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HIGH-LEVEL ADVISORY SERVICES TO  
THE AUTOMOTIVE SECTOR

SI/PHI/88/802

PHILIPPINES

Technical report: Opportunities for Export-Oriented Industrial Development\*

Prepared for the Government of the Philippines  
by the United Nations Industrial Development Organization

Based on the work of K. Chen,  
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### Executive Summary

At the request of the Philippine Government, the United Nations Industrial Development Organization (UNIDO) sponsored a mission to assist the Philippines to identify and assess export-oriented industrial development opportunities in the automotive sector. Emphasis was put on the involvement of the private sector from both the Philippines and the industrialized nations.

The mission took place during the period of December 3 to 11, 1988, and spent time to consult extensively with Filipino officials and experts in industry, government, and academe, and with corporate executives and specialists from industrialized nations in the Cebu Export Processing Zone as well as in the Metropolitan Manila area.

The initial focus of the UNIDO mission was restricted to the replacement parts manufacturing and marketing. The rationale behind this focus was based on the observation that the manufacture of complete vehicles from the Philippines for export to compete in a global market that is already overcrowded with world-class vehicles produced by both traditional and newly industrialized countries seemed out of the question in the foreseeable future. On the other hand, the manufacture of automotive parts to supply foreign automakers located overseas would require the kind of product quality and just-in-time delivery that the Philippine automotive parts manufacturers would find extremely difficult to meet. Therefore the realm of feasibility for the Philippine automotive industry for exports appeared to be restricted to the aftermarket (that is, the market for the spare parts and replacement parts after the initial vehicle sales).

While the above focus remains well-justified in the near future, the UNIDO mission, after consultation and reflection with the Philippine public and private sectors, concluded that a longer-term strategy which includes the manufacture of complete vehicles in the Philippines must be developed not only to satisfy higher-level national goals, but also to keep replacement parts manufacturing as a viable industrial activity in the long run. This is because of the globalization of the automotive industry, including the tiering trend of automotive parts supplier industry. Those automotive parts manufacturers which do not have close connections with the original equipment manufacturers (OEMs) will find it very difficult to stay profitable in the long run.

The above conclusion has led to the recommendation by the UNIDO mission that the Philippines should seriously explore a

two-prong approach: the development of selected automotive parts manufacturing for both domestic and foreign aftermarkets in the near term; and the development of a strategy for the manufacture of Philippine automobiles in the long term. These two developments should be coordinated so that they will become confluent and mutually supportive of each other.

In support of the above recommendation, a preliminary framework has been developed and a preliminary analysis has been done for identifying selected automotive parts to be manufactured in the Philippines for export in the near future. In addition, the essential characteristics of a national strategy for the manufacture of a Filipino car in the longer term have been described.

### Background

A new policy of the United Nations Industrial Development Organization (UNIDO) in recent years is to emphasize the private sector involvement in international industrial development. This means the involvement of the the private sector in both the developing countries and the industrialized countries. Much of this new policy is being implemented through UNIDO's Division of Special Programmes and Activities.

In May 1987, Mr. Domingo L. Siazon, jr., UNIDO's Director General, accompanied by the Director of UNIDO's Division of Special Programmes and Activities, and other UNIDO officials, visited the University of Michigan to discuss UNIDO's new policy with a number of U.S. companies, public officials, as well as the administration and the faculty (especially those in the business and engineering schools) at the University of Michigan. One of the results of that visit was an agreement signed between UNIDO and the University of Michigan to provide mutual support in the activities involving the private sector in international industrial development. Because of University of Michigan's proximity to the U.S. automotive and high-technology electronics industries, the University of Michigan was encouraged to consider facilitating UNIDO's initiatives to involve the private sector activities in these two sectors.

In response to the above challenge, Dr. Kan Chen, Professor of Electrical Engineering and Computer Science at the University of Michigan, accepted the invitation by the Philippine Government to visit the Philippines for three days in October 1987 to explore the feasibility and desirability of conducting two missions -- one on the automotive sector and the other on the electronics sector -- to assist both the private and the public organizations in the Philippines to identify export-oriented industrial development opportunities. Subsequently a return visit was paid by Mr. Eduardo Santayana of the Philippine Metals Industry Research and Development Center (MIRDC), who spent ten days in the United States during the month of March 1988 to further delineate the scope and the objectives of the two missions. These two mutual visits resulted in the recommendation for the automotive mission to focus on the manufacture of automotive parts for export to the foreign aftermarket (that is, the market for the spare parts and replacement parts after the initial vehicle sales).

The Philippines has been engaged in automotive assembly and manufacturing since 1952. Assembly has been based on semi and completely knocked down kits imported from industrialized countries. Manufactured automotive products have included parts for the domestic assembly operations with a view toward increasing local contents and replacement parts for the aftermarket. For export purposes, the latter (spare parts and replacement parts for the aftermarket) appear more practical as the requirements for product quality and just-in-time delivery by

the foreign original equipment manufacturers (OEMs) have been very stingent and are expected to be even more so in the future.

Given the above background and initial focus of the mission, which was formally requested by the Philippine Government and approved by UNIDO, the following team members were selected, with their expertise and complementary roles as indicated:

**Kan Chen, Professor of Electrical Engineering and Computer Science, and Director of the Program in Technology Planning and Assessment, University of Michigan**

- expert in international industrial development
- mission organizer and leader

**Harold C. MacDonald, former Vice President for Product Planning, Ford Motor Company, and Consultant to Echlin**

- automobile and parts manufacturing
- experience in China

**Henry P. Alessio, partner, Easton Consultants, Inc.**

- automotive parts aftermarket
- international competition

Details of the background of the above experts are given in Appendix A. The fact that all three members of the mission are from the United States was inadvertent as the intention of the UNIDO mission was to be multilateral. In fact, attempts had been made to include a Japanese expert in the mission even though it turned out that time did not permit the fruitful recruit of an appropriate representative from Japan. However, it is hoped that the private sector from Japan and other industrialized countries will participate in the implementation of some of the recommendations to be made in this report.

The mission took place during the period of December 3 to 11, 1988. Plenary meetings, small group discussions, site visits, working lunches and dinners, and debriefing sessions were held, involving public officials and agencies, indigenous and multinational private firms, universities, and professional and trade associations in the Philippines. These mission activities were conducted in the Cebu Export Processing Zone as well as in the Metropolitan Manila area. The agenda of the mission activities is given in Appendix B and the persons contacted by the mission during the seven-day period are listed in Appendix C.

### Objectives

Given the above background, the objectives of the mission are to assist the Philippines to identify and assess export-oriented industrial development opportunities in the automotive sector. The initial focus will be on the manufacture of automotive spare and replacement parts for export to the foreign aftermarket. Both near-term and long-term strategies are to be considered. The mission is expected to make specific recommendations for actions to be taken by the Philippine government, industries, academic and professional institutions, and by international agencies including UNIDO and other United Nations organizations, in order for the Philippines to capture and benefit from these opportunities.



## Investment Climate and Comparative Advantages

Automotive manufacturing is a global industry. For the Philippines to export to the automotive world market, some form of cooperation with foreign firms, including investment by the foreign firms in the Philippines, is usually a necessary first step. As the industrial planners and investors take a longer view and compare alternative strategies, the relevant comparative advantages of the Philippines must be considered as a basis for long-term cooperation and competition. Thus, before we get into the near-term and longer-term trends and strategies, we need to assess the general investment climate in the Philippines and the country's comparative advantages that are relevant to the automotive industry.

### Investment Climate

From almost everyone who has been approached recently for considering industrial cooperation or investment in the Philippines, the first question invariably is about the political stability in the country. People who have not set foot in the Philippines have a mental image derived from the news media that another political coup may erupt anytime, an image that is certainly not conducive to foreign investment. Our impression and assessment are that the Philippine political situation is much more stable than what the news media tend to project. Unfortunately, this discrepancy between the common image and realities have persisted not only among those foreign executives who have never been to the Philippines, but also between the decision makers at the headquarters of the multinational companies investing in the Philippines (who are frequently jolted by the political news) and the expatriates running their operations in the country (who have much more confidence in the Philippine investment climate).

Perhaps the strongest votes of confidence in the Philippine investment climate have been casted by the actual investment decisions of a number of multinational companies. Many of these companies which have had operating experience in the Philippines are either increasing their investment or returning to the country if they have withdrawn in recent years. In the automotive industry [see Ward's Automotive International, December, 1988], for example, Toyota has recently decided to return to the Philippines, from which it withdrew in 1984 after two decades of major presence. The newly-formed venture is jointly owned by Toyota (25%), Mitsui & Co. (15%), and Philippine investors (60%). The joint venture is expected to start assembling automobiles in early 1989, with an initial capital of about \$10 million.

Toyota's return to the Philippines is not a single isolated event. Elsewhere in the automotive industry, Isuzu plans Philippines assembly of commercial vehicles in a joint venture

with General Motors. Toyota and Isuzu will each have an initial production in the range of 2,000-3,000 units per year. In addition, Suzuki plans to have Philippines Hino, a Hino Motors Ltd. subsidiary, assemble minitrucks with a startup output of 900 units annually. These developments represent a definite reversal of the pulling out of foreign interests in 1983 when there were foreign investments in five vehicle assemblers in the Philippines. By 1986, there were only two such foreign interests, Mitsubishi Motors Corporation (MMC) and Nissan Motor Company, remaining in the Philippines. Now, both MMC and Nissan are expanding their operations in the country.

The return of the multinational companies to the Philippines is also taking place in other industries. For example, in the electronics industry, Texas Instruments has increased its cumulative investment for assembly and testing of integrated circuits in Baguio Export Processing Zone from \$53.8 million in 1986 to \$88.4 million by the end of 1988. Motorola, which plans to quadruple its production space, again for assembly and testing of integrated circuits, in the Metropolitan Manila area over the next three years.

It should be noted that the increasing investment of the multinational companies in the Philippines, although no news to the interested people in that country, is not well known to the rest of the world. Obviously, some systematic publicity about such facts outside of the regular news media would be helpful to change the poor and inaccurate image of the investment climate in the Philippines.

The mission members also reviewed a great deal of data collected by the Philippines government that are indicative of the investment climate in the Philippines. Among the most noteworthy data are the substantial restoration of labor stability as reflected by the sharp decrease of mandays lost from strikes since the unsettling year of 1986.

The total investment in the Philippines has been increasing substantially. In 1987, the Philippine Board of Investment registered a total of nearly 1,500 projects with an aggregate project cost of about \$250 million, a more than threefold increase over 1986. By far the largest fraction of investment has been coming into the country from Japan, Taiwan, and South Korea.

From a dismal -14.1% growth rate in 1985, Philippine exports registered positive growth rate of 4.6% in 1986 and 17.6% in 1987. For the first four months of 1988, export earnings increased by 27% to a total value of \$2.1 billion, compared to \$1.6 billion a year ago.

On the other hand, one should not read from the above paragraphs that the investment climate in the Philippines is entirely rosy. The heavy burden of foreign debt (in the order of \$25 billion), the still relatively high population growth and

unemployment rate (in the order of 7%), and the countryside insurgency problem, are all dark clouds casting shadows on the business and investment climate. The major point we wish to make here is that the real situation is not nearly as bad as the very negative image conveyed by some of the news media.

### Comparative Advantages

The Philippines ranks as one of the richest countries in Southeast Asia in terms of natural resources, second only to Indonesia because of the substantial oil reserves of the latter country. However, as far as the automotive industry is concerned, the extensive agricultural lands, the vast forest reserves, the rich mineral deposits (especially gold and copper), and the hydro and geothermal energy resources of the country, are not nearly as important as the Philippine human resources.

The Philippines is considered the third largest English-speaking country in the world, after the United States and the United Kingdom, and English is the primary language used in its school and college curricula. The highly literate population provides an important human resource. The multinational companies with operations in the country have all praised the work ethic, the diligence, and the trainability of the indigenous work force. The wage and salary levels of the excellent manpower are quite low. Even with the integration of the cost of living adjustments (COLA) into the basic wages, the pay rates for semi-skilled and skilled labor in the automotive industry are still significantly below that in other ASEAN countries, and the starting salaries of engineering graduates are still in the order of \$100 per month.

Concomitant to the English-speaking background, the Philippine population as a whole also has a very good understanding of the Western world, especially the United States. There is a great deal of commonality between the Philippine and the American social systems - legal, political, economic, educational, religious, and cultural. No doubt this affinity between the two countries has its roots in their historical ties. However, the relative depth of the Philippine understanding of the Western world, as compared to other Asian countries, has not been explicitly and sufficiently recognized as a comparative advantage for industrial development.

There are a number of higher educational institutions in the Philippines. All the top three universities - University of the Philippines (UP), De La Salle University, and Ateneo de Manila University - have departments and programs graduating scientific and technical people for the automotive industry. As the comprehensive state university, UP attracts the best students in the country and has seven colleges including Engineering, Law, and Medicine. Its large campus in the suburb of Manila has plenty of land for expansion. De La Salle and Ateneo are located in the business districts of Manila. In addition to

regular university departments, these two universities also offer post-graduate and continuing education programs. The three universities provide hundreds of graduates per year in the areas of electrical and mechanical engineering, which are important to the automotive industry. Many of these graduates go abroad to pursue advanced degrees or receive additional training. While the curricula in these universities appear adequate, their equipment is understandably deficient for state-of-the-art technical training.

While the quality and trainability of the Philippine technical people are quite high by international standards, their costs have remained quite low -- even by average Asian pay scales. According to government and industry sources, the starting salaries for four-year engineering graduates have hovered around \$100-120 per month. Due to their abundance and underutilization, not only in the Manila Metropolitan Area but also in other cities such as Cebu and Baguio, these salary figures also apply to engineers with several years of experience. Multinational firms located in the Philippines have had excellent experience in using and training these technical people to do design as well as manufacturing engineering work. This English-speaking, hard-working, capable and low-cost human resource pool continues to grow and provides perhaps the most important comparative advantage for the Philippines in the automotive industry.

### Background of the Philippine Automotive Industry

To provide an appropriate context for the specific findings of the mission, we will first summarize the background of the Philippine automotive industry [Moran, 1988]. The Philippine automotive industry began in the year of 1952. Up to that time, all motor vehicles in the Philippines were imported as completely-built up units. In order to reduce the drain on foreign exchange, the Philippine government embarked on an import substitution policy in 1952, which led to the assembly of automobiles with semi-knocked down packs from overseas and with minimal local content. Vehicle assemblers proliferated afterwards and at one time there were approximately 19 firms assembling 129 models and variants. From the standpoint of economy of scale, which is important in automotive manufacturing, the overcrowded automotive industry proved to be wasteful and uneconomical. In 1972, the Progressive Car Manufacturing Program (PCMP) was launched with limited participation, progressively higher local content over time, and some measure of exports.

Although not as successful as it could have been, the PCMP was able to attain a local content of 45% for cars and 65% for commercial vehicles. Assembling operations were limited to 5 participants. Increasingly local automotive parts were produced by domestic car firms, and 220 component manufacturers came into being. The consequent savings of foreign exchange amounted to \$400 million over 14 years. Employment reached a peak of over 10,000 in 1978. Through technology transfer, the Philippine automotive manufacturers were able to make such major components as engines, transmissions, body stampings and axles. Total vehicle sales were in the range of 60,000 units per year from the late 1970s through 1983, and registrations were near 500,000.

Then the economic crisis hit in late 1983 after the assassination of Senator B. Aquinos and continued until 1986 after the downfall of the Marcos regime. During this period, vehicle sales were only about 5,000 units per year. Sales recovered to 6,000 units by 1987, and climbed to an estimated volume of 14,000 in 1988. As indicated in the previous section, only two automobile assemblers with investments from Mitsubishi and Nissan, respectively, remained in operation by 1986. The recent turnabout has been a result of the new political situation in the Philippines and the launching of three new motor vehicle programs by the Philippine government: (1) Car Development Program, (2) Commercial Vehicle Development Program, and (3) Motorcycle Development Program. These programs are all purported to revitalize the automotive industry in the Philippines, with the objectives of viable parts manufacturing, technology transfer and development, employment generation, reasonable domestic vehicle prices, and foreign exchange savings and earnings. With these new programs, the current production level of around 15,000 to 17,000 vehicles per year is targeted for increase by 1991 to 28,000 passenger cars, 23,000 commercial vehicles (which may be broken down to 15,000 Asian Utility Vehicles and light commercial

vehicles; and 8,000 trucks and buses). The review and assessment of these new motor vehicle programs provided part of the essential information for the UNIDO mission that has prepared this report.

## Automotive Parts Manufacturing

### Tiering of Parts Suppliers

If the Philippines are going to export automotive parts to the world market, it will be important to first consider the trends and the changing structure of the automotive parts market in the world outside of the country. "Globalizing" describes many aspects of the automotive industry. The original equipment manufacturers (OEMs) of motor vehicles and their components suppliers have operations around the globe, and often organize their international activities in three major areas of the world; viz., the Americas, Europe, and the Asia/Oceania. Technology is a popular theme used by these world class industry participants to distinguish themselves from competitors. While certain technology is becoming similar, or being more commonly used, other factors suggest individual companies' approach to technology is what provides comparative advantage.

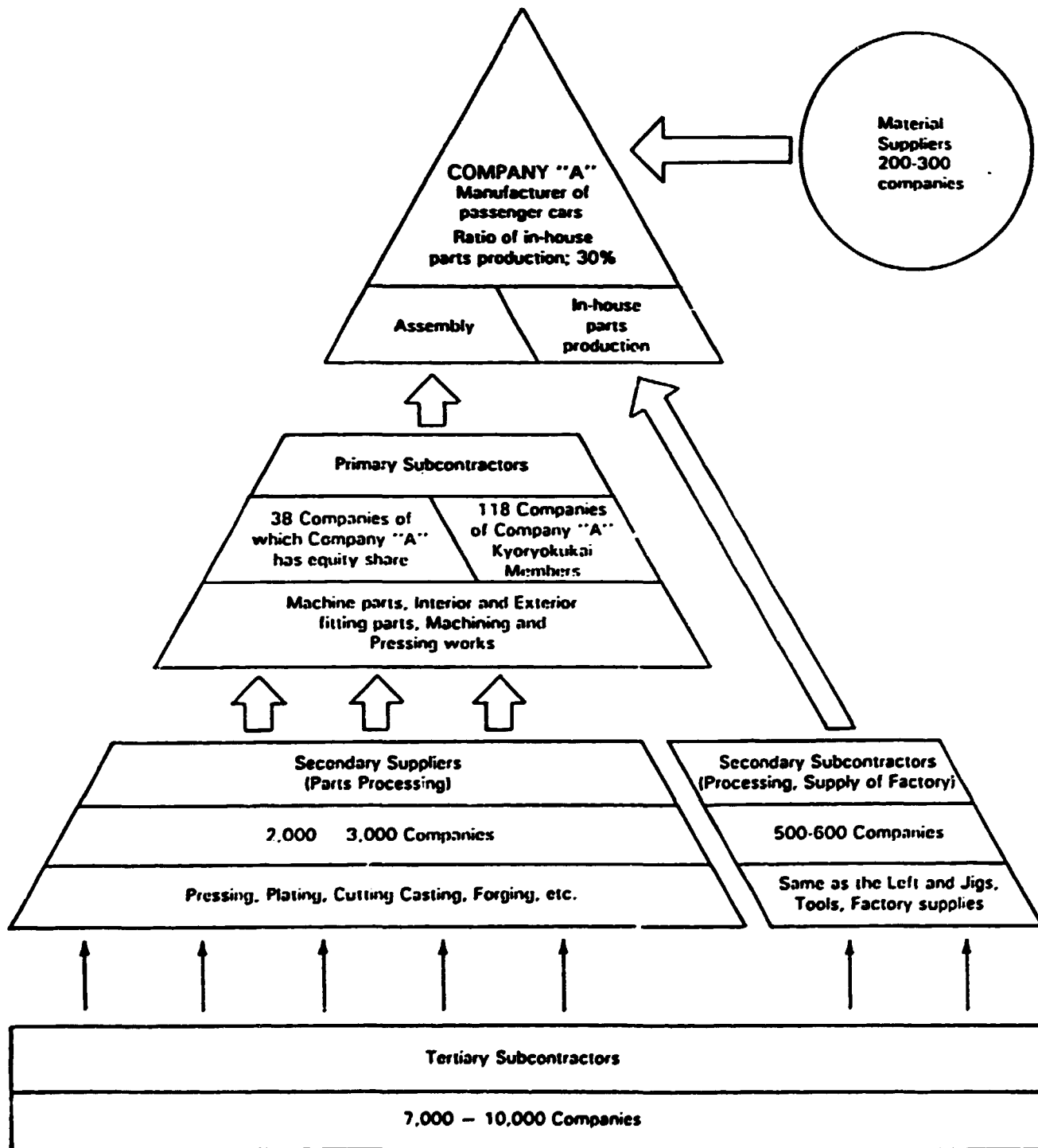
Most or all OEMs have, or are evolving toward, a "tiering" organization which cause relatively few large suppliers to interact directly with the OEMs. The first tier direct suppliers are, in turn, supplied in part by the second tier companies; second tier companies get some of their needs from the third tier, and so on. Figure 1 shows the tiered supplier relationships with an illustrative Japanese OEM. The Japanese auto industry has been a world leader in this tiering trend.

More important than supplier relationships are two resultant structural changes: (1) increased competition among parts suppliers (to participate in as high a tier as possible); and (2) increased demands by OEMs for an even closer cooperation between them and their direct suppliers. Tier one suppliers must respond faster to design changes, be faster in making prototypes, and be faster to prepare for production.

The most significant demand placed on the first tier is to be able to develop systems of components which are integrated with all other systems comprising the vehicle. Tier one systems suppliers are involved early in the OEM design process and are expected to contribute design and technical problem solving capabilities. This requires continual and intense investment in R&D which is often a feature that distinguishes tier one from other suppliers. In other words, tier one suppliers are not merely parts producers!

Tiering of suppliers is evident worldwide. Nippondenso and Yazaki are Japanese companies which sell directly to the Big 3 (General Motors, Ford, and Chrysler) in the United States; products made under license from Bosch (Germany) and Bendix (U.S.) are made for original equipment (OE) in Japan; and, many Japanese and European suppliers sell to Japanese "transplant" vehicle assemblers in the United States. Clearly the world's highest quality parts suppliers will gain market share on others

Production Structure of Typical Japanese Automaker



Note: 1. Ratio of in-house production

$$= \left[ \frac{1 - \text{Purchase Cost} + \text{Cost of manufacturing parts processing}}{\text{Total Manufacturing Cost}} \right] \times 100\%$$

Note: 2. For each partsmaker, the number of companies to which they supply is not limited to one company.

Source: Small and Medium Enterprise Agency, *White Paper on Small Business*, 1981 edition.

Figure 1



as the automotive industry continues to globalize.

Effects of higher quality, world class parts producers will, in time, be felt in the aftermarket. In certain geographic markets such as the United States, the aftermarket is sufficiently large to support companies that manufacture parts only for replacement needs. That is, there are some companies that do not compete vigorously for the highest (OE) tier. In most countries (including the Philippines), however, the aftermarket demand -- relative to OE production -- is much less than that in the United States. In those cases it is more difficult for a parts supplier to achieve scale economies from replacement only parts manufacturing that will yield competitive production costs, or support sufficient investment in technology.

Figure 2 shows a Canadian version [Automotive Parts Manufacturers Association of Canada] of the effects of tiering. Lower tier companies are expected to supply OE parts to higher tier companies, but in time the first tier companies will also be the major suppliers to the aftermarket. In the long run, the higher tiers will best be able to stay abreast of necessary parts producing technology and achieve competitive costs that will support export marketing.

### The Philippine Situation

Inspite of the setback during the 1983-86 period discussed in the background section, there are residual capabilities and capacity to produce automotive components in the Philippines -- mainly the vestiges of its "peak" industry of the early 1980s (1978 was the peak new vehicle sales year, but 1980 was the peak production year). Companies in the Philippines supply roughly 30 percent of the "local content" for assembled new cars, but many of those companies are owned all (e.g., Goodyear tires) or in part (e.g., Yazaki-Torres wiring harness) by foreign firms.

Foreign-owned and locally-produced goods provide Filipino jobs, but do not always develop a base for technological strength for the future automotive industry in the Philippines. The current level of technology may be questionable when compared to world class standards. Further, the current capacity of the local components industry may be in question if vehicle production surges as planned. Finally, with regard to interest in the aftermarket and its export potential, many "local content" products are geared primarily to OE applications (seats, soft trim, and wiring harnesses), and one that may be difficult to ship long distances (e.g., batteries). In 1988, 94% of automotive parts exports (to the United States) were wiring harnesses. The next largest category, radiators, is less than 2% of total exports.

Before we discuss the potential for Philippine exports of automotive parts for the world's aftermarket, it will be interesting to consider such aftermarket locally in the

TIER STRUCTURE OF CANADIAN AUTOMOTIVE PARTS INDUSTRY

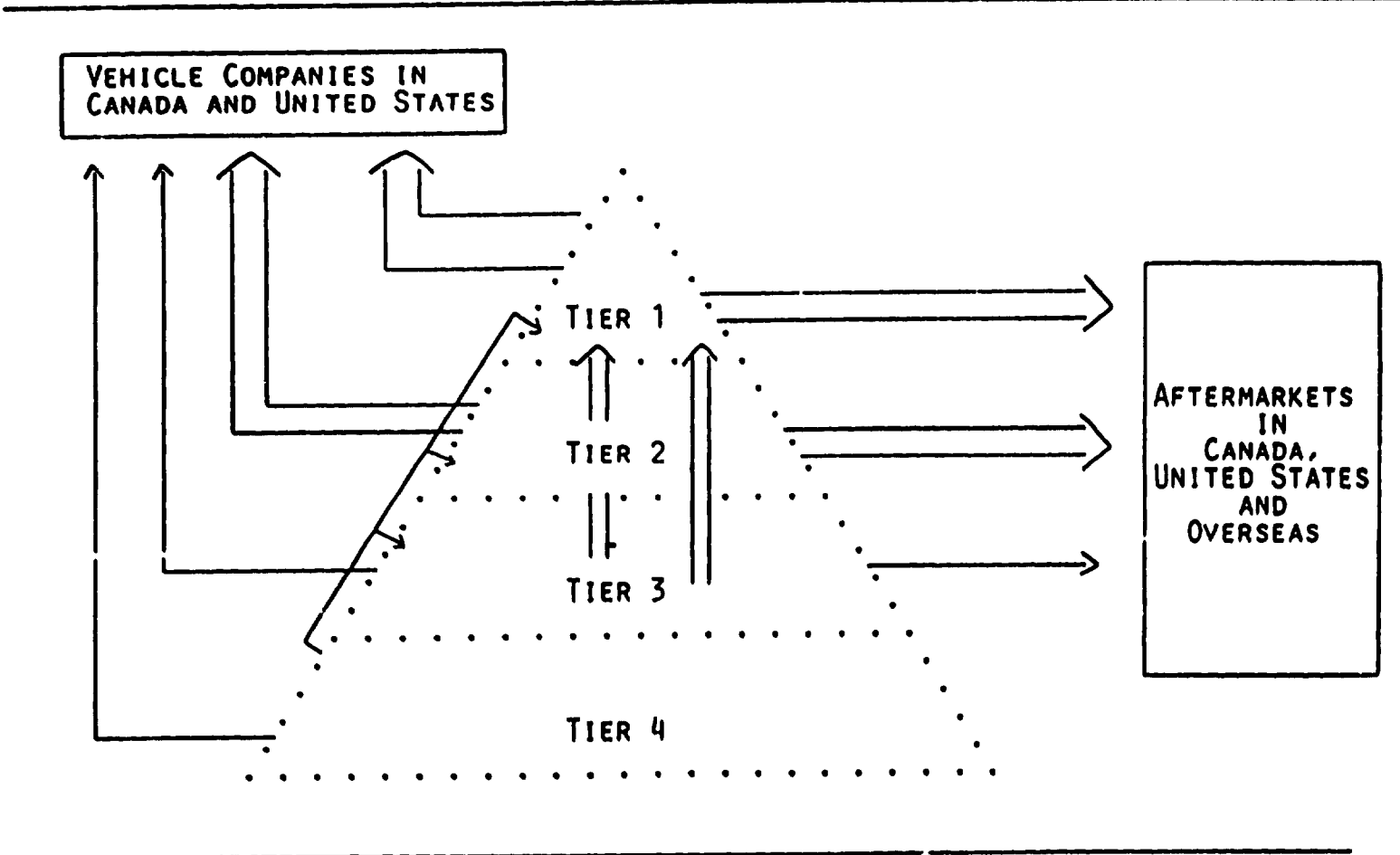


Figure 2

Philippines itself. Since the Philippines has fewer total vehicles than other ASEAN countries (see more on this in the later section), vehicle production is not basic, but rather assembly of imported kits; volume potential for manufactured new vehicles may be below economic optimum; and thus apparently aftermarket parts are not adequate to export outside the region. Aftermarket weakness is further demonstrated by the apparent lack of new Filipino parts being consumed. For example,

<u>Parts Source</u>	<u>Share of Philippine Aftermarket</u>
New parts from the Philippines	58
New parts from Taiwan, China	10
New parts from Japan	10
OES (new parts from OEMs)	15
Used parts from all above	60

It appears that the development of a Filipino-owned automotive components industry for either in-country new vehicle assembly or for serving aftermarket needs of existing vehicles will take many years. A plan with a timeframe of around 10 years is probably realistic. An optimal program should include the simultaneous development of a parts industry and a basic manufactured vehicle, as we will discuss in the next section.

### Basic Automobile Manufacturing

The globalizing trend of the automotive industry and the tiering trend of automotive parts suppliers around the world, as discussed in the last section, have brought into question the long-term viability of the automotive parts industry of any country without its own original equipment manufacturers (OEMs) engaged in basic automotive manufacturing. It has become increasingly likely that automotive parts manufacturers which do not have close connections with the OEMs will find it very difficult to stay profitable in the long run.

#### The Current Dilemma

At this time, the Philippines makes very little of their cars and trucks, and produce motorcycles mainly by rebuilding used ones from other parts of the Far East. The Philippines have very little modern manufacturing equipment or technology in the automotive industry. The country does have people who are willing to work hard but are relatively unskilled in modern manufacturing techniques. For example, the cars built in the Nissan plant visited by the UNIDO mission are assembled and painted primarily from completely-knocked down kits shipped overseas by Nissan, with some local parts added such as brake rotors, tires, and a few other components. The price of the car is around \$12,500 which is well above the financial reach of most Filipinos. While Nissan and Mitsubishi are able to sell all that they can make, the rich are the only people with enough money to buy the cars due to the high selling price.

While the overall quality of these assembled cars is fair, the paint job and other areas of finish leave much to be desired, and therefore the cars are not world class or exportable even after using the Japanese subassemblies. We have the impression that many, if not all, Filipino manufacturing executives share our evaluation and recognize their dilemma.

#### Basic Alternatives

The New Motor Vehicle Programs established recently by the Philippine government are intended to overcome the existing problems, and to develop an automobile and replacement parts market. While these programs emphasize the immediate revitalization of the Philippine automotive industry, they have not given as much strategic direction to the Philippine automotive industry as could have been done. Some background on the present automobile business as it is conducted throughout much of the world is needed to develop a strategic plan. In our judgment, there are at least three major ways of producing complete automobiles as follows:

- (1) The first way is to import kits from another company and

assemble the kits where the vehicle is to be sold. Some local content can be added. While this may be the fastest way for a country to build whole vehicles, it is also by far the most expensive way due to extra shipping costs, taxes, and other special costs. This is presently the Philippine way.

(2) The second way is to design and develop an automobile from scratch, build manufacturing plants, equip these plants with good used or new machine tools, establish a production methodology that will result in a world class automobile that can be sold locally or can be exported if desired. The key to this approach is modern design and manufacturing technologies implemented with good production equipment. This will result in a much lower-cost vehicle and will permit a much lower selling price even though the time to implement this approach is longer than the first. The initial investment can be amortized over a number of years and will not substantially raise the final cost of the vehicle. However, this second alternative assumes the existence of modern technology that many countries like the Philippines do not have.

(3) The third way to locally produce an automobile, which can be implemented in a time period somewhere between those for the first two ways, is to find a joint partner that is producing world class cars in other countries, and is willing to enter a business in the country where the product is to be produced and sold. Capital has to be raised jointly and then the procedure described in the second way should be followed. This approach obtains both the product and manufacturing technologies from the partner and shares profits. This alternative will result in costs approximately the same as that in the second way except if labor costs are lower, in which case the total costs would be lower. This third way can result in the lowest total costs and selling price, and is the way we would recommend for the Philippines to consider seriously.

A variation of the third way is to buy licenses for the needed technologies from foreign producers, and then build the plant, establish the operating technology by buying the training services from the licensor(s) for building the product. In this case the local plant owns the entire operation and reaps all the profits.

The time it will take for all three of the above alternatives to achieve world class automobile quality will range from about six to ten years. However, the last two approaches will probably result in better quality from the start than that being produced with the first way.

#### Basic Choice for the Filipino Car

An extremely important point to be determined is the size and type of automobiles to be built as "the Filipino car" so that a good number of Filipinos can afford to buy the new automobile. The Gross National Products (GNP) and the future projection of

average family income should be studied carefully in order to determine how many people will be able to purchase the new vehicles to be built. A comparison with other countries such as Mexico, Brazil, and other countries should be made to determine how the Philippines will compare with them by the years 1995-2000 when production of the new vehicle can be up to full capacity.

At this time, we have the figures of per capita GNP in the Philippines around only \$80-100. However, future projections according to the Comprehensive Agrarian Reform Program (CARP) suggest a scenario of average annual family income rising to \$2,000 to 3,000 by the year 2000 [Estrella]. Using a multiplier of 3 or 4 to average family income would suggest that the selling price of the Philippine vehicle should be in the range of \$6,000 to \$8,000.

The same approach can be used in determining the size or volume of the plant(s) to be built with the joint venture partner(s) or under license. According to figures used by such automobile producers as the Ford Motor Company on a worldwide basis, the smallest practical factory unit of volume is approximately 50,000 units per year on a one-shift basis, or 100,000 on a two-shift basis. The optimum number of units is 300,000 units on a two-shift basis. This will yield lowest costs and therefore selling price.

It may be that a small car like the Ford Fiesta or Ford Festiva (selling at \$5,000 to \$6,000 per unit) will be required to meet the manufacturing costs and resulting selling price. The Ford Festiva or "B" class car (subcompact car) is in the fastest growing segment in other parts of the world today. This growth is being dictated by the low initial price and fuel or operating costs. If such a car is chosen as the Filipino car, it would also have an attractive export potential.

Note that the above suggestion for the Philippines to design and produce a Filipino car will not only fulfill all of the objectives of the New Motor Vehicle Programs (viable automotive industry, technology transfer, employment generation, reasonable vehicle prices, and foreign exchange savings), but also help automotive parts manufacturing remain viable in the Philippines and become increasingly export-oriented in the long run. In other words, with careful planning, the development of automotive parts manufacturing (for both domestic and foreign aftermarkets) and the development of a strategy for the manufacture of a Filipino car will become confluent and mutually supportive of each other.

### Strategic Considerations

Scale economies that will be needed to help the fledgling Philippine automotive parts industry prosper must come from basic automobile manufacturing and from exports. It will be several years before the vehicle population within the Philippines will support world class volumes, and it will similarly take time to convert the Philippine vehicle maintainer from the current preference for used replacement parts. In this section, we will discuss strategic considerations of marketing, investment timing, and experience of the automotive industry in other developing countries -- for both parts and basic vehicle production.

#### Marketing

Marketing against world class competition will be a challenge to Filipino-owned companies that is just as formidable as developing world class manufacturing and product quality. A support system, specialized for export marketing, should be developed in the same timeframe as capacity to manufacture components with acceptable quality comes onstream. Examples of similar marketing support in other countries which produce world class automotive parts include:

- a) Japanese trading companies -- different than the large "sogoshosha" such as Mitsu and Marubeni -- specially focused on automotive parts. As the Japanese automotive components industry evolved, manufacturers were free to concentrate on what they did best, and relied, at least in part, on trading companies for export activities. This is an option that could be developed in the Philippines. It is believed that as Japanese automotive parts manufacturers matured, some of them gradually took on more marketing responsibilities. This is particularly true of "sister companies" to the OEMs that have "transplanted" themselves around the world.
- b) In the United States there is a category of specialized parts importer/distributors. Their function is to develop replacement parts sources in many different countries, both industrialized and newly industrialized countries, and to assemble a "line" of goods that are in turn marketed to various channels of distribution. The vehicles for these replacement parts are foreign or imported vehicles, and not the ones typically produced by the "Big 3" in the U.S. This may benefit Philippine parts producers in that the local industry in the Philippines will support Toyota, Nissan, and Mitsubishi vehicles which are all imported into the United States.
- c) Many countries have agents or "reps" (independent sales representatives) that specialize in automotive parts by

importing, exporting, or both. This activity is paid on the basis of a set percentage of the value of the buying/selling transaction. Agents typically do not take ownership of the goods being transacted, but act as a broker or go-between that links buyer and seller. Depending on specific export market, Philippine parts producers may also establish working relations with a number of such agents.

### Strategic Classification of Automotive Parts

Specific to component parts, world class manufacturing capacity and resultant quality standards must be sought. Parts must be identified that are most desirable for local manufacture; investment plans probably are best phased over time. It is advisable that specific parts be organized into strategic classifications; for example:

- a) Those currently made by Filipino companies with acceptable quality;
- b) Those that can be made by Filipinos with little or no outside help;
- c) Those that will require additional technology best transferred by licensing agreements; i.e., Filipinos could physically manufacture the product, but at this time have no experience (training) or design/development capabilities;
- d) Those that will require technology as above, but additionally will benefit from a joint venture partner with whom to share capital risk, acquire specialized training and equipment, and/or gain a sales position in offshore markets; and
- e) As the Philippine automotive industry evolves toward one of total local basic manufacturing, there will be the probability of manufacturing parts such as engine blocks, crankshafts, and metal body stampings.

Particularly in classifications a) through c) above, export marketing assistance for aftermarket parts will be critical to help achieve scale economies. Plan should be implemented now which (1) classify all component parts, (2) develop sources of investment capital, (3) encourage Filipino entrepreneurs to enter into this national strategy, (4) search, screen, and negotiate with licensing and venture prospects from all areas of the world, and (5) design a marketing support system.

For (4) and (5) above, an export-import group should be established in the Philippines to determine worldwide opportunities for licensing or joint venture. This group can search for potential associates throughout the world which can include Japan, Europe, the United States, Brazil, and other countries. One word of caution in searching for partners is to not insist on exporting vehicles as soon as the plants start to produce vehicles. The reasons are (a) the period of time to reach world class quality takes several years, and (b) there is an over-capacity for vehicle production in general which discourages



foreign countries from additional exports at this time.

### Investment Timing

Timing takes another critical dimension depending on whether the Philippines wants to be a direct participant in their basic automotive manufacturing by designing and producing complete vehicles. Several factors point to a possible strong effort in the near future by Japanese parts companies to invest in the Philippines:

- a) The Philippine peso has weakened significantly relative to the U.S. dollar, which in turn has weakened substantially relative to the Japanese yen. This phenomenon helped stimulate Japanese transplant activities in the United States. Nearly 300 Japanese parts companies have located in the United States, many since 1985 when the dollar began to weaken. Similar transplanting should occur in the Philippines, especially as vehicle production increases.
- b) It is well known that Japanese OEMs are active exporters of whole vehicles to the United States. A recent ruling by the United States allows a Japanese vehicle that is assembled in an ASEAN country with 51% or more local content to be imported into the U.S. as a vehicle from that ASEAN country -- not from Japan [Automotive Parts International]. This might help Japanese OEMs more than the Philippines; i.e.,
  - i) Locally produced cars might be designed for use in the U.S.;
  - ii) Local content can be contributed by Japanese parts companies already manufacturing in other ASEAN countries; and
  - iii) In some cases "local companies" may be 100% Japanese owned by virtue of exporting 70% of volume.

Without proactive efforts by the Philippines and its local entrepreneurs and investors, the plans for a local automotive parts industry could be preempted by Japanese OEMs -- either by their sister companies coming to the Philippines, or by companies already in other ASEAN countries such as Malaysia and Thailand.

### Comparison with Other Countries

For automotive parts manufacturing, Mexico is an interesting country for comparison as it has been promoting its automotive parts suppliers to export their products. The Mexican government put its first Automotive Decree in place in 1962; there have been others since. The various Decrees have included degrees of protection; attempts to integrate the vehicle assembly industry; and objectives to reduce automotive trade deficits. Regulations, tax and fiscal incentives, and tariff and non-tariff barriers all

have been tools used to implement the Decrees.

The Mexicans developed an interesting system of classifying automotive parts which may help the Philippines in designing their own programs in this regard. Each Mexican classification has regulations which determine the rules for exports, imports, and local production.

<u>Classification</u>	<u>Comments</u>
1	Mandatory local parts
2a	Currently made in Mexico; no approval to import
2b	Currently made in Mexico; need government approval before importing
3	Non-essential components
4	Optional luxury items
5	Raw materials and non-automotive components

From the standpoint of foreign investments in automotive industries in the ASEAN countries, the following tabulation [from Dodwell Marketing, 1986] would help estimating the future potential for the Philippines:

<u>ASEAN Countries</u>	<u>Number of Foreign Investments</u> <u>OEM Related</u>	<u>Parts Companies</u>
Indonesia	11	23
Malaysia	6	23
Philippines	8	8
Singapore	-	31
Thailand	10	36

Finally, for basic automobile manufacturing, the recent experience in the People's Republic of China would be relevant since both China and the Philippines have relatively low but rather rapidly growing per capita GNP, and that both have relatively large number of population per vehicle. Specifically, in 1986, the ratio was 124 people per car in the Philippines and 292 in China, as compared to 1.4 in the U.S., 5.5 in Singapore, and 35 in Thailand [data from the Motor Vehicle Manufacturers Association, USA].

For a number of years, China has been trying to modernize its basic automobile manufacturing program, and has developed a strategy which apparently is beginning to work. China did not have modern technology, modern machinery, or technically trained people to operate modern machinery or to design modern vehicles -- a situation rather similar to that of the Philippines.

Through a series of licensing arrangements and joint ventures they have entered business enterprises which are starting to work. Some monetary incentives have also been included such as tax deferrals, increased localizatin levels over a period of years have also be included.

The volume of annual production for passenger cars in China is being increased from 60,000 cars in 1988 to 700,000 cars by the year 2000. The combined production objectives for car and truck are expected to total 2,000,000 units by the year 2000. Some of these cars will be small enough and inexpensive enough to be affordable by the average citizen, while some will be medium size for business and taxi use, and a few large vehicles for senior officials and other government use. The finished selling price of the small cars should be in the vicinity of \$5,000 to \$7,000. Perhaps a very cheap mini car such as the Dahatsu Charade can also be considered that could sell for even less. It is recommended that the Philippine government seriously consider to adopt a program similar to the Chinese program.

## Conclusions and Recommendations

As indicated from the previous sections, the economic climate in the Philippines has definitely changed with its political situation for the better in the past few years, even though the relatively favorable conditions have not been universally recognized outside the country. This basic turnabout, coupled with other confluent factors such as the substantial appreciation of the Japanese yen against the Philippine peso, and the establishment of the New Motor Vehicle Programs by the Philippine government, have all contributed to the Philippine automotive industry's significant recovery from the severe setback during the years between 1983 and 1986.

In recent months, a number of Japanese and other foreign automotive firms have announced their new or revived investment plans in the Philippines. It appears that there are definite and excellent opportunities in automotive parts manufacturing in the Philippines, both for import substitution through the increase of local contents of the automobiles being assembled in the country, and for exports through the outsourcing of foreign manufacturers in the Philippines or through international aftermarket channels. However, because of the globalization of the automotive industry, including the tiering trend of automotive parts supply industry, those automotive parts manufacturers which do not have close connections with the original equipment manufacturers (OEMs) will find it very difficult to stay profitable in the long run. Therefore, we concluded that a longer-term strategy which includes the basic design and manufacture of complete vehicles in the Philippines must be developed not only to satisfy higher-level national goals, but also to keep replacement parts manufacturing as a viable industrial activity in the long run.

In the remaining portion of this section, we will make recommendations regarding the general investment climate and a two-prong approach for the Philippine automotive industry: the development of selected automotive parts manufacturing for both domestic and foreign aftermarkets in the near term; and the development of a strategy for the manufacture of Philippine automobiles in the long term. These two developments should be coordinated so that they will become confluent and mutually supportive of each other.

### Investment Climate

The investment climate in the Philippines is much more favorable than what the news media have projected overseas. The Philippine government, with the assistance of the private companies in the Philippines, both foreign and indigenous, should mount a deliberate and systematic effort to publicize internationally about the economic and political conditions in the Philippines. Such international publicity should emphasize not only how the new national policies are intended to encourage

foreign investment in the country, but also what the multinational companies have actually done recently to accelerate investment in the Philippines.

While it may be obvious to some government officials, we wish to stress the urgent need to reduce the bureaucracies involved in day-to-day business and in governmental approval procedures for the investment and operations of the foreign firms in the Philippines, including the further improvements of the Filipino Customs Department. Frequent surveys and communications with foreign firms in the Philippines should be conducted to detect potential emergence of new problems and to help keep the whole process efficient.

### Automotive Parts Manufacturing

Since there are literally thousands of parts and components in an automobile, it would be impossible for the UNIDO mission, within the short period of one week in the Philippines, to recommend any specific automotive parts for the country to manufacture for import substitution and/or for export. However, in support of the general recommendation, we have given considerable thoughts to the development of a potential framework that would help future identification of such opportunities.

As discussed previously, Mexico has developed a scheme for classifying automotive parts to help determine their regulatory rules for exports, imports, and local production. The Mexican scheme cannot be used directly here but has helped stimulate our thoughts about an analogous framework that is particularly relevant to the systematic identification and ranking (prioritizing) of automotive parts to be manufactured in the Philippines.

The framework which we have developed on a preliminary basis and which we would recommend the Philippines to expand further is based on a number of our observations and analyses of the specific situation in the Philippines. For example, our UNIDO mission has visited the Nissan plant for assembling cars from knocked-down kits shipped to the Philippines from abroad. We raised the question about how Nissan could be helped to increase their local content in order to satisfy the requirements for all participants of the Car Development Program (CDP). An important answer was that the local parts should be made available to them to replace their shipping units. Therefore one characteristic of the framework should be in terms of shipping units used by the CDP participants. Other relevant characteristics of the framework include the considerations given to the comparative advantages of the Philippines such as low-cost labor and abundance of copper.

The preliminary framework for identifying and priority ranking automotive components for Filipino investment is given in Appendix D. We have grouped the components in three broad

categories: original equipment parts; aftermarket parts; and "at large" product opportunities. A matrix plotting the relative market size versus relative capital investment has been suggested to help rank all the components. In addition, a preliminary analysis of automotive aftermarket parts by business category is presented in Appendix E. In this analysis, aftermarket parts are grouped under four categories: high labor content; technology licensing; joint venture; and import. We recommend these preliminary framework and analysis be expanded by the Philippine government and industry, with the possible assistance by international experts, in order to put the results to practical use for identifying and prioritizing opportunities for automotive parts manufacturing in the Philippines in the near term.

### Basic Design and Manufacturing of a Filipino Car

We have argued that, for the long-term viability of the automotive parts manufacturers as well as for the fulfillment of the strategic mission of the automotive industry in the Philippines, the country should seriously consider the development and production of a Filipino car. We have described three basic ways of producing entire vehicles, and we recommend the third way -- to find joint venture partners to produce world class cars -- as the most practical and desirable way for the Philippines to follow.

To pursue this longer-term goal, which may take 10 years to reach, the Philippines should immediately embark on a study to determine the most appropriate car to design and produce. The group to conduct such a study should be broadly constituted to include technical and marketing expertise, to include specialists from both the private and the public sectors, and to include international consultants when the needs arise. The study should take into account of the present level and future projections of per capita GNP and the distribution of family incomes in the Philippines, so that realistic projections can be made on the number of families that can afford to buy the Filipino car by the year 2000. Such a study should include the "informal sector" which is significant and has been estimated to be at least 40% to 50% of the Philippine economy [Avenir, 1988]. The export potential of the Filipino car to various segments of the international market, including the overseas Filipinos, must also be estimated. The total production of the Filipino car must reach at least 50,000 units per year to be economical. Given the 1988 sales of automobiles in the Philippines in the order of 14,000, a four-fold increase over the next 12 years does not seem to be out of reach, especially if some of the cars produced can be sold overseas.

Once the basic design of the Filipino car has been chosen, an export-import group should be established in the Philippines to determine worldwide opportunities and conduct specific negotiations for licensing and joint ventures. Such a group must include business strategists, as well as technical and marketing

people, who can search for and reach agreements with foreign partners, which are mutually attractive to them and to the Philippine enterprises.

In pursuing the above tasks, we further recommend that the Philippines consult with other countries and organizations, such as China and the China National Automotive Industry Corporation (CNAIC) in Beijing, respectively, which have gone through the same strategic steps in the recent years. This same approach to searching and negotiating with foreign partners may also be followed by the Philippine automotive parts supply industry. Furthermore, the development of selected automotive parts manufacturing and the development of the Filipino car should be coordinated so that the two developments will become confluent and mutually supportive of each other.

Acknowledgments

The mission members wish to thank the support they have received from UNIDO and from the Philippine Government. We very much appreciate the capable and tireless efforts made by Mr. Rene A. Briones of the Philippine Center for International Trade Expositions & Missions, Inc. (CITEM) in making the arrangements for the mission to visit many organizations and individuals, both according to the preset schedule and extemporaneously. We are particularly grateful to Mr. Eduardo Santayana of the Philippine Metals Industry Research and Development Center (MIRDC) for his imaginative assistance in developing the mission in the first place, and in skillfully facilitating the positive interactions between the mission members and the many diverse interests and personalities in the Philippines.



Appendix A: Backgrounds of Mission Members

Kan Chen is Professor of Electrical Engineering and Computer Science, University of Michigan in Ann Arbor, Michigan, USA. He is also President of Kan Chen, Inc. in Ann Arbor. Professor Chen's teaching and research responsibilities have been in the fields of systems engineering, technology planning and assessment, and social decision making. Dr. Chen has had international consulting and lecturing experience in a number of countries, including China, Japan, India, Mexico, African and European countries. He has published 7 books and over 100 technical papers.

Harold C. MacDonald worked most of his career at Ford Motor Company where he was responsible for vehicle engineering and planning as a Group Vice President. He became responsible for the Engineering and Research staff in 1975 and held that responsibility as a Corporate Vice President until his retirement in 1982. He served as National President of the Society of Automotive Engineers (SAE) in 1980, and is a Fellow of SAE. For the past six years, Mr. MacDonald has been an Honorary Advisor to the China National Automotive Industry Corporation, helping the Chinese automotive industry develop its long-term strategy.

Henry P. Alessio is a founding Partner of Easton Consultants, Inc. During his consulting career, Mr. Alessio has managed projects for clients in a broad range of technical products, mainly industrial manufacturers and distributors. He has done numerous automotive parts studies for both automakers and aftermarket, heavy duty and passenger cars, made by U.S. and other countries. Mr. Alessio has developed innovative ways to measure aftermarket demand trends which are based on parts consumption patterns of various ages of vehicles; and aftermarket share of individual vehicle companies which are used to support efforts to enhance customer satisfaction index (CSI) rankings.

Appendix B: Itinerary

2 to 4 December, 1988

Transit and arrival in Manila

5 December, 1988 (Monday)

Briefing on the Philippine Automotive Industry

Presentations by the UNIDO mission, followed by small group discussions

6 December, 1988 (Tuesday)

Plant visit: Philipinas Nissan, Inc.

Plant visit: UE Automotive, Inc.

Courtesy call: Undersecretary Ceferino L. Follosco

7 December, 1988 (Wednesday)

Leave for Cebu

Courtesy call: Assistant Secretary Joel Mari S. Yu

Small group discussion: Cebu automotive parts manufacturers

Site visit: Mactan Export Processing Zone (MEPZ)

Plant visit: Timex (in MEPZ)

8 December, 1988 (Thursday)

Return to Manila

Courtesy call: Christian A. Newman (UNIDO office)

9 December, 1988 (Friday)

Courtesy call: Secretary Antoio V. Arizabal

Plant visit: Metals Engineering Resources Corp. (Metercor)

Plant visit: Kawasaki Motors (Phils.)

Courtesy call: Secretary Raul Manglapus

10 December, 1988 (Saturday)

Small group discussion with Car Foundation

Report preparation

11 December, 1988

Departure from Manila

Appendix C: Contacts

Public Sector

Antonio V. Arizabel, Ph.D.  
Secretary  
Department of Science and Technology

Rogelio B. Balajadia  
Zone Manager  
Mactan Export Processing Zone (MEPZ)

Josephine S. Briones-Gonzalez  
CITEM (Cntr for Intl. Trade Expo. & Missions)

Rene A. Briones  
CITEM

Ofelia Bulaong  
Director  
Board of Investment

Oliver B. Butalid  
Cebu Provincial Director  
Department of Trade & Industry

Ceferino L. Follosco  
Undersecretary  
Department of Trade & Industry

Christian A. Newman  
Senior Industrial Advisor  
United Nations Industrial Development Org. (Manila)

Eduardo L. Santayana  
Assistant Executive Director  
Metals Industry Research & Development Center (MIRDC)

Constante V. Ventura  
Executive Director  
Metals Industry Research & Development Center (MIDRC)

Joel Mari S. Yu  
Assistant Secretary  
Department of Trade & Industry

Private Sector

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Sales Executive  
Creative Trade Center

Ramir V. Bonghanoy  
VP-General Manager  
Machinesystems Corp.

Amby Cattony  
Division Manager  
IMF Chrome, Inc.

Henry T. Co  
Group Manager, Engineering Services Department  
Philipinas Nissan, Inc.

Raul Concepcion  
UE Automotive Manufacturing, Inc.

Ibarra E. Cruz  
Professor & Chairman  
Department of Mechanical Engineering  
University of the Philippines

Alice B. De Vera  
Vice President  
Kawasaki Motors (Phils.) Corp.

Mike Del Gallego  
President & General Manager  
Degalen Corp.

Pacificador C. Directo  
President  
Directric Industries Inc.

Amando Dumlao  
President  
Philippine Iron & Steel Institute

Edgardo C. Gatpandan  
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Kawasaki Motors (Phils.)

Antonio A. Gimenez  
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Philipinas Nissan, Inc.

Nelson L. Go  
Managing Director  
Imperial Aluminum Inc.

Raul Hernandez  
General Manager  
Metals Engineering Resources Corp. (Metercor)

Joe Hsieh  
Operations Manager  
Timex

Simeon V. Javier  
President  
S&J Cottage Industries, Inc.

George Co Lim  
President  
UE Group of Companies

Martin A. Lim  
General Manager  
Solid Parts Corp.

Rolando LL. Manaloto  
President & General Manager  
Mansteel International Corp.

Jose Y. Mateo  
VP - General Manager  
4A's Development Corp.

Loreto P. Matibag  
Production Manager  
Metals Engineering Resources Corp. (Metercor)

Henry V. Moran  
President  
Philippine Automotive Federation, Inc.

Hernando P. Morante  
General Manager  
Vincent Industries

Peter Ong  
Prop./Manager  
Petter Enterprises

Bro. Parolin, SDB  
Don Bosco Youth Center

R. Perfecto-Gohu  
Senior VP - Administration  
Uniden Weston

B. Christine Phillips  
Financial Contrcller  
National Semiconductor Corp.

Rolando S. Ramento  
Plant Manager  
UE Automotive

Masanori Takahashi  
VP - General Manager  
Far East Wire Harness Corp.

**Noboru Takahashi**  
President  
Far East Wire Harness Corp.

**William Uy**  
Chairman/President  
United Rebuilders, Inc.

**Mario S. Viel**  
General Manager  
Creative Trade Center

**Naohisa Yasui**  
VP - Treasurer  
Kawasaki Motors (Phils.)

APPENDIX D

PRELIMINARY FRAMEWORK FOR IDENTIFYING AND PRIORITY RANKING AUTOMOTIVE COMPONENTS FOR FILIPINO INVESTMENT

I. ORIGINAL EQUIPMENT (OE) PARTS

Begin by describing the CKD assembly process with the help of CDP participants.

- A. "Unbundle" the 2 thousand sub assemblies, or standard shipping units. Units can be sub-aggregated into understandable categories (component families); e.g., body panels comprise about 300 shipping units, and weather stripping, clips, and insulation board is a category of about 60 units. A windshield wiper blade and arm may be one shipping unit, while an oil filter is integral with the engine shipping unit.

The CDP participant requisitions standard shipping units from Japan for assembly in the Philippines. If a Filipino supplier can be found for certain parts, the shipping unit represented by that part will no longer be requisitioned or requisitioned in smaller volumes.

- B. List all parts by a manufactured unit description regardless of whether it be an OEM shipping unit, component family, or individual item. To illustrate, a wheel and lug nuts may be parts of a shipping unit or component family; however, lug nuts may be able to be manufactured by a Filipino company -- thus a manufactured unit.
- C. Rank manufactured units by "ease of separation" from a standard shipping unit. That is, a timing belt may be able to be manufactured in the Philippines, but it would be difficult (not impossible) to separate from the complete engine shipping unit because of its integral engine function. A headlamp or a windshield wiper arm would be more separable.
- D. Priority rank the easily separable manufactured units into categories of technology content. For example,
1. Lower tech categories may include products that Filipino companies are either now manufacturing or could easily produce by acquiring a license from a manufacturer in another country. Brake shoes and pads, wiper blades, and water and oil pumps may be appropriate examples.
  2. Higher tech categories should include manufactured units that would require a Filipino company to enter into a joint venture with a manufacturer from another country. The joint venture will help



to share capital risk and/or acquire technology and know-how.

The number of categories is not key. It is more important to develop a priority ranking of investments to be made. Neither the Philippine government nor Filipino private sector companies can invest in everything. This process attempts to identify the choices that are most feasible for a Filipino company to enter, and those that should be most welcome by a CDP participant.

To minimize complexity, the selection process ignores variables such as projected profit return or amount of local content that would be contributed by the respective investment alternatives. Also, CDP participants probably have preferences with regard to localized products that influence the vehicle performance, reliability, or safety.

## II. AFTERMARKET PARTS

Aftermarket, or replacement parts initially were the main focus of the UNIDO mission. While this focus may have changes in degree, it remains important, particularly in light of the expected need for Filipino companies to produce parts that are of acceptable quality for export marketing.

An alternative approach for priority ranking "pure" aftermarket parts for investment follows.

- A. Identify the full range of aftermarket parts typically consumed by existing (as opposed to newly produced) vehicles. Exhibit 3 shows one array of parts categories. In reality there are many more individual parts, and several other sources can be used for their identification.
- B. Develop a two-dimensional analysis of aftermarket parts viewed by (1) sales volume per individual part, and (2) investment needed for producing the product. In another way, the most potential per unit of risk capital.

Exhibit 4 graphically shows how aftermarket parts might array along the two axes. The part that is located in the upper right corner of the matrix is most desirable; the priority ranking of all parts would be along a diagonal from upper right to lower left. This analysis does not take into account several business variables such as: the profitability of each product/business; the proportion of the aftermarket served by vehicle dealers (which often precludes some suppliers from participation); and, the alignment of competitive manufacturers of the same products in other parts of the world.

Exhibit 3

ESTIMATED TOTAL USAGE OF AFTERMARKET REPLACEMENT  
PARTS OF JAPANESE CARS AND LIGHT TRUCKS IN THE  
UNITED STATES -- 1988

<u>PARTS CATEGORY</u>	<u>DISTRIBUTION OF 1988 VALUE</u>
Engine Hard Parts	9.9%
Cranking System	7.5
Charging System	7.3
Exhaust System	6.8
Brake Systems	6.2
Shocks Front & Rear	5.0
Oil Filters	4.1
Clutch & Drive Train	4.3
Steering & Suspension	3.2
Spark Plugs	2.7
Water Pumps	2.9
Air Filters	2.0
Lighting Including Switches	2.0
Transmission Parts	2.1
Belts & Hoses	2.0
Wiper Blades	1.7
Carburetor	1.6
Ignition Parts	1.5
Ignition Wire Sets	1.5
McPherson Struts	1.2
Fuel Pumps	1.2
U Joints & CV Joints	1.0
A/C & Heater	0.9
Fuel Filters	0.7
PCV Valves	0.3
All Other	13.7
Warranty	6.7
	<hr/>
Total	100.0%

\*At installer Costs in 1982 Dollars.

Source: U.S. Dept. of Commerce, March 1985.

ILLUSTRATIVE TIME - PROGRESSION OF PROBABLE DOMESTIC  
MANUFACTURE OF SPECIFIC AFTERMARKET PARTS

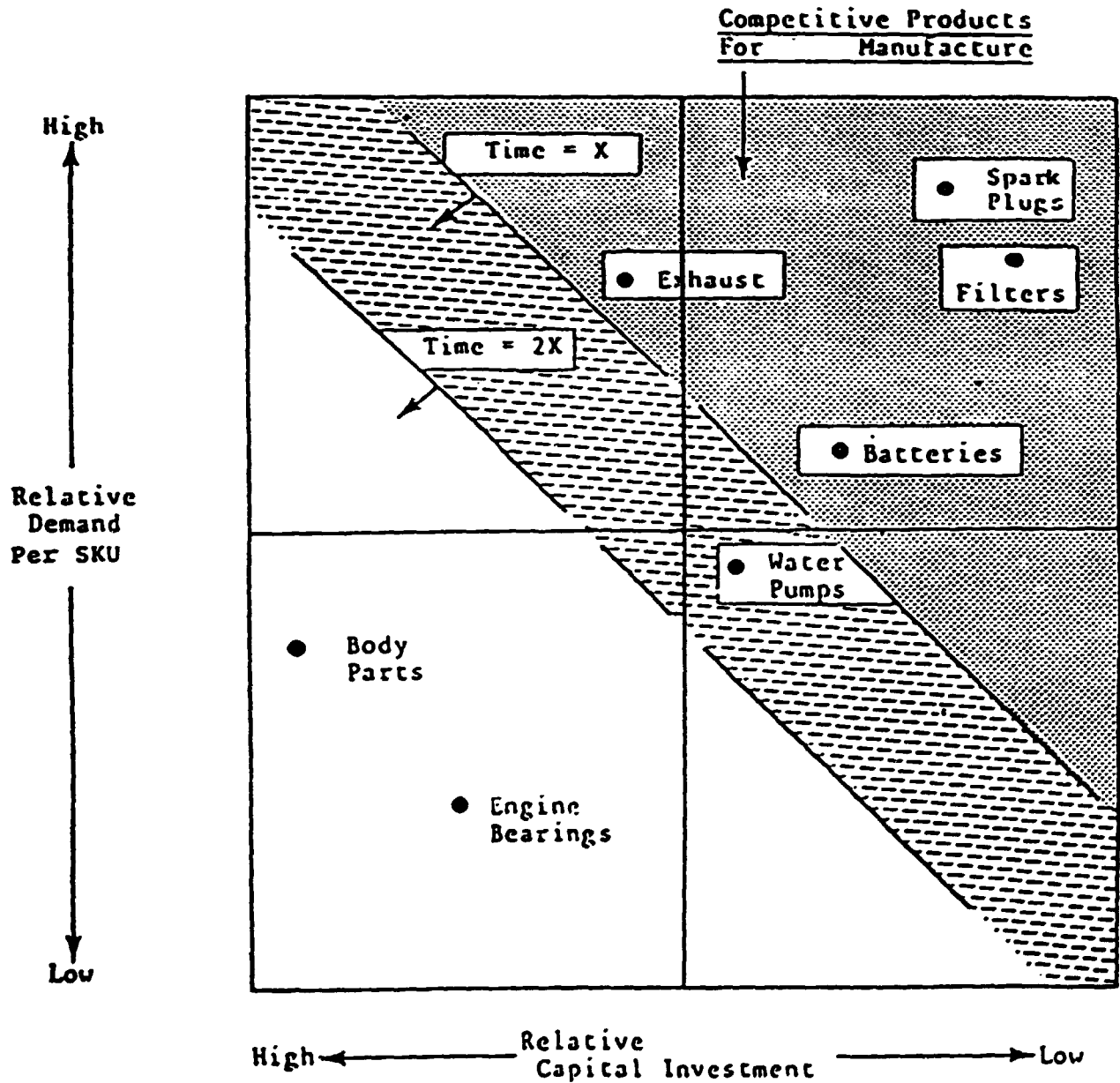


Exhibit 4

Plot points can be approximated from several sources of information.

1. The annual reports of publicly-owned suppliers of aftermarket products can help determine investment requirements. For example, financial ratios from a sample of companies illustrate:

<u>Company</u>	<u>Aftermarket Product(s)</u>	<u>Sales (mil.)</u>	<u>Total Assets (mil.)</u>	<u>Prop. Plant Equip. (mil.)</u>	<u>Assets per Sale*</u>
Echlin Inc.	Brake, ignition, fuel	\$ 1,294.3 (FY 8/31/88)	\$ 1,086.6	\$ 242.2	0.84
Federal-Mogul (45% replacement)	Engine, bearings, oil seals	1,075.4 ( '87)	803.6	333.8	0.75
Johnson Controls	Batteries	588.1	416.5	--	0.71
Parker-Hannifin Auto 'v. (49% replacement)	A/C hose, clamps, caps, wiper blades	240.0 (FY 6/30/88)	135.3	--	0.56

\*The horizontal axis of Exhibit

2. Demand characteristics can be illustrated by the following estimates.

<u>Aftermarket Parts Category</u>	<u>Estimated U.S. Market*</u>	<u>Approximate Number of SKUs**</u>	<u>Sales Per Part (thous.)***</u>
<b>Brake System</b>			
o Pads and shoes (lined)	\$550	1000	\$550
o Hydraulics, hardware, and other	650	1700	382
<b>Clutches</b>			
o New	135	600	225
o Rebuilt	115	900	128

\*Millions of dollars of sales to the WD (distributor) level of distribution.

\*\*"Stock-keeping units," or individual parts that comprise an entire "line" of a certain category of part. Estimates are not precise.

\*\*\*The vertical axis of Exhibit A

- C. Segregate the priority ranked parts (B, above) into two general groups: (1) those that are, or can be, made by Filipino companies, and (2) those that probably need a foreign partner for either a license or a joint venture. This grouping can create two separate but simultaneous investment priorities: i.e., two lists of product businesses generated from the upper right in sequence to the lower left of the business matrix (B, above).
1. Businesses for local Filipino capital investment to create quality and volume to compete on a worldclass basis; and,
  2. Businesses for which partners from all geographic sectors of the automotive world should be sought. Funding (IMF, World Bank, United Nations, OPIC, et al) may be an important ingredient to forming effective partnerships.

### III. "AT LARGE" PRODUCT OPPORTUNITIES

Both OE and aftermarket parts frameworks (I and II, above) are disciplined and comprehensive, and are market or business driven. Yet, there may be other situations which are uniquely appropriate for the business environment offered by the Philippines.

An analysis of the positive traits -- generically -- of doing business in the Philippines, compared with the type of companies from around the world that have taken advantage of them, may identify a pattern that can be exploited.

For example:

- o Relatively low labor cost
- o High literacy
- o English speaking
- o Work ethic; trainability
- o Western social mores
- o Degree of "untapped" local market demand
- o Proximity to other vehicle consuming/building market areas
- o Natural resources; iron ore, rubber, copper, hydro power
- o Free trade zones

Compared with the rationale of selected companies in the

Philippines (Timex, National Semiconductor, Goulds Pump, Moog Hydraulics, and United Technologies contemplated), possibly a pattern of similar investment reasons can be identified. Japanese companies, too, have invested; however, more investments have been made in other ASEAN countries. The related Japanese rationale (i.e., the rationale for other ASEAN investments) may be a helpful contrast.

If, for instance, low labor rates is by far the main reason for locating in the Philippines, then perhaps a search for products or businesses that have relatively high rates of direct labor can be conducted. Companies may be identified through this process that do not appear high on the priority list from either I or II, above. Wiring harness assembly is a good example of a direct labor intensive business.

APPENDIX E

PRELIMINARY ANALYSIS OF AUTOMOTIVE  
AFTERMARKET PARTS BY BUSINESS CATEGORY

I. HIGH (RELATIVE) LABOR CONTENT

N.B.: By definition, "high labor" probably means "low capital" or "low technology," and probably is a general classification of parts which should be given immediate priority for Philippine private sector investment. The low tech nature further suggests a minimal amount of reliance on CDP/CVDP technology, or technology from companies outside the Philippines -- generally.

- o Foundry work. Equipment to improve productivity can be bought outside the Philippines. The government might consider investing in, or subsidizing, the consultation of an industrial engineer specialized in foundries (an area of specialization of Carnegie Mellon). Each time a capacity expansion or modernization is contemplated, this may be a worthwhile expenditure. Many products -- typically OE rather than aftermarket -- can be made in various kinds of foundries; e.g., carburetor bodies (shrinking demand), sleeve bearings, water/oil pump housings, pistons, aluminum roadwheels (can be aftermarket), and intake manifolds. Contracts must be earned from, the OEMs or companies which finish the cast foundry products.
- o Wiring harnesses. Not an aftermarket product line, but the archetypical optimal Philippine auto product for both production and export -- Yazaki-Torres, Far East Wire Harness Corp., and Kawasaki. None are fully Filipino companies, yet the Philippines have copper and assembly labor.
- o Tires. Already there are 3 companies. A technology tie is surely needed. A surprising amount of labor is needed in producing tires.
- o Fiberglass sections/panels. The entire exterior skin of the Corvette is fiberglass; many "specialty" aftermarket products such as spoilers and ground effects are fiberglass. Possibly there could be a low production volume vehicle that could justify fiberglass panels. Capital first cost investment will be less than conventional metal stamping; however, MUCH more study and expert opinion is needed before anyone "runs" with this idea.
- o Seats. Not aftermarket. Foam is already being produced in the Philippines; the specific company is not known at this time. Metal stampings associated

- with seat frames are also appropriate for Philippine production.
- o Soft trim; interior door panels. Similar to seat (not aftermarket); Philippine production is believed underway.
  - o Chrome roadwheels. A "specialty" aftermarket product in the United States. Many producers in southern California use Mexican labor to perform the buffing operation in preparation for dipping and chroming.
  - o Electronics assembly. A growing automotive application, but typically is not an aftermarket product. Control modules (ECMs) are an example of what can be assembled.
  - o Spark plugs. The manufacture of spark plugs relies on economies of scale; yet, there are examples of assembly (versus manufacturing) operations -- similar to KD vehicles. In China a United States company (believed to be AC or Champion) is assembling plugs (in a venture), and when NGK first entered the United States it assembled rather than manufactured. This may be an option to "force" local content since the three CDP participants have close relations with both Nippondenso and NGK. A technology tie is surely needed. The product has high aftermarket use, and possibly some export potential.

## II. TECHNOLOGY LICENSING

N.B.: This category suggests that Filipino companies can (in many cases do) functionally produce the product, but because of the changes that are occurring, it is best to pay a company to learn how to employ the next generation of technology.

- o Batteries. Apparently Filipino-made batteries have a short campaign life -- in the range of only 1 year. Probably, too, Filipino batteries use lead material with a high antimony content. Elsewhere in the automotive world batteries have useful lives of 4 to 6 years; grid forming has been automated; and, materials have evolved (e.g., lead calcium, and hybrids). In some instances electrolytes are no longer liquid. Aftermarket demand should be relatively high, but export potential may be low.
- o Windshield wiper blades and arms. The Philippines have natural rubber which should be an advantage. Metal stamping (arms) should be no problem. Both aftermarket and export potential should be relatively high.
- o Tire Vulcanizing. Retreading probably is very active in the Philippines. A cold process equipment franchi-



sor apparently is already active in the Philippines.

- o. Mufflers. This may be a worthwhile product in which to invest technology since there are limited exports now, and with current technology the foreign exchange may be enhanced further. It is a classic, metal-bending business which has accepted longer lasting materials (aluminized metal), and is experimenting with stamped designs. Japanese applications (including those mufflers used by the CDP participants) are of particular interest to the United States aftermarket.
- o. Radiators. This product currently is being produced by Filipinos for CDP participants, the aftermarket, and for export -- on the surface an ideal Philippine automotive product. Current Filipino technology (some licensed) includes conventional brass and copper; newer technology includes thin wall construction, aluminum, and plastics. If export sales to industrialized countries are expected to grow through the 1990s, Filipino producers should stay abreast of technology especially with the advantage afforded them through locally produced copper.

### III. JOINT VENTURE (MANUFACTURING AND/OR MARKETING)

N.B: This category suggests that certain products require an usually large capital investment for local production and/or they may require certain levels of high-tech, hands-on assistance in order to produce acceptable quality. In selected other cases export marketing help might be helped by having a foreign joint venture partner.

- o. Filters. Ordinarily filters (oil, air, fuel) are produced in relatively automated facilities. A Filipino company could benefit by sharing the capital requirements with a venture partner. There may be a "middle ground" of licensed or joint ventured assembly (such as possibly spark plugs), but anything less than that would probably result in a filter product which would lack cost competitiveness for broadscale export sales. Probably there would be limited potential in the United States aftermarket for the specific applications made locally for the CDP participants.
- o. Brake drums and rotors. These products represent foundry operations described in I, above, and have relatively high aftermarket demand. However, two issues loom unanswered: (1) the quality level which is said to be improving (time will tell), and (2) capacity which is limited to a portion of the OE demand of the CDP participants. There may be need to acquire (or venture with) foundry know-how if quality performance doesn't measure up (high reject rates lower productivity which is an acknowledged problem). Also, a partner

to share capital risks of equipment for expanded capacity and/or leading edge quality and productivity may be desirable if export sales are a priority. Other Asian countries have succeeded in marketing these foundry products to the United States aftermarket.

- o Wire and cable. Automated equipment is needed. There are 15 industrial wire producers in the Philippines which, together with raw copper resources, may be a material source for automotive suppliers. Alternatively, cutting and crimping equipment (less expensive) may be all that is needed. Battery jumper cables are not a popular Philippine aftermarket product, but may have export potential.

#### IV. IMPORT

Some automotive products are better suited to be imported from foreign companies that have appropriate scale, high technology, or specialized production equipment. As an auto industry in the Philippines evolves and matures, more of these products may become appropriate for local manufacture or assembly.

- o Engines. Initially, complete engines are best imported for KD assembly. It is inappropriate to expect internal engine parts -- say the crankshaft or bearings -- to be locally produced while the rest of the engine is made by an OEM (assumed outside of the Philippines). Even many external parts should be produced in the proximity of the engine so that, in advance of shipping, an engine can be properly tested. These parts might include oil filters, pumps, and fuel management. On balance, most engine parts will be among the later ones to emerge from a developing Philippine components industry -- at least until engines are produced in-country. A selected number of parts, say water pumps, may develop enough aftermarket demand to justify local production in time. Still other parts might be able to be produced in the Philippines for shipment to the engine assembler.
- o "Loose" engine aftermarket parts. Many internal engine parts, even for replacement purposes, require advanced manufacturing techniques which probably will preclude Filipino companies in the near term from becoming basic producers. For example engine valves require high tech machining and metallurgy, and probably cannot be economically produced without benefits of OE scale.
- o Glass. Raw glass, before tempering, probably must be made in large scale facilities.
- o Ball and Roller bearings. Another example of a component part that requires scale economy and advanced technologies.

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