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U.S. Automotive Industry: Recent History and Issues

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U.S. Automotive Industry: Recent History and Issues

Summary

More than one million Americans are employed in manufacturing motor vehicles, equipment and parts. But the industry has changed dramatically since the U.S. “Big Three” motor vehicle corporations (General Motors, Ford and Chrysler) produced the overwhelming majority of cars and light trucks sold in the United States, and directly employed more than that many people themselves. By 2003, most passenger cars sold in the U.S. market were either imported or manufactured by foreign-based producers at new North American plants (so-called “transplant” facilities). The Big Three now dominate only in light trucks, and are being challenged there by the foreign brands. The Big Three have shed about 600,000 U.S. jobs since 1980, while about one-quarter of Americans employed in automotive manufacturing (nearly 300,000) work for foreign-owned companies — and that excludes Chrysler, which was acquired by Daimler Benz of Germany in 1998.

These changes have had major effects on the structure and location of the U.S. motor vehicle industry. Michigan has been the state most directly and adversely affected, losing about 100,000 auto industry jobs since the late 1970s. Most other Midwest auto belt states have either held steady or posted gains in total industry employment, even if they have lost Big Three jobs. Some southern states, notably Kentucky and Tennessee, have been the largest net gainers of jobs in the industry. The transplant vehicle manufacturers virtually all began and have remained non-union; the United Auto Workers (UAW) union has lost more than half its members since 1979 — from 1.5 million to less than 700,000. Big Three representatives state that they are now burdened with health care and pension costs of as much as \$1,500 per vehicle in competing with foreign-based companies and have sought tax relief from Congress to alleviate this disadvantage.

The global industry also has changed. In North America, there has been regional consolidation, enabled by trade policy changes leading to the North American Free Trade Agreement of 1994. Congress approved a federal bailout of Chrysler in 1979 and forced the Reagan Administration to negotiate quotas on imports from Japan in the 1980s. Nevertheless, the overall U.S. deficit in automotive trade widened from \$9 billion in 1979 to more than \$100 billion annually since 2000. Acting under World Trade Organization rules, the United States has pressed Japan, Korea and China, among others, to reduce their automotive trade and investment barriers.

Fuel economy and environmental issues in the automotive industry have also been subjects of major concern in Congress, and these issues have had important effects on the motor vehicle market. Currently, the manufacturers are suing California to prevent its regulation of emissions of carbon dioxide and other greenhouse gases, which they claim is preempted by federal statute. This report will be updated as warranted by developments.

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U.S. Automotive Industry: Recent History and Issues

Introduction and Key Findings

In the immediate post-World War II era, the auto industry was seen as both a pillar and a beneficiary of American growth and economic achievement. General Motors Chairman Charles Wilson proclaimed in the 1950s, “What’s good for the country is good for General Motors, and vice-versa.” More than half the automobiles sold in the United States were then produced by General Motors (GM). Its organizational genius, Alfred Sloan, had succeeded in creating a company that built cars “for every purse and purpose,” as opposed to the original concepts of Ford, the first icon of automotive mass production, whose sole major product for 20 years, the Model T, was “any color you wanted, as long as it was black.”¹ The other “Big Three” producers of the postwar era, Ford and Chrysler, together with the still-surviving lesser domestic manufacturers (American Motors, Studebaker-Packard and Kaiser), built a range of vehicles that met every consumer need. Among foreign producers, only Volkswagen and a few luxury and sports cars had even small niches in the U.S. marketplace.

From this once-dominant position in the domestic market, the Big Three today produce less than 60% of all automobiles and light trucks sold in the United States. Their market share has been steadily declining. The Big Three developed a consumer-oriented light truck product, the “sports utility vehicle” (SUV), which market they still dominate, but Japanese and German-based manufacturers have been making major inroads in this class as well. Moreover, to some critics the Big Three have been on the wrong side of every environmental, safety and social issue, from opposition to the Clean Air Act, corporate average fuel economy (“CAFE”) standards, and mandatory seat belt requirements in the 1960s and 1970s, to slowness in developing alternative fuel vehicles today.²

The Big Three are still the largest domestic producers, but one of them, Chrysler, is a subsidiary of DaimlerChrysler, a German-controlled and managed company. The smaller U.S. producers have all disappeared, and imports, especially from Asia, have surged. The smaller manufacturers have been replaced in the

¹ Although, “in its first five years of production the Model T could be had in red, green, gray or dark blue as well as basic black.” Ford pared its vehicle color choices down to black to reduce costs and production time. Douglas Brinkley, *Wheels for the World* (New York: Penguin Books, 2003), pp. 129, 181-82.

² Graeme P. Maxton and John Wormald, *Time for a Model Change* (Cambridge, U.K.: CUP, 2004), pp. 60-61.

domestic market by “transplanted” units of Japanese, German and Korean companies, which now build in North America significant and increasing shares of their vehicles that are sold in the United States. Most of the major companies now compete globally, through cross-ownership and investment in manufacturing plants more than through trade in finished vehicles. They also compete through what a 2004 Commerce Department report described as “global supply chains:”

Whereas U.S. automobile manufacturers once provided a ready market for many domestic suppliers of parts and components, the manufacturers now operate on a global basis. Thus, automotive parts suppliers must now find niches in the global supply chains of U.S. auto companies or their foreign competitors to succeed in today’s market ... The possibility of relying on increased auto sales that automatically translate into increased orders and components for U.S. suppliers simply no longer exists.³

Developments in the U.S. Domestic Automotive Industry

The U.S. automotive manufacturing sector is large and dynamic, but its structure is changing. Whatever changes are occurring globally or within the domestic market, production and sales in the United States remain at historically high levels. The overall picture of North American production is, however, accompanied by tension within the industry created by the entrance of new international competitors as domestic manufacturers. Growth has been due in part to internationally based companies (“transplants,” especially from Japan) investing in the North American market initially as a substitute for importing, while the Big Three struggled with downsizing issues. With growing automotive manufacturing capacity elsewhere, especially in Asia, there are concerns that the motor industry may be creating a problem of global overcapacity. The result could be accelerating rationalization and industry closures, which could have especially negative consequences for the Big Three and their U.S. employees.

Such changes do not necessarily portend a declining automotive industry in the United States. Gross output in the U.S. automotive manufacturing sector in 2004, including motor vehicle parts, trailers, bodies and heavy trucks, was \$424 billion (current dollars). That was the largest output of any durable goods manufactured product grouping measured by the Commerce Department Bureau of Economic Analysis (BEA).⁴ Although annual U.S. motor vehicle output has moved up and down since 2000, the automotive industry still grew faster than domestic manufacturing overall in 1990-2003. Real output has increased 55% since 1990, compared to 35% for manufacturing as a whole. But the balance of production between traditional, Big Three manufacturers and foreign-owned transplants has been shifting in favor of the latter, and that shift has recently been accelerating.

³ U.S. Department of Commerce. *Manufacturing in America* (January 2004), pp. 29-30.

⁴ For a discussion of why gross output, rather than value added, is used to measure the total size of the automotive manufacturing sector, see below in this report, p. 12.

The automotive sector employs more people than in 1990, while employment in overall domestic manufacturing significantly declined.

The Big Three-dominated automotive manufacturing sector struggled in the 1980s, and shed hundreds of thousands of jobs. But between 1990 and the end of that decade, while employment growth in the rest of manufacturing was just about flat, automotive manufacturing employment increased almost 25%, or about 250,000 jobs. Despite an employment decline in the industry in 2001-2004, there were still 55,000 more people employed in automotive manufacturing than in 1990, while manufacturing in general lost more than three million jobs over the whole period. This report examines how the strategies of both the Big Three and the transplants have contributed to maintaining or increasing employment.

There appears increasingly to be two U.S. automotive industries based on organization of the labor force: the traditionally unionized Big Three and the foreign-owned “transplants,” which are mostly non-union.

The Big Three assembly plants are all organized by the United Auto Workers (UAW) union.⁵ The Big Three have reduced direct employment by about 600,000 jobs since 1979. Many of these jobs have been shifted to specialized parts suppliers, who employ far more people than the vehicle manufacturers. The two largest are the parts manufacturing spinoffs from formerly integrated Big Three companies (Delphi from GM, Visteon from Ford). Both companies are still organized by the UAW. The UAW has also obtained “benevolent neutrality” agreements, whereby the Big Three promise not to encourage suppliers to oppose unionization, and agreements under which the Big Three promise to give fair consideration to sourcing manufacturing activities in-house rather than from outside suppliers. As the Big Three have lost market share in recent years, the UAW has experienced a serious membership decline — from 1.5 million in the late 1970s, to less than 700,000 today.

There are few union shops among the transplant assembly operations. The transplants have encouraged direct investment from their traditional home country suppliers into the United States, as well as development of local supplier networks. Based on U.S. official foreign investment data, we estimate that foreign-owned automotive companies by 2002 employed about one quarter of the 1.1 million workers in automotive manufacturing in the United States, not counting the employees of the Chrysler Group of DaimlerChrysler.

The bifurcation of the industry has led to serious competitive cost issues for the Big Three manufacturers.

The Big Three maintain that paying pension and health care costs for retirees, as negotiated under union contracts over past decades, may cost \$1,500 or more per vehicle produced today. The Big Three have supported both health care and tax policy changes in Congress that would have alleviated this burden, but such changes have not been passed into law.

Moreover, the Big Three have contracts with the UAW that require them to pay employees and provide benefits, even when production lines are not operating. In the

⁵ The full name is the United Automobile, Aerospace and Agricultural Implement Workers of America, but its shorter abbreviation and title are commonly used.

period after the September 11, 2001, terrorist attacks in New York and Washington, they kept their factories producing vehicles and used big consumer incentives to keep selling those vehicles. But GM and Ford have begun to lose market share in the United States nevertheless. This strategy was initially profitable and helped the country pull out of the recession of 2001, but now Ford and GM have begun to lose money in their North American automotive operations. The three largest Japanese-owned companies in the United States, Toyota, Honda and Nissan, are all currently profitable and have held or increased market share in recent years.

“Card checks” are a key strategy for the UAW in trying to regain members. The UAW is seeking to maintain its active membership level by insuring that the Big Three do not outsource parts supply jobs to non-union operations. They are aggressively using a “card check” approach to try to expedite organizing activities at independent parts-making companies. Under a card check system, employers may recognize a union as representing employees at a facility for collective bargaining purposes, once a majority of the employees have signed a card authorizing the union to represent them, as opposed to formal elections supervised by the National Labor Relations Board (NLRB).

The UAW so far has failed to organize any transplant assembly operations that are independent of links to the Big Three. The use of card checks is also under legal challenge before the NLRB. The UAW and the AFL-CIO have supported legislation in Congress that would clarify the legality of the use of card checks in establishing union representation.

The changes in the structure of the U.S. automotive industry and the decline in the market share of the Big Three has most adversely affected Michigan and the Northeast. The core of the U.S. industry, including its major supplier base, is shifting from the traditional Midwest “auto belt” to the Sunbelt, and to other locations in the South and West. Michigan has lost a minimum of 100,000 jobs since the peak of automotive manufacturing employment in the late 1970s. Losses in other midwestern states appears to have been offset by the shift of production jobs from the Big Three to outside suppliers and by increased inward foreign direct investment. Ohio, Illinois and Missouri may have marginally gained or lost automotive jobs, and Indiana appears to be a significant net gainer. Major northeastern industrial states, particularly Pennsylvania, New York and New Jersey, have lost automotive jobs as the Big Three have rationalized suppliers and assembly plants. Kentucky and Tennessee have been the biggest job gainers, while South Carolina, Alabama, North Carolina and Texas have all gained automotive employment. Shift of jobs away from the Midwest may have been reduced by the widespread adoption of “just-in-time” manufacturing, modern trucking supply strategies and the development of interstate highways, which typically enable parts manufacturers to supply assembly plants up to 400 miles away.

The Automotive Industry in the International Context

The domestic automotive industry is completely integrated within North America. Trade barriers affecting vehicles and parts production within North America have been eliminated by successive trade agreements, culminating in the North American Free Trade Agreement (NAFTA). After producing about 12

million vehicles annually in the late 1970s, the U.S. domestic industry went through cyclical periods of decline and recovery, and next reached that level again in 2000. It has subsequently declined somewhat from that total. Canada during this period has increased production from less than two million units per year to an average of nearly three million; Mexico has increased from less than half a million to about two million annually. Each of the Big Three, and now most of the transplants, have vehicle assembly plants in each of the three countries.

The U.S. automotive trade deficit in 2004 was nearly \$150 billion.

The deficit has grown from less than \$10 billion in 1979 to \$150 billion, despite high levels of inward investment by foreign-brand manufacturers, and a decline in imports relative to vehicles built at transplant assembly facilities. U.S. policies in the 1980s, aimed at requiring foreign-owned companies to produce here more of the vehicles that they sell in the United States, and other policies aimed at heightening consumer awareness about imported vehicles and parts, such as the American Automobile Labeling Act, appear to have had little effect on the growth of this sectoral trade deficit.

About \$40 billion of the automotive trade deficit is with the NAFTA partners; the United States has a large deficit in vehicles with these two countries, though as of 2004 it had a small surplus in automotive parts. The United States had a deficit of more than \$30 billion with the European Union, where exports of U.S.-made vehicles and parts of more than \$10 billion were more than offset by imports in both categories. The largest component of the deficit was bilateral trade with Japan, from which U.S. imports were more than \$48 billion, and U.S. exports were about \$2 billion. The United States also imported nearly \$12 billion in vehicles and parts from Korea, with less than \$1 billion in exports. China's role in the automotive trade deficit in 2004 was relatively insignificant, though imports of parts from that country are rising.

Automotive trade issues have had a high priority in U.S. trade policy since the early 1980s. In the wake of the Chrysler bailout and the unsuccessful effort of Ford and the UAW to request that the U.S. International Trade Commission (ITC) establish import safeguards protection, the focus of this policy was on rising levels of imports. Responding to congressional pressures and the request of the Reagan Administration, the Japanese government formally agreed to voluntary export restraints (VER) and Japanese companies began to undertake investments here. The policy shifted in the 1990s to focus more on opening the Japanese market to imports of motor vehicles and parts from the United States and other countries. This effort culminated in a U.S.-Japanese bilateral agreement in 1996.

With the establishment of the World Trade Organization (WTO) in 1995, U.S. policy shifted again to focus more on multilateral pressure against trade-related investment measures and other barriers aimed at creating protected automotive markets for domestically established manufacturers in many of the industrializing countries. The United States has brought or participated in trade cases against such countries as Brazil, India, Indonesia, Korea and the Philippines. Criticism from the United States and other WTO members of China's official policy on the automotive industry led to establishment of a new automotive development policy in 2004 in that

country, though it is not clear if implementation of that policy will be free from all violations of WTO rules. The United States has also proposed that elimination of nontariff barriers to trade in motor vehicles and parts be added to the agenda of the WTO Doha Round of negotiations on revised trade rules.

Meanwhile, inauguration of free trade talks between the United States and Thailand has led to concerns in Congress that one result could be duty-free entry into the U.S. market of pickup trucks made in that country, the world's second-largest producer. Since 1963, the United States has maintained a high tariff on imported pickups. Many in Congress are concerned that Japanese and Korean manufacturers could evade this duty by importing trucks made at their Thai facilities.

Globalization means major changes for the U.S. automotive industry and its suppliers. The largest motor vehicle markets for the foreseeable future are the advanced industrial countries, where vehicle sales have been slow (or even negative) during the past fifteen years. The fastest growth has been in certain large developing countries, or countries in transition from planned to capitalist market economies (namely, China, India and Russia). Some analysts believe that there is already excess capacity in the global market, and that capacity will increase out of proportion to new demand from developing markets. The major motor vehicle manufacturers, especially including Ford and GM, increasingly source their vehicles from manufacturing facilities in the regions where they are sold, in part due to differing customer demands and tastes. As the vehicle manufacturers globalize and rationalize their supply base, the impact on the U.S. auto parts manufacturing base, which employs several times as many people as the vehicle manufacturers themselves, could be the closure of many companies and facilities. With the Ford and GM market share in North America having declined, a large number of major U.S. automotive suppliers are in financial difficulties. Moreover, many of the historically independent suppliers who sold directly to the Big Three, or indirectly through "Tier 1" suppliers, may lack the scale to be competitive in the global market.

Impact of Fuel Economy and Emissions Standards

Environmental issues, including vehicle emissions, fossil fuel consumption, and resource use, have played an increasing role in shaping the U.S. auto industry. Environmental decisions play a key part in automotive design, research and development of new vehicles, and marketing to consumers.

Fuel economy standards have been effective in reducing energy consumption, but have had a significant effect on U.S. auto manufacturing. Corporate average fuel economy (CAFE) standards are estimated to have reduced fuel consumption by as much as one-third from what it otherwise would have been. Undoubtedly, the standards have significantly affected vehicle design, as well as manufacturing and marketing decisions. However, because of separate standards for passenger cars and light trucks, as well as distinction between imported and domestic vehicles, the current standards likely have had differential effects on various manufacturers. Further, any future changes to the CAFE system would likely leave some manufacturers better positioned than others.

While individual manufacturers may have been advantaged or disadvantaged by the current CAFE system, the total effects of CAFE on U.S. auto industry employment and output seem to be limited, according to an analysis by the National Research Council. However, CAFE standards have affected the ownership of U.S. manufacturing plants, if not the total level of employment.

Emissions standards have directly affected the automotive industry over the past four decades and this effect may increase. Highway vehicle emissions have dropped dramatically over the past few decades. For example, allowable nitrogen oxide emissions from passenger cars have been cut by roughly 70% from 1980 levels. They will be cut further with the introduction of the Tier 2 light-duty vehicle standards set by EPA.

Like CAFE standards, the emissions standards may give a competitive advantage to some manufacturers over others. On average, smaller vehicles with smaller engines tend to emit less than larger vehicles with larger engines. Therefore, those manufacturers that produce larger vehicles may have more difficulty and may likely need to invest more to comply with the standards. Furthermore, as the Tier 2 standards eliminate separate treatment for passenger cars and light trucks, the effects on large vehicle producers may increase. Therefore, auto makers that focus on small cars may have a competitive advantage over manufacturers that produce a larger proportion of light trucks.

California's Greenhouse Gas Rule may be the most significant current issue regarding automotive fuel economy and emissions standards. California adopted regulations in 2004 to require a reduction of greenhouse gas emissions of 30% by 2016 in passenger vehicles. There are no current federal standards for greenhouse gas emissions, and critics of the regulation maintain that greenhouse gases (including carbon dioxide) are not pollutants under the federal Clean Air Act. Thus, they argue that the greenhouse gas standard is a *de facto* fuel economy standard, and they maintain that reducing emissions of carbon dioxide — the key greenhouse gas — requires reductions in fuel consumption. Opponents of the rule argue that authority to set fuel economy standards rests solely with the federal government.

The California rule has been challenged in court. The Big Three and many international auto manufacturers oppose the California rule. California officials maintain that they have the authority under the Clean Air Act to regulate vehicle greenhouse gas emissions. The outcome of this case could have major effects on the U.S. auto industry as California is a major vehicle market, and some other states are likely to adopt the California standards if upheld.

Automotive Industry Outlook and Policy Issues

The prospects for the automotive industry in the United States are mixed. Sales have been maintained at a high level since 2000, although only by liberal use of manufacturers' incentives — and neither sales nor total production has grown since then. Heavy use of incentives, especially by GM and Ford, have promoted sales

since 2001, but at the price of reducing current profits and future demand. If companies continue promoting sales through financial incentives, then higher interest rates, which are widely expected in financial markets, will raise the cost of incentives and further reduce earnings. Big Three earnings have also been adversely affected by “legacy costs,” such as rising contributions to pension funds and retiree health care. Thus, the prospects for this industry as 2005 began were not as robust as in many other sectors.⁶

However, GM and Ford were profitable overall in 2004, despite declines in domestic market share, losses on U.S. automotive operations, legacy costs, and problems in Europe.⁷ Chrysler has overcome annual losses of as much as \$3 billion in recent years, has introduced successful new products in North America, and increased both sales and market share in 2004.

All three leading Japanese transplant producers (Honda, Toyota and Nissan) are operating profitably in the U.S. market, and Toyota and Nissan scored double-digit percentage sales increases in 2004. Hyundai, the remaining independent Korean manufacturer, is opening a major new manufacturing plant in Alabama in 2005, while the Ford-Mazda plant in Michigan will produce the new Mustang, whose sales forecasts are strong. At the end of 2004, even the Japanese companies were using incentives on popular models, as consumers had come to expect them. However, their incentives were much lower per vehicle, than those offered by GM and Ford.⁸ Among foreign-brand motor vehicle manufacturers, only Volkswagen, which does not assemble cars in the United States, and Mitsubishi have experienced major declines in sales in 2004. These two companies’ problems are linked to global competition and management issues, not confined to the U.S. market.

Recent Legislation

In terms of legislative action, the final version of the major corporate tax bill (P.L. 108-357, the American Jobs Creation Act of 2004), which passed at the end of the 108th Congress, saw deletion of some provisions that were favorable to the automotive industry, or at least to parts of it. The legislation as passed:

- Deleted tax credits that had been proposed of up to \$4,000 for purchase of gasoline-electric hybrid vehicles, and up to \$8,000 for purchase of fuel cell-powered vehicles;

⁶ *Business Week*, “Borrowing from the Future,” analysis of automotive sector in special “Outlook” section (Jan. 10, 2005), p. 100.

⁷ GM stock values and creditworthiness were reduced in March 2005, however, when CEO G. Richard Wagoner announced the company would lose money in the first quarter, followed by reduced earnings the rest of the year; Greg Schneider, “General Motors CEO Takes over American Unit,” *Washington Post* (Apr. 5, 2005), p. E2.

⁸ According to Autodata information reproduced in *ibid.*, GM incentives per automobile in March 2005 averaged more than \$4,000 per vehicle, Ford and Chrysler averaged more than \$3,000, while Nissan averaged \$2,000, and Toyota and Honda about \$1,000. See also *Detroit Free Press*, “Auto Industry Report: Japanese Use Incentives” (Jan. 7, 2005).

- Eliminated a proposed two-year deferral of taxes, supported by the National Automobile Dealers Association, on payments by GM to Oldsmobile dealers, who lost their franchises when the company discontinued that brand — the deferral would have allowed dealers to reinvest the payments and would reportedly have been worth an average of \$67,000 per dealer;
- Reduced the amount that business persons can deduct from their taxable income in one year for purchases of large SUVs — the amount was lowered to \$25,000, although the full, original deduction of up to \$100,000 remains in effect for large pickups and vans used in businesses.⁹

Policy Issues for the 109th Congress

While the automotive industry in the United States may not be in a crisis, the 109th Congress may address a number of policy issues that deal with the subject of equitable competition, both internationally and in the domestic market.

Pension and Health Care Issues. A report issued on behalf of the Big Three stated that their ageing work forces, increasing numbers of retirees and generous health care benefits impose an average cost of at least \$1,200 per vehicle in 2004, compared to little or no “legacy” costs of this type for transplant producers. The Big Three, along with the UAW, supported amending tax legislation in the 108th Congress to give manufacturers tax credits for health care payments for older workers and retirees, but no such amendment or separate legislation was introduced. This subject could again become a legislative issue in the 109th Congress.

Currency Exchange Rates. The Automotive Trade Policy Council, representing the Big Three, has complained that exchange market intervention by Japanese monetary authorities has frequently prevented market forces from appreciating the yen and thus make it easier for the Big Three to compete against imports from Japan. At the end of 2001, the value of the dollar was about 132 yen. It fell to nearly 100 by the end of the first quarter in 2004, the last period of publicly acknowledged intervention by Japan. The dollar by April 2005 was a little above that level.

More broadly, many U.S. manufacturers, including automotive suppliers, have pressed for a revaluation of China’s currency, the yuan, which has been fixed at 8.28 per dollar for a decade. As China’s bilateral trade surplus has risen with the United States rapidly during this period, they have pressed to secure a currency realignment that would be more reflective of China’s competitiveness. At least ten legislative measures were introduced in the 108th Congress that addressed this issue. One industry coalition filed a petition urging the Bush Administration to take action under Section 301 of U.S. trade law, and another threatened to do so. The Bush Administration did not accept such petitions in 2004, as its representatives stated that it was not appropriate to address exchange rate issues with trade policy instruments.

⁹ *Automotive News*: Harry Stoffer, “Tax Bill Losses Outnumber Wins” (Oct. 11, 2004); and, (editorial) “Congress Closed 3 Auto Loopholes — Good Riddance” (Oct. 18, 2004).

Instead the Administration pressed China in consultations to adopt a more flexible exchange policy.¹⁰

In the 109th Congress, a provision to address the China currency revaluation issue was introduced as Section 321 of S. 14, a broad bill introduced by Senator Debbie Stabenow and 13 co-sponsors, addressing job creation, fair trade, competitiveness and other issues. It would mandate that a 27.5% tariff be applied to imports from China, unless the President could certify within six months that China, following negotiations required in the legislation, had either made efforts to revalue its currency upward or was no longer accumulating foreign reserves to prevent appreciation of its currency against the dollar. S. 295, introduced by Senator Charles Schumer and 13 co-sponsors, imposed the same level of duty on imports from China, unless the President certified that China is no longer manipulating its exchange rate and had adopted market-based trading policies. A version of this legislation was added as an amendment to S. 600, the Foreign Affairs Authorization Act, on April 6, 2005, when the motion to table failed on a vote of 33-67. Subsequently, it was reported that the amendment would be stripped from that legislation, with a promise by the Senate leadership to Senator Schumer that he would receive a floor vote on S. 295 by July 27, 2005.¹¹ On the House side, Representatives Tim Ryan and Duncan Hunter with 35 cosponsors introduced on April 6, 2005, H.R. 1498, which would approach this issue in a different way. H.R. 1498 would clarify existing U.S. trade law to allow remedies to be sought against imports from China that are shown to benefit from Chinese government exchange rate manipulation.

Labor Representation. Decisions on whether to allow union representation to be determined by the card check process, as described in the previous section, at plants owned by automotive parts suppliers are pending before the NLRB. Legislation introduced in the 108th Congress would have validated the card check process by law. It may be anticipated that similar legislation would be introduced again, especially if the NLRB took a negative position regarding card checks.

Fuel Economy and Emission Standards. Requiring higher fuel economy standards, and establishing a different process for setting such standards for SUVs and other light trucks, were issues debated in the context of energy legislation in the 108th Congress. With the world price of oil in early 2005 at times exceeding \$55 per barrel, and with no comprehensive energy bill having been passed, these issues may

¹⁰ The Sec. 301 petition of the China Currency Coalition was covered especially in *American Metal Market*, "Tired of 'Tacit' Nod, US Group Confronts China on Currency" (Sept. 10, 2004), p. 1, and "China Currency Plea Falls on Deaf Ears" (Sept. 13, 2004 print ed.), p. 2. On Administration policy, see *DER*, "Treasury's Speltz Says China Should Make Exchange Rate Flexible" (Sept. 14, 2004), p. A-9. For the CRS analysis, see CRS Report RL32165: *China's Exchange Rate Peg: Economic Issues and Options for U.S. Trade Policy*. The China currency issue in the 108th Congress, including legislative proposals, were summarized in Gary C. Hufbauer and Yee Wong, "China Bashing 2004," *International Economic Policy Brief* PB04-5, Institute for International Economics (Sept. 2004), pp. 4-9 and App. 1-2.

¹¹ *Congressional Record*, April 6, 2005, pp. S3248-53; Greg Hitt, "Senate Slams China Currency Policy," *Wall St. Journal* (Apr. 7, 2005), p. A2; R.K. Morris, "Editor's Letter: China Alarm," *Global Positions Notebook* (Apr. 11, 2005).

be addressed again in the 109th Congress. In addition, California has proposed emission standards for carbon dioxide and other greenhouse gases. The vehicle manufacturers have brought suit in federal court, claiming that the U.S. Clean Air Act allows California only to regulate specifically identified pollutants, not other emissions, and that the proposed standard is a *de facto* fuel economy standard, on which state action is specifically preempted by federal law.

Pickup Trucks in U.S.-Thailand Free Trade Agreement (FTA). In the FTA it is negotiating with the United States, Thailand is seeking to remove the general U.S. 25% import duty on pickup trucks that it would export here. Most Thai-made pickups are built by local affiliates of Japanese and Korean companies. U.S. Big Three manufacturers oppose duty-free entry of pickup trucks from Thailand, outside the context of a broader trade agreement that addresses what they believe are continuing trade restrictions on automotive imports in Japan and Korea. Resolutions were introduced in the 108th Congress that any FTA with Thailand should not include duty-free access for Thai-made pickup trucks to the U.S. market. A letter co-signed by 40 senators in March 2005 in support of this position indicates that this will continue as an issue in the 109th Congress.

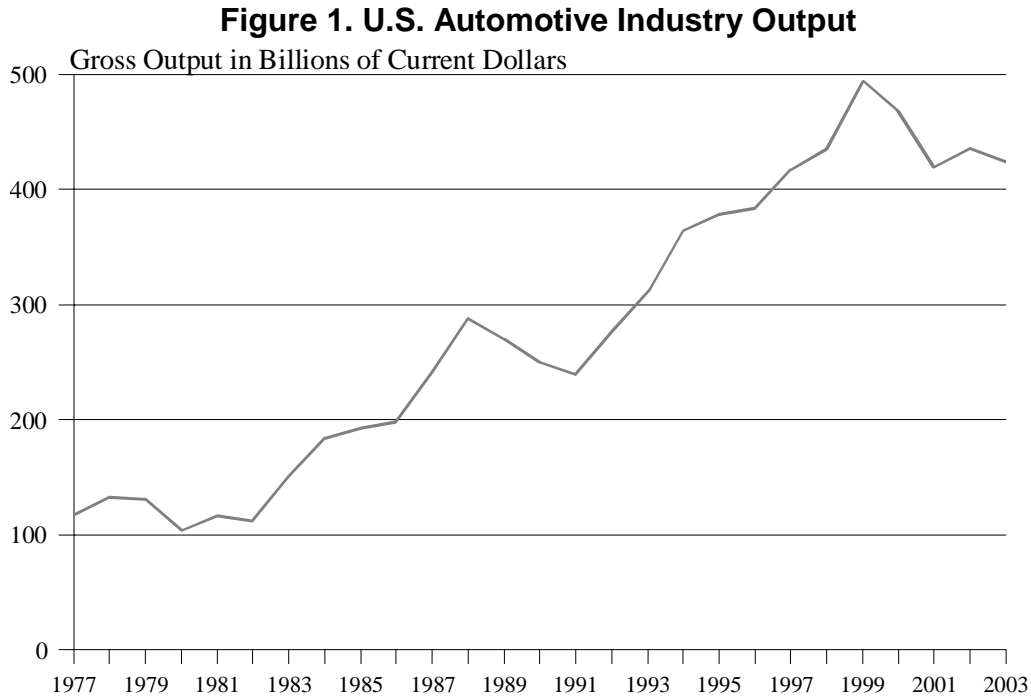
Broader Issues of Automotive Trade Policy. The U.S. government has been active in WTO cases aimed at removing foreign government trade restrictions and policies that have distorted trade in motor vehicles and parts. These included cases in which countries such as Brazil, India, Indonesia and the Philippines had discriminatory policies to require domestic content in locally made vehicles, subsidize exports, or restrict imports as part of national automotive development strategies. The Administration is continuing to review implementation of a new and less prescriptive automobile policy in China. It is working with Korea in an effort to change features of that country's tax policies that discriminate against imported vehicles. It is continuing to monitor policies in Japan that affect the establishment and activities of foreign-owned vehicle and parts manufacturers. Tying all these approaches together, the Administration in early 2005 proposed including a wide-ranging approach to elimination of automotive trade restrictions as part of the ongoing Doha Round negotiations on revising WTO rules.

North American Industry Profile

Size and Growth of the U.S. Automotive Industry

Figure 1 illustrates the growth of the U.S. motor vehicle manufacturing industry since the late 1970s, in terms of gross output as reported by the Bureau of Economic Analysis (BEA) of the Department of Commerce. In current dollars, the industry has expanded from just over \$100 billion per year in the late 1970s to nearly \$500 billion in 1999, which is still the all-time peak. Gross output declined in 2000-01, rose to \$436 billion in 2002, but then fell again slightly to \$424 billion in 2004. The motor vehicle industry is defined in this figure to include automotive parts manufacturing. It also includes heavy trucks, truck trailers, mobile homes, travel trailers and campers, not just automobiles, light trucks and parts, which are the focus of this

report. But 92% of 2003 total industry output as shown in **Figure 1** was accounted for by the principal subjects of the present report.



Source: Department of Commerce. Bureau of Economic Analysis. "1947-1997 Historic SIC Data" and "1998-2003 NAICS Data Gross Output by Industry."

Note: SIC 371 (Motor Vehicles and Equipment), 1977-88; NAICS 3361 (Motor Vehicles); NAICS 3362 (Motor Vehicle Bodies and Trailers); and NAICS 3363 (Motor Vehicle Parts), 1987-2003.

Gross output is used in this report as the most accurate measure of the scale of the industry. Gross output includes the value of intermediate inputs as well as that of the final assembly process, whereas gross domestic product originating in the motor vehicle industry, a common measure, reflects only the value added by final assembly. Intermediate input production, whether done by nameplate assemblers or by suppliers, is an integral part of this industry, as these inputs are specifically designed for automotive applications. Gross output excludes imported or exported intermediate inputs.¹² The gross output of automotive manufacturing represented 10.8% of the total gross output of U.S. manufacturing in 2003.

Through 1997, the industry is defined for statistical purposes as Standard Industrial Classification (SIC) category 371, "motor vehicles and equipment." Beginning in 1998, the Commerce Department switched to the North American Industry Classification System (NAICS), and it has subsequently recalculated industry output on the NAICS basis back to 1987. In this report, the domestic automotive industry since 1987 is defined as including the categories of motor vehicles (NAICS 3361), separately produced motor vehicle bodies (NAICS 3362), and motor vehicle parts (NAICS 3363); these are commonly combined in BEA data

¹² Definition of terms as applied by the U.S. Department of Commerce, Bureau of Economic Analysis (BEA); information from discussions with Robert McCahill, BEA Office of Industry Analysis, July 23, 2004.

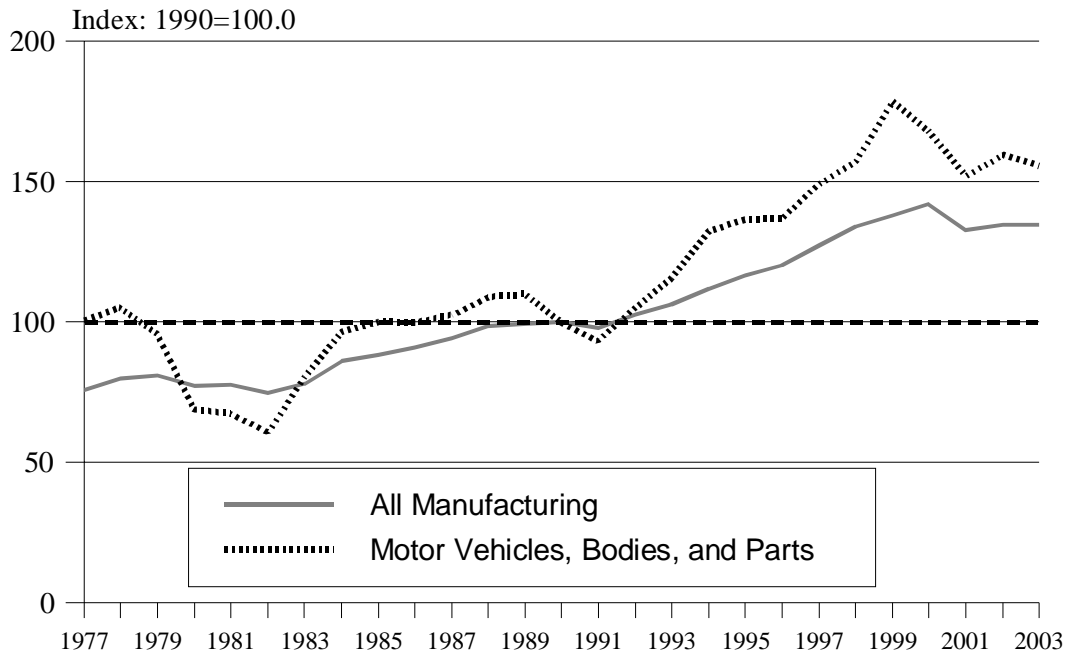
as “motor vehicles, bodies and trailers, and parts.” Under the NAICS system, using these definitions, industry output is somewhat higher than on the basis of SIC 371, because NAICS 3363 incorporates products that were previously included under non-automotive categories (for example, automotive air conditioning equipment). However, the SIC and NAICS automotive data track closely enough that they are presented here as a single output series. The one-time switch from SIC to NAICS-based industry definition partially explains most of the jump in output in 1987 to \$241 billion from \$198 billion the previous year.

Figure 2 illustrates the growth of U.S. automotive industry output on a real basis since 1977, and compares it to overall U.S. real growth in manufacturing output.¹³ The figure illustrates that U.S. automotive manufacturing did not grow as strongly as U.S. manufacturing overall between 1979 and 1990, but did outperform manufacturing in general from 1990 to 2000. The principal reason for this higher relative rate of automotive growth, detailed examination later in the report will show, is increased output from new plants owned by foreign-based manufacturers, the so-called “transplants.”

Inflation-adjusted output in the automotive sector increased about 75% between the late 1970s and 1999, some of which may be accounted for by the definitional change from SIC to NAICS. The figure shows the sensitivity of the industry to the business cycle, with declines in the real value of output during recessionary periods in the early 1980s, the early 1990s, and 2000-01 (starting even before the recession in the latter year). Growth resumed in 2002, but real output again fell slightly in 2003, leaving the industry 13% behind where it was in 1999. Overall, from 1977 to 2003, the inflation-corrected real dollar value of the sector increased by less than 2% per year. But as the number of major motor vehicle assemblers operating in the United States increased significantly, this implies possibly smaller profit margins and downsized workforces for some manufacturers.

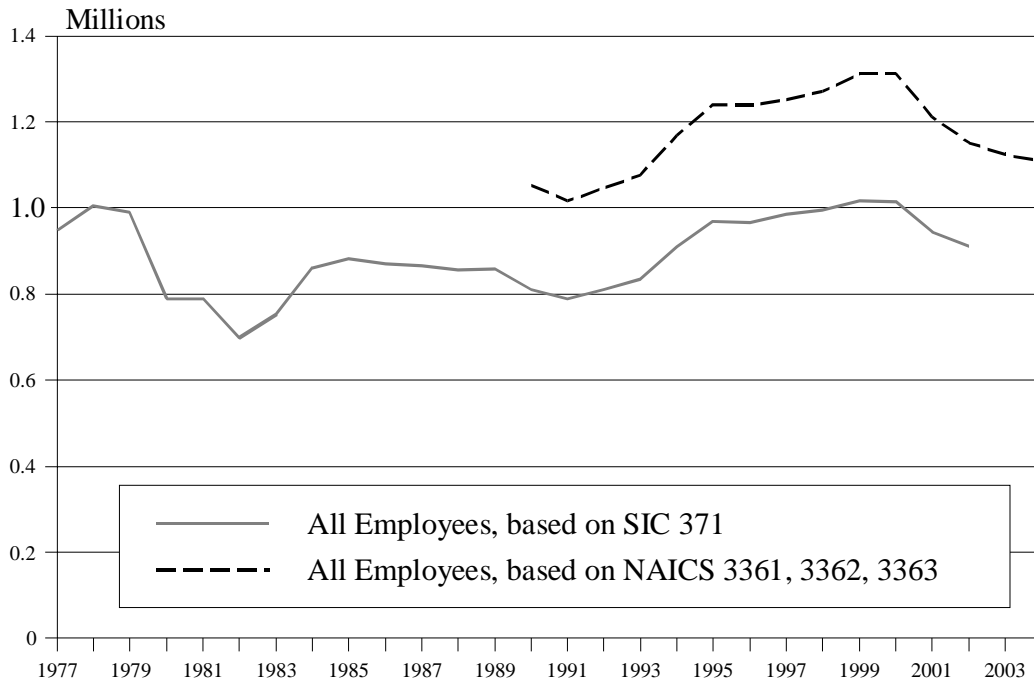
Before 1990, the growth in real domestic automotive output was weaker than the rate of overall real manufacturing output growth; the industry barely recovered from the recession of the early 1980s, before the next recession was upon it. Since 1990, automotive industry output has outperformed the rest of the manufacturing sector of the economy. The inflation-adjusted index for all manufacturing increased by 31.5% between 1977 and 1990. For the automotive sector, the net change was essentially zero from 1977 to 1990. It is true that automotive output peaked one year earlier than total manufacturing, but even at the 1989 peak, the level was less than 10% higher than in 1977. Both automotive and general manufacturing sectors did much better in the 1990s, but the auto sector significantly outperformed general manufacturing. In 1999 it peaked at 75% above the 1990 level, compared to a level for all industry of about 40% above the 1990 base. After four years of slower growth, the automotive output index for 2003 (the latest available data year) was still much higher than that for all manufacturing (55% above the 1990 base, compared to 35%).

¹³ In Figure 2, the definitions of both automotive and general manufacturing real output switch from SIC to NAICS in 1987. For purposes of comparison, both series are indexed to 1990, when the NAICS definition applies.

Figure 2. Real Output of Automotive and Total Manufacturing

Sources: All manufacturing output data, U.S. Department of Labor. Bureau of Labor Statistics. “Major Sector Productivity and Costs Index” (<http://www.bls.gov>, SIC basis as viewed Sept. 17, 2003; NAICS basis, as viewed March 1, 2005.). Automotive data as for Figure 1.

Employment in the automotive sector may not have grown on a net basis over the past 25 years, but neither has it fallen substantially, unlike some other industrial sectors. A direct comparison is difficult, because there are two different data series for automotive employment, and they only overlap for the period 1990-2002. **Figure 3** shows that on the basis of SIC 371 (for which 2002 was the last year for annual data), total employment in the automotive sector peaked at more than 1 million in 1978, and then reached that level again 20 years later, before falling lower during the recent “down” cycle. The employment levels reported by BLS on the current NAICS basis are significantly higher than the equivalent SIC 371 data, because of the inclusion of specialized parts manufacturing. The NAICS-based employment figure, which has been calculated by BLS back to 1990, is shown as a separate line in **Figure 3**. On this basis, total employment in all automotive-related industries was more than 1.3 million in 1999-2000, and is still more than one million, despite falling since then.

Figure 3. U.S. Employment in Automotive Manufacturing

Sources: Department of Labor. Bureau of Labor Statistics. "National Employment, Hours and Earnings." <http://data.bls.gov> (as viewed on March 3, 2005)

As in the case of real output, automotive manufacturing has maintained its employment level better than manufacturing overall since 1990. **Figure 4** compares the patterns of automotive employment with that for manufacturing generally. The chart uses index values to normalize the percentage change in the respective categories. The SIC 371 data are shown for the period 1977-2002, when that series was terminated, and the NAICS-basis automotive data available from 1990. However, as the figure shows, the rates of change, whether measured on an SIC or NAICS basis for automotive manufacturing employment, are virtually identical, so the growth rate of employment in the 1990s is not a statistical artifact.

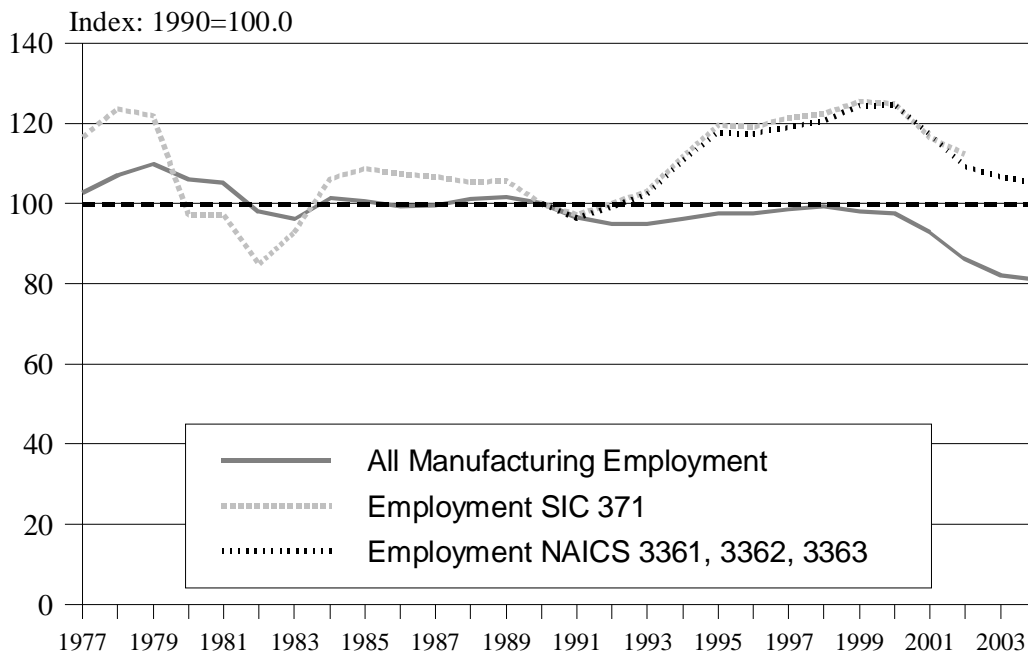
The index of total manufacturing employment and automotive manufacturing employment both peaked around 1978-79. Since then, manufacturing employment has trended slowly and steadily down, with some cyclical variations. The all-time record level of manufacturing employment was 19.4 million jobs in 1979, and the U.S. economy has never come close to creating so many manufacturing jobs since then. After the most recent economic recession, overall manufacturing employment fell almost 20% below the latest peaks in 1990 and 1998.¹⁴

After worse performance than general manufacturing before 1990, automotive manufacturing in the United States has demonstrated superior performance since then

¹⁴ A detailed discussion of the long-term downward trend in manufacturing employment is presented in CRS Report RL32179, *Manufacturing Output, Productivity and Employment: Implications for U.S. Policy*, pp. 4-10. The contrasting experience of the automotive industry is discussed in that report on pp. 28-29.

in creating manufacturing jobs during the strong-growth 1990s, and in maintaining jobs since 2000. For automotive manufacturing employment, the cyclical swings of the late 1970s and early 1980s were stronger than for general manufacturing employment, and the relative decline in jobs between 1979 and 1990 was twice as large: 18% against 9%. But between 1990 and the end of that decade, while manufacturing employment was just about flat, automotive manufacturing employment increased almost 25%, or about 250,000 jobs (NAICS basis). Even by 2004, after four years of slow growth, there were still 55,000 more people employed in automotive manufacturing than in 1990, while manufacturing in general lost more than three million jobs over the period. This report will later examine in detail how the strategies of both the Big Three and the transplants have contributed to maintaining or increasing employment in the sector.

Figure 4. U.S. Total and Automotive Manufacturing Employment



Source: Department of Labor. Bureau of Labor Statistics. “National Employment, Hours and Earnings” (<http://data.bls.gov> as viewed on March 3, 2005).

As a consequence of these trends, employment in automotive manufacturing has increased as a share of all manufacturing jobs. As of 1990, when NAICS-based data become available, automotive manufacturing employment of more than 1 million represented 6% of all U.S. manufacturing employment. At its peak in 2000, employment in automotive manufacturing represented 7.6% of all manufacturing employment. Levels of both total and automotive manufacturing employment have subsequently fallen, but because auto-related employment fell more slowly in absolute terms, in 2004 it actually represented a slightly higher rate of all manufacturing employment than in 2000 — 7.7%. The key employment question in the industry is whether it is due for more rationalizing and downsizing, as has been the pattern in other manufacturing sectors.

Table 1 shows how employment has shifted among the three NAICS automotive sector categories. Motor vehicle manufacturing accounted for only 20,000 new positions between 1990 and 2000, and by 2004 had fewer employees

than in 1990. This change reflects a downsizing of the Big Three, especially through spinoffs, which were not fully offset by expansion of assembly operations by the transplant competition. Motor vehicle parts added almost 200,000 jobs between 1990 and 2000 (from 653,000 to 839,000 employees), and as of 2004 still employed 35,000 more people than at the beginning of the period. The smallest category, motor vehicle bodies and trailers, had the largest percentage rate of growth between 1990 and 2000, increased employment by more than 40%. By 2004, the number had retreated to 164,000, still 35,000 (27%) higher than in 1990.

Table 1. Employment by Automotive Manufacturing Categories
(Thousands)

	1990	2000	2004
NAICS 3361 (Motor Vehicles)	271.4	291.4	256.1
NAICS 3362 (Bodies, Trailers, etc.)	129.8	182.7	164.5
NAICS 3363 (Motor Vehicle Parts)	653	839.5	688.5
Total	1054.2	1313.6	1109.1

Source: U.S. Department of Labor. Bureau of Labor Statistics. "National Employment, Hours and Earnings" [<http://data.bls.gov>], as viewed Mar. 4, 2005.

Formerly, the Big Three domestic manufacturers were highly integrated, with the assemblers of cars and trucks manufacturing many of their own parts, as well as the vehicles and engines.¹⁵ In recent years, assemblers have increasingly outsourced more of their parts, subassemblies and systems; "modularization" of outsourced systems and components has become a new key concept in the motor vehicle manufacturing business. For example, both GM and Ford have spun off their parts manufacturing operations. GM spun off its main parts operation as Delphi in 1999, while Ford did the same, creating Visteon in 2000. Notwithstanding its long tradition of vertically integrated manufacturing, the U.S. automotive industry also has an equally long tradition of specialist suppliers. As the major Japanese and European assemblers have established manufacturing operations in North America since the 1980s, the domestic industry has seen both the establishment of foreign-owned parts and systems suppliers that have accompanied them, and domestic U.S. firms' efforts to compete for the supply business.¹⁶

¹⁵ Most famously, Henry Ford not only poured his own steel at the Ford steel mill in the River Rouge manufacturing complex, but the mill used iron ore from Ford-owned mines, transported to the "Rouge" on Ford-owned ships. James P. Womack, Daniel T. Jones and Daniel Roos, *The Machine That Changed the World* (New York: Rawson Associates, 1990), p. 39. Rouge Steel still operates on the same site today, where it continues to supply Ford, although, after more than a decade as a spun-off company, it was acquired in 2003 by the Russian company, Severstal.

¹⁶ An analysis of its impact on South Carolina, commissioned by BMW, included a review of the suppliers that moved or expanded operations in the state: *The Economic Impact of BMW on South Carolina* (University of South Carolina, Moore School of Business, 2002), pp. 11-19, esp. Figure 8. The 1998 *Report on the Significance of Toyota Motor*

Consolidation of the North American Industry

This report has initially focused on the size and growth of the motor vehicle production sector in the United States. The context has been the consolidation of motor vehicle manufacturing in North America into a single, albeit somewhat bifurcated, industry. This development has proceeded in three important phases:

- The U.S.-Canadian Automotive Products Trade Agreement of 1965 effectively created a single industry in the two countries, owned by the U.S. Big Three (plus American Motors). By the agreement and an associated “letter of understanding” between the Canadian government and representatives of the U.S. automotive manufacturing companies (to which the U.S. government “acquiesced,” but was not a party), the manufacturers agreed to increase Canadian-origin content in vehicles and parts, as a percentage of the gross value of their Canadian sales each year. In exchange, the manufacturers did not pay U.S. or Canadian tariffs on automotive products in bilateral trade. Both Canadian and U.S. analysts believe that the agreement was not sectoral free trade, as it is often described, but rather a form of managed trade, in which duties were eliminated on a two-way basis, as long as certain Canadian sourcing conditions, closely monitored by the Canadian government, were met.¹⁷
- In 1988, the auto agreement was subsumed into the broader U.S.-Canadian Free Trade Agreement (FTA). The principal U.S. automotive negotiating goal within the FTA appears to have been to “freeze” the Canadian duty remission program to the existing (Big Three) registrants, rather than having Canada extend it to Japanese and Korean investing companies. However, the FTA contained general provisions that effectively phased out the remaining Canadian incentives, restrictions, and performance requirements on automotive operations.¹⁸
- On January 1, 1994, the North American Free Trade Agreement (NAFTA) entered into effect. Under NAFTA, Mexico agreed to gradually liberalize and then eliminate the restrictive provisions of

Manufacturing, Kentucky, Inc. by Prof. Charles F. Haywood found that 120 of 175 automotive suppliers had moved to Kentucky since the location of Toyota’s plant there.

¹⁷ This conclusion is drawn from separate analyses of the agreement by the U.S. International Trade Commission and a Canadian source, quoted in CRS Report 88-122E, *Automotive Products Trade with Canada and the U.S.-Canada Free Trade Area Agreement* (available from the author of the present report), pp. 6-7.

¹⁸ *Ibid.*, pp. 14-19. Although, according to Gary Hufbauer and Jeffrey J. Schott, certain Canadian auto industry safeguard provisions from the 1965 deal were even later “untouched by NAFTA ... a tribute to the negotiating skills, if not the economic wisdom, of the Canadian team.” See their *NAFTA: An Assessment*, rev. ed. (Washington: Institute for International Economics, 1993), p. 38n.

the Mexican Auto Decree, a policy that had been developed in accordance with the theory of import substitution. This policy had restricted the distribution of automobiles and trucks in Mexico to locally established manufacturers (the Big Three, VW and Nissan), and subjected them to extensive performance requirements. The most notable of these rules was a “trade balancing” requirement that a manufacturer had to export twice the value of vehicles that it imported. Trade balancing and local sourcing rules were gradually eliminated over a ten-year period, though restrictions remain on imports of used cars and trucks. NAFTA requires automotive goods to meet special rules of origin. For passenger cars, light trucks, and their engines and transmissions, the rule is 62.5% North American content, compared to 50% under the original U.S.-Canada automotive agreement.¹⁹

These agreements, over a period of thirty years, have curtailed Canadian and Mexican attempts to promote and protect automotive assembly and supplier industries through restrictive and interventionist government policies. Of course, both the central governments of Mexico and Canada, as well as provincial, state and local governments, continue to seek to attract or keep auto plants through incentive programs, as do U.S. states and localities.²⁰

In Canada, automotive exports now account for 23% of total national exports. But concern has been expressed in Canada that the automotive trade surplus has been declining since 1999. A Canadian Automotive Partnership Council (CAPC) has been formed, with representatives of all groups with an interest in the industry (including the Big Three, Honda, Toyota, parts manufacturers, dealers, the Canadian Auto Workers union, the academic community, and federal and provincial governments). CAPC has produced a study and policy recommendations, with the explicit target of reversing declines in the trade balance in both vehicles and parts.²¹

In Mexico, automotive products have been among the major products of the *maquiladora* program. Prior to NAFTA, manufacturers could minimize both exposure to Mexican trade and tariff laws, while minimizing exposure to U.S. tariffs at maquiladora plants that exported at least 50% of their production. According to

¹⁹ Governments of Canada, the United Mexican States and The United States of America. *Description of the Proposed North American Free Trade Agreement* (Aug. 12, 1992), pp.7-10; Hufbauer and Schott, pp. 37-40.

²⁰ See, for example, “Canada Pledges Millions for Ford Plant,” *Automotive News* (June 21, 2004), p. 6, on Canadian federal and provincial support worth \$Canadian 200 million to meet Ford “demands” for help in a major revamp of its Oakville, Ont. assembly operations. GM has received \$350 million from the same sources in support of \$2 billion worth of new investment in three Ontario projects; “GM Steers \$2 Billion into Ontario,” *Detroit Free Press* (Mar. 3, 2005).

²¹ CAPC. *A Call for Action: A Canadian Auto Strategy* (Oct. 2004). Full report available at [<http://capcinfo.ca>]. The report is discussed in: Bureau of National Affairs. *Daily Report for Executives (DER)*, “Group Urges Canadian Government to End Barriers to Auto Trade with U.S.” (Oct. 29, 2004), p. A-15.

the U.S. General Accounting Office (GAO), 112,000 Mexicans worked in such establishments that produced items of “transportation equipment” in 1991. That was about a quarter of the total of all maquiladora workers, and equal with electronic and electrical products as the two largest employing sectors.²² With the establishment of NAFTA, the export minimum for maquiladora facilities has been eliminated, and any product now manufactured in Mexico (under NAFTA origin rules) enters the United States duty-free.

There is still a low-cost production, comparative advantage logic to locating the manufacture of certain products or components for the U.S. market in Mexico, and as some analysts note, some maquiladora operations have moved into more sophisticated manufacturing and R&D activities.²³ The significance of Mexican manufacturing establishments for automotive parts in North America automotive assembly industry is indicated by the fact that the value of parts imported into the United States from Mexico rose from less than 12% of all parts imports to almost 30% between 1993 and 2002. Mexico displaced Canada as the leading source during this period. Imports of complete vehicles from Mexico also increased more than fivefold, to more than \$20 billion in value by 2002. This was greater than the value of imports from Germany, though still much less than Canada or Japan.²⁴

The maquiladora industries in total lost 278,000 jobs between late 2000 and early 2002, but they remain an important aspect of North American motor vehicle production. Some analysts have asserted that Mexico as a low-cost location for sub-assemblies, parts and components for manufactures has been overtaken by competition from China. But a sectoral breakdown of apparent trade share gains and losses for maquiladoras indicates that, trade gains in automotive parts and systems by Chinese producers appear to complement, rather than subtract from, market shares held by Mexican maquiladora exporters.²⁵ A late 2004 article also noted that, as Mexico moves away from the import-substitution model, the low-cost high-volume models sold in Mexico are actually imported from lower-cost production areas, and that Mexican auto factories are actually beginning to specialize in higher-cost vehicles for the global market (such as the VW “new” Beetle, and the Chrysler PT Cruiser).²⁶

²² Program described in CRS Report 93-1050E, *Mexico’s Maquiladora Industry*, by M. Angeles Villarreal; GAO data reported on p. 6.

²³ Federal Reserve Bank of Dallas, El Paso Branch. “Maquila Industry: Past, Present and Future,” *Business Frontier* (Issue 2, Aug. 26, 2004).

²⁴ See CRS Report RL32179, pp. 51-52 and Table 5. U.S. automotive trade data will be covered in detail later in this report.

²⁵ Federal Reserve Bank of Dallas, El Paso Branch. “Maquila Downturn: Structural Change or Cyclical Factors?” *Business Frontier* (Issue 2, Aug. 26, 2004), Table 2, reporting results of research by Ernesto Acevedo Fernández of the Mexican Ministry of Finance and Public Credit.

²⁶ Joel Millman, “Mexico Blazes Trade Success; Auto Industry Matures to Supply Global Markets,” *Wall St. Journal* (Nov. 29, 2004), p. A12.

Press reports also note a 2004 comeback in hiring at Mexican maquiladora operations, which may indicate that the economic problems of maquiladoras have been the result of the U.S. recession and some confusion over Mexican tax law changes, more than competition from China.²⁷ With respect to the North American motor industry and its growing reliance on “just-in-time” inventory systems, it could be difficult to replace Mexican sources for original equipment (OEM) suppliers with product shipped long distances from China. Moreover, in an effort to reassure maquiladora operators and to retain or expand their investment within global supply chain systems, Mexico has launched a Sectoral Promotion Program (“PROSEC”), which gives producers in 20 maquiladora sectors an opportunity to import non-NAFTA components at reduced Mexican tariff rates (0% to 5%).²⁸ Recent data indicate that both output and employment at maquiladora plants expanded strongly in 2004.²⁹ A Mexican official has also stated that the Mexico-Japan Free Trade Agreement, signed in September 2004, and which entered into effect on April 1, 2005, could substantially increase Mexico’s role as a supplier to the U.S. market for Japanese automobile and auto parts manufacturers.³⁰

Figure 5 shows the impact of these changes on the U.S. and North American motor vehicle assembly industry.³¹ As of the late 1970s, the U.S. automotive industry, then almost exclusively the Big Three, built an average of about 12 million vehicles (cars and light trucks) per year. This was more than 85% of total vehicle production in North America. Canada at that time built less than two million vehicles per year, and Mexico fewer than 500,000. During the recessionary period 1980-82, the U.S. auto industry averaged fewer than 8.0 million units per year. From that low point, U.S. production output expanded, with one other big recessionary dip in the early 1990s, to 13.0 million vehicles by 1999. Once again there was a decline in demand as a recession overtook the U.S. economy, but this time, the decline in units built in the United States was relatively modest: in 2002-03, U.S. output was more than 12 million vehicles, or about the same as the totals of the late 1970s. As of 2003, 74% of the vehicles produced in North America were still assembled in the United States.³²

²⁷ “Made in the Maquilas — Again,” *Business Week* (Aug. 16, 2004), p.45.

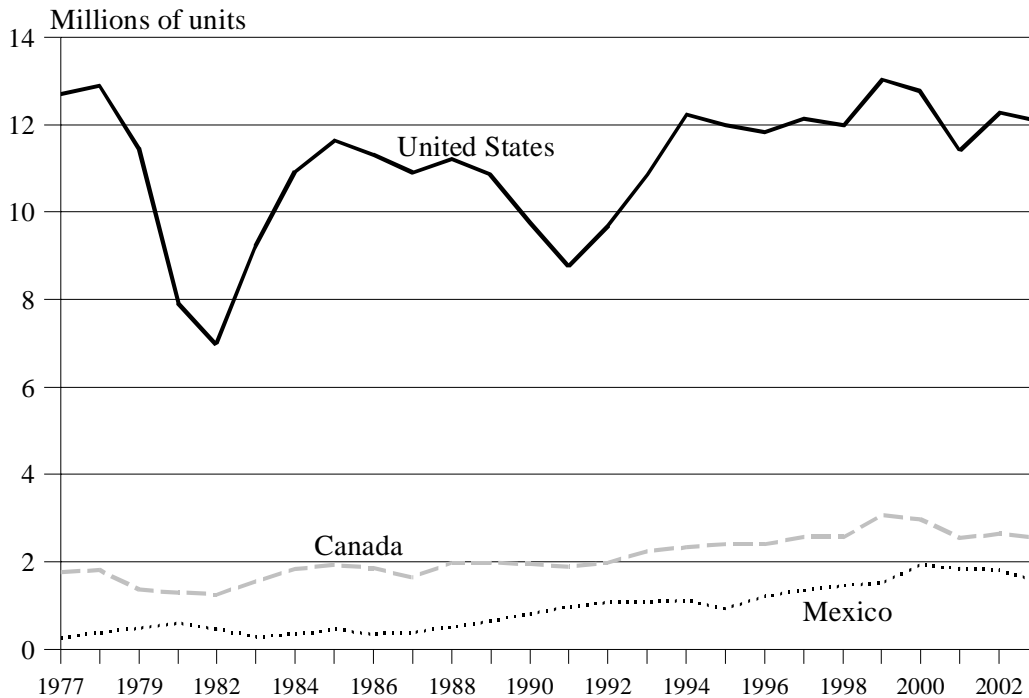
²⁸ “Maquila Industry: Past, Present and Future.”

²⁹ “It’s Hot South of the Border,” *Business Week* (Mar. 7, 2005), p.32.

³⁰ Bureau of National Affairs. *Daily Executive Report (DER)*, “Mexico says FTA with Japan Will Boost Japanese Exports in U.S. after April 1” (Mar. 15, 2005), p. A-10.

³¹ See **Appendix Table 1** for the detailed numbers.

³² The automotive industry tends to measure output in terms of “units,” rather than value, even though vehicle unit values, and the profits per unit sold, vary significantly between lower-cost and higher-cost cars and light trucks.

Figure 5. Location of North American Motor Vehicle Production

Source: *Ward's Automotive Yearbook, 2004.*

Both Canada and Mexico have seen fairly steady increases in their total output and shares of North American production. Canada produced about 12% of the industry's North American total in the late 1970s, after the U.S.-Canada automotive trade agreement was in place. Output there declined with the recession of the early 1980s. By 1988-89, as the FTA entered into effect, Canada's output hit 2.0 million, and close to a 15% market share. By 1999, when NAFTA had been in effect for six years, Canada's total output exceeded 3.0 million units and a 17.6% share of a record North American production of 17.7 million units. In the post-2000 industry downturn, Canada has continued to produce about 2.5 million units annually.

From the late 1970s through the end of the century, Mexico's automotive unit production advanced even more steadily, to one million units by 1991, and just under two million in 2000-01 — despite a major decline in the mid-1990s because of a serious domestic financial crisis. Mexico's percentage share of total North American production, which was around 2% in the late 1970s, reached double-digit levels in 2000-02, before declining to just less than 10% in 2003. Mexico's own internal demand in 2004 reached a record high of 1.1 million vehicles, as the economy again grew strongly.³³

Total North American vehicle production has thus steadily risen for the past 20 years, while sectoral and regional trade deals have created the basis for a fully regionalized industry. In the early 1980s, output took a devastating fall, from 14.5 million units per year in 1977-79, to an average of just 9.5 million units during the next three years, a fall of 35%. Since then, production has never been less than 11

³³ "Hot South of the Border," *Business Week*.

million units, and has been in the 15-18 million unit range annually since 1994. The share of vehicles assembled in the United States has fallen, though not dramatically, while the absolute number of vehicles assembled in the United States has remained about the same, allowing for changes in economic trends and overall demand.

Rise of International Investment in North America

The overall picture of growth in North American production masks the tension within the industry created by the entrance of new international competitors as domestic manufacturers. Growth has been due in part to internationally based companies (especially from Japan) investing in the North American market initially as a substitute for importing, while the Big Three struggled with downsizing issues, as will be reviewed in a later section. Together with growing automotive manufacturing capacity elsewhere, especially in Asia, there are concerns that the motor industry may be creating a problem of overcapacity. The result could be more serious rationalization and industry closures, especially in North America, as well as in Japan and Europe, the other two traditional major producing regions.³⁴

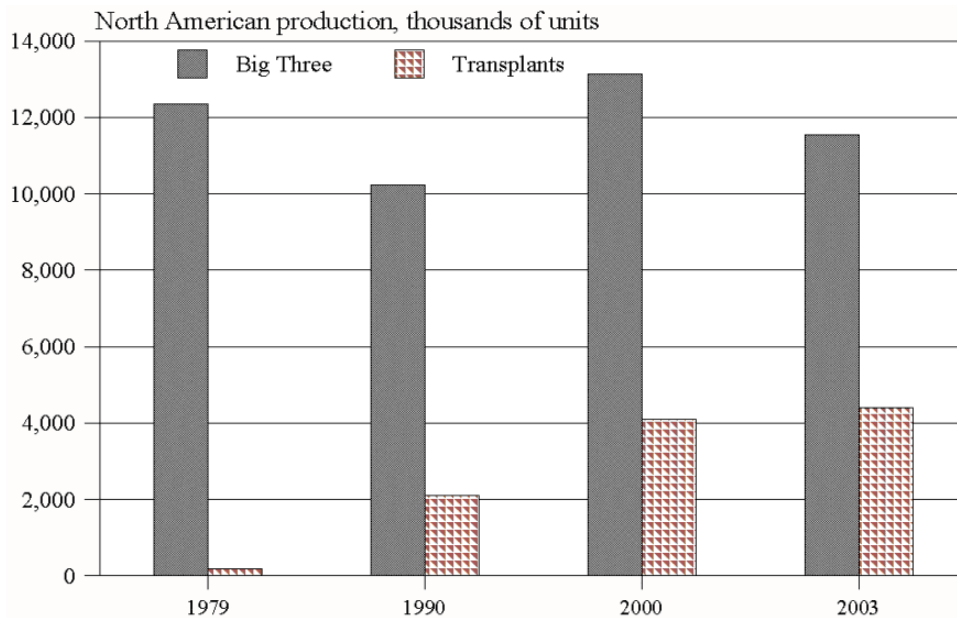
Figure 7 illustrates the increasing role of international (foreign-based) producers in the U.S. motor vehicle market (cars and light trucks, the latter including pickup trucks, minivans and SUVs). The figure uses 1979, 1990 and 2000 as growth years, at or near peaks of domestic U.S. economic growth and automotive production. The year 2003 is also shown, to provide the latest complete annual data. Detailed data for manufacturers within North America are provided in **Appendix Table 2**.

The total number of vehicles produced in North America by the traditional Big Three manufacturers has not changed very much overall since the late 1970s, as can be seen in **Figure 7**, when one looks at the growth peaks. The Big Three produced more than 12 million vehicles in North America in 1979. Production dropped dramatically in the recessionary period 1980-82. Despite a recovery in the later 1980s, by 1990 total production was still two million vehicles less than in 1979. By 2000, production in North America by the Big Three companies³⁵ was more than 13 million vehicles, less than one million more than in 1979. With the onset of recession and slower economic growth after 2000, total Big Three production declined by 1.8 million units, to about 11.5 million, in 2003.³⁶

³⁴ See special section, "Perpetual Motion: A Survey of the Car Industry," *The Economist* (Sept. 4, 2004).

³⁵ While Chrysler had effectively been acquired by Daimler Benz in 1998, these data count the subsequent Chrysler Group operations separately from Mercedes Benz production in the United States, which had already begun in 1995. Other Big Three links with foreign-based investors to establish North American production facilities are also counted as "transplants," as noted in **Appendix Table 2**. This is how such operations are treated in industry sources.

³⁶ Sales were disappointing overall through the first eight months of 2004, especially for GM and Ford, which reported plans to cut production for the balance of the year. Chrysler sales increased, especially for some new products, and results were mixed, though generally somewhat higher for imports and foreign-brand vehicles; Associated Press, "Ford, GM Sales Drop; Both Cut Production" (Sept. 1, 2004); Reuters, "Ford Cuts Production after Sales Fall" (Sept. 1, 2004); John K. Teahen, Jr. "Dog Days of August Are a Dog for Ford, Too,"

Figure 6. Production in North America by Type of Company

Source: *Automotive News Market Data Book*.

A closer look at **Appendix Table 2** reveals significant variations within North America and among the Big Three. GM produced more than seven million vehicles in 1979; by the 1990s, its annual production level was around 5-6 million units per year. In 2000, GM produced 5.6 million vehicles, and by 2003, despite a slow economy, that level had fallen only minimally, to 5.3 million. However, this level, it can be argued, was artificially maintained by high levels of discounted fleet sales and expensive customer incentives of up to \$6,000 per vehicle.³⁷ Ford production at the end of the 1970s was just over half the GM level; in 1990 it had reached nearly 70% of GM's total, and in 2000, Ford produced more than 80% of the number of vehicles produced in North America by GM. But with the economic recession and an aging Ford lineup of models, the ratio declined somewhat to 71% in 2003. Similarly, Chrysler also gained on GM in North American production totals. It produced less than a quarter of the number of vehicles manufactured by GM in 1979, but by 2000-03, its North American output was about half the GM level. As will be shown later, some of this change is because of greater relative success of Ford and Chrysler in producing light trucks, including minivans and SUVs.

Automotive News (Sept. 13, 2004).

³⁷ When GM reported disappointing earnings for the third quarter of 2004, it was noted in one source that, "In North America, GM reported a \$22 million loss," despite a September sales surge, in part because "it led the industry with an average incentive of \$4,340 a vehicle;" Associated Press, "Pricing, Europe Weigh on GM Results" (Oct. 14, 2004). On GM incentives, see "General Motors Incentives to 'Stay High,' Executive Says," *Bloomberg.com* (Aug. 14, 2004); David Welch, "GM: Enough with the Come-Ons," *Business Week* (July 26, 2004), p. 44.

Another shift in vehicle output within the Big Three is the increasing role of Canada and Mexico in final vehicle assembly. **Appendix Table 2** illustrates that the U.S. production level of 9.8 million vehicles in 2000 was about one million below the level of 1979, and was another one million less in 2003. Meanwhile, Canada had substantially higher production levels in 2000-03 than in 1979 or 1990, and Mexico's Big Three production in 2000-03 was double the level of 1990 (before NAFTA). This relative decline of the U.S. role in Big Three North America production appears solely due to a decline at GM, particularly at its U.S. plants. In 1990, 2000 and 2003, GM produced at least two million fewer vehicles in the United States than in 1979. Both Ford and Chrysler produced more vehicles annually in the United States in 2000-03 than in 1979 or 1990, although Ford vehicle output by its U.S. factories in 2003 was barely higher than in 1979.

Foreign transplants have increased their share of North American motor vehicle production from virtually nothing to more than a quarter of the total in 25 years, as shown in **Figure 7** and, in more detail, in **Appendix Table 2**. Volkswagen was the only foreign-based producer in 1979, when it produced 175,000 units at its plant in New Stanton, Pennsylvania. That plant proved to be unsuccessful, and has since been closed, with subsequent VW production in North America located in Mexico. By 1990, most Japanese manufacturers had vehicle production facilities in North America. Some transplants were built in direct collaboration with the Big Three, but most of the production came from plants independently designed, built and operated by the Japanese-based producers. The initial decisions of Japanese manufacturers to locate in North America was in part a function of U.S.-Japan trade relations, as will be described in a subsequent section of this report. But whatever the cause, by 1990, more than two million vehicles were assembled each year by the transplants in North America, and more than two-thirds were built in the United States.

This total doubled to more than four million annually by the end of the decade. Moreover, while Big Three output dropped by 1.6 million units between 2000 and 2003, transplant output continued to increase, despite the economic slowdown: from 4.1 million to 4.7 million units assembled in North America, with all the net gain coming at U.S. plants. The Japanese producers were joined by BMW and Mercedes Benz, which opened their first North American production facilities in South Carolina and Alabama respectively in 1994 and 1997. The German manufacturers' confidence in the ability to assemble world-class vehicles in the United States may be indicated by exclusive production of certain models in these plants for distribution to both U.S. and worldwide markets.

A close examination of the transplants' data in **Appendix Table 2** also shows that the more profitable or higher-volume transplants have been those that were started up by the foreign-based companies themselves, rather than those that were developed in conjunction with the Big Three. Honda's plants in Ohio, Ontario, and, most recently, Alabama, were all initiated by the company on its own.³⁸ Nissan's

³⁸ See the special section in *Automotive News* (Sept. 6, 2004) commemorating the 20th anniversary of Honda's manufacturing beginnings in Ohio, which started with a motorcycle plant. The first article, "Changing the Rules," by Lindsay Chappell, emphasizes the different approaches from traditional U.S. automotive manufactures employed by Honda.

plants were also built and operated on their own, as was the large Toyota plant at Georgetown, Kentucky, the largest of the transplant operations in North America, in terms of annual vehicle output. The one major exception is “NUMMI” (for New United Motor Manufacturing Inc.). This was a closed GM plant in Fremont, California, which Toyota reopened and has successfully managed as a joint venture with GM (and with UAW-represented workers).³⁹ By contrast, the plant built by Mitsubishi in the “Diamond-Star” alliance with Chrysler in Normal, Illinois; the Ford-Mazda “AutoAlliance” plant in Flat Rock, Michigan; and the GM-Suzuki CAMI operation in Cambridge, Ontario, have all been more limited or less successful in terms of output growth. The Subaru-Isuzu plant in Lafayette, Indiana, was a joint venture between Subaru (owned by Fuji Heavy Industries of Japan) and Isuzu (partly owned by GM); but the Isuzu truck operation at that facility has now been shut down.⁴⁰ About three-quarters of the net increase in transplant production of 2.4 million vehicles in North America since 1990 has come from the independently built and operated facilities of Honda, Nissan and Toyota (excluding NUMMI) alone, to which should be added the 250,000 vehicles produced by BMW and Mercedes Benz at new plants (Mercedes Benz started production before the acquisition of Chrysler by Daimler Benz, the common parent).

Transplant activity thus represents a permanent new competitive force in North American vehicle manufacturing, one which, in general, has no ties to the Big Three. By contrast, Big Three-linked “transplants” primarily represent an effort by the Big Three to defend market share in some segments through vehicles produced by controlled or allied foreign producers. But this effort has had limited success and impact on the North American vehicle market to date. GM has also tried to create a homegrown “transplant” operation, the Saturn company, based on new models of relationships with customers, dealers and labor, which would allow it to compete more effectively with economy models from foreign-based producers. While the initial approach and the resulting product were well received, “the unit has posted only one profitable year since 1990 ...” and “Saturn [sales have] never moved past the 300,000 mark. Its best year was a decade ago.” GM is reinvesting in the operation, and reorganizing it as a corporate division.⁴¹

Not only have the transplants increased their total output since 2000, but new operations are ramping up or are in development. Nissan has started producing a range of new products in Mississippi. Hyundai, having earlier closed a plant in Quebec, is building a new facility in Alabama, and Toyota is building a new large pickup truck plant in Texas. International investors have thus become a large, established, independent, and growing part of the U.S. and North American automotive manufacturing picture.

³⁹ Womack *et al.*, *The Machine That Changed The World*, pp. 82-84.

⁴⁰ For an excellent overview of transplant activities and recent developments in North America, see the special section on “New American Manufacturers” in *Automotive News*, (June 14, 2004), pp. 23-30DD, esp. the summaries by Lindsay Chappell in “The Transplants’ Changing Faces,” p. 26.

⁴¹ Dave Guilford, “Once Different Saturn Looks More like GM,” *Automotive News* (June 14, 2004), p. 30V; Jerry Flint, “Saturn: The Forgotten Promise,” *Forbes.com* (Aug. 17, 2004); “GM to Invest in Plant to Help Saturn Brand,” *Detroit Free Press* (Aug. 27, 2004).

Big Three Lead in Light Trucks — Transplants Grow Rapidly

As noted in a previous CRS report,⁴² the major difference between the development of the Big Three's domestic product output and that of the transplants in terms of their production output is the increasing shift of the former from cars to light trucks. This shift is summarized in **Figure 7**, with more statistical detail provided in **Appendix Table 3**, the latter adapted and updated from the earlier CRS report.

As of 1990, despite its substantial downsizing in the 1980s, GM still produced more than 2.6 million cars in the United States, compared to 1.47 million trucks — cars represented 64% of its U.S. motor vehicle output. Somewhat surprisingly, perhaps, given its acquisition of Jeep and its minivans, Chrysler in that year produced about 40% more cars in the United States than trucks (730,000 against 530,000). Only Ford, whose pickup trucks had been outselling Chevrolet since 1968, and which in 1990 began producing the highly successful Explorer SUV on a truck chassis, produced more light trucks than cars at its U.S. assembly plants in that year.⁴³ And overall, despite the popularity of some models produced at U.S. transplant facilities by the 1990s (Honda Accord in Ohio, Toyota Camry in Kentucky), more than 78% of all cars produced in the United States were still made by the Big Three, as well as more than 95% of all light trucks.

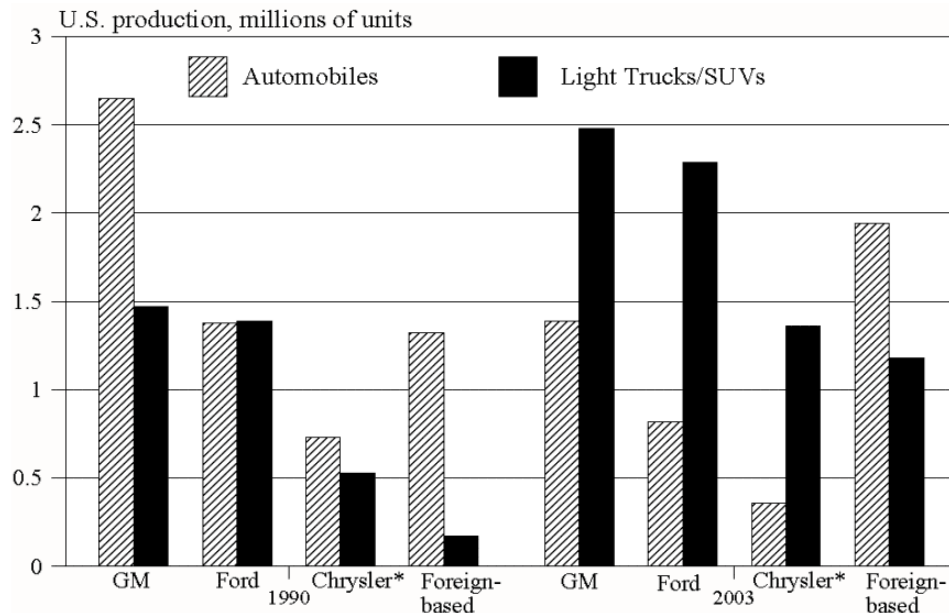
By 2003, the Big Three product mix had changed dramatically in favor of a greater focus on truck output from U.S. plants. Most notable was a reversal of the ratio at GM, whose U.S. output was 64% trucks in 2003, exactly the opposite of the 1990 ratio. The ratio of trucks to cars from Ford and Chrysler was even higher. Ford's Explorer continued to register strong sales despite a safety controversy over rollovers and Firestone tires; trucks represented 74% of Ford's U.S. output in 2003. Chrysler dedicated almost 80% of its U.S. production in 2003 to the light truck segment. In particular, as both Big Three and Japanese-based companies struggled to launch models competitive in the minivan segment that Chrysler invented, "Chrysler dominated the market for minivans from 1984 until the late 1990s, capturing half the total sales."⁴⁴ Overall, according to a study prepared for the Alliance of Automobile Manufacturers, light trucks, including SUVs, now account for around 60% of total U.S. motor vehicle production of cars and light trucks (including the output of both the Big Three and foreign-based manufacturers).⁴⁵

⁴² CRS Report RL32179. See the section on "Automobiles and Light Trucks," by M. Angeles Villarreal, pp. 24-30 and Fig. 6.

⁴³ Brinkley, *Wheels for the World*, p. 593.

⁴⁴ Charles K. Hyde, *Riding the Roller Coaster: A History of the Chrysler Corporation* (Detroit: Wayne State University Press, 2003), pp. 265-269.

⁴⁵ Alliance of Automobile Manufacturers, *Economic Contribution of the Automotive Industry to the U.S. Economy — An Update* (Fall 2003), p. 3, cited in CRS Report RL32179, p. 25.

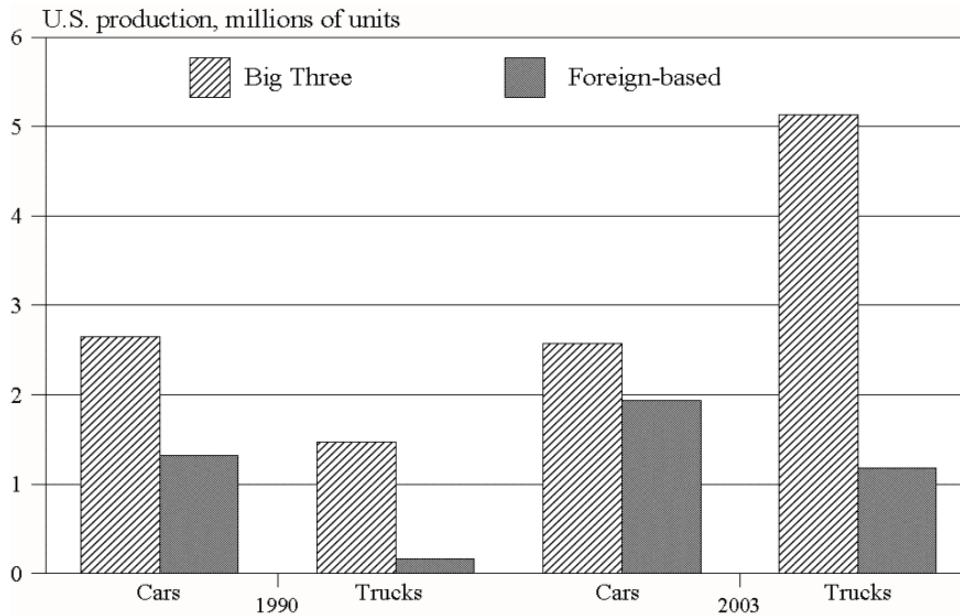
Figure 7. U.S. Car and Light Truck Production by Manufacturer

Source: *Automotive News Market Data Book*.

* Chrysler was acquired by Daimler-Benz in 1998, and is a subsidiary of DaimlerChrysler AG

By contrast to the Big Three, foreign-based producers have developed a strong position in the U.S. car market, and now account for 43% of all passenger car production at their U.S. transplant facilities; see **Figure 8**, which compares Big Three and transplant total car and light truck sales. (As will be shown below, foreign-based companies actually sell a majority of the cars sold in the U.S. market, when imports are also counted.) Combined transplant car production in 2003, as indicated in **Figure 7**, was greater than that of GM, Ford or Chrysler individually, whereas in 1990 it was only ahead of Chrysler, the smallest of the Big Three in car output. Michelene Maynard, in her book, *The End of Detroit*, documents how Ford successfully developed the Taurus in the mid-1980s, and how it became the leading seller among all car models in 1992-95. But then as the Toyota Camry and Honda Accord were redesigned in the late 1990s, the Ford product declined in sales, and is set to be discontinued.⁴⁶ On the other hand, it should be added that the Big Three have not given up on the passenger car segment. For example, GM has launched new luxury Cadillac models from a modernized plant in Lansing, Michigan; Ford is launching several new models for the 2005 model year, including a completely redesigned Mustang; and, Chrysler has had recent initial successes in launching two new rear-wheel-drive vehicles, the redesigned Chrysler 300 and the Dodge Magnum “sports wagon.”

⁴⁶ Michelene Maynard, *The End of Detroit: How the Big Three Lost Their Grip on the American Car Market* (New York: Doubleday, 2003), pp. 43-54. Significantly, Brinkley in *Wheels for the World* devotes a full chapter to the successful development and launch of the Taurus, but fails to note the model’s subsequent unsuccessful redesign and decline in sales; see pp. 696-714, 727.

Figure 8. Total Car and Truck Production by Company Type

Source: As for Figure 7.

However, foreign-based motor vehicle manufacturers have not been content only to gain increasing shares of the car segment. They have also rolled out new products from their domestic U.S. production facilities to challenge the Big Three in the light truck segment. By 2003, transplant production of light trucks had reached 14% of total U.S. light truck output (see **Figure 8**), and every indication is that they intend to compete vigorously in that segment. Mercedes Benz specifically designed its Alabama plant to inaugurate production of its first SUV, the new “M-class.” BMW introduced its “sports activity” vehicles into production at its South Carolina plant. Honda now builds its Odyssey minivan at a new Alabama plant, and is adding production of its Pilot SUV there. Toyota builds a wide range of light truck vehicles in its U.S. plants, and is planning to build its first full-size pickup truck at a new plant in San Antonio, Texas. Nissan has introduced its own full-size pickup, the Titan, along with other light truck products at a new plant in Mississippi.⁴⁷

Shifts in Employment Among Companies

A generation ago, the U.S. automotive manufacturing industry was dominated by the domestic Big Three, integrated, unionized nameplate assembly companies, located, with their suppliers, predominantly in a Midwest “Auto Belt,” with branch assembly plants around the country. Today, that structure has been significantly modified.

The number of U.S. automotive manufacturing employment workers directly employed by the Big Three has declined substantially since the early 1980s,

⁴⁷ Some of these plans are reviewed by Chappell, “Transplants’ Changing Faces.”

especially at GM and Ford. As of 1979, the Big Three together employed almost one million persons in the United States: 618,000 at GM; 240,000 at Ford; and 109,000 at Chrysler. GM also employed 39,000 persons in Canada and Ford employed 18,000 there; they may be considered as integrated with domestic U.S. production. In addition, 28,000 persons were employed by American Motors in the United States and Canada, so the total employed by U.S.-based nameplate manufacturers was more than one million in the two countries.⁴⁸

The 1980s witnessed a dramatic downsizing of Big Three employment, especially domestically. The rise of imports and the recession of the early 1980s resulted in much lower Big Three production and large-scale layoffs. Employment levels did not recover to pre-recession levels after prosperity returned to the domestic industry. By 1990, GM had shed more than half its total number of U.S. employees, with a total of 279,000 listed in its annual report of that year. Ford and Chrysler each reduced domestic employment by about a quarter; to 181,000 for Ford, and 79,000 for Chrysler.

As shown above, the production focus of the Big Three shifted to the light truck market in the 1990s, and particularly to the SUV and minivan segments. But this did not prevent a further substantial decline in direct employment levels, despite a decade of strong market growth. As also noted earlier, GM and Ford both downsized especially by spinning off major parts operations in the late 1990s. The location breakouts reported in corporate annual reports are not consistent over time, but for 2000, GM reported total North American automotive employment of 212,000, compared to 365,000 on a similar basis ten years earlier. For 2003 the total employment level reported for North America for GM automotive operations was down to 190,000. Ford's total reported decline in 1990-2000 in U.S. employment was smaller, to 163,000, but this still included some employees being shifted to the newly spun off Visteon Corporation in the latter year. By 2003, Ford reported total North American automotive employment as only 122,000.⁴⁹

Chrysler's story is more complicated, both because of its acquisition of American Motors (AMC) in the 1980s, and its merger with Daimler Benz in 1998 to form DaimlerChrysler (DCX). But it seems probable that it has also downsized, though by a lesser number. Annual reports indicate that the combined Chrysler and AMC totals in 1979 were 162,000 employees worldwide (mainly U.S. and Canadian). The Chrysler worldwide total was 110,000 in 1990 (the latter would mainly represent both Chrysler's automotive operations and those it acquired with AMC in the United States and Canada). The Chrysler Group of DaimlerChrysler (DCX) reported a total of 93,000 employees for 2003, primarily in the United States, and total DCX employment for the United States was 102,000.⁵⁰

⁴⁸ These figures are taken from 1979 annual reports of the Big Three, plus American Motors. Chrysler indicated that it employed an additional 25,000 persons outside the United States, but did not specifically break out data for Canada.

⁴⁹ Ford annual reports, 1990, 2000 and 2003; GM annual report, 1990 and U.S. Securities and Exchange Commission annual 10-K report, 2000 and 2003.

⁵⁰ Chrysler Corp. annual report, 1990; DCX annual reports, 2000 and 2003; American Motors annual report/10-K filing, 1986.

From about one million Big Three employees in the United States and Canada in 1979, the level has thus declined to about 400,000 by 2003, or a net fall of almost 600,000 jobs. Not all of the jobs were simply eliminated. Some of them were transferred to spun off or independent supplier companies.

How many of these jobs have been replaced by new transplant investments? The Japanese Automobile Manufacturers Association (JAMA) reported that their members employed more than 56,000 U.S. workers at 20 “manufacturing plants” in 2003. JAMA further states that, “Japanese automakers now supply 64% of their total U.S. sales from their North American plants, compared with less than 12% in 1986.”⁵¹

A more comprehensive figure for the United States is provided by BEA. According to its foreign investment data, the total number of persons employed by foreign-affiliated manufacturers of motor vehicles, bodies and parts (NAICS 3361-62-63) was 328,000 in 2002, as reported in that year’s benchmark survey of inward foreign investment. This compares with 188,000 in the 1997 benchmark, and 58,000 (on the basis of SIC 371) in 1992. However, most of the net gain in 1997-2002 is presumably due to the DCX merger, and the Chrysler Group is not counted in the industry as a transplant. Chrysler Group’s employment total was 95,000 in 2002, including some employees in Canada and Mexico, meaning that only about 50,000 of the net 1997-2002 increase of 140,000 employees of foreign-affiliated automotive companies was due to employment expansion by other manufacturers. Another feature of this data is the “primary line of business rule,” which means that foreign-owned companies with multiple U.S. operations need report all their corporate data under only one line of business. Thus, foreign automotive companies with both importing and manufacturing operations in the United States may report their investment data, not as manufacturing, but as “wholesale trade — motor vehicles and motor vehicle parts and supplies.” In 1992, this item added 71,000 employees to the total for U.S. affiliates of foreign companies in the motor vehicle industry, or more than the 58,000 reported as working in motor vehicle manufacturing. In 1997, the motor vehicle wholesale activities business number went up to 88,000, but in 2002 it declined to 54,000 (implying that the primary line of business for some foreign companies may have shifted from importing to manufacturing). This number could be added to the total for motor vehicles and parts manufacturing.

The net result would be that perhaps about 287,000 persons worked for foreign-affiliated automotive companies (excluding Chrysler) operating in the United States in 2002.⁵² This number may be compared to the approximately 1.1 million persons

⁵¹ JAMA. *Growing Investment and Employment in America* (2004), pp. 2 and 7.

⁵² U.S. Department of Commerce. Bureau of Economic Analysis (BEA). “Operations of Foreign Affiliates in 2002: Preliminary Results from the Benchmark Survey,” *Survey of Current Business* (Aug. 2004), Tab. 19.2; “Foreign Direct Investment in the U.S.: Financial and Operating Data for U.S. Affiliates of Foreign Multinational Companies — Final 1997 Estimates and Revised 1992 Estimates,” at [<http://www.bea.gov>]. Data on employment by Japanese-based auto companies, Chrysler and DCX are from proprietary private sources, and may not be compatible with BEA survey-reported data. The Association of International Automobile Manufacturers in March 2005 released *The Contribution of the*

working in the United States in the automotive manufacturing industry in 2003 (NAICS 3361-62-63), as reported in **Table 1** of the present report. This would mean that roughly a quarter of those who work in some aspect of automotive manufacturing now work for foreign-affiliated companies (again excluding Chrysler).

Changes Among States in Automotive Employment

Table 2 illustrates how the changes in automotive manufacturing employment, including the arrival of transplants, have affected the distribution of auto industry jobs among the leading states in automotive employment. It compares the changes in levels of employment ascribed to automotive manufacturing industry categories, as measured in the BLS county-level Quarterly Census of Employment and Wages, a report based on company filings of unemployment compensation premiums.

The table compares state automotive industry employment levels in 1979, near the peak U.S. automotive manufacturing employment peak year, with the levels of 2003, after two years of economic recovery from the 2001 recession. SIC 371 and NAICS 3361-3362-3363 data are used for 1979 and 2003 respectively. As noted earlier, with respect to **Figure 3**, this may result in an undercounting of employees working in automotive manufacturing in the earlier year, especially in auto parts businesses. The undercount could be as high as 25%, and may mean that state losses in this industry are actually understated, while state gains are not as high as indicated.

Also, data may not be published when there are only one or two operations, with the risk of disclosing proprietary corporate data. This constraint affected mostly NAICS 3361 data, motor vehicle assembly, in 2003. In **Table 2**, the non-disclosure issue affected data from three states, Tennessee, South Carolina and Wisconsin. Other states affected by the data disclosure restriction do not appear to have enough automotive employment to move into the upper tier of auto industry employment shown in the table, regardless of the missing numbers.

Table 2. Leading States in Automotive Employment

State	2003 Rank	Total employees, 2003 Naics 3361-62-63	1979 Rank	Total employees, 1979 Sic 371
Michigan	1	269,902	1	394,048
Ohio	2	136,399	2	119,947
Indiana	3	125,367	3	67,225
Kentucky	4	53,096	14	14,262
Illinois	5	41,120	9	28,551
California	6	40,546	4	49,532
Tennessee	7*	38,040	13	14,747
Missouri	8	36,896	6	38,760
Texas	9	28,901	11	16,298
New York	10	28,623	5	41,814
North Carolina	11	26,907	15	10,879
Georgia	12	21,781	10	18,778
Alabama	13	21,136	19	8,061
South Carolina	14*	20,717	34	1,471
Pennsylvania	15	20,702	8	32,489
Wisconsin	16*	19,319	7	33,425

Source: U.S. Department of Labor. Bureau of Labor Statistics. "Quarterly Census of Employment and Wages," viewed on [<http://www.bls.gov>] (Oct. 21-22, 2004).

* 2003 total excludes non-disclosable data.

The most striking change is the apparent loss of auto industry-related jobs in Michigan. It is still by far the leading state in terms of auto industry employment, but experienced a decline of at least 125,000 employees between 1979 and 2003 in automotive-related industries. Michigan not only ranked first among all states in automotive employment in 1979, but accounted for 43% of all employment counted under SIC 371. Though still the leader under the corresponding NAICS categories in 2003, Michigan's share was down to 23%. Also, late 2004 estimates provided by *Ward's*, an auto industry data source, indicate that in 2004 Michigan will be passed for the first time by Ontario as the largest auto-producing regional jurisdiction in North America. Ontario was estimated to produce 2.7 million vehicles in 2004, compared to 2.6 million from Michigan. Ontario would show a gain of about

600,000 from 1994, compared to a decline of 800,000 in Michigan over the same period.⁵³

Other midwestern “auto belt” states were not as severely affected. The number two state from 1979, Ohio, gained about 17,000 jobs, from 119,000 to 136,000, though the gain could be a statistical artifact, caused by the switch from SIC to NAICS-based data. On the other hand, Marysville, Ohio, is the site of the Honda assembly plant, which in 1979 was the first transplant manufacturing operation established in North America by a Japanese automotive company. By 2003, Honda employed more than 14,000 workers there and at other assembly, engine and transmission plants in Ohio. Indiana, which ranked third in auto-related employment in both 1979 and 2003, apparently gained the most auto-related jobs between the two years. It nearly doubled its total, from 67,000 to 125,000. Indiana also has seen the establishment in recent years of two major assembly plants by Japanese-owned companies, a Toyota truck plant in Princeton and the Subaru plant in Lafayette.⁵⁴

Thomas Klier of the Federal Reserve Bank of Chicago has analyzed job loss in the automotive industry on a shorter term basis, since the year 2000, in these three states. His data, based on the same source used in **Table 2**, plus industry data, also show that the most severely affected state is Michigan. He found that Michigan in 2000-03 lost 15% of its automotive assembly jobs, and more than 20% of its automotive parts employment (60,000 jobs in three years). Combined employment declines since 2000 in Ohio and Indiana in automotive assembly operations were somewhat less than in Michigan: 11.4% in assembly operations and 15% in parts, or a combined total of 35,000 jobs. These three states accounted for most of the net decline in employment nationally in assembly operations, as the net loss in the other 47 states was only 3.3% during the period. In parts, the net decline in employment in the rest of the country was more proportionate, 10.7%. However, when Klier reviewed this same data from a different source, plant-level data, the conclusion was that the major employment losses in the automotive supply industry were largely among “captive” suppliers owned and operated by the Big Three. Klier linked the loss of automotive industry employment in these three states primarily to the loss of market share by the Big Three.⁵⁵

Among other midwestern “auto belt states,” Illinois also showed a net increase in **Table 2**, from 29,000 to 41,000. However, this net increase in both states again could be explained by the shift from an SIC basis to NAICS. The only midwestern state besides Michigan to post a major decline in auto industry jobs was Wisconsin, which fell from seventh in 1979, with more than 33,000 jobs, to sixteenth in 2003. Its total of less than 20,000 employees in the industry by the latter date does exclude NAICS 3361 assembly operations, but the major presence in this category, the AMC plant in Kenosha, was closed by Chrysler soon after its acquisition of the smaller

⁵³ Brian Dunn, “Ontario to Top Michigan in ‘04 Auto Production,” *American Metal Market* (Dec. 3, 2004), p. 5.

⁵⁴ Honda’s Ohio plant was originally a motorcycle manufacturing operation. JAMA, p. 3 chart summarizes 2003 data for statements about transplant activities in this section.

⁵⁵ Thomas Klier, “Caution Ahead — Challenges to the Midwest’s Role in the Auto Industry,” *Chicago Fed Letter*, no. 211 (Feb. 2005).

competitor. Missouri also registered a small decline in **Table 2**, and fell two places, from sixth to eighth, in state rankings.

The biggest relative gainers in automotive industry employment were several southern states, beneficiaries of increasing production in the South, particularly by transplants, but also to some degree, by the Big Three. Kentucky, already the home of a Ford truck plant in Louisville and the Chevrolet Corvette manufacturing plant in Bowling Green, moved dramatically up the table of automotive manufacturing states with the establishment of the Toyota plant in Georgetown, which produces vehicles on the Camry, Avalon and Solara platform, as well as engines. With a head count of more than 7,000 employees, it is the largest single transplant operation in the United States. By 2003, Kentucky had moved up from thirteenth to fourth in automotive employment, counting more than 50,000 employees. Tennessee would probably rank next, if the employees at assembly plants established by Nissan in Smyrna and GM Saturn in Spring Hill in the 1980s, which together employ more than 7,000 persons, were added to the total of 38,000 shown in **Table 2**.

There are a group of southern states on the fringe of the top ten, which showed employment gains. Texas is ninth, and will get a boost from the new Toyota truck plant in San Antonio. Georgia fell slightly in rank, from tenth to twelfth, although it showed a net small job gain to more than 21,000 employees. It has long-established Ford and GM plants in the Atlanta area. DCX had planned a new commercial van plant near Savannah, but cancelled the development in 2003.⁵⁶ North Carolina is not known for major assembly plants of cars and light trucks, but has a sufficient diversity of automotive industries to advance to eleventh from fifteenth, having added 16,000 new automotive jobs.⁵⁷ Alabama moved from nineteenth to thirteenth, and is poised to advance further. Besides the Mercedes Benz M-Class plant in Vance, Honda has opened a minivan and engine plant in Lincoln, where it is planning to more than double employment in the near future.⁵⁸ Meanwhile, Hyundai is returning to North American manufacturing as it builds a new multi-product plant near Montgomery.⁵⁹ South Carolina has also become a significant player, moving from thirty-fourth to fourteenth in state rankings, even without counting more than 2,000 employees at the BMW assembly plant in Greer, who are not included in the BLS data.

Before writing the analysis noted above, Thomas Klier had also found that, even in a system of “just-in-time” manufacturing, “having suppliers located in the immediate vicinity of an assembly plant is not necessary to maintain a system of tight linkages and low inventories.” Rather, he found that a larger radius — about 400 miles, or the equivalent to one day’s delivery time by truck, was sufficient for the purpose of supplying assembly plants. Early transplant location decisions, not only

⁵⁶ “DaimlerChrysler Drops Truck Plant,” *Wall St. Journal* (Sept. 24, 2003), p. A11.

⁵⁷ Freightliner trucks and Thomas Built buses are also manufactured in North Carolina; “UAW Scores a Touchdown at Thomas Built,” *Solidarity* (May-Jun. 2004).

⁵⁸ See also, Lindsay Chappell, “Honda Adds N.A. Capacity,” *Automotive News* (May 3, 2004), p. 6.

⁵⁹ See entry in *Automotive News* summary, “Transplants’ Changing Faces” (June 14, 2004).

Honda in Ohio, but also Toyota in Kentucky and Nissan in Tennessee, were essentially within this delivery distance for most midwestern suppliers, even though they may have stretched the definition of the auto belt to the south. Thus, Klier in 1999 defined the principal location of U.S. automaking, including the transplants, as “reconcentrating” from dispersed locations around the country to the I-65/I-75 interstate corridors.⁶⁰

A reconcentration of the industry along the I-65/I-75 corridor has particularly led to a loss of auto industry jobs in the industrial Northeast, as seen in **Table 2**. New York fell from fifth to tenth in industry rankings, with a loss of 13,000 employment positions; Pennsylvania declined from eighth to fifteenth, with a loss of 12,000 jobs; New Jersey, not shown in the table, declined from nearly 15,000 employees in 1979 to a little more than 2,000 in 2003, plus at least one remaining uncounted assembly plant. California also suffered from this trend, as it lost 9,000 auto industry jobs, as shown in **Table 2**, and declined in the ranking from fourth to sixth (probably seventh, in view of Tennessee’s unreported numbers in vehicle assembly employment).

In a later presentation to a Chicago Federal Reserve Bank conference on manufacturing in the Midwest, Klier noted that more recent location decisions stretched his auto belt geography farther to the south and west.⁶¹ Nissan has located a large new plant in Canton, Mississippi, near I-55, off the edge of the one-day trucking corridor described by Klier. Moreover, the new Toyota full-size truck plant — located in the Texas customer base for such vehicles (San Antonio) — discards the corridor location model altogether. Nissan has addressed this issue by developing an industrial park at the site of its Mississippi facility, and requiring designated “Tier 1” (direct) suppliers to locate there; Toyota is considering the same option in Texas.⁶²

On the other hand, there are also some counter-trends. Most transplant-owned supplier locations continue to be in or near the I-65/I-75 corridor (exemplified by the Toyota-owned engine block plant in St. Louis, its engine and transmission plants in West Virginia and Huntsville, Alabama, only a few hours’ drive from Georgetown, Kentucky, and Nissan’s recent decision to expand its engine plant in Decherd, Tennessee). Also, companies have found that they can manage the logistics of just-in-time manufacturing from more distant and disparate suppliers through a trucking

⁶⁰ Thomas H. Klier, “Agglomeration in the U.S. Auto Supplier Industry,” Chicago Federal Reserve Bank *Economic Perspectives*, XXIII:4 (1st qtr., 1999), pp. 18-34. Location decisions by Toyota and Honda in Ontario also fit this pattern. Klier did note that foreign-owned auto parts suppliers tended to locate closer to transplants than domestic suppliers. Also, industries might move to the South for other reasons, including lower operating and energy costs, cheaper land for greenfield investments, and location incentives.

⁶¹ Thomas H. Klier, “Midwest Auto Industry — Performance and Outlook,” presentation at *Is Midwest Manufacturing at a Crossroads?* Federal Reserve Bank of Chicago (Sept. 30, 2003).

⁶² U.S. International Trade Commission (ITC). *Industry Trade and Summary: Motor Vehicles* (USITC Pub. 3545, Sept. 2002), p. 10. Comments from Nissan and Toyota officials during plant visits in Smyrna, TN, and Georgetown, KY., Feb. 17-18, 2004.

relay system, known as “cross-docking.”⁶³ Nevertheless, the conclusion of Klier remains that the “risk for the upper Midwest” is that, “future Big Three capacity reductions will disproportionately impact the northern end of the auto corridor.” In view of recent Big Three contract decisions, he believes that such continued capacity reductions are likely.⁶⁴

Divergence in Labor Relations Organization

Whatever the impact of recent developments in the location of auto manufacturing on state and regional employment levels, there can be no question but that employment trends in recent decades have been adverse for union membership, and specifically for the UAW. According to a 2004 press report, “The UAW’s active membership dropped to 624,000 at the end of 2003 — the lowest level in more than six decades and down from a peak of 1.5 million in 1979.”⁶⁵ The same source contains a chart showing that this decline has not abated in recent years, as the latest annual total compared to more than 762,000 members in 1999 and 702,000 at the end of 2002.

This decline is not isolated from developments in other industries, where union membership — both absolutely and as a share of employees in industry sectors — has tended to fall since the early 1980s.⁶⁶ The overall decline in total membership may be seen as an aspect of productivity gains and the steady decline recorded in the U.S. automotive industry of the hours required to build a motor vehicle — and, thus, a relative decline in production workers on the factory floor. But productivity alone cannot explain the relative fall in the share of employees who are unionized in an industry.

While the unionized Big Three have downsized, the unions have been generally unable to organize transplant operations. The ITC’s 2002 report on the motor vehicle industry cites three organizing failures at Nissan’s plant in Smyrna, Tennessee, and other failures in recent years at Honda in Marysville, Ohio; Toyota in Georgetown, Kentucky; and, Mercedes Benz in Tuscaloosa (Vance), Alabama. The ITC report also cites the organizing successes of the UAW — all, as noted earlier in this report, at assembly plants linked to the Big Three.⁶⁷ Overall, BEA foreign investment data indicate that 33.7% of employees of majority-owned U.S. automotive products affiliates of foreign companies were represented by unions in 2002, for a total of more than 110,000 organized workers.⁶⁸ However, as of 2002, Chrysler Group alone

⁶³ ITC. *Motor Vehicles*, pp. 9-10. Robert Mottley, “Henry Ford Would Be Horrified,” *American Shipper* (June 2004), p.8.

⁶⁴ Klier, “Midwest Auto Industry.”

⁶⁵ E. Mayne, “UAW Slashes Staff, Travel to Cut Costs,” *Detroit News* (Jun. 22, 2004), p. 1.

⁶⁶ See CRS Report RL32179, pp. 9-10.

⁶⁷ ITC. *Motor Vehicles*, pp. 7-8.

⁶⁸ BEA. *Survey of Current Business* (Aug. 2004), p. 205, Table 10.

possibly accounted for the majority of these union members, as it reported that its UAW union contract covered 58,000 employees.⁶⁹

Womack *et al.* present the view in *The Machine That Changed the World* that union organization of the work force, in both the United States and abroad, is an artifact of old style mass production in the motor vehicle industry. The nature of the organization and quality of work under “Fordism” led to a stratification of factory operations, with little opportunity for advancement by production workers in terms of skill development or possibility of achievement of management positions. Consequently, the critical determinant of worker advancement and security became purely a matter of seniority, with the union as the buffer between workers and management on issues such as contract terms and disputes within a highly formalized system of work rules.

Such a system was considered unacceptable in the context of “lean production” as it evolved in Japan, and then was transferred by Japanese companies to the United States and Canada in transplant operations. Key features of the system became known throughout the automotive manufacturing world by their Japanese names, such as *kaizen* (continuous improvement), *andon* (ability of a single worker to stop an entire production line when a quality problem is observed), and *kanban* (“just-in-time” inventory management). The MIT team who wrote *The Machine That Changed the World* reported that Toyota, author of lean production in its most refined form, the “Toyota Production System” (TPS), studied Big Three methods in the 1940s and 1950s, and concluded that smaller market volumes and higher material costs in Japan would not support the inventory methods and rates of product reworking that were observed in Big Three management of production and inventory control. Toyota, Honda and other leading Japanese manufacturers concluded that they needed tighter control of quality throughout the manufacturing process and even beyond — from customer order to supplier relations to order fulfilment. They also needed a system of “flexible manufacturing,” which enabled them to alter production output among different models and to introduce new models off existing platforms in a fashion that was faster, more efficient and less costly than Big Three retooling and design procedures. In all facets of lean production as operated by the Japanese companies and their competitors, a key element is a closer and more continuous relationship between engineers and production staff — at both assembly operations and parts suppliers — than was considered possible in a bifurcated union-management dichotomy in the mass production system.⁷⁰

Many representatives of the Big Three and the UAW today challenge such an analysis. The Big Three have become highly sensitive about plant visits, being concerned that they actually originated many TPS and lean production techniques, which were then copied by the Japanese companies. The Japanese companies learned from the Big Three, some representatives say, when the Big Three opened

⁶⁹ DaimlerChrysler 2002 annual report, p. 50.

⁷⁰ This analysis is based on Womack *et al.*, *The Machine That Changed the World*. See esp. the comments on pp. 40-43 and 252-253 on the evolution of the union role in automotive mass production, and the UAW response to the transplants and the lean production model. On mass production and worker organization in Europe, see pp. 227-235.

their factories and were candid in discussing technology application issues.⁷¹ But a study by the Harbor automotive consulting organization, which surveys plant efficiencies every year, reportedly found in June 2004 that manufacturing inefficiencies contributed to an average loss by Ford of \$48 on every vehicle that it produced in North America, while Nissan, the industry leader, had a profit of \$2,402 per vehicle, and Toyota followed with a profit of \$1,742.⁷²

The UAW has been skeptical about the goals of “flexible” manufacturing, the outsourcing of parts and components by nameplate manufacturers, and other Big Three work reorganization tactics, which reduce reliance on the centrally organized workforce and workplace practices that have been developed over time through collective bargaining agreements. A recent report by the International Metalworkers’ Federation argued that “flexibility” is a codeword for the global industry’s “deregulation agenda,” aimed at reducing regulations designed to protect the public interest, as well as workers’ interests, in health and safety, wages, and working conditions.⁷³ This concern has been amplified as the UAW reacted to the downsizing in employment at the core automaking activities of the Big Three, the outsourcing of parts and components to spun-off or third-party manufacturers and the continued market pressure from non-union foreign-based companies.

UAW-Big Three contracts are multiyear agreements based on pattern negotiations, typically after the union has selected a specific target employer for each new industry contract. The most recent contracts were signed in 1999 and 2003. The UAW has focused in recent contract negotiating rounds on job security, as well as security of defined benefits as included in union contracts, while conceding the necessity for the Big Three to close plants and downsize the workforce in view of technological change, as well as changes in product market share.⁷⁴ Recent contract agreements with the Big Three addressed the UAW concerns that in-house sourcing of new work is being given inadequate consideration by management. “The union may at any time appeal any sourcing grievance to an umpire ... [who] is empowered

⁷¹ See quote from former CEO Philip Caldwell of Ford in Brinkley, *Wheels for the World*, p. 588. This view led to a general closure of Big Three plants to outside visitors. It was only recently reversed by Ford CEO William C. Ford, Jr. He has wanted to make Ford’s new truck plant on the River Rouge site a model of environmentally and ergonomically progressive industrial engineering: “I would like the Rouge again to be the most copied and studied industrial complex in the world.” (*Ibid.*, p. 746). In the “Motor City” region of Detroit and southeast Michigan, it is the only automobile factory that tourists can visit today, unlike some transplant operations, which welcome tourists (the BMW plant in Greer, South Carolina, has included a company museum, theater and gift shop on the site for several years).

⁷² Bill Koenig, “Ford to put \$300 Million in Michigan Truck Plant,” *Detroit Free Press* (Dec. 16, 2004).

⁷³ International Metalworkers’ Federation. *Auto Report 2004* (presented to UAW, June 2004), pp. 19-22.

⁷⁴ A summary of key issues with each of the Big Three in the 2003 agreements is reported in CRS Report RL32179, pp. 28-29. Comprehensive analyses of employment benefits and economic security gains are presented in *UAW Ford Report*, *UAW GM and Delphi Report*, and *Newsgram: UAW DaimlerChrysler Hourly workers*, all dated Sept. 2003.

to make the union whole if he or she finds the company violates the contract, even if there are no layoffs as a result of the sourcing violation.”⁷⁵

The UAW has also sought to minimize enrollment losses as the Big Three have downsized their core automaking operations. One approach has been to use “card checks,” by which companies agree to recognize and bargain with a union whenever a majority of workers has signed union recognition cards. Card checks are generally considered easier and cheaper for unions to organize than a formal election under National Labor Relations Board (NLRB) auspices, as well as being more reliable in terms of the anticipated result. GM, along with Delphi, in the 1999 and 2003 contract negotiations, agreed to allow a “card-check recognition process” in determining representation at manufacturing facilities. They further agreed to inform suppliers of their “positive and constructive relationship” with the UAW, in order to signal that Big Three companies are not seeking to move sourcing to non-union shops, or to discourage union organization of suppliers.⁷⁶

The use of card checks has been challenged before the NLRB, as the UAW has sought to regain membership by organizing supplier plants. The UAW had gained recognition through use of card checks at plants operated by two auto supplier companies, Dana Corp. and Metaldyne Corp. But some workers at the plants petitioned to decertify the UAW, on the grounds that card checks do not constitute a secret ballot on union representation, as guaranteed under the National Labor Relations Act. By a 3-2 vote, reportedly on political party lines, the NLRB on June 7, 2004, decided to take a “critical look” at whether the process of card checks with management neutrality agreements constitute a fair system in determining whether employees desire a union. UAW president Ron Gettelfinger has said that he does not believe that the NLRB will overturn the widespread practice of card checks.⁷⁷ However, the UAW has suspended organization of a local at a foreign-owned North Carolina bus manufacturing plant, where it had succeeded in gaining recognition through a card check, in order to avoid being accused of acting prejudicially while the NLRB is investigating the issue.⁷⁸ On the other hand, on April 8, 2005, an NLRB administrative law judge dismissed complaints by several workers and the national Right to Work Legal Foundation that an agreement between the UAW and Dana at a Michigan plant constituted an illegal “pre-recognition” agreement between management and the UAW prior to any decision by employees to choose the union as their collective bargaining agent. This decision is subject to appeal.⁷⁹

⁷⁵ *UAW Ford Report* (Sept. 2003), p. 13.

⁷⁶ *UAW GM and Delphi Report* (Sept. 2003), p. 3.

⁷⁷ *Automotive News*, “NLRB May Stifle UAW’s Efforts to Grow,” (June 14, 2004) and “Gettelfinger Not Worried About Card-Check Decision,” (June 28, 2004).

⁷⁸ *Detroit Free Press*, “UAW Yields to Organizing Protest, Awaits Vote” (Feb. 26, 2005).

⁷⁹ NLRB Decision JD-24-05 (Apr. 8, 2005); Mary-Beth McLaughlin, “Key Union Tactic at Dana Plant Is Upheld,” *Toledo Blade* (Apr. 16, 2005); “Labor Relations Board Upholds UAW Neutrality Agreement with Dana,” UAW press release (Apr. 15, 2005); “Statement of National Right to Work Foundation on Preliminary Upholding of UAW Union ‘Neutrality Agreement’ with Dana Corp.,” press release (Apr. 15, 2005).

Legislation was introduced in the 108th Congress that would specifically have allowed representation to be determined by card checks and would increase penalties for employers that interfere in attempts to unionize. The bill, entitled, the “Employee Free Choice Act,” was introduced on November 21, 2003, in the House by Representative George Miller, and gained 207 cosponsors. A companion bill was introduced in the Senate on the same day by Senator Edward Kennedy, with 36 cosponsors. Congress took no action on either measure. In an August 2004 interview, AFL-CIO president John J. Sweeney indicated that the legislation was a priority for the labor movement, and was supported by the Democratic presidential and vice-presidential candidates.⁸⁰ This legislation has not been reintroduced in the 109th Congress.

Another issue that has been contested in automotive industry labor-management relations is modularization, which has been utilized by motor vehicle manufacturers in an effort to improve efficiency, while reducing their upfront costs. But it has been considered as a form of outsourcing and, therefore, controversial to the UAW.

Modularization was pioneered by Volkswagen in South America, particularly at a new bus and truck factory that the company built in Brazil. VW did not build or operate the factory alone: key suppliers not only manufactured complete component systems on site, but also invested directly in the parts of the complex that they operated.⁸¹ The ITC report notes that modularization was derived from studying how Dell revolutionized computer manufacturing and contrasts it with “traditional” assembly line manufacturing as follows:

Although the traditional model for auto manufacturing is to have the vehicle move down an assembly line as components are installed piece by piece, modular assembly shifts a large portion of the supply chain management and component integration responsibility to Tier 1 suppliers, which deliver a complete module — *e.g.*, a cabin cockpit fitted with instrument clusters, airbags, audio equipment, and wiring — to the automaker. Studies have reportedly shown that outsourcing of basic parts assembly to module producers could save automakers as much as 20% on production costs.⁸²

Modularization may remove the nameplate assembler from directly manufacturing much of the product; it becomes rather the marketer, coordinator and distributor of the final vehicle. Notwithstanding that the VW experiment in Brazil was not highly successful in terms of productivity or product quality, it spawned imitations locally, perhaps due to local labor conditions, and then in North America.⁸³ The ITC notes that GM attempted to bring the concept to its new Lansing Grand

⁸⁰ *Washington Post*, “AFL-CIO Sets Its Sights on a Kerry Victory” (Aug. 25, 2004), p. E1.

⁸¹ Alice Abreu, Huw Beynon and José Ricardo Ramalho, “‘The Dream Factory:’ VW’s Modular Production System in Resende, Brazil,” *Work, Employment & Society*, XIV:2 (2000), pp. 265-82. Interestingly, the article notes that the VW plant at Resende has not been especially successful in terms of productivity, when compared with other automotive operations.

⁸² ITC, *Motor Vehicles*, pp. 13-14.

⁸³ Abreu *et al.*, “Dream Factory,” p. 272, 277-80.

River Cadillac factory, but UAW opposition may have discouraged implementation of the “supplier-next-door” concept, although not the installation of complete modules received from suppliers.⁸⁴

Chrysler is making the boldest step so far to establish modularization at a union-represented North American site. It is building a new Jeep plant on the site of one of its oldest factories, in Toledo, Ohio. Chrysler is investing about \$900 million in the venture, with about \$300 million invested by suppliers that will build the body and chassis, and paint the vehicles, on site. Out of a planned 4,000 production workers, drawn mostly from currently laid off auto workers, about 40% will be directly managed and employed by the suppliers. The UAW local has agreed to this arrangement, and is negotiating separate contracts, with different rates of pay and benefits, with the suppliers.⁸⁵

Modularization does not yet appear to be accepted as the inevitable next evolutionary step in North American automotive manufacturing. At a 2004 conference, for example, a Toyota executive answered a question about “modular assembly” by stating that it is not used by Toyota. Since his company, the executive stated, viewed its comparative advantage as being in manufacturing, Toyota prefers to build all major assemblies itself, though sometimes it might assemble them off-site from the final vehicle assembly point.⁸⁶

This report has discussed the decline or slow growth of Big Three production in North America, the link between the Big Three and the UAW, and the relatively rapid growth of non-unionized transplant production. But this is not to imply that international companies investing in the United States have not also experienced mistakes and difficulties in implementing their manufacturing investment decisions.

Nissan’s new factory in Mississippi, for example, experienced a number of problems across its product lines, which caused its product quality ratings by a

⁸⁴ ITC, *Motor Vehicles*, p. 14.

⁸⁵ Jeremy Grant, “Chrysler Rolls Out Assembly Work,” *Financial Times* (Aug. 3, 2004), p. 18; Mark Phelan, “DCX, UAW, Suppliers OK Historic Teamwork,” *Detroit Free Press* (Aug. 4, 2004); “DaimlerChrysler, Suppliers Team Up,” *Detroit News* (Aug. 4, 2004); Sholnn Freeman, “Chrysler to Expand Ohio Plant, In Novel Venture with Suppliers,” *Wall St. Journal* (Aug. 4, 2004), p. 8; James Flanigan, “In U.S., a New Model for Auto Industry,” *Los Angeles Times* (Aug. 8, 2004), p. C1; John Seewer, “Suppliers to Partner with Jeep in Toledo,” *Cincinnati Post* (Aug. 4, 2004), p. B6; Mary Connelly, “Test in Toledo: Can Four Work as One?” and, Ralph Kisiel, “The Past Haunts the ‘Plant of the Future,’” *Automotive News* (Aug. 9, 2004), pp. 1 and 4. Some articles note that, although Chrysler has experience with supplier integration in assembly plant operations in Brazil, the specific DCX precedent for the approach in Toledo is the Mercedes Benz small car manufacturing plant, “Smartville,” in Hambach, France. Mary Connelly, “Zetsche: Haden Looks Like Partner in Toledo,” *Automotive News* (Oct. 11, 2004), p. 26, covers the story that one of the three initial suppliers pulled out of its investment, to be prospectively replaced by another company.

⁸⁶ Robert J. Ried, plant manager of a new Toyota assembly plant in Baja California, Mexico, speaking at the Global Insight “Global Automotive Conference,” Dearborn, MI (Sept. 30, 2004).

respected private authority to decline substantially compared to its competitors. Analysts speculated that the problem lay in overreaching by the company, which sought to introduce new products, in a new-concept plant in a new location, while training thousands of new employees.⁸⁷ Far worse than the problem faced by Nissan is the series of mistakes and problems faced by Mitsubishi. The already-struggling company announced that it had hidden quality and design defects on cars sold in Japan, leading to a public apology, resignation of the CEO, and serious declines in sales and market shares both in the home market and North America. Its affiliate DCX announced that it would invest no more in the ailing Japanese automaker and has begun to reduce its 37% shareholding in the company, despite contracts for development and production of joint platforms and vehicles. The Japanese government and creditors, including the Japanese corporate parent, have stepped in to prevent a complete collapse of the Mitsubishi automotive entity.⁸⁸ Overall, veteran automotive reporter Lindsay Chappell in a recent survey demonstrated that transplants — the “New American Manufacturers” — have had a number of quality problems, ageing product lines with declining profits, and some less than successful North American manufacturing investments. “The days of easy growth are over,” he wrote.⁸⁹

Pension and Health Care Issues

Big Three representatives say that they are unfairly burdened in competing with both imports and domestic production from foreign-based automakers by their own rising pension and health care costs. Though most are non-union operations, the transplants also provide an equivalent level of benefits. But being newer investors in the United States, they do not yet face a burden of health care and other benefit costs, which have accumulated over the decades for the Big Three, as the number of retirees increases. Moreover, the average age of current employees is higher for the Big Three, and health care costs are correspondingly higher. Like some other long-unionized American industries, such as integrated steel mills, the Big Three face aggressive non-union competition less burdened by these costs.

⁸⁷ *Business Week* “Nissan: The Squeaks Get Louder” (May 17, 2004), p. 44; and, “The Way of Carlos Ghosn” (Oct. 4, 2004), esp. p. 54; “Nissan Hustles Engineers to the U.S. — Carmaker Scrambles to Improve Scores for New-Vehicle Quality,” *Automotive News* (June 28, 2004).

⁸⁸ Sarah A. Webster, “DCX Decides It Won’t Bail Out Struggling Mitsubishi,” *Detroit Free Press* (Apr. 23, 2004); “MMC Reels as Daimler Walks Away,” and “Mitsubishi Pledges Support for Car Unit,” *Financial Times* (Apr. 24, 2004), pp. 1 and 8; *FT.com*, “Mitsubishi Motors CEO Steps Down,” and “Crisis at Mitsubishi Motors Deepens,” (Apr. 26, 2004); and, “Mitsubishi Motors’ Rescue Tops \$10 Billion” (Jan. 28, 2005).

⁸⁹ Lindsay Chappell, “Trouble on the Horizon,” *Automotive News* (June 14, 2004), pp. 23-24. See also, “How Honda Is Stalling in the U.S.,” *Business Week* (May 24, 2004), pp. 62-63, and Hyundai’s concerns about maintaining its recently regained quality rating, “Hyundai: Kissing Clunkers Goodbye,” *Business Week* (May 17, 2004), p. 45; and, L. Chappell, “Hyundai Double-Checks Supply Chain as Production Nears at Alabama Plant,” *Automotive News* (Oct. 25, 2004).

GM CEO G. Richard Wagoner, Jr. estimated in 2004 that every GM vehicle built in North America included \$1,400 in health care costs — typically more than the value of the steel in the same vehicle.⁹⁰ In February 2005, he raised this estimate to \$1,525.⁹¹ According to the *Detroit Free Press*, “GM ... has estimated its future retiree health care obligation is \$67.54 billion, but has set aside less than \$10 billion for that obligation. GM provides health care to about 1.1 million people, more than any other corporation in the country.”⁹² With ageing labor forces and retirees now outnumbering active employees, Ford and Chrysler face similar pressures.⁹³ The Automotive Trade Policy Council (ATPC), the joint representative organization in Washington of the Big Three, estimated in 2004 that the overall Big Three average health care costs per vehicle are \$1,220, compared to an average of \$450 estimated for Japanese and other foreign-owned manufacturers. The total Big Three health care bill in 2003 was \$10 billion, compared to an estimated \$1.6 billion for their competitors, ATPC said. In terms of retirees and surviving spouses supported by pension benefits, ATPC estimated that the Big Three support more than 800,000 persons, compared to less than 1,000 now supported by foreign-owned competitors operating in the United States — though that latter number is bound to grow over time, while the Big Three number should peak in the next few years, and then decline.⁹⁴

More recent data in an *Automotive News* article gave even higher estimates and greater discrepancies, based on 2004 data. It stated that GM paid for the health care of 339,000 retirees, accounting for more than two-thirds of GM’s \$5.2 billion spending on health care (and not counting a \$9 billion contribution to a trust fund for health care costs). Ford spent \$2 billion on retiree health care in 2004, and the Chrysler Group spent \$1.3 billion. By comparison, Toyota’s employees in Japan are switched from the company health care plan to a national health care system within two years of retirement; the company is thus responsible currently for retiree health care coverage of only 3,000 persons in Japan.⁹⁵

Furthermore, the Big Three have been locked into multiyear labor contracts that require them to support laid off workers at 95% of salary, plus benefits, for the length of the contract. Under these circumstances, the companies, led by GM, decided not to cut back production and close plants after an economic recession and the September 11, 2001, terrorist attacks threatened growth prospects. They decided to

⁹⁰ “Health Care Costs Burden GM by \$4 Billion, CEO Says,” *Detroit Free Press* (Feb. 11, 2005); a Toyota executive was quoted as saying that health care costs at one of his company’s plants cost his company \$12,000 annually per employee.

⁹¹ ; “U.S. Firms Losing Health Care Battle, GM Chairman Says,” *Washington Post* (Feb. 11, 2005), p. E1.

⁹² Jeffrey McCracken, “Retiree Costs Weigh on Firms: Health, Pension Debts Multiply,” *Detroit Free Press* (May 28, 2004).

⁹³ See also David Welch, “Has GM Outrun Its Pension Problems?” *Business Week* (Jan. 19, 2004), p. 70.

⁹⁴ ATPC, *Contribution of U.S. Auto Industry*, charts 10-14.

⁹⁵ James B. Treece, “Japan’s Health Care Gives Toyota Edge,” *Automotive News* (Mar. 28, 2005), p. 26.

maintain production levels, then heavily discounted their products. At GM this meant incentives of up to \$6,000 per vehicle or interest-free financing for up to 72 months. Ford has also followed a similar strategy in recent years. Chrysler, which has successfully introduced two major new products in 2004, has at least been able to cut back on its incentives. However, even the leading Japanese producers — Toyota, Honda and Nissan — have offered incentives, especially to move some of their older product lines. The consequence has perhaps been positive for the overall U.S. economy, by stimulating vehicle production and purchases, thus offsetting recessionary forces in late 2001 and afterward. But the cost may be overbuilt inventory and production capacity, especially for the Big Three. By the end of 2004, Ford and GM were cutting production and working time. Both were losing money on North American automaking operations, as well as losing market share in both cars and trucks. The issue was seen as especially critical at GM, which has maintained eight separate brand identities (after terminating Oldsmobile in 2000), and whose investment-grade credit rating has become endangered in early 2005.⁹⁶

In the first quarter of 2005, GM issued a profit warning, subsequently announced a \$1.1 billion loss for the quarter, then suspended all further earnings “guidance” for the year.⁹⁷ GM focused attention on the rising cost of health care as a “crisis” and requested that the UAW consider changes in health care coverage to assist the company in resolving its financial problems. The UAW refused to consider a reopening of its contract, though it did state that there might be means of alleviating the problem, without a full-blown renegotiation. For example, its contract with Chrysler had been amended after earlier losses for that company, so that union members picked up some portions of the their health care costs.⁹⁸

The Big Three also have sought assistance from Congress in offsetting their health care costs in their effort to remain competitive. Representatives of the companies met with members of Congress, with the support of the UAW and the United Steelworkers, in an effort to gain tax credits for health care payments for 55- to 64-year-old workers and retirees. They pointed out that corporate tax cuts ultimately approved by Congress in the American Jobs Creation Act, containing tax

⁹⁶ *Business Week*, “GM: A Dangerous Skid” (Nov. 1, 2004), pp. 40-41; and “Running Out of Gas” (Mar. 28, 2005), pp. 29-31; *Automotive News*, “Downsizing Detroit” (Mar. 14, 2005), pp. 1 and 55; *Wall St. Journal* “Ford and GM Lose Ground to Imports: Heavy Incentives Don’t Stem Flight” (Nov. 4, 2004); *Detroit Free Press*, “First Quarter reactions: GM Tries to Make 8 Brands Salable” (Apr. 20, 2005). On GM incentive programs, see K.C. Crain, “GM’s Bold Promos Hit and Miss in 2004,” *Automotive News* (Dec. 6, 2004), p. 43. There is some question as to whether transaction prices have really fallen, or whether GM and Ford have both increased incentives while raising base prices; “Car and Truck Pricing: Despite Deals, Buyers End Up Paying More,” *Detroit Free Press* (Jan. 27, 2005); and, “GM’s Sticker Shock,” *Business Week* (Mar. 7, 2005), p. 50.

⁹⁷ Greg Schneider, “Industry Giant Falling Behind: GM Reports \$1.1 Billion Loss” (Apr. 20, 2005), p. A1; *Bloomberg.com*, “GM Has \$1.1 Bln 1st-Qtr Loss, Withdraws 2005 Forecast” (Apr. 19, 2005).

⁹⁸ *Detroit Free Press*, “UAW Won’t Reopen GM Contract” (Apr. 15, 2005), and “Widening Burden: GM Confirms That Cost of Health Care Is a Crisis” (Apr. 20, 2005); *Automotive News*, “UAW to GM: Go Slow on Health Care” (Apr. 18, 2005), p. 3.

law changes in response to a WTO decision (P.L. 108-357), would do little to assist their firms in competition with foreign-based manufacturers, because of low rates of profit in recent years from domestic manufacturing. Despite an effort by Senators Arlen Specter and John Rockefeller to add such a provision to the legislation, it was not included.⁹⁹ Failing to gain relief in the 108th Congress on this issue, the domestic automotive manufacturers also reportedly held discussions on the issue with representatives of Senator John Kerry's unsuccessful presidential campaign, and have expressed interest in both Senator Kerry's health reform plan and a different approach proposed by Senator William Frist, the Republican Majority Leader.¹⁰⁰

U.S. Automotive Trade: Data and Policy Issues

Growth of Foreign-Based Competition in the U.S. Market

As shown in **Figure 9**, the U.S. consumer automotive market, including cars and light trucks (pickups, minivans and SUVs), has grown moderately over the past 25 years, when considered in terms of total unit sales. From more than 14 million units in 1979, at a then-peak in general manufacturing output and employment, total motor industry sales since 2000 have averaged more than 17 million units per year. The market is cyclical, and it dipped substantially during general recessions in the early 1980s, just before and during the recession of 1990-91 and again, more moderately, during the most recent recession after 2000. Moreover, as also shown in the figure, most of the overall growth in sales has come from vehicles produced by foreign-owned companies, primarily from production at foreign direct investment "transplant" manufacturing operations in North America, rather than from Big Three North American plants.

In 1979, nearly 80% of all consumer vehicles — cars and light trucks — sold in the United States were built by the domestic Big Three manufacturers. Already by that date, imported cars, largely from VW of Germany or the Japanese manufacturers, were making an impact in the market, as they accounted for 26% of sales of cars alone. Imported trucks had a smaller share of the domestic market, but

⁹⁹ Harry Stoffer, "Big Three Ask for Help on Health Care," *Automotive News* (May 31, 2004), p. 3. Legislation was offered as an amendment to the Senate version of the tax bill, by Sen. Specter (printed in *Congressional Record*, May 10, 2004, p. S5166). An exchange of correspondence and analyses on the issue between Sen. Rockefeller and the leadership of the Senate Finance Committee is contained in Sen. Rockefeller's "Dear Colleague" letter of Aug. 9, 2004, and attachments, and "Dear Colleague" letter from Sens. Grassley and Baucus of Sept. 24, 2004, with attachment. No votes were held on the legislation.

¹⁰⁰ *Financial Times*, "Motor Industry Signals Interest in Kerry's Healthcare Proposals" (Oct. 13, 2004); Jason Stein, "GM CEO Likes Health Care Idea," *Automotive News* (Nov. 1, 2004), p. 3. For a pessimistic assessment of the likelihood of government assistance in early 2005, see Harry Stoffer, "Health Care: Odds Are that GM Won't Get Much Government Help," *Automotive News* (Apr. 11, 2005), p. 51. Other views on the background and development of the issue are in Allan Sloan, "General Motors Getting Eaten Alive by a Free Lunch," *Washington Post* (Apr. 19, 2005), p. E3; and, J. McCracken and K. Merz, "Auto Industry's Role in Health Care," *Detroit Free Press* (Apr. 14, 2005).

at that time light trucks were less than a quarter of the total vehicle market. As the economy recovered and the dollar strengthened in the mid-1980s, imported vehicles increased to more than three million units in 1984-85, and to more than four million units in 1986-87. In those years, for example, imported cars accounted for almost 40% of sales, the highest level ever. During this period, the United States and Japan negotiated a “voluntary export restraint,” discussed below, which effectively capped the level of imports from that country. In the 1990s, the total level of vehicle imports remained below three million units annually, though it has again been higher than that level since 2001.

As shown in **Figure 9**, with further details provided in **Appendix Table 4**, transplant output by foreign-owned manufacturers (which excludes facilities of the Daimler-owned Chrysler Group), in recent years has equaled or even surpassed imported units in terms of vehicle sales. In 1995, the two million transplant-produced units sold in the United States surpassed the number of imported vehicles sold here for the first time. This balance was maintained until 2002, when imports again were slightly higher than transplants, as both surpassed the three-million mark in unit sales.¹⁰¹

Foreign-brand vehicles now are the dominant market force in passenger car sales. If one adds imports and transplants together, they account for 55% of the 7.6 million passenger cars sold in the United States in 2003. Moreover, the share of sales taken by imported passenger cars in 2003 is now actually higher than in 1979: 28% of sales, compared to 21% then.

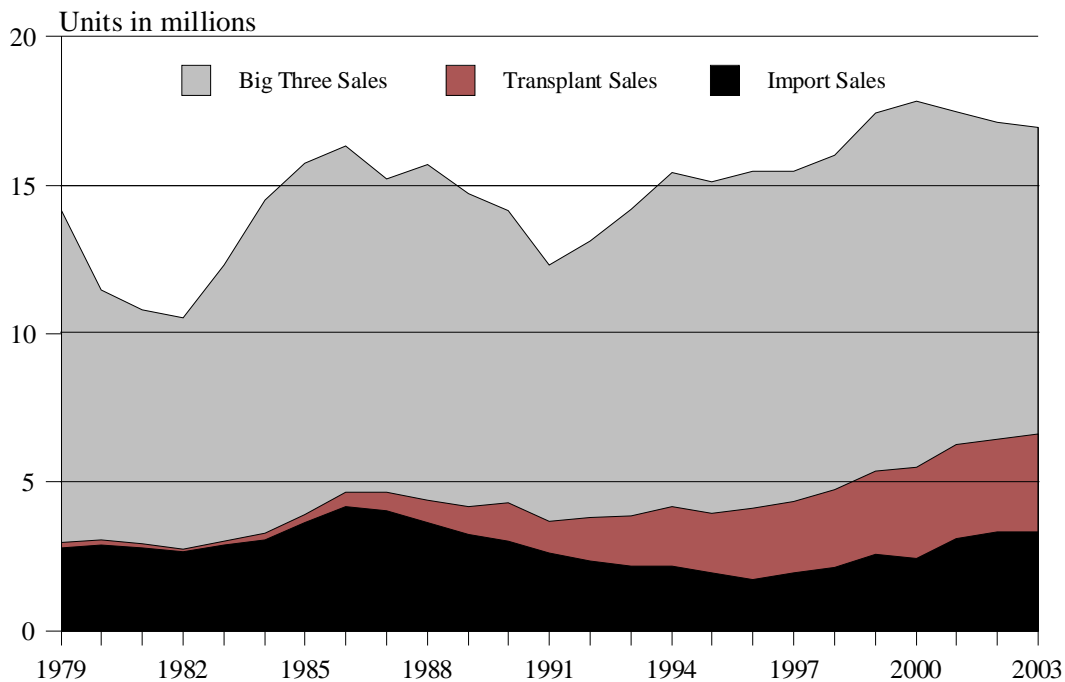
Part of the reason for this is that the Big Three have focused more on the light truck market. Annual U.S. car sales have been surpassed by light trucks (9.4 million in 2003), and the position of the Big Three is relatively stronger in this category. Nevertheless, foreign nameplates are growing here as well. Imported light trucks have exceeded one million vehicles per year since 2001, although in view of the fast growth of the domestic market, in 2003 they accounted for only about the same share as in 1979 — 13% as against 14%. However, transplants, which were virtually non-existent in 1979, accounted for another one million in light truck sales annually since 2001. Together, imports and transplants accounted for almost 25% of all U.S. light truck sales in 2003, compared to only 11% as recently as 1995.¹⁰² Through the first

¹⁰¹ A small share of transplant production is affiliated with the Big Three, but it is still counted as transplant activity. Besides the NUMMI joint venture between Toyota and GM in Fremont, California, other transplants that were or are affiliated with the Big Three include the Ford-Mazda “AutoAlliance” plant in Michigan, and the Mitsubishi plant in Illinois, originally formed in the “DiamondStar” alliance with Chrysler. NUMMI continues as a highly successful operation, producing mainly Toyotas, but also some GM-branded vehicles. In general, however, the Big Three-affiliate transplants have been smaller in volume and less successful than independently established transplant operations. See *Automotive News* summary of transplant operations, “Transplants’ Changing Faces” (June 14, 2004).

¹⁰² Veteran auto industry journalist Jerry Flint stated that in October 2004, foreign nameplates had risen to 30.4% of the light truck market, and their inevitable increase was forcing the Big Three to re-emphasize their car lines with new models; “The Year of the Car,” *Forbes.com* (Nov. 23, 2004).

ten months of 2004, foreign brands (including imports and transplants) together reportedly accounted for about 40% of all U.S. new car and light truck sales.¹⁰³

Figure 9. U.S. Motor Vehicle Sales



Sources: *Ward's Motor Vehicle Facts & Figures* (from 2000), various years; and, American Automobile Manufacturers' Association. *Motor Vehicle Facts & Figures* (through 1999), various years.

Note: "Imports" are vehicles assembled outside North America.

The results of these sales, production and import trends, in terms of sales by motor vehicle companies in the U.S. market, are shown in **Table 3**. The Big Three strength in light trucks has not been enough to offset their overall decline in vehicle market share. GM is particularly affected by this decline, dropping more than a third of its market share between 1979 and 2003, from 44% to 28%. Ford's sales have fallen by one-half in cars — but doubled in trucks; still, they have lost about three points in market share. Chrysler's strength in SUVs and minivans have helped the company, moribund in 1979, actually gain market share over the past quarter-century, though only from 11% to 12.8%. Still, Chrysler's gain did little to offset the overall Big Three decline in sales shares, from nearly 80% to less than 62% — and preliminary data for 2004 indicate even more dramatic losses in market share for the two largest Big Three producers.

¹⁰³ Jerry Flint, "Stranded in Washington," *Forbes.com* (Dec. 7, 2004).

Table 3. U.S. Motor Vehicle Sales by Manufacturer
(sales numbers in thousands)

	Sales 1979				Sales 2003			
	Cars	Light Trucks	Total	%	Cars	Light Trucks	Total	%
GM	4,918	1,428	6,346	44.8	1,959	2,757	4,716	28.3
Ford	2,140	1,198	3,338	23.6	1,169	2,268	3,437	20.7
Chrys.	1,167	391	1,558	11.0	457	1,671	2,128	12.8
Big Three	8,225	3,017	11,242	79.4	3,585	6,696	10,281	61.8
Toyota	508	130	638	4.5	996	870	1,866	11.2
Honda	353	NA	353	2.5	820	530	1,350	8.1
Nissan	472	102	574	4.1	505	289	794	4.8
Hyundai/Kia N.A.		N.A.	N.A.	N.A.	439	198	637	3.8
Mazda	157	8	165	1.2	164	95	259	1.6
Mitsubishi*	N.A.	N.A.	N.A.	N.A.	162	95	257	1.5
Subaru	128	—	128	0.9	116	70	186	1.1
Suzuki	N.A.	N.A.	N.A.	N.A.	23	36	59	0.4
Asian-owned mfrs.	1,618	240	1,858	13.1	3,225	2,183	5,408	32.5
VW	334	2	336	2.4	262	27	289	1.7
BMW	35	—	35	0.2	236	41	277	1.7
Mercedes-Benz	53	4	57	0.4	187	32	219	1.3
Ger-owned mfrs.	369	6	428	3.0	685	100	785	4.7
Other	461	217	625	4.4	115	50	165	1.0
Total	10,673	3,480	14,153	100.0	7,610	9,029	16,639	100.0

Sources: *Ward's Automotive Yearbook 1980, 2004*; total vehicle sales numbers for 1979 from Motor Vehicle Manufacturers Association, *MVMA Motor Vehicle Facts and Figures '80*.

* Some Mitsubishi vehicles sold by Chrysler Corp. under Chrysler brand names in 1979.

Among foreign brands, the big winners over the past 25 years are obviously Asian-based producers, who increased their share of total consumer vehicle sales by a factor of about 2.5, from 13% to 32.5%. Three companies account for most of the change: Toyota, which increased its share of sales from 4.5% to 11.2%; Honda, which more than tripled sales share from 2.5% to 8.1%; and, Hyundai, which was not even selling cars in the United States in 1979, but took nearly 4% of the market in 2003. Even Nissan, which registered a much more modest sales gain over the entire period, has done well to increase its share, after virtual bankruptcy as a company, and serious losses of market share to other import brands in the late 1990s. The only other foreign-based producers with significant U.S. market share are three companies from Germany. Among them, gains by the BMW and Mercedes brands have more than offset VW's decline, but total market share is still less than 5%.¹⁰⁴

The initial year-end sales data for 2004 confirmed, or even accelerated, these trends. Industry light vehicle sales overall were 16.9 million units, fractionally ahead of 2003. But domestic Big Three brands' share fell by a further 1%. Chrysler Group's 3.7% sales gain in the year could not offset declines by GM (down 1.3% to about 25%) and Ford (down 4.5%, to less than 20%), which occurred despite those two companies heavy incentive programs. Toyota (sales up 10.4% for the year) and Nissan (up 24%), introduced new brands and products, and saw exceptional sales gains for the year; Toyota became the first foreign brand to sell more than two million vehicles in the U.S. market. Honda (up 3.3%), Hyundai (plus 4.6%), and Subaru also registered gains, though at more modest levels. Among Asian brands only Mitsubishi saw a decline in U.S. sales in 2004. Its sales in 2004 were down 37%, and the CEO of its U.S. operating company resigned at the end of the year. Overall, Asian manufacturers gained another two points in U.S. light vehicles market share. Some of this gain came at the expense of European manufacturers, particularly VW, whose sales fell 13.6%. Mercedes Benz sales were flat, but BMW increased U.S. sales by 7% in 2004.¹⁰⁵

The performance of the two remaining U.S.-owned manufacturers worsened further in early 2005. GM's loss of \$1.1 billion in the first quarter was largely due to weak performance in the U.S. domestic market, and as seen above, was partly attributed by the company to a continuing rise in health care costs. Shortly after the GM announcement, Ford announced substantially reduced earnings in the first quarter of 2005 and that the company would not achieve CEO Ford's earlier announced goal of \$7 billion in profits by 2006.¹⁰⁶

¹⁰⁴ On VW's U.S. decline, see Jerry Flint, "VW's Future Is in the Future," *Forbes.com* (Oct. 26, 2004).

¹⁰⁵ *USA Today*, "Ford, GM See Slipping Sales in 2004" (Jan. 5, 2005), p. 1B, and *ibid.*, "U.S. Mitsubishi Chief Announces Surprise Resignation," p. 2B; *Automotive News*, "In a Big Year, GM and Ford Lose Share to Toyota, Nissan," and "Toyota, Nissan Gain Share," plus sales tables (Jan. 10, 2005), pp. 1 and 49-51; Jim Mateja, *Chicago Tribune*, "'I Didn't Bail Out,' Mitsubishi Chief Says" (Jan. 6, 2005), p. 1; *Business Week*, "Mitsubishi: Falling Further Behind" (Jan. 17, 2005), p. 38.

¹⁰⁶ *Wall St. Journal*, "Ford's Profits Fall Sharply as Competition Dents Sales," (Apr. 20, 2005); *Detroit Free Press*, "Ford Hauls in \$1.2 Billion," (Apr. 21, 2005); *Washington Post*, "Ford Profit Plunges as SUV Sales Drop" (Apr. 21, 2005), p. E2.

Some critics argue that the loss of market share by GM and Ford, particularly in passenger cars, reflects more than issues such as exchange rates, or health care costs, or cyclical trends. These critics argue that there is a qualitative difference in corporate management and organization, which means that foreign-owned companies seem to be able to identify consumer needs and tastes more readily than the two largest Big Three auto manufacturers.¹⁰⁷ Moreover, through flexible manufacturing techniques, pioneered by the Japanese car manufacturers, other companies have been able to respond to changes in market demand in a manner more agile than the Big Three, with high-quality products, even as they have been also able to ramp up volume. Nine of the top 10 choices in the 2005 annual ranking of cars and trucks by *Consumer Reports* magazine, for example, were from one of three Japanese nameplates (Toyota, Honda and Subaru). “Twenty-one vehicles, *all of them Japanese* [emphasis added], scored combined ‘high’ ratings for safety, reliability, fuel economy and owner satisfaction,” according to a press report. The article further noted that, “A reputation for quality has helped Asian brands increase their market share for eight straight years ... [reaching] a record monthly high of 36.3% in January [2005].”¹⁰⁸

The Changing U.S. Automotive Trade Balance

The growth of transplants has been the major change in the structure of the U.S. automotive market since import levels peaked in the early 1980s. The number of foreign-brand vehicles made domestically now roughly equals the number of imported units, for both cars and light trucks. Moreover, encouraged by provisions in federal legislation, such as the American Automotive Labeling Act and corporate average fuel economy requirements, as well as the business realities of “just-in-time” inventory control and manufacturing processes, foreign investing companies have steadily increased the local content of their transplant vehicles. Nevertheless, as shown in **Figure 10**, the U.S. trade deficit in automotive products, including vehicles, engines and parts, has continued to increase steadily over the past two decades.

Figure 10 presents the automotive trade balances as reported annually by the Commerce Department on an “end use” basis for selected years over recent decades. As illustrated by the figure, the deficit has increased steadily. Although part of this increase is due to price inflation of motor vehicles, the increase in the deficit is mainly due to the fact that exports grew at less than half the rate of imports in both the 1980s and 1990s. Thus, a U.S. deficit of \$9 billion in 1979 became a deficit of \$50 billion in 1990, and more than doubled again, to \$117 billion in 2000. Even though the domestic automotive market grew slowly after 2000 and exports did not fall, the automotive trade deficit increased further to more than \$140 billion in 2004.

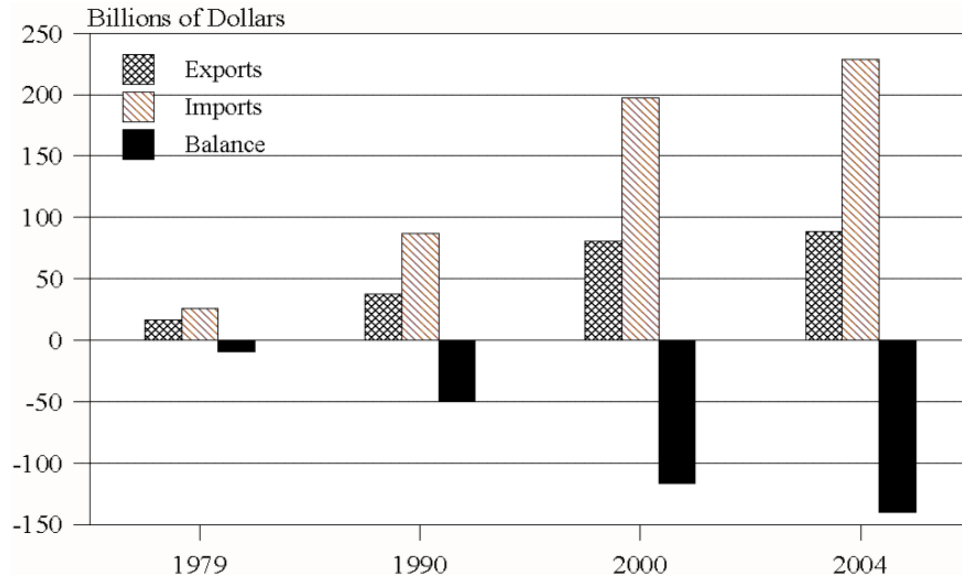
¹⁰⁷ This argument is made most forcefully and comprehensively in Maynard, *End of Detroit*. Hyde, *Riding the Roller Coaster*, attributes Chrysler’s relative success in introducing new products to having learned “lean engineering” from the acquisition of AMC, pp. 279-84.

¹⁰⁸ “Japan Dominates Magazine List,” *Detroit Free Press* (Mar. 7, 2005).

The details of how this deficit has grown and changed, and trade patterns with other countries, are shown in **Appendix Table 5**.¹⁰⁹

The detailed data indicate that the U.S. automotive deficit is structural. The global auto market is not integrated, and is shaped on the regional level by different tastes and priorities, notably a much higher emphasis on fuel economy in major European and Asian markets than is shared in the United States and Canada. When the Big Three pioneered the mass production and marketing of automobiles in the early years of the Twentieth Century, both Ford and GM from an early date expanded internationally by direct investment and building vehicles in other markets, more than they did by exporting.¹¹⁰ But even in trade with Canada, the U.S. deficit has been steadily increasing over the long term. Indeed, more than half of the approximately \$100 billion increase in the automotive trade deficit since 1990 is due to increases with the NAFTA trading partners.

Figure 10. U.S. Trade Balance in Automotive Products



Source: U.S. Department of Commerce. Bureau of the Census. Foreign Trade Division. "FT-990" (1979) and "FT-900: Highlights of U.S. Trade" (1990, 2000 and Dec. 2004).

The following subsections review U.S. automotive trade on a detailed basis with major trading partners. The data are drawn from **Appendix Table 5**.

¹⁰⁹ Note that the numbers in the table do not exactly match those in Figure 11, because they were calculated by the Commerce Department on the basis of the harmonized tariff schedule (HTS) as reported by the International Trade Commission, instead of end-use trade data. However, the amounts and direction of the balances are essentially similar. Data for 1979 on this more detailed basis are not available.

¹¹⁰ For example, Ford's third great commercial success of the pre-World War II era (after the "T" and "A" Models) was the "Model Y," which was never introduced in the United States. It was designed and built for the British and European markets, and manufactured only there. Brinkley, *Wheels for the World*, pp. 397-99, 406-7.

NAFTA Automotive Trade. U.S. exports of motor vehicles and parts have mainly gone to the NAFTA trading partners, both before and after the agreement went into effect in 1994, although the automotive deficit has widened with both countries. In 2004, 65% of all U.S. motor vehicle exports and 78% of all parts exports went to the NAFTA partners, which are about the same shares as in 1990. The value of U.S. vehicle exports to Mexico did increase from \$300 million to more than \$4 billion, as Mexico liberalized its import substitution rules, and parts exports more than doubled, from \$4.3 billion to \$11.3 billion. Canada remains the largest single foreign market for the United States in both categories, with more than \$18 billion in vehicle exports and nearly \$30 billion in parts, more than half the total U.S. exports in both cases. Both totals were more than double the 1990 levels.

But the United States in 2004 ran automotive trade deficits with both countries, even though it did have a \$10 billion surplus in parts with Canada. Thus, in addition to being the largest U.S. automotive export market, NAFTA also plays a dominant role on the import side. NAFTA now supplies 46% of all U.S. vehicle imports and more than 50% of all parts imports. These facts are possibly not widely publicized, because, to a major extent, this is due to the operations of the Big Three and their suppliers in the two countries. While in 1990, the value of U.S. vehicle imports from Canada were \$3.5 billion less than from Japan, by 2004, imports from Canada were about 50% ahead of both Japan and the European Union, and accounted for a third of all imports. Mexico supplied less than 5% of U.S. total vehicle imports in 1990, but more than 13% in 2004. Mexico is also the leading supplier of motor vehicle parts imports, just ahead of Canada. The United States in 2004 imported ten times the dollar value of parts imports from the two NAFTA neighbors, in roughly equal shares, than it did from China, which has been of such concern to many people as a new competitor.

Trade with Other Countries. The U.S. automotive trade balance with the European Union (EU, formerly known as the European Community) in recent years has shifted more than with any other non-NAFTA partner. U.S. trade with the EU has been historically unbalanced in favor of the European side in both cars and parts. However, the level of motor vehicle imports from the EU (mostly Germany) has increased since 1990 dramatically faster than the rate from Japan, the national competitor traditionally of greatest concern to the U.S. motor industry in recent decades. With \$31 billion in total vehicle imports in 2004, the EU is now challenging Japan for second place behind Canada in this category. Moreover, with a total surplus of \$42 billion in cars and parts, the EU is also now beginning to approximate Japan's bilateral automotive surplus, which was \$48 billion in 2003; on the other hand U.S. exports of vehicles and parts was \$10.7 billion to the EU in 2003, compared with only \$2.0 billion to Japan.

Korea has also become a significant factor in the U.S. automotive trade deficit, as the bilateral U.S. deficit in vehicles and parts rose from just \$1.5 billion in 1990 to \$11 billion in 2003. Moreover, among all major trading partners, the Korean market remains most restrictive in terms of U.S. exports — only about \$500 million in total in 2004.

As mentioned above, automotive imports from Japan are widely believed to be the continuing major source of a U.S. automotive trade deficit. However, in recent

years Japan has played little role in increasing this deficit. Vehicle imports from Japan increased only modestly compared to other sources since 1990 — from \$26 billion to \$32.9 billion in 2000, and virtually no increase between 2000 and 2004. The increase in parts imports — once of concern to those who felt that transplants are only “screwdriver” operations — has been even more modest. Parts imports from Japan increased from \$10.4 billion in 1990 to \$15.4 billion in 2004, while they increased by four times overall.

Another country that has been of heightened concern to U.S. manufacturers in recent years has been China. But although China may now be a major global player in automotive manufacturing, it has played little role so far in terms of the U.S. trade account. There are so far virtually no motor vehicle imports from China. Parts imports have been growing but the totals are still relatively modest — from \$1.6 billion in 2000, and \$3.8 billion in 2003. While China is growing rapidly as a manufacturer of motor vehicles, parts and components, sheer distance may limit China’s role as a supplier for original equipment manufacturers using “just-in-time” inventory control and supply techniques. The former chairman of GM China, Philip F. Murtaugh, was quoted as saying “I don’t see China becoming a major car exporter in the foreseeable future. There is no economic rationale.”¹¹¹ Nevertheless, there are persistent reports of plans to export vehicles from China to other markets.¹¹² China may play a more significant role with respect to the supply of parts for the replacement market, where timeliness of delivery is not such a key issue.¹¹³

Development of Trade Policy Issues

In the late 1970s, as the Big Three and the UAW reacted to the intensification of competition from imports, there was also a period of highly charged debates about issues of fairness in automotive trade and about the possibility of corrective trade policy actions. Congress and the Reagan Administration took a number of steps to ameliorate foreign competitive pressures, most notably the negotiation of a “voluntary export restraint” on the part of Japan. These restraints eventually lapsed (the United States and its trading partners agreed to eliminate trade quotas of this type in creating the World Trade Organization in 1995). Measures specifically aimed at automotive trade were still being initiated in the 1990s, but have gradually become

¹¹¹ In *Business Week* special report, “The China Price” (Dec. 6, 2004), p. 112.

¹¹² Nissan and Honda are cited in *ibid.* as at least considering some export possibilities with their local Chinese investment partner. Chrysler Group CEO Dieter Zetsche has said that DCX could export vehicles from China at some point, including possibly to the U.S. market, and reportedly DCX is already in negotiations to set up such an operation; *Automotive News*, “DCX Is Open to China Exports” (Mar. 14, 2005), p. 8; and *Autonews.com*, “DCX Eyes Exporting Chinese-Built Chryslers to NA” (Apr. 21, 2005). An importer who first brought Yugo and Subaru automobiles to the U.S. has signed a deal with Chinese automaker Chery, with a goal of selling 250,000 vehicles in 2007; AP, “Goal of New Chinese Car Importer: Japanese Quality for a Bargain,” *Detroit Free Press* (Jan. 3, 2005). On the logistical difficulties of long-distance sourcing from China generally, see T. Aeppel, “Manufacturers Cope with Costs of Strained Global Supply Lines,” *Wall St. Journal* (Dec. 10, 2004), p. A1.

¹¹³ For further discussion on the development of China as an automotive producer, see p. 76.

dormant. The Big Three continue to argue that the exchange value of the Japanese yen against the dollar remains too low, and thus favors Japanese producers.

The Chrysler “Bailout”. Events surrounding the threatened financial collapse of the Chrysler Corporation in the late 1970s and the federal loan guarantees provided that company in 1980-81 serve to mark the beginning of an activist era of federal intervention in automotive policy linked to imports and automotive trade issues. The smallest of the Big Three (but nevertheless the tenth-largest U.S. corporation at the time), Chrysler ended the 1970s on the brink of bankruptcy. In 1979, after the Treasury Department had rejected the company’s appeal for financial aid, corporate chairman John Riccardo resigned, and was replaced by Lee Iacocca, who succeeded in gaining from the Carter Administration and Congress the Chrysler Loan Guarantee Act, signed into law on December 21, 1979. Under this statute, which was accompanied by employment and corporate cost reductions, union labor cost concessions and state-level aid packages, the company borrowed \$1.2 billion from private sector sources in 1980. Within three years, the company had paid off its loans. The federal government actually sold at a substantial profit the warrants it had required on Chrysler stock as collateral.¹¹⁴

The 1980 Safeguard Case on Foreign Imports. While the drama over Chrysler was being played out, the Big Three automotive industry more broadly was affected by the impacts of the Iran crisis of 1979, the so-called “second oil price shock” that also hit in that year, and the onset of a recession in 1980. Car production fell from 14.7 million units in 1978 to 9 million in 1980. A total of 800,000 workers in the automotive and related industries were laid off, because of reduced demand, and the unemployment rate within the industry stood at 30%. Meanwhile, fuel-efficient Japanese car imports had increased by 500% between 1973 and 1980.

Douglas Fraser, president of the UAW, sought congressional action to force trade restraints on Japan, in order to assist domestic manufacturers. Failing to obtain immediate legislative relief, the UAW, joined by Ford, filed a petition in mid-1980 with the U.S. International Trade Commission (ITC), requesting relief under Section 201, the safeguard or “escape clause” provision of the 1974 U.S. Trade Act. But the ITC in such a case had to find that imports were a “substantial” cause of injury to the producing industry, i.e., not less than any other cause. The ITC agreed that imports had damaged the U.S. automotive industry, but, on a 3-2 vote, decided that they were not a substantial cause. It ascribed the industry’s difficulties more to the effects of the recession, higher interest rates, and consumer preference for smaller vehicles than to the rise in imports, and thus declined to recommend any limitations on imports under the safeguard provisions of the law.¹¹⁵

¹¹⁴ Hyde, *Riding the Roller Coaster*, pp. 241-248, 254-257.

¹¹⁵ John M. Rothgeb, Jr. *U.S. Trade Policy* (Washington: CQ Press, 2001), pp. 165-67. The full details of this case are in: USITC. *Certain Motor Vehicles and Certain Chassis and Bodies Therefor: Report to the President on Investigation TA-201-44 under Section 201 of the Trade Act of 1974*, Publ. 1110 (Dec. 1980).

Voluntary Export Restraints on Japan.¹¹⁶ The failure of the UAW-Ford safeguards petition to obtain trade relief increased pressure in Congress for legislative action. A bill was proposed in 1981 to enact quotas on imports from Japan, which would have been less than the totals actually being imported annually. Senator Robert Dole of Kansas, then Chairman of the Finance Committee,¹¹⁷ reportedly informed the new Reagan Administration that this legislation would be passed in the Senate by a veto-proof majority.

The Reagan Administration pressed Japan instead to take action on its own by enacting “voluntary” restraints on its automotive exports. To avoid a possible conflict with U.S. antitrust rules by purely private manufacturers’ action, the Japanese government had to issue an order, on May 1, 1981, to the auto manufacturers, by which exports to the United States were limited to 1.68 million units for one year. This so-called voluntary export restraint (VER) avoided further action on the quota bill being considered in the Senate. However, as the U.S. auto industry continued to struggle in the early 1980s, the House twice passed domestic content legislation that would have forced Japanese automotive manufacturers to produce vehicles in the United States for the local market. To discourage such measures, the Japanese export restraints were extended annually for several years, with some upward adjustment in the volume numbers.

The three leading Japanese manufacturers in terms of sales in the United States (Toyota, Honda, Nissan) all established manufacturing plants in the United States by 1985. This result had been sought by both the UAW and the Big Three. Their view was apparently that in taking such a step, the Japanese manufacturers would have to hire U.S. workers, would thus face the same competitive manufacturing conditions as the domestic Big Three, and would also lose the export advantage of a currency that was then falling substantially against the U.S. dollar.

But things did not play out exactly as the U.S. auto interests had planned. Forced to manufacture in the North American market, the Japanese companies developed new and larger products more specifically designed for this market. While imports did decline, vehicles produced at the transplant operations more than filled the market gap, so that Big Three domestic market share has also tended to fall. Vehicles such as the Toyota Camry and Honda Accord, for example, have been the largest-selling passenger car models for the past 20 years, save for a period when they were topped by Ford’s Taurus. Also, as noted above, though the Japanese companies did become large U.S. employers, the UAW was not able to organize most of their operations. While successfully manufacturing in the United States, the Japanese companies were also able to move their imports up-market, gaining large profits on vehicles, in part because of the scarcity value accruing from trade restrictions.

By the mid-1980s, the officially supported VER was lifted, though export limits were continued for several more years by the Japanese on a more informal basis. In part, the lifting of restraints resulted from a return to higher sales and profits by the

¹¹⁶ The account in this subsection is primarily based on Rothgeb, *U.S. Trade Policy*, pp. 168-71.

¹¹⁷ In *ibid.*, Sen. Dole is misidentified as the Senate Majority Leader in 1981.

Big Three. It reportedly reflected disagreement among them as to whether they supported any continued formal U.S. policy of promoting export restrictions.

U.S.-Japan Autos and Auto Parts Issue in the 1990s. The last major U.S.-Japan automotive trade dispute was the Clinton Administration's use of Section 301 of the 1974 Trade Act in the mid-1990s in an effort to open the Japanese market wider to U.S. auto and automotive parts exports. The increase in both Japanese imports and Japanese-owned motor vehicle manufacturing in the United States had led Japan to become the biggest supplier of auto parts imports into the United States by 1990. Furthermore, Japan had not only overtaken Canada in that category by a substantial margin (\$10.4 billion to \$9.1 billion), but U.S.-Japan trade was much more unbalanced. Thus, the United States had a surplus with Canada in parts, and, though it ran an overall automotive two-way trade deficit, Canada was also the biggest U.S. export market for vehicles. By comparison, U.S. exports of cars and parts to Japan were each less than \$1 billion.

The Reagan and George H.W. Bush Administrations had increasingly dealt with industrial trade issues with Japan by adopting "results oriented" policies and by focusing on "structural impediments" to U.S. exports and a more balanced bilateral trade account. President Clinton updated this approach in an effort focused on two industrial product sectors (autos and parts, and photographic film), where it was felt that U.S. manufacturers could successfully export to Japan, and where the trade balance was heavily in Japan's favor.

Already, the George H.W. Bush Administration had reached a new agreement on auto parts with Japan, but the issue of balance in market access had not been resolved. Subsequently, the Clinton Administration announced in 1994 the initiation of a "Super 301" trade policy action, wherein it might recommend punitive retaliation, if the issue were not resolved on a bilateral or multilateral basis. President Clinton announced in May 1995 that, if Japan did not satisfactorily respond, the United States would establish punitive 100% tariffs on luxury automobiles from Japan, such as the Lexus, which were (and still are) largely imported into the United States. The United States also initiated a WTO case, and Japan then retaliated by countersuing in the WTO against the U.S. procedure.

Eventually, the issue was resolved to the modest benefit of the United States. An agreement was reached just before the negotiating deadline set by the U.S. government, in late June 1995, and the WTO cases were shelved. The U.S. side did not achieve a specific import target as it had sought, but it did gain a Japanese promise to allow a substantial increase in the dealer networks of foreign-owned companies, and to allow the use of foreign-made parts in the repair of cars that fail the rigorous Japanese automobile inspections. But Japanese imports of U.S.-made vehicles in 2004 remained lower than the level of 1990, despite some highly publicized "reverse exports," such as Honda station wagons, from the United States to Japan. While the number of dealerships did not increase dramatically, the real explanatory variable may have been the prolonged period of slow Japanese growth from the 1990s forward. U.S. exports of auto parts to Japan totaled \$1.5 billion by

2004, compared to \$900 million in 1990 (some of these exports may be engines and transmissions exported from Japanese-owned U.S. plants).¹¹⁸

American Automobile Labeling Act (AALA). This measure was introduced by Senator Barbara Mikulski as an amendment to Transportation appropriations legislation and added by voice vote in the Senate on August 30, 1992. It was signed into law as Section 355 of P.L. 102-388 on October 6, 1992. The AALA established origin labeling requirements for every new vehicle sold in the United States beginning on October 1, 1994. The labeling rules were designed to ensure “truth in advertising,” according to then-president Andrew Card of the American Automobile Manufacturers Association, which represented the Big Three interests in Washington at that time and which supported the law. A UAW spokesman added, “We think it gives consumers important information. The Japanese dislike it because it doesn’t allow them to hide the fact that a large part of their parts still come from abroad.”¹¹⁹

The law, as implemented in regulations by the National Highway Transportation Safety Administration (NHTSA), requires that prominently displayed labels on vehicles should show where a vehicle is assembled, plus the percentages of content from principal sources of parts in any car for which 15% or more of the total value of the parts content (excluding labor costs) comes from countries other than the United States or Canada. Critics noted that the law established a third separate standard for measuring automotive content: the AALA rule for labeling disclosure purposes, plus a 60% NAFTA content rule for customs purposes; and, a 75% domestic content rule to determine whether the vehicle is foreign or domestic for purposes of complying with corporate average fuel economy standards (see below in this report). They also noted that somewhat arbitrary differences in applying AALA rules to suppliers meant, for example, that content in a Toyota-badged vehicle and a GM-badged vehicle from the same joint venture operation (Fremont, California)

¹¹⁸ Rothgeb, *U.S. Trade Policy*, pp. 215-17; Charles S. Pearson. *United States Trade Policy: A Work in Progress* (Hoboken, NJ: John Wiley & Sons, 2004), pp. 70-72. A more detailed study of U.S.-Japan trade relations in the 1990s is Edward Lincoln, *Troubled Times: U.S.-Japan Trade Relations in the 1990s* (Washington, DC: Brookings Institution, 1999). In his earlier work, *Japan’s Unequal Trade*, Lincoln made the point that Japan’s low propensity to import foreign manufactured goods is related to the generally low rate of direct foreign investment in Japan. However, in addition to the Renault acquisition of a controlling share of Nissan, followed by its appointment of Carlos Ghosn as Nissan’s CEO and the institution of a radical downsizing and streamlining program in Japan, a number of the U.S. Big Three and related companies maintain major stakes in the Japanese motor industry. Ford owns 33.4% of Mazda, GM owns 12% of Isuzu, 20.3% of Suzuki and a 20% stake in Subaru’s parent, Fuji Heavy Industries. Chrysler’s parent, DaimlerChrysler, owned 37.4% of Mitsubishi Motors, but is in the process of reducing its stake during Mitsubishi’s financial restructuring; see *Automotive News, Guide to Global Automotive Partnerships* (Sept. 2004).

¹¹⁹ Quotations from Donald W. Nauss, “New U.S. Car Labeling Law Criticized as Being Confusing ... U.S. Auto Makers Insist Disclosure Is Full and Fair,” *Los Angeles Times* (Sept. 25, 1994), p. D4. The most recent report from the Japan Automobile Manufacturers Association states that purchases of parts from the United States by Japanese automakers was \$41.5 billion in “fiscal 2003” (Apr. 2003-Mar. 2004), compared to \$2.5 billion in fiscal 1986; *Growing Investment and Employment in America* (2004), p. 8.

could be counted in different ways, because Toyota and GM might have different relationships with the original equipment suppliers.¹²⁰

NHTSA reportedly conducted a survey of consumer use of the labeling information in 2001, which found that “just 5% said that they were influenced by the label to any degree whatsoever,” and “Even among consumers who described themselves as Buy American advocates, just 20% said they knew of the ... content labels and only 9% had read one at a dealership.” The same source noted that early problems confirming sourcing from various suppliers had been compounded by various industry developments that had increased cross-ownership and sourcing locations among domestic and foreign brands. Nonetheless, representatives of both the Big Three and their foreign-owned competitors questioned by a reporter did not assign a high priority to efforts to change the law.¹²¹

U.S. Initiatives Against Automotive Trade Barriers. While U.S. trade policy on automotive issues had earlier concentrated on problems viewed as caused by imports, in the late 1980s, it began to focus more on foreign export barriers. While not necessarily opening large immediate markets for U.S. products, these initiatives are aimed at opening markets for U.S. companies as foreign markets grow and develop, as well as at creating a “level playing field” in trade rules, as sought by many critics of U.S. trade policy, both inside and outside Congress. This policy escalated with the inauguration of the World Trade Organization (WTO) on January 1, 1995, because a defendant country could no longer block an adverse finding against itself. The Office of the U.S. Trade Representative (USTR) cites four WTO cases against foreign automobile development regimes, which had established trade barriers against imports or promoted domestic content and exports in ways contrary to WTO rules.¹²²

Indonesia. The USTR brought a case in 1998 against Indonesia’s auto regime, designed to promote and protect its domestic motor industry. As a result of an adverse WTO finding, the Indonesian government substantially liberalized its auto regime in 1999.

India. In 2000, USTR initiated a dispute settlement proceeding in the WTO, later joined by the EU, to challenge India’s auto regime under the WTO Agreement on Trade-Related Investment Measures (“TRIMs”). In response to the WTO findings, India introduced a new automobile investment policy in 2002.

¹²⁰ Detailed commentary on the AALA from Nauss, “New U.S. Car Labeling Law;” also, Terry Box, “Sum of Their Parts,” *Dallas Morning News* (Oct. 6, 2004), p. 1A; Cindy Skrzycki, “A Clash over Content Labeling,” *Washington Post* (Sept. 30, 1994), p. B1.

¹²¹ Ann Job, “Your Car’s Nationality,” Associated Press (Mar. 10, 2003); see also, Cheryl Jensen, “Label of Contents Window Stickers Show How Tricky It Is to ‘Buy American,’” *Chicago Tribune* (Aug. 11, 2002), p. 1.

¹²² The summaries of U.S. WTO cases and their outcomes in this subsection, as well as the comments on Korea, are taken from country entries in USTR. *2004 National Trade Estimate Report on Foreign Trade Barriers (NTE)*, April 2004). All U.S. WTO cases, including these four auto regime cases are listed in USTR. “Snapshot of WTO Cases Involving the United States” (Updated Oct. 6, 2004), as listed at [<http://www.ustr.gov>].

Philippines. The Philippines in 1995, pursuant to the TRIMs Agreement, notified the WTO of its intention to maintain local content and foreign exchange balancing requirements to promote foreign investment. In 1999, it requested a five-year extension for the measures applying in the motor vehicle sector. After consultations under WTO rules with the United States, the Philippines announced in November 2001 the immediate termination of the exchange balancing requirements, and a final phaseout of all motor vehicle local content requirements in July 2003, a commitment still being monitored by USTR. The Philippines also amended its excise tax on automobiles in August 2003 from one based on engine displacement, which is biased against large vehicles exported from the United States, to a system based on value.

Brazil. USTR has also challenged the Brazilian automotive licensing regime, and has noted that, pursuant to a 1998 agreement, this was a WTO case “resolved to U.S. satisfaction without completing litigation.” However, USTR also notes in its most recent *National Trade Estimate* that the Mercosur free trade area, of which Brazil is a member, established a special “automotive list” of 55 items (vehicles and parts) under its common external tariff, and the rate is 35%. Moreover, Brazil has negotiated automotive agreements with third countries to allow duty-free treatment within agreed quotas.

In addition to these specific policy changes negotiated under WTO rules, USTR has been acting to reduce perceived market barriers and discriminatory treatment in two other major Asian automotive producers:

Korea. In 1998, South Korea and the United States concluded a memorandum of understanding (MOU) aimed at improving market access for foreign motor vehicles. While USTR notes Korean implementation of the MOU, it has also found little progress in opening the Korean market to imports (less than 20,000 units, for a market share under 2% in 2003), while Korean exports to the United States have boomed. One issue is the Korean tax structure, and USTR is negotiating with the Korean government to change the basis for its tax, which discriminates against vehicles with large engine capacity more typical of imported cars. USTR has also made progress in gaining Korean acceptance of internationally agreed product standards used in imported vehicles.

China. The United States and other members of the WTO had been highly critical of China’s 1994 Industrial Policy for the Automotive Sector. This policy was replaced by a new “Development Policy of the Automobile Industry,” announced on June 1, 2004. The new policy abolished many formal restrictions and domestic content rules. This included an issue particularly noted by the United States — China’s former refusal to allow non-banks (such as automotive credit companies) to finance consumer purchases of automobiles. However, USTR remains concerned at the vague and unclear nature of many statements in the new policy (such as how China plans to regulate imports in keeping with its new registration system for auto manufacturers, and whether China will effectively allow imports of complete

knockdown kits).¹²³ Moreover, the new policy still requires foreign-owned manufacturers in China to operate through joint ventures, in which their ownership will be limited to a maximum of 49%. U.S. and other foreign motor vehicle companies in China have also expressed concern that China's new automotive fuel efficiency standards discriminate against larger and heavier imported vehicles, such as SUVs.¹²⁴

Automotive Nontariff Trade Barriers in WTO Doha Round. In addition to these case-by-case initiatives, the United States also proposed on January 28, 2005, that WTO open discussions on removing nontariff barriers (NTBs) to trade in automobiles and automotive parts within its Doha Development Round negotiations on revising WTO rules. The U.S. proposal would add this subject to the ongoing talks on nonagricultural market access. It noted that trade in motor vehicle and parts constituted 13.3% of all world manufactured goods trade in 2003, and a high percentage of exports of many countries, both industrial and developing. The United States proposal stated that, "We do not foresee the end result of NTB negotiations to resemble the Aircraft Agreement [a self-contained agreement applying to one specific industry], but rather to result in a series of results, each of which addresses a particular NTB facing the automotive industry."

The proposal specified in particular five examples of the kind of barriers to be addressed: restrictions on financing of vehicle purchases; distribution channels; taxation; equity restrictions on foreign investment; and, barriers to importation and sale of remanufactured parts (all of which have been mentioned in specific cases above). The modalities of the negotiations were indeterminate, as automotive trade NTBs could be addressed in a range of specific ongoing Doha negotiation fora.¹²⁵

Thailand Free Trade Agreement and U.S. Pickup Truck Tariff. An additional trade issue that created concern in Congress in 2004 is a possible U.S. free trade agreement with Thailand that would give Thai-made pickup trucks duty-free access to the U.S. market. Domestic manufacturers of pickup trucks still benefit from the 25% "chicken tariff" on imported pickup trucks. This tariff was established in 1963 in response to European restrictions on U.S. frozen chicken parts, as a component of its Common Agricultural Policy (CAP). In retaliation, the United States established high tariffs on a number of products then imported mainly from Europe, including pickup trucks.¹²⁶ U.S. imports at that date were primarily produced by VW in Germany, where U.S. chickens had been frozen out of a lucrative market by the CAP.

¹²³ USTR, *2004 NTE*, p. 79; WTO. "China's Transitional Review Mechanism: Communication from the United States," G/MA/W/58 (Doc. 04-3613, Aug. 31, 2004), p. 2.

¹²⁴ Keith Bradsher, "China Sets Its First Fuel-Economy Rules," *New York Times* (Sept. 23, 2004), p.1.

¹²⁵ *DER*, "U.S. Calls for WTO Talks on Ending Nontariff Barriers to Automotive Trade" (Feb. 2, 2005), p. A-4. The full U.S. proposal is on the WTO website under TN/MA/W/18/Add.6 (Jan. 28, 2005), doc. No. 05-0371. The quote is from p. 1.

¹²⁶ Presidential Proclamation 3564 at 28 *Federal Register* 13247-48 (Dec. 5, 1963).

The exceptionally high tariff has never been reduced or repealed. An early U.S. government ruling on imported SUVs excluded them from classification with pickup trucks, with respect to application of the 25% tariff level.¹²⁷ NAFTA has also eroded some of the protective benefits of this measure, especially with respect to Mexico. Toyota, Mazda and Nissan now primarily produce their pickup trucks in the United States for the domestic market, though Toyota is opening a new plant for its Tacoma line in Mexico, and Nissan is already there.

USTR has begun negotiations for a free trade agreement with Thailand, as part of a general policy to promote bilateral and regional free trade deals. Thailand is already the world's second-largest producer of pickup trucks, having attracted a wide range of foreign investors to open plants. These are primarily Japanese and Korean companies, though Ford has an interest there through Mazda, and GM also has a presence. The Big Three, while generally supporting free trade agreements, have opposed allowing Thai pickups tariff-free access to the U.S. market through a free trade deal. They note that their Japanese and Korean competitors would thereby gain access to the U.S. market for Thai-made vehicles, without having been forced to reduce their own home market barriers to U.S. exports. The UAW and the AFL-CIO, generally skeptical of free trade deals, have opposed any U.S. elimination of the tariff on pickup trucks for Thailand as part of a free trade package.¹²⁸

Resolutions on this issue were introduced in each House in the 108th Congress on February 24, 2004, with 38 co-sponsors in the Senate and 91 in the House. The 108th Congress took no action on the resolutions, and they have not been reintroduced in the 109th Congress. These resolutions did not oppose the Thailand FTA outright, but sought to express a sense of Congress that negotiations on access to critical segments of the United States automobile market should not take place on a piecemeal basis, but rather as part of broader negotiations that included all major automobile producing nations. On March 18, 2005, 40 senators co-signed a letter to the USTR advocating that U.S. tariff barriers should not be reduced on automotive imports in the context of this FTA, unless a broader, multilateral agreement addressed non-tariff barriers in the automotive industry.¹²⁹

Exchange Rates and Automotive Trade Issues. The rapid rise in the dollar's exchange rate in the first half of the 1980s was a major issue affecting U.S. manufacturers, including the Big Three, who complained that the dollar's rise against the yen in particular gave Japanese exporters additional assistance to compete in the U.S. market. That issue was allayed with a subsequent decline in the dollar's exchange rate against the entire basket of industrial country currencies from 1985

¹²⁷ Flint, "Stranded in Washington."

¹²⁸ CRS Report RL32314, *U.S.-Thailand Free Trade Agreement Negotiations*, by Raymond J. Ahearn and Wayne M. Morrison, pp. 9 and 14; BNA, *International Trade Reporter*, "U.S. Auto Workers Urge Bush to Maintain Truck Tariffs in Thai FTA" (March 4, 2004), p. 398; AFL-CIO Executive Council Actions, Statement on "U.S.-Thailand Free Trade Agreement" (Mar. 11, 2004); Jenalia Moreno, "Ending Tariff on Pickup Trucks Could Mean Jobs, Sales, Competition," *Houston Chronicle* (Jul. 6, 2004).

¹²⁹ Letter from Sens. Carl Levin, George Voinovich, *et al.* to Acting USTR Peter Allgeier (Mar. 18, 2005).

until the mid-1990s.¹³⁰ But the dollar's resurgence against all currencies from 1995 to 2001, especially the yen, was again a serious concern to the Big Three, and they still believe that the yen is undervalued.

While much of U.S. industry has been most worried about the value of the Chinese currency (which they believe the Chinese government has maintained at a level that is too low to the dollar, given the large and growing U.S. bilateral trade deficit), the auto industry remains fixated on the yen. The recent report of the ATPC, cited above, illustrates a declining share of U.S. auto market shares held by the Big Three that parallels a decline in the dollar exchange value of the yen, especially in the late 1990s. Thus, as the yen's value fell from about 85 to the dollar in early 1995 to 140 in 1999, the Big Three's monthly U.S. market share declined from almost 80% to about 70% (excluding a brief drop to a much lower level in 1999 when GM was on strike). After that, however, the yen rose in value, to fewer than 120 to the dollar in early 2004 (the last date on the ATPC chart), while the Big Three share on ATPC's chart continued to fall, to less than 60%. The ATPC claims that the yen was still being held down by massive amounts of intervention in exchange markets by Japanese monetary authorities, peaking at \$140 billion in the first quarter of 2004.¹³¹

However, by the end of 2004, the yen had risen to about 103 to the dollar, with no further market intervention by Japanese monetary authorities.¹³²

Globalization of the Automotive Industry

Near its beginning, this report quoted a Commerce Department report, *Manufacturing in America*, as evidence of a general understanding that manufacturing is being globalized. This development is not unique to the automotive industry, and indeed, it may superficially seem less globalized than many other industry sectors. Because of differences in customer priorities, dictated in part by considerations such as the price of fuel, vehicles differ radically from market to market.¹³³ Nevertheless, in terms of industry ownership, and including parts suppliers, some companies have been global for a long time, while mid-size and strictly regional companies have increasingly been acquired by larger competitors.

¹³⁰ For exchange rate impact on U.S. manufactures trade in general in the 1980s and the early 1990s, see CRS Report RL32179, *Manufacturing Output, Productivity and Employment*, coordinated by Steven Cooney.

¹³¹ ATPC. *The Contribution of the U.S. Auto Industry to the American Economy* (distributed 2004), charts 17-19.

¹³² Paul Blustein, "U.S. Dollar Continues Its Broad Decline," *Washington Post* (Dec. 2, 2004), p. E1; *DER*, "Japan's Finance Minister Expresses Concern over Dollar Drop; No November Intervention" (Dec. 8, 2004), p. A2.

¹³³ Even in the area of fuel economy and efficiency, the regional approaches may be radically different. For example, nearly half the cars now sold in Europe have diesel engines, while such vehicles are relatively rare in the United States. Two Japanese manufacturers, Toyota and Honda, pioneered gas/electric "hybrid" engine technology in their home market, then found an avid niche market for this product in the United States, especially as gasoline price soared in 2003-4. See summary in Maxton and Wormald, *Time for a Model Change*, ch. 3.

Ford and GM played pioneering roles in the first half of the twentieth century in globalizing automotive technology and manufacturing. They have continued to play active roles in consolidation of motor vehicle assembly operations and global market supply chains. But the two U.S. industry leaders have nevertheless experienced significant losses of global market shares. Chrysler, the third member of the Big Three, has never been strong in overseas markets, abandoned them altogether in the 1970s and has been itself acquired by a foreign-based company. With respect to the parts supply industry, which employs far more Americans today than the vehicle assembly companies, the two major spinoffs of the GM and Ford parts divisions are among the global leaders in sales, but have not performed well financially. Both they and the other U.S.-based automotive parts companies have reportedly been hindered by their continued reliance on the Big Three for the bulk of their sales.¹³⁴

Globalization and the U.S. Market

Figures 11 and 12 address the issue of who is expanding faster, U.S. automotive manufacturers abroad, or foreign manufacturers in the U.S. domestic market. To measure expansion on a comparable basis, these two figures are based on sales of affiliates. It might have been preferable to measure relative changes in direct investment positions, but these data might be misleading, in part because U.S. manufacturers have increasingly used finance affiliates in third countries in equity transactions, and this practice may distort statistical reporting on the destination of investments.¹³⁵ The two figures cover the period from 1983, when the earliest data on a comparable basis are readily available, to 2002, which is the latest year for such complete data.

Figure 11 shows the value of sales of direct investment affiliates abroad of U.S. companies (10% or more equity ownership) in the “transportation equipment” manufacturing sector (more than 90% of which represents automotive vehicles and parts). **Figure 12** illustrates trends in the sales of domestic affiliates of foreign direct investors in the United States (10% or higher equity ownership). The figures in this latter case include transportation equipment manufacturing investments through 1986, and then motor vehicle and equipment manufacturing thereafter, when those data were broken out separately. Additionally, however, on the inward investment side the figure includes investment in wholesale trade — motor vehicles and equipment. As described earlier in this report, under the “primary line of business” rule many foreign investors in the auto industry with both manufacturing and trading

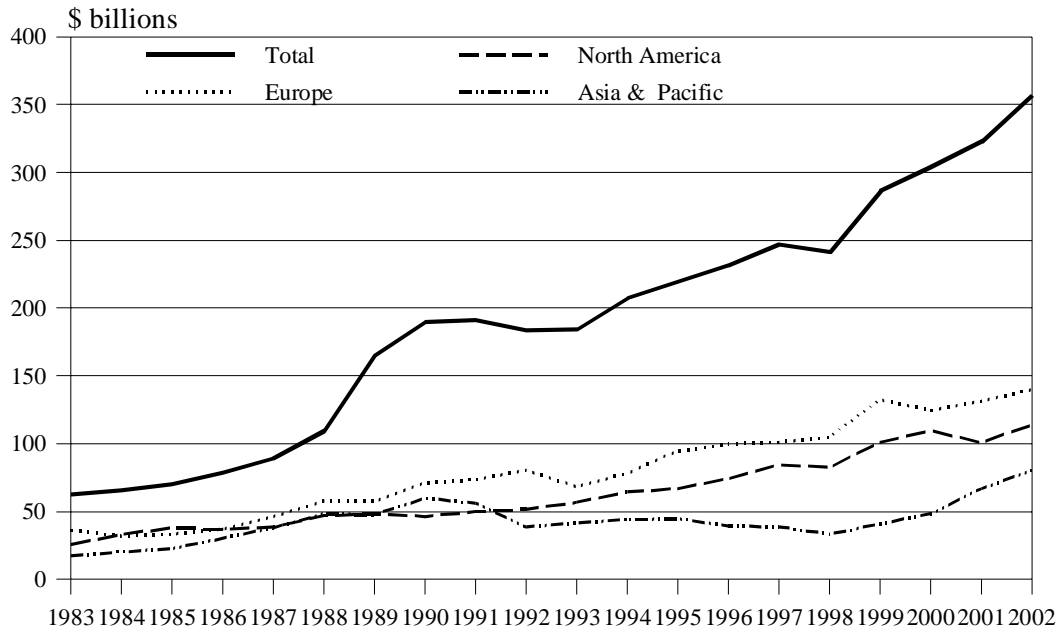
¹³⁴ *Automotive News*, “Analysts Pound Big 3 Suppliers” and “TRW Stock Drops as Earnings Lag” (Sept. 6, 2004), pp. 1 and 4.

¹³⁵ BEA. *Survey of Current Business* (July 2001), “Direct Investment Positions for 2000: Country and Industry Detail,” by Maria Borga and Raymond J. Mataloni, Jr., technical note, pp. 23-25, and additional comments to this author by Mr. Mataloni. There is also the longstanding issue of measurement of investments on an “historical cost” basis, by which the equity value of an investment is not updated, until it is transferred or revalued for some other purpose, and may not therefore reflect current market value. Direct investment and production overseas by GM and Ford goes back decades, and is much older than transplant investment in the United States, contributing to a possible distortion of relative values.

operations in the United States have chosen to report details of their operations under the latter category. In the early years of this series, virtually no Japanese motor vehicle investment in the United States was reported under manufacturing, and in 2002, about two-thirds of the sales of Japanese motor vehicle affiliates was still reported under investment in wholesale trade. U.S. companies operating through affiliates abroad could make the same choice in reporting outward data, but sales by the Big Three under this heading do not seem to be significant.

Looking at the sales figures for this 20-year period as a whole, there seems to be relatively little difference in the magnitude of sales in the two directions. Foreign sales by U.S. multinational affiliates of U.S. automotive companies (cars and parts) increased from \$62 billion in 1983 to \$357 billion in 2002; sales by affiliates of foreign companies investing in the U.S. market increased from \$54 billion in 1983 to \$321 billion in 2002. Investigation of the details of performance by different regions and for different sub-periods does illustrate some dramatic shifts.

Figure 11. Sales of Foreign Affiliates of U.S. Automotive Manufacturers



Note: Canadian data for majority-owned foreign affiliates (MOFAs) only; Mexico data for 1991, 1993, 1994 include estimates for data from non-MOFAs, and data for 1999 interpolated from 1998-2000. Asia-Pacific data for 1999 interpolated from 1998-2000.

Source: BEA. "U.S. Direct Investment Abroad: Financial and Operating Data for U.S. Multinational Companies," at www.bea.gov.

On the outward investment side, U.S. sales to North America and Europe grew at about the same pace during the 1980s, about 9 to 10% per year. At that time, the North America number was dominated by Canada, with Mexico accounting for less than 10% of affiliate sales annually until the later years of the period.¹³⁶ Sales in Asia

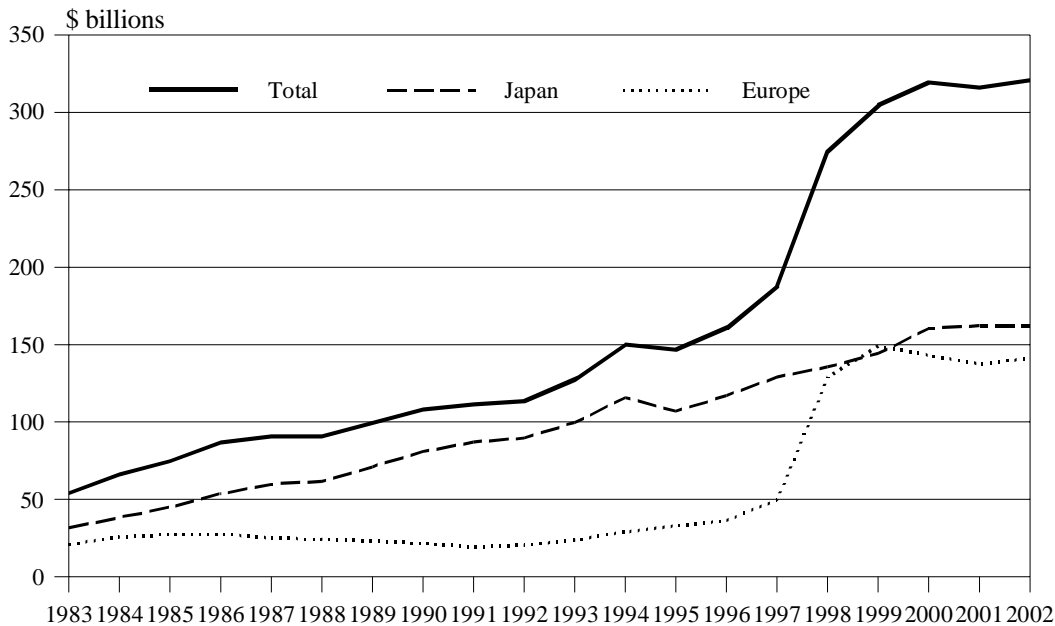
¹³⁶ Note that Canadian data are for majority-owned affiliates only, but this appears to account for well over 90% of U.S. investment in the automotive vehicle and equipment

grew twice as fast (19%), but this is misleading, since typically 80% of these sales were in Japan — and U.S. companies were not invested in the largest and most successful local auto producers, or were limited to small equity shares. For the years in which the Commerce Department has published data for sales of majority-owned U.S. affiliates in Japan, the total was usually less than 1% of all affiliate sales.

In the 1990s, the solid growth of the North American market continued (8.7% annually through 1997), but Mexico came to account for a third of total sales of \$114 billion by U.S. affiliates in the two countries. This share was boosted by NAFTA's impact on U.S. parts exports, as well as Mexico becoming a significant market for vehicle exports. Sales of U.S. affiliates in Europe slowed to around 5% per year in 1990-1997, but it remained the single largest market for U.S. companies' sales, as Ford and GM expanded their presence through acquisition of a number of mid-range brands (\$140 billion total sales by 2002). By comparison, sales fell in the Asia/Pacific region, averaging a decline of 6% per year in 1990-97, as the entire Japanese economy and domestic auto market were both characterized by weak performance during this period. From 1998 to 2002, sales to Asia by affiliates recovered. They doubled from less than \$40 billion annually in 1997-98 to more than \$80 billion in 2002, a performance highlighted by the appearance of China as a major market.

Domestic sales of U.S. affiliates of foreign investors grew more slowly than sales of outward investors through 1995. But while sales by Japanese-owned affiliates grew steadily from \$32 billion in early 1980s to more than \$160 billion annually in 2000-2002, as shown in **Figure 12**, the sales of European investing companies stagnated around \$20-30 billion per year through the early 1990s. VW closed its U.S. plant and declined as a competitor of the Japanese in the import market. Renault sold off its controlling interest in American Motors, as part of that company's eventual acquisition by Chrysler. Then, in 1998, Daimler Benz acquired Chrysler, in a so-called "merger of equals," and sales by U.S. affiliates of European automotive manufacturers were once more close to par with the Japanese (\$142 billion in 2002).

Figure 12. Sales of U.S. Affiliates of Foreign Automotive Manufacturers



Note: Sales of foreign affiliates in manufacturing (transportation equipment through 1986, thereafter for motor vehicles and equipment), plus wholesale trade (motor vehicles and equipment). Sales of Japanese affiliates in motor manufacturing not given in source for 1983-84, 1986-87, but less than \$500 million annually. European affiliates' sales for 2000 and 2002, and Japanese affiliates' sales for 2002 include estimates for sales of wholesale affiliates.
Source: BEA. "Foreign Direct Investment in the United States: Operations of U.S. Affiliates of Foreign Companies," at www.bea.gov.

Global Performance of Automotive Manufacturing Companies

The world market shares of the two largest and remaining U.S.-owned members of the Big Three have experienced major declines. **Table 4** shows the leading vehicle manufacturers globally, generally according to size rank.

As worldwide output of vehicles increased from 41 million in 1979 to more than 60 million in 2003, the table illustrates the notable decline in the share produced by the two largest Big Three companies.¹³⁷ Although General Motors' total vehicle output only fell marginally over the 25-year period, and it was still the largest producer with more than eight million vehicles, its share dropped from nearly 21% to less than 14%, a fall of one-third. Meanwhile, Ford, the number two U.S. motor vehicle manufacturer, fell from second to third worldwide, despite increasing vehicle production by one million. Ford's share dropped from 13.6% to 10.8%. The Ford

¹³⁷ Total vehicle sales in Table 4 include commercial trucks and buses, but buses and heavy trucks comprise only a small share total production. In comparing global performance by automotive companies, one must deal with radically different market segmentation from region to region. For example, the light-truck SUV or pickup for private non-commercial use is almost uniquely U.S.-Canadian phenomenon. Light trucks in Asia and Latin America are mainly for farm or commercial use, though they may double as passenger vehicles, while in Europe, light trucks are almost exclusively for commercial use; Maxton and Wormald, *Time for a Model Change*, pp. 16-17.

and GM share declines occurred despite extensive and aggressive acquisitions and investments abroad by both companies.

In the late 1980s and 1990s, GM acquired Saab cars of Sweden and increased its stake in several Japanese manufacturers. It then bought a 20% stake in Italian producer Fiat in 2000, with an agreement reportedly to purchase the entire vehicle manufacturing company if the Fiat management decided to sell. In 2005, GM agreed to pay Fiat \$2 billion to be relieved of this obligation, as both GM and Fiat have been recording poor results in Europe in recent years.¹³⁸ GM claims that the deal was nevertheless a “net positive,” as Fiat supplied GM a diesel powertrain that it will use in most of its diesel fleet — about half of its European sales in 2005 will be diesel, up from only 10% in 2000.¹³⁹ Reportedly, GM has lost \$3 billion in Europe since 1999. In addition to backing out of the Fiat commitment, GM has taken steps to downsize in Europe by a 20% employment cut, although, as in the United States, the company’s deals with the unions include a commitment not to reduce employment further before 2010.¹⁴⁰

GM has sought to counter its problems in Europe and North America with an aggressive policy in Asia. It acquired a controlling 45% interest in the financially troubled Korean manufacturer Daewoo in 2003, and will use Daewoo’s Korean production facilities as a worldwide source for small cars, frequently branded under the Chevrolet name.¹⁴¹ It has been extremely aggressive in China, particularly in establishing Buick as a leading brand and, in recent years, running second there to VW through its alliances with Shanghai Automotive Industry Corporation (SAIC).¹⁴² GM CEO G. Richard Wagoner is recently quoted as saying that investment and cooperation are essential in securing shares of the market in China (and India), which will help GM gain sales and earnings — and thus enable it to better meet both the competition and its own commitment to workers in the United States: “We invest it

¹³⁸ “GM to Pay Fiat to Settle Dispute over Alliance,” *Wall St. Journal* (Feb. 14, 2005), p. A1; “GM to Pay \$2 Billion to End Ties with Fiat,” *Detroit Free Press* (Feb. 14, 2005). **Table 4** excludes the GM-Fiat investment.

¹³⁹ Jason Stein, “Fiat Finale: Bargain or Blunder,” *Automotive News* (Feb. 21, 2005), p. 8.

¹⁴⁰ *Financial Times*, “GM to Axe 12,000 Jobs in Europe as Part of \$500m-a-Year Cost Drive” (Oct. 12, 2004); and, “Workers Put Blame Firmly on Company,” (Oct. 15, 2004); *FT.com*, “GM Reaches Deal with Unions” (Dec. 9, 2004); *Detroit Free Press*, “GM Europe Plans Hefty Buyouts to Cut Staffing” (Dec. 10, 2004); Associated Press, “German Plant to Make GM’s Midsize Vehicles” (Mar. 4, 2005); *Automotive News*, “GM Shifts Saab Production to Germany” (Mar. 14, 2005), p. 8.

¹⁴¹ *Business Week*, “Daewoo: GM’s Hot New Engine” (Nov. 29, 2004), pp. 52-53.

¹⁴² “Guide to Global Automotive Partnerships,” as cited in **Table 4**, below.

there, we get a higher return, and we can use that to pay off obligations here.”¹⁴³ GM has also turned around losses and gained market share in other regions.¹⁴⁴

After several unsuccessful efforts to acquire holdings in major foreign automotive firms, Ford acquired the car making unit of the Swedish manufacturer Volvo in the 1990s, as well as three British up-market automotive manufacturers: Aston Martin in 1985, then Jaguar and Land Rover in the next decade. These acquisitions were combined into Ford’s “Premier Automotive Group.” Ford had also acquired a small stake in Toyo Kogyo, the Japanese company that produced Mazdas. As that company’s financial problems worsened, Ford acquired a controlling 33% interest in Mazda in 1996.¹⁴⁵

Chrysler’s situation developed in the opposite direction; instead of expanding overseas, it was acquired by a foreign-based automaker. Chrysler shed its overseas operations during financial difficulties in the 1970s. By 1979, it produced only 1.4 million vehicles, good for ninth place worldwide. Daimler Benz, a specialist producer of up-market cars and trucks, in 1979 produced 604,000 vehicles, eighteenth place on the global auto manufacturers lists (the Chrysler and Daimler totals are shown together in **Table 4** in 1979, but the companies were not then affiliated). Chrysler’s subsequent brushes with bankruptcy highlighted an apparent need for a more robust global partnership. In 1998, the company was acquired by Daimler, in what was described initially as a “merger of equals,” but subsequent developments have made it clear that the merged company is controlled fully from headquarters in Stuttgart, Germany (the head of Chrysler Group at this writing is Dieter Zetsche, a German national appointed by the German management board after serious Chrysler losses after 2000). The combined company in 2003 produced 4.3 million vehicles, which raised it to fifth place on the global motor vehicles production list.¹⁴⁶

¹⁴³ *Detroit Free Press*, “GM Looks to Gain Ground in Asia, Control Costs Back Home” (Dec. 20, 2004), part of an extensive series, “GM, Asia and the New Reality,” focused on GM activities in China and India (Dec. 20-21, 2004). The impact on domestic suppliers is explored in a separate series, “Tough Calls at Home,” in *ibid.*, Dec. 23, 2004.

¹⁴⁴ Jason Stein, “Latin America, Africa, Middle East Reap Biggest Net Income for GM,” *Automotive News* (Nov. 29, 2004), p. 16.

¹⁴⁵ Brinkley, *Wheels for the World*, 720-29.

¹⁴⁶ Hyde, *Riding the Roller Coaster*, ch. 16. This author makes it clear, however, that he believes that Chrysler could have survived as an independent company.

Table 4. Selected Leading Global Motor Vehicle Producers

Company	Home Country	Owns/(Owned By), %:	Production (millions of vehicles)			
			1979	(%)	2003	(%)
1) General Motors	USA	Holden — Australia, Opel, Vauxhall, Saab, Hummer, GM Daewoo (45), Fuji Heavy Ind. (20), Suzuki (20), Isuzu (12)	8.6	20.8	8.2	13.6
2) Toyota	Japan	Daihatsu, Hino Trucks	3.0	7.2	6.7	11.1
3) Ford	USA	Aston Martin, Jaguar, Land Rover, Volvo, Mazda (33)	5.5	13.2	6.5	10.8
4) Volkswagen	Germany	Audi, Bentley, Bugatti, Skoda, Lamborghini, Seat	2.1	5.2	5.0	8.3
5) DaimlerChrysler*	Germany	Chrysler Group, Mercedes Benz	2.0	4.9	4.3	7.1
6) Peugeot-Citroën	France		2.3	5.5	3.3	5.5
7) Hyundai	Korea	Kia (47)	n/a	0.0	3.1	5.1
8) Nissan	Japan	(Renault, 44) Dongfeng — China (50)	2.4	5.7	3.0	5.0
9) Honda	Japan		0.8	1.9	3.0	4.9
10) Renault**	France	Nissan (44)	2.2	5.3	2.4	4.0
11) Fiat	Italy	Ferrari, Maserati, Alfa Romeo, Seat (in 1979)	2.2	5.4	2.1	3.5
12) Suzuki	Japan	(GM — 20)	0.3	0.8	1.9	3.2
13) Mitsubishi	Japan	(DaimlerChrysler, 25)	0.9	2.3	1.6	2.6
14) BMW	Germany	Mini, Rolls-Royce	0.3	0.8	1.1	1.9
15) Mazda	Japan	(Ford, 33)	1.0	2.3	1.0	1.7
16) Fuji Heavy Ind.	Japan	Subaru (GM — 20)	0.3	0.8	0.5	0.9
17) MG Rover***	Britain		0.6	1.5	0.1	0.2

Sources: *Automotive News Market Data Book*, 1979 and 2004. Ownership data from *ibid.*, “Guide to Global Automotive Partnerships” (Sept., 2004), excl. GM-Fiat. Details on corporate mergers and acquisitions through 2001 in CRS Report RL30633, *The World Automobile and Truck-Building Industry: Consolidation and Globalization*, by John Williamson.

* 1979 total includes Chrysler Corp. and Daimler Benz production.

** 1979 total includes American Motors production.

*** 1979 - British Leyland.

Ahead of DaimlerChrysler in the rankings in 2003 was Volkswagen, which more than doubled its production output, from 2.1 million vehicles in 1979 to five million in 2003. VW to a great extent has increased its sales by acquisitions and production alliances. In addition to the Audi brand, which it acquired in the 1960s, VW has bought specialist up-market brands (Bugatti, Bentley, Lamborghini), has acquired Seat, formerly the Spanish affiliate of Fiat, and acquired the Skoda brand and facilities in the Czech Republic after the fall of the Communist government. Moreover, through its Chinese alliances with First Automobile Works Group and Shanghai Automotive, VW became the leading producer in the rapidly expanding Chinese market, with half the market in 1999. VW's increase in production has not resulted in great financial success for the company. It has especially been bedeviled by high labor costs combined with slow market growth in its German and continental European home market. It furthered suffered in 2004 as a Chinese financial clampdown reduced automotive credit and sales growth, and VW also lost as much as half its Chinese market share.¹⁴⁷

By contrast with GM, Ford, DCX and VW, the largest U.S. and German-based auto manufacturers, the major Japanese companies have expanded more by exporting and by direct investment abroad in new production facilities, than by foreign or domestic acquisitions of companies and brands. Toyota, already number three in the world in vehicle production in 1979, moved past Ford into the global number two position with production of 6.7 million vehicles in 2003, more than double the total of 1979, and an 11% market share. But unlike the other leading vehicle manufacturers, Toyota controls only one other producer, Daihatsu, and a truck manufacturer, Hino. Both were in financial distress when they were acquired in 1998-2000, and have very limited product distribution outside Japan.¹⁴⁸ Toyota has been aggressive in establishing joint ventures, in China, in the United States (with GM at NUMMI), and in several other countries.

Honda, which has moved from the fifteenth position globally to the ninth spot, more than tripled vehicle production from 800,000 in 1979 to three million in 2003, and increased its market share from 1.9% to 4.9% during this period. But it did this without any acquisitions of other companies or brands. Like Toyota, Honda has established a number of joint venture operations, all in Asia.

Nissan is somewhat the reverse of this story. As of 1979, it was not only the second-ranking vehicle producer in Japan, but also number four in the world, with total output of 2.4 million vehicles. Its Datsun 240Z sports coupe was arguably the

¹⁴⁷ *FT.com*, "Moody's Warns on VW Plan for Cost Savings" (Jul. 2, 2004); and, "VW Faces Erosion of Dominance in China" (Aug. 3, 2004); *Business Week*, "Volkswagen Slips into Reverse" (Aug. 9, 2004), p. 40; *Wall St. Journal.Online* "Volkswagen to Cut Investment; Chief Strategist to Step Down" (Nov. 12, 2004). Lack of strong-selling new models has also caused VW sales to stagnate in the U.S. — the company may fall behind BMW in total vehicle unit sales when final 2004 numbers are tallied; *Automotive News*, "BMW Approaches VW as Top European Seller Here" (Dec. 6, 2004), p. 1.

¹⁴⁸ CRS Report RL30633, pp. 9-10 (excluding Toyota's in-house brands, Scion and Lexus).

first Japanese-made “halo”(iconic) motor vehicle in the U.S. market. But Nissan, along with other Japanese manufacturers, had problems in the domestic market in the 1990s, which it was unable to offset with rising sales overseas. By the late 1990s, the company was in serious financial difficulties, and sold a controlling equity stake to Renault — a deal made by Renault only after the French company’s deal to acquire Volvo fell through because of opposition in Sweden. Under the leadership of Renault-appointed CEO Carlos Ghosn, Nissan substantially reduced its workforce and closed a number of Japanese factories. But Ghosn did manage to turn the company around. By 2003, **Table 4** shows Nissan with only a modest gain in production over 1979 to three million vehicles, and it fell in global rank, from fourth to eighth, with market share down from 5.7% to 5.0%. But it is reportedly the world’s most profitable car manufacturer, and in 2004 showed major gains in the U.S. market. Ghosn became the head of the combined company in 2005.¹⁴⁹

The other Japanese companies are minor players in the context of today’s automotive top league. Mitsubishi Motors Corporation (MMC) is an offshoot of the Mitsubishi Heavy Industries empire, and remains the fourth largest Japanese motor vehicle producer. But, as noted above, its sales in both Japan and North America have plummeted after corporate scandals, mismanagement and overexpansion, and its long-term continuation at its present level of production is problematic.¹⁵⁰ The DCX holding in Mitsubishi shown in the table is in the process of being wound down, and the company is currently being reorganized. Mazda, a long-time proponent of rotary engine technology, nearly went bankrupt in the 1970s, and remains a minor producer, effectively controlled by Ford. Similarly, Fuji Heavy Industries, a large industrial conglomerate with some co-investment from GM, controls the Subaru and Isuzu brands. The latter is mainly a Japanese-based truck producer, which has contracted to provide diesel engines for GM in Europe.

Hyundai is the only Korean company to have made the major league of automotive production, rising to seventh place globally and having acquired control over Kia, the second-largest selling Korean brand. After initial failures to expand in North America because of quality issues, Hyundai has succeeded in relaunching its brand in North America with a new emphasis on quality and a ten-year, 100,000-mile new car warranty. However, Hyundai has also actively sought to diversify manufacturing outside its Korean base. Not only is it opening a new factory in Alabama, but it also has established joint ventures that manufacture smaller vehicles in India and China, for both local markets and possibly for export. In January and February 2005, Hyundai vehicles actually outsold GM and VW products in China for the first time.¹⁵¹

¹⁴⁹ James Mackintosh, “A Superstar Leader in an Industry of Icons,” *FT.com* (Dec. 16, 2004); Jathon Sapsford, “Nissan’s Ghosn, on Track to Run Renault, Faces Bumpy Road,” *Wall St. Journal* (Jan. 7, 2005), p. B1; Carlos Ghosn and Philippe Riès, *Shift: Inside Nissan’s Historic Revival* (New York: Doubleday, 2005), chs. 8-21.

¹⁵⁰ See, for example, *Business Week*, “More Bad News for Mitsubishi Motors” (Nov. 22, 2004), p. 65.

¹⁵¹ Joann Muller and Robyn Meredith, “Last Laugh: How Hyundai Went from Punchline to Powerhouse,” *Forbes* (Apr. 25, 2005).

The remaining major companies in the table are all based in Europe, and all have limited exposure elsewhere. BMW has been very successful with a limited market offering. It was originally a Munich-based manufacturer of aircraft engines and motorcycles. However, with a 2003 output of only 1.1 million vehicles, BMW has been more of an up-market and niche producer, than a volume seller. Its venture into that market, through an acquisition of Britain's Rover Group, was a failure, and was spun off. Of the two large French companies, Peugeot, which acquired the Citroën brand in the late 1970s, has generally been successful with a strategy that was primarily based on European sales, and is one of the global leaders in producing diesel engines for smaller passenger cars. Recently, Peugeot also announced that, because of strong growth in sales in Iran and Latin America, areas outside western Europe accounted for almost 25% of total sales in 2004.¹⁵² Renault, as discussed earlier, tried and failed to establish its presence in North America through an acquisition of American Motors, but has been more successful through taking a controlling position in Nissan. The two brands to date have not been integrated. Fiat has been moribund, with declining market shares and production, as foreign producers increasingly penetrate its home market in Italy, and its positions have also been weakening elsewhere.¹⁵³ MG Rover is only included on the list to illustrate the end of the independent British-owned motor industry. Its name reflects two brands spun off by BMW, after it tried and failed to resurrect British Leyland's vehicle brands (but BMW kept the Mini and Rolls-Royce products).¹⁵⁴ In April 2005, MG Rover ran out of money, ceased operating, and went into receivership.¹⁵⁵

In terms of market share, European producers are now beginning to face the issue of serious import penetration at home by Japanese and Korean brands. Prior to 1991, automotive trade between many individual European countries and Japan was limited by a series of restrictive provisions — allegedly loose or non-existent in some cases (Germany, U.K.) and extremely limited and tightly enforced in others (France, Italy, Spain, Portugal). In 1991, the European Commission and Japan negotiated a “transitional” agreement, under which authority over trade limits was transferred to the Commission, with national quotas loosened through 1999. After that, all quotas and restraints, such as local content rules, were to be lifted.¹⁵⁶ Maxton and Wormald note that, apparently due to differing consumer product tastes and other market differences, the termination of quotas in the EU did not result in a major increase in market penetration by Japanese and other Asian-branded vehicles, whether imported or produced in Europe. The Asian producers held 11.2% of the market in 1992, increased share to 14.8% by 1999, but saw a drop thereafter, according to their data.¹⁵⁷ However, their conclusion may have been premature. A

¹⁵² Tom Griggs, “Peugeot sales Rise on Strong Global Demand,” *FT.com* (Jan. 7, 2005).

¹⁵³ See *Business Week*, “Fiat Is in Deep, Deep Trouble” (Dec. 13, 2004).

¹⁵⁴ MG Rover went into bankruptcy and ceased operations, at least temporarily, in April 2005; Associated Press, “MG Rover Seeks Bankruptcy” (April 9, 2005).

¹⁵⁵ *Wall St. Journal*, “MG Rover Will Be Broken Up, Layoff of 5,000 Expected” (Apr. 15, 2005).

¹⁵⁶ CRS Report 92-94 E, *The European Community-Japan Automobile Agreement*.

¹⁵⁷ Maxton and Wormald, *Time for a Model Change*, pp. 28-29.

recent report in the *Wall St. Journal* notes that the five largest European car makers lost 1.2 points of market share in the first three quarters of 2004, most of which was gained by the five largest Asian companies. By 2004, the Asian companies' market share in Europe had risen to nearly 18%.¹⁵⁸

The table omits from the lower part of the rankings two manufacturers from the former Soviet Union, AvtoVaz of Russia (producer of the Lada) and AvtoGaz of the Ukraine. They produced together a total of about one million cars in 2003, but are otherwise of no international market significance. The table also omitted several Chinese producers, because they are in joint ventures with other leading companies, and their output would be double-counted; in no case did they produce one million vehicles in 2003. Given the strength, size and rapid growth of the Chinese market, these companies have been interested in acquiring partners' technologies.¹⁵⁹ They may soon become formidable players in their own right, though there is debate on the export potential they represent.¹⁶⁰ There are also a number of Indian producers, including a subsidiary of the industrial conglomerate Tata, which has independently produced vehicles for the local market and has export ambitions.¹⁶¹

Performance by Producing Countries

Most of the major motor vehicle companies now produce vehicles not only in more than one country, but also in more than one geographical region. The spread of technology has occurred primarily through joint venture, vehicle design and technology-sharing arrangements between top-level international producers, based in the United States, Europe or Japan, and manufacturing partners in other countries. And, although the total motor vehicle market has expanded by about 50% since 1997-80 — from about 40 million to about 60 million vehicles produced annually — the industrial, developed nations “triad” still dominates global manufacturing, production and sales in the industry. As shown in **Figure 13**, out of a little more than 60 million total motor vehicles produced in 2003, approximately three-quarters were built in the European Union, North America and Japan. Maxton and Wormald conclude in their industry analysis that, overall, this is a mature, slow-growth industry, and that dynamic will be little affected by demand growth in developing economies over the foreseeable future, even including China.¹⁶²

In recent years, the largest markets have seen relatively little total volume growth in production and sales, though as shown earlier with respect to North America, there have been significant changes in market shares by types of vehicle

¹⁵⁸ Stephen Power, “Europe’s Car Makers Face Turmoil as Japanese Gain in Market Share,” *Wall St. Journal* (Oct. 14, 2004), p. A1.

¹⁵⁹ Honda and GM, for example, are currently involved in disputes in which they claim that local Chinese companies over allegedly copied cars; *FT.com*, “Honda Sues Chinese Carmaker over Copying” (Dec. 9, 2004), and “GM Sues Chinese Company over ‘Copied’ Car” (Dec. 16, 2004). See also Maxton and Wormald, *Time for a Model Change*, p.131.

¹⁶⁰ See Jamie Butters, “China as a Competitive Threat,” *Detroit Free Press* (Dec. 22, 2004).

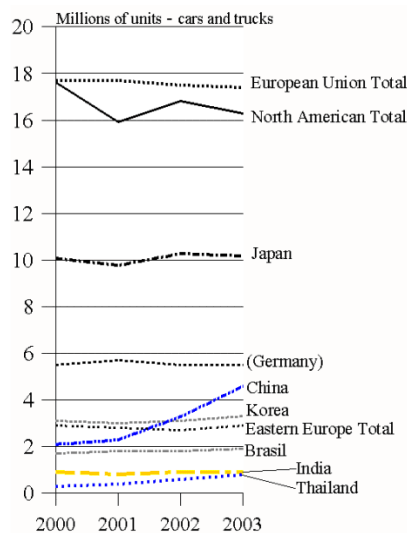
¹⁶¹ Maxton and Wormald, *Time for a Model Change*, pp. 134-36.

¹⁶² *Ibid.*, especially ch. 4.

sold and by different producers. North American output (including transplants and exports, but net of imports) peaked at nearly 18 million vehicles in 2000, but has fallen since then to closer to 16 million vehicles annually.

European Union vehicle output has remained higher than in North America, around 17.5 million, and it, too, has fallen since 2000. Germany, with about 5.5 million vehicles annually, accounts for around 30% of EU production. To the total for western Europe, one might also add the eastern Europe total of just under 3 million vehicles annually, most in assembly plants directly owned by EU-based manufacturers (such as the Skoda plants in the Czech Republic, owned by VW, or Renault's low-cost Dacia Logan model, produced in Romania), or in joint ventures.

Figure 13. Major Motor Vehicle Production Countries and Regions



Source: *Automotive News Data Book 2002, and 2004.*

Despite advances by its producers in foreign markets, Japan's own production has not markedly grown over the past fifteen years. It peaked at more than 10 million vehicles in the early 1990s, fell below that level for most of the decade, before rising just above that level again since 2000. The successful expansion of some of the Japanese manufacturers in foreign markets has been to some extent undermined by weakness in domestic demand and the existence of too many separate producers — many of which have been effectively taken over by larger and stronger domestic or foreign companies, as described earlier in

this report. Overall, a recent forecast by the automotive team at Global Insight (formerly DRI), sees only very slow (less than 2% each year) or negative growth in light vehicle sales in the United States, western Europe and Japan over the next five years.¹⁶³

No country has developed an independent, world-class motor vehicle industry since Japan in the 1950s and 1960s. Korea tried to do so, based on a significant and highly protected domestic market, as described by the U.S. Trade Representative and discussed above, and expanding export sales, but largely failed. By 2002, Hyundai was its sole locally owned, internationally successful motor-vehicle producing company. Kia was taken over by Hyundai after the country's severe financial crisis of 1998, and the other domestic producers are now effectively controlled by foreign

¹⁶³ Global Insight, *World Car Industry Forecast Report* (Dec. 2004), Table W3(b).

interests.¹⁶⁴ **Figure 13** shows that Korean industry stabilized at around 3.5 million units annually since 2000.

But as Maxton and Wormald point out, other countries keep trying to develop their own auto industries, because they view the industry as an essential “pillar” of domestic economic growth. Without a modern motor vehicle industry, leaders of both developing and “transitional” (e.g., Communist or ex-Communist) economies do not see a way to generate homegrown demand for full industrialization. Moreover, expanding the availability of motor vehicles may validate successful development strategies through the achievement of enhanced personal mobility at the mass level. These authors argue that most industrializing countries thus cling to a model of motor vehicle industry development, which seeks to capture technology from established international manufacturers, through joint venture arrangements, enforced by de facto or de jure protectionism, that require technology transfers. Furthermore, given the low levels of income per capita in such countries, their usual highly unequal nature of income distribution, and the strain that large-scale automotive import levels would place on the balance of payments, the authors state that a policy of satisfying motor vehicle demand through imports would not be politically or economically feasible.

Maxton and Wormald conclude owning a private automobile (or light truck for personal use, as in North America) remains essentially an accouterment of citizens of wealthy countries, requiring a current minimum income level equivalent of \$10,000 per year for the vehicle owner. Thus, although, by their calculations, 11% of global gross domestic product is connected with the motor vehicle industry, and 15% of all steel, 40% of all rubber, 25% of all glass and “a staggering 40% of annual oil output” in the world are consumed by motor vehicles, 70% of all vehicles produced are still sold in western Europe, North America and Japan. Nor do they see the balance changing, except at a slow pace, and one at which new capacity is brought on stream faster than the ability of markets, even fast-growing ones in developing countries, to absorb product at a rate that is both economically efficient and profitable for producers.¹⁶⁵

The key market in their analysis, as well as in that of most major motor vehicle manufacturers, is China. Alone among all national or regionally integrated markets in which more than one million vehicles were sold in 2003, China has exhibited fast growth since 2000. Production has increased by 2.5 times, moving China from just a little ahead of Brazil, at more than two million vehicles of all types in 2000, to more than 5.5 million in 2003, fourth only on a national basis to the United States, Japan and Germany. During this period alone, China has passed Canada, all of eastern Europe, Spain, Korea, and France (3.6 million vehicles in 2003). Global Insight’s world car industry forecast for September 2004 reported that in 2002, Chinese sales of light vehicles exploded by 37% in one year alone. It grew another 13% to more than 4 million vehicles of this type in 2003, before slowing to an estimated 2004 level of 9%, as the government clamped down on credit to cool an

¹⁶⁴ ITC, *Motor Vehicles*, pp. 60-61; the EU, Japanese and Korean industries and vehicle markets are summarized more generally in pp. 49-61.

¹⁶⁵ Maxton and Wormald, *Time for a Model Change*, pp. 3-8.

overheating economy. Nevertheless, Global Insight forecasts double-digit sales increases through 2008, and a total level of light vehicle sales in China of more than 7.5 million by 2009. The net forecast increase of three million units in light vehicle sales between 2003 and 2009 accounts for 55% of the projected 5.5 million unit increase in sales for all of Asia, outside Japan, during the next five years.¹⁶⁶

Maxton and Wormald rate China as having the best chance among countries still trying to develop an independently based auto industry, through aggressive manipulation of joint venture agreements between national companies and overeager foreign investment partners. But they are skeptical that even China, with a coherent, state-developed industry plan and the world's largest market potential can achieve this goal within a reasonable market plan time frame. Each additional one million vehicles per year sold in China, they note, is only about the equivalent of week's sales in the advanced industrial countries. And, even if China succeeds in creating an export industry, they hypothesize, its greatest impact on export markets by the end of the present decade will be in small vehicles, with an emphasis on low-priced products.¹⁶⁷

Among other producers, these two authors rate Russia, India, and surprisingly, Iran, as having some chance of creating "new competitors" with a global impact. Russia now produces about 1.5 million cars annually, or about half the total in the former Soviet Union-eastern European countries. The key issue that the authors saw there was the overall economic organization of society and the economy. Iran, which in most recent data produced about 600,000 cars, or more than 80% of the Middle East total, with technology acquired from Peugeot, was rated by the authors as having a chance of expanding its low-end production and export base in the Middle East and Central Asia region, and perhaps beyond.¹⁶⁸ India produces less than one million cars annually, but is gradually emerging from its uncompetitive, autarchic policies. Independent companies have been negotiating joint venture deals with major international manufacturers, but Indian policy is less coherent and developed than China's, while the state of road development also remains a significant barrier.¹⁶⁹

Maxton and Wormald rate other countries as "peripheral" or "networked." These are countries they describe as maintaining an automotive manufacturing base, but that they judge are unable to develop and sustain products independently of the major international "core" producers. This would include countries with formerly independent producers, such as Britain, Sweden and Spain. It also includes a variety

¹⁶⁶ Global Insight, *World Car Industry Forecast Report*, pp. 25-26, 474-78. Note that in total motor vehicle production reported in Fig. 14, China has a relatively high proportion of heavy trucks, as compared to other major producing countries.

¹⁶⁷ *Ibid.*, pp. 127-36. See also the discussion above on China in connection with U.S. trade patterns and Appx. Table 5.

¹⁶⁸ Global Insight, *World Car Industry Forecast Report*, p. 12, estimates total light vehicle sales in Iran of 800,000 in 2004, in a closed market, with the industrial country manufacturing affiliates being Peugeot, Renault and Hyundai.

¹⁶⁹ On these countries, Maxton and Wormald, *Time for a Model Change*, 132-136; on India, see also the articles on that country in *Detroit Free Press*, "GM, Asia and the New Reality" (Dec. 21, 2004).

of countries such as Australia, Indonesia, Brazil, Argentina and Mexico, which once had “autarchic,” government-controlled import-substitution policies, but where they felt a protected local industry mainly survives as a “satellite” of major producers elsewhere. The authors believe that Korea and Italy are headed generally in this direction, as is Malaysia, whose market is too small to support an independent motor industry. One interesting, high-growth example of this phenomenon, as shown in **Figure 13**, is Thailand, which because of comparative advantage in pickup truck production has been the only substantial producer with a high rate of growth since 2000 (its total 2003 vehicle output of about 900,000 nearly equaled that of India).¹⁷⁰

The Global Automotive Supplier Industry

As noted earlier in this report, the U.S. motor vehicle parts and equipment industry employs far more people than the brand-name motor vehicle assemblers. This industry has been under increasing pressure, as motor vehicle manufacturers seek both to rationalize and globalize their supply chains.

The U.S. auto parts industry in recent years has thus faced pressure from two directions. First, while proliferating models in hopes of filling more market niches, the major vehicle manufacturers have also sought to reduce costs by driving model designs off a smaller number of vehicle “platforms,” emphasizing greater commonality of parts, but with more distinctive features, while reducing the number of suppliers. Ford and GM have also stressed that they intend to source more parts from cheaper production locations, especially China. As the vehicle manufacturers, especially the U.S. Big Three, have increasingly “deintegrated” their manufacturing processes — relying more on outside suppliers who must compete to supply parts, components and modules — they have used their market power to force a “cost-down” model of ever-decreasing unit prices on suppliers.¹⁷¹

This pressure has been exacerbated by the growth of Japanese- and European-based transplants, which has increased the presence of foreign-based auto suppliers in the U.S. market, and added to competition and capacity in a market that is already mature. For example, three of the five Japanese suppliers among the top 25 globally have about a quarter or more of their sales in North America. One of them, Yazaki, sold nearly as much in North America in 2003 as it did in Japan.¹⁷²

The second factor that has squeezed this industry is the rising cost of materials, especially steel. Motor vehicle parts manufacturers were among the leaders in calling for a rollback of the safeguard tariffs applied by President Bush in 2002 to a wide range of steel imports, under Section 201 of the U.S. Trade Act of 1974. Eventually, the President terminated the safeguards about halfway through the planned term of three years, in December 2003. However, instead of falling, the rise in the price of

¹⁷⁰ Maxton and Wormald, *Time for a Model Change*, pp. 91-126.

¹⁷¹ Maxton and Wormald, *Time for a Model Change*, pp. 154-63, especially complaints by suppliers about GM, summarized in Fig. 5-23; also, Lindsay Chappell, “Big 3 Pay Price for Bad Supplier Relations,” *Automotive News* (Dec. 27, 2004), p. 1.

¹⁷² Details on these data are in **Table 6**, later in this report.

steel dramatically accelerated, more than doubling earlier levels. To some extent, the major systems and parts suppliers, the “Tier 1” companies, were shielded from the price rise. They are allocated steel by the Big Three, who directly negotiate long-term supply contracts with the steel companies. This does not protect Tier 2 and Tier 3 suppliers in many cases. These are frequently smaller companies, especially located in the Midwest, who must buy steel on a spot basis after they have successfully bid on a contract. Furthermore, many of the Big Three supply contracts, which are negotiated on a rolling basis, have expired as prices are peaking, leaving customers to decide whether to lock in high current prices in long-term contracts.¹⁷³

Table 5. Automotive Industry Supplier Location

Location from assembly	Product characteristics	Parts/components
Global	<ul style="list-style-type: none"> • High technology • Low variability • Light, compact 	<ul style="list-style-type: none"> • Integrated circuits
2,000 km	<ul style="list-style-type: none"> • Economy of scale • Moderate variability • Moderate weight and bulk 	<ul style="list-style-type: none"> • Alternators • Starters • Radiators • Hub units
300-400 km	<ul style="list-style-type: none"> • Modules/system assemblies for specific vehicles • Moderate variability • Heavy or bulky 	<ul style="list-style-type: none"> • Heating, ventilation, air conditioning systems • Fuel tanks
20-30 km	<ul style="list-style-type: none"> • Modules/system assemblies • Sequenced exactly in vehicle assembly • Heavy or bulky 	<ul style="list-style-type: none"> • Seats • Alarms • Dashboards • Painted bumpers

Source: Maxton and Wormald, *Time for a Model Change*, pp. 151-52 and Fig. 5-15.

Maxton and Wormald contend that the motor vehicle parts and equipment industry is moving toward internationalization and consolidation at the global level. This may be either through supply of the global market by increased international trade, or, as may be compelled in the automotive industry because of “just-in-time”

¹⁷³ See CRS Report RL32333, *Steel: Price and Availability Issues*; and, Brian Becker and Kevin Hassett, *The Steel Industry: An Automotive Supplier Perspective* (Washington: Motor & Equipment Manufacturers Assn., 2005). Ford and U.S.-based auto parts manufacturers, including Delphi, the largest such company, testified at an ITC hearing on “sunsetting” antidumping and countervailing duties on imported hot-rolled steel from Japan, Brazil and Russia; USITC. “Certain Hot-Rolled Flat-Rolled Carbon-Quality Steel Products from Brazil, Japan and Russia” (Investigations 701-TA-384 and 731-TA-806-808, review), public hearing, Mar. 2, 2005.

manufacturing, by increased direct international investment in production facilities near assembly plants. A typology that seeks to explain supplier location, as outlined by the two British authors, is summarized in **Table 5**. This global analysis is interesting to compare with discussion above of the auto parts supply business by the Chicago Federal Reserve Bank. Both approaches stress that changes in location of parts manufacturing operations would move incrementally. But the Chicago Fed emphasized that the key determinant would be the location of the assembly plant itself and the associated transportation infrastructure. Maxton and Wormald emphasize instead the size, complexity and specificity of the part, component or system. These authors believe that, as with the vehicle manufacturers, the parts industry will move in the direction of consolidation (following the recent trend of deintegration from the vehicle assemblers). But, if ownership is consolidated at the global level, the typology outlined in **Table 5** may help determine to what extent local manufacturing operations are consolidated globally or regionally.

Notwithstanding the arguments put forward for globalization, via exporting, direct foreign greenfield investments, or mergers and acquisitions, an analysis of **Table 6** shows that the original equipment manufacturers (OEM) sales of most major automotive parts manufacturers tend to focus on one region, with possibly a secondary focus in one other region. Few are spread more widely, to any significant degree.

This not surprising with respect to Delphi and Visteon, the spun-off GM and Ford parts makers, respectively, who are the largest U.S.-based suppliers on the list. Both make a wide range of parts for their former parents; about 50% of Delphi's sales in 2004 were to GM, while fully two-thirds of Visteon's revenues came from Ford. For Delphi, 74% of sales are in North America, 21% in Europe and only 5% in Asia and the rest of the world. For Visteon, the concentration is slightly different, but similar: 67% North America, 18% in Europe, and 15% elsewhere. Johnson Controls, another top-ten, U.S.-based supplier, follows the same pattern, with 92% of OEM sales in North America and Europe — though as an independent supplier, the distribution between the U.S. and Europe is more equal. The other two U.S.-based companies in the top ten, Lear and TRW Automotive, are well-established in Europe as well as North America, but have no sales at all in Asia.

Magna, the large Canadian-based supplier, again follows the pattern: 60% of sales in North America, 30% in Europe, 2% elsewhere. Bosch, the leading European-based auto parts supplier, which may have overtaken Delphi as the world's largest in 2004, follows a similar pattern from the European perspective.¹⁷⁴ Most of its sales are in Europe, it is well-represented in North America and elsewhere, but has no sales in Asia. This also applies to the next four European suppliers (Faurecia, Valeo, ZF Friedrichshafen and the automotive unit of the German electrical

¹⁷⁴ *FT.com*, "Bosch Sales Lead Delphi for the First Time" (Jan. 27, 2005). In comparison with Delphi, Bosch's ranking was helped by the large share of its 2004 euro-valued sales in Europe, which also gained from exchange rate appreciation against the dollar. According to the article, Bosch also "profited in part from heightened demand in Europe for diesel engines [as] it is the market leader [there] for diesel injection systems."

engineering company, Siemens): concentration in Europe, double-digit shares of sales in North America, only single-digit sales in Asia.

Conversely, the top two Japanese companies, Denso and Aisin Seiki, have 65% and 80% of sales in Asia, respectively, and about 90% each there and in North America. As was mentioned in the earlier section on trade policy issues, the U.S. Trade Representative has long alleged that Japanese and Korean markets are closed, or tightly restricted, for foreign auto parts manufacturers. Many European countries also applied formal or de facto restrictions that favored local content and suppliers for decades. While U.S. automotive policy rules have been established that distinguished between foreign-made and locally produced parts, such rules in general have not discouraged higher levels of direct investment in the United States by foreign-based parts manufacturers.¹⁷⁵

Another interesting feature of **Table 6** is that after placing five suppliers in the global top ten, the heft of U.S.-based suppliers falls off dramatically. Only four other U.S.-based companies are in the top 25: Dana ranks fourteenth (\$7.9 billion), the automotive products sales of chemical company Du Pont place it eighteenth (\$5.5 billion), Collins & Aikman is number 23 (\$4 billion), and ArvinMeritor right behind (\$3.9 billion). The low and falling rankings of many U.S.-based suppliers is not a statistical artifact or illusion:

Their share of the shrinking pie is disappearing faster than the market around them. In the past five years, U.S. factories have lost \$47.4 billion in original-equipment business to rivals in other countries ...¹⁷⁶

Many U.S. auto parts manufacturers are medium- or smaller-sized specialist companies. Most are concentrated in the North American market, which, as this report has generally shown, is a mature market with limited growth potential. Stagnant growth, especially among the Big Three, higher steel and other material costs, and increased competition from foreign-based companies have put this domestic industry under increased financial pressure. Two major U.S. suppliers, Federal-Mogul (no. 37 in the global top 100) and Tower Automotive (no. 40), are operating in bankruptcy. Oxford Automotive (no. 88) only recently left bankruptcy by selling or closing all ten of its U.S. manufacturing plants. Others, such as Collins & Aikman have been in financial distress, and two smaller suppliers of castings to the industry have recently gone bankrupt.¹⁷⁷

¹⁷⁵ Maxton and Wormald discuss the relative rates of regional concentration market shares held by foreign investors in Fig. 5-17, and on p. 152.

¹⁷⁶ Lindsay Chappell, "U.S. Parts Factories Lose More Ground," *Automotive News* (Feb. 28, 2005), p. 10; the quote from the article is based on "U.S. Commerce Department data compiled by Des Rosiers Automotive Consultants Inc. of Richmond Hill, Ontario."

¹⁷⁷ *Automotive News*, "Analysts Pound Big Three Suppliers" (Sept. 6, 2004), p. 1; Bernard Simon, "Gloom Sets in Across U.S. Motor Industry," *Financial Times* (Oct. 13, 2004); *Detroit Free Press*, "Auto Supplier Profits Dwindle" (AP wire story, Nov. 20, 2004); "Tower Automotive Files for Chapter 11 Bankruptcy Aid" (Feb. 3, 2005); "Oxford Automotive Is Out of Bankruptcy" (Mar. 25, 2005); and "S&P Cuts C&A Rating; Bankruptcy Possible" (Mar. 31, 2005).

Table 6. Leading Automotive Parts Suppliers
(Sales and rankings data for 2003)

Company	HQ country	Total OEM automotive parts sales and % distribution				
		\$ bils.	N.Am.	Europe	Asia	R.o.W.
1) Delphi	USA	26.2	74	21	3	2
2) Robert Bosch	Germany	23.2	23	61		16
3) Denso	Japan	16.9	23	12	65	
4) Visteon	USA	16.5	67	18	8	7
5) Lear	USA	15.7	60	36		4
6) Magna Intl.	Canada	15.3	68	30	1	1
7) Johnson Controls	USA	15.2	53	39	7	1
8) Aisin Seiki	Japan	13.5	12	7	80	1
9) Faurecia	France	12.7	10	86	3	1
10) TRW Auto.	USA	11.3	41	50		9
11) Siemens VDO	Germany	9.5	18	73	7	2
12) Valeo	France	8.9	19	71	7	3
13) ZF Frhafen.	Germany	8.2	20	70	7	3
14) Dana	USA	7.9	70	19	6	5
15) Continental	Germany	7.6	30	60	5	5
16) ThyssenKrupp	Germany	7.3	50	46	1	3
17) Yazaki	Japan	5.9	38	11	43	8
18) DuPont	USA	5.5	50	35	11	4
19) CalsonicKansei	Japan	5.4	26	8	66	
20) Autoliv	Sweden	5.3	35	50	10	5
21) Michelin	France	4.7	27	44		29
22) Koyo Seiko	Japan	4.1	11	27	60	2
23) Collins & Aikman	USA	4.0	73	25	1	1
24) ArvinMeritor	USA	3.9	50	40	7	3
25) GKN	UK	3.9	50	38		12

Source: *Automotive News*, "Top 100 Global Suppliers" (June 28, 2004).

The recent Ford and GM losses in market share and production have contributed to losses for Delphi and Visteon, their former subsidiaries, and consequently for their smaller Tier 2 and Tier 3 suppliers. Visteon, the number four global supplier, has not made a full-year profit in its four years of existence, and has lost a total of \$3.2

billion. In terms of providing more business or other assistance, William Clay Ford, Jr., CEO of Visteon's former parent and leading customer, said, "We're willing to sit down with them and to say where we can be helpful. But we're not Santa Claus."¹⁷⁸ But Ford nevertheless reached an agreement with Visteon that provided \$390 million in anticipated savings in 2005, including payment of about one-quarter of the employment costs of 18,000 UAW members who were technically "leased" by Ford to Visteon as part of the original spin-off deal.¹⁷⁹ Delphi in 2004 recorded losses for the second straight year, and it anticipates another loss for 2005. Its problems were compounded by accounting irregularities involving rebates from their own suppliers. The company's CEO and CFO have both resigned.¹⁸⁰

Fuel Economy and Emissions Standards¹⁸¹

Since the 1960s and 1970s, environmental issues, including vehicle emissions, fossil fuel consumption, and resource use, have played an increasing role in shaping the U.S. auto industry. Environmental decisions play a key part in automotive design, research and development of new vehicles, and marketing to consumers.

In response to increasing ground-level ozone pollution (smog), California established the first requirements for auto emissions control technology in 1961. With the passage of the Clean Air Act in 1970, the first federal auto emissions standards went into effect in 1975. In response to the 1973-1974 Arab oil embargo, the Energy Policy and Conservation Act of 1975 established Corporate Average Fuel Economy (CAFE) standards for passenger cars in the 1977 model year (MY), and the Department of Transportation established standards for light trucks in MY1978. While not enacted for environmental reasons, fuel economy standards are seen by some as a key strategy for reducing fossil fuel consumption, and, with it, greenhouse gas emissions. Since the 1970s, federal CAFE standards, as well as federal and California emission standards, have become increasingly stringent. For example, from 1978 to 1990, passenger car CAFE standards rose from 18.0 miles per gallon (mpg) to 27.5 mpg; light truck standards rose from 17.5 mpg in 1982 to 21.0 mpg in 2005. Similarly, by 2009, federal standards for nitrogen oxide emissions from

¹⁷⁸ B. Simon, "No Santa for Troubled Visteon," *FT.com* (Nov. 23, 2004); and Doron Levin, "Car Glut Has Repercussions for Visteon and Delphi," *Bloomberg.com* (Dec. 13, 2004).

¹⁷⁹ *Detroit Free Press*, "Ford Deal to Save Visteon \$390 Million" (Mar. 11, 2005); *Automotive News*, "Downsizing Detroit," "Once Again, Ford Has to Bail Out Visteon," and "Small Suppliers Hit the Hardest" (Mar. 14, 2005), pp. 1 and 54-55.

¹⁸⁰ *Detroit Free Press*, "Delphi Loses; Outlook Bleak" (Jan. 21, 2005); "Accounting Scandal Hits Delphi; Exec Ousted" (Mar. 5, 2005); "Delphi Scandal Rocks Industry" (Mar. 5, 2005); "Delphi Accounting Woes Rattle Through Industry" (Mar. 11, 2005); "Battenberg Defends His Departure" (Mar. 15, 2005); and *Automotive News*, "Supply Chain 'Rebate' Part of Delphi Trap" (Mar. 14, 2005).

¹⁸¹ This section was written by Brent Yacobucci.

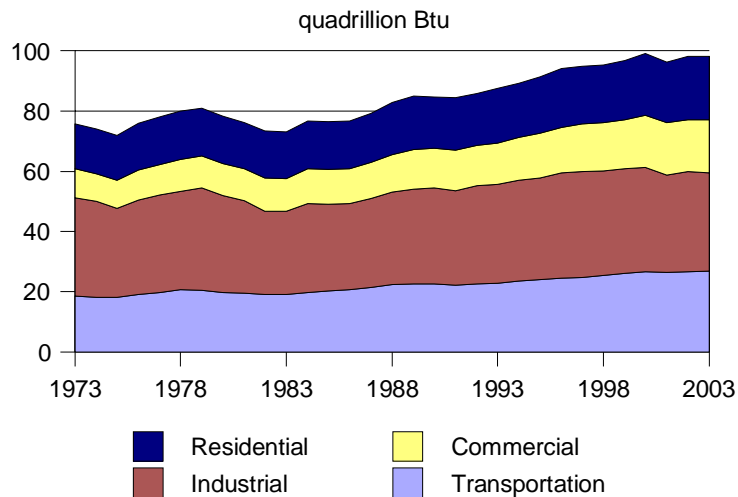
passenger cars will have decreased by over 90% from 1980 levels, while allowable hydrocarbon emissions will have been cut by roughly 80%.¹⁸²

These standards have affected the U.S. auto industry in many ways. Now, auto makers must design and build vehicles that meet environmental standards, or face fines. These standards have promoted the use of new technologies and helped create whole new businesses (e.g., emissions control devices, emissions testing equipment). At the same time, these standards have had noticeable effects on the consumer auto market.

Fuel Economy Standards¹⁸³

Transportation consumes over 25% of annual U.S. energy demand, and the majority of that energy is consumed by passenger vehicles (nearly 60%). In total, highway vehicles (including passenger vehicles, buses, and heavy trucks) account for over 75% of transportation energy consumption, and roughly 21% of all U.S. energy consumption (see **Figure 14**). The majority of this consumption is petroleum, a fossil fuel, and environmentalists see curbing fossil fuel use as a key component of strategies to reduce greenhouse gas emissions.

Figure 14. U.S. Consumption of Total Energy by End-Use Sector



Source: U.S. Department of Energy, Energy Information Administration, *Monthly Energy Review*.

Because of a growing motor vehicle fleet, and increasing miles traveled per vehicle, annual fuel consumption by passenger vehicles has increased dramatically since 1970, despite the introduction of fuel economy standards (see **Figure 15**).

¹⁸² U.S. Environmental Protection Agency, Office of Mobile Sources. *Milestones in Auto Emissions Control*. Ann Arbor, MI. August 1994. CRS Report RS20247, *EPA's Tier 2 Emission Standards for New Motor Vehicles: A Fact Sheet*, by David Bearden.

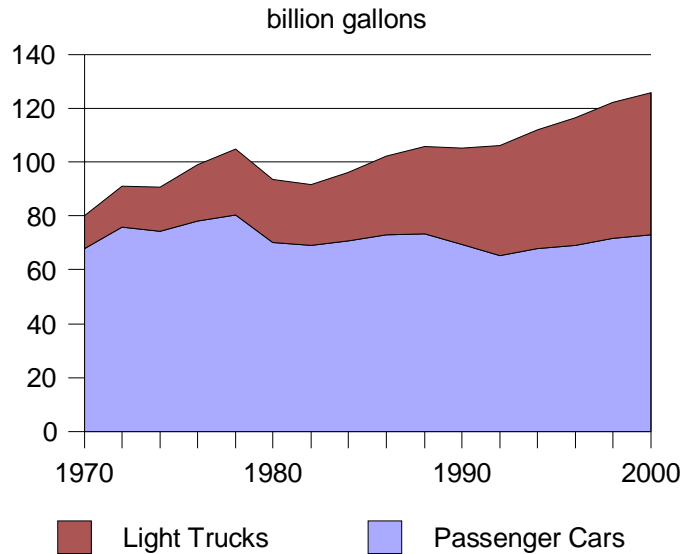
¹⁸³ For information on the history of fuel economy standards, as well as current legislative action, see CRS Issue Brief IB90122, *Automobile and Light Truck Fuel Economy: The CAFE Standards*, by Robert Bamberger.

Much of this increase in consumption is attributed to the growth in the use of light trucks, including minivans and SUVs, as passenger vehicles. It is expected that in the absence of fuel economy standards, fuel consumption would have increased at an even faster rate. According to the National Research Council:

While it is difficult to say what fuel consumption would have been had there been no CAFE standards, it is clear that if light-duty fuel use had continued to grow at the same rate as light-duty VMT [vehicle miles traveled], the United States would be consuming approximately 55 billion more gallons of gasoline each year.¹⁸⁴

This 55 billion gallons would represent roughly a 40% increase in gasoline consumption. While there is no guarantee that fuel consumption would have risen this much, it is clear that the CAFE standards have been effective at reducing fuel consumption from what it otherwise would have been.

Figure 15. Annual Passenger Vehicle Fuel Use, 1970-2000



Source: Stacy C. Davis, Oak Ridge National Laboratory, *Transportation Energy Data Book*.

One of the most significant environmental standards faced by auto makers are the CAFE standards.¹⁸⁵ Although not enacted for environmental reasons, fuel economy standards are seen by some as a key strategy for reducing fossil fuel consumption, and thus, greenhouse gas emissions. In a given model year, the average fuel economy of a manufacturer's passenger car and light truck sales must meet or exceed the CAFE standard for that year. Otherwise, manufacturers are subject to

¹⁸⁴ National Research Council, *Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards*. Washington, D.C. 2000. p. 19.

¹⁸⁵ Energy Policy and Conservation Act of 1975 (P.L. 94-163).

finer. The structure of CAFE and manufacturers' responses to it have shaped the evolution of the auto industry over nearly three decades.

Structure of CAFE System. For a given model year, each manufacturer's vehicles are divided into three fleets: domestically-produced passenger cars, foreign-produced passenger cars, and light trucks. Each of these fleets must meet the applicable CAFE standard separately. For MY2005, the passenger car (both domestic and foreign) standard is 27.5 miles per gallon (mpg), while the light truck standard is 21.0 mpg. The specific definitions of passenger car vs. light truck and foreign vs. domestic have had direct effects on vehicle design and plant location, as will be discussed below.

If a manufacturer's fleet fails to meet the average standard, the company is assessed a fine of \$5.50 per vehicle, for each 1/10th of an mpg below the standard. For example, if a manufacturer sold 1 million light trucks in MY2005, with an average fuel economy of 20.8 mpg (2/10 below the standard), the total fine would be \$11 million. However, if manufacturer's fuel economy exceeds the CAFE standard in a given year, that manufacturer may bank credits for future use (up to three years). Likewise, a manufacturer may borrow credits from future years (up to three years) if the manufacturer expects to exceed the standard in the future.¹⁸⁶ Manufacturers may also generate CAFE credits through the manufacture and sale of alternative fuel vehicles. Credits may not be traded among manufacturers, nor may a manufacturer trade credits among its various fleets (e.g., a manufacturer may not transfer credits from its domestic car fleet to its light truck fleet).

Since 1983, the National Highway Traffic Safety Administration (NHTSA), which administers the CAFE program, has assessed over \$500 million in fines on European auto manufacturers.¹⁸⁷ To date, no American or Asian auto maker has ever paid a CAFE fine.¹⁸⁸ But regardless of whether a manufacturer has paid a fine, the CAFE program has had a noticeable effect on the U.S. auto industry, as has the specific structure of CAFE.

Light Truck and Passenger Car Fleets. The distinction between light trucks and cars under CAFE has directly affected the U.S. industry, especially the ways in which new vehicles are designed. A vehicle is classified as a light truck if it has off-road capability or has significant "truck-like" features. These features include an open bed, an enclosed loading area, or a loading area that can be made flat through the removal of rear seats.¹⁸⁹ Under this definition, all pickup trucks, vans,

¹⁸⁶ To use so-called "carry-back" credits, the manufacturer must submit a plan for approval by the National Highway Traffic Safety Administration (Department of Transportation), which oversees the CAFE program.

¹⁸⁷ National Highway Traffic Safety Administration, *CAFE Overview*. [<http://www.nhtsa.dot.gov/cars/rules/CAFE/overview.htm>] Accessed January 10, 2005.

¹⁸⁸ In some cases, this is due to significant banking of CAFE credits, including alternative fuel vehicle credits.

¹⁸⁹ 49 CFR 523.

and minivans qualify as light trucks as do the majority of SUVs.¹⁹⁰ The original justification for the separate standards is that when CAFE was enacted, light trucks were used mainly as commercial and agricultural work vehicles and needed more hauling capacity, and would thus be less able to meet the car standard. Further, these vehicles were a relatively small portion of the U.S. automobile market in the 1970s.¹⁹¹

The distinction between cars and trucks under CAFE has drawn criticism by some environmental groups because light trucks are used more and more as passenger vehicles (as opposed to work vehicles), as evidenced by the fact that light trucks claim more than half of the passenger vehicle market. Further, critics of the auto industry are concerned that a manufacturer may be able to make minor modifications to a passenger car to turn it into a light truck. They argue that if the original car has a fuel economy below the passenger car standard, but above the light truck standard, then an auto maker could improve both its CAFE averages without improving its overall fuel economy. In fact, some vehicle models that were originally declared passenger cars by automakers are now considered light trucks for CAFE purposes.

The Two-Fleet Rule. In addition to the distinction between passenger cars and light trucks, there is also a distinction between domestically-produced passenger cars and those produced in foreign countries.¹⁹² If 75% or more of a vehicle's parts and labor originate in the United States or Canada (and Mexico, under NAFTA), it is considered part of a manufacturer's domestic fleet. Otherwise, it is considered part of its foreign fleet. Except in some specific cases, the ownership of the manufacturer does not affect whether the vehicle is considered foreign or domestic.

This distinction was enacted by Congress to keep U.S. manufacturers from relocating small car production abroad and closing small car plants in the United States.¹⁹³ If a manufacturer were to do so, then the relocated production could not be counted in the average with vehicles produced domestically. In the case of smaller cars, which tend to have higher fuel economy, this became a major disincentive to relocate those plants outside of the United States.

However, this two-fleet rule also created a barrier preventing foreign-owned manufacturers from using American-made parts in their North American assembly plants. Under the two-fleet rule, a foreign manufacturer (operating in the United States) that produces a vehicle using 75% domestic content (parts and labor) must

¹⁹⁰ Vehicles which are similar in design to both cars and SUVs, frequently referred to as Crossover Utility Vehicles (CUVs), may fall into the light truck category or the passenger car category, depending on design.

¹⁹¹ For more information on the differences between passenger car and light truck standards, see CRS Report RS20298, *Sport Utility Vehicles, Mini-Vans, and Light Trucks: An Overview of Fuel Economy and Emissions Standards*, by Brent Yacobucci.

¹⁹² There was a similar two-fleet rule for light trucks, but this rule was eliminated after MY1995.

¹⁹³ P.L. 94-163, Sec. 503(b).

classify that vehicle as domestic, and the vehicle cannot be counted toward that manufacturer's import fleet average. If that manufacturer's import CAFE average is just meeting the standard, reclassifying one vehicle from import to domestic could suddenly take that manufacturer out of compliance and make them subject to penalties.

Soon after the enactment of the CAFE standards, Volkswagen established a plant in the United States. However, the company chose to use foreign parts so that the high-efficiency vehicles it was producing could be counted toward its import fleet average. Therefore, in 1980, Congress established an exemption for foreign makers who had established plants in the United States by the end of 1985.¹⁹⁴ These manufacturers may petition NHTSA to claim U.S.-produced vehicles as part of their import average, as long as doing so would not harm U.S. auto industry employment.¹⁹⁵ This waiver allows foreign manufacturers to build plants in the United States and use American-made parts without the risk of CAFE penalties.

In 2004, Nissan petitioned to include vehicles produced in a plant in Mexico as part of its import average. As a result of NAFTA, those vehicles, which were previously classified as imports, were reclassified as domestic. However, as these were smaller, more efficient vehicles, the reclassification made their import fleet noncompliant with the standard. NHTSA concluded that denying Nissan's request would result in the use of fewer American-made parts, which would lead to fewer jobs in the U.S. auto industry.¹⁹⁶

Alternative Fuel Vehicles. In addition to the credits generated by exceeding the CAFE standard in a given year, auto makers may also generate credits through the sale of alternative fuel vehicles — those that run on fuels other than gasoline or diesel fuel. The Alternative Motor Fuels Act of 1988 was enacted to promote the expanded use of alternative fuels and establish a market for alternative fuel vehicles.¹⁹⁷ Alternative fuel vehicles are treated as having a significantly higher fuel economy than their conventional counterparts. However, there is a limit to the level of CAFE increase attributable to the sale of alternative fuel vehicles — 0.9 mpg in MY2004 and thereafter.

In 2002, the Department of Transportation (DOT) concluded that the CAFE incentives have been “successful in stimulating a significant increase in the availability of alternative fuel vehicles.”¹⁹⁸ The majority of these vehicles are dual-fuel and flex-fuel vehicles, which have the capability of fueling on alternative fuels

¹⁹⁴ Automotive Fuel Efficiency Act of 1980 (P.L. 96-425).

¹⁹⁵ 49 U.S.C. 32904 (b)(6)(B).

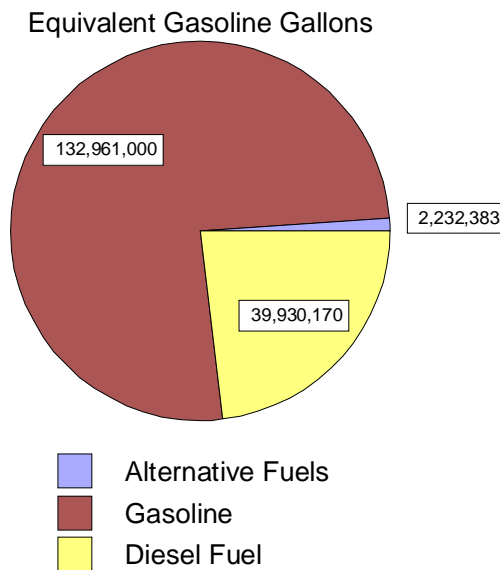
¹⁹⁶ 69 *Federal Register* 21883, *Nissan North America, Inc.; Petition for Exemption From Two-Fleet Rule Affecting Compliance With Passenger Automobile Fuel Economy Standards*.

¹⁹⁷ P.L. 100-94.

¹⁹⁸ U.S. Department of Transportation, U.S. Department on Energy, and U.S. Environmental Protection Agency, *Effects of the Alternative Motor Fuels Act CAFE Incentives Policy*. March 2002. p. iii.

or gasoline.¹⁹⁹ However, DOT also stated that the availability of alternative fuel has not kept pace with the increase in the number of alternative fuel vehicles.²⁰⁰ Critics of the incentives argue that the sale of dual-fuel natural gas/gasoline vehicles and flex-fuel ethanol/gasoline vehicles has allowed automakers to sidestep CAFE requirements without affecting gasoline consumption. Their argument is supported by the findings of the Energy Information Administration, which indicate that the majority of these vehicles are sold and used as traditional gasoline-powered vehicles.²⁰¹ Further, despite the number of vehicles on the road, alternative fuel use for transportation is still low compared to petroleum (see **Figure 16**), and the majority of alternative fuel use in the United States is as a blending component in conventional gasoline, not as a fuel in alternative fuel vehicles.²⁰²

Figure 16. Estimated Consumption of Vehicle Fuels, 2003



Source: U.S. Energy Information Administration, *Alternatives to Traditional Transportation Fuels 2003*.

Safety Concerns. One of the key policy concerns over CAFE has been its effect on vehicle safety. A key criticism of the CAFE standards is that more traffic fatalities have resulted from the enactment of the standards. CAFE critics argue that

¹⁹⁹ Dual-fuel vehicles are capable of operating on either an alternative or conventional fuel, depending on which mode is chosen. Flex-fuel vehicles are capable of operating on an alternative fuel, a conventional fuel, or any mixture of the two. In the United States, most of these vehicles are operated on gasoline.

²⁰⁰ Ibid. p. iii

²⁰¹ U.S. Energy Information Administration, *Alternatives to Traditional Transportation Fuels 2003*.

²⁰² Ibid.

one of the cheapest and easiest ways to make vehicles compliant with CAFE is to reduce their size and weight, thus reducing fuel consumption. They argue that as a result of the standards, vehicle size and weight rapidly decreased from the early 1970s to the late 1970s, and that more traffic deaths have resulted.²⁰³ Opponents of this view argue that other factors (such as size, as opposed to weight) may have played a role in the number of fatalities, and that the effects of CAFE on safety are more limited.²⁰⁴

The conclusion that traffic fatalities have increased from an earlier downsizing or downweighting of the passenger car fleet could inform any future policy discussion on CAFE. Such a conclusion does not necessarily mean, however, that any future increases in CAFE would result in more traffic deaths. The National Research Council concluded that given sufficient lead time, and with proper design, CAFE can be improved significantly without jeopardizing overall passenger safety. They argue that new technologies can be implemented to improve fuel economy without changing other vehicle specifications, if manufacturers are given sufficient lead time.²⁰⁵ Further, in the case of a collision between two vehicles of different weights, passengers in the lighter vehicle are more likely to be hurt or killed. It has been argued that if the heaviest vehicles were downweighted (larger light trucks), while keeping the weight of smaller vehicles constant, any increased risk to passengers in the heavier vehicles could be offset by a decreased risk to the passengers in the smaller vehicles. Therefore, the specific structure of changes to CAFE would likely affect the safety of the vehicle fleet.²⁰⁶

Effects of CAFE on the Auto Industry. It is difficult to separate the economic effects of the CAFE standards from other factors affecting the auto industry. However, the total effects of CAFE on industry employment and output seem to be limited. According to the National Research Council:

Examination of the data shows little evidence of a dramatic impact of fuel economy regulations. General economic conditions, and especially globalization of the automobile industry, seem to have been far more important than fuel economy regulations in determining the profitability and employment shares of the domestic automakers and their competitors.²⁰⁷

However, CAFE standards have affected the ownership of U.S. manufacturing plants, if not the total level of employment. As was stated above, the two-fleet rule has had a noticeable impact on the parts used in foreign-owned U.S. facilities. This effect seems to be even more likely in the future, as more and more foreign manufacturers

²⁰³ It should be noted that traffic deaths, measured as a ratio of the number of vehicles, the number of vehicle-miles traveled, or population, have dropped significantly since the 1970s. The area of debate is whether the number of deaths would have been even lower in the absence of CAFE standards.

²⁰⁴ National Research Council, op. cit. p. 117.

²⁰⁵ Ibid., p. 4.

²⁰⁶ Ibid., p. 119.

²⁰⁷ Ibid., p. 22.

locate plants in the United States. Those manufacturers not grandfathered by the two-fleet rule may choose to assemble vehicles using foreign parts, instead of parts made in North America.

Further, it is likely that the CAFE standards have given a competitive advantage to some manufacturers over others. Those auto makers with a history of building smaller and more efficient vehicles have had less need to adjust their design and manufacturing, as well as marketing,²⁰⁸ in response. If CAFE standards were tightened, the advantage for small car producers would likely be expanded.

In addition to competitive effects of the CAFE structure, the alternative fuel CAFE incentives have undoubtedly motivated auto makers to produce more alternative fuel vehicles than they might have otherwise. Whether or not these vehicles have helped reduce petroleum consumption, several automakers have focused on producing flex-fuel and dual-fuel vehicles to increase their CAFE averages. In some cases, the result has been the use of additional components to make the vehicle flex fuel compatible — a capability consumers may not even know their vehicles have, and thus never use.

Current Issues. Several issues have dominated the discussion of fuel economy standards over the past few years. At the federal level, these include a proposal by NHTSA to examine the structure of the CAFE system, legislative proposals to increase CAFE standards for cars and/or light trucks, and debate over whether to continue the CAFE alternative fuel vehicle incentives. Other relevant issues include state actions to control greenhouse gas emissions from automobiles, and actions by other countries to set fuel economy standards or greenhouse gas emissions limits.

California's Greenhouse Gas Rule. Perhaps the most significant current issue regarding automotive fuel economy is the decision by the state of California to require carbon dioxide emissions standards for passenger cars and light trucks. Enacted in 2002, California's A.B. 1498 requires the state to promulgate regulations to achieve the maximum feasible and cost-effective reduction of greenhouse gases from cars and trucks.²⁰⁹ The regulations, adopted by the California Air Resources Board on September 24, 2004, require a reduction of greenhouse gas emissions of 30% by 2016. The regulation covers passenger vehicles, but would not affect heavier vehicles such as commercial trucks or buses.

Under the Clean Air Act, California may petition the Environmental Protection Agency to establish its own emissions standards for automobiles, as long as those standards are at least as stringent as the federal standard, and as long as the standards are enacted to meet "compelling and extraordinary conditions."²¹⁰ However, there

²⁰⁸ It is argued that some manufacturers subsidize the sale of their smaller vehicles in order to improve their fleet fuel economy and avoid paying CAFE penalties.

²⁰⁹ Carolyn Whetzel, "California Agency Adopts Nation's First Rule to Limit Greenhouse Gases from Vehicles," *Daily Environment Report*. September 27, 2004. p. A-1.

²¹⁰ Clean Air Act, section 209. 42 U.S.C. 7543.

is no current federal standard for greenhouse gas emissions; federal standards focus on designated pollutants with direct effects on air quality and health, including ground-level ozone (smog) and carbon monoxide. Critics argue that greenhouse gases are not designated pollutants, and that the greenhouse gas standard is a *de facto* fuel economy standard, since reducing emissions of carbon dioxide — the key greenhouse gas — requires reductions in fuel consumption. Under CAFE, states do not have the authority to set their own mileage standards; authority remains solely with the federal government.²¹¹

Several auto dealers and a group representing auto makers have challenged the California auto greenhouse gas standard in court.²¹² Two of the plaintiffs' main arguments are that California is preempted from setting a fuel economy standard under CAFE, and that greenhouse gases are not a pollutant under the Clean Air Act.²¹³ California officials maintain that they have the authority under the Clean Air Act to regulate vehicle greenhouse gas emissions.

The outcome of this case will likely have major effects on the U.S. auto industry. If the standards are upheld, New York and other states are likely to adopt California's standards. The state of California estimates that complying with the standard could cost \$1,000 per vehicle by 2016, while opponents argue that costs could be as much as \$3,000 per vehicle. While reducing greenhouse gas emissions and fuel consumption, the new standards would likely increase purchase costs. Such standards would likely have varying effects on automakers depending on the fuel efficiency of their products.

International Fuel Economy Standards. Over the past few years, several countries have acted to increase passenger vehicle fuel economy, generally as a strategy to reduce greenhouse gas emissions and comply with mandated emissions limits under the Kyoto Protocol on climate change.²¹⁴ Other countries have promoted greater fuel economy as part of a strategy to reduce energy consumption. Most recently, automakers and the Canadian government signed a Memorandum of Understanding (MOU) on automotive greenhouse gas emissions. All major automotive manufacturers have agreed to reduce emissions from passenger cars and

²¹¹ 49 U.S.C. 32919.

²¹² *Central Valley Chrysler v. California Air Resources Board*, E.D. Cal., No. CV-F0466663, December 7, 2004.

²¹³ Carolyn Whetzel, "Automakers, Dealers Challenge Regulation in California to Limit Vehicle Carbon Dioxide," *Daily Environment Report*. December 8, 2004. p. A-12.

²¹⁴ The Kyoto Protocol entered into force on February 16, 2005. Developed countries must meet country-specific emission reduction targets. However, the United States did not ratify the treaty, and thus is not bound by its requirements. For more information on the Kyoto Protocol, see CRS Report RL30692, *Global Climate Change: The Kyoto Protocol*, by Susan R. Fletcher.

light trucks roughly 6% below the Canadian government's 2010 reference case.²¹⁵ If the reference case is accurate, this could mean an increase in Canadian new passenger vehicle fuel economy of as much as 25% or more. However, if the reference case overstates growth in fuel consumption, then the overall effect of the agreement could be lessened. Likewise, if the reference case underestimates consumption growth, then reducing consumption below the reference case could require an even more drastic increase in fuel economy. In addition to Canada, the European Union and Australia have established voluntary greenhouse gas and fuel economy standards, respectively; Japan and China have established mandatory fuel economy standards.²¹⁶

Emissions Standards

Motor vehicles are a major source of key air pollutants. In 2001, highway vehicles accounted for over 50% of all U.S. carbon monoxide (CO) emissions, 35% of nitrogen oxide (NO_x) emissions, and nearly 30% of volatile organic compound (VOC) emissions (**Figure 17**). These pollutants either directly affect human health through respiratory distress, or promote the formation of ground-level ozone (smog). However, as a direct result of state and federal emissions standards for light- and heavy-duty vehicles, total emissions from highway vehicles have dropped significantly, largely due to tighter emissions standards (**Figure 18**). Between 1970 and 2002, annual carbon monoxide emissions from highway vehicles dropped 62%, nitrogen oxide emissions dropped 42%, VOC emissions dropped 73%, and PM-10 (particulate matter of 10 microns diameter or greater) emissions dropped 58%.

California first enacted motor vehicle emissions standards in the 1960s, in response to worsening air quality in the state, especially in the Los Angeles area. In response to growing national concerns over air quality, as well as concerns raised by auto makers over varying state standards, the federal government promulgated national emissions standards (for light-duty vehicles) in the 1970s. Since that time, emissions standards have been tightened several times, both in California and federally. In addition, emissions standards have been enacted for heavy-duty highway vehicles, as well as non-highway mobile sources, from all-terrain vehicles to heavy construction equipment.

While annual emissions have dropped since the development of vehicle and engine standards, attaining air quality standards — especially in the largest urban areas — remains a difficult goal and a major policy issue. As was stated above, highway vehicles are still a key emitter of pollutants. New technologies and new strategies will need to be employed if further vehicle emission reductions are to be achieved.

²¹⁵ *Memorandum of Understanding Between the Government of Canada and the Canadian Automotive Industry Respecting Automobile Greenhouse Gas Emissions*. April 5, 2005. Windsor, Ontario.

²¹⁶ Feng An and Amanda Sauer. Pew Center on Global Climate Change. *Comparison of Passenger Vehicle Fuel Economy and Greenhouse Gas Emissions Standards Around the World*. December, 2004. Arlington, VA.

Figure 17. U.S. Transportation Emissions, 2002

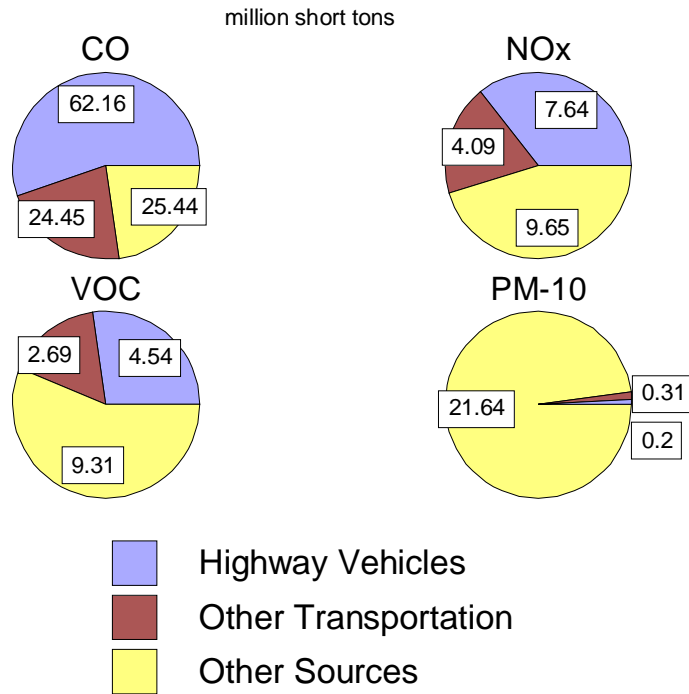
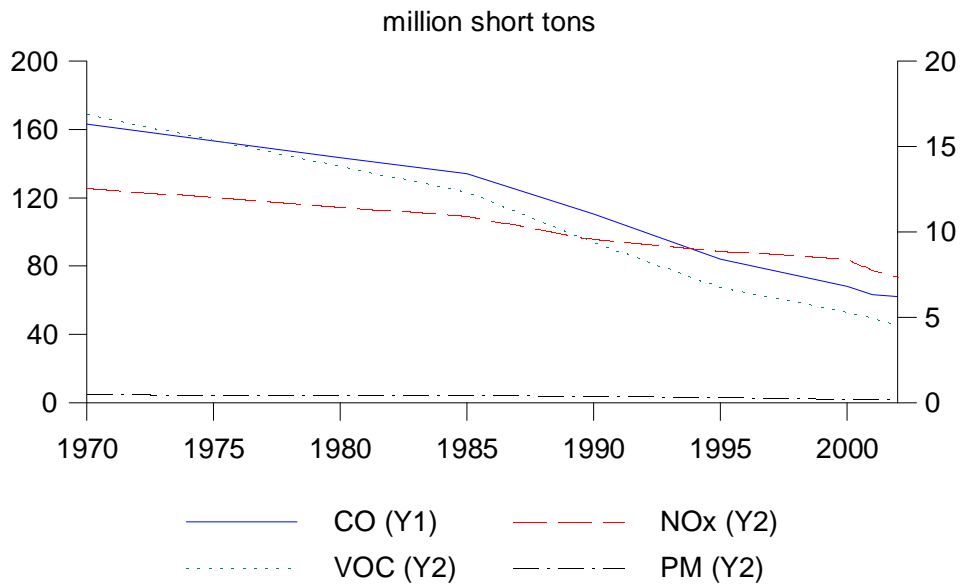


Figure 18. Pollutant Emissions from Highway Vehicles, 1970-2002



Source for Figs. 17-18: U.S. Environmental Protection Agency, *National Emission Inventory Air Pollutant Emission Trends* [<http://www.epa.gov/ttn/chief/trends/trends02/trendsreportallpollutants010505.xls>].

New Emission Standards. In the early 2000s, the Environmental Protection Agency (EPA) promulgated new standards for both light- and heavy-duty vehicles, through its authority under the Clean Air Act. In February 2000, EPA promulgated “Tier 2” regulations for passenger cars and light trucks, reducing allowable NOx emissions by 77% to 95% by MY2009 as compared to pre-2004 standards.²¹⁷ Further, for the first time, all passenger cars and light trucks will be held to the same emissions standards.²¹⁸ EPA estimates that the ultimate cost per vehicle will range from \$70 to \$250, depending on the type of vehicle — cost estimates increase with vehicle size and power.²¹⁹

In addition to the light-duty Tier 2 standards, in January 2001, EPA promulgated new standards for heavy-duty (primarily diesel) engines. Beginning in MY2007, heavy-duty engine NOx standards will be reduced by 90% from MY2004 standards. These standards will be fully phased in by MY2010.²²⁰ EPA estimates that the new standards will cost \$1,200 to \$1,900 per vehicle, or roughly 1% of the cost of a new truck or bus.

Effects of Emissions Standards on the Auto Industry. Over the past four decades, auto emissions standards have directly affected the auto industry. Before the 1960s, there was virtually no market for auto emission control devices. The California standards of the 1960s and the federal standards of the 1970s created a market for the catalytic converter, now a standard component in any passenger car or light truck. An entire category of auto parts suppliers — emission control manufacturers — has evolved since the 1960s. Further, the emissions profile has become a key component of a new vehicle’s design, especially in terms of the vehicle’s engine and exhaust systems.

As can be seen from **Figure 18**, highway vehicle emissions have dropped significantly from the 1970s, and they can be expected to continue to decline with the introduction of new technologies to meet the Tier 2 light-duty vehicle standards and the 2007 heavy-duty standards. Despite concerns about costs of meeting increasingly stringent emissions standards, in the past auto makers have succeeded in meeting the challenge, even when the technology to meet the standard had not necessarily been identified at the time the standards were initially promulgated. The costs of meeting the standards have likely limited auto manufacturer’s profits, but by and large the costs of compliance have been lower than those predicted by policy makers when the standards were promulgated. However, whether this will be true of the new standards remains a matter for speculation.

²¹⁷ 65 *Federal Register* 6698. For more information, see CRS Report RS20247, *EPA’s Tier 2 Emission Standards for New Motor Vehicles: A Fact Sheet*.

²¹⁸ Before the Tier 2 standards, passenger cars and light trucks were regulated separately for emissions, as they currently are for fuel economy.

²¹⁹ U.S. Environmental Protection Agency (EPA), *Clean Vehicles + Clean Fuel = Clean Air*. January 2004.

²²⁰ 66 *Federal Register* 5002. For more information, see CRS Report RL30737, *Diesel Fuel and Engines: An Analysis of EPA’s New Regulations*, by Brent Yacobucci, et al.

It should be noted that there are differential effects from emissions standards. On average, smaller vehicles with smaller engines tend to emit less than larger vehicles with larger engines. Therefore, those manufacturers that produce larger vehicles may have more difficulty and likely need to invest more to comply with the standards. As the Tier 2 standards eliminate the separate treatment for passenger cars and light trucks, the effects on large vehicle producers may increase. Therefore, auto makers that focus on small cars may be better positioned than manufacturers that produce a larger proportion of light trucks.

In addition to the above distinctions, separate emissions standards for California (as well as other states that adopt the California standards) could expand the competitive advantage for small vehicle producers, as the California standards are even more stringent than the Tier 2 standards.

Fuel Quality. Improved fuel quality is a key component in the success of any technology to improve vehicle emissions. The elimination of lead in gasoline paved the way for the use of catalytic converters in automobiles, in addition to eliminating lead itself as a source of air pollution.

To meet more and more stringent vehicle emissions standards, even cleaner fuel is necessary. To allow the use of advanced catalysts and other technologies, fuel must be virtually sulfur-free. As part of EPA's Tier 2 and heavy-duty engine emissions strategies, by 2010 gasoline sulfur content will be reduced by over 90%, while diesel sulfur content will be reduced by 97%. It is expected that these reductions in sulfur content will improve the durability of new emission control systems, potentially reducing the cost to the auto industry. It should be noted, however, that these improvements have costs, and that fuel prices will likely increase as a result. It is possible that if fuel costs increase too much, miles driven will decrease, limiting demand for new vehicles.

Current Issues. While EPA's management of the implementation of new emissions regulations is a matter of Congressional oversight, there has been limited Congressional action on auto emissions in recent years.

Appendix Table 1. North American Vehicle Production, by Country
(Millions of units)

Year	United States		Canada		Mexico		Total vehicle production
	Vehicles	% of North America total	Vehicles	% of North America total	Vehicles	% of North America total	
1977	12.7	85.8%	1.8	12.2%	0.3	2.0%	14.8
1978	12.9	85.4%	1.8	11.9%	0.4	2.6%	15.1
1979	11.5	85.2%	1.6	11.9%	0.4	3.0%	13.5
1980	8.0	80.8%	1.4	14.1%	0.5	5.1%	9.9
1981	7.9	80.6%	1.3	13.3%	0.6	6.1%	9.8
1982	7.0	80.5%	1.2	13.8%	0.5	5.7%	8.7
1983	9.2	83.6%	1.5	13.6%	0.3	2.7%	11.0
1984	10.9	83.8%	1.8	13.8%	0.3	2.3%	13.0
1985	11.6	82.9%	1.9	13.6%	0.5	3.6%	14.0
1986	11.3	83.7%	1.9	14.1%	0.3	2.2%	13.5
1987	10.9	84.5%	1.6	12.4%	0.4	3.1%	12.9
1988	11.2	81.8%	2.0	14.6%	0.5	3.7%	13.7
1989	10.9	80.7%	2.0	14.8%	0.6	4.4%	13.5
1990	9.8	78.4%	1.9	15.2%	0.8	6.4%	12.5
1991	8.8	75.2%	1.9	16.2%	1.0	8.5%	11.7
1992	9.7	75.8%	2.0	15.6%	1.1	8.6%	12.8
1993	10.9	76.8%	2.2	15.5%	1.1	7.7%	14.2
1994	12.2	78.2%	2.3	14.7%	1.1	7.1%	15.6
1995	12.0	78.4%	2.4	15.7%	0.9	5.9%	15.3
1996	11.8	76.6%	2.4	15.6%	1.2	7.8%	15.4
1997	12.1	75.2%	2.6	16.1%	1.4	8.7%	16.1
1998	12.0	74.5%	2.6	16.1%	1.5	9.3%	16.1
1999	13.0	73.9%	3.1	17.6%	1.5	8.5%	17.6
2000	12.8	72.3%	3.0	16.9%	1.9	10.7%	17.7
2001	11.4	72.2%	2.5	15.8%	1.9	12.0%	15.8
2002	12.3	73.7%	2.6	15.6%	1.8	10.8%	16.7
2003	12.1	74.2%	2.6	16.0%	1.6	9.8%	16.3

Source: Ward's Communications. *Ward's Automotive Yearbook 2004*. p. 117.

Note: The term "production" does not mean that all components used in assembling the vehicle were necessarily from the country of final assembly.

Appendix Table 2. North American Motor Vehicle Production by Company

(Thousands of Units, Cars and Light Trucks)

A. Big Three	1979		1990		2000		2003	
GM	7,057		4,977		5,631		5,301	
— USA		6,270		4,127		4,223		3,890
— Canada		787		714		963		940
— Mexico		†		136†		445		471
Ford	3,601		3,410		4,613		3,725	
— USA		3,069		2,723		3,759		3,119
— Canada		531		517		630		462
— Mexico		†		170†		224		144
Chrysler Group*	1,692		1,813		2,893		2,488	
— USA		1,445		1,253		1,784		1,731
— Canada		247		394		704		448
— Mexico		†		167†		405		309
Other**			22		1		40	
Big 3 Totals	12,350		10,222		13,138		11,554	
— USA		10,785		8,125		9,767		8,780
— Canada		1,565		1,624		2,297		1,850
— Mexico		—		473		1,074		924

Source: *Automotive News Market Data Book* (1980, 1991, 2004), except as noted, for both parts 2A and 2B.

* Unit of DaimlerChrysler; Chrysler Corp. prior to 2000 data. DaimlerChrysler's U.S. production unit of Mercedes Benz is under transplants. Chrysler totals for 1979 include Jeep, then made by American Motors.

** AM General specialty vehicles for government purchase, 1990; Hummer, 2000-2003.

† Mexican data for 1979 not available in source; data for 1990 from *Ward's Automotive Yearbook 1991*.

Appendix Table 2 (Continued)

B. Foreign- Based Mfrs.	1979		1990		2000		2003	
Toyota			484		1,153		1,350	
— USA				217		625		728
— NUMMI (w/GM)				205		344		395
— Canada				61		184		227
Honda			537		1,023		1,259	
— USA				433		677		845
— Canada				104		327		392
— Mexico						19		22
Nissan			371		690		814	
— USA				235		377		522
— Mexico				136†		313		292
Mitsubishi (US)			148		222		174	
BMW (US)					84		166	
Subaru-Isuzu (US)			72		209		122	
Mercedes Benz (US)					80		84	
Volkswagen (US/Mex.)***	175		193†		426		287	
Other‡			287		215		150	
Transplant Totals	175		2,093		4,102		4,407	
— USA		175		1,493		2,726		3,120
— Canada				271		619		670
— Mexico				329		758		617

*** 1979: U.S. production only; 1990-2003: Mexican production.

† Mexican data for 1979 not available in source; data for 1990 from *Ward's Automotive Yearbook 1991*.

‡ Includes Mazda-Ford AutoAlliance, GM-Suzuki CAMI, Hyundai and Volvo (Canada), Renault (Mexico) for relevant years.

Appendix Table 3. U.S. Motor Vehicle Production by Company Type

	Car Production				Light Truck/SUV Production			
	1990		2003		1990		2003	
	Units (mils.)	Share (%)	Units (mils.)	Share (%)	Units (mils.)	Share (%)	Units (mils.)	Share (%)
GM	2.65	43.6	1.39	30.8	1.47	41.3	2.48	33.9
Ford	1.38	22.7	0.82	18.2	1.39	39.0	2.29	31.3
Chrysler*	0.73	12.0	0.36	8.0	0.53	14.8	1.36	18.6
Total Big Three	4.76	78.3	2.57	57.0	3.38	95.1	6.13	83.9
Foreign-Based Mfrs.	1.32	21.7	1.94	43.0	0.17	4.9	1.18	16.1
Total U.S. Production	6.08	100.0	4.51	100.0	3.55	100.0	7.31	100.0

Source: *Ward's Automotive Yearbook*, 2004.

* Chrysler Corp. prior to 1999, now Chrysler Group of DaimlerChrysler.

Appendix Table 4. U.S. Motor Vehicle Sales
(units in millions)

Year	Total Sales			Transplants			Imports		
	Cars	Light Trucks	Total	Cars	Light Trucks	Total	Cars	Light Trucks	Total
1979	10.7	3.5	14.2	0.2	0.0	0.2	2.3	0.5	2.8
1980	9.0	2.5	11.5	0.2	0.0	0.2	2.4	0.5	2.9
1981	8.5	2.3	10.8	0.2	0.0	0.2	2.3	0.5	2.8
1982	8.0	2.6	10.6	0.1	0.0	0.1	2.2	0.4	2.6
1983	9.2	3.1	12.3	0.1	0.0	0.1	2.4	0.5	2.9
1984	10.4	4.1	14.5	0.2	0.0	0.2	2.4	0.6	3.0
1985	11.0	4.7	15.7	0.3	0.0	0.3	2.8	0.8	3.6
1986	11.5	4.9	16.4	0.4	0.1	0.5	3.2	0.9	4.1
1987	10.3	4.9	15.2	0.5	0.1	0.6	3.2	0.9	4.1
1988	10.5	5.1	15.6	0.6	0.1	0.7	3.0	0.6	3.6
1989	9.8	4.9	14.7	0.8	0.1	0.9	2.7	0.5	3.2
1990	9.3	4.8	14.1	1.1	0.2	1.3	2.4	0.6	3.0
1991	8.2	4.2	12.4	0.9	0.2	1.1	2.0	0.5	2.5
1992	8.2	4.9	13.1	1.2	0.3	1.5	1.9	0.4	2.3
1993	8.5	5.7	14.2	1.3	0.4	1.7	1.8	0.4	2.2
1994	9.0	6.4	15.4	1.5	0.5	2.0	1.7	0.4	2.1
1995	8.6	7.0	15.6	1.6	0.4	2.0	1.5	0.4	1.9
1996	8.5	7.0	15.5	1.9	0.5	2.4	1.3	0.5	1.8
1997	8.3	7.2	15.5	1.9	0.5	2.4	1.4	0.6	2.0
1998	8.2	7.8	16.0	2.1	0.6	2.7	1.4	0.7	2.1
1999	8.7	8.7	17.4	2.1	0.7	2.8	1.8	0.8	2.6
2000	8.9	9.0	17.9	2.2	0.9	3.1	1.6	0.9	2.5
2001	8.4	9.1	17.5	2.2	1.0	3.2	2.1	1.0	3.1
2002	8.1	9.0	17.1	2.1	1.0	3.1	2.2	1.1	3.3
2003	7.6	9.4	17.0	2.1	1.1	3.2	2.1	1.2	3.3

Sources: *Ward's Motor Vehicle Facts & Figures* (from 2000), various years; and, American Automobile Manufacturers' Association. *Motor Vehicle Facts & Figures* (through 1999), various years.

Appendix Table 5. Details of U.S. Automotive Trade

(All totals in billions of dollars)

Trading partners	1990		2000		2004	
	Exports	Imports	Exports	Imports	Exports	Imports
Canada — Vehicles	8.1	20.4	14.9	40.9	18.4	46.5
— Auto Parts	13.7	9.1	29.6	17.6	29.9	19.2
Mexico — Vehicles	0.3	2.9	3.8	21.0	4.1	19.1
— Auto Parts	4.3	4.5	12.6	18.2	11.3	21.4
NAFTA Totals:						
— Vehicles	8.4	23.3	18.7	61.9	22.5	65.6
— Auto Parts	18.0	13.6	42.2	35.8	41.2	40.6
European Union*						
— Vehicles	1.7	9.3	2.2	22.2	6.1	31.0
— Auto Parts	1.9	4.6	4.8	7.7	4.6	10.9
Japan — Vehicles	0.9	23.9	0.8	32.6	0.5	32.9
— Auto Parts	0.9	10.4	2.2	14.5	1.5	15.4
Korea — Vehicles	0.1	1.1	0.0	4.9	0.1	10.0
— Auto Parts	0.2	0.7	0.5	1.1	0.5	1.9
China — Vehicles	0.0	0.0	0.0	0.0	0.1	0.1
Auto Parts	0.0	0.1	0.2	1.6	0.6	3.8
World — Vehicles	13.6	60.6	24.7	127.0	34.6	141.8
— Auto Parts	22.9	31.7	53.7	67.0	52.6	80.4

Source: U.S. International Trade Commission. *Trade Dataweb*, from U.S. Harmonized Tariff Schedule, using Department of Commerce definitions.

* Includes the 15 members of the European Union as of January 1, 1995, for all data years.