3-4. Automotive Parts Industry in the U.S.

3-4-1. A Brief Description of the Present Situation in the Market

The auto parts industry in the United States consists of 2,000 companies which employ more than 600,000 workers according to census data. In 1987 the industry accounted for factory shipments (sales) of about $94.5 billion.

Auto parts manufacturers as a group sell their products in two principle market segments:

Table V.3-39 Major Market

Segment	Customers	Marketing Channels
Original Equipment (OE)	Vehicle Manufacturers	Factory Direct
Replacement Parts or "Aftermarket"	Vehicle Owners	Via Wholesalers, Distributors, Installers, Parts Stores

About half the U.S. parts manufacturers sell to both the OE and aftermarkets while the others sell just to the aftermarket where the trade includes many accessories (special wheels, radios, etc.) as well as parts to replace those which have been damaged or worn out.

The auto parts industry is made up of many small- and medium-size producers and relatively few large ones. In the case of many important components a few firms dominate and this situation will become more so as vehicle makers continue to move toward buying complete "systems". The larger firms are becoming increasingly multinational and are now given more responsibility for the design of the products they build. Few really big companies are devoted entirely to auto parts, but spread themselves across many product areas.

Smaller firms in the industry have a difficult time keeping up with the pace in design, equipment investment and expansion into foreign markets. An increasing number of them have become "second tier" suppliers which means that they make specialized components that they sell to the OE suppliers who have direct contact with auto manufacturers. For example, Ford buys seating from firms such as Douglas & Lomason (D & L) who can ship completed seats to a Ford plant in the exact order required to match the flow of vehicles down the assembly line. A manufacturer of seat springs for D & L is called a "second-tier" supplier to Ford.

For many small manufacturers both U.S.-based and foreign, the second-tier or third-tier relationship is very desirable. Less is expected of them in design, technology and capital, though in exchange, they have little direct contact with the auto companies and therefore less influence on their own destinies.

Another favored market for small suppliers is replacement parts. They can concentrate on manufacturing a few types of parts and get lower costs since they do not have to provide as much design, product testing and just-in-time shipments. Also, these smaller manufacturers including hundreds of small foreign manufacturers, may be able to avoid competing with the major manufacturers by supplying them with parts to fill out the product line. Distribution is the key in replacement parts since the final selling price of a product includes distribution mark up which is generally greater than manufacturing costs. A small manufacturer often must enter the complex distribution system by supplying parts that will be sold through a manufacturer such as TRW or a distributor such as Genuine Parts.

Distribution of aftermarket parts is a complex subject covered later in this report. U.S. companies dominate the distribution of aftermarket parts and accessories though many of the products sold are imported.

3-4-2. Demand and Supply

(1) U.S. Production

The industry that manufactures automobiles (Motor Vehicles and Car Bodies - SIC 3711) is made up of a few very large firms, namely the Big-3 of General Motors, Ford and Chrysler, and the foreign transplants, Honda, Mazda, Nissan, Toyota and Volkswagen. It is larger than the parts industry in terms of total value of shipments, $120 billion in 1987, but employs 270,000 people, which is considerably below the parts industry.

The truck and bus industries are much smaller in size and are not included in the industries mentioned above. Two items to be noted are:

1) Truck components are frequently indistinguishable from auto components and are often reported with the auto parts industry.
2) Light trucks are often purchased by individuals and used in the same manner as automobiles though their sales and production are reported with trucks and not automobiles. For example, in 1986 about 7.9 million cars were assembled

in the U.S. along with about 3.5 million trucks, of which, 3.1 million were light trucks. Vans, such as the popular Ford Aerostar, are classed as trucks.

Another point of note is that vehicles and parts flow very freely across the border of the U.S. and Canada. Because of this free flow the two countries are often considered together as the North America market. Ford and GM make many cars in Canada for the joint market. Chrysler has its Eagle operations there as well as all van manufacturing. To clarify the relationship, note these figures for 1987 production in units.

Table V.3-40 Production of Cars & Trucks in the U.S. & Canada, 1987

U.S. cars	7,022,521
Canada cars	802,581
U.S. trucks	3,807,934
Canada trucks	817,320
Total U.S./Canada cars and trucks	12,450,356

To a lesser degree, the same thing is going on between the U.S. and Mexico. Ford, Chrysler, GM, Nissan and VW make cars in Mexico, some of which are sold in the U.S.

Table V.3-41 Shipments of Auto Parts in the U.S., 1987

SIC#		Shipments 1987 ($ Billions)
3465	Automotive Stamping	$17.3
3592	Pistons, rings, etc.	2.6
3647	Vehicle lighting equipment	1.0
3691	Storage batteries	2.5
3694	Engine electrical equipment	5.5
3714	Parts and accessories	65.6
	TOTAL	$94.5

The above categories are generally used to define the auto parts industry. Tires are not included, nor are many automotive products such as polishes, lubricants and fuels.

Most of the products included in the six SIC groups above are made predominantly of metal, but there is no sure way to know what proportion may be other materials. Since this report is to focus on metal parts, it is to be noted that some changes are taking place in both the quantity and character of automotive materials.

(2) Materials Trends

It has been estimated that total average car weight will decline by 10% (from 3,028 to 2,725 lbs/car) between 1985 and 1995. The reduction will result from increased usage of advanced materials which by 1995 will represent about 35% of the total weight of a typical car. As part of this change, heavier materials will be displaced by materials of higher value such as high-strength low-alloy steel, magnesium, powdered metals, advanced composites, engineering plastics and ceramics.

One carmaker's view on the trend in material usage by major categories shows the composition of cars changing as follows:

Table V•3-42 Composition of Cars-Percentage by Weight

Material	1980	1985	1990	%Change 1980 to 1990
Total iron & steel:	71.9	70.0	66.0	-5.9
Carbon steel	54.5	47.0	41.0	-13.5
High strength steel	6.7	14.0	17.0	+10.3
Cast iron	10.7	9.0	8.0	-2.7
Aluminum	3.2	4.5	7.0	+3.8
Plastics	5.5	7.0	10.0	+4.5
Other material	19.4	18.5	17.0	-2.4
TOTAL	100.0	100.0	100.0	-1.2 Net

Source: Materials Engineering, Sept. 1986
Metal Progress, May 1986
Private communication

(3) Demand for Replacement Parts

Replacement parts are probably about $40 billion of the $94.5 billion referred to above as the total parts market. Definitions of the aftermarket differ so widely as to products included and price points that it is difficult to rationalize all the figures available.

Using another set of assumptions as to what constitutes the replacement parts market, the results show:

Table V•3-43 Replacement Market Size, 1987

	1987 Est.
Hard parts (engine, suspension, exhaust, etc.)	$30.9
Tires, batteries, chemicals	10.3
Body parts for crash repair	5.7
TOTAL	$46.9

Source: Study Team estimate

Within the $30.9 billion market of hard parts, the distribution by type of vehicle on which the replacements are installed is estimated to be:

Vehicle	Billion	Percent
U.S. domestic	$25.6	83
Japanese	4.3	14
Other	1.0	3
TOTAL	$30.9	100%

A big change is underway in these proportions because of the growth in Japanese vehicles. The Japanese segment is expected to grow about 9% per year and will double its market by the early 1990s.

In contrast, the short range market for domestic passenger car replacement parts will show a decline. This is tied to the number of domestic cars in operation which will experience a low growth rate and a significant decline in the replacement rate for key parts categories. Total light truck demand, however, will be up and overall demand for domestic replacement parts will be up slightly for 1987, leveling in 1990.

(4) Imported Parts Market Share

Overall, we calculate imported parts at a market share of 18.3% in 1987, up from 7.6% in 1972. There is more on this subject in Section III which deals with foreign trade.

"Domestic content" of vehicles includes assembly labor and probably transportation costs and other items. Therefore, it is not the same as market share, and in fact it demonstrates that share figures in such a large market as this are not rigidly defined.

More important, 1988 is a critical year in U.S. parts imports. Import data in this report only goes through the end of 1987 and there have been changes in trend since then. Some of the factors are:

1) Newly opened assembly plants in the U.S. (Mazda, Diamond Star) which will initially import a large proportion of their components.
2) Decline in value of the U.S. dollar, shutting down many foreign sources that were growing.
3) Strenuous efforts of transplants such as Honda to increase their U.S. parts sources.
4) Further integration of Big 3 plants in Mexico into the U.S. operations.

It will be important for any foreign manufacturer to keep up with changes in the American market caused by recent decline in the dollar's value. Opportunities of the mid-1980s may no longer be there.

(5) Imported/Domestic Competition

Competition among imported and domestic auto parts greatly favored the imports in the early 1980s. With the U.S. dollar's decline and great improvements in productivity induced by international competition, the nature of the competition is changing.

1) Low Wages

   Wage levels for blue-collar workers are becoming increasingly irrelevant in world competition. Productivity still matters -- indeed it matters increasingly more. Quality, design, service, innovation, marketing, all are becoming more important. But blue-collar wages as a direct cost are a minor factor.

2) Overcapacity Holds Prices Down

Any industry with overcapacity is likely to have difficult price competition, unused facilities and perhaps too little profitability to attract investment in new equipment.

There is overcapacity in the U.S. auto parts industry but it is difficult to measure. While current total U.S. industrial capacity utilization is around 80%, the auto-parts industry utilization is said to be only a little lower at 77%. If there was obvious overcapacity, a larger spread would be expected.

The biggest shock to the parts industry has been the globalization of competition on price and quality. Once the U.S. auto industry opened its mind to the possibility of foreign sources, everyone had to live by the same standards worldwide. But that trend is now several years old and with help from a lower-valued dollar, the strong and smart companies are surviving.

(6) U.S. Consumption Patterns

The Big-3 U.S. automakers have increased their outside purchases of parts, components, modules, systems and service over the past few years to the benefit of independent suppliers. Several forces are driving this trend, not the least of which is wage rates in auto plants versus wages in supplier companies.

1) The Role of Labor Rates

The Big-3 are tied to master labor contracts, and are less able to control wage increases than outside suppliers, who are often not organized. From interviews with the United Auto Workers (UAW), it is apparent the unions believe this is the main reason for increased outsourcing. The percentage difference between wage scales has been increasing substantially.

Table V.3-44 Comparison of Hourly Wage Rates
Auto Plants vs. Component Plants

1971 – 1975	auto plant wage rates	13% higher
1976 – 1980	auto plant wage rates	16% higher
1981 – 1985	auto plant wage rates	20% higher

The Big-3 have also been attempting to reduce the number of their suppliers, in part by outsourcing a complex component or whole system rather than just a part. The success of this program has increased the dollar volume of outsourcing, and has also improved quality, as suppliers are required to measure up to strict quality requirements. Ford, GM and Chrysler have all instituted programs which require quality improvement. One of the Big-3 expressed the opinion that their suppliers' quality had improved measurably, and had moved about 25% of the way toward Japanese quality. Some auto parts suppliers also commented that their quality, while improved, does not yet meet Big-3 goals.

2) Three Tiers of Suppliers

As outsourcing increases, a three tier grouping of suppliers is emerging. The first tier suppliers are usually large companies offering design, engineering and production capabilities for systems or modules. Some companies in this group are growing more than 20% annually, and are actively pursuing business from other than the Big-3 companies, both offshore and in the U.S. Many of them provide a global source for an auto model made in more than one location. Interestingly, the first tier vendors see the Big-3 as both customers and competitors, since the Big-3 have in-house capability in many components. There are only a few instances of the Big-3 taking an equity position in suppliers, as compared to Japan where many automobile makers own an interest in their suppliers.

The second tier are suppliers of parts and/or service products to the first tier. They usually do not supply systems, but will often have proprietary products. This tier of suppliers is growing; and some of them have a high degree of sophistication as compared to the second tier players in Japan who tend to be relatively unsophisticated. The third tier suppliers provide parts to the second tier and so on.

Will this trend to outsourcing continue? It seems inevitable although union opposition may slow the trend. The first tier suppliers are realizing that outsourcing gives them new market opportunities, serving Japanese auto companies locating in the U.S., and export markets, as well. The Big-3 like the flexibility outsourcing gives them, as well as the lower labor costs, potential for improved quality, less assembly line downtime, and better productivity. It is difficult to imagine a program that provides better quality at lower cost.

(7) Quality

Quality remains a major battleground in competition for auto parts business, particularly on the original equipment side. It is not quite as much of an issue in replacement parts.

Starting in about 1980, there has been a growing perception that Japan has been able to produce cars of consistently higher quality than has the United States. This perception began with cars imported from Japan, but the reputation for quality has been extended to cars made in the U.S. under Japanese control and incorporating a limited number of U.S.-made components.

Because a reputation for product quality is such a powerful selling tool, the whole industry, both vehicles and components, has put extraordinary energy into improving design and manufacturing quality. One of the leaders in this movement is the American Supplier Institute, Inc. (ASI), a non-profit, tax exempt organization dedicated to quality management and the competitive improvement of American industry. ASI was created in 1981 by Ford Body and Assembly to serve as a resource for supplier quality assurance, with original training materials prepared by Dr. W. Edwards Deming and others. ASI has expanded into the Taguchi Methods, Quality Function Deployment (QFD) Flexible Manufacturing Systems (FMS), and Company-Wide Quality Control (CWQC).

ASI's board and steering committee include representatives of the Big-3 automotive manufacturers, over 20 of the largest U.S. parts makers and a sprinkling of academic people.

(8) Brand

Brand names are not important in selling original equipment parts to auto makers. Vendors' brands are not used in selling cars and in fact are seldom visible on the vehicle beyond the battery which generally carries the in-house brand, Delco or Ford. The tire maker's name is always visible.

The reputation of the supplier, however, is very important in selling to auto makers particularly when it is supported by capable design facilities, reliability in delivery and low price. Large automotive suppliers such as Dana, Doehler-Jarvis, GE, Wickes, Allied Signal and many others advertise their design and problem-solving skills directly to automotive designers and executives at major auto producers. This advertising by trade publications, radio and other means is very sharply focused on the Detroit area where most auto decision makers live.

In replacement parts, brand names are a very important matter, especially since a significant volume is bought at retail by users. Champion, AC Delco, TRW and Fram are strong, important and very valuable brands that help sell millions of dollars of parts at retail. There are also store brands where the reputation of the retailer and the products are merged. Sears buys its mufflers from outside suppliers but sells and installs them under the Sears Muzzler brand. Speedy Muffler King is an example of vertical integration since their mufflers are made by Walker, a unit of Tenneco Automotive, who also own the Speedy chain of installation shops. In the shops the emphasis is on the Speedy brand, while sales through independent distribution is under the Walker name. Midas (a unit of IC Industries) is a similar case of vertical integration in exhaust system manufacture and installation.

Any parts manufacturer who does not have an established brand name must realize it is very expensive to build brand recognition and is probably not worth the effort anyway. It is much more practical to become a supplier to chains or distributors who have established brand names or store recognition.

3-4-3. U.S. Foreign Trade in Auto Parts

(1) General Description

Table V.3-46 shows all the basic production and trade data on the U.S. auto parts industry for a period of 17 years. Data is from the U.S. Department of Commerce.

Over the 16 years of 1972 – 1987, the parts industry has grown only from inflation since production of U.S.-made cars and trucks is down a little over the period:

1972	11,299,236
1987	10,975,334

Replacement parts demand is up, of course, because there are more vehicles on the road. About 180 million now vs. 120 million in 1972.

In the U.S. market, the biggest change has been in the rise of U.S. parts imports, both in value and as a percentage of the total market.

Change, 1972 – 1987

Total U.S. Sales Parts	+ 232%
U.S. Imports	+ 786%
U.S. Exports	+ 293%

A comparison over the same period of years shows:

	1972	1987
Exports as a percent of U.S. $ production	10.2%	12.1%
Imports as a percent of U.S. $ market	7.6%	18.3%

In terms of trade balance, the U.S. has moved from a net exporter to a net importer over the period as seen in Table V.3-46 and in this summary for the selected years:

(US$ Billion)	1972	1979	1984	1988 (Proj.)
U.S. Exports	$2.9	$7.1	$11.1	$12.2
U.S. Imports	2.1	5.9	12.1	20.4
Net U.S. Exports (Imports)	$.8	$1.2	($1.0)	($8.2)*

*Note that the U.S. International Trade Commission computed the parts trade deficit a little differently and got $1.2 billion in 1982 and $10 billion in 1986.

In the early years of the above period, imports and exports with Canada dominated all U.S. foreign trade in auto parts. Because U.S.-Canada trade in auto parts has been carried out under special trade agreements for many years, and because trade beyond North America was limited, the U.S. parts industry was essentially operating in a vacuum so far as competing with the rest of the world was concerned. The special bilateral trade with Canada was always largely in balance. What upset this comfortable situation was the sharp rise in imports from Japan and to a lesser extent West Germany, Mexico, France, Korea and Brazil, all of which was without any substantial rise in U.S. exports to those countries.

After 1984 (actually retroactive to 1983), the U.S. Census Bureau changed to a different set of product classifications and a new set of reports. Their reason for changing was to improve the reliability of data they published. (cf. Tables V.3-47, 48)

	Foreign Trade Reports	
	Old Series	New Series
Imports	FT 210	FT 135
Exports	FT 610	FT 410

Looking first at U.S. exports for the five years through 1987, Canada continues to be the dominant factor. Its share, however, has declined from 78% to 64% over the period. Two factors are at work in raising exports to countries other than Canada. One is the increasing importance of Mexico which now has substantial production of U.S. bound Big-3 cars. Because Mexico has become a "semi-domestic" U.S. manufacturing area its share of U.S. exports has gone from 8% to 14%. The other is the decline in the value of the U.S. dollar compared with many other currencies.

The big story, of course, is that because of the decline in U.S. currency value relative to many other currencies, U.S. imports have slowed their growth while exports have accelerated.

In summary, the data show that trade with Canada moves in both directions, in high volume as part of agreements that for many years have made the U.S. and Canadian markets virtually one, so far as auto parts are concerned.

With so much Canadian product destined for the U.S., it might follow that Canada would build production facilities here. Not so. Data published by Automotive Parts International on foreign owned auto plants in the U.S. shows there are 18 Canadian-controlled auto parts plants in the U.S. of which 7 were started in the 1970s. In the case of Japan, there are 182 plants with only 15 dating to the 1970s or earlier. There has been no recent rush by Canada to build capacity in the U.S. market, and there does not appear to be any rush to build U.S. plants in Canada, though good data is not available. Probably there are two reasons for the U.S. and Canada not building plants in each other's country.

1) Parts can travel quickly and easily in both directions across the U.S.-Canada border to meet competitive and product requirements wherever they may be.
2) The two currencies move more-or-less together in value so that there has been no sudden change in cost or in the relative return on capital in the two countries.

Neither of these conditions characterizes the movement of trade between Japan and the U.S. In particular, the risk remains that some time in the future there may be another sudden change in relative value of currency such as the one that pushed the dollar down so sharply against the yen, as well as European and some other currencies. The recent currency change has made the U.S. a low-cost producer. Disregarding the

risk that there may be other such changes, many foreign parts producers have invested heavily in alternate source facilities in the U.S., even though at least temporarily it means reducing or idling production at facilities in Japan or Europe. Much of the overcapacity the industry now decries is both of this desire to quickly move capital where it can earn a better return. Currently this strategy favors owning plants in the U.S. rather than in Japan or Europe.

In addition, the newly built foreign plants in the U.S. provide higher productivity and better quality control.

Forecasting U.S. exports and imports of auto parts has become very difficult because of rapidly changing global circumstances. As the amount of parts making capacity in the U.S. grows and as both Japanese and European automakers seek more ways to use U.S. parts, there will be a trend toward more U.S. exports and fewer imports. Eventually the U.S. trade will move at least part way in the direction of an even balance, but how far and how fast it will move in that direction is extremely difficult to project.

One continuing unknown is the expanding role of South Korea. The U.S. Department of Commerce (DOC) believes the Korean industry can provide a market for U.S. made parts and accordingly has organized trade shows in Korea and encouraged American parts makers to attend. DOC believes there has been some success in this regard and cites new data showing U.S. auto parts exports to Korea.

1985	–	$23 million
1986	–	45 million
1987 (8 mo.)	–	89 million

While from DOC's standpoint these figures look like proof that their export stimulation program has been a success, the scale of that success is very small considering what moves in the opposite direction. Hyundai sold nearly 100,000 more cars in the U.S. during 1987 compared with 1986 and there were 35,000 of the Korean made Pontiac LeMans sold here in 1987, up from none in 1986. In terms of value, U.S. imports of passenger cars from Korea and some of the other countries in 1986 and 1987 were as follows:

Table V.3-45 Value of U.S. Passenger Car Imports

(Unit: US$ billion)

	South Korea	Mexico	Japan	Brazil
1987	2.061	1.176	21.305	.239
1986	.797	.433	21.061	.001
Increase	1.264	.743	.244	.238

Source: U.S. International Trade Commission, compiled by
Automotive News, March 14, 1988.

Light trucks, which are tabulated separately, showed that U.S. imports from Japan declined from $4.9 billion in 1986 to $4.3 billion in 1987.

Imports of parts from Japan will probably decline as more of the Japanese parts plants in this country get into production. The decline will be delayed by opening of Diamond-Star and Toyota-Georgetown which will increase the demand for imported components. U.S. exports to Japan may increase slowly as more American vendors get at least small orders.

Imports of parts from Korea will probably increase as more U.S. vehicle manufacturers "discover" Korea as a source of components. Further, there may be much more parts manufacturing capacity coming on line if Kia Motors Corporation goes through with plans for expansion of a vehicle plant near Seoul.

In February Kia announced its intentions to expand by 600,000 its present 300,000 unit per year plant which makes Festiva for Ford (a 10% owner of Kia) and cars of its own brands. They would try to sell two-thirds of the new product in the U.S. If this ambitious $1.6 billion investment should go forward it would probably be accompanied by a sharp increase in component manufacturing capacity in Korea, adding to the pressure to export to the U.S.

Auto parts imports from Europe are expected to decline as VW closes its U.S. assembly facility. At the same time, U.S. exports to Europe may increase. BMW recently held a meeting in Florida to which they invited dozens of potential U.S. suppliers of OE components. They want to increase U.S. content in their vehicles for reasons of both cost and trade relations. Sales of the expensive European brands in the U.S. were down last year so brands such as Audi, Mercedes, Peugeot, Porsche, Saab, VW and Volvo may follow the BMW idea in order to hold down prices while showing themselves willing to increase U.S. content.

Mexico will almost certainly increase its northward shipments of components. GM alone is shipping 1,500 engines a day from Ramos Arizpe with 56% domestic content.

The detailed items in annotated form are listed in accompanying Exhibit III-2, along with the current rates of duty. Also included in Exhibit III-2 is an example of the proposed changes in the tariff schedule which the Customs Service expects will be approved in 1989.

B. Customs Regulations

The tariff duties are categorized into three rates as follows:

Rate 1 – Most favored nations (largest category and includes some communist countries; e.g., Poland, Yugoslavia)
Rate 2 – Certain Communist nations
Rate 3 – Generalized System of Preferred (GSP) countries.

The current duties for motor vehicles and parts under Rate 1 are either "free", 2% or 3.1%. The duty under Rate 2 is either 10%, 25% or 35%. In the "special" rates category, G.S.P. countires are given duty-free status for certain tariffs. Many Pacific Basin countries are on the free list. Others pay 3.1%, but all rates are subject to change.

3-4-4 Distribution in the Automotive Aftermarket

(1) Channels, Structure and Functions

The U.S. aftermarket for both domestic and Japanese vehicles is divided into two primary distribution segments: 1) the original equipment (OE) parts distribution system and 2) the independent distribution system. In the former, OE parts producers distribute replacement components through the vehicle manufacturer's service and parts divisions to franchised dealers for in-house service use or for sale to retail and wholesale customers. In the latter, both OE suppliers and independent manufacturers distribute parts through various independent channels (e.g., wholesale distributors and jobbers) to repair services or retail outlets.

In the early days of the domestic automotive industry, new vehicle dealers handled most repair work. Consequently, the vehicle manufacturer's own dealer/distribution network was the dominant source of parts and service for U.S. cars. However, that domination has decreased over the years as the independent aftermarket grew.

The independent aftermarket has grown for several reasons. First, more cars on the road and increased demand made it possible for independent producers to manufacture "will fit" parts* in economic quantities. Second, vehicle manufacturers created stiff competition among OE suppliers which, in turn, held down prices for parts used in new vehicles. This encouraged parts manufactures to improve their profits by serving the aftermarket. Third, independent auto repair shops grew so numerous that they became more convenient and generally lower priced than the repair facilities of new car dealers. Fourth, do-it-yourself (DIY) auto repairs increased significantly as more owners bought parts and did their own repairs.

Similarly, when imported vehicles began selling in the United States the import car dealers supplied virtually all of the parts used in service and repair of their vehicles because volume was too small to interest the independent parts manufacturers, distributors or repair shops. As Japanese vehicles became the dominant import, so also the Japanese new car dealer became the dominant source of replacement parts. However, that domination is fading as the Japanese car population grows. The reasons for this decline are the same as those in the U.S. aftermarket for domestic vehicles.

New car dealers generally conduct repair business during the warranty period. After that, 60 to 70% of repair work is done outside the dealership, with foreign car dealers still holding onto more business than domestic car dealers.

*"Will fit" parts are replacement parts produced by manufacturers other than the original equipment supplier. These parts are not "genuine" but will fit and are typically made to a product standard that is acceptable.

(2) Overall Structure

Following the evolutionary changes just described, the current major aftermarket channels for all cars and light trucks are:

	Approximate Share
1) Warehouse distributors (WDs) including controlled distribution groups and their jobbers	55%
2) Original equipment vehicle manufacturers and their dealers	20%
3) Direct outlets (e.g., mass merchandisers, franchised repair specialists and automotive retail chain stores).	25%

The significant difference between distribution of parts for imported cars and for domestics is the role of the car dealers. This distributor dealer network of Toyota, Honda, Nissan and the like enjoys a very high proportion of the parts going into their own cars. It is estimated at a 55% overall market share. It is high because dealers for Toyota, etc. control the distribution of parts. If one wants so-called genuine parts made by Toyota, Honda, etc., one must go to their dealers. They are not available from retailers. Parts from independent foreign manufacturers enter this country through import distributors or expeditors and are sold to various installers and at retail. That is about 30% of this market segment. Domestic manufacturers make up the other 15%.

(3) Warehouse Distributors (WD)

The primary channel of aftermarket parts distribution for U.S. manufacturers has historically been the conventional warehouse distributor (WD). The WD provides complete lines of parts to jobbers for resale to independent garages and other professional installers. U.S. manufacturers rely on price, brand name and completeness of line to compete in this channel. They make use of the well-established jobber distribution network that receives products from WDs and sells to the thousands of installers and service shops nationwide.

(4) Mass Merchandisers

The other important distribution channel for U.S. manufacturers is the mass merchandiser. Mass Merchandisers include stores like K-Mart and Sears & Roebuck that both sell and install, as well as regional chain stores that only sell parts. In contrast to WDs which distribute complete parts lines, the mass merchandisers deal primarily in fast-moving parts such as filters, exhaust systems, shocks, spark plugs and ignition components. Brand awareness is important to mass merchandisers because they depend on the drawing power of national advertising by the manufacturers. Thus names such as Fram, Autolite, Champion and A-D Delco are commonly found in these stores. Because of the strength of these names it was easy to adapt these products to the rising number of imported cars. Thus by the early 1980s Sears could sell plugs, filters, mufflers, etc., for a Toyota as easily as for a Chevy.

U.S. parts manufacturers sell their products to the mass merchandisers either directly or through an intermediate agent known as a "feeder WD." Mass merchandisers buy many parts and accessories through importers from countries in the Pacific Basin.

The parts sourcing decisions generally revolve around customer acceptance of the brand, gross profit margin, and return on investment as reflected in the turnover rate for that part and supplier. Sourcing decisions for low-cost parts and accessories (e.g., mirrors, turn signal flasher lights and ignition components) are based on similar criteria, with less emphasis on brand name. Consequently, small off-shore producers selling through U.S. importers dominate this low end of the market. They depend heavily on "do-it-yourselfers" (DIY) who change their own spark plugs, filters, spark plug wire sets, wiper blades, etc.

In recent years, DIY work on cars and light trucks has been an important part of the aftermarket. This usage has been primarily limited, however, to the very fast moving and highly competitive parts categories (30% of shock absorber sales and 60% of oil sales). Research indicates a decline of DIY hard parts replacement is taking place on newer vehicles as vehicle sophistication increases. For example, MacPherson struts, which are difficult to change, are found on most new cars rather than shocks, which a DIY can change quite easily. For these and other reasons, many former DIY mechanics are having work done professionally, often by the increasingly cost effective service specialists such as the quick lube center.

The mass merchants are gaining in other ways. Some, like Sears, already have a big installation business and are pushing to increase it. Others like Pep Boys are increasing the number of stores and emphasizing their installation services. Mas merchants created a niche for themselves by eliminating steps, specifically the WD and jobber in the distribution chain. They passed savings on to the customer but stuck to selected high volume parts.

(5) Importer/Distributor

As demand grew for replacement parts to service the increasing number of imported cars, the business went mostly through new car dealers. Then an independent group of importer/distributors (World Parts is one) grew up to enable independent repair facilities to obtain parts for foreign vehicles.

Importer/distributors usually buy replacement parts from the country of origin of the vehicle or of the original part. The specific source within that country may be one of the following:

1) The OE manufacturer is a possible source, but usually not a major one since most tooling is owned by the vehicle manufacturer, who can restrict the sale of parts made with that tooling.

2) Suppliers to vehicle manufacturers with excess capacity and the ability to modify part designs for one manufacturer so that they "will fit" those of other manufacturers. Examples include bearings and piston rings.
3) Small independent parts producers who are able to price competitively by using cheap labor and sub-standard raw materials and quality control procedures.

Many importers that specialize in Japanese car and light truck parts have found new sources of supply outside Japan. These countries include Taiwan, Korea and other Asian countries where labor and raw material costs are below those in Japan.

Importer/distributors have lost some of their market share to the conventional WD and jobber channel. Reasons for this shift closely parallel the move toward independent distribution for domestic parts that was described earlier. As the number of foreign vehicles increases and ages, more gas stations and independent garages will offer full service on Japanese cars and light trucks. This trend has been strengthened by the growing ability of U.S. producers to provide parts of consistent quality on demand through conventional aftermarket channels. This is in direct contrast to the situation in the late 1970s when most major U.S. parts manufacturers were not producing or manufacturing replacement parts for Japanese cars and light truck.

(6) Other Sources of Parts

Honda, Toyota, Mazda and Nissan often say that they will comb the earth looking for the best available source for every part needed to build the best cars. Their dealers in theory can search widely for replacement parts, but in fact they seldom do. Discussions with major Japanese brand car dealers have shown that they generally buy parts through the parent company distribution organization for these basic reasons:

Quality – The quality (e.g., fit and service life) of many of the genuine parts is perceived as being superior to those available through independent channels. On many safety-related parts, (e.g., brake and steering/suspension components) the fear of exposure to liability suits is higher for parts which are not perceived to be of OE quality or which are produced by other than a first-line supplier.

Availability – In general, the availability of genuine parts to the dealer has been good, and some parts, e.g., engine castings, are not readily available through independent channels.

Convenience – By using the OE parts distribution system they get the advantages of an inventory control plan, stock order allowances, return allowances and some

protection from potential product liability suits. On safety-related parts like brake pads the dealer is in a much stronger position if he has used "genuine" replacement parts.

Loyalty – So many dealers have become very wealthy by their Japanese car franchise that they are eager to maintain a high quality relationship in every possible way.

(7) New Pricing Techniques

As with most subjects, certainly in the automotive industry, there are more complications than are seen at first. In the case of aftermarket parts pricing, competition at all levels – manufacturing, distributing and retailing – has created intense price pressure and changes in the whole way of doing business.

One new pricing response to these pressures is that importers and wholesalers can sell directly to fleets or installers by telephone with computer-based information systems. This cuts out the jobber level and thereby adds to price competition.

Another plan creates a "key installer" list supported by manufacturers who offer an additional 3 to 7% rebate on sales through participating jobbers to make them more competitive at these large "key" accounts.

In another plan manufacturers offer distributors additional discounts if multiple lines are carried. For example, a distributor who handles TRW's engine parts alone receives a certain discount but could obtain a larger discount if he added TRW suspension parts or some other TRW lines. Because inventory, sales and reorder data are now largely computerized it is easy to keep track of these complex plans; easy, though sometimes confusing enough so that the distributor may not know what he really pays for every item. For example, if a WD drops the Borg-Warner clutch line of Echlin he may find that his real costs of other Echlin product lines go up because the most favorable discount is based on handling several Echlin product lines and on his purchase volumes.

3-4-5. Sales and Distribution Strategies

In the U.S. automotive replacement parts market the most successful strategies are based on control of distribution rather than excellence of manufacture. Not that manufacturing is ignored, but rather the major players like TRW, Arvin, Echlin, Tenneco, AC Delco and Fram know that they can manufacture products at the quality level and cost required to remain competitive. Most of these large players in

replacement parts are also successful in the OE parts business where high quality and low cost are the only way to survive.

It would be very difficult for a new manufacturer or marketer to break into the market at a high level. Even the Japanese with all their success in OE parts have not made a strong move into replacement parts, other than those supplied through Japanese car dealers. Nippondenso for example is a highly successful supplier of OE parts to Toyota (which is of course a part owner of ND) and many other automakers. Their efforts in the aftermarket, however, have been limited and they have done little to try to build the ND trademark up to the level of U.S. marks such as Fram, AC, Midas or Walker.

Some day a foreign parts manufacturer may try to make a quantum leap into the aftermarket here by acquiring a manufacturer with a well-known trademark or distributing organization. For most manufacturers trying to enter the U.S. automotive aftermarket, the approach is quite different. Here are strategy steps to consider.

Step 1 – Analyze the characteristics of replacement parts to see which might be attractive. For example, Table V.3-49 is graded originally by WRA to determine which ones were most attractive to U.S. producers. The ideas are just as valid for foreign firms if the grades are turned the other way. A category of "low-attractiveness" to U.S. suppliers is automatically a "high attractiveness" to foreign suppliers. Note that this approach is conceptual and must be interpreted by each company in terms of its own objectives of profitability or volume. There is no automatic success from following these ratings.

Step 2 – Review the matrix in Table V.3-50 which quantifies the ratings mentioned in the previous table and adds further factors for consideration again. WRA's original objective was to find product categories of interest to U.S. manufacturers so a low point score suggests products of interest to offshore sources. As before, any conclusions must be drawn in keeping with each user's own particular circumstances and objectives.

Step 3 – Review the data on imports and exports to see generally what type of parts are moving from where to where. It is usually better to try to go with existing flows of trade rather than starting in a direction that has not previously been successful. Note that 1988 is a critical year of transition in U.S. trade. Many products formally imported into the U.S. are once more being manufactured here while exports are increasing. Therefore it is necessary to keep up with the latest data rather than simply projecting trends from past years.

Step 4 – Obtain suggestions from local chambers of commerce, trade associations and the off-shore buying offices of various automakers. Data on some American automotive trade associations is in Table V.3-51.

Step 5 – Determine the prime contractor for some automotive systems that appear to have parts that would be desirable to make. For example, find out who makes transmissions for an auto manufacturer and determine what parts the company could make. Most smaller manufacturers will be "second tier" suppliers who work only individually with the automakers themselves. There is a legend about an eager supplier who wanted to get as a customer the Honda plant in Ohio. He bought a Honda and disassembled it. Among the target parts list was the wheel jack. He got the business either because of his brash approach or his price and quality.

These steps are a few that should be helpful getting a start. Any manufacturer trying to improve his position as an auto parts supplier will spend a good deal of time developing a good strategy.

Table V.3-46

MOTOR VEHICLE PARTS AND AUTOMOTIVE STAMPINGS
HISTORICAL PERFORMANCE - TRENDS AND FORECASTS
1972 - 1988

(In billions of U.S. dollars)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	EST. 1987	PROJ. 1988
1. Total U.S. Shipments	28.5	33.3	33.4	33.6	44.2	54.0	61.5	61.6	51.7	57.7	55.4	67.6	82.1	86.0	90.8	94.5	97.0
2. 3714 - Parts/Accessories	19.4	22.9	22.7	23.0	30.4	37.8	43.0	42.9	35.6	40.2	38.4	46.8	55.8	58.4	62.5	65.6	67.6
3. 3465 - Automotive Stampings	5.2	6.0	6.2	5.9	8.0	9.6	10.7	10.3	8.3	8.9	9.0	11.5	14.7	15.8	16.6	17.3	17.8
4. Others	3.9	4.4	4.5	4.7	5.8	6.6	7.8	8.4	7.8	8.6	8.0	9.3	11.6	11.8	11.7	11.6	11.6
5. Imports	2.1	2.6	2.7	2.7	3.7	4.5	5.7	5.9	5.1	5.9	6.5	8.6	12.1	13.7	15.4	18.6	20.4
6. Total New Supply	30.6	35.9	36.1	36.3	47.9	58.5	62.2	67.5	56.8	63.6	61.9	76.2	94.2	99.7	106.2	113.1	117.4
7. Imports as % of New Supply	6.9	7.2	7.5	7.4	7.7	7.7	9.2	8.7	9.0	9.3	10.5	11.3	12.8	13.7	14.5	16.4	17.4
8. Exports	2.9	3.4	4.1	4.6	5.5	6.0	6.9	7.1	7.3	8.8	8.6	8.9	11.1	11.7	10.7	11.4	12.2
9. Percent Exports	10.2	10.2	12.3	13.7	12.4	11.1	11.2	11.5	14.1	15.3	15.5	13.2	13.5	13.6	11.8	12.1	12.6
10. Total U.S. Market	27.7	32.5	32.0	31.7	42.4	52.5	55.3	60.4	49.5	54.8	53.3	67.3	83.1	88.0	95.5	101.7	105.2
11. Imports as % of U.S. Market	7.6	8.0	8.4	8.5	8.7	8.6	10.3	9.8	10.3	10.8	12.2	12.8	14.6	15.6	16.1	18.3	19.4
12. Price Index	37.4	38.6	43.8	52.8	56.0	60.7	64.9	71.2	78.8	93.2	100.0	100.9	102.3	103.6	104.0	104.6	105.1

Source: 1988 U.S. Industriel Outlook - U.S. Dept. of Commerce

Footnotes:
Line 4 includes these SIC's: 3592 - Pistons, rings, etc.; 3647 - Vehicle lighting equipment; 3691 - storage batteries; 3694 - Engine Electrical Equipment.
Lines 5 and 8 - Since pricing basis may be different for imports, these values should be examined for trends along each line rather than strictly compared with U.S. shipments.
Line 12 - Price Index for U.S. shipments only. Not imports or exports. 1982 = 100

Table V.3-47 MOTOR VEHICLE PARTS AND ACCESSORIES
U.S. EXPORTS
1983

(In millions of U.S. dollars)

SUB-CLASSIFICATION/COUNTRY	STAMPINGS 002	BUMPERS 006	HUB CAPS WHEELCOVERS 014	RADIATORS 018	MUFFLERS TAILPIPES 022	BRAKES 026	TRANSMIS. PASS CARS 034	SHOCK ABSORBERS 042	OTHER PARTS 046	TOTAL NAMED CLASSIF.	PERCENT
Canada	1046.2	54.2	14.4	41.4	40.6	204.9	400.6	47.2	2493.5	4343.0	78.8
Mexico	43.3	1.7	0.1	0.4	0.2	10.9	11.1	2.3	368.4	438.4	7.9
Brazil	-	-	-	-	0.2	1.3	-	0.1	1.6	3.2	-
Venezula	2.5	0.3	0.1	-	-	14.0	0.2	1.2	208.7	227.0	4.1
Colombia	0.1	0.5	-	0.2	-	8.8	0.2	0.8	21.3	31.9	0.6
United Kingdom	0.2	0.1	0.1	0.2	-	9.1	22.3	0.2	62.3	94.5	1.7
West Germany	0.1	-	-	-	0.1	6.1	21.8	1.3	83.3	112.7	2.0
France	-	-	-	0.2	0.5	9.1	3.2	0.3	34.5	47.9	0.9
Italy	0.1	-	-	-	-	0.2	-	0.2	5.6	6.1	0.1
Sweden	0.1	-	-	-	0.1	4.1	0.4	-	47.3	52.0	0.9
Japan	0.1	-	-	0.3	-	4.5	11.3	0.8	33.6	50.6	0.9
South Korea	-	0.4	0.2	-	-	0.8	-	-	10.4	11.8	0.2
China T/Taiwan	-	-	-	0.2	-	0.9	-	-	5.9	7.0	0.1
Australia	0.2	0.1	-	0.3	0.1	7.6	1.0	1.2	62.2	72.7	1.3
China M	-	-	-	-	-	0.3	-	-	7.5	7.8	0.1
Singapore	-	-	-	-	-	1.5	-	0.7	-	2.2	-
Hong Kong	-	-	-	-	-	-	-	-	0.5	0.5	-
Thailand	-	-	-	-	-	0.2	-	0.3	-	0.5	-
Malaysia	-	-	-	-	-	0.3	-	0.2	-	0.5	-
Other	4.9	5.6	0.7	3.1	5.3	84.9	17.3	18.8	422.6	563.2	10.2
TOTAL	1097.8	62.9	15.6	45.3	47.1	369.5	498.4	75.6	3869.3	5510.3	100.0

Source: U.S. Exports, Schedule E Commodity by Country, FT-410, Bureau of the Census, U.S. Dept. of Commerce, February 1984, Card 5

Table V.3-47(Cont.) MOTOR VEHICLE PARTS AND ACCESSORIES
U.S. EXPORTS
1984

(In millions of U.S. dollars)

SUB-CLASSIFICATION/COUNTRY	STAMPINGS 002	BUMPERS 006	HUB CAPS WHEELCOVERS 014	RADIATORS 018	MUFFLERS TAILPIPES 022	BRAKES 026	TRANSMIS. PASS CARS 034	SHOCK ABSORBERS 042	OTHER PARTS 046	TOTAL NAMED CLASSIF.	PERCENT
Canada	1342.8	51.8	17.5	59.5	61.7	267.4	506.8	42.7	3283.7	5633.9	72.1
Mexico	68.2	3.9	0.1	1.6	1.1	18.1	16.0	3.1	664.2	776.3	9.9
Brazil	-	-	-	0.1	-	2.3	1.0	-	18.1	21.5	0.2
Venezula	1.2	0.5	0.2	-	0.2	20.3	2.3	2.3	260.2	287.2	3.6
Colombia	1.7	0.3	-	-	-	8.7	0.2	0.4	19.4	30.7	0.3
United Kingdom	0.2	-	1.0	0.3	0.1	9.1	19.9	0.1	72.4	103.1	1.3
West Germany	0.1	-	-	0.1	-	7.1	32.6	0.8	81.0	121.7	1.5
France	0.1	-	-	0.1	-	8.5	0.2	0.2	35.4	44.5	0.5
Italy	-	-	-	-	-	0.9	0.2	0.1	6.9	8.1	-
Sweden	-	0.1	-	-	-	5.0	0.1	0.1	44.9	50.2	0.6
Japan	0.2	-	-	0.1	0.2	6.0	15.5	1.1	68.0	91.1	1.1
South Korea	-	-	-	0.3	0.1	0.7	-	-	15.8	16.9	0.2
China I/Taiwan	-	-	-	-	-	1.1	-	0.1	4.8	6.0	-
Australia	0.1	-	-	-	0.1	12.8	2.9	2.1	81.2	99.2	1.2
China M	-	-	-	-	-	0.2	-	-	9.1	9.3	0.1
Singapore	-	-	-	0.1	-	0.5	-	1.0	9.3	10.9	0.1
Hong Kong	-	-	-	-	-	0.1	-	-	0.5	0.6	-
Thailand	-	-	-	-	-	0.2	-	0.2	2.0	2.4	-
Malaysia	-	-	-	-	-	-	-	0.2	2.0	2.2	-
Other	1.9	2.4	0.4	1.4	4.2	64.9	6.8	16.6	395.9	494.5	6.3
TOTAL	1416.5	59.0	19.2	63.6	67.7	433.9	604.5	71.1	5074.8	7810.3	100.0

Source: U.S. Exports, Schedule E Commodity by Country, FT-410, Bureau of the Census, U.S. Dept. of Commerce, March 1985, Card 5

Table V.3-47(Cont.) MOTOR VEHICLE PARTS AND ACCESSORIES
U.S. EXPORTS
1985

(In millions of U.S. dollars)

SUB-CLASSIFICATION/COUNTRY	STAMPINGS 002	BUMPERS 006	HUB CAPS WHEELCOVERS 014	RADIATORS 018	MUFFLERS TAILPIPES 022	BRAKES 026	TRANSMIS. PASS CARS 034	SHOCK ABSORBERS 042	OTHER PARTS 046	TOTAL NAMED CLASSIF.	PERCENT
Canada	1281.0	37.5	16.9	68.2	41.0	226.4	742.6	29.2	3123.3	5566.1	68.9
Mexico	83.0	4.9	-	1.8	1.0	27.2	22.2	3.9	975.0	1119.0	13.9
Brazil	-	-	-	-	-	1.4	3.1	-	46.9	51.4	0.6
Venezula	1.4	1.1	0.1	-	-	53.2	1.3	0.8	17.2	75.1	0.9
Colombia	0.1	0.4	-	-	-	4.7	0.3	-	20.4	25.9	0.3
United Kingdom	0.2	0.1	0.1	0.1	0.2	6.4	14.7	-	80.6	102.4	1.3
West Germany	0.2	-	-	0.5	0.1	10.8	31.3	0.8	127.0	170.7	2.1
France	-	-	-	-	-	2.8	0.1	-	33.5	36.4	0.5
Italy	-	-	-	-	-	1.0	0.5	0.2	7.1	8.8	0.1
Sweden	-	-	-	0.2	-	1.3	0.1	-	47.7	49.3	0.6
Japan	0.1	-	-	-	0.8	4.8	9.5	0.6	97.2	113.0	1.4
South Korea	-	-	-	-	0.2	0.6	-	-	11.4	12.2	0.2
China T/Taiwan	-	-	-	-	-	0.3	-	-	7.7	8.0	0.1
Australia	0.1	0.1	-	0.2	0.2	8.4	4.9	1.2	101.9	117.0	1.4
China M	-	-	-	-	-	0.2	-	-	8.7	8.9	0.1
Singapore	-	-	-	-	-	0.5	0.1	0.6	7.1	8.3	0.1
Hong Kong	-	-	-	-	-	0.1	-	-	1.1	1.2	-
Thailand	-	-	-	-	-	0.1	-	0.3	3.3	3.7	-
Melaysia	-	-	-	-	-	-	-	0.1	0.8	0.9	-
Other	2.2	2.7	0.4	1.7	2.6	69.1	3.0	16.3	497.7	595.7	7.5
TOTAL	1368.3	46.8	17.5	72.7	46.1	419.3	833.7	54.0	5215.6	8074.0	100.0

Source: U.S. Exports, Schedule E Commodity by Country, FT-410/Dec. 85, Bureau of the Census, U.S. Dept. of Commerce, March 1986, Table 2

Table V.3-47(Cont.) MOTOR VEHICLE PARTS AND ACCESSORIES
U.S. EXPORTS
1986

(In millions of U.S. dollars)

SUB-CLASSIFICATION/COUNTRY	STAMPINGS 002	BUMPERS 006	HUB CAPS WHEELCOVERS 014	RADIATORS 018	MUFFLERS TAILPIPES 022	BRAKES 026	TRANSMIS. PASS CARS 034	SHOCK ABSORBERS 042	OTHER PARTS 046	TOTAL NAMED CLASSIF.	PERCENT
Canada	1207.1	39.9	17.9	42.5	35.5	177.1	629.7	31.8	2549.1	4730.6	66.1
Mexico	48.1	2.5	0.1	3.0	1.0	26.5	13.0	4.9	851.6	950.7	13.3
Brazil	-	-	-	1.8	-	3.5	1.7	-	54.9	61.9	0.9
Venezula	1.4	1.9	0.1	0.1	-	24.6	0.7	1.5	220.1	250.4	3.5
Colombia	-	0.8	-	-	-	5.6	0.1	-	15.2	21.7	0.3
United Kingdom	0.2	-	-	0.2	-	7.8	8.2	0.3	87.2	103.9	1.5
West Germany	0.2	-	-	0.1	0.1	9.9	2.5	0.1	147.9	160.8	2.3
France	-	-	-	-	-	3.4	0.1	0.2	31.6	35.3	0.5
Italy	-	-	-	0.1	-	0.4	-	-	11.3	11.8	0.2
Sweden	0.1	-	-	-	1.0	1.8	-	-	57.5	60.4	0.8
Japan	0.1	-	-	-	-	7.6	8.8	0.5	112.9	129.9	1.8
South Korea	-	-	0.2	0.3	0.1	0.9	-	-	26.9	28.4	0.4
China T/Taiwan	-	-	-	-	-	0.4	-	0.1	9.3	9.8	0.1
Australia	0.1	-	-	0.1	0.2	4.9	4.9	1.1	75.3	86.6	1.2
China M	-	-	-	-	-	0.5	-	-	8.2	8.7	0.1
Singapore	-	-	-	-	-	0.5	-	0.7	5.6	6.8	0.1
Hong Kong	-	-	-	-	-	0.1	-	-	0.7	0.8	-
Thailand	-	-	-	-	-	0.1	-	0.3	3.3	3.7	-
Malaysia	-	-	-	-	-	-	-	0.1	0.3	0.4	-
Other	1.7	1.1	0.2	0.7	3.3	51.0	29.5	13.1	389.2	489.8	6.9
TOTAL	1259.0	46.2	18.5	48.9	41.2	326.6	699.2	54.7	4658.1	7152.4	100.0

Source: U.S. Exports, Schedule E ASI:87 Fische 24 April 1987 (This source is equivalent to FT-410)

Table V.3-47(Cont.) MOTOR VEHICLE PARTS AND ACCESSORIES
U.S. EXPORTS
1987

(In millions of U.S. dollars)

SUB-CLASSIFICATION/COUNTRY	STAMPINGS 002	BUMPERS 006	HUB CAPS WHEELCOVERS 014	RADIATORS 018	MUFFLERS TAILPIPES 022	BRAKES 026	TRANSMIS. PASS CARS 034	SHOCK ABSORBERS 042	OTHER PARTS 046	TOTAL NAMED CLASSIF.	PERCENT
Canada	1267.3	59.8	21.5	55.6	47.7	247.2	570.7	41.8	2936.8	5248.4	64.9
Mexico	56.7	4.4	0.3	8.2	1.0	27.2	12.4	6.8	1038.1	1155.1	14.4
Brazil	-	0.1	-	0.6	-	3.9	0.6	-	78.4	83.6	1.0
Venezula	0.6	0.2	-	0.5	0.2	26.7	1.1	2.1	220.4	251.8	3.3
Colombia	-	0.8	-	-	-	8.4	0.1	-	13.2	22.5	0.3
United Kingdom	-	-	-	0.1	0.2	7.1	12.4	0.6	107.7	128.1	1.6
West Germany	0.1	-	-	0.1	0.8	15.8	4.6	0.1	158.0	179.5	2.2
France	-	-	-	0.1	-	7.4	0.4	0.4	58.7	67.0	0.8
Italy	-	-	-	-	-	0.6	0.2	-	32.1	32.9	0.3
Sweden	0.3	-	0.1	-	1.9	3.0	0.1	-	55.9	61.3	0.8
Japan	0.1	0.7	-	0.4	-	10.9	15.5	0.4	95.2	123.2	1.5
South Korea	-	-	-	0.6	-	0.6	31.6	-	62.0	94.8	1.2
China T/Taiwan	-	-	0.1	-	-	0.4	-	0.1	10.7	11.3	0.1
Australia	0.1	-	-	0.1	-	4.8	6.1	1.5	85.8	98.4	1.2
China M	-	-	-	-	-	0.1	-	-	13.5	13.6	0.2
Singapore	0.1	-	-	-	-	0.9	-	0.9	8.3	10.2	0.1
Hong Kong	-	-	-	-	-	0.1	-	0.5	1.6	2.2	-
Thailand	-	-	-	-	-	0.1	-	0.6	1.1	1.8	-
Malaysia	-	-	-	-	-	-	-	0.1	0.6	0.7	-
Other	4.0	3.0	0.4	1.8	4.3	66.7	21.8	13.9	381.0	496.9	6.1
TOTAL	1329.3	69.0	22.4	68.1	56.1	431.9	677.6	69.8	5359.1	8083.3	100.0

Source: U.S. Exports, Schedule E Commodity by Country Monthly, FT-410, Bureau of the Census, U.S. Dept. of Commerce, December 1987

Table V.3-48 MOTOR VEHICLE PARTS AND ACCESSORIES U.S. IMPORTS 1983

(In millions of U.S. dollars)

SUB-CLASSIFICATION/COUNTRY	STAMPINGS 008	BUMPERS 010	HUB CAPS WHEELCOVERS 016	RADIATORS 022	MUFFLERS TAILPIPES 026	BRAKES 032	TRANSMIS. PASS CARS 042	SHOCK ABSORBERS 052	OTHER PARTS 085	TOTAL NAMED CLASSIF.	PERCENT
Canada	5.2	88.0	3.7	66.7	84.8	254.1	484.5	18.5	2020.4	3025.9	58.5
Mexico	51.2	43.5	-	2.3	1.2	15.1	3.4	0.3	140.3	257.3	5.0
Brazil	0.5	1.6	0.4	0.2	2.0	14.4	-	1.0	29.7	49.8	0.9
Venezula	-	-	-	-	-	2.0	-	-	0.2	2.2	-
Colombia	-	-	-	-	-	0.4	-	-	-	0.4	-
United Kingdom	2.3	0.4	0.1	0.6	1.0	8.5	21.7	1.5	88.8	124.9	2.4
West Germany	18.9	6.1	2.0	3.9	24.8	24.8	37.1	10.1	166.0	293.7	5.7
France	1.7	0.6	0.1	6.3	0.8	3.0	80.4	0.2	221.2	314.3	6.1
Italy	3.4	0.2	0.4	-	3.7	4.6	-	0.5	21.8	34.6	0.7
Sweden	2.9	0.1	0.4	0.3	3.1	0.9	0.7	0.2	12.8	21.4	0.4
Japan	90.0	23.3	2.8	8.3	24.8	39.0	80.8	18.6	541.2	828.8	16.0
South Korea	0.7	-	1.8	1.7	-	1.6	-	-	7.8	13.6	0.3
China T/Taiwan	17.8	1.0	23.7	1.9	0.1	0.5	0.1	0.6	20.8	66.5	1.3
Australia	-	-	-	-	-	8.8	-	0.1	2.0	10.9	0.2
China M	-	-	-	-	-	-	-	-	0.8	0.8	-
Singapore	-	-	-	1.7	-	-	-	-	4.2	5.9	0.1
Hong Kong	-	-	-	-	-	-	-	-	0.6	0.6	-
Thailand	-	-	-	-	-	-	-	-	-	-	-
Malaysia	-	-	1.0	-	-	-	-	-	-	1.0	-
Other	1.0	1.6	0.3	0.3	0.8	5.8	1.0	11.6	98.3	120.7	2.4
TOTAL	195.6	166.4	36.7	94.2	147.1	383.6	709.7	63.2	3376.9	5173.3	100.0

Source: U.S. General Imports and Imports by Consumption, Schedule A Commodity by Country, FT-135, Bureau of the Census, U.S. Dept. of Commerce, May 26, 1984 - Card 3

Table V.3-48(Cont.) MOTOR VEHICLE PARTS AND ACCESSORIES
U.S. IMPORTS
1984

(In millions of U.S. dollars)

SUB-CLASSIFICATION/COUNTRY	STAMPINGS 008	BUMPERS 010	HUB CAPS WHEELCOVERS 016	RADIATORS 022	MUFFLERS TAILPIPES 026	BRAKES 032	TRANSMIS. PASS CARS 042	SHOCK ABSORBERS 052	OTHER PARTS 085	TOTAL NAMED CLASSIF.	PERCENT
Canada	12.4	140.0	5.6	79.2	102.1	350.5	685.2	26.2	2733.7	4134.9	55.6
Mexico	68.7	35.6	-	1.1	2.7	30.9	5.6	0.5	238.4	383.5	5.1
Brazil	0.4	2.4	0.4	0.5	1.3	30.4	-	2.8	6.5	44.7	0.6
Venezula	-	-	-	-	-	0.1	-	-	1.7	1.8	-
Colombia	-	-	-	-	-	0.3	-	-	1.0	1.3	-
United Kingdom	1.7	0.6	0.6	0.9	1.6	15.0	31.5	3.3	124.2	179.4	2.4
West Germany	22.2	9.8	1.6	6.0	21.7	32.6	38.8	14.7	229.4	376.8	5.0
France	1.5	0.7	0.2	6.7	1.0	5.1	80.7	0.3	263.1	359.3	4.8
Italy	5.7	0.3	0.3	0.6	3.5	10.6	0.1	0.7	39.7	61.5	0.8
Sweden	3.3	0.2	0.4	0.5	4.5	1.2	0.7	0.3	19.1	30.2	0.4
Japan	137.1	36.9	5.5	18.2	25.9	60.9	91.3	23.8	1043.2	1442.8	19.5
South Korea	0.9	0.1	0.9	3.7	0.9	2.0	0.3	-	11.8	20.6	0.2
China T/Taiwan	29.8	2.6	33.6	2.7	0.2	1.0	0.1	0.3	40.6	110.9	1.4
Australia	-	-	-	-	-	10.4	-	-	9.0	19.4	0.2
China M	-	-	-	-	-	-	-	-	0.1	0.1	-
Singapore	-	-	-	2.4	-	0.1	-	-	13.0	15.5	0.2
Hong Kong	0.1	-	0.2	-	-	-	-	-	0.7	1.0	-
Thailand	-	-	-	-	-	-	-	-	0.1	0.1	-
Malaysia	-	-	1.3	-	-	-	-	-	-	1.3	-
Other	1.0	1.9	0.7	1.1	1.1	6.8	3.0	11.5	214.7	241.8	3.2
TOTAL	284.8	231.1	51.3	123.6	166.5	557.9	937.3	84.4	4990.0	7426.9	100.0

Source: U.S. General Imports and Imports by Consumption, Schedule A Commodity by Country, FT-135, Bureau of the Census, U.S. Dept. of Commerce, CIF Values

Table V.3-48(Cont.) MOTOR VEHICLE PARTS AND ACCESSORIES
U.S. IMPORTS
1985

(In millions of U.S. dollars)

SUB-CLASSIFICATION/COUNTRY	STAMPINGS 008	BUMPERS 010	HUB CAPS WHEELCOVERS 016	RADIATORS 022	MUFFLERS TAILPIPES 026	BRAKES 032	TRANSMIS. PASS CARS 042	SHOCK ABSORBERS 052	OTHER PARTS 085	TOTAL NAMED CLASSIF.	PERCENT
Canada	33.0	181.5	5.2	97.6	88.7	369.1	684.8	23.7	3078.5	4562.1	53.8
Mexico	71.9	3.3	-	2.9	2.9	39.9	5.7	1.1	293.2	420.9	5.0
Brazil	0.4	2.3	0.3	0.1	0.6	45.5	0.3	-	89.0	138.5	1.6
Venezula	-	-	-	-	-	0.7	-	2.8	4.0	7.5	-
Colombia	-	-	-	-	-	0.3	-	-	0.5	0.8	-
United Kingdom	2.3	0.6	0.2	1.9	1.6	19.6	31.5	2.1	144.2	204.0	2.4
West Germany	24.2	11.4	1.6	8.5	18.9	40.6	55.7	24.6	302.7	488.2	5.7
France	1.4	0.8	0.4	3.1	1.0	3.5	131.7	1.5	215.0	358.4	4.2
Italy	4.4	0.4	0.4	0.3	2.9	7.7	0.8	0.7	52.7	70.3	0.8
Sweden	5.0	0.1	0.4	0.7	3.4	1.7	1.1	0.3	21.1	33.8	0.4
Japan	174.1	45.6	7.3	25.0	33.6	72.0	179.7	27.2	1219.6	1784.1	21.0
South Korea	1.2	-	1.6	6.1	-	2.1	-	-	22.5	33.5	0.4
China T/Taiwan	31.2	3.7	36.8	5.0	0.4	1.6	0.1	0.1	46.1	125.0	1.5
Australia	-	-	-	-	-	13.1	-	0.3	30.0	43.4	0.5
China M	-	-	0.1	-	-	0.5	-	-	0.5	1.1	-
Singapore	-	-	-	2.2	-	0.2	-	-	15.9	18.3	0.2
Hong Kong	0.1	-	0.2	-	0.2	0.1	-	-	0.6	1.2	-
Thailand	-	-	-	0.9	-	-	-	-	-	0.9	-
Malaysia	-	-	0.5	-	-	-	-	-	0.2	0.7	-
Other	0.8	2.2	0.7	1.1	1.8	9.5	0.9	12.0	154.5	183.5	2.2
TOTAL	350.0	251.9	53.7	155.4	156.0	627.7	1092.3	96.4	5690.8	8476.2	100.0

Source: U.S. Dept. Imports and Imports by Consumption, Schedule A Commodity by Country, FT-135, Bureau of the Census, U.S. Dept. of Commerce
CIF Value

Table V.3-48(Cont.) MOTOR VEHICLE PARTS AND ACCESSORIES
U.S. IMPORTS
1986

(In millions of U.S. dollars)

SUB-CLASSIFICATION/COUNTRY	STAMPINGS 008	BUMPERS 010	HUB CAPS WHEELCOVERS 016	RADIATORS 022	MUFFLERS TAILPIPES 026	BRAKES 032	TRANSMIS. PASS CARS 042	SHOCK ABSORBERS 052	OTHER PARTS 085	TOTAL NAMED CLASSIF.	PERCENT
Canada	30.4	205.0	0.9	80.6	97.6	396.3	595.1	21.6	3178.1	4605.6	46.9
Mexico	28.8	0.6	0.2	4.3	3.2	40.1	8.2	1.0	392.3	478.7	4.8
Brazil	0.5	2.1	-	0.2	1.3	61.3	0.4	2.5	87.6	155.9	1.5
Venezula	-	-	-	-	0.1	0.5	-	-	7.5	8.1	-
Colombia	-	-	-	-	-	0.2	-	-	0.3	0.5	-
United Kingdom	2.3	0.7	0.3	0.9	2.0	20.0	8.2	2.3	187.6	224.3	2.2
West Germany	31.2	13.1	1.9	9.4	18.6	56.6	54.8	-	372.1	557.7	5.5
France	1.9	1.0	0.3	1.8	1.2	11.7	223.7	1.0	207.1	449.7	4.5
Italy	4.7	0.9	0.2	0.6	-	7.5	1.9	0.4	69.8	86.0	0.9
Sweden	6.3	0.2	0.6	0.9	4.3	2.1	1.7	0.4	31.0	47.5	0.4
Japan	213.2	58.9	11.4	35.4	55.7	98.2	349.9	31.2	1848.0	2701.9	27.5
South Korea	3.6	0.1	0.2	6.8	0.2	3.4	0.3	-	32.2	46.8	0.5
China T/Taiwan	36.4	7.6	47.5	5.4	1.5	5.8	0.1	0.1	63.3	167.7	1.7
Australia	-	-	-	-	-	10.9	-	1.2	14.4	26.5	0.3
China M	-	-	-	-	-	-	-	-	0.9	0.9	-
Singapore	-	-	-	2.0	-	-	-	-	9.7	11.7	0.1
Hong Kong	-	-	0.2	-	0.2	0.1	-	-	1.1	1.6	-
Thailand	-	-	-	2.3	-	-	-	-	0.3	2.6	-
Malaysia	-	-	0.4	-	-	-	-	-	0.1	0.5	-
Other	1.2	2.4	2.4	1.6	5.8	12.9	1.2	45.2	165.6	238.3	2.4
TOTAL	360.5	292.6	66.5	152.2	191.7	727.6	1245.5	106.9	6669.0	9812.5	100.0

Source: U.S. General Imports & Imports for Consumption, Schedule A, Commodity by Country, FT-135, Dec. 1986 U.S. Dept. of Commerce March 1987
CIF Values

Table V.3-48(Cont.) MOTOR VEHICLE PARTS AND ACCESSORIES
U.S. IMPORTS
1987

(In millions of U.S. dollars)

SUB-CLASSIFICATION/COUNTRY	STAMPINGS 008	BUMPERS 010	HUB CAPS WHEELCOVERS 016	RADIATORS 022	MUFFLERS TAILPIPES 026	BRAKES 032	TRANSMIS. PASS CARS 042	SHOCK ABSORBERS 052	OTHER PARTS 085	TOTAL NAMED CLASSIF.	PERCENT
Canada	35.5	244.4	0.2	69.4	113.6	492.0	567.0	22.8	3279.6	4824.5	43.0
Mexico	30.6	0.2	0.1	21.0	3.4	41.1	20.4	0.3	483.0	600.1	5.5
Brazil	0.7	1.9	0.4	0.3	1.4	65.7	1.9	2.0	150.7	225.0	2.0
Venezula	2.0	-	-	0.1	0.1	0.2	-	-	11.5	13.9	0.1
Colombia	-	-	-	-	-	0.1	-	-	0.4	0.5	-
United Kingdom	3.7	0.9	0.2	1.0	2.4	19.7	3.9	1.3	176.2	209.3	1.9
West Germany	49.1	16.9	2.9	11.5	23.9	74.6	61.6	28.1	509.0	777.6	6.9
France	1.2	0.8	0.2	1.6	1.0	21.3	63.4	0.5	211.0	301.0	2.7
Italy	5.5	1.2	0.2	0.1	4.5	12.6	1.4	2.0	86.5	114.0	1.0
Sweden	7.5	0.3	0.6	1.3	4.8	4.0	2.0	0.6	25.7	46.8	0.4
Japan	281.5	57.5	14.5	30.6	71.2	137.5	454.6	68.8	2363.3	3479.5	31.0
South Korea	4.0	0.5	0.3	11.2	0.1	6.0	0.3	-	51.2	73.6	0.7
China T/Taiwan	39.1	11.8	45.0	5.9	0.8	9.6	0.5	0.3	77.1	190.1	1.7
Australia	-	0.1	-	-	-	10.1	-	3.0	21.8	35.0	0.3
China M	-	-	0.1	-	-	-	-	-	1.8	1.6	-
Singapore	-	-	-	2.6	-	-	-	-	10.7	13.3	0.1
Hong Kong	-	-	0.2	-	0.3	-	-	-	0.9	1.4	-
Thailand	0.3	-	-	3.0	-	-	-	-	0.2	3.5	-
Malaysia	-	-	0.4	-	-	0.1	-	-	0.1	0.6	-
Other	1.0	2.3	7.7	1.6	2.0	17.8	3.1	26.2	239.2	300.9	2.7
TOTAL	461.7	338.8	73.0	161.2	229.5	912.4	1180.1	155.9	7699.6	11212.2	100.0

Source: U.S. General Imports & Imports for Consumption, Schedule A Commodity by Country, FT-135, U.S. Dept. of Commerce June 5, 1988
CIF Values, Table 2

Table V.3-49 RELATIVE ATTRACTIVENESS OF REPLACEMENT PARTS
FAST MOVING AND HIGHLY COMPETITIVE PARTS

PART CATEGORY	ATTRACTIVENESS FOR U.S. FIRMS Marketing	Manufacturing	COMMENTS
Exhaust Systems	High	High/Medium	Brand awareness of parts and installation service favor U.S. manufacturers
Brake Pads, Shoes, and Systems	High	High/Medium Low	Quality and productivity favor U.S. producers for wears-out parts. Tooling cost favors imports for castings and sub-assemblies. Possible downward trend with use of semimetallics. Safety and liability are concerns.
Shocks - Front and Rear	High	High/Medium	High awareness of U.S. brands. Installation is low-cost and widely available. However, front shocks are disappearing in favor of MacPherson struts.
Oil Filters Air Filters Fuel Filters PCV Valves	High	High	Extremely competitive market with strong brand awareness favors U.S. manufacturers.
Spark Plugs	High	High	Well-established brands in distributor system. Fewer plugs per car and longer life restrain growth.
Ignition Parts	High/Medium	High/Medium	Demand is expected to decline. Some components are either being phased out (points and condensers) or combined (coil and distributor). Wire sets continue strong.
Belts and Hoses	High	High	Typically a service station or DIY item. Distribution is a key factor. Tooling costs usually low.

Note: High ratings on attractiveness to U.S. firms corresponds to low attractiveness to foreign firms and vice versa.

Table V.3-49(Cont.) SLOWER MOVING AND LESS PRICE COMPETITIVE PARTS

PART CATEGORY	ATTRACTIVENESS FOR U.S. FIRMS		COMMENTS
	Marketing	Manufacturing	
New Charging System: Alternators and Voltage Regulators	Medium	Medium	High tooling costs. Component availability serious problem since alternator replacement market is more than 75 percent remanufactured.
New Cranking System: Starter	Medium	Medium	Same as charging system.
Steering and Supension Components	Medium	Medium	Many part numbers. Low level of interchangeability and high tooling costs. Manufacturer must have full line.
Carburetor and Fuel Injection System	High/Medium	Low	Remanufactured carburetor business has core availability and component sourcing problems.
Clutch and Drive Train	Medium	Medium	Increased use of automatic transmissions will lower parts demand. Clutch plates, discs and covers are attractive to U.S. manufacturers.
Universal Joints and Constant Velocity Joints(CVJ)	Medium	Medium	Growing rate for CVJs appears higher than anticipated in areas of high corrosion. About 50% are remanufactured.
MacPherson Struts	High/Medium	Medium	The aging of cars will make this an attractive product.
Fuel Pumps	Low/Medium	Low/Medium	Demand is expected to decline. Move to fuel systems will lower wear-out rate. Model proliferation and tooling costs reduce attractiveness.
Water Pumps	Low	Low	Typically a remanufactured product with low level of brand loyalty

Note: High ratings on attractiveness to U.S. firms correspond to low attractiveness to foreign firms and vice versa.

Table V.3-49(Cont.) SLOWEST MOVING PARTS - OFTEN ONLY AVAILABLE THROUGH CAR DEALERS FOR JAPANESE VEHICLES IN THE UNITED STATES

PART CATEGORY	ATTRACTIVENESS FOR U.S. FIRMS Marketing	Manufacturing	COMMENTS
Air Conditioning and Heater Parts	Low	Low	High number of parts and low replacement frequency. High capital investment not warranted.
Transmission Parts	Low	Low	Low replacement frequency. Also, market will attract remanufactured units produced offshore.
Selected engine hard parts, e.g. Oil Pump, Connecting Rods, Manifold	Low	Low	High capital investment. Many part numbers with very low volume required for full line. U.S. manufacturers will source many requirements offshore.

Note: High ratings on attractiveness to U.S. firms corresponds to low attractiveness to foreign firms and vice versa.

Source: Western Reserve Associates
Reproduced from "A Competitive Assessment--the U.S. Aftermarket for Japanese Cars."
U.S. Department of Commerce, International Trade Administration, Washington

Table V.3-50 RELATIVE ATTRACTIVENESS OF REPLACEMENT PARTS

High Scores: More attractive to U.S. Suppliers
Low Scores: More attractive to Foreign Suppliers

	Marketing Issues					Manufacturing Issues					
FAST MOVING & HIGHLY COMPETITIVE	Market Potential	Brand	Com-petition	Channels Open	Mkt. Sub-Total	Tooling Cost	Complete Line	Ease of Line	Safety	Mfg. Sub-total	TOTAL
Exhaust Systems	10	8	6	5	29	3	5	6	5	19	48
Brake Parts - Friction	10	6	5	5	26	5	7	6	3	21	47
Brake Parts - Hydraulic	9	6	5	5	25	1	6	6	3	16	41
Shocks - Front & Rear	9	7	6	5	27	4	5	6	4	19	46
Filters - Oil, Air, Fuel	10	7	5	5	27	6	7	7	5	25	52
Spark Plugs	9	8	5	5	27	5	7	7	5	24	51
Ignition Parts	8	6	6	5	25	5	7	6	5	23	48
Belts and Hoses	8	6	6	5	25	5	7	6	5	23	48
SLOWER MOVING, LESS COMPETITIVE											
Alternator	7	6	6	5	24	1	6	5	5	17	41
Starter	7	6	6	5	24	1	6	5	5	17	41
Steering & Suspension Components	7	5	6	5	23	3	6	5	5	19	42
Carburetor	7	7	6	5	25	1	6	5	3	15	40
Clutch & Drive Train	7	5	6	5	23	5	6	5	5	21	44
Fuel Pump	7	6	6	5	24	3	6	5	5	19	43
Water Pump	6	5	5	5	21	3	6	5	5	18	39
MacPherson Struts	7	7	6	5	25	4	5	6	4	19	44
SLOW MOVING											
Air Conditioning & Heater Parts	6	5	5	4	20	1	5	5	5	16	36
Oil Pump	5	5	5	5	20	1	5	5	5	16	36
Manifold	6	5	5	3	19	1	5	5	5	16	35
Connecting Rods	6	5	5	3	19	1	5	5	5	16	35

Source: Western Reserve Associates. Reproduced from "A Competitive Assessment - The U.S. Aftermarket for Japanese Cars." U.S. Department of Commerce, International Trade Administrators, Washington, D.C.

Table V.3-51 TRADE ASSOCIATIONS - AUTO PARTS*

TRADE ASSOCIATION	FOUNDED	MEMBERS	STAFF	MEMBERSHIP & ACTIVITIES	PUBLICATIONS
(ABPA) Aftermarket Body Parts Association 420 Pierce St., #300 Houston, TX 77002	1980	135	2	Members are suppliers to the collision repair industry. Provides ongoing education and communication programs to improve marketing skills and to keep abreast of technological changes in the crash parts replacement industry. Encourages a nationwide distribution network to make parts available to consumers.	1) Body Language 2) Collision Parts Journal 3) Crash Parts Industry Roster
(AERA) Automotive Engine Rebuilders Association 234 Waukegan Rd. Glenview, IL 60025	1922	3,500	7	Wholesalers and rebuilders of automotive replacement parts. Also has associate members who are suppliers of parts, equipment, tools and services to the rebuilder members. Acts as a clearinghouse for automotive jobber machine shop information.	1) Monthly Bulletin 2) Service Bulletin 3) Shop Management Bulletin 4) Shop Procedure Bulletin 5) Technical Bulletin 6) Proceedings of Annual Convention 7) Membership Roser 8) Camshaft Identification Guide 9) Cylinder Head & Block Identification Guide 10) The Crankshaft Manual
(APAA) Automotive Parts & Accessories Association 5100 Forbes Blvd. Lauham, MD 20706	1967	1,680	37	Members are automotive parts and accessories retailers, distributors and manufacturers. Holds industry-wide trade show, offers placement service, compiles statistics, conducts research, operates speakers' bureau, provides specialized education for retailers, distributers, manufacturers and manufacturers' representatives. Administers Automotive Refrigeration Products Institute, Automotive Products Expert Council and Vehicle Security Association.	1) Tech Service Report 2) Report (newsletter) 3) Governmental Affairs Report 4) International Report 5) Marketing Report 6) Annual Report 7) Membership Directory 8) Show Directory 9) Foreign Buyers Directory

* Selected from among 30 or more trade associations in the auto parts industry.

Table V.3-51 (Cont.) TRADE ASSOCIATIONS - AUTO PARTS*

TRADE ASSOCIATION	FOUNDED	MEMBERS	STAFF	MEMBERSHIP & ACTIVITIES	PUBLICATIONS
(ASIA) Automotive Service Industry Association 444 N. Michigan Ave. Chicago, IL 60611	1959	8,500	N/A	Members are executives representing independent automotive wholesalers, warehouse distributors, heavy duty vehicle and equipment parts distributors, automotive electrical service and supply wholesalers and manufacturers and remanufacturers of replacement parts. Provides seminars, awards, statistics and trade shows.	1) Voice of Industry 2) Selling Today 3) Membership Directory, Buyers Guide, and Product Directory
(MEMA) Motor & Equipment Manufacturers Association P O Box 1638 300 Sylvan Ave. Englewood Cliffs, NJ 07632	1904	750	73	Manufacturers of original and replacement parts for automotive and heavy duty equipment. Also makers of maintenance equipment and accessories. Offers legal, safety, and legislative representation and consultation, personnel services, and manpower development workshops. Maintains credit reporting and collecting service covering wholesalers, retailers, chainstores and warehouse distributors. Consolidates freight and provides freight bill auditing service. Maintains international liaisons. Conducts seminars on domestic and overseas marketing, compiles statistics and offers automated order-entry and price-update services.	1) Marketing Insight 2) Credit & Sales Reference 3) Membership Roster & Buyer's Guide 4) Autobody Supply & Equipment Market 5) Automotive Jobbers in the U.S.A. 6) Car Maintenance in the U.S.A. 7) Distributors Financial Analysis 8) Heavy Duty Truck Maintenance in the U.S.A.

*Selected from among 30 or more trade associations in the auto parts industry

4. Cost Analysis

Because it is thought that the parts now under domestic production require analysis that is based on specific and realistic numerical values, studies were made from the following two viewpoints.

(1) The level of selling prices should be understood, and to what extent they have price competitiveness should be clarified.

(2) If they lack price competitiveness, the reasons should be analyzed and what measures there are to gain price competitiveness should be considered.

The parts not under current domestic prodution were left untouched, given the following considerations:

(1) It is surmised that in the future, parts which can be produced under a small- or medium-scale production system, if they are domestically produced, can be similarly viewed as those now under domestic production.

(2) As for parts requiring a large-scale production system, such as engines for example, casting and forging projects have already been under detailed consideration.

4-1. Cost Level of Domestically Produced Parts

(1) Method of Deriving Cost

Data on the manufacturing costs of each item produced by individual firms is of such a character that it cannot be understood from surveys. During the latest survey, therefore, approximate cost levels were derived by gathering rough figures of the selling prices for major parts from the firms visited. Then, with the cooperation of automakers, unit purchase prices of domestically-produced and imported parts were figured. In addition, the unit purchase prices of imported parts were checked against the domestic selling prices in Japan of the same parts.

The component ratio of cost by item of expense was obtained from respondents to a separately conducted questionnaire.

(2) Method of Comparison

The unit prices of domestically-produced parts used for comparison are the unit purchase prices of automakers. Regarding imported parts, the unit prices should be reckoned at the point of time when automakers put them to use. The unit prices of imported parts, therefore, include import duties and expenses related to transport ("Import Open Market Value") in addition to CIF prices. The rates of import duties are 40% for passenger cars and 5% for commercial vehicles. The unit prices of imported parts for comparison are converted into Malaysian dollars at exchange rates prevalent at the point of time when the comparison was made.

(3) *Results of Comparison*

The results of comparison of the specific items of parts under the latest survey are shown in Table V.4-1. The comparison involved quality rating as well as price. This is because quality is a very important factor for automotive parts and the fact that price appraisal alone will bring about a biased view.

Table V.4-1 Comparison of Unit Price of Specific Parts

Parts	Domestic Price/Import Price		Quality Evaluation
	A Company	B Company	A~C Company
Fuel Tank	401 — 526%	525%	○
Brake & Fuel Pipe	194		○
Radiator	129 — 131	134	○
Shock Absorber	117 — 161	131	○
Electric Horn	124 — 132		△
Coil Spring	112		○
Exhaust Pipe	77 — 209		○
Exhaust System	74 — 95	97	△
Muffler	71 — 83		○
Air Filter	71		△
Wiper Mote & Braket	130 — 150		○
Starter Motor	137	109	○
Alternator	77	91	○
Damping Sheet	131		○
Mud Flap		140	○
Seat Belt	87	132	○
Wiring Harness		99	○
Glass		80	○
Carpet		80	○
Seat Pad	52	55	X

Note: ○ ; No Problem
△ ; Sometimes Poor
X ; Poor

Table V.4-1 shows that the level of unit prices of imported parts almost exhibits the same trend, though it differs somewhat according to firm. As compared with imported parts, characteristics of domestic products may be cited as follows:

a) Metal parts generally cost more than parts made of other materials

b) Among metal parts, simple parts manufactured at facilities for volume production cost more

c) The cost of metal parts made from single large-sized and expensive metal moulds is high

d) The cost of assembled parts which require many pieces of equipment to produce generally is high

e) The cost of parts which wear out easily and are also shipped to the replacement equipment market generally is low

f) Generally, there is no problem with quality.

The appointed time limit of delivery of products to automakers is well observed, causing no specific problems.

(4) Needed Cost Level

It may be said that the needed cost level should be price competitive. From this point of view, the unit price levels of domestic products cannot be said to be price competitive, even if they are lower than those of imports, as shown in Table V.4-1 by percentages of less than 100. In the case of Company A in the Table, customs duties and other expenses make the prices of imported passenger car parts about 68 percentage points higher. In order to make the unit price levels of domestic automotive parts equal to those of imports, therefore, they have to be lowered to around 60% of the current level. In other words, costs will have to be reduced by approximately 40%. These figures are based on the assumption that the comparison value shown in Table V.4-1 is 100. If the comparison value is more than 100, the required rate of cost reduction will be correspondingly higher.

4-2. Analysis of Factors for the Higher Cost of Domestically Produced Parts

4-2-1. Cost Penalty

(1) General Considerations

When an import substitution industry such as metal processing is newly developed, raw materials and facilities often have to be imported and operation should start while the size of the market is still small. In such a case, costs will generally be higher than in countries where the industry has already been developed. In other words, prices of domestic products will be higher than imports. This is what is called the "cost penalty" arising from domestic production. This phenomenon is said to be common in developing countries and is not limited to Malaysia alone.

(2) Promotion of Domestic Production and Cost Penalty

It goes without saying that it is most desirable to have domestic production progress without cost penalty. As a matter of fact, however, the unit prices of domestic products are high as shown in Table V.4-1. Therefore, various protection measures have been taken, as stated earlier. One such measure to actively protect domestic production is the Mandatory Deletion Program (MDP). Viewed in relation to cost, it works as follows:

Parts manufacturers request an application from the Mandatory Deletion Program once they are able to produce parts which they desire to have deleted from the status of approved CKD parts. Based on the request, automakers test the parts for use in individual models to consider the advisability of adopting them. MDP status is applied to one part after another found usable. Generally, however, a time limit is set for consideration before one can apply. In concrete terms, when MDP status is applied, 80% of the models are assured coverage by the program. Once an MDP status is applied, imports are not permitted unless there is a specific technological reason and parts manufacturers consent This means a substantial ban on imports.

The procedures stated above include technological considerations but no cost studies. Under such protection measures, therefore, a reduction of costs will not be easy unless the principle of competition works among parts manufacturers with price competition occurring.

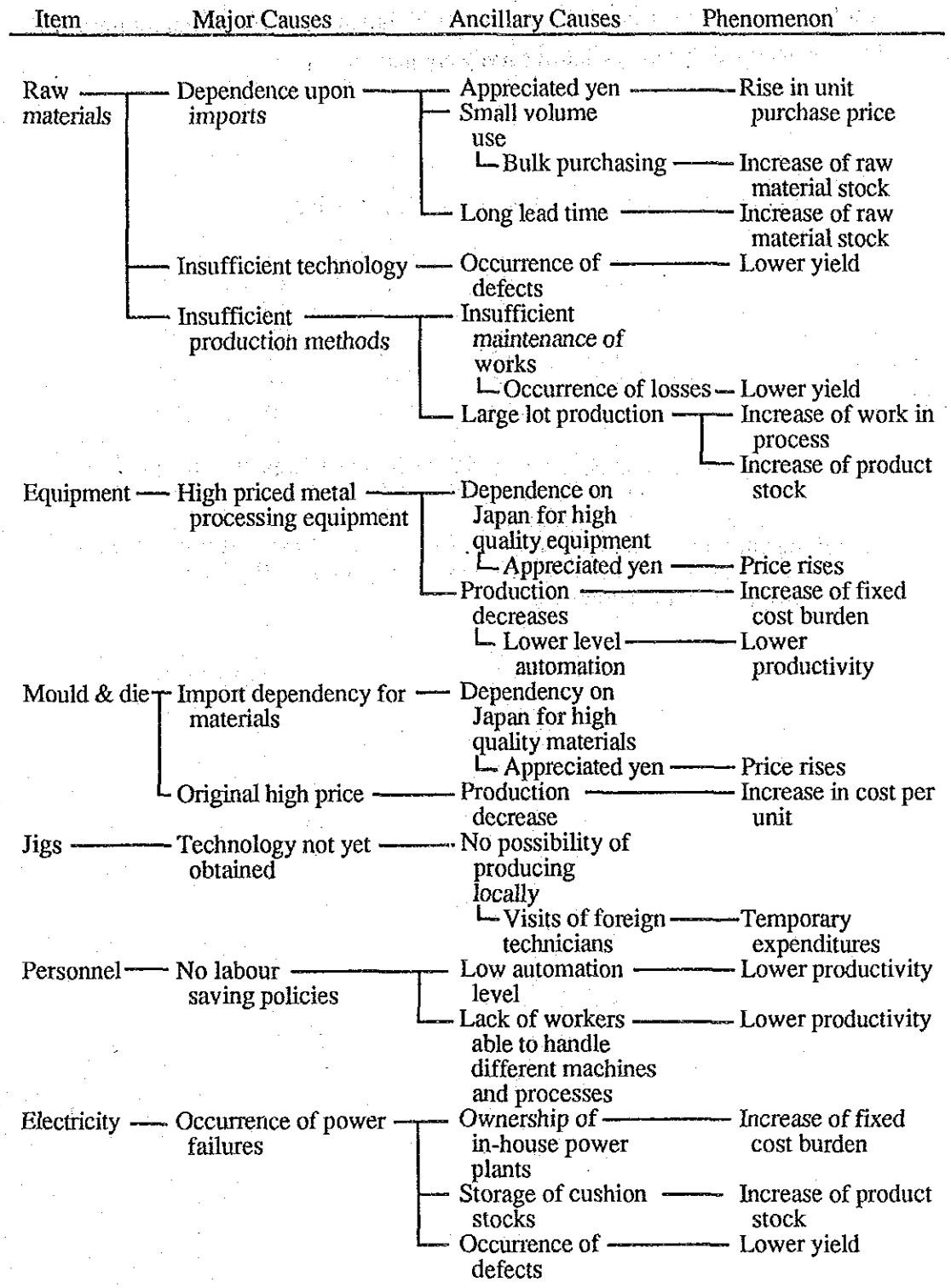
4-2-2. Factors for the High Cost of Domestically Produced Parts

(1) Qualitative Consideration of Structural Elements of Cost

On the basis of the views of managers of firms obtained through the latest survey and what has been learned on visits to factories, factors considered responsible for the high costs have been classified by the main structural elements of cost. The results are shown in Table V.4-2.

As for the factors in Table V.4-2, many managers emphasized the yen's appreciation in relation to raw materials, and small volume of production and high purchasing costs for facilities. Similarly, they cited small volume of production and high unit cost of purchases for metal moulds as well.

Table V. 4-2. Major High Cost Causes



(2) Quantitative Consideration of Structural Elements of Cost

Table V.4-3 shows a breakdown of cost of Japanese parts manufacturers with which the data obtained during the latest survey are juxtaposed.

Table V.4-3 Cost Price Structure Ratios

Item	Japan	A	B	C	D
Raw Materials	47	30	45	66	75
Labor Costs	23	10	7	3	12
Equipment and Others Costs	30	60	48	31	13
TOTAL	100	100	100	100	100

Notes: Companies A and B, raw material processing companies that produce such items as bolts. Companies C and D, companies that assemble such items as air conditioners.

Source: Japan, Small and Medium Enterprise Agency, 1988 cost price indexes for small and medium enterprises. Companies A, B, C, and D, response to questionnaire.

Broadly speaking, Table V.4-3 indicates the high component ratio of expenses for facilities and other items for material processing firms such as Companies A and B. This coincides with the statements of the managers interviewed. It is surmised that the lower volume of production has raised the component ratio of fixed expenses for facilities, metal moulds and other items.

Table V.4-4 shows the result of a trial calculation using the data of Table V.4-1 and Table V.4-3. In drawing up Table V.4-4, reference was made to Table V.4-1 and the level of 120% of unit prices of domestic products, as compared with those of imports, was regarded as a representative value. Incidentally, the level corresponds to about 200% of domestic unit prices in Japan. From Table V.4-3, on the other hand, component ratios in Japan and Company A were taken as representative values. The comparison is made on the assumption that the unit price in Japan equals 100 yen.

Table V.4-4 Cost Price Ratios and Their Relationship to Cost Standards

Item	Japan		Company A		
	Unit price	Ratio	Unit price	Ratio	Company A unit price/ Japan unit price
Raw Materials	¥47	47%	¥60	30%	128%
Labor Costs	23	23	20	10	87
Equipment and Other Costs	30	30	120	60	400
TOTAL	100	100	200	100	200

Table V.4-4 shows that the expenses for domestic raw materials are higher than those of Japanese products while personnel expenses are lower. Expenses for facilities and other items, however, are four times as much as those of Japanese products.

Although a trial calculation, it may be said that Table V.4-4 still represents a model of the current cost structure.

Unlike facilities, metal moulds cannot be used in common for various products. When production volume is small, therefore, the cost is high per unit of product. During the latest visits to firms, opinion was heard at one firm that domestic production of new parts was considered but found to be impossible because dies alone would cost M$300,000. With a view to finding the level of dies prices, in Japan we conducted an estimation of the cost of dies for processing several parts we had sketched at places under survey. The gist of the results is shown in Table V.4-5.

Table V.4-5 Results of Die Cost Estimate

Processed Parts and Die Classifications			Die Costs (Unit: M$1,000)
1) Outer diameter: about 70mm			
	thickness: 2.3mm	press-punch die	90
2) Outer diameter: 120mm	thickness: 4.5mm	press-punch die	148
3) 1,350x1,219mm	thickness: 0.8mm	sheet die	157
4) Outer diameter: 380mm	thickness: 3.5mm	punching die	165
5) Same as above			190
6) Same as above			230
7) Same as above			333

Notes: Finished shape is different for 4) and 5), and 6) and 7); 4) and 5) are the same type of parts, but they have different manufacturing processes. 6) and 7) are the same type of parts, but they have different manufacturing processes.
Cost is calculated on a scale of M$1 = ¥50.

Malaysian dies are not particularly high priced as can be found in the level of dies cost shown in Table V.4-5. It may be said the problem is with an inability for volume production despite the use of dies.

4-2-3. Consideration of Price Competitiveness

Measures to strengthen price competitiveness will be considered from two aspects.

(1) Unitary Aspect

From the unitary aspect, it may roughly be said to be necessary to strengthen the following two points:

a) Establishment of basic technology

It may be said that manufacture of quality products is a prerequisite for becoming price competitive. In interviews during the latest survey with automakers who use domestic products, we heard that domestically manufactured parts in general had become good. The results are shown in V.4-1. But many made the appraisal that durability was low although there were no immediate problems with their use, or that the same part could be used in some models but not in others. While visiting parts manufacturers, we heard complaints that the quality standards for automotive parts were too rigid. But it may be said that manufacture of quality products is an essential condition for establishing price competitiveness. Such an improvement of technological ability will allow a solution to the high cost factors shown in Table V.4-2 as well as the expansion of sales.

b) Perfection of control technology

It may be said that in Japan, many firms have gained great results from efforts to eliminate waste. As for quality, the ability to manufacture a few good products is one thing and the ability of continuously putting out hundreds of thousands of good products is another. During the latest survey, a remarkably wide gap appeared to exist in the production management and quality control systems among firms. Rationalization through the perfection of control technology can be accomplished only over time. According to the manager of a firm we visited, he received a lot of detailed advice from a technological expert dispatched from Japan, and the results were good. He also explained that it took three years for the advice to take root to some degree in his firm. Another firm said that men of talent who can be entrusted with production control had not been nurtured yet. Among the high cost factors shown in Table V.4-2, there are some such as the reduction of work in process that cannot be solved without perfection of control technology. It is surmised that steady progress of activities for improvement will lead to cost reductions.

(2) Structural Aspect

To what extent can a unit selling price be cut by a rise in production volume? Or, conversely speaking, what extent of production volume is necessary to reduce unit selling price? This point may be said to be a structural problem which parts manufacturers cannot solve alone.

The relationship between a reduction of unit selling price and a rise in production volume on condition that no change in profit and loss is brought about is shown in Fig. V.4-1. The premise of the figure is the assumption that the cost structure remains as it is despite any increase in production volume. Also, parameter R represents the current ratio of variable and fixed expenses.

As found in Fig. V.4-1, a 25% cut in unit selling price under the cost structure of R = 1.0 would keep profits at the same level as they are currently if production volume doubled. Again, if unit selling price had to be cut by 40% to establish price competitiveness, profits would be affected unless production volume rose 5 times as much as now under the cost structure of R = 1.0.

The ratio of variable expenses/fixed expenses, or parameter R, found from the data in Table V.4-3 is shown in Table V.4-6.

Table V.4-6 Variable Costs and Fixed Costs

Item	Japan	Company A	Company B
Variable Cost Ratios	60.4%	51%	57%
Fixed Cost Ratios	39.6	49	43
TOTAL	100	100	100
Variable Costs/Fixed Costs	1.53	1.04	1.33

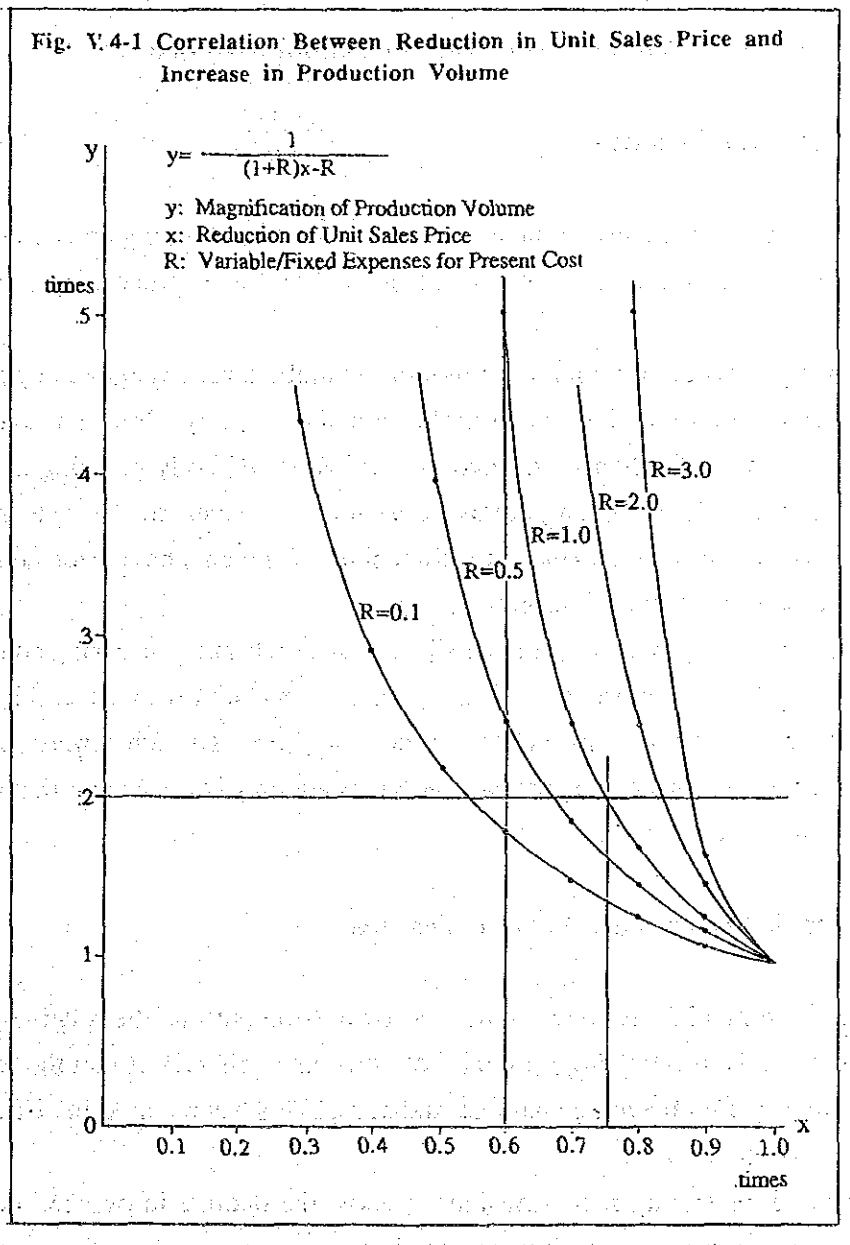
Note: Breakdown of variable costs is direct materials cost, purchased parts cost, indirect materials cost, outside order processing cost, cost for fuel such as crude oil, and other direct costs

It is found from Table V.4-6 and Fig. V.4-1 that Company A with an R of 1.04 could compete by cutting its unit selling price by about 25% and doubling its production volume.

Table V.4-1 shows the unit selling price of fuel tanks are particularly high. The necessity of large-sized presses and metal moulds for production has lowered their parameter R below 1.0. Therefore it may be said that increased volume of production will contribute greatly to a reduction of cost and a cut of unit selling price.

In the production of metal parts which requires large fixed expenses, generally it may be said that increased volume of production will contribute greatly to a reduction of cost, allowing a rise in price competitiveness.

Fig. V.4-1 Correlation Between Reduction in Unit Sales Price and Increase in Production Volume



5. Growth Measures for the Automotive Metal Parts Industry

5-1. Summary of Current Problems

This summary has been made from two points of view, namely, from the standpoints of the automobile and the automotive parts industries, together with a consideration of problems drawn from the aforementioned issues.

The problems which were drawn are listed comprehensively in Table V.5-1 attached further on.

5-1-1. Major Problems Viewed from the Automobile Industry

(1) Scope of Reliance on Imports

It is observed that the automobile industry consists of processing and assembling. In Malaysia, however, assembling was first introduced and then processing came into operation.

Assembling is a step in which a foreign car manufacturer engages in operations with its own technologies and parts brought into the country, and it is basically acknowledged as a form of reliance on imports. At PROTON body-pressing is carried out and assembling has already been put into operation. However, steel sheets, a major material, are imported and various kinds of technical developments have been conducted by its partner, Mitsubishi Motors Corporation.

In the area of parts processing, almost all steel materials and processing equipment and technologies rely on importation. Again, in the production of assembly parts, imports are still relied on for many of the components, too. Though a portion of the materials are domestically made and some technologies are now being acquired, the scope of its import reliance remains high.

(2) Limited Domestic Market and a Decline of Demand

It is indicated that Malaysia has a high car ownership but that the relatively small population has created a limited domestic market. It is also pointed out that the prices of cars are high compared with average national incomes. This has resulted in difficulty to expand the demand situation.

Furthermore, reflecting recent business trends, the decline in demand has been immense. Accompanying the quantity decrease has been a weakening of economies of

scale. Due to these reasons, rises in cost, excessive production capacity, and inefficiency in production have been emerging.

(3) Excessive Number of Vehicle Models Compared with Vehicle Output

Foreign auto manufacturers engage in assembly by transferring models developed in their own countries. In this way, many foreign assemblers have advanced into Malaysia. Thus there are too many assemblers compared with the car production rate, yet the number of models is increasing in correspondence with model changes.

With some exceptions, most parts are produced based on the designs of each automobile assembler. Therefore there are not many common parts which can be shared among multiple manufacturers. Moreover, every model produced by the same assembler requires the parts it specifies.

Accordingly, small output of respective models has directly caused small output in parts production. With the recent increase in production of the PROTON Saga, such a problem concerning parts for PROTON is now being solved. However, parts manufacturers producing parts for models other than for the PROTON Saga have to ultimately face a decrease in production, which has created another problem.

5-1-2. Major Problems Viewed from the Angle of the Parts Industry

(1) Low Technical Levels in Parts Production

Malaysia does not have much experience in parts production, and its parts manufacturers are at present rather small in size. This explains why their technical experts and skilled workers are in the stage of development, and parts which can only be produced in large scale plants are not yet produced in the country.

Technologies required for parts production mostly depend upon technical transfer from foreign parts manufacturers. Therefore, although technologies for the respective parts have already been introduced, wide peripheral technologies have not yet developed.

Moreover, concerning technical problems faced by parts manufacturers in daily production, the Malaysian car assemblers are unable to give such advices or suggestions or technical aspects as those which are usually given in Japan.

(2) Weak Price Competitiveness for Parts

The main causes of the weak price competitiveness of Malaysian automotive metal parts is the small lot production. In particular, the cost of mould is very expensive in the total production cost due to both high mould price and low production volume with a unit of mould.

There might be factors which bring down price competitiveness other than the low production volume. Considered factors include low productivity arising from the small size of enterprises and inferior working environments, the owners' ways of thinking regarding enterprise management, and financing problems which prevent equipment modernization investments.

Another problem would be the delay of the production technology development which would fit for small lot production of multiple kinds of parts.

(3) Weaknesses in Measures to Expand Parts Production

Viewed from the parts industry, the quantity of products demanded in the domestic market, above all in OEM only, is too small. On the other hand, an increase in the volume of production is desirable from the viewpoint of economies of scale. This is why parts manufacturers in advanced countries have increased the export volumes of their own parts accompanied by improvement of their technologies. The major export market is REM, and under the present situation, efforts for marketing expansion in this market are being made by every parts manufacturer. However, only comparatively large-scale enterprises can carry out marketing expansion.

5-2. Countermeasures for Major Problems

Measures to help alleviate the current problems of the parts industry are as follows:

(1) Measures to Overcome the Low Level of Technology

a) Establish a basic technical research system

In order to promote domestic production of automotive metal parts, development and acquisition of production technologies and manufacturing skills should be required. For this purpose, it is advisable for organizations to establish a research system which

would supply its results to the public. At the same time, diffusion of the research results to the private sector is also recommended. It is further suggested that continuous on-the-spot guidance be conducted in addition to an introduction of new innovations in technology and quality improvement measures. For example, assembly type parts, now regarded as domestically produced, still largely depend upon imported parts. Therefore, assistance by public organizations is expected to support the local enterprise's effort to produce those parts domestically.

b) Affiliation and technical cooperation with foreign enterprises

To enhance the domestic production rate of automotive metal parts, it has been observed to be efficient either to promote affiliation with foreign enterprises or to introduce technologies from them. Therefore it is desirable to expand and enrich every possible measure for those improvements.

(2) Measures to Cope with Weak Price Competitiveness

a) Promote domestic metal mould production

It has been observed that the percentage weight of moulds are high in the cost structure. Materials for metal moulds, if not domestically produced, could be purchased cheaply, provided appropriate designing and processing technologies are obtained. In the present situation, since development of the domestic mould industry is premature, improvements of technical levels in this field are recommended.

b) Have affiliated companies grow

Due to small lot production, machinery and equipment cannot maintain a high working ratio. Therefore it is advisable to develop linkage type of a firm to which a particular processing works are concentrated without dividing those operations among many firms. For this purpose, enhancement of the technical levels of the local linkage type of firms is necessary. Regarding metal processing technologies, continuous long-term on-the-spot guidance is needed. Furthermore, assistance is requested from assembly type of firms so that these linkage type of firms can develop their capabilities by getting sufficient volume of orders.

c) Make studies on diversification of products

It is suggested that a study be made as to whether automotive parts manufacturers who are equipped with multi-purpose machines can produce some metal products other than automotive parts.

d) Educate owners

It is advisable to strengthen enterprises by introducing overall business management education. Education on the following aspects is advisable as a measure for multi-item production on a small scale, a means to enhance productivity, tackle methods for cost reduction and methodology to introduce small group activities, and so on.

(3) Measures Against Small Domestic Market Demand

Expansion of exports is one policy to expand production. In joint ventures or technically cooperating enterprises, parent companies and their partners have already created supply systems in the major markets. In this case, the two enterprises are expected to coordinate their activities there.

On the other hand, local enterprises with no such relationships are irrelevant to this coordination of activities. However, they have to face the difficulty of acquiring information concerning export markets. Accordingly, as one of the growth measures for local enterprises, it is suggested to give them assistance by offering information for export promotion.

Table V.5-1 Current Problems

(1) Problems Viewed from the Angle of the Environment Surrounding the Parts Industry

a) Decrease of parts production caused by the reduction in automobile production

- In spite of the extreme diminishment in assemblers' operation rates, the number of car models has not been reduced, and the volume of parts for each model have drastically decreased. Therefore, at the moment, there is over production capacity.
- Since the use of domestic parts currently cause excessive cost increase, parts manufacturers cannot adopt a positive attitude.

b) Excessive number of car models and model changes

- Time and high costs are required to apply domestically produced parts to a newly developed model.
- Standardization of the parts is not easy and interchangeable parts are few.

c) Uncertainty about the outlook for the automobile market

- Fundamentally domestic markets are small.
- Car prices are high compared with national income.
- The number of car owners, compared to the population, is already high.
- Quality requirement has reached a severe stage in the automobile export market.
- Future prospects are dim for other assemblers than PROTON Corporation.

d) High dependence on imported raw materials

- Prices of raw materials and parts are rising.
- Inventories of materials three months in advance are usually needed.
- Cold steel sheets and tool steel are not domestically produced.

e) Equipment and tools are highly dependent on imports

- Imported equipment is costly.
- Metal moulds are costly.

f) Lack of active entrepreneurship

- Because of sophisticated technologies and small lot production in automotive parts plants, few are willing to engage in production as unprofitable as the usual metal parts industry.

(2) Problems Viewed from the Angle of the Country's Systems and Policies

a) Positive measures to curtail the number of domestic models cannot be taken

- Compared with total car production volume, number of assemblers are numerous.
- Positive measures for car models cannot be taken.
- There are too many models compared with the number of cars produced.
- Standardization of parts is necessary among models.

b) Insufficient grasp of production situation based on the issued licenses

- Manufacturers have no duty to report on their operational or productive situation by item, so the data on these areas are insufficient.

c) Ambiguity in the classification of parts

- Parts are registered and controlled without classified into two-wheels and four-wheels.

d) Easiness of the import of second-hand motorcars

- Imports of second-hand motorcars in 1987 increased compared to the previous year.

e) Complicated government-related procedures

(3) Problems Viewed from the Angle of Technical Standards and Technical Developments

a) Low level or lack of manufacturing skills

- Precision machinery processing technology is not yet established.
- Present pressing technology level can cover only pulling and bending.
- Large-scale casting capacity has reached up to three-ton items on an experimental basis.
- Aluminum casting technology has not yet established.

b) Technical development delay in metal moulds

- Even simple pressing moulds cannot be designed.
- Drawing processing often creates creases.

c) Small amount of self-made parts

- Even in PROTON, R&D are largely carried out at their partner firm in Japan.
- Many parts are produced on the basis of joint ventures or technical cooperation.

d) Lack of manufacturing skills for main parts

- Important safety parts are not made domestically.
- Peripheral technologies are not developed.

e) Lack of evaluation ability among the assemblers of Malaysia

- To adapt domestic parts, tests are carried out in the exporting country, which takes time.
- Improvements of technology to reduce costs of parts are implemented slowly.

f) Lack of test equipment among parts manufacturers

- Measuring equipment for tests is not available; tests are conducted in the exporting country.

g) Low technical standards

- Many enterprises operate by introducing already developed technologies in firms overseas.
- Self-production of necessary tools such as welding tools, etc., for new models is not possible.

h) Low standards of management techniques

- Most of local enterprises do not maintain plants orderly and the gaps in technical levels among them are large.
- Some enterprises do not have the knowledge on multiple-item and small-lot production method.
- The management staff members cannot make detailed cost calculations.

i) Low quality standards

- Even if samples are made properly, products manufactured on a bulk basis are not accurate.
- Quality gaps are observed among delivered goods.

j) Delayed standardization.

(4) Problems Viewed from the Angle of Business Management

a) Lack of mutual parts supply systems

- There are not such mutual supply system as that PROTON provides other corporations their produced bodies.

b) Lack of linkage between the auto assemblers and parts manufacturers

c) Many corporations are divided into sub-corporations from the reason of taxation system

- Duplication in clerical works and management tasks is observed.
- It is doubtful whether the decision of the management sector is fully communicated to the whole enterprise.

d) Low productivity

- Equipment is old and some of the enterprises only achieve around one-third of Japan's productivity.
- Production volume is small, which gives no merit for automation.

e) Frequently observed job-hopping

f) Higher labor costs compared with Thailand or Indonesia

g) Higher electricity rates compared with neighboring countries

h) Small flexibility in personnel recruitment and layoff

i) High absence rate caused by employee illnesses

j) Welfare facilities are not fully installed

k) Insufficient enthusiasm to diversify the product lines to those of other industries

l) Lack of price competitiveness in the export market, and even in domestic market due to higher costs than those of imported goods

m) Delay in payments schedule.

(5) Problems Viewed from the Angle of Developing Human Resources

a) Opportunities are given for acquisition of technologies only in the technologically tied-up enterprises

b) Lack of exchange of information among enterprises

- Inspection of plants is difficult among different types of industries.
- Contracts are often required even for the acquisition of management skills.

(6) Problems Viewed from the Angle of Marketing Strategies

a) Import markets for parts are controlled by technically tied-up enterprises, therefore marketing constraints exist

- In the Republic of Korea and Taiwan their domestic supply system of automotive parts are already established.

b) Japan, as a trade partner, requests very strict delivery system, known as a just-in-time system. Participation in the system is difficult.

c) There are no sufficient marketing capabilities in tied-up enterprises to allocate overseas market to Malaysian firms.

d) Exported products are requested to achieve high quality standards, but the current technical levels of them in Malaysia are low

e) On Japan's part, it is cheaper to export auto parts directly from Japan then to export them from Malaysia after assembling imported parts.

(7) Others

a) Frequent electric power outs

- Production costs become higher due to the necessity to install in-house power generators.
- Inferior goods are produced during power outs.

VI. CHINAWARE

VI. CHINAWARE

1. Overview of the Industry

1-1 Product Items

In this report, chinaware is defined to include both ceramic tableware and ceramic artware, which are available in such various types as porcelain, semi-porcelain, bone-china, stoneware and earthenware.

Heading No.		Description	Unit of Quantity	Import	Sales Tax
69.11		Tableware, kitchenware, other household articles and toilet articles, of porcelain or china.			
6911.10	000	– Tableware and kitchenware	kg	30% or $1.20 w.i.t.h	10%
6911.90	000	– Other	kg	30% or $1.20 w.i.t.h	10%
6912.00	000	Ceramic tableware, kitchenware, other household articles and toilet articles, other than of porcelain or china	kg	30% or $1.20 w.i.t.h	10%
69.13		Statuettes and other ornamental ceramic articles.			
6913.10		– Of porcelain or china:			
	100	cigarette boxes, ash trays and other smokers' accessories	Value	30%	10%
	900	other	Value	20%	10%
6913.90		– Other:			
	100	cigarette boxes, ash trays and smokers' accessories	Value	30%	10%
	900	other	Value	20%	10%

1-2 Supply and Demand

1-2-1 Consumption

Because of the lack of exact production data of chinaware in Malaysia, the estimation of the size of the domestic market is difficult. Approximately, it is estimated that the total consumption of chinaware in Malaysia was in the range of M$60 million - M$70 million annually over the past 5 years.

Table VI. 1-1 Demand and Supply Flow of Chinaware in Malaysia

(Unit: M$ million)

Year	Production	Import	Export/ Re-export	Apparent [1] Consumption
1981	53.4	21.3	5.6	69.1
1982	47.7	18.5	5.6	60.6
1983	54.3	25.0	10.0	69.3
1984	47.3	26.7	14.6	59.4
1985	60.8	27.4	22.0	66.2
1986	80.0 [2]	19.7	34.0	65.7

1. Apparent consumption is measured as:
   Production + Import - Export/Re-export
2. Estimate based on field interviews:

Source:Industrial Surveys 1981-1985
Malaysia Annual Statistics of External Trade 1981-1986

1-2-2 Production

According to "Industrial Surveys 1985" published by the Department of Statistics, the total production of pottery, china and earthenware was M$60.8 million, and the total number of establishments was 20 in 1985. This production value is underestimated because figures of those firms having less than 30 employees in W. Malaysia and those having less than 5 employees in Sabah and Sarawak are excluded. However, it is overestimated as a production estimate of chinaware because it would include some ceramic items other than chinaware. On balance, the production figures of Industrial Surveys are judged to be acceptable for use in the estimation of chinaware production in Malaysia.

Table VI. 1-2 Manufactures of Pottery, China and Earthenware in Malaysia

	1982	1983	1984	1985
W. Malaysia				
No. of establishment	19	11	9	10
Total production ($ mil)	48.0	52.8	45.9	59.2
Sabah & Sarawak				
No. of establishment	8	8	9	10
Total production (M$ mil)	1.6	1.5	1.4	1.5

Source: Industrial Surveys 1982-1985

1-2-3 Exports and Imports

Exports of chinaware showed a rapid annual average increase rate of 40.5% during the period 1983-1986 in value terms, while imports showed a slight decline during the same period. As a result, Malaysia has changed from a new importer of chinaware to a net exporter in 1986. (Refer to Table VI. 1-3, Table VI. 1-4, and Fig. VI. 1-1)

The major items of the exports are statuettes and other ornaments, which occupied around 78.2% of the total chinaware imports of Malaysia in recent 5 years, and played the major role in the recent rapid export expansion of chinaware. This owes largely to the start of operation by a large-scale foreign subsidiary firm which directs 100% of their products to export markets. Major markets are the U.S. (share 76.3%), the Netherlands (11.0%), Australia, Canada Singapore, Japan and the U.K. Because the firm has a further expansion plan at present, the export of these items is expected to continue to grow. As for tableware, the exports showed a sudden increase in 1987. The share of tableware exports to the total chinaware exports reached 23.4% to 1987, a jump from 13.5% in the previous year. Another Japanese investor is planning to start operation of a tableware factory. Thus, the exports of tableware would also increase after 1989.

After reached the peak at 1985, the imports of chinaware is steadily decreasing. The major item of the imports has been tableware of porcelain. However, the imports of this tableware of porcelain has been decreasing in recent 5 years. The largest supplier country of the item is China, followed by Japan and W. Germany. The share of these three countries to the total import of tableware of porcelain occupy up to 86.6%.

Among chinaware imports, the largest item is ware of porcelain, occupying around 65% of the total chinaware import. The import of tableware of porcelain showed a small but steady decline tendency after 1983.

The major countries/areas exporting porcelain tableware are China, Japan and Taiwan.

Table VI. 1-3 Import Flow of Chinaware in Malaysia

(Unit: M$1,000)

Item	1983	1984	1985	1986	1987
(Tableware)					
Tableware of porcelain	17,480	15,118	14,794	12,823	11,444
Tableware of stoneware	1,536	1,650	2,587	1,728	1,486
Tableware of other kinds	944	1,275	2,909	999	602
(Artcraft)					
Cigarette Accessories	107	298	110	143	52
Lamp and light fittings	50π4	856	538	636	344
Statuettes and other ornaments	4,488	7,473	6,463	3,343	3,031
TOTAL	25,059	26,670	27,401	19,672	16,959

Source: Malaysia Annual Statistics of External Trade, 1982-1987

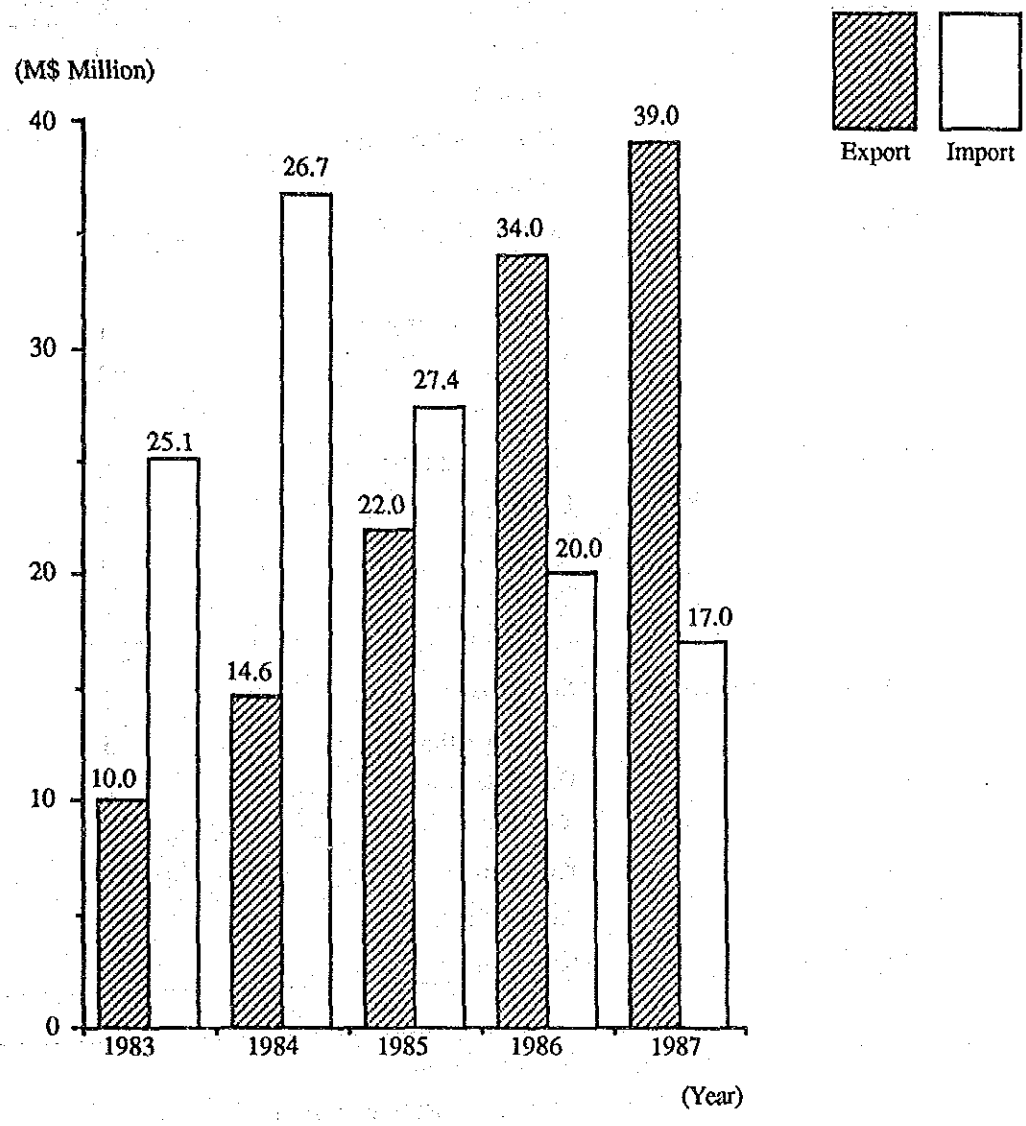
Table VI. 1-4 Export Flow of Chinaware in Malaysia

(Unit: M$1,000)

Item	1983	1984	1985	1986	1987
(Tableware)					
Tableware of porcelain	571	271	365	294	1,888
Tableware of stoneware	2,875	2,758	2,387	2,781	4,910
Tableware of other kinds	681	1,001	1,072	1,534	2,319
(Artcraft)					
Cigarette accessories	19	16	8	78	7
Lamp and light fittings	18	29	49	55	3
Statuettes and other ornaments	5,825	10,583	18,094	29,236	29,830
TOTAL	9,989	14,613	21,975	33,978	38,957

Source: Malaysian Annual Statistics of External Trade, 1982-1987

Fig. VI. 1-1 Export and Import Trend of Chinaware in Malaysia



1-3 Industry Structure

Although there are no exact figures available, there are a relatively large number of family-management type of small-scale ceramic ware manufacturers in Malaysia.

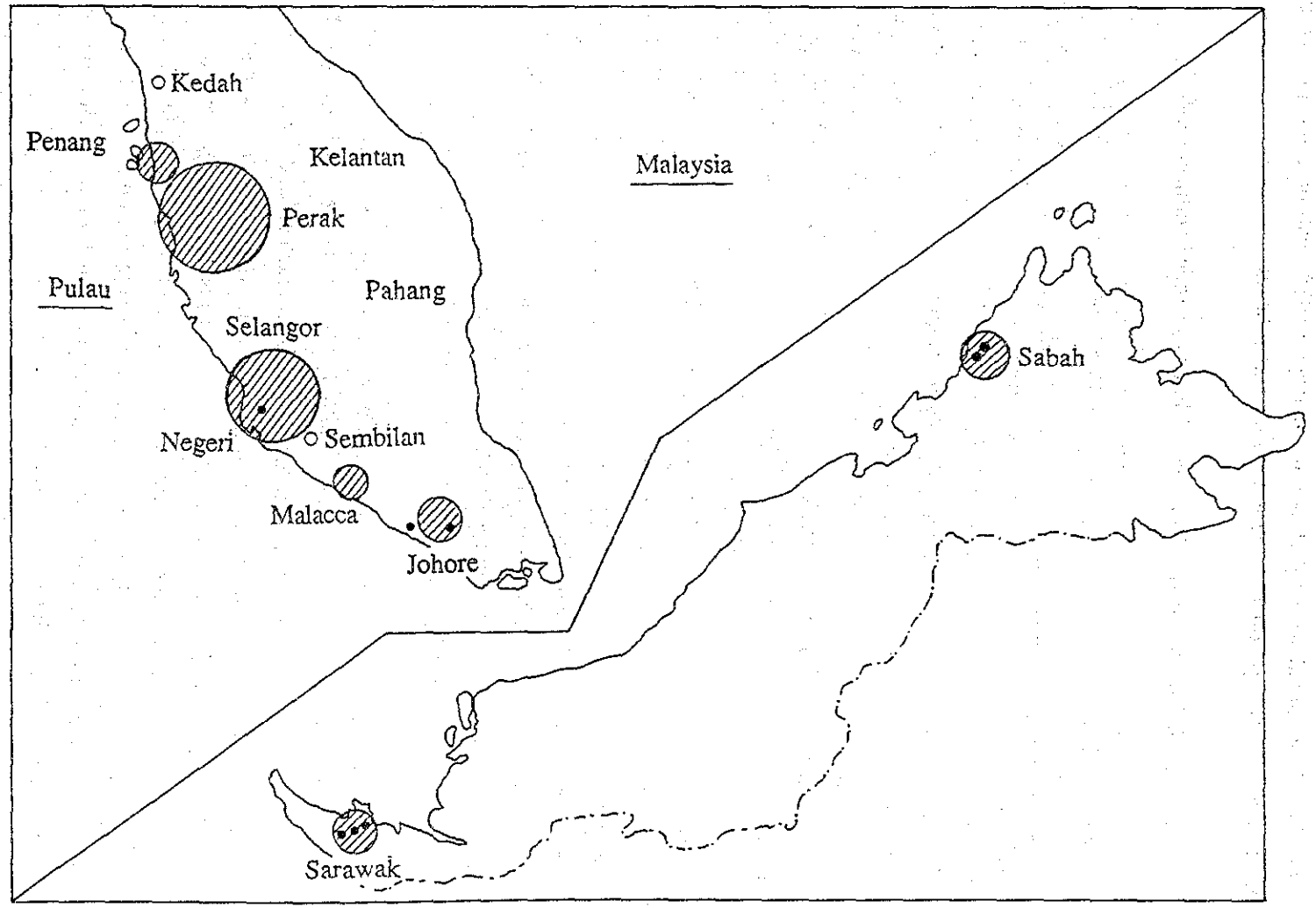
According to :"Industrial Mineral Assessment Report 1984" published by the Geological Survey Department of Malaysia, the number of ceramic ware manufacturers in Peninsular Malaysia is estimated at 114, and "Craft Directory" published by Malaysian Handicraft Development Corp. show those number in East Malaysia at 6. The location of the firms by state is summarized in Table VI. 1-5.

Table VI. 1-5 Location of Ceramicware Manufacturers

State	City	No. of Firms
KEDAH	Kuala Muda	1
	Kuliam	1
PENANG	Seberang Prai Utara	4
	Timor Laut	1
PERAK	Kuala Kangsar	2
	Kerian	5
	Batang Padang	1
	Kinta	43
	Dinding	2
SELANGOR	Kuala Selangor	6
	Gombak	1
	Petaling	3
	Ulu Langat	7
	Federal Territory	24
NEGERI SEMBILAN	Seremban	3
MALACCA	Melaka Tengah	5
JOHORE	Batu Pahat	1
	Kluang	3
PAHANG	Kuantan	1
SABAH	Kota Kinabalu	3
SARAWAK	Kuching	3
TOTAL		120

Source: W. Malaysia Malaysian 1987 Yearbook
Industrial Mineral Assessment Report
1984 Directory on the clay, sand and rock-based industries in Peninsular Malaysia (Geological Survey Department).
E. Malaysia Malaysian Handicraft Development Corporation

Fig. VI.1-2 Geographical Location of Ceramic Ware Manufacturers in Malaysia



Further, "Industrial Mineral Assessment Repot 1984" estimate the production volume of major ceramic products, except for bricks, as follows:

Table VI. 1-6 Production Volume of Major Ceramic Products 1984

Type of Product	Major States of Production	Production Volume/year
1. Wall/floor tiles	Selangor, N. Sembilan	3,826,000 m^2
2. Mosaic tiles	Johore, Selangor	552,000 m^2
3. Sanitary wares	Selangor, Johore, Kedah	675,000 pcs.
4. Tablewares	Johore, Selangor	6,828,000 pcs.
5. Roofing tiles	Selangor & F.T.	1,330m,000 pcs.
6. Sewage and subsoil pipes	Perak	7,312,000 pcs.
7. Flower pots	Penang, Perak	2,703,000 pcs.
8. Latex cups	Melaka, Perak	5,742,000 pcs.
9. Cooking pots	Selangor and F.T., Perak	167,000 pcs.
10. Cooking stoves	Perak, Selangor	222,000 pcs.
11. Saving boxes	Selangor & F.T.	218,000 pcs.

Source: Industrial Mineral Assessment Report
"Production Statistics on Clay, Sand and Rock-based Industries in Peninsular Malaysia for 1984" by N.K. Ang
(Geological Survey Department of Malaysia)

In practice, however, above estimated number of firms is considered to be still underestimated. According to the survey conducted by SIRIM in 1981, the number of ceramic ware manufacturers in Peninsular Malaysia would reach around 350.

Most of these ceramic ware manufacturers in Malaysia do not necessarily specialized in the production of a specific item. Many firms, for example, produced those kinds of products as sewage pipes, flower pots or ornaments in the same factory at once. For this nature of the factory, it is very difficult to estimate the number of firms which produce the targeted product items of tableware and ceramic artware. But the number would become the one which is rather limited.

From their management characteristics, however, chinaware manufacturers in Malaysia could largely be grouped into the following four categories:

A) Tableware manufacturers

B) Decorative manufacturers

- B-1 High-class decorativeware manufacturers
- B-2 General decorativeware manufacturers in W. Malaysia
- B-3 General decorativeware manufacturers in Sabah and Sarawak

At present there is only one specialized tableware manufacturer in Malaysia. This is a joint venture between Japanese and local firms. Their production capacity is around 1.0 million pcs of tableware per month, and the number of employees is about 450 in 1988. Their products are directed both for domestic and for export markets. Another Japanese firm is now preparing to start tableware production in Malaysia.

There are 2 high-class decorative manufacturers presently operating in Malaysia. One firm is a U.S. and another is a Japanese wholly owned subsidiary. Their operation scales are relatively large with the total number of employees around 1,200 and 480, respectively. Their products are all directed into foreign markets.

Most of other chinaware manufacturers are small-scale firms which produce such various kinds of products as flower pots, tableware of earthenware or ceramic artware.

2. Present State of Production

2-1 General

In the field interview survey over 10 chinaware manufacturers were covered, including both tableware and artware manufacturers, located both in W. Malaysia and in Sabah and Sarawak. The names of the companies interviewed and a brief summary of the findings are shown in Table VI.2-1.

General decorativeware manufacturers in W. Malaysia are relatively small in scale. The number of employees of these firms is usually between 30 and 60. They produce various kinds of novelty items such as ash-trays, lamp fittings and statuettes. They produce a limited number of tableware of earthenware. Some of their products are often exported.

Decorative manufacturers in Sabah and Sarawak are mostly the producers of traditional pottery. Most of their products are sold at their own shops located near their factories. Their employees are usually very small in number ranging from 20 to 30.

Table VI.2-1 Summary of Field Interview Survey

		Name of Companies Interviewed	Export Ratio ($)	Number of Em-ployees (No.)	Sales Strategies	Production Process & Specifications	Technical Level	Prodcut Product Development	Relationship with Periphery Industries
West Malaysia	Tableware	Oriental Ceramics	30	450	Export products to Japan, the U.S., Singapore, etc. through their parent company in Japan and its subsidiaries.	Commonly used production process applied for hard earthenware production. Domestic clay materials are used.	High as a manufacturer of hard earthnware	The type of products is to be up-graded to stoneware or further to porcelain.	Local clay material supplier should be developed. Superior quality of packaging materials are needed.
	High-class Decorativeware	Marulee Franklin Porcelain	100 100	480 1,200	All of the products are exported through their parent companies overseas.	Both designs of the products and the specifications for production are decided in the headquarters of their parent companies.	Very high level of quality control measures are taken	Most R&D activities especially in new product development are conducted in the headquarters of their parent companies.	Domestic suppliers which could supply clay materials fit for porcelain production are needed.
	General Decorativeware	Aw Pottery Asian Pottery Hong Pottery	60 20 30	70 30 60	Domestic sales are conducted at shops beside the factories. Except for one firm, others export products based on ad-hoc inquiries.	Major method of forming is slip casting, but jigger forming is also used. Many facilities are already obsolete.	Inferior compared with the technical levels in major competing countries such as China, Taiwan, or Thailand.	Their first concern seems to be more on sales rather than on production.	Various kinds of supportive measures are needed in order to breeding them up to export oriented firms.
East Malaysia		Wong Sian Hup (Sabah) Siner Pottery Wong Sian Hup (Sarawak) Hua lian Pottery	0 0 0 0	23 20 20 25	Products are all sold as souveniors at shop beside the factories.	Most of the factories follow the same traditional production process.	No systematic production control or quality control measures are taken.	For the production of other artware than traditional pottery, the directly imported foreign technologies are used.	Most of them are presently independent from other industries.

2-2 Tableware Manufacturer

There is only one specialized tableware manufacturer operating in Malaysia at present. This company is a joint venture between a Japanese and a local firm. Established in 1973, they presently produce around 0.83 million pcs of tableware per month and export about 30% of their products.

2-2-1 Production process and specifications:

Their production process is basically as follows:

Forming --> Biscuit Firing --> Glazing --> Glost Firing

This process is most commonly used for the production of hard earthenware in Japan and in other major chinaware producing countries. For decoration both the Under Glaze Decoration method, decorating before glost firing, and the Over Glaze Decoration method, decorating after glost firing, are used.

As for raw materials domestic clay minerals are used, but feldspar for glazing is imported. They make good use of kaolin clay produced in Johore.

2-2-2 Technical level

The key production technologies for tableware production are that of raw material formulation and that of firing. The raw material formulation technology includes the quality testing of mineral raw materials, production of well-formulated materials and glazing chemicals. The firing technology is the one to produce a constant quality of ceramic products by proper temperature control.

The tableware manufacturer now operating in Malaysia is a joint venture with a Japanese manufacture, which has over 50 years of tableware production experience, and has enough technical background both in knowledge and experience comparable with other competing countries.

2-2-3 Production development

The product development could be divided into the following two directions; one is the development of new type of products which are produced from different materials through different production processes, and another is the development of new designs or shapes of the existing type of products. For the first type of development, very high level of technology is needed. The latter type of development must be continued day by day and every year.

As for the tableware manufacturer presently operating in Malaysia, it is planning to start the production of tableware of vitreous china, which is a kind of stoneware of high value. They are planning to target these products for the domestic institutional market, in particular, the hotel market.

2-2-4 Sales strategies

They export products to Japan, the U.S., Singapore, Australia and the Middle East through their parent company in Japan and its subsidiaries overseas.

For domestic sales, they have a couple of shops directly under their control. Due to the inflow of a large volume of tableware both of high and medium qualities from competing countries, the domestic competition is very severe.

They are going to penetrate the hotel market with tableware of vitreous china as described above.

2-2-5 Relationship with periphery industries:

For the development of high-value tableware production for the export market, the development of supporting industries has to be achieved in Malaysia. Particularly important is the supply of domestic clay minerals. They are at present supplied in as-mined conditions, which creates inconsistent product quality. According to the tableware manufacturer in Malaysia, they would have to be dependent on imported clay minerals for the production of vitreous china. Further, the development of those firms which could supply superior quality packaging materials for high premium products would be needed.

2-3 High-class Decorativeware Manufacturers.

Two high-class decorativeware manufacturers presently operating in Malaysia are both wholly-owned subsidiaries of U.S. firm and Japanese firm, respectively. All of their products are exported.

2-3-1 Production process and specifications:

Their major products are statuettes or animal figurines which are finely designed. Formings are all made by the slip casting method. After forming, biscuit firing, decoration and glaze firing follow. Superior design is the key area which decides the value of this high-class decorativeware. In both firms, the designs of the products and the specifications for production are both decided in the headquarters of their parent companies overseas.

2-3-2 Technical level:

In order to maintain their products, high brand image in the world market, quality controls are conducted based on the very strict standards designated by their parent companies. Based on the designs and specifications instructed from their parent companies, Malaysian factories are presently producing very high quality products fully competitive in the overseas markets. Both of them are making best use of skillful handworks of Malaysian workers.

2-3-3 Product development:

Most of the R & D activities especially in the field of new product development, are conducted in their headquarters overseas. Accordingly, the efforts of Malaysian firms are confined to areas as productivity increase on of quality control. Some efforts are also directed for the higher percentage use of local clay materials.

2-3-4 Business administration and sales strategies:

In each of these two firms, the Malaysian firm is operated as one of the production centers of their parent company, and has no particular administrative problem. All of their sales activities are also conducted by their parent companies.

2-3-5 Relationship with periphery industries:

In order to achieve a strict quality standard, almost all of their raw materials including clay minerals are imported. One of the firms presently uses a limited volume of domestic kaoline clay in combination with imported clay materials. However, the volume is still limited because of the lack of domestic sources which could supply a sufficient quality of clay material fit for porcelain production.

2-4 General Decorativeware Manufacturers in W. Malaysia

There is a relatively large number of ceramic decorativeware manufacturers in W. Malaysia. They are mostly very small in scale, but produce a wide range of products. Their products include not only decorativeware but also tableware of earthenware or clay pipes. Many of them sell their products also to the export market. The average number of employees of firms interviewed was about 60. One of them was a joint venture with a Japanese firm.

2-4-1 Production process and specifications:

The major method of forming is slip casting, but jigger forming is also used. Most of the products are fired only one time, but some are finish fired after biscuit firing. The usual temperature for finish firing is around 1,200°C. Most of the firms use 100% local ball clay, but some firms combine some 10% of feldspar into local ball clay. Most of the factories have a long history of over 50-60 years. And due to the repeated expansion of factory buildings and equipment, the lay-out of factories is not well-organized, and many facilities are already obsolete.

2-4-2 Technical level:

The technical level of decorativeware manufacturers in W. Malaysia is judged to be still inferior compared to those of major competing countries such as China, Taiwan or Thailand. The products made in Malaysia are still at the level of earthenware, while those of major competing countries are of porcelain. The major cause of this inferior product quality is the unavailability of high-quality clay materials. Therefore, technical improvement in the areas of kiln temperature control, of raw material combination or of design development would have to be achieved. In the field of design development, particularly, most of the firms have no capability to develop their own design, and could not go beyond the stage of imitation.

2-4-3 Product development:

Except for one firm which has an established sales route to the export market, all other companies interviewed have very weak sales capability. As such, their first concern is to concentrate on sales at the expense of product development, although they understand the necessity to make further improvement in their production technology and to modernize their production facilities.

2-4-4 Business administration:

Almost all of the firms are managed as family businesses. Together with their weak and unstable sales achievement, the recruitment of funds for facility up-grading from commercial banks seems to be rather difficult.

2-4-5 Sales strategies:

One company has a high export ratio. This company sells 60% of their products overseas. They have a sales subsidiary in the U.S., and actively participate in the various trade shows overseas. For domestic sales, this firm has a large retail shop beside the factory, which is also used as a show-room for the foreign buyers or sightseers. Other companies sell most of their products at their own retail shops operated beside their factories, and have no other established sales network. Although they export some portion of their products, these transactions are infrequent. They export their products based on ad-hoc inquiries from overseas buyers which are received through MEXPO or other sources.

2-4-6 Relationship with peripheral industries:

Because all firms are small in scale, it seems to be very difficult for them to up-grade their product quality to an exportable level without support from outside supporting industries or organizations. For one, they need ball clay and other mineral material suppliers who could supply higher and more consistent quality of materials. Two, they need a technical institution to test and analyze the material and product quality. Three, they

need a financial institution which can supply funds to up-grade their production facilities with short term loans. Finally, but most importantly, they need support for increasing their marketing capability both for the domestic and export markets.

2-5 Decorativeware Manufacturers in Sabah and Sarawak

The decorativeware manufacturers in Sabah and Sarawak mainly produce a traditional type of pottery called "Sarawak pottery". Most of them produce not only pottery but also various kinds of artware such as light fittings, ashtrays or figurines. Some also produce such clay products as clay pipes, flowerpots or sanitaryware.

2-5-1 Production process and specifications:

Most of the factories follow the same traditional production process. After forming by slip casting, products are dried naturally. At the stage that the water content ratio has dropped to around 6-7%, they are glazed and decorated by knife carving. After being naturally dried, they are fired either in traditional kilns making use of fire wood or in shuttle kilns making use of oil or LPG.

2-5-2 Technical level:

The production technology of these firms is wholly dependent on the personal skill of each factory manager based on his experience. There are no systematic production control or quality control measures taken.

2-5-3 Product development:

For the production of traditional Sarawak pottery, no product development efforts would be required. For the production of other artware some modernization efforts are observed, but these efforts are mainly directed into the direct import of foreign technology. Some firms make use of pre-combined clay materials imported mainly from Taiwan, in spite of the availability of domestic clay resources.

2-5-4 Business administration and sales strategies:

Almost all decorativeware manufacturers in Sabah and Sarawak are family firms. Their factories are usually built alongside the main roads, and products are all sold as souvenirs at the shops beside the factories. Most of them have no other sales network nor any experience in exports.

2-5-5 Relationship with periphery industries:

Except for some firms using mostly imported clay materials, most of the firms are independent from other industries. They use such easily available raw materials as ball clay or rice husks effectively. Their sales are, however, heavily dependent on the development of the tourist industry.

2-6 Raw Material

2-6-1 General

The basic raw materials used in the chinaware production are kaolin, clay, feldspar, limestone and silica sand. Malaysia is rich in most of these raw materials except for feldspar. At present, feldspar is fully imported, as well as a small amount of chemicals used as glazes and decoration pigments.

2-6-2 Kaolin

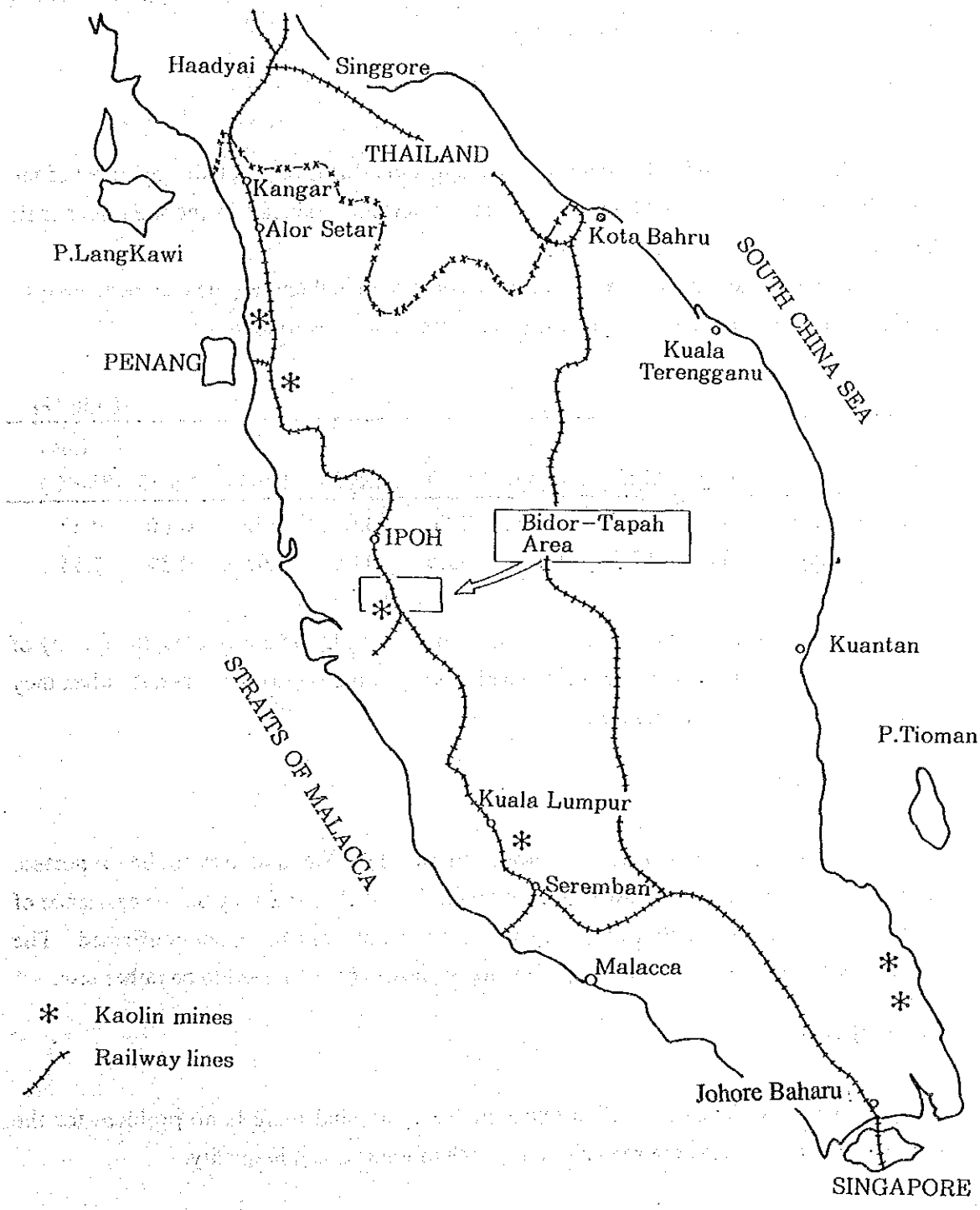
The present major production areas of kaolin in Malaysia are the Bidor-Tapah area in Perak State and the Jemaluang area in Johore state. A relatively large volume of kaolinite clay suitable for ceramic products is reported to be found in Sarawak. (Refer to Fig. VI. 2-1)

Kaolin in Bidor-Tapah: There are two sedimentation refining plants of kaolin in Bidor-Tapah. The products of these two plants are mainly used in such industries as paper-manufacturing, emulsion paints, pesticides or rubber products. Only about 10% of the products are directed to ceramic manufacturers. According to a manufacturer using the material, the product quality of kaolin presently produced is not satisfactory for the production of high-class decorativeware of porcelain. According to the chemical analysis results of kaolin from Bidor reported in "Investment Opportunities in the Claybased Industry" published by MIDA, the contents of major items are; Al_2O_3 29.06%, Fe_2O_3 3.74% and TiO_2 0.78%. With this quality level, the kaolin from Bidor would not be appropriate for the production of high-grade tableware or decorativeware of porcelain. Further investigation would be needed for the possibility of producing a higher grade of kaolin from the area.

Kaolin in Johore: According to the same MIDA report described above, the major chemical contents of kaolin from Johore are as follows: Al_2O_3 36.10%, Fe_2O_3 0.70% and TiO_2 0.24%. The kaolin of this level of quality is judged to be useful for the production of high-grade tableware.

Kaolin in Sarawak: According to the data presented from the Geological Survey Department, Kuching, the chemical analysis results of kaolin produced from Sarawak is as follows; Al_2O_3 22-25%, Fe_2O_3 0.6-0.7% and TiO_2 0.6-0.8%.

Fig. VI.2-1 Kaolin Reserves in Peninsula Region of Malaysia



According to the chemical analysis data mentioned above shown, the kaolin produced from Johore shows the highest quality. In order to evaluate the quality of kaolin, not only chemical analysis but also the tests for plasticity have to be conducted. Further, these various kinds of factors that would become essential for the feasibility of economic production would have to be examined such as reserve volume, transportation condition or exploitation concession terms.

2-6-3 Ball Clay

Malaysia is rich in clay material. Though some firms import ball clay, most of the ceramic manufacturers in Malaysia use clay materials produced in the area near their factories.

According to the data obtained from a ceramic manufacturer, the chemical analysis result of the clay from their presently used clay reservoir is as follows:-

(Unit: %)

	SiO_2	Al_2O_3	Fe_2O_3	CaO	MgO	U_2O	Na_2O	Ig. Loss (850°C)
Upper Layer	63.6	21.8	1.44	0.86	0.06	1.42	0.66	9.37
Lower Layer	70.6	18.1	0.62	0.65	0.05	1.95	0.24	7.11

According to the factory manager of the firm presenting the above data, the quality of clay presently produced is unstable, which is very common to clay materials when they are used in as-mined condition.

2-6-4 Feldspar

At present, feldspar is not produced in Malaysia and has to be imported. According to the Geological Survey Department in Sabah and Sarawak, the existence of oligoclase in Sabah and that of feldspathic clay in Sarawak has been confirmed. The possibility of the economic level of production is, however, estimated to be rather low.

2-6-5 Silica

A massive deposit of silica exists in Malaysia, and there is no problem for the supply of silica to chinaware manufacturers both in volume and in quality.