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FOREIGN INVESTMENT

Growing Japanese Presence in the U.S. Auto Industry

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GAO

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The Honorable Marcy Kaptur
The Honorable John Dingell
The Honorable Edward Madigan
House of Representatives

This report responds to your request that we assess potential employment and other effects of foreign investment in the U.S. auto sector. Seven Japanese-affiliated automakers and more than 100 Japanese-affiliated auto parts suppliers have begun operating or constructing facilities in the United States in recent years. These investments have raised concerns over the future of the U.S. auto manufacturing and parts suppliers industries. This report addresses some of those concerns.

As arranged with your offices, unless you publicly announce its contents earlier, no further distribution of this report will be made until 14 days from its issue date. At that time, we will send copies to appropriate congressional committees and other interested parties. Copies will be made available to others upon request.

Frank C. Conahan
Assistant Comptroller General

Executive Summary

Purpose

In the 1980s Japanese automakers have invested more than $5 billion in U.S.-based assembly facilities. Seven Japanese-affiliated auto manufacturers and more than 100 Japanese-affiliated auto parts suppliers are operating or constructing facilities in the United States. The growth of foreign direct investment has led to concerns over the future of the U.S. auto manufacturing and parts supplier industries. Critics suggest that it is causing job losses, reducing the market share for U.S. companies, and contributing to industry overcapacity.

In view of these concerns, Representatives Marcy Kaptur, John Dingell, and Edward Madigan requested that GAO address several issues, including

- whether foreign investment in the U.S. auto sector results in net job losses in that sector and
- whether U.S. parts suppliers are given a fair opportunity to supply U.S.-based foreign automakers.

Background

Since the late 1970s, the U.S. automobile industry has undergone many structural changes. U.S. manufacturers now face strong competition. About 25 automakers from 8 countries export their products to the United States and some have or are establishing assembly facilities here. Similar changes also affect the auto parts supplier industry. U.S. automakers are purchasing more parts from foreign sources or foreign-affiliated suppliers in the United States. In response to business considerations, export restraints, and concern over potential trade barriers, Japanese automakers began to build assembly plants here.

Results in Brief

U.S. auto-related employment will likely be substantially smaller in 1990 than it was in 1985 due to gains in worker productivity, increased use of foreign parts by U.S. automakers, and increased imports. The operations of Japanese-affiliated automakers in the United States could result in even more losses because they use fewer workers and more foreign content than U.S. automakers. However, whether the Japanese affiliate operations lead to net job losses or gains is highly dependent on the extent to which their production displaces the production of U.S. automakers instead of imports, a factor that cannot be empirically projected. GAO used two methods to explore the range of possible job effects under different displacement assumptions.

Japanese-affiliated automakers are importing higher percentages of auto parts than U.S. automakers. Their sourcing decisions appear to be strongly influenced by price, quality, and timely delivery.

Some U.S. suppliers have succeeded in selling to Japanese-affiliated automakers, apparently meeting these automakers' rigorous expectations of suppliers. Because U.S. automakers have begun to adopt similar expectations of suppliers, the future competitiveness of many U.S. parts suppliers may be contingent on their willingness and ability to adapt to this expanded role.

The number of Japanese-affiliated parts suppliers competing for business in the United States has rapidly increased since early 1984, and this trend is likely to continue.

Principal Findings

Estimated Job Impacts

The United Auto Workers (UAW) conducted two separate studies of expected job losses in the U.S. auto industry. The two studies addressed the issue differently and used different methodologies in arriving at their estimates. The first study attempted to estimate expected job losses in 1990 attributable only to the operations of the Japanese-affiliated automakers. The second study attempted to estimate expected job losses between 1985 and 1990 attributable to four principal causes, including the operations of Japanese-affiliated automakers. Because the UAW's purpose was to raise consciousness about the potential impact of Japanese-affiliated automakers on jobs, it understandably used assumptions in its studies which would yield the maximum potential net job losses.

In the first study conducted in 1986 the UAW estimated that under certain conditions there would be 200,000 fewer U.S. auto-related jobs in 1990 because Japanese-affiliated automakers have greater labor efficiency and import more parts and components than do U.S. automakers.

Having the advantage of more current data and adjusting technical assumptions to reflect more probable conditions, GAO re-estimated the potential net job impact in 1990. A key job impact determinant, the displacement ratio (the rate at which Japanese-affiliated assemblers' production displaces U.S. automakers' production rather than imports)

cannot be empirically projected. Opinions range from nearly 100 percent displacement to almost none.

GAO re-estimated the net job impact using several displacement rates. Using a relatively high rate of 85 percent yielded an estimate of about 45,000 jobs lost. At lower displacement rates, potential net job losses are reduced until, at about 60 percent, the Japanese-affiliated automakers' operations create more jobs than are lost. If no displacement occurs, there would be a gain of about 112,000 jobs.

In the second study which projected overall job losses in the auto industry, the UAW estimated a decline of about 500,000 in U.S. auto industry employment between 1985 (a recent peak employment year) and 1990. Causes of the decline were labor productivity gains in the auto industry as a whole, increased auto imports, increased use of foreign parts by U.S. automakers, and the effects of the production of Japanese-affiliated automakers. About 25 percent of the job loss was attributable to the latter cause.

GAO also used more current data and modified assumptions, and re-estimated that aggregate job losses from all these factors together probably will not exceed 360,000.

Business Considerations Drive Sourcing

Japanese-affiliated automakers' sourcing decisions appear to be strongly influenced by business considerations. Traditionally, they have used different production and management methods than U.S. automakers. The Japanese affiliates' relationships with suppliers and expectations regarding price, quality, and timely delivery are more demanding than those of traditional U.S. automakers. They also reportedly rely more on suppliers for subassemblies, component design and engineering, and just-in-time production and inventory management.

Some U.S. suppliers have succeeded in selling to Japanese-affiliated automakers. In many cases, their success appears to be attributable to their willingness to meet the Japanese automakers' more demanding expectations of suppliers. U.S. automakers have begun to adopt many of the methods used by Japanese affiliates, including the expanded role for suppliers. Therefore, the future competitiveness of many U.S. parts suppliers may be contingent on their willingness and ability to adapt to the broader role expected by both U.S. and Japanese-affiliated automakers.

Japanese Supplier Presence Growing

The number of Japanese-affiliated suppliers operating facilities in the United States has nearly doubled since early 1984, and totaled 104 as of August 1987. To some degree these suppliers may be contributing to overcapacity for some product lines. Their advantages over U.S. suppliers include experience in meeting Japanese automaker expectations in Japan. However, these suppliers may be at a disadvantage when dealing with U.S. workers and automakers because of differences in language and cultural and business practices.

Recommendations

GAO is making no recommendations.

Agency Comments

Most of the data in this report were provided by the private sector and, therefore, GAO did not request comments from any federal agency.

Contents

Appendixes

Tables

Abbreviations

BLS	Bureau of Labor Statistics
GAO	General Accounting Office
NUMMI	New United Motors Manufacturing, Inc.
UAW	United Automobile, Aerospace and Agricultural Implement Workers of America
VER	Voluntary Export Restraint

Introduction

Since the late 1970s, the U.S. automotive industry and market have undergone significant structural changes. The U.S. market, once dominated by vehicles designed and produced within the United States, has taken on global dimensions. U.S. manufacturers, once considered the world industry leaders, now face severe competitive pressures. About 25 automobile manufacturers from 8 countries now export their products to the United States and a number have already established or are establishing production facilities in the United States.

The auto parts supplier industry has also taken on global dimensions. Increasingly, U.S. automobile manufacturers are purchasing components and parts from foreign subsidiaries, international joint venture operations, and foreign auto parts suppliers. In addition, U.S. parts suppliers have established manufacturing facilities in other countries and many foreign suppliers have begun operating in the United States.

Before 1979 the U.S. auto market was distinctly different from most of the other auto markets. The typical foreign automobile was smaller, with a less powerful, more fuel-efficient engine than the typical U.S. automobile. Foreign consumers preferred the smaller vehicles because they generally had lower average incomes than U.S. consumers and gasoline cost two to three times more in foreign countries than in the United States.

Differences between the U.S. automobile market and the rest of the world came to an end in 1979, when the Iranian oil embargo brought gas lines and a sharp increase in the price of gasoline to the U.S. market. The U.S. demand for automobiles swung sharply to smaller, more fuel-efficient vehicles of the types manufactured in Japan and Europe for many years.

With a shrinking market and a shift in the demand toward smaller cars, U.S. automakers were especially vulnerable to foreign competition. While their small fuel-efficient cars were selling at capacity, their ability to produce such cars was limited. Meanwhile the demand for their larger cars, on which so much of their profits depended, declined significantly. Demand for imported cars grew from less than 18 percent of the U.S. market in 1978 to 22 percent in 1979 and 26 percent in 1980. The sharp rise in the value of the dollar beginning in 1980 further weakened the competitive position of the U.S. industry. As shown in table 1.1, U.S. automakers have lost considerable market share to cars produced by foreign automakers in the last few years.

Table 1.1: Market Share for the U.S. Automobile Industry

Figures in percent

	1984	1985	1986	1987
U.S. automakers	76	74	71	67
Foreign automakers[a]	24	26	29	33

[a]Includes sales from U.S.-based facilities as well as imports.

Japanese auto companies increased their share of the U.S. market from about 8 percent in 1976 to about 23 percent in 1987. Japanese companies had developed reputations for high-quality products and for innovative and highly efficient production processes. In May 1981, in response to U.S. political pressure to restrict automobile imports from Japan, the Japanese government imposed a voluntary export restraint (VER), restricting annual exports to the United States to 1.68 million units. The VER was intended to provide domestic auto assemblers with a period of time to adjust their production technologies and facilities and to redesign products to be more competitive with foreign assemblers. The VER was increased in steps to 2.3 million units for the period April 1, 1987 to March 31, 1988.

Reacting to the competitive pressures, U.S. auto manufacturers began to change the way they were doing business. Some formed joint ventures with Japanese automakers, which provided first-hand experience in Japanese production and management techniques. Many of the features which made the Japanese model a success are now being tried and implemented by U.S. automakers. Many of these changes affect their expectations for and relationships with auto parts suppliers.

Due to changes in production and procurement policies by the U.S. auto manufacturers, increased import competition, and a shrinking domestic share of the U.S. market, auto parts companies are also seeking ways to increase productivity and improve product quality and the efficiency of their inventory management. Consequently, many suppliers are expanding their engineering, design, research, and development capabilities, adopting new technologies and inventory management techniques, and working more closely with auto manufacturers in the design and introduction of new products.

Direct Foreign Investments

In the last 10 years, foreign automakers have invested an estimated $5 billion in U.S.-based automobile and light truck assembly facilities. As of October 1, 1987, the following eight auto or light truck assembly plants were operating or under construction in the United States.

1. Honda of America Manufacturing, Inc.

2. Nissan Motor Manufacturing Corporation U.S.A.

3. Toyota Motor Manufacturing, U.S.A., Inc.

4. Mazda Motor Manufacturing (U.S.A.) Corporation (Ford owns 25 percent of Mazda Corporation of Japan, the parent company)

5. New United Motors Manufacturing, Inc. (joint venture between Toyota and General Motors)

6. Diamond-Star Motors Corporation (Joint venture between Mitsubishi and Chrysler—Chrysler owns 24 percent of Mitsubishi)

7. Subaru-Isuzu Automotive, Inc. (General Motors owns 38.6 percent of Isuzu Motors Ltd. of Japan)

8. Volkswagen of America, Inc. (Volkswagen recently announced plans to close its U.S. production facility in 1988)

For a profile of each company, see appendix I.

All but one of these foreign automakers have Japanese affiliations. Establishing production facilities in the United States provides a number of benefits to Japanese automakers, including opportunities to

- provide a hedge against fluctuations in the yen/dollar exchange rate;
- gain direct access to a growing market for them at a time when the Japanese market is approaching saturation;
- avoid the export limits imposed by the VER and potential import barriers; and
- quiet critics who were demanding that cars sold in the United States be built here.

The rapid growth of foreign investment in the U.S. automobile industry, particularly by Japan, has led to concerns over the future of the U.S.-owned auto manufacturing and parts supplier industries. Proponents of

direct foreign investment contend that it will help spur the domestic auto assembly and parts industries to improve their overall competitive posture. They contend that foreign investment creates jobs and provides consumers with a wider product choice at lower prices than would otherwise be available.

On the other hand, the United Auto Workers (UAW) contend that this foreign investment will result in a net job loss to the auto assembly and parts supplier industries. They and other critics believe that foreign automakers are reducing the market share for U.S. automakers and parts suppliers and contributing to overcapacity at both the automaker and parts supplier levels.

Objectives, Scope, and Methodology

Because of concerns about the possible adverse effects of foreign investment in the United States, Representatives Marcy Kaptur, John Dingell, and Edward Madigan requested that we inquire into the possible effects such investment was having on the U.S. auto and parts industries.[1] Our review focused on the following questions.

1. Is foreign investment in the U.S. auto sector resulting in net job losses in that sector?

2. Are U.S. auto parts suppliers being given an opportunity to supply U.S.-based foreign automakers?

3. To what extent are foreign-affiliated parts suppliers establishing facilities in the United States?

4. Do employees of foreign-affiliated automakers fare as well as workers in domestically owned companies?

5. Are U.S.-based foreign automakers relying on foreign sources for construction, insurance, and financial services?

6. Where did foreign-affiliated automakers get their start-up capital?

7. Are foreign-affiliated automakers' profits being reinvested in the United States or repatriated to their parent companies?

[1]The auto parts industry consists of two markets—original equipment and aftermarket. We focused on the original equipment market only.

We interviewed representatives from the U.S. auto industry and each of the U.S.-based foreign-affiliated automakers. We also visited the U.S. production facilities of Honda, Nissan, and New United Motors Manufacturing, Inc. (NUMMI). Although we focused primarily on Japanese-affiliated automakers[2], we also obtained data on certain aspects of Volkswagen of America's operations. We did not obtain data on Renault's investment in American Motors Corporation because of its sale to Chrysler Corporation.

We met with representatives of automotive and supplier industry associations, the UAW, Department of Commerce, and the U.S. International Trade Commission. We conducted an extensive search of available literature on the subject of foreign investment in the United States. In addition, we reviewed the work of other analysts and researchers in this area, including studies by the Japanese Auto Manufacturers Association, the U.S. International Trade Commission, the Department of Commerce, and the UAW.

We contacted many U.S. auto parts suppliers for assistance in identifying issues and problems they may have experienced in attempting to sell their products to Japanese-affiliated automakers. We conducted extensive telephone interviews and visited with some U.S. auto parts suppliers and obtained selected information from others to corroborate and further explain specific issues raised during our review. We also conducted telephone interviews with Japanese-affiliated auto parts suppliers we identified as operating in the United States as of August 1987.

Because private industry was not required to provide us with data and because of the intense competition within the industry, we could not verify much of the information provided. When possible, we corroborated the reasonableness and accuracy of the information.

Estimating Net Job Impact

To assess the net job impact of foreign direct investment in the U.S. auto industry, we reviewed recently publicized UAW estimates, identifying and assessing its basic methodologies for estimating net job loss. We also identified and evaluated the basic assumptions and data elements used for UAW calculations. As a part of our analysis, we simulated job impacts associated with alternative assumptions to show the sensitivity of these

[2]This term refers to the U.S. operations of the seven Japanese-affiliated companies previously identified.

estimates to variations in some assumptions, including those associated with

- projected 1990 sourcing of U.S. vs imported parts for both domestic and U.S.-based foreign-affiliated automakers and
- displacement of other domestic auto production resulting from foreign-affiliated assemblers' U.S. production.

Results of our analysis and simulations were subsequently discussed with and reviewed by the analyst who prepared the UAW studies as well as with other researchers doing work in this area.

Selection of U.S. Suppliers

The exact number of U.S. auto parts suppliers is not known and estimates vary widely, so selecting a statistically valid sample was not possible. We obtained information from over 60 U.S. suppliers regarding their experiences selling or trying to sell products to foreign-affiliated automakers. We held detailed interviews with 30 suppliers we selected from among those identified to us by industry associations and spokespersons, representatives of foreign-affiliated automakers, and others. The 30 suppliers were selected to represent a cross-section of the industry in terms of (1) sales volume, (2) types of products sold, and (3) experiences (both good and bad) in attempting to sell their products to foreign-affiliated automakers.

Selection of U.S.-Based Japanese Suppliers

To identify the Japanese-affiliated parts suppliers operating in the United States, we consolidated listings provided by the Motor Equipment Manufacturers Association, the Auto Parts and Accessories Association, and other sources. We identified a potential universe of 164 companies. We were unable to locate or make contact with 41 of these companies, 2 refused to participate in the study, and we subsequently deleted 19 more because they did not supply the auto industry. We held detailed telephone interviews with the remaining 102 companies,[3] and their responses provide the basis for our discussions of U.S.-based Japanese parts suppliers in chapter 4.

[3]Twelve companies preferred to provide written responses to our questions; follow-up telephone contacts were made to clarify their written responses where necessary.

Estimated Net Job Effects of Japanese-Affiliated Automakers' U.S. Operations

Several studies using different assumptions have predicted significant declines in U.S. auto-related employment. As part of our effort to estimate net job effects attributable to the establishment of Japanese-affiliated automakers in the United States, we evaluated studies and held discussions with several government and private researchers. After considering various approaches and methodologies, we patterned our work after two different studies done by the Research Department of the UAW because they were designed to isolate the effect of Japanese direct investment on employment and their results were often presented during congressional hearings and other deliberations and in the press.

However, we updated some data inputs and modified some of their assumptions, particularly regarding plant employment levels, domestic content levels, and product displacement rates (the rate at which Japanese-affiliated assemblers' production displaces U.S. automakers' production rather than displacing imports). In general, the major causes of differences between the UAW's estimates done in January 1986 and ours result from our different purposes,[1] our ability to consider and reflect recent changes in the economic environment (i.e. the appreciation of the yen), and our access to more current data than were available when the UAW did its study.

As with all economic projections, assumptions have to be made about future conditions (i.e. sales levels and import restraints) and relationships (i.e. the ratio of vehicles produced to jobs). Therefore, the results of our analyses should not be considered precise predictions but rather as broad estimates for the purpose of providing an indication of the magnitude of the expected effect of Japanese direct investment and other factors on U.S. employment levels.

The UAW's first study attempted to estimate expected job losses in 1990 attributable only to the operations of the Japanese-affiliated automakers. This study, done in January 1986, estimated that there could be 200,000 fewer U.S. auto-related jobs in 1990 because Japanese-affiliated automakers have greater labor efficiency and they import more parts and components than do U.S. automakers. Key assumptions in the UAW's study were that Japanese-affiliated automakers will (1) produce 2.2 million vehicles which will displace U.S. made vehicles on a

[1]Because the UAW's purpose was to raise consciousness about the potential impact of Japanese-affiliated automakers on jobs, it understandably made its estimates contingent upon those conditions which would yield the maximum job loss.

one-for-one basis and (2) maintain domestic sourcing in their vehicles of 30 percent or less.

We re-estimated the net job impact using several displacement rates because this major influencing factor cannot be empirically projected. Depending on the displacement rate used in the analysis, the outcome could be either job losses or gains. Using a relatively high (85 percent) displacement rate and assuming the Japanese affiliates produce 1.8 million vehicles in 1990 and have 50 percent domestic (U.S.) sourcing[2] in their vehicles compared with 83 percent for traditional U.S. automakers' vehicles, yields an estimated job loss of 45,000. At lower displacement rates, potential net job losses are reduced until, at about 60 percent, Japanese-affiliated automakers' operations create more jobs than are lost. If Japanese-affiliated automaker production only displaced imports, there would be an estimated net gain of 112,000 jobs in 1990. If the Japanese affiliates should export some of their U.S. production, as some have announced, this would add additional employment to the U.S. economy.

Using the same methodology to estimate job impact in 1987, the estimated net job loss (if displacement was 85 percent) would be 39,000. If only imports were displaced, net job gains would be 33,000.

The UAW's second study attempted to estimate expected job losses between 1985 and 1990 attributable to four prinicpal causes, including the operations of Japanese-affiliated automakers. The UAW estimated a decline of about 500,000 in U.S. auto-related employment between 1985-90. Causes of the decline were labor productivity gains in the auto industry as a whole, increased auto imports, increased use of foreign parts by U.S. automakers, and the effects of the increased production of Japanese-affiliated automakers. About 25 percent of the estimated job loss was attributable to the latter cause.

We again used more current data and modified assumptions and re-estimated that aggregate job losses from these factors likely would not exceed 360,000.

As with the first method, estimating the most probable net job effect of the Japanese-affiliated automakers' operations is contingent upon being able to reasonably estimate the rate at which their production displaces the production of U.S. automakers. Because this cannot be done with

[2]Domestic sourcing refers to the portion of all parts and materials used at the auto assembly level which were obtained from U.S. sources.

any degree of certainty, we are showing only the extreme case.[3] As the displacement rate goes down, the aggregate net job loss also goes down and the relative contribution of the causes change. The contributions of the factors at the upper end of the job loss range are (1) labor productivity gains, 132,000, (2) increased imports, 137,000, (3) increased use of foreign content by U.S. automakers, 44,000, and (4) increased U.S. production of Japanese-affiliated automakers, 57,000.

Method #1 Comparison of U.S. Job Opportunities in 1990 With and Without Japanese-Affiliated Automakers

This method essentially estimates what the net effect on U.S. jobs would be if U.S. automakers produced the number of vehicles expected to be displaced by Japanese-affiliated automakers. Differences in jobs needed result primarily from the labor efficiencies the Japanese automakers have vis-a-vis U.S. automakers and from the greater Japanese reliance on imported parts.

In general, this method involves determining or making reasonable assumptions about

- the expected production levels of cars and light trucks in U.S.-based, Japanese-affiliated assembly plants;
- the rate at which these vehicles displace the U.S. production of U.S. automakers;
- the number of U.S. automaker plants that would be needed to produce these vehicles;
- the number of workers needed to produce these vehicles in Japanese-affiliated vs. U.S. automakers' plants (also considering labor productivity gains);
- the differences in the nature and amount of domestic sourcing; and
- the way these differences will likely affect jobs in upstream[4] supplier industries.

We used this methodology to estimate job effects for both 1987 and 1990. Our estimates for 1990 are discussed in detail to facilitate their comparison with the UAW's, which was for 1990 only.

[3]For this study, we used a 100-percent displacement rate as the maximum (as did the UAW), even though we believe it is unlikely to be that high.

[4]Upstream suppliers provide inputs directly or indirectly to the vehicles up to the assembly level. Downstream industries (involved in post-assembly operations, such as distribution and sales) are not included because their employment levels are unlikely to vary significantly.

Expected Production Levels

Based upon announced U.S. plant capacity and various industry estimates, we assume that the Japanese-affiliated automakers will produce 1.8 million vehicles in 1990; the UAW assumes that 2.2 million will be produced. The UAW estimate included 400,000 vehicles to be imported from Canadian-based, Japanese-affiliated automakers.

Displacement Ratio

The displacement ratio measures the extent to which the Japanese-affiliated automakers displace the sales (and therefore the production) of U.S. automakers. We found no good empirical estimates of what the displacement ratio is likely to be.

Some analysts argue that the U.S. production of Japanese-affiliated automakers largely displaces imports, noting that the Japanese affiliates' vehicles often cannot be substituted directly for vehicles produced domestically by U.S. automakers. Others argue that Japanese affiliates' production does primarily displace the output of U.S. automakers. They note that Japanese producers have continued to fill their VER quotas even while producing cars in the United States. Hence, they argue, Japanese affiliates' production does not displace imports from Japan. It is possible, however, that the affiliates' production displaces imports from other countries which are not restricted by quotas.

Because its purpose was to show the extreme case, the UAW established as a condition underlying its estimate the premise that Japanese-affiliated automakers' production displaced only U.S. production of U.S. automakers. This assumption is not shared by other industry analysts and the UAW analyst told us that transplants will probably not displace only U.S. production. And, as stated, some industry analysts believe Japanese affiliates' production is mostly displacing imports.

U.S. Automaker Plant Displacement

We estimated how many U.S. plants would be needed by U.S. automakers to produce the cars displaced by the Japanese-affiliated automakers. In line with the UAW's approach, and to simplify the analysis, we assumed that the typical U.S. assembly plant produced 200,000 vehicles a year. This was derived by dividing total car sales by the number of U.S. plants operating in 1985. This approach assumes no significant differences between beginning and end-of-year inventories or significant changes in plant utilization rates.

Assembly Job Opportunities

Once the number of additional operating plants has been established, the number of job opportunities created by these plants can be estimated and compared to the jobs created in the Japanese-affiliated plants. In general, the Japanese affiliates use fewer workers because their vehicles are smaller, designed to be easier to assemble, and include more subassemblies. Also, their operations are more flexible and their use of substantially fewer job classifications (see ch. 5) provides greater labor efficiency.

Based upon data obtained from automakers and industry analysts, we estimate that 4,068 assembly workers will be needed in the typical U.S. automaker's plant to produce 200,000 vehicles in 1990 and 2,560 workers in the Japanese-affiliated plants. Adjustments were needed to equate the activities involved at assembly plants and to exclude temporarily laid-off workers when they were included in the data provided to us. We also assume a 2-percent annual labor productivity gain through 1990. The UAW did not initially adjust future job needs downward to reflect productivity gains, however a subsequent UAW study also assumed this 2-percent gain.

The UAW estimated that 5,932 assembly workers would be needed in the typical U.S. automaker's plant and 2,424 workers in the Japanese-affiliated plants. The UAW divided its own estimate of total assembly jobs[5] in 1985 by the number of traditional U.S. plants in operation at that time to obtain the first number and collected data from five Japanese-affiliated plants for the second number. Our estimate took productivity gains into account and used more current Bureau of Labor Statistics (BLS) data than were available when the UAW did its study. The newer BLS data specifically identified assembly workers, thereby avoiding the need to estimate them.

Domestic Sourcing and Its Effect on Jobs

Employment at upstream suppliers is influenced by the amount of domestic sourcing, which is difficult to estimate because the percent of domestic sourcing in U.S. and Japanese-affiliated automakers' products is changing. U.S. automakers are tending to have less domestic sourcing than in the past and the Japanese-affiliated automakers more. U.S. automakers are tending to import more parts as they look globally for the best combination of price and quality in their efforts to strengthen their competitiveness.

[5]The UAW used its own membership data which did include some temporarily laid-off workers.

To develop our estimate of the effect on upstream U.S. supplier jobs, we first estimated the total jobs required at auto parts and all upstream suppliers to serve each traditional U.S. assembly plant—that is, 487 percent of the assembly level jobs (using the multiplier of 4.87 estimated using BLS coefficients).[6] In other words, for the 4,068 workers at each U.S. automaker's assembly plant in 1990, there would be 19,811 workers at auto parts and upstream suppliers, assuming that assemblers use only domestic parts. We assume the same number of suppliers' jobs are needed for the Japanese-affiliated automakers. Based on information provided by U.S. and Japanese automakers and industry analysts, we estimate that in 1990 Japanese-affiliated automakers will be importing 50 percent of their parts and U.S. automakers about 17 percent. Adjusting the upstream employment estimate using these percentages produces estimates that the traditional U.S. assembly plant will generate 16,443 jobs at U.S. suppliers and the typical Japanese-affiliated plant 9,906 jobs.

The UAW estimated that a typical U.S. assembly plant will generate about 25,000 jobs at suppliers and a Japanese-affiliated plant about 6,700 jobs. The UAW used the 1984 multiplier of 4.08[7] and assumed that the 1985 domestic sourcing ratio of 30 percent or less for Japanese-affiliated plants will persist to 1990. It also used an estimate of U.S. plant employment levels which we believe to be too high because it includes temporarily laid-off workers. Our estimates are closer to those of domestic and foreign automakers and to other industrial consultants. The domestic parts in vehicles produced in Japanese-affiliated plants have been and are expected to continue increasing through 1990 due in part to political pressure, the appreciation of the yen, and the increasing number of U.S. companies able to meet the broader expectations that Japanese-affiliated automakers have of their suppliers.

The UAW noted that its study was done in January 1986, well before the yen achieved its current high value. While it recognizes that domestic sourcing of the Japanese-affiliated automakers will rise by 1990, it also noted the growing use of parts from low wage countries and the fact that the yen's appreciation increases the dollar amount of value-added

[6]We assume the multiplier will have the same value for 1985 and 1990. In estimating total labor requirement for an industry, BLS assumed all parts from upstream industries to be domestic.

[7]The UAW used BLS's 1984 Labor Requirement Coefficients to derive its 1985 multiplier (4.08). The UAW's inclusion of temporarily laid-off workers in its assembly job estimate tends to understate the multiplier

in Japan (which leads to a higher import content ratio). The UAW's comments illustrate the difficulty of precisely measuring future domestic content. However, based on the Japanese automakers' past performance and the factors noted above, we believe it is reasonable to use these automakers' announced domestic sourcing goals in our analysis. The impact of the additional factors cited by the UAW are unclear. For example, export prices do not fluctuate as widely as exchange rates. Further, because the Japanese economy is highly dependent on imported materials, the yen's appreciation tends to reduce Japanese suppliers' costs, as denominated in yen.

Results of the Analysis

Table 2.1 shows the results of our analysis using the factors and assumptions discussed above. It also shows the effect of changes in the displacement rate or content levels.

Table 2.1: Estimated Net Job Losses (Gains) in 1990 Due to Japanese-Affiliated Automakers' Operations

Domestic Sourcing of U.S. vs Japanese-affiliated Automakers	Displacement Ratios				
(percent)	1.00	0.85	0.70	0.61	0.00
83 vs 50[a]	72,000	45,000	17,000	400	(112,000)
85 vs 30	112,000	83,000	55,000	38,000	(77,000)

[a]Most probable domestic sourcing levels

As discussed, we are unable to confidently estimate the probable displacement rate, therefore we cannot estimate the "most probable" net effect on jobs. As shown, for the most likely estimate of domestic sourcing, the crossover from being job losses to net job gains occurs around the 60-percent displacement rate.

Net Job Effect in 1987

To estimate net job impacts in 1987, we followed the methodology described in the preceding section but used inputs relating to 1987 instead of 1990. Specifically, that

- Japanese-affiliated plants would produce 735,000 vehicles (based upon actual 1987 production levels);
- average plant employment would be 2,720 for Japanese-affiliated plants vs 4,322 for U.S. automakers;
- the supplier to assembler job multiplier would remain 4.87; and
- the Japanese-affiliated automakers' domestic sourcing ratio would be 0.3 vs 0.9 for U.S. automakers.

Using these inputs yields the results shown in table 2.2.

Table 2.2: Estimated Net Job Effects in 1987 Due to Japanese-Affiliated Automakers' Operations

Displacement Ratio	Net Job Loss (Gain)
1.00	52,000
0.85	39,000
0.70	27,000
0.00	(33,000)

The 39,000 net job loss at 85-percent displacement is not much different from the 45,000 job loss estimate for 1990 because of offsetting trends. The average domestic sourcing of Japanese vehicles was lower in 1987 than is expected in 1990 (which costs more 1987 jobs); however, the number of 1987 vehicles produced was also lower, which tends to reduce jobs lost for U.S. assemblers and suppliers.

Method #2 Expected Net Job Effects Between 1985 and 1990 and Their Causes

The UAW did an analysis comparing the auto industry's employment level in 1985 with the level expected in 1990 and broke down the difference by its major causes. As with method #1, we followed the UAW's methodology, updating or adjusting inputs to reflect what we believed to be more probable conditions, and recomputed the estimate. We also refined the UAW's methodology for allocating job losses to the major causes.

We believe that method #2 as adjusted is useful in identifying the relative impact of the major influences on employment levels. However, it is a less accurate measure of the net job effects resulting from the total operations of the Japanese-affiliated automakers than is method #1, because method #2 (1) assumes the total labor content of both U.S. and Japanese vehicles is the same and (2) does not capture the effect on jobs from the Japanese-affiliated automakers' 1985 operations, the base year for the comparison.

In general, method #2 entails estimating

- the U.S. sales volume in 1990 and how these sales will be divided among imports, U.S. automakers, and Japanese-affiliated automakers;
- how production translates into jobs and how this translation is affected by worker productivity gains; and
- how differences between U.S. and Japanese-affiliated automakers' domestic content will affect jobs.

Our formulas and computations are shown in appendix II.

Estimated 1990 Sales

We used the UAW's assumptions that total U.S. vehicle sales in 1990 would be 15.4 million, the same as in 1985. While many variables affect vehicle sales and estimating that far into the future is speculative, 15.4 million has the advantage of eliminating the influence on jobs that would result from changes in total sales volume.[8]

As in method #1, we estimated that the Japanese-affiliated automakers would produce 1.8 million vehicles in 1990 (about their full capacity), whereas the UAW estimated 2.2 million. The UAW included 400,000 imports from Canadian-based, Japanese-affiliated operations. The Japanese-affiliated plants produced 300,000 vehicles in 1985, the base year. As a result of our different judgments about the production levels of Japanese affiliates, we estimated that U.S. automakers would produce 8.8 million vehicles in 1990, while the UAW estimated 8.4 million vehicles. We both assumed that imports would increase by 1.2 million, from 3.6 million in 1985 to 4.8 million in 1990.

Employment Levels

To relate vehicle production levels to jobs we and the UAW each developed "vehicles-per-worker" ratios through a process which essentially involves dividing the cars produced that year by the total number of assembly and upstream workers in 1985.

We used different employment data than the UAW to estimate the average assembly level employment; consequently, our multiplier is higher than the one the UAW derived. Our vehicles-per-worker ratio for 1985 is 7.57, the UAW used 6.53. The UAW analyst believes our ratio is too high; however, considering the more current and directly usable data we were able to obtain from BLS and the automakers and the corroboration by industry analysts of our assembly worker-per-plant estimate, we believe our ratio is reasonable.

The vehicle-per-worker ratio is affected by changes in worker productivity which must be taken into account in order to correctly translate vehicle production into jobs in future periods. We accepted the UAW's estimate that worker productivity will likely increase at an annual rate

[8]This method assumes that total U.S. sales consist of current year production and imports and considers differences between beginning and end-of-year inventories as well as exports to be insignificant.

of 2 percent between 1985 and 1990. Adjusting our 1985 ratio by 2 percent per year yields a vehicle per worker ratio of 8.36 for 1990.

Domestic Content

Domestic content is the sum of the value of parts and materials procured from U.S. sources plus the value of domestic assembly labor, overhead, and markups. Because of its higher domestic content, U.S. automakers' production generates more U.S. jobs than does the production of Japanese-affiliates. However, the difference in the percent of the domestic content is narrowing as U.S. automakers increase their imports while the Japanese-affiliated automakers are reducing theirs.

Information provided by U.S. and Japanese automakers and industry analysts indicates that in 1985 Japanese-affiliated automakers had 54.5-percent domestic content and U.S. automakers 93.5 percent. Similarly, the domestic content in 1990 is estimated to be 67.5 and 89.0 percent, respectively.

The UAW assumed a typical U.S. automaker had 95-percent domestic sourcing in 1985 and would have 85 percent in 1990 and that the Japanese affiliates had 28.5 percent in 1985 with no increase expected through 1990. Domestic sourcing is a narrower term than domestic content, referring only to the value of parts and materials procured domestically.

The UAW analyst agreed that the method of adjusting for domestic content differences could be improved by (1) providing for increasing domestic content in the Japanese-affiliated automakers' production as has been and is expected to continue happening through 1990 and (2) using domestic content ratios rather than domestic sourcing ratios for the Japanese affiliates.

In method #1, it was appropriate to use domestic sourcing ratios rather than domestic content ratios because assembly and supplier job losses were calculated separately. These ratios are defined below, along with a formula to convert domestic sourcing ratios to domestic content ratios. Our formula was accepted by several industry analysts. However, the UAW analyst, while agreeing that use of the domestic content ratio would have been more appropriate, suggested how the conversion formula might be modified for application to the Japanese affiliates. The suggested modification would reduce the extent to which profit and overhead allowances would be included in the value added in the United States.

We agree that some adjustment might be appropriate. However, data is not readily available for establishing reasonable adjustments. For instance, new facilities may not be profitable until they reach full capacity. For some Japanese-affiliated automakers, this may not occur before 1990. Also, half of the Japanese affiliates have either direct or equity links to a U.S. automaker, so it should not be assumed that all profits will leave the United States. Without further data and analysis we cannot determine how significant these refinements might be. They would probably tend to increase job losses at least slightly.

Formulas for Converting Domestic Sourcing Ratio (Dsr) To Domestic Content Ratio (Dcr)

Formula: DCR = 0.35 + 0.65 x DSR

Where:
DCR is defined as the value of domestic parts and the value added at assembly and wholesale levels, divided by the total vehicle value.

DSR is defined as the total value of domestic parts and components divided by the total value of all parts and components.

0.65 is the share of vehicle value represented by material, parts and components prior to assembly of vehicles. (0.35 + 0.65 = 1.00, or the total value of a vehicle.)

0.35 is the share of vehicle value added at the assembly and wholesale levels, thus including labor inputs, overhead and markups at these levels.

We used the following ratios in our analysis.

Table 2.3: Ratios Used in Our Analysis

		DCR	DSR
Traditional U.S. automakers	1985	0.935	0.90
	1990	0.890	0.83
Japanese-affiliated automakers	1985	0.545	0.30
	1990	0.675	0.50

Results of Our Analysis

Using more current data than the UAW had available and modifying assumptions as discussed above, we re-estimated that the aggregate auto-related job losses between 1985 and 1990 would be at most 360,000 (vs the UAW's estimate of 500,000). Table 2.4 shows how much each of

the four causes of the potential decline will contribute to it. (The method used to calculate this break down is described in app. II.)

As with method #1, the rate at which the Japanese-affiliated production displaces U.S. automakers' production affects the results of this analysis. Because this ratio cannot be reliably estimated, we show only the extreme case. For this study, we used a 100-percent displacement rate as the maximum (as did the UAW), although we expect it will not be that high. We did so because adjusting this ratio downward triggers simultaneous movement of some variables. As in method #1, as the displacement rate drops, job losses are reduced until at some point more jobs are created than lost. When this happens, these gains would act to offset losses caused by the other factors.

Table 2.4: Net Auto-Related Job Losses Between 1985-90 by Cause

(assuming a 100-percent displacement ratio[a])

Contributing factor	Estimated job losses	Percent of total
Labor productivity gains	132,000	35.7
Increased use of foreign content by U.S. automakers	44,000	11.9
Increased imports	137,000	37.0
Increased U.S. production of Japanese-affiliated automakers	57,000	15.4
Total	**370,000[b]**	**100.0**

[a]A 100-percent displacement ratio assumes that the output of Japanese-affiliated automakers displaces the production of U.S. automakers on a one-for-one basis.

[b]Summation of job losses from the individual causes is not a precise measure of all factors operating simultaneously. Direct computation of the total job losses yields an estimate of 360,000. However the method for allocating the total among the causes unavoidably leads to some imprecision. For further details see app. II.

Japanese-Affiliated Automakers' Sourcing Appears to Be Strongly Influenced by Business Considerations

U.S. auto parts suppliers are concerned that Japanese-affiliated automakers will continue to import high percentages of auto parts and are alarmed over the number of Japanese-affiliated auto parts suppliers locating in the United States. In addition, U.S. suppliers believe that Japanese-affiliated automakers are importing and buying parts from Japanese-affiliated suppliers because of nationalistic preferences or organizational ties rather than business considerations.

To gain a perspective on U.S. supplier concerns and whether they have a reasonable opportunity to compete, we focused our inquiry on

- the extent of U.S. sourcing by Japanese-affiliated automakers;
- differences in how the Japanese-affiliated and U.S. automakers have traditionally sourced parts;
- factors which influence the sourcing decisions of Japanese-affiliated automakers; and
- U.S. supplier experience in dealing with the Japanese-affiliated automakers.

We found that Japanese-affiliated automakers are importing higher percentages of auto parts than are U.S. automakers, although these percentages appear to be decreasing. Japanese-affiliated automakers' sourcing decisions appear to be strongly influenced by business considerations. However, because both automakers and suppliers were sometimes unwilling to provide detailed information on specific experiences, we could not determine that all transactions were free from automaker discrimination. Further, where differences in products between U.S. and Japanese-affiliated suppliers are minor, it would seem reasonable that the Japanese automakers would avoid the risk of using an unknown supplier in favor of a known one. Such risk avoidance is not uncommon among U.S. automakers, and at least one of them is continuing to keep certain parts production in-house, even though in some instances its operations are not competitive with outside suppliers.

Because data on both foreign content and sourcing decisions were considered sensitive and often proprietary, much of the information provided to us on these topics was testimonial. In assessing the reasonableness of data provided, particularly that related to sourcing decisions, information was corroborated to the extent practical through discussions with representatives from the U.S. auto industry, suppliers, analysts, and industry associations. These discussions indicated that price, quality, and timely delivery are the primary factors considered by the U.S. auto industry in making sourcing decisions. Therefore, we used

these same factors in assessing the reasonableness of Japanese-affiliated automakers' sourcing practices.

U.S. Sourcing by Japanese-Affiliated Automakers

The Japanese-affiliated automakers are buying the following products from U.S.-based companies, some of which may be affiliated with Japanese or other foreign companies.

- Steel and various stamped parts,
- plastic resins and products,
- paint,
- tires,
- windshields and other windows,
- batteries,
- air conditioners and heaters,
- fuel pumps,
- exhaust system components,
- lights,
- carpeting,
- trim,
- seat assemblies, and
- windshield wiper motors.

However, Japanese-affiliated automakers have less domestic content in their U.S.-built vehicles than U.S. automakers. They contend that this is partly because many U.S. suppliers are unable to meet their sourcing needs. They stated that their expectations and relationships with suppliers regarding price, quality, delivery, and other capabilities are different and sometimes more demanding than those of traditional U.S. automakers and suppliers.

As of August 1987, each Japanese-affiliated automaker used from 42 to 121 U.S.-based suppliers as shown in table 3.1; from 8 to 28 of these suppliers had Japanese affiliations. The automakers generally claimed they did not know the percent of their U.S.-sourced parts which came from Japanese-affiliated suppliers because they do not accumulate such data.

Table 3.1: Number of U.S.-Based Suppliers Used by Japanese-Affiliated Automakers as of August 1987

	U.S.-based suppliers		
Automakers[a]	With Japanese affiliation	Without Japanese affiliation	Total
Honda	28	91	119
Mazda	19	23	42
Nissan	15	106	121
Toyota	8	52	60
Diamond-Star	15	38	53
NUMMI	9	95	104

[a]Subaru-Isuzu had not selected suppliers.

These U.S. and foreign-affiliated suppliers provide components that, based on the total wholesale price of the vehicles produced, contribute to domestic content levels ranging from 50 to 63 percent. In contrast, U.S. automakers are reporting domestic content averages of 86 to 99 percent for 1986 models. The percentages of domestic content for all automakers are shown in table 3.2.

Table 3.2: U.S. Content Reported by U.S. and Japanese-Affiliated Automakers[a]

Figures in percent

Automaker	U.S. Content
Honda	60 (30 at start-up)
Mazda	50
Nissan	
Autos	63 (47 at start-up)
Trucks	56 (38 at start-up)
Subaru-Isuzu	50[b]
Toyota	60[b]
Diamond-Star	55[b]
NUMMI	
Nova	60 (50 at start-up)
Corolla	50
Chrysler[c]	91 to 98
Ford[c]	86 to 99+
General Motors[c]	94 to 99+

[a]U.S. content percentages calculated by automakers using the methodology prescribed by Environmental Protection Agency regulations for calculating content for Corporate Average Fuel Economy (CAFE) determinations. Items considered in calculating these numbers may vary by company because of the flexibility provided in the regulations. Also, as allowed by the EPA regulations, U.S. automakers counted Canadian content as domestic in the figures reported. Japanese-affiliated automakers reported U.S content percentages as of August 1987. U.S. automakers reported domestic content for 1986 vehicle production.

[b]Estimated percent of domestic content when vehicle production begins.

[c]A range is shown because computations are made for each model.

Japanese-affiliated automakers plan to increase the U.S. content levels of their vehicles substantially in the next few years. However, according to one of these automakers, the practice of establishing long-term relationships with its suppliers affects its ability to readily increase its current levels of U.S. content. Because automaker commitments generally extend for the length of a model run (4 to 5 years), many suppliers will not have an opportunity to compete for Japanese-affiliated automaker business during that time. Some automakers stated that they expect their U.S. content levels to increase substantially when models change.

Japanese-affiliated automakers told us they expect to increase U.S. content, as shown in table 3.3.

Table 3.3: U.S. Content Goals for the Japanese-Affiliated Automakers Currently in Production

Automaker	U.S. Content
Honda	75 percent by 1991
Mazda	70 percent by 1991
Nissan	75 to 80 percent by early 1990's
NUMMI:	
Nova[a]	70 percent by 1989
Corolla[a]	60 percent by 1989

[a]NUMMI produces the Nova, which is distributed through General Motors, and the Corolla, which is distributed through Toyota

Industry analysts believe that Japanese-affiliated automakers are increasing U.S. content partly to deflect pressure for protectionist legislation and partly because the weakened U.S. dollar (relative to the Japanese yen) is making the price of U.S. items more attractive.

In contrast, U.S. automakers are expected to increase foreign content levels, due, at least in part, to increased competitive pressures to reduce their costs and increase product quality. Auto analysts estimate that, on average, the percentage of foreign parts in cars produced by U.S. automakers will increase from the current average of about 10 percent to about 17 percent by 1990.[1]

Differences in Production Methods Which Affect Sourcing Decisions

U.S. and Japanese automakers have traditionally used different production methods, which affect the way they source parts and help to explain why some U.S. suppliers may have a difficult time selling parts to Japanese-affiliated automakers. These differences involve the extent of in-house vs outside sourcing, the extent to which subassemblies or kits are purchased in lieu of individual parts, component design and engineering, contract requirements, and production and inventory processes.

In-House Sourcing

Traditionally, Japanese automakers have relied more heavily on outside suppliers for auto parts than have the U.S. automakers. Currently two of the major U.S. automakers source more of their parts in-house (GM-70 percent, Ford-50 percent and Chrysler-25 percent) than do Japanese automakers (an average of approximately 30 percent). However, many

[1]In addition to increasing foreign content, U.S. automakers are also increasing their imports of entire vehicles sold with their own nameplates. These vehicles are referred to as captive imports. There were about 254,000 captive imports in 1986, and this number is expected to grow to about 450,000 in 1988.

Japanese automakers partly own some of their suppliers. According to the Japanese Automobile Manufacturers Association, however, these interests do not preclude automakers from procuring parts from other, more competitive sources.

Subassemblies

Japanese automakers tend to buy more subassemblies than do U.S. automakers. Prime candidates for such procurements are seats, instrument panels, and suspension systems. Although Japanese-affiliated automakers tend to rely more on outside suppliers, they typically have direct business relationships with only about 200 to 300 suppliers. In contrast, U.S. automakers generally have direct business relationships with about 2,300 to 5,000 suppliers. Therefore, U.S. suppliers that are accustomed to selling individual parts may not be prepared to sell the subassemblies which the Japanese-affiliated automakers prefer to buy.

Component Design and Engineering

Japanese-affiliated automakers require suppliers to be heavily involved in the initial design and development of certain parts and subassemblies. In addition, suppliers are expected to continuously improve their products. Therefore, suppliers are expected to have the design and development capabilities to respond quickly to requests for product changes deemed necessary in the course of a model run. Suppliers are also expected to cut costs each year through design or production modifications, which also requires a degree of engineering capability.

In the past, U.S. automakers have typically relied on their own resources for design and engineering. Suppliers made parts in accordance with drawings provided by the automakers, often using automaker-supplied dies and tooling. However, U.S. automakers are beginning to rely more heavily on suppliers for the design of parts and subassemblies and for product improvements.

Contract Requirements

U.S. companies historically have tended to use rigid, price-oriented contracts, usually covering a one-year period. In Japan, automakers and suppliers have longer term relationships involving continuous collaboration and coordination in every aspect of parts design, production, and supply. Japanese-affiliated automakers believe that longer term relationships help them to be more responsive to consumer preferences, maintain high quality, and keep costs down. However, these long-term relationships may limit the opportunities available for other suppliers to

obtain business. U.S. automakers are now entering into longer term relationships for the same reasons.

Production and Inventory Systems

Japanese automakers have traditionally required their suppliers to operate according to a process called "just-in-time"—delivering the exact number of parts precisely when the automaker needs them. The automakers also encourage suppliers to produce parts just-in-time. By synchronizing production and delivery of parts, both automakers and suppliers can reduce inventory and related costs. The smooth operation of the just-in-time process depends on the quality of the parts delivered. Because there are generally no back-up parts for replacing defective ones, suppliers must work to eliminate defects during the production process. By rigorously controlling production, repair costs or wasted materials are kept to a minimum, as are post-production inspection, storage, and handling costs.

The expanded supplier role called for under the just-in-time process, while having economic advantages, can leave automakers vulnerable to supplier problems, so the need for technical competence and a cooperative working relationship with suppliers is particularly important. U.S. automakers, recognizing the economies and efficiencies of the just-in-time system, are implementing these techniques and are increasingly looking for this capability in their suppliers. Some suppliers who have not operated under this process may have difficulty implementing it. For example, some suppliers who are located at great distance from an automaker may have difficulty providing components on a just-in-time basis.

Other Factors Influencing Sourcing Decisions

Japanese-affiliated automakers told us that, in addition to price, quality, and timely delivery, several other factors influence their decisions about which products will be procured domestically and which will be imported from the parent company or from Japanese suppliers. Among the factors that influence sourcing decisions are need for economies of scale, use of parts kits, criticality of parts, and the need to integrate vehicle and component design and engineering.

Economies of Scale

Industry officials generally agree that some items such as engines and transmissions, require that significant quantities be produced to warrant the investment needed to construct a manufacturing facility. In

some instances, it may be more cost-effective to increase production volume in existing overseas facilities than to establish new facilities or to provide tooling to existing facilities in the United States. Long lead times might also be required to develop new tooling and this may be a further inhibitor to U.S. sourcing. Automakers stated that production capacity generally must reach or exceed about 350,000 to 600,000 units to achieve the economies of scale necessary to warrant construction of an engine or transmission plant.

During 1986, production volume at the Japanese-affiliated automakers averaged about 200,000 units; therefore engines and transmissions were shipped from plants already in production, generally in Japan. However, in 1986, Honda began producing engines for the Civic model at its Anna, Ohio, facility. These engines incorporate an aluminum block cast at the Anna facility and an engine kit imported from Japan. In January 1987, Honda announced plans to expand its Ohio engine plant to also produce engine and drivetrain components for the Honda Accord. Full-scale engine production for the Accord and Civic is slated for 1990, when Honda's U.S. vehicle production is expected to exceed 360,000 units annually.

Kits

In some instances, Japanese-affiliated automakers are buying such items as engine parts as part of a kit from the parent company or supplier in Japan. Kits facilitate subsequent assembly, so the individual parts are generally not sought. Consequently, U.S. suppliers have a difficult time providing these items. In some instances, U.S. companies have established relationships with the Japanese automakers in Japan and have successfully sold these types of parts for inclusion in kits.

Critical Parts

Japanese-affiliated automaker officials stated that items considered to be most critical to vehicle performance are generally made in-house, either in the U.S. affiliate or through the parent company in Japan. Although this practice may limit opportunities for outside suppliers, it helps to ensure high quality control in the design and manufacture of the items. For example, one automaker said that all of its most critical car parts—the vehicle frame and body panels, engine, and transmission—are made in-house.

Engineering and Design

Since the Japanese-affiliated automakers generally develop their vehicles in Japan, those component manufacturers with engineering and

development capabilities in Japan tend to have an advantage in obtaining business with their automakers. One automaker stated that the more consultation about a product is required with its engineers in Japan, the greater the likelihood the product will be sourced from a company located in Japan.

U.S. Supplier Experiences With Japanese-Affiliated Automakers

We contacted the Motor Equipment Manufacturers Association and the Automotive Parts and Accessories Association to learn the extent of U.S. suppliers' concerns about the Japanese presence in the United States and the kinds of difficulties they were experiencing with these automakers. We also discussed supplier concerns with the Japanese-affiliated automakers and with officials from the Department of Commerce's Office of Automotive Affairs and Consumer Goods.

We spoke with or obtained information from over 60 suppliers and selected 30 for in-depth interviews. These 30 represented a cross-section of the industry in terms of sales volume, types of products sold, and experiences both good and bad in attempting to sell their products to foreign-affiliated automakers. We attempted to corroborate specific supplier and automaker assertions. However, automakers and suppliers often would not provide specific details about their negative experiences due to concern that doing so could jeopardize possible future business relationships.

Of the 30 suppliers we selected for in-depth interviews, 15 had done business with at least one Japanese-affiliated automaker. Some suppliers were successful in obtaining business with one automaker and unsuccessful with another. Fifteen companies stated they had not been successful in obtaining business with any of the Japanese-affiliated automakers.

Difficulties Encountered by U.S. Suppliers

Many of the U.S. suppliers we interviewed said they encountered difficulties in obtaining business from Japanese-affiliated automakers. Most frequently cited difficulties were overcoming preexisting relationships between Japanese automakers and their suppliers and language and cultural differences.

Suppliers' comments regarding the Japanese automaker/supplier relationship varied widely. Some suppliers believed that automakers select Japanese-affiliated suppliers because they have organizational or financial ties to them. Others believed that Japanese-affiliated suppliers have

an advantage in obtaining this business because they have already proven themselves to the Japanese automaker in Japan. In addition, some suppliers noted that Japanese-affiliated suppliers are already accustomed to the automaker's production system and have no language or cultural barriers to overcome.

Another barrier less frequently cited was difficulty in obtaining and/or interpreting drawings or specifications from the Japanese-affiliated automakers. Some suppliers stated that they were refused drawings, while others stated that when they received them they were fundamentally different from U.S. automakers' drawings and difficult to read or interpret. Although this may make gaining Japanese-affiliated automaker business more difficult, U.S. automakers stated that they do not modify their drawings or specifications to accommodate foreign suppliers either.

Approaches Used to Overcome Difficulties

In some instances, suppliers were successful in overcoming difficulties in attempting to sell to the Japanese-affiliated automakers. Several approaches used for overcoming these difficulties are discussed below.

Joint Ventures

Eight U.S. suppliers stated that they had entered into joint ventures with Japanese-affiliated suppliers which, in most cases, contributed to their success in obtaining Japanese-affiliated automaker business. Some suppliers stated that the joint venture allowed them a chance to "prove" themselves to these automakers and to learn how Japanese suppliers and automakers do business. They expected this would lead to increased business with the Japanese-affiliated automakers.

Licensing or Collaborative Agreements

Obtaining licensing agreements[2] with Japanese-affiliated suppliers was cited as an effective means of gaining access to Japanese automakers. For example, one manufacturer stated that it entered into a licensing agreement with a Japanese supplier, established a good reputation with that supplier, and then used the supplier to advertise its competence and competitiveness to the Japanese-affiliated automakers. This manufacturer eventually obtained business with the Japanese-affiliated automakers.

[2]Licensing agreements are used by a company to authorize another to produce and/or market its products or to use its production process.

In a similar instance, one supplier already had business with a Japanese-affiliated automaker, but was having difficulty interpreting the automaker's drawings and specifications. At the encouragement of the automaker, the supplier entered a technical collaborative agreement with one of the automaker's Japanese-affiliated suppliers. The U.S. supplier stated that the agreement helped it to overcome its problems and eventually led to a joint venture with the Japanese supplier in the United States. The supplier added that its Japanese-affiliated business continues to increase.

Representative in Japan

Some suppliers stated that having a company representative in Japan is essential to secure Japanese-affiliated automaker business. Some suppliers stated that they had hired representatives fluent in Japanese and with prior business experience in Japan. Two suppliers stated that representation in Japan is particularly important when the component must be designed to accommodate the automaker's specifications or is part of a major subassembly (such as an engine or transmission) shipped from Japan to the United States as part of a kit. However, suppliers with limited resources to invest in Japan are at a disadvantage. One large manufacturer of transmission and engine parts stated that small to medium-sized companies are particularly disadvantaged because they generally do not have the resources available that larger companies have.

Persistence and Commitment to Customer

Many suppliers believed that their demonstrated persistence and commitment to the customer was a main factor in their ability to obtain the Japanese-affiliated automaker business. For example, a supplier of body and trim parts stated that it began writing to a Japanese automaker 10 years ago. When the automaker finally decided to manufacture in the United States, it contacted the supplier. The automaker visited the supplier's facility several times and made detailed inspections of every facet of the operation. After 4 to 5 years of frequent communication, the supplier obtained its first contract. The supplier stated the process was costly but well worth the investment. The Japanese-affiliated automaker's orders now constitute one-third of the supplier's total business.

Differences in the Way U.S. and Japanese-Affiliated Automakers Interact With Their Suppliers

Most companies that succeeded in obtaining Japanese-affiliated automaker business stated that there were major differences in supplying a Japanese-affiliated vs a U.S. automaker. Most of the differences involved product design and specifications, quality control, and plant visits.

An auto body parts supplier stated that the specifications and drawings provided by Japanese-affiliated automakers were not detailed and that the supplier was not only expected to develop the product, but also to improve upon the product's specifications. He added that the U.S. automakers provide detailed specifications and drawings and expect the supplier to provide the component only as specified.

Some suppliers said that Japanese-affiliated automakers are more involved with the product at every stage of the production process than are the U.S. automakers. A trim and body parts supplier stated that the Japanese-affiliated automaker makes daily contact with his company regarding defects. In addition, a steel supplier and a tire supplier stated that the Japanese-affiliated automakers allow little, if any, deviation from tight quality specifications.

Some suppliers stated that the Japanese-affiliated automakers tend to visit them more frequently and to conduct more comprehensive inspections. For example, a steel manufacturer characterized its Japanese-affiliated automaker visits as "preventative" while U.S. automaker visits were "reactive" after a problem had arisen. In addition, some suppliers commented that the Japanese-affiliated automakers tend to bring a wide variety of staff to completely inspect and evaluate their operations while the U.S. automakers send fewer people and have less structured, more courtesy-type, visits.

Some suppliers stated that U.S. automakers appear to be adopting more and more of the Japanese automaker's sourcing practices—demanding more design and engineering services, better quality products at competitive prices, and making more frequent and more critical visits to supplier facilities.

Benefits Resulting From Relationships With the Japanese-Affiliated Automakers

Most companies that obtained business with a Japanese-affiliated automaker stated that their contacts with these automakers had affected their business practices in a positive way. The benefits most often cited were increased production efficiency, increased emphasis on quality control, and more constant attention to product and process

improvement. Some suppliers said they now felt more competitive and some were now demanding more from their own suppliers as well.

Conclusions

Japanese-affiliated automakers' sourcing decisions appear to be strongly influenced by price, quality, and timely delivery. Despite sourcing a wide variety of products in the United States, Japanese-affiliated automakers have significantly lower levels of domestic content than do U.S. automakers. Most have announced plans to further increase their domestic content over the next few years, which will bring them closer to the levels of U.S. automakers. The greatest increases in domestic content may occur with the next model changes.

Traditionally, Japanese-affiliated automakers have used production and management methods which differ from those used by U.S. automakers. This may explain, in part, why some U.S. suppliers experienced difficulties and felt frustrated and discriminated against when trying to sell to Japanese-affiliated automakers. Some U.S. suppliers that have succeeded in selling to Japanese-affiliated automakers have been willing to make changes in order to meet Japanese automaker expectations.

Differences in the ways that Japanese-affiliated and U.S. automakers operate are narrowing. U.S. automakers, recognizing potential economies and efficiencies available from Japanese production and management methods, have begun to implement many of these same methods. These broader, often more stringent expectations will make it necessary for many U.S. suppliers to demonstrate their ability and willingness to adapt to changing demands in order to remain competitive in a changing market. If industry analysts' projections (discussed in Chapter 2) are accurate, Japanese affiliates will have a larger share of U.S. production and traditional U.S. automakers will not only have a smaller share of the market, but are also likely to increase imported parts in their vehicles as they seek to improve their competitiveness.

Increasing U.S. Presence of Japanese Parts Suppliers

Representatives of the U.S. parts supplier industry have expressed concern that the industry is seriously threatened by the influx of Japanese suppliers establishing facilities in the United States. Concerns generally cited by U.S. suppliers are that Japanese-affiliated suppliers will

- contribute to overcapacity, thereby harming the economic interests of U.S. suppliers and their employees, and
- have unfair advantages over U.S. suppliers resulting from their pre-existing ties to Japanese automakers and from economic incentives provided by state and local governments.

Implicit in this concern is an assumption that Japanese-affiliated automakers will increase their share of U.S. production at the expense of traditional U.S. automakers, thus reducing the U.S. market for U.S. suppliers' products.

In general, we found that the basis for supplier concerns have some validity. A growing number of Japanese suppliers are opening facilities in the United States and are supplying parts to both U.S. and foreign-affiliated automakers. Some of these suppliers are operating as joint ventures with non-Japanese companies in the United States. Further, those suppliers that have ties to Japanese automakers may have a competitive advantage over U.S. suppliers. In addition, suppliers establishing new plant capacity, as are many of the Japanese-affiliated suppliers, may benefit competitively from state and local incentives.

The impact that the presence of Japanese suppliers will have on the U.S. supplier industry is difficult to measure. While the Japanese suppliers do have some advantages over U.S. suppliers, calling them unfair may not be accurate. The Japanese-affiliated suppliers often have prior experience in meeting Japanese automaker expectations and may be less likely to encounter cultural barriers when dealing with these automakers. Further, Japanese-affiliated suppliers establishing new facilities in the United States may be in a better position as a group to take advantage of state and local government incentives. However, their lack of experience in the United States may be a disadvantage when dealing with U.S. workers and automakers.

Japanese Supplier Presence

The number of Japanese-affiliated suppliers opening facilities in the United States nearly doubled from January 1984 to August 1987. We identified 104 Japanese-affiliated suppliers operating in the United States as of August 1987. Of these, 102 were willing to provide us with

information on their operations. As shown in table 4.1, nearly half of the 102 companies responding to our inquiry began operating in the United States between January 1984 and August 1987. Because the factors contributing to this trend (discussed below) are still present, more such suppliers are likely to follow; one analyst suggests that 300 more might begin operations by 1990. We did not attempt to assess the reasonableness of this estimate, which was based in part on the frequency of inquiries being made to U.S. state promotional offices in Japan.

Table 4.1: Japanese-Affiliated Suppliers in the United States

Year established	Number of companies
Prior to 1970	19
1970 to 1975	14
1976 to 1980	9
1981 to 1983	13
1984 to 1985	22
1986 to August 1987	25
Total	**102**

Japanese-affiliated suppliers offered several reasons for opening facilities in the United States, but the reason cited by 74 of the 102 companies was "to gain access to a growing market". Their response is consistent with auto analysts' assessments that the auto market in Japan is no longer growing.

In addition to market access, 43 of the companies stated that they were also influenced by the belief that it was cheaper to manufacture their product closer to their customer. Since Japanese-affiliated automakers, including those in the United States, generally require suppliers to ship on a just-in-time basis, close proximity to customer facilities may offer any parts supplier a competitive advantage.

Tables 4.2 through 4.5 profile the 102 Japanese-affiliated suppliers we interviewed.

Table 4.2: Types of Products Sold by the Affiliates

Product Category	Number of Producers[a]
Accessories	21
Auto body	34
Chassis	27
Chemicals	4
Electrical	15
Engine	25
General services	1
Equipment	2

[a]Some companies sell products in more than one category.

Table 4.3: Size of Affiliate Suppliers

Number of Employees	Number of Companies
100 or less	42
101 to 400	36
Over 400	19
Could/would not say	5
Total	**102**

Table 4.4: Affiliate Suppliers' U.S. Customers

Customer	Number of Firms
U.S. automakers only	27
Foreign affiliate only	33
Both U.S. and foreign affiliate	28
Another supplier or aftermarket	13
Could/would not say	1
Total	**102**

Table 4.5: Extent of Affiliates' Auto-Related Business

Percent of Business	Number of Companies
1 to 50	24
51 to 99	28
100	50
Total	**102**

Japanese suppliers establishing facilities in the United States are adding to production capacity, except where existing capacity was either bought out or incorporated into a joint venture operation. We did not

attempt to quantify the extent to which this creates or contributes to "overcapacity" because of the difficulties involved in defining a comparison base and comparing unlike operations, products, and technologies among suppliers.

Some Suppliers Have Formed Joint Ventures

Of the 102 Japanese-affiliated suppliers we interviewed, 21 indicated that they were in joint ventures with U.S.- based non-Japanese companies. Virtually all of their sales were made to original equipment manufacturers; for 20 of the 21 joint ventures we were told that the Japanese companies owned less than 50 percent of 4 ventures, 50 percent of 11 ventures, and over 50 percent of 5 ventures.

The 21 joint venture companies are profiled in tables 4.6 through 4.8.

Table 4.6: Types of Products Sold by Joint Ventures

Product Category	Number of Suppliers[a]
Accessories	4
Auto body	10
Chassis	5
Electrical	2
Engine	6

[a]Some companies sell products in more than one category

Table 4.7: Size of Joint Ventures

Number of Employees	Number of Suppliers
100 or less	11
101 to 400	7
Over 400	3
Total	**21**

Table 4.8: Extent of Joint Ventures' Auto-Related Business

Percent of Business	Number Of Suppliers
1 to 50	2
51 to 99	3
100	16
Total	**21**

It appears likely that some partners to these joint ventures exchanged technologies or product information as a result of their joint venture

arrangements. When asked what benefits they expected to derive from a joint venture, "exchange of technological or managerial expertise" was cited by 13 of the 21 companies. Other expected benefits included access to a growing market, cited by 11 companies, and the need to be near customers and increased profit potential, cited by 7 companies.

Opportunities for Competitive Advantage

Some Japanese-affiliated suppliers have had opportunities available to them which may have given them a competitive advantage over some U.S. suppliers. In some instances, Japanese-affiliated suppliers had relationships with automakers in Japan who encouraged them to open facilities in the United States. In other instances, state and local governments offered economic incentives to Japanese (as well as U.S.) suppliers who open facilities in their areas. While it may be difficult to quantify the effects of these opportunities, it is likely that they have given Japanese suppliers some competitive edge over some established U.S. suppliers in selling to automakers in the United States.

Japanese suppliers have been encouraged by both Japanese-affiliated and U.S. automakers to establish facilities in the United States, but this does not appear to be widespread. Of the 102 firms we interviewed, 24 stated that they had been encouraged by Japanese-affiliated automakers to open facilities here and 6 stated that they had been encouraged by U.S. automakers.

According to representatives of Japanese-affiliated automakers, Japanese suppliers generally were not directly encouraged to establish U.S. facilities. However, in a few instances, encouragement was offered to producers of products which were otherwise not available from U.S. suppliers or were considered critical to product quality and/or needed to be closely integrated with assembly production. For example, Honda officials told us that at the time they initiated vehicle production in the United States, Honda planned to purchase seats from a U.S. supplier. However, in 1982 no American suppliers were manufacturing seat assemblies because U.S. automakers were manufacturing seats in-house. As a result, Honda entered into an agreement with two Japanese manufacturers to form Bellemar Parts. With a new facility constructed in Russellspoint, Ohio, Bellemar Parts supplies Honda in Marysville, Ohio, with seat assemblies, exhaust items, and mounted tires on a just-in-time delivery basis.

In another case, Honda encouraged four Japanese suppliers to open a joint venture facility in Ohio called KTH Parts Industries. This facility

supplies Honda with stamping and welded chassis parts on a just-in-time basis. According to Honda officials, these parts were considered critical to the vehicle and were originally produced by Honda at its Marysville plant. Honda officials indicated that in 1984, when the Ohio assembly plant was expanded, it no longer had the capacity to produce these parts in-house. Honda officials stated that because it is company policy to carefully control production of certain critical parts, Honda looked to suppliers who already had lengthy experience in producing these same critical parts for Honda Motor Company in Japan. With the financial assistance of Honda and the manufacturing know-how and technical expertise from four Japanese suppliers, KTH Parts Industries was established in Ohio to provide parts to Honda's Ohio assembly plant.

Organizational or financial ties of Japanese-affiliated suppliers to automakers in Japan or to Japanese-affiliated automakers in the United States have likewise not been widespread. Only 28 of the 102 Japanese suppliers stated they had such ties and 64 said they had no ties. Another 10 could or would not say.

Sixty-one of the Japanese-affiliated parts suppliers we interviewed sell their products to U.S.-based Japanese automakers. Forty-seven responded to a question on the basis of their success and indicated it was influenced by one or more of the reasons shown in table 4.9.

Table 4.9: Reasons for Success in Selling To Japanese-Affiliated Automakers

Reason	Number of Times Cited by 47 Firms
Ties to assemblers in Japan	26
Quality of product	23
Expertise in field	10
Competitive price	7
Other	7

Similarly, 17 of these 47 suppliers cited quality of their products and 4 cited their prices as contributing to their success in selling to the U.S. automakers. According to one U.S. automaker, Japanese suppliers are generally world-class suppliers, offering lower prices and higher quality products than many U.S. suppliers.

Several U.S. suppliers voiced concern that economic incentives offered by state and local governments provide Japanese-affiliated competitors

(who tend to be seeking new locations) with an unfair economic advantage. Because of the difficulty in quantifying and comparing incentives, we could not assess the extent to which incentives may have provided a competitive advantage to Japanese suppliers. However, many state and local governments are offering economic incentives to encourage industrial expansion and new development in their areas. According to the Department of Commerce, loans, grants, training funds, and other items are available in most states to businesses willing to develop or expand manufacturing facilities. Businesses interested in developing new facilities may also receive local tax abatements.

We interviewed officials in 7 states with foreign-affiliated automaker facilities about incentive packages available to businesses. State officials indicated that U.S. businesses have received the greatest percentage; however, in the auto sector, foreign investors have received an increasing share. With rising Japanese investment in the last 2 to 3 years, Japanese companies have received an increasing percentage of the incentives. Such incentives reduce the cost of new investments by Japanese based suppliers.

Conclusions

U.S. suppliers have some valid concerns about the numbers of Japanese-affiliated suppliers moving to the United States. In the last 3-1/2 years, the number operating in the United States has nearly doubled. Further, it is likely that the number will continue to increase as more Japanese-affiliated suppliers seek access to the U.S. market. It is also likely that, as in the past, some of them will seek out joint ventures with non-Japanese suppliers operating in the United States. It is difficult to predict the total impact of these Japanese-affiliated suppliers and joint ventures on the industry's capacity. However, where new facilities are opened and existing ones not closed, some overcapacity can reasonably be expected to result for at least some product lines.

Japanese-affiliated suppliers have some competitive advantages over U.S. suppliers in selling to Japanese-affiliated automakers. Although not a widespread practice, a few were directly encouraged by Japanese-affiliated automakers to open facilities in the United States, and some have financial or organizational ties to these automakers either in the United States or Japan. Some were already accustomed to the demands of Japanese automakers, which may have helped them obtain business from Japanese-affiliated automakers in the United States. This experience may also have given them some advantage in dealing with U.S.

automakers, as these automakers continue to adopt Japanese management and production techniques.

Assessment of Potential Effects of Foreign Investment on Other U.S. Interests

Foreign direct investment in the U.S. auto industry raises several questions regarding its actual or potential impact on a wide range of activities, including

- Do employees of foreign-affiliated automakers fare as well as workers of domestically owned automakers?
- Are foreign-affiliated automakers relying on foreign sources for services?
- Where did the foreign-affiliated automakers obtain their start-up capital?
- Are profits from foreign-affiliated automakers being repatriated or left in the United States?

U.S. and foreign-affiliated automakers provided us with some information on these topics. In some cases they did not provide specific information because it might be useful to competitors or adversely affect certain business trusts or confidences.

In general we found that

- employees of foreign-affiliated automakers are faring reasonably well,
- foreign-affiliated automakers are relying on a combination of U.S. and foreign sources for services,
- start-up capital was obtained from parent companies; U.S., Japanese and third-country bank loans; sale/leaseback arrangements; and local bonds; and
- profits are reportedly being reinvested in U.S. manufacturing facilities or to reduce debt.

Do Employees of Foreign-Affiliated Automakers Fare as Well as Those of Domestically Owned Automakers?

Comparing how well workers are faring is at best a very judgmental and imprecise process since job content varies by company, purchasing power of wages varies with local living costs, health benefits vary widely, and profit-sharing availability and methods of calculation vary by company. Because of these variables and our limited access to specific data, we directed our assessment of this area to answering the following labor-related questions.

- Are foreign-affiliated assemblers paying wage levels generally comparable to those of domestic automakers?

- Do employees of foreign-affiliated automakers have non-wage benefits similar to those of domestic automakers?
- How do worker job classifications differ between foreign-affiliated and domestically owned automakers?
- How many foreign nationals are employed by foreign-affiliated automakers compared with the total number of employees at the facility?

In addition, we were requested to ascertain the extent to which employees of foreign-affiliated automakers are affiliated with a union.

Estimates of differences in total labor costs per hour are sometimes used to indicate the relative well-being of workers. Automakers generally refused to disclose their total labor costs per hour. However, this would not have been a particularly revealing basis for comparison in any event, because it includes not only wages and non-wage benefits to employees, but also other labor-related costs, such as pensions. The automakers agreed that the total labor costs per hour for foreign-affiliated automakers are lower than those for U.S. automakers. Among the reasons cited for this difference are a younger labor force at foreign-affiliated facilities (which brings about lower health insurance premiums) and little if any pension payout by these automakers.

We were able to collect information on wage levels and non-wage benefit packages, and as discussed below, compensation packages provided employees by U.S. and Japanese-affiliated automakers appear generally comparable.

Wage Levels

We compared assembler wages for employers of U.S. and foreign-affiliated automakers by looking at both starting wages and those paid after the first 12 to 18 months. As shown in table 5.1, employees of foreign-affiliated and U.S. automakers receive comparable wages.

Table 5.1: Wage Comparisons for Auto Assemblers as of August 1987

Company	Hourly Wage Level	
	Starting	12 to 18 Months
Volkswagen	$11.72	$12.72
Honda	11.00	12.65
Mazda	10.98	12.92
Nissan	11.10	12.20
Subaru-Isuzu	(a)	(a)
Toyota	10.49	11.18
Diamond-Star	11.41	12.75
NUMMI	11.95	13.94
Chrysler	10.90	12.82
Ford	10.90	12.82
General Motors	10.90	12.82

[a]Levels not yet determined

Non-Wage Benefits

As table 5.2 shows, foreign-affiliated automakers provide a wide range of employee benefits, many of them similar to those provided by U.S. automakers.

Table 5.2: Non-Wage Benefits[a]

Automaker	Health & life insurance	Profit sharing	Auto leasing	Purchase discount	Attendance bonus
Volkswagen	X			X	X
Honda	X	X	X	X	X
Mazda	X	X	X	X	
Nissan	X	X	X	X	X
NUMMI	X			X	X
Chrysler	X			X	X
Ford	X	X		X	X
General Motors	X	X		X	

[a]Subaru-Isuzu, Toyota and Diamond-Star have not determined the benefits to be provided

Job Classifications

Job classifications define the scope of work each employee performs. Generally, as the number of classifications increases, the scope of work is reduced along with flexibility for using available employees.

Japanese-affiliated automakers tend to have significantly fewer job classifications than traditional U.S. automakers. (See table 5.3.) Japanese-affiliated plants use work teams and each team member is trained to do

all the tasks performed by the team. Often, jobs are rotated among team members.

In contrast, a traditional U.S. auto plant may have over 90 different job classifications. Employees generally perform only those tasks specifically allowed for their operation. These differences in job classifications, however, are narrowing. For example, U.S. automakers have worked with the UAW to reduce the number of classifications at some U.S. facilities.

Table 5.3: Job Classifications

Automaker	Number of classifications	
Volkswagen	94	
Honda	3	(1 Team leader, 1 production and 1 maintenance)
Mazda	2	(1 Production and 1 maintenance)
Nissan	4	(1 Production leader, 1 production technician, 1 maintenance leader, and 1 maintenance technician)
Subaru-Isuzu	(a)	
Toyota	3[b]	
Diamond-Star	(a)	
NUMMI	4	(1 Production and 3 maintenance)
Chrysler	82	(At a traditional assembly plant)
Ford	91	(At a traditional assembly plant)
General Motors	95	(At a traditional assembly plant)

[a]Not determined.

[b]Expected when production begins

Number of Employees Who Are Foreign Nationals

Foreign-affiliated automakers are not employing large numbers of foreign nationals in relation to their total employment. Generally, the foreign nationals hold managerial or technical positions. The total number of positions held by foreign nationals varied by company, as shown in table 5.4.

Table 5.4: Total Employment and Number of Foreign Nationals Employed at Foreign-Affiliated Automakers

Automaker	Number of employees	Number of foreign nationals	
Volkswagen	2,500	34	Germans
Honda	4,242	199	Japanese
Mazda	3,500	70	Japanese[a]
Nissan	3,190	13	Japanese
Subaru-Isuzu	3,200	50	Japanese[a]
Toyota	3,000	50	Japanese[a]
Diamond-Star	2,900	50	Japanese[a]
NUMMI	2,500	35	Japanese

[a]These numbers are corporate estimates, since facilities are not yet fully operational.

Union Affiliation

Three of the eight U.S.-based, foreign-affiliated automakers have not begun production, and decisions about unionization have not yet been made. Of the five U.S.-based, foreign-affiliated automakers in production, three have unionized workforces—Volkswagen, Mazda and NUMMI.

Are Foreign-Affiliated Automakers Relying on Foreign Sources for Services?

We asked foreign-affiliated automakers whether they were obtaining major services, such as banking, insurance, and construction domestically or from foreign sources, specifically

- the number and types of service provided by banks and their locations;
- the types of insurance coverage and the location of the providers; and
- the national origin of prime and subcontractors used for original construction and any additional facility construction.

The degree to which companies were willing to provide specific information varied widely from company to company and issue to issue. Their guardedness stemmed from concerns about divulging information which might be useful to competitors. Also, they did not want to violate business trusts with their service providers.

Financial/Banking Services

Foreign-affiliated automakers told us that they are using both U.S. and foreign banks, as shown in table 5.5. For example, major borrowings are from both U.S. or foreign sources, depending on where the best rates can be obtained. In some instances, automakers were not willing to identify the names or even the number of financial institutions used.

Table 5.5: Finance/Banking Services

Automaker	Banking Institutions	
	Foreign	Domestic
Volkswagen:		
Payroll, checking, and foreign exchange	1	4
Honda:		
Payroll, loans, checking, supplier payments, overseas payments	0	7
Loans	4	0
Mazda:		
Payroll, checking, foreign exchange, and supplier payments	0	5
Foreign exchange, overseas payments	2	0
Nissan:		
Payroll, loans, checking, foreign exchange, supplier payments, other services	0	(a)
Loans, foreign exchange, overseas payments, other services	(a)	0
Subaru-Isuzu:		
Checking	0	2
Other	4	0
Toyota:		
Payroll, checking, foreign exchange, supplier payments, overseas payments	0	(a)
Diamond-Star:		
Payroll, loans, checking, foreign exchange, supplier payments, overseas payments	0	23
Loans, foreign exchange, overseas payments	20	0
NUMMI:		
Payroll, loans, checking, supplier payments, other services	0	(a)
Loans, supplier payments, other services	(a)	0

[a]Automaker did not provide the number of institutions used.

Insurance Services

Foreign-affiliated automakers told us that their insurance decisions are based on an insurer's ability to provide coverage at a competitive price. As shown in table 5.6, they are using a mix of both foreign and domestic insurance sources. However, employee-related insurance needs tend to be provided by domestic rather than foreign sources.

Table 5.6: Insurance Services

Automaker	Insurance Provider[a] Foreign	Domestic
Volkswagen:		
General liability, health, workers' compensation		X
Honda:		
Disability, general liability, property insurance, health, builders risk, employer liability, workers' compensation, life		X
General liability, property insurance, builders risk, employer liability	X	
Mazda:		
General liability, property insurance, health, builders risk, employer liability, workers' compensation, life, other		X
Ocean marine, product liability	X	
Nissan:		
Disability, general liability, property insurance, health, employer liability, workers' compensation, life, other		X
General liability, property insurance, employer liability, ocean marine, inland marine	X	
Subaru-Isuzu:		
General liability, builders risk, employer liability, workers' compensation, other		X
Toyota:		
Disability, general liability, property insurance, health, builders risk, employer liability, workers' compensation, product liability, life, other		X
General liability, property insurance, workers' compensation, ocean marine	X	
Diamond-Star:		
Disability, general liability, property insurance, health, builders risk, life		X
General liability, property insurance builders risk, employer liability, workers' compensation, inland marine, other	X	
NUMMI:		
Disability, general liability, property insurance, health, builders risk, employer liability, workers' compensation, inland marine, life, other		X
Ocean marine, product liability	X	

[a]Automakers did not provide the number of institutions used.

Facility Construction

U.S.-based, foreign-affiliated automakers have relied primarily on domestic contractors for facility construction. However, Mazda, Subaru-Isuzu, Toyota, and Diamond-Star relied on foreign general contractors (or project managers) and U.S. subcontractors for actual facility construction. (See table 5.7.)

Table 5.7: Construction of Facilities

	Facility contractor	
Automaker	**Foreign**	**Domestic**
Volkswagen	None	3
Honda	None	4
Mazda	1 General contractor	Over 100
Nissan	None	1 General contractor; others not specified
Subaru-Isuzu	1 General contractor	100 (estimated)
Toyota	1 General contractor	7
Diamond-Star	1 General contractor 3 subcontractors	26
NUMMI	6	141

Where Did the Foreign-Affiliated Automakers Obtain Their Start-Up Capital?

The underlying concern in this area was whether Japanese companies were getting below-market interest rates on borrowings for plant construction. We were unable to obtain enough information to be conclusive in this regard. Foreign-affiliated automakers told us their parent companies primarily provided their start-up capital. Some also obtained start-up capital from bank loans and sale/leaseback financing. Some of the automakers would not provide details on these arrangements. In addition to the information shown in table 5.8, foreign-affiliated automakers have also received economic incentives from state and local governments.

Table 5.8: Reported Sources of Start-Up Capital

Automaker	**Funding source**
Volkswagen	Parent company.
Honda	Parent company.
Mazda	Information considered proprietary.
Nissan	Combination of parent company/U.S. bank loans, local bonds, and sale/leaseback arrangement.
Subaru-Isuzu	Parent companies and borrowings.
Toyota	Parent company.
Diamond-Star	Parent companies (Chrysler and Mitsubishi) and borrowings from U.S., Japanese and third-country banks.
NUMMI	$450 million total investment GM - $100 million/land, building, cash Toyota - $100 million cash, $200 million - sale/leaseback financing, $50 million - other, including commercial borrowing

Are Profits From Foreign-Affiliated Automakers Being Repatriated or Left in the United States?

Of the foreign assemblers currently in production, Honda, Nissan, and NUMMI are reporting a profit. Honda officials stated that the company is reinvesting its profits in the expansion of its U.S. manufacturing facilities. Nissan recently reported marginal profitability but, according to company officials, it is presently in a net debtor position and profits are being used to reduce debt. NUMMI officials reported a profit for fiscal year 1986 and indicated that profits were reinvested in their U.S. operations.

Profiles of Foreign-Affiliated Automakers

Honda of America Manufacturing, Inc.

Ownership	American Honda Motor Co. Inc. (97%) Honda Motor Co., Ltd. (3%)
Plant location and size	Marysville, Ohio. A newly constructed 2.2 million square foot facility.[a]
Capital investment	$700 million[b]
Production start date	1982
Product(s)	Accord, Civic sedans
Production capacity	360,000
1986 production volume	238,160
Domestic content	60%
Number of employees	4,200
Employee profile	77% male 23% female average age 30
Union affiliation	None
Suppliers	119 American suppliers, 28 of whom are U.S.-based Japanese suppliers or U.S.-Japanese joint venture companies. Two suppliers are joint-ventures between American Honda and Japan-based suppliers.

[a]Also at Marysville is a motorcycle manufacturing plant. Honda also operates a motorcycle and auto engine plant currently being expanded to produce additional automobile engines and parts at Anna, Ohio

[b]Includes $42 million for the motorcycle plant With its recently announced second auto plant and expansion, Honda's estimated capital investment in its Ohio manufacturing plants will total $1.7 billion by 1991.

Nissan Motor Manufacturing Corporation U.S.A.

Ownership	Nissan Motor Co. Ltd. (80%) Nissan Motor Corporation U.S.A. (20%)
Plant location and size	Smyrna, Tennessee. A newly constructed 3.2 million square foot plant on a 782 acre site.
Capital investment	$848 million
Production start date	1983
Product(s)	Light trucks, Sentra
Production capacity	265,000
1986 production volume	173,263
Domestic content	56%-trucks, 63%-cars
Number of employees	3,300
Employee profile	77% male 23% female average age mid-30s
Union affiliation	None
Suppliers	121 U.S. parts suppliers; 15 are Japanese owned.

Subaru-Isuzu Automotive, Inc.

Ownership	Isuzu Motors Ltd. (38.6% owned by GM) - Fuji Heavy Industries joint venture.
Plant location and size	Lafayette, Indiana (869 acre site)
Capital investment	$500 million
Production start date	November 1989
Product(s)	Sedan, station wagon, and a pick-up truck and sports utility vehicle
Production capacity	120,000
1986 production volume	- 0 -
Domestic content	50% (expected at start-up)
Number of employees	1,700 (when in production)
Employee profile	Not available
Union affiliation	Not yet determined
Suppliers	Suppliers have not been selected.

Volkswagen of America, Inc.

Ownership	Volkswagen A.G.
Plant location and size	Westmoreland, Pennsylvania[a]
Capital investment	(Data not available)
Production start date	1978
Product(s)	Golf, Jetta
Production capacity	225,000
1986 production volume	84,398
Domestic content	Over 60%
Number of employees	2,500
Employee profile	(Data not available)
Union affiliation	UAW
Suppliers	About 200 U.S.-based suppliers.

[a]In November 1987 Volkswagen announced that it would cease U.S. production at the end of the 1988 model year.

Diamond-Star Motors Corporation

Ownership	50/50 joint venture between Chrysler Motors Corp. and Mitsubishi Motors Corp. (24% owned by Chrysler)
Plant location and size	Bloomington-Normal, Illinois. A new, 1.8 million square foot facility on a 636 acre site is currently under construction.
Capital investment	$1.2 billion
Production start date	Fall of 1988
Product(s)	Small sports specialty car and subcompact vehicles
Production capacity	240,000
1986 production volume	- 0 -
Domestic content	55% (estimated at start-up)
Number of employees	2,900 (at full production)
Employee profile	Not yet in production
Union affiliation	Employees will have opportunity to decide
Suppliers	53 U.S. suppliers contracted and others being selected.

Mazda Motor Manufacturing (U.S.A.) Corp.

Ownership	Mazda Motor Corporation (25% owned by Ford)
Plant location and size	Flat Rock, Michigan. A newly constructed 2.7 million square foot facility.
Capital investment	$550 million
Production start date	September 1987
Product(s)	Mazda MX6, Probe
Production capacity	240,000
1986 production volume	- 0 -
Domestic content	50%
Number of employees	3,500 (at full production)
Employee profile	(Data not available)
Union affiliation	UAW
Suppliers	As of August 1987, had selected 42 U.S.-based auto parts suppliers—23 American, 12 Japanese, and 7 joint-ventures.

New United Motors Manufacturing, Inc. (NUMMI)

Ownership	50/50 GM-Toyota joint venture having a 12 year corporate life.
Plant location and size	Fremont, California. A renovated, formerly idle, GM facility.
Capital investment	$450 million
Production start date	1984
Product(s)	Chevrolet Nova, Corolla FX, Corolla FX16
Production capacity	250,000
1986 production volume	205,000
Domestic content	60%-Nova, 50%-Corolla
Number of employees	2,500
Employee profile	80% male 20% female average age 40
Union affiliation	UAW
Suppliers	103 U.S. suppliers, 9 of which are Japanese-affiliated.

Toyota Motor Manufacturing, U.S.A., Inc.

Ownership	Toyota Motor Corporation
Plant location and size	Georgetown, Kentucky. A new facility is under construction on a 1,400 acre site.
Capital investment	$800 million
Production start date	mid-1988
Product(s)	Camry
Production capacity	200,000
1986 production volume	- 0 -
Domestic content	60% (estimated at start-up)
Number of employees	3,000 (when in production)
Employee profile	Not available
Union affiliation	Employees will have opportunity to decide.
Suppliers	60 U.S.-based auto parts suppliers to date; 8 are Japanese-affiliated.

Formulas and Quantitative Factors Used to Calculate Potential Job Losses

ethod #1

o compute the 45,000 job loss estimate shown in table 2.1, we used the following steps.

Determine the job effects at the assembly level.

300,000 ıpanese-affiliated ıtomaker production	×	.85 Displacement rate	=	1,530,000 U.S. automaker units displaced	
530,000 S. automaker units splaced	/	200,000 Units per average plant	=	7.65 U.S. automaker plants displaced	
65 S plants displaced	×	4,068 Average workers per plant	=	31,120 Jobs lost at U.S. automaker plants	
panese-affiliated plants eded to produce 800,000 units	×	2,560 Jobs per average plant	=	23,040 Jobs created at Japanese-affiliated plants	
1,120 ssembly jobs lost	−	23,040 Assembly jobs created	=	8,080 Lost assembly jobs	

Net job losses at upstream suppliers.

87 LS multiplier of supplier bs per assembly job	×	4,068 Worker per U.S. automaker plant	=	19,811 Supplier jobs per U.S. automaker plant		
65 splaced plants	×	19,811 Supplier jobs per plant	×	.83 Domestic sourcing ratio of U.S. automakers	=	125,790 U.S. supplier jobs lost
apanese-affiliated plants eeded to produce 800,000 units	×	19,811 Supplier jobs per plant	×	.5 Domestic sourcing ratio	=	89,150 Supplier jobs created
5 790 S. supplier jobs lost	−	89,150 U.S. supplier jobs created	=	36,640 Net supplier jobs lost		

Total net job effect.

080 ssembly jobs lost	+	36,640 Supplier jobs lost	=	44,720 Net job loss

lethod #2

o compute the changes in auto-related employment between 1985-90, we used the following steps.

We determined the total job losses (allowing all factors to vary between 1985 and 1990).

1 5 million oduction of U.S. tomakers in 1985	×	93.5% Domestic content ratio of U.S automakers in 1985	/	7.57) + average vehicles per worker ratio in 1985
3 million oduction of Japanese filiates in 1985	×	54.5% Domestic content ratio of Japanese affiliates in 1985	/	7.57) −
8 million oduction of U.S tomakers in 1990	×	89% domestic content ratio of U.S automakers in 1990	/	8.36) − average vehicles per worker ratio in 1990
8 million oduction of Japanese iliates in 1990	×	67.5% domestic content ratio of Japanese affiliates in 1990	/	8.36)

= 1 420.000 + 22.000 − 937.000 − 145.000 = 360.000

(continued)

2. We allocated total job losses to four causes—increase in imports, increase in production of Japanese-affiliated automakers, labor productivity gains, and changes in domestic content ratios.

In assessing the job effect due to each of the four causes, we held the other relevant factors constant at the average values of 1985 and 1990. By doing so we have *approximately* decomposed total job losses into four causes.

The details of computations are listed as follow.

(a) Job losses due to production increase of Japanese-affiliated automakers *only*, holding domestic content ratios and vehicles per worker ratio *constant* at average values of 1985 and 1990.

(1.5 million Displaced domestic production (increase between 1985-90)	× 91.25% Average domestic content ratio for U.S. automakers	/ 7.965) Average vehicles-per-worker ratio	
−(1.5 million Increase in Japanese affiliates production	× 61% Average Domestic content ratio of Japanese affiliates	/ 7.965)	
= 57,000 job losses			

(b) Job losses due to import increase *only;* holding domestic content ratios and vehicle-per-worker ratio *constant* at average values of 1985 and 1990.

1.2 million Increase in imports between 1985-90	× 91.25% Avg. domestic content ratio of U.S. automakers	/ 7.965 Avg. vehicle-per-worker ratio	= 137,000 job losses

(c) Job losses due to productivity gain *alone*, holding production levels and domestic content ratios constant at average values of 1985 and 1990

[(11.5 million + 8.8 million)/2] Average production level of U.S. automakers	× 91.25% Avg. domestic content ratio for U.S. automakers	× 0.0125 Decrese in labor requirement per car between 1985-90
+ [(0.3 million + 1.8 million)/2] Average production level of Japanese affiliates production	× 61% Avg. domestic content ratio Japanese affiliates	× 0.0125
= 132,000 job losses		
where 0.0125 =	(1 / 7.57) worker-per-vehicle in 1985	− (1 / 8.36) worker-per-vehicle in 1990

(d) Job losses due to domestic content ratio changes *alone*, holding production levels and vehicles-per worker ratio *constant* at average values of 1985 and 1990.

(10.15 million Average production level of U.S automakers	× 4.5% Decrease in domestic content ratio between 1985-90	/ 7.965) Average vehicle-per-worker ratio
− (1.05 million Average production level of Japanese affiliates	× 13% Increase in domestic content ratio of Japanese affiliates	/ 7.965)
= 44,000 job losses		

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