, David J. and Michael S. Flynn. *The Internationalization of Domestic U.S. Auto Production.* SAE Technical Paper Series No. 910815. International Congress and Exposition, Detroit, Michigan. February 25-March 1, 1991.

Auto Parts Advisory Committee (APAC) News Release. June, 1991.

Bernstein Research. *The Automobile Industry.* New York: Sanford C. Bernstein & Co., Inc., 1991.

Booz-Allen & Hamilton Inc. in association with Pilorusso Research Associates Inc. *A Comparative Study of the Cost of Competitiveness of the Automotive Parts Manufacturing Industry in North America.* Toronto, Ontario. March 1990.

Boston Consulting Group Ltd. and PRS Consulting International Ltd. *The Competitive Challenge Facing the EC Automotive Components Industry.* Prepared for The Commission of the European Community, Directorate General for Internal Market and Industrial Affairs. January 1991.

_____. *The Competitive Challenge Facing the European Automotive Components Industry,* February 1991.

Canadian Auto Workers (CAW) Research Group on CAMI. *Team Concept: A Case Study of Japanese Product Management in a Unionized Canadian Auto Plant.* Presented to the International Colloquium, "Workplace Industrial Relations and Industrial Conflict in International Perspective", Universite Laval, Quebec, August 7-9, 1991.

Clark, Kim B. and Takahiro Fujimoto. *Product Development Performance: Strategy, Organization, and Management in the World Auto Industry.* Harvard Business School Press, Boston, 1991.

Cole, David E., David J. Andrea, and Richard L. Doyle. *Delphi VI Forecast and Analysis of the U.S. Automotive Industry Through the Year 2,000.* UMTRI, Office for the Study of Automotive Transportation, 1992.

Cole, Robert E. *"U.S. Quality Improvement in the Auto Industry: Close but No Cigar".* California Management Review, Summer 1990, pp. 71-84.

_____, and Donald R. Deskins, Jr. "Racial Factors in Site Location and Employment Patterns of Japanese Auto Firms in America." *California Management Review>* Volume 31, Number 1, Fall, 1988, pp. 9-22.

_____, and Taizo Yakushiji, eds. *The American and Japanese Auto Industries in Transition: Report of the Joint US-Japan Automotive Society.* Center for Japanese Studies, The University of Michigan, Ann Arbor, 1984.

Congress of the United States. Office of Technology Assessment. *Making Things Better -- Competing in Manufacturing*. Summary. OTA, 1990.

_____. *Competing Economies: America, Europe, and the Pacific Rim.* OTA-ITE-498 Washington, DC: U.S. Government Printing Office, October, 1991.

_____. *National Commitment Needed to Restore Competitiveness.* Washington, DC: U.S. Government Printing Office, 1991.

_____. *Worker Training: Competing in the New International Economy.* Summary. OTA, Washington, DC: U.S. Government Printing Office, 1990.

Cusumano, Michael A. and Akira Takeishi. "Supplier Relations and Management: A Survey of Japanese, Japanese-Transplant, and U.S. Auto Plants." *Strategic Management Journal*, 1991.

Department of Commerce (DOC)/Ministry of International Trade and Industry (MITI). Automotive Parts Survey, June 27, 1991.

DesRosiers Automotive Consultants. *The Canadian Automotive Parts and Assembly Industries: An Input-Output Analysis*. January 1992.

Drucker, Peter F. *Japan: New Strategies for a New Reality.* The Wall Street Journal, October, 1991.

Dyer, Davis, Malcolm S. Salter, and Alan M. Webber. *Changing Alliances.* (Boston: Harvard Business School Press, 1987.)

Economic Consulting and Planning, Inc. "North American Light Vehicle Outlook", New York, 1990.

Economic Strategy Institute. *The Case for Saving the Big Three - Interim Report.* 1991.

_____. *Final Report on Indirect Public Policy Support for the Automobile Industry.* Presented to the Office for the Study of Automotive Transportation (OSAT), University of Michigan Transportation Research Institute. December, 1991.

Ernst & Young and the Office for the Study of Automotive Transportation (OSAT) U-M. *The Car Company of the Future: A Study of People and Change.* 1991.

_____, and the American Quality Foundation. *International Quality Study: The Definitive Study of the Best International Quality Management Practices.* 1991.

Ettlie, John E. and Albert H. Rubenstein. *Simulating the Flow of Innovations to the U.S. Automotive Industry*. Technological Forecasting and Social Change, 1981.

Farrow, Maureen, Grady Means, and Erik Rule. *Automotive Select Panel - Study of the Competitiveness of the North American Automotive Industry, Phase I Study: Competitive Assessment Base.* Coopers & Lybrand Consulting Group. May 23, 1991.

Florida, Richard, Martin Kenney, and Andrew Mair, *The Transplant Phenomenon,* Commentary, Winter, 1988: 3-9.

Flynn, Michael S. *Japanese Auto Companies in the U.S. Automotive Industry: Challenges of Change.* Prepared for The JAMA Forum, 1991.

_____. *Automotive Research and Development in Canada.* A Report Prepared for The Science Council of Canada. January 1991.

_____, and Sean P. McAlinden, David J. Andrea. *The U.S.-Japan Bilateral 1993 Automotive Trade Deficit.* Office of the Study of Automotive Transportation (OSAT), University of Michigan Transportation Research Institute, September, 1989.

_____, and David J. Andrea. *Capacity, Competition, and Change: the 1988/1989 OSAT Supplier Survey Respondent Report.* UMTRI, Office for the Study of Automotive Transportation, June, 1989.

_____. *Supplier Perceptions of Customer Quality Expectations.* Paper presented at the American Society for Metals Conference on Customer/Supplier Relationships, Chicago, Illinois, November, 1985.

_____, and David J. Andrea, *Capacity and Competition: the 1988/89 OSAT Supplier Survey Respondent Report.* UMTRI, Office for the Study of Automotive Transportation, June, 1989..

_____. "Currencies and Competition: Implications for Michigan Suppliers", Auto in Michigan Project Newsletter, Volume 2, No. 1, November, 1986.

Frame, J. Davidson, and Francis Narin. *The United States, Japan and the Changing Technological Balance.* Elsevier Science Publishers B.V. December, 1989.

Fuss, Melvyn and Leonard Waverman. *Productivity Growth in the Motor Vehicle Industry, 1970-1984: A Comparison of Canada, Japan, and the United States.*

_____, and Stephen Murphy. *The State of the U.S., Canadian, and Japanese Auto Industries: Impacts of Cost and Policy Changes.* January, 1992.

Gawalt, John A. *Selected Data on Research and Development in Industry: 1989.* Prepared by Science and Engineering Activities Program, Division of Science Resources Studies, National Science Foundation. February 1991.

Genther, Phyllis A. *A History of Japan's Government-Business Relationship: The Passenger Car Industry*. Michigan Papers in Japanese Studies, No. 20. 1990.

Global Competitiveness Corporation and Technology International Inc. *Survey of Direct U.S. Private Capital Investment in Research and Development Facilities in Japan.* Final Report. Prepared for Science and Engineering Indicators Program, NSF. January 1991.

Gomi, Yuji. *Guide to Japanese Taxes 1991/92.* CCH International, Chicago, 1991.

Halberstam, David. *The Reckoning*, (New York: William Morrow and Company, Inc., 1986).

Harbour & Associates. "The Harbour Report—A Decade Later", 1990.

Hertzenberg, Stephen. "The Internationalization of the Auto Parts Industry: 1958-1987 and Beyond", U.S. Department of Labor, Office of International Economic Affairs, Bureau of International Labor Affairs, January, 1989.

Hoffman, Kurt and Raphael Kaplinsky. *Driving Force: the Global Restructuring of Technology, Labor, and Investment in the Automobile and Components Industry.* Boulder, CO: Westview Press, 1988.

Howes, Candace. Testimony before the Joint Economic Committee hearing on "The Future of U.S. Manufacturing: Auto Assemblers and Suppliers", December, 1991.

_____. *The Benefits of Youth: The Role of Japanese Fringe Benefit Policies in the Restructuring of the U.S. Motor Vehicle Industry.* In International Contributions to Labor Studies, 1991, pp. 113-132.

Japan Automobile Importers' Association (JAIA). *Imported Car Market of Japan - 1991.* April 1991.

Japan Automobile Manufacturers Association Inc. *1991 The Motor Industry of Japan..*

_____. *The JAMA Forum.* Vol. 9 No. 2 Tokyo, 1991.

_____. *Automotive Distribution in Japan.* Washington, D.C., 1990.

Japan Economic Institute of America. *Japan-U.S. Business Report.* Washington: Japan Economic Institute of America, 1991.

Japan, International Tax and Business Guide, DRT International, May 1991.

Jontz, James (U.S. Representative). Testimony before the House Committee on Ways and Means hearing on "Issues Affecting U.S. Competitiveness: Auto Parts Trade", July, 1991.

Keller, Maryann. *Rude Awakening: The Rise, Fall, and Struggle for Recovery of General Motors* (New York: William Morrow and Company, Inc., 1989).

Kochan, Thomas A., Harry C. Katz, and Robert B. McKersie. *The Transformation of American Industrial Relations.* New York: Basic Books, Inc., 1986.

Krugman, Paul A. *Myths and Realities of U.S. Competitiveness.* Science, Nov. 1991.

L'Expansion. *Les Premiers Rates de la Voiture Japonaise.* [The First Failures of the Japanese Car] 5/18 September 1991.

Lieberthal, Kenneth, Michael Flynn, Kim Woodard, et al., *Paths to Sino-U.S. Automotive Cooperation.* The University of Michigan, 1989.

Lynn, Leonard H. *Cultural Differences and the Management of Engineering in U.S.-Japanese Joint Ventures.* Published in the Proceedings of the Portland International Conference on Management of Engineering and Technology, October 27-31, 1991.

Mannering, Fred, and Clifford Winston. "Brand Loyalty and the Decline of American Automobile Firms", Brookings Papers: Microeconomics 1991, pp. 67-114.

McAlinden, Sean P., David J. Andrea, Michael S. Flynn, and Brett C. Smith. *U.S.-Japan Automotive Bilateral 1994 Trade Deficit,* OSAT, University of Michigan report for The Automotive Parts Advisory Committee. May 1991.

McNeil, Donald G. *Washington Tries to Sort Out Health Insurance Proposals.* The New York Times. November 17, 1991.

Mitsubishi Research Institute. *Research Review.* Vol. 5 No. 2 Tokyo, 1991.

_____. *Economic Outlook for Fiscal Years 1991 & 1992.* Tokyo, 1991.

Monteverde, K. and D. Teece. "Supplier Switching Costs and Vertical Integration in the Auto Industry", *Bell Journal of Economics,* Volume 13, Number 1, Spring 1982, pp. 206-213.

Motor Vehicle Manufacturers Association (MVMA). Facts and Figures 1991.

Motor Vehicle Manufacturers Association (MVMA). Facts and Figures 1989.

_____. World Vehicle Data, 1991.

National Academy of Engineering. *The Bridge - Manufacturing Issue.* Washington: 1991.

OECD Economic Outlook. December, 1991.

Office for the Study of Automotive Transportation (OSAT), University of Michigan, 1991 & North American Light Vehicle Outlook, Economic Consulting and Planning, Inc.

_____. Product Timing Chart, 1991.

Ohta, Yoichi. *Intercompany Relationships in Japanese Manufacturing Industries>* Unpublished Master's Thesis, Trinity College, Oxford University, 1985.

Phase I: Japan's Distribution System and Options for Improving US Access. Washington, U.S. International Trade Commission, 1990, p. 59.

Restoring Competitiveness to U.S. Industry. A Statement of the Manufacturers' Alliance for Productivity and Innovation (MAPI) presented by Kenneth McLennan, President, before the U.S. House of Representatives Committee on Ways and Means, Washington, DC. July, 1991.

Salter, Malcolm, Robert S. Miller, F. Alan Smith, and Elliott Hall. *The Road Ahead: The Future of the American Auto Industry.* Congressional Economic Leadership Institute, Washington, DC. September, 1990.

Schieber, G. J., and J. P. Poullier. *International Health Spending Issues and Trends.* Health Affairs, Spring, 1991: 106-116.

Smith, Brett C. *Japanese Automotive Supplier Investment Directory. Fourth Edition.* UMTRI, Office for the Study of Automotive Transportation, October, 1991.

Sobey, Albert J. *Travel in February 2021 - An Optimistic View.* October 1991.

_____. *Potential Automotive Industry Response to Business Challenges and Opportunities.* November 1991.

Razin, Asaf and Joel Slemrod ed. *Taxation in the Global Economy.* (NBER Economic Research Report), 1990, p. 216.

Urabe, Kuniyoshi, John Child, and Tadao Kagono, eds. *Innovation and Management: International Comparisons.* Berlin/New York: Walter de Gruyter, 1988.

Sheriff, A. "The Competitive Producer Position of Automobile Manufacturers: performance and strategies," International Motor Vehicle Program, MIT, Cambridge, 1988.

U.S. Affiliates of Foreign Companies: Operations in 1989, Survey of Current Business, Vol. 71, No. 7, Bureau of Economic Analysis, U.S. Department of Commerce, Washington, D.C., July 1991.

U.S. Department of Transportation. Transportation Systems Center. *Briefing Book on the United States Motor Vehicle Industry and Market.* Cambridge: Transportation Systems Center, 1991.

U.S. General Accounting Office. *Health Care Spending Control-The Experiences of France, Germany, and Japan.* November, 1991.

Ward's Automotive Yearbook, 1991. Fifty-third edition. Ward's Communications, Detroit, 1991.

Winston, Clifford and Associates, *Blind Intersection.* Washington, D.C., The Brookings Institution, 1987.

Womack, James P., Daniel T. Jones, and Daniel Roos. *The Machine That Changed The World.* Rawson Associates, New York. 1990.