

practice, so the conditions of use and problems cannot be determined. It is, however a new type of export promotion and therefore will be briefly discussed here.

The MTDCR was set up using government funds, but is actually run by a consortium headed by the Malaysian Chamber of Commerce and Industry.

Its main functions are to provide offices and equipment and accompanying secretarial services to Malaysian companies and to operate standing exhibition halls. It has 32 offices in all. The charges for their use have not yet been set, but will be held to a level deemed appropriate for use by small Malaysian businesses.

This could be a considerably effective means of assistance to small and medium businesses which find it hard to secure a base for operations overseas.

3.3. ASEAN REGIONAL COOPERATION AND TARIFF POLICIES

3.3.1. Regional Tariffs

At the ASEAN Conference of Economic Ministers of September 1994, it was decided to postpone the CEPT by five years. As a result of this, further, it was decided that each country should place 20 percent of the temporarily excluded products under the CEPT scheme each year. The tariff rates for these were to be reduced to the level of 0 to 5 percent by the year 2003. Due to this, each country was pressed by the need to lay a foundation for industry for liberalization of regional trade within a short time period.

The schedules for reduction of tariffs for automotive parts for the countries concerned are shown below. The tariff rates for automotive parts before the implementation of the CEPT were as follows:

Malaysia	0 to 30 percent
Thailand	5 to 60 percent
Indonesia	0 to 100 percent
The Philippines	5 to 45 percent
Singapore	0 percent (some 30% products as exceptions)

At the present time, the schedules for accelerated reduction of tariffs of all countries except for Malaysia have not yet been announced, but even under the old schedule, the tariffs for most products was supposed to be reduced to the level of 0 to 15 percent by the year 2005.

Under the new schedules, that level could well be realized within this century. Further, Indonesia is the country with the most temporary exclusion items among the four countries. As stated above, however, due to the accelerated agreement, these are supposed to be incorporated into the CEPT within five years. Accordingly, there should be a major reduction in the tariffs and non-tariff barriers in the regional trade of automotive parts within the next several years.

3.3.2 Tariff Rates Outside Region

The tariff rates of Malaysia for trade outside of the region are gradually being reduced overall, but there is no clear schedule. The intent is to give industries which still cannot compete tariff protection for the time being. The offers made at the GATT negotiations were less for reductions of tariff rates than improvements of bind rates.

Table 3-3-4 Tariff Reduction Schedule under CEPT (Malaysia)

(Unit : %)

ITEMS	TRACK	BASE	1993	1998	2000	2001	2003
1 TIRES AND TUBES	F	30	27	11	5		
2 BRAKE LININGS AND PADS	N	*(30)	*	*	*		
3 LEAF SPRINGS, HELICAL SPRINGS	N	5	5	5	5		
4 ENGINES	N	2	2	2	2		
		5	5	5	5		
5 PARTS FOR ENGINE	N	0	0	0	0		
		35	33	20	14	11	5
6 AIR CONDITIONERS & PARTS	N	15	14	8	5		
		30	28	20	14	11	5
7 RADIO RECEIVERS	F	10	9	5			
8 HALOGEN, SEALED BEAM, FILAMENT LAMPS	F	2	2	2			
		7.5	7	5			
9 ELECTRIC PARTS FOR ENGINES	N	0	0	0	0		
		20	18	9	5		
10 LIGHTING OR SIGNALLING EQUIPMENTS	N	5	5	5	5		
12 BUMPERS	N	30	28	20	14	11	5
13 SAFETY SEAT BELTS	N	30	28	20	14	11	5
14 OTHER BODY PARTS AND ACCESSORIES	N	30	28	20	14	11	5
15 MOUNTED BRAKE LININGS	N	30	28	20	14	11	5
16 BRAKES AND SERVO-BRAKES	N	15	14	8	5		
17 GEAR BOXES	N	15	14	8	5		
18 DRIVE-AXLES WITH DIFFERENTIAL	N	15	14	8	5		
19 NON-DRIVING AXLES	N	15	14	8	5		
20 WHEELS & PARTS	N	30	28	20	14	11	5
21 SUSPENSION SHOCK-ABSORBERS	N	15	14	8	5		
22 RADIATORS	N	30	28	20	14	11	5
		30	28	20	14	11	5
23 SILENCERS & EXHAUST PIPES	N	15	14	8	5		
24 CLUTCHES & PARTS	N	18	16	8	5		
25 STEERING WHEELS, COLUMNS & BOXES	N	30	28	20	14	11	5
26 OTHER PARTS	N	15	14	8	5		
		30	28	20	14	11	5
27 SEAT	F	15	13	5			

Note: 1. The table for Malaysia is based on the tentative schedule before gazetting, therefore it might be somewhat different from the finally pronounced one.

2. In case the tariff rates of sub items under a type are not the same, the highest and the lowest are shown in the tables

3. Some types partially include sub items which belong to "Exclusive" items

Source MITI Malaysia, and Products and Tariff Reduction Under the CEPT, ASEAN Secretariat, 1993

Table 3-3-5 Tariff Reduction Schedule under CEPT (Thailand)

(Unit : %)

	ITEMS	TRACK	BASE	1993	1998	2000	2001	2003	2005	2008
1	TIRES AND TUBES	F	15	15	5	5	5	5	5	5
			35	30	20	15	10	5	5	5
2	BRAKE LININGS AND PADS	N	20	20	20	15	10	5	5	5
3	LEAF SPRINGS, HELICAL SPRINGS	N	26.25	26.25	25	20	20	20	15	5
4	ENGINES	N	15	15	15	10	5	5	5	5
			30	30	30	20	20	20	15	5
5	PARTS FOR ENGINE	N	5	5	5	5	5	5	5	5
			22.5	22.5	22.5	20	20	20	15	5
6	AIR CONDITIONERS & PARTS	N	22.5	22.5	22.5	20	20	20	15	5
			45	30	25	20	20	20	15	5
9	ELECTRIC PARTS FOR ENGINES	N	26.25	26.25						
			35	30	25	20	20	20	15	5
10	LIGHTING OR SIGNALLING EQUIPMENT	N	17.5	17.5	17.5	15	10	5	5	5
			35	30	25	20	20	20	15	5
11	CHASSIS & BODIES	N	5	5	5	5	5	5	5	5
			30	30	30	30	30	30	30	30
12	BUMPERS	N	30							
			45	30	25	20	20	20	15	5
13	SAFETY SEAT BELTS	N	30							
			35	30	25	20	20	20	15	5
14	OTHER BODY PARTS AND ACCESSORIES	N	35							
			60	30	25	20	20	20	15	5
15	MOUNTED BRAKE LININGS	N	35							
			45	30	25	20	20	20	15	5
16	BRAKES AND SERVO-BRAKES	N	35							
			45	30	25	20	20	20	15	5
17	GEAR BOXES	N	35							
			30	30	25	20	20	20	15	5
18	DRIVE-AXLES WITH DIFFERENTIAL	N	35							
			45	30	25	20	20	20	15	5
19	NON-DRIVING AXLES	N	60	30	25	20	20	20	15	5
			30	30	25	20	20	20	15	5
20	WHEELS & PARTS	N	17	17	17	15	10	5	5	5
			45	30	25	20	20	20	15	5
21	SUSPENSION SHOCK-ABSORBERS	N	35							
			45	30	25	20	20	20	15	5
22	RADIATORS	N	35							
			45	30	25	20	20	20	15	5
23	SILENCERS & EXHAUST PIPES	N	35							
			45	30	25	20	20	20	15	5
24	CLUTCHES & PARTS	N	35							
			45	30	25	20	20	20	15	5
25	STEERING WHEELS, COLUMNS & BOXES	N	35							
			45	30	25	20	20	20	15	5
26	OTHER PARTS	N	30							
27	SEAT	N	60	30	25	20	20	20	15	5

Note: 1 The table for Malaysia is based on the tentative schedule before gazetting, therefore it might be somewhat different from the finally pronounced one.

2. In case the tariff rates of sub items under a type are not the same, the highest and the lowest are shown in the tables

3. Some types partially include sub items which belong to "Exclusive" items

Source: MITI Malaysia, and Products and Tariff Reduction Under the CEPT, ASEAN Secretariat, 1993

Table 3-3-6 Tariff Reduction Schedule under CEPT (Indonesia)

(Unit : %)

	ITEMS	TRACK	BASE	1993	1998	2000	2001	2003	2005	2008
1	TIRES AND TUBES	N	40	40	30	20	20	20	15	5
2	BRAKE LININGS AND PADS	N	5	5	5	5	5	5	5	5
3	LEAF SPRINGS, HELICAL SPRINGS	N	20	20	15	10	5	5	5	5
			40	40	30	30	20	20	15	5
4	ENGINES	N	40	40	30	30	20	20	15	5
5	PARTS FOR ENGINE	N	5	5	5	5	5	5	5	5
			10	10	5	5	5	5	5	5
6	AIR CONDITIONERS & PARTS	N	5	5	5	5	5	5	5	5
			20	20	15	10	5	5	5	5
7	RADIO RECEIVERS, RADIO RECEIVERS WITH	F	40	40	20	15	10	5	5	5
8	HALOGEN, SEALED BEAM, FILAMENT LAMP	N	10	10	5	5	5	5	5	5
			40	40	20	15	10	5	5	5
9	ELECTRIC PARTS FOR ENGINES	N	5	5	5	5	5	5	5	5
			40	40	30	30	20	20	15	5
10	LIGHTING OR SIGNALLING EQUIPMENTS	N	10	5	5	5	5	5	5	5
			10	10	5	5	5	5	5	5

Note 1. The table for Malaysia is based on the tentative schedule before gazetting, therefore it might be somewhat different from the finally pronounced one.

2. In case the tariff rates of sub items under a type are not the same, the highest and the lowest are shown in the tables

3. Some types partially include sub items which belong to "Exclusive" items

Source: MITI Malaysia, and Products and Tariff Reduction Under the CEPT, ASEAN Secretariat, 1993.

Table 3-3-7 Tariff Reduction Schedule under CEPT (The Philippines)

(Unit : %)

ITEMS	TRACK	BASE	1993	1998	2000	2001	2003	2005	2008
1 TIRES AND TUBES	F	30	30	20	15	15	5	5	5
2 BRAKE LININGS AND PADS	N	16.5	15	15	10	10	5	5	5
3 LEAF SPRINGS, HELICAL SPRINGS	N	30	30	25	25	20	20	15	5
4 ENGINES	N	5	5	0	0	0	0	0	0
		30	30	25	25	20	20	15	5
5 PARTS FOR ENGINE	N	5	5	0	0	0	0	0	0
6 AIR CONDITIONERS & PARTS	N	45	40	30	25	20	20	15	5
7 RADIO RECEIVERS	N	27							
		29.25	22	15	15	15	15	15	5
8 HALOGEN, SEALED BEAM, FILAMENT LAMP	N	6	5.5	0	0	0	0	0	0
		18	16.5	15	10	10	5	5	5
9 ELECTRIC PARTS FOR ENGINES	N	6	5.5	0	0	0	0	0	0
		10	10	10	10	10	5	5	5
10 LIGHTING OR SIGNALLING EQUIPMENTS	N	12	11	10	10	10	0	0	0
		30	20	20	20	20	20	15	5
13 SAFETY SEAT BELTS	N	30	30	25	25	20	20	15	0
14 OTHER BODY PARTS AND ACCESSORIES	N	30	28.75	22.5	20	20	15	10	5
15 MOUNTED BRAKE LININGS	N	7.5	7.5	0	0	0	0	0	0
16 BRAKES AND SERVO-BRAKES	N	7.5	7.5	0	0	0	0	0	0
17 GEAR BOXES	N	7.5	7.5	0	0	0	0	0	0
18 DRIVE-AXLES WITH DIFFERENTIAL	N	5.5	5	0	0	0	0	0	0
19 NON-DRIVING AXLES	N	5.5	5	0	0	0	0	0	0
20 WHEELS & PARTS	N	15	15	10	10	10	0	0	0
21 SUSPENSION SHOCK-ABSORBERS	N	15	0	0	0	0	0	0	0
24 CLUTCHES & PARTS	N	7.5	7.5	0	0	0	0	0	0
25 STEERING WHEELS, COLUMNS & BOXES	N	7.5	7.5	0	0	0	0	0	0
26 OTHER PARTS	N	6	5.5	0	0	0	0	0	0
27 SEAT	N	45	40	30	25	20	20	15	5

Note 1. The table for Malaysia is based on the tentative schedule before gazetting, therefore it might be somewhat different from the finally pronounced one.

2. In case the tariff rates of sub items under a type are not the same, the highest and the lowest are shown in the tables

3. Some types partially include sub items which belong to "Exclusive" items

Source: MITI Malaysia, and Products and Tariff Reduction Under the CEPT, ASEAN Secretariat, 1993

3.3.3. Major Problems Regarding Customs Policy

Liberalization of the ASEAN regional market will be completed by 2003 since all ASEAN countries have agreed to enforce AFTA (CEPT) five years earlier than the original plan. As Table 3-3-3, shows Malaysia is already offering most of all the automotive parts.

The major problem is the attitude of automotive parts manufacturers towards changes in the domestic and ASEAN market environment in the near future and not the tariff reduction schedule itself. Malaysian automotive parts manufacturers whose market has been protected from tough competition with foreign products are now required to move quickly in response to these changes. Nevertheless, most of them do not seem to take it seriously mainly because they are favoured by a large business boom.

On the other hand the Malaysian government still intends to keep the tariff high on some imports from outside ASEAN, according to its policy of domestic industries' development. However, as a means to improve the competitiveness of Malaysian products in ASEAN, reductions of tariffs on raw materials, parts and some manufactured products such as testing apparatus imported from outside the region are also necessary.

4. BARRIERS TO AND STRATEGIES FOR THE DEVELOPMENT OF EXPORT-ORIENTED PARTS INDUSTRY

4.1. PROBLEMS OF OVERALL MANAGEMENT FOR EXPORT-ORIENTED COMPANIES

4.1.1. Management Problems Based on the Questionnaire Survey

In this section, the management problems for export-oriented automotive parts manufacturers are summarized based on the questionnaire survey of automotive parts manufacturers in comparison with non-export oriented manufacturers.

In analysing the results of the questionnaire survey, the 109 companies which responded are divided into export-oriented and non-export-oriented companies. The export-oriented companies are further categorized into three types.

Type 1: Manufacturers whose original purpose of establishment is exporting to many foreign countries including advanced countries

Type 2: Manufacturers which have production bases in ASEAN areas with the original purpose of producing parts for the Malaysian and other ASEAN countries' markets

Type 3: Local entrepreneurial companies

Table 3-4-1 shows companies to be analyzed.

Table 3-4-1 Companies to Be Analysed

Classifications	Number of Companies
Type 1 Exporting Companies	2
Type 2 Exporting Companies	11
Type 3 Exporting Companies	29
Other Companies (Notes)	67
Total	109

Notes: Most "Other Companies" are non-exporting companies, but some of the companies which cannot be classified into Type 1, 2 and 3 due to their unclear export items and amounts are included in "Other Companies." In the following analysis, "Other Companies" are described as non-exporting companies.

Source: The questionnaire survey for Malaysian automotive parts manufacturers

The number of Type 1 companies is very small, so in the following analysis the total number of Type 1 and Type 2 is used.

(1) Procurement of Materials and Parts

Fig. 3-4-1 and 3-4-2 show the results of the questionnaire survey concerning procurement of materials and parts.

Type 3 exporting companies and non-exporting companies think that procurement prices of materials are high, while Type 1 and 2 exporting companies think that they are not. This is because Type 1 and 2 exporting companies have international procurement networks of materials through their parent companies. Type 1 and 2 exporting companies are not satisfied with the delivery time and quality of materials, which means that the requirement level of Type 1 and 2 exporting companies for them is higher than that of Type 3 and non-exporting companies.

The same result can be seen regarding the procurement of parts and components. Non-exporting companies are not satisfied with prices, while exporting companies are dissatisfied with delivery time and quality.

Fig.3-4-1 Materials

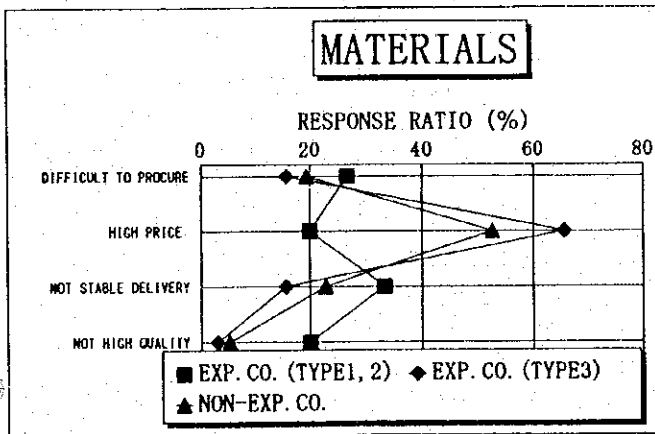
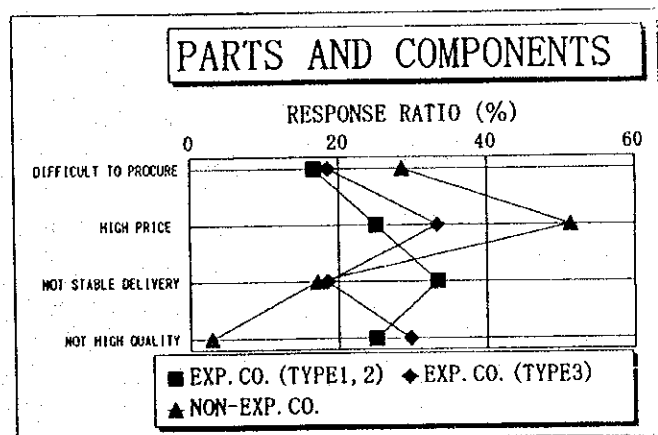


Fig.3-4-2 Parts And Components



(2) Production

Fig. 3-4-3, 3-4-4 and 3-4-5 show the results regarding production.

Regarding production capacity, the number of companies with excess capacity exceeds that of those with too little capacity. However, more than 30% of Type 1 and 2 exporting companies answered that their production capabilities are at insufficient levels and some of those companies think that production capabilities cannot keep up with production expansion.

Type 3 exporting companies and non-exporting companies think that there are no problems regarding their machinery and equipment, while about 40% of Type 1 and 2 companies answered that their machinery and equipment are a little too old. That suggests that introducing the newest machinery and equipment is essential for raising the quality of parts and productivity for those companies which export OEM parts to foreign countries including advanced countries.

Fig.3-4-3 Production Capacity

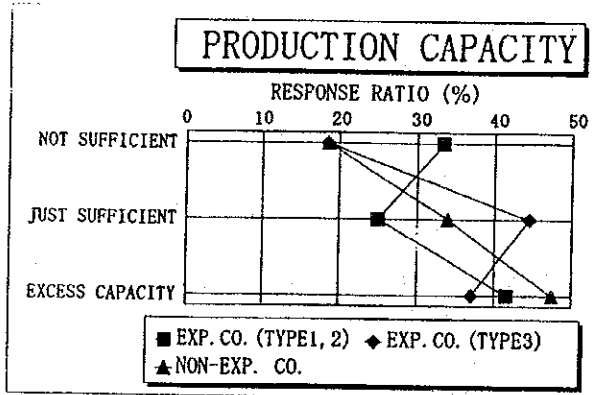


Fig.3-4-4 Machinery And Equipment

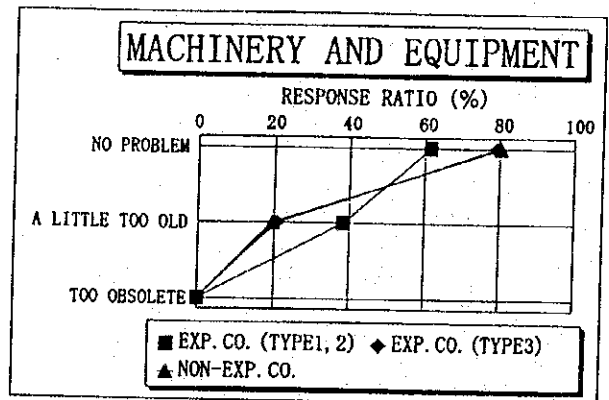
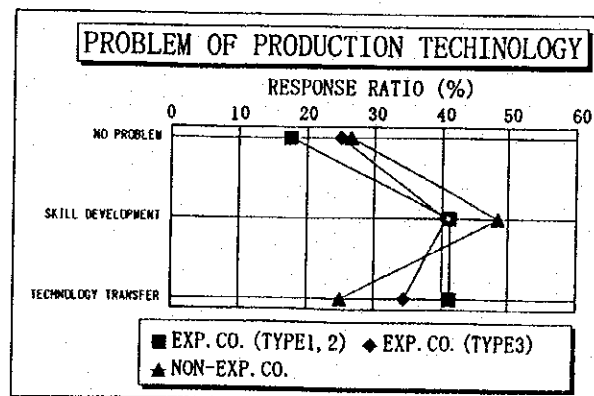


Fig.3-4-5 Problem Of Production Techninology



Overall, the number of companies which need technical skill development or further technological transfer from overseas exceeds that of companies which think that there is no problem regarding production technologies. This trend can be seen more among exporting companies. Exporting companies tend to need technological transfer from overseas more than non-exporting companies do.

(3) Recruiting Workers and Their Wages

Fig. 3-4-6 and 3-4-7 show the results of the questionnaire survey.

The difficulty of recruiting workers is a common problem for parts makers. On the other hand, the total number of companies which answered that wage levels of workers are a little too high or are increasing rapidly exceeds that of companies which answered that there is no wage problem. Especially, many of the Type 1 and 2 exporting companies answered that the wage levels of workers are increasing rapidly because they have to recruit a lot of new workers to keep up with the expansion of production volumes.

Fig.3-4-6 Workers' Recruitment

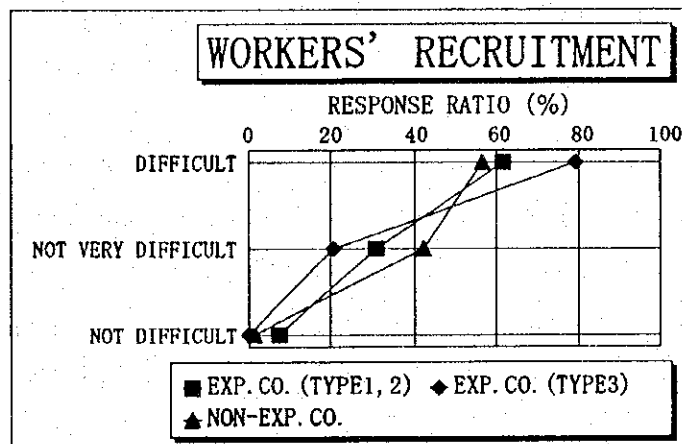
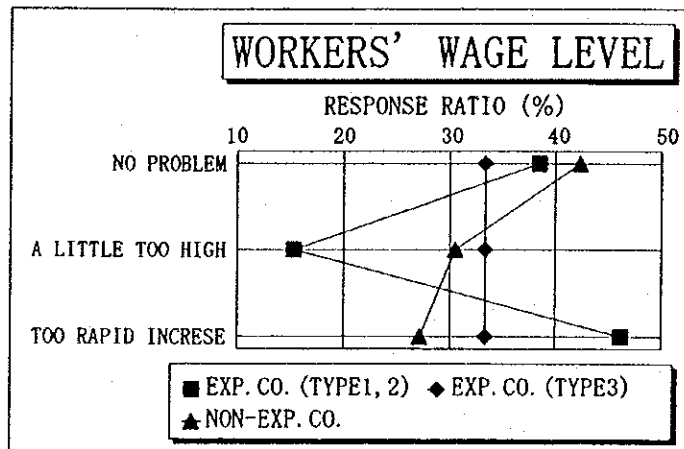


Fig.3-4-7 Workers' Wage Level



(4) Levels of Employees and Their Education

Fig. 3-4-8, 3-4-9 and 3-4-10 show the results of the questionnaire survey.

More than 60% of all the companies which responded think that workers' technical levels are medium, and more than 30% answered that they are at low levels. On the other hand, there are few companies which have a high evaluation of them. Non-exporting companies have a more negative evaluation of their workers' skills than exporting companies do.

Overall, lack of training facilities or trainers is a more serious problem than lack of training funds is. However, non-exporting companies think that lack of training funds is also an important problem.

About 60% of companies answered that there is no problem regarding managers. However, some of them pointed out managers' insufficient skills and the small number of managers. Taking into account the above factors and the data of Fig. 3-5-5, it is thought that training of technological skills for workers and engineers is more important than that of general management capabilities for managers from the viewpoint of the necessity of upgrading the levels of both workers' skills and production technologies.

Fig.3-4-8 Workers' Technical Level

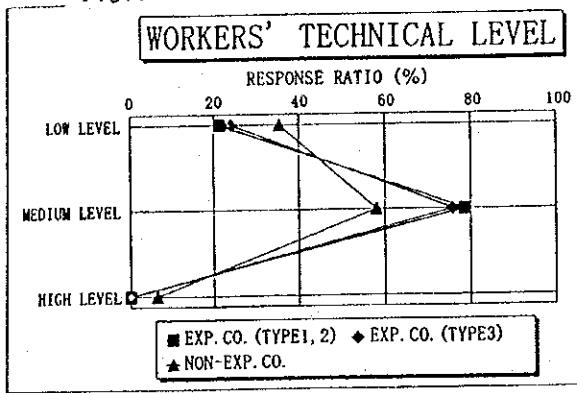


Fig.3-4-9 Workers' Training

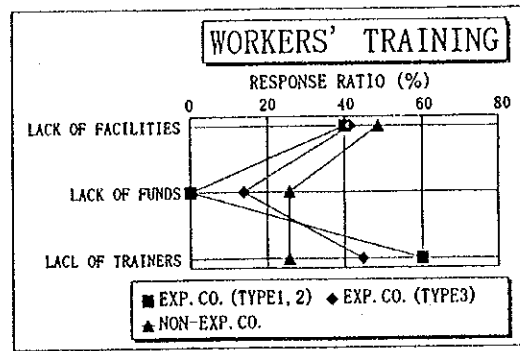
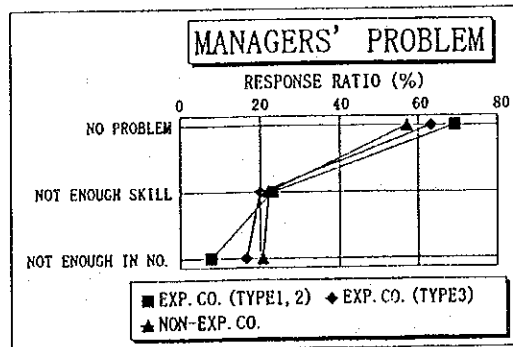


Fig.3-4-10 Managers' Problem

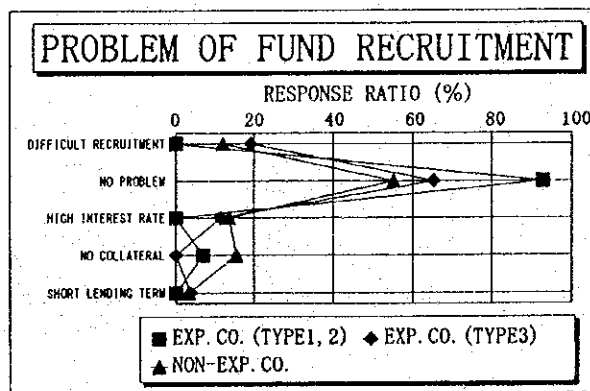


(5) Financing

Fig. 3-4-11 shows the results of the questionnaire survey concerning financing.

There are almost no problems regarding financing. Each company is thought to have substantial cash reserves, supported by the steady increase of sales due to the demand expansion. Therefore, there is not so much difficulty in fund recruitment from banks. However, in some cases non-exporting companies have difficulty recruiting funds from banks.

Fig.3-4-11 Problem Of Fund Recruitment



4.1.2. Summary

Table 3-4-2 summarizes all of the answers from companies which responded.

According to the interview survey of the JICA study team, the general management capabilities of exporting companies, especially OEM parts exporting companies, were thought to be higher than those of non-exporting companies. Based on the questionnaire survey, however, there is no significant difference between exporting and non-exporting companies concerning general management capabilities. That is because the top management requirements for general management capabilities is higher in exporting companies than in non-exporting companies.

The results of Table 3-4-2 are summarized as follows:

- a. There are few big problems concerning financing and machinery and equipment.
- b. The utilization ratio of machinery and equipment and procurement costs of materials, parts and components tend to be high due to the low production volume.
- c. Many companies point out difficulty in recruiting new workers and increasing wages because of the lack of workers.
- d. Training workers is indispensable for raising the production skills of workers and production technologies which is a very important theme for parts manufacturers. Further, it is necessary to organise education facilities and secure trainers.

The above b., c. and d. are common problems for both exporting and non-exporting automotive parts companies in Malaysia. Basically, exporting companies are required to produce higher quality, lower cost and more functional parts, which makes it necessary for them to improve production capabilities more actively.

In the near future, Malaysian automotive parts manufacturers which need to increase their exports should emphasize higher value-added and price competitive parts because of the limitations of the domestic production volume of cars and the increases in workers' wages. In order to do so, they should try to improve production technologies and train their workers more actively.

Table 3-4-2 Summary of Management Problems

	Exporting companies		Non-exporting companies	
Procurement of materials and parts	△	* price: △ * delivery: △ * quality: △	△	* price: × * delivery: △ * quality: ○
	<p>* Both of them depend substantially on imports for raw materials and the procurement amount is small, which has resulted in increasing purchasing prices. * Exporting companies have a negative evaluation of the quality of materials.</p>			
Production	△	* utilization ratio: × excess * machinery and equipment: ○ * production technologies: × (Further improvement and technology transfer are necessary.)	△	* utilization ratio: × excess * machinery and equipment: ○ * production technologies: × (Further improvement is necessary.)
	<p>* Production capacity tends to be excessive, but there is no problem regarding production facilities. * There are some problems concerning production technologies. Exporting companies have to proceed with technology transfer.</p>			
Recruiting workers and wages	×	* recruitment: × (difficult) * wages: × (increasing for Type 1 companies)	×	* recruitment: × (difficult) * wages: ×
	<p>Production processes need to be automated in order to decrease the number of workers.</p>			
People development and education	△	* workers' technical levels: △ * training: × (lack of training facilities and trainers) * managers: △	△	* workers' technical levels: △ * training: × (lack of training facilities, trainers, training funds) * managers: △
Financing	○		○	

Note: ○: Good △: Fair ×: Poor

4.2. COST

4.2.1. Procurement of Raw Materials and Parts

To keep the competitive advantage over parts suppliers in a target company, it is expected that raw material and parts cost, which accounts for seventy to eighty percent of total cost, has to be cheaper than that of the target country or at least at a similar level. In Malaysia, however, most materials and parts which constitute export-oriented parts come from Japan, the export target country, and the price competitiveness of Malaysian parts manufacturers is far behind those in Japan.

Example of Brake and Clutch (PBR)

- Caliper (Brake): Material is ductile iron. Few companies are able to produce products which are high and stable in quality. Yodoshi Malleable, only one possible manufacturer, is preparing localisation.
- Pressure Plate (Clutch): Material is gray iron. HICOM Engineering is supplying this material, but their defect rate is high, 5 to 20%.
- Disk (Clutch): These are forging parts. Belton plans to supply forging parts to PBR by introducing 1,000 ton press machines. They must bear a high investment cost of approximately RM 1 million for new machinery. Indian made forging parts have an acceptable quality level and are cost competitive.
- Heat treatment: PBR import all the parts requiring heat treatment because no supplier is able to produce high volume small parts with stable quality. QHT, an Australian heat treatment company, has built a pilot plant in Malaysia and plans to start full-scale production after 18 months' trial operation. QHT is the sole supplier for heat treated small parts in Malaysia.

Table 3-4-3 shows the results of the evaluation of the availability of parts in the ASEAN region made by a Japanese car maker, which implies the necessity of developing the supporting industry in Malaysia.

Table 3-4-3 Availability of Parts in ASEAN Countries

	Malaysia	Thailand	Philippines	Indonesia
Steel & Stamping	△	○	△	○
Aluminum Die Casting	△	○	×	○
Plastic Injection	○	○	△	×
Rubber	△	○	△	△
Glass	○	○	○	○
FC Casting	×	○	×	○
Forging	×	△	△	△
Machining	×	○	×	△
Competitive Area	Injection parts Small aluminum parts Electrical system	Almost all areas	Small injection parts Labour-intensive parts	Die casting (FC,AL)

Note: ○: Competitive △: Moderate ×: Uncompetitive
Source: A Japanese car maker

4.2.2. Labour Cost

Labour cost in Malaysia is much higher than in most other ASEAN countries, China, Vietnam, and India, which is weakening Malaysia's competitiveness.

Table 3-4-4 Comparison of Labour Cost in Asian Countries
(Worker Wages Including Allowances)

Country	Labour Costs (US\$/month)
Malaysia	240-480
Thailand	123-287
Indonesia	97-194
Philippines	156-195
China	28-78
Vietnam	50-70

Note: Labour cost in China is calculated at twice the minimum wages paid in major Chinese cities.

Source: Guidebook for Business in Asian Countries, JAIC, 1994

unusual case because this process takes time.

On the other hand, hardware technology is improved through the introduction of new facilities, technology, production method, and materials. Development of a new model rather than a daily grass-root activity provides an opportunity for improvement.

As a background comment, it should be noted that Japanese parts suppliers have rapidly raised their technology level spurred by frequent model changes. Fully utilizing the opportunities of model changes, they have aggressively attempted to introduce innovative production methods and/or new materials that can not be introduced into the existing production lines because of the short pay back periods or quality assurance problems. The production technology level had to be improved so that it would not become a bottleneck of design changes. Parts suppliers dealing with TOYOTA and NISSAN have been improving hardware technology through two to three full model changes a year.

One of bottlenecks to improve technology in Malaysia is that suppliers do not have a chance to experience frequent model changes. Further, they can not help adopting a labour intensive production method for profitability reasons because most models are not mass-production models.

4.2.5. Operation Rate

Table 3-4-3 implies that the number of companies with over capacity is larger than with those with limited capacity. Among the companies the JICA Study Team interviewed, several companies are suffering from high fixed costs because of low operation rates. The reasons for the low operation rates include a shortage of labour, as well as insufficient orders.

4.3. QUALITY

The results of the questionnaire survey on ISO 9000 series are shown in Table 3-4-5. Qualifying for the international standard, ISO 9000, is a common task of every supplier, and is a "must" for

export oriented suppliers. It is recommended that the government strongly encourage export oriented companies who have no plan to acquire the series.

Table 3-4-5 ISO 9000 Series Acquisition by Automotive Parts Manufactures

	Already exported	Planning for export	No plan for export	Total
Acquired ISO	16 (35%)	1 (6%)	6 (23%)	23 (26%)
Plan for ISO	21 (47%)	14 (82%)	11 (42%)	46 (52%)
No plan for ISO	8 (18%)	2 (12%)	9 (35%)	19 (22%)
Total	45 (100%)	17 (100%)	26 (100%)	88 (100%)

Source: Questionnaire survey of automotive parts suppliers conducted by JICA

4.4. DELIVERY

Car makers adopt strict delivery control systems because their purchased parts costs account for the majority, approximately 70% in the case of Japanese car makers, of the manufacturing cost. They require parts suppliers to practice Just-in-Time delivery. For example,

- i. Design changes occur until right before a new model is launched. Every time they occur, parts suppliers have to promptly modify the dies and jigs, adjust their parts to the car maker's in-house parts, and deliver the finished parts on time.
- ii. Parts suppliers are required to rework promptly in the case of quality trouble. If it is urgent, the suppliers sometimes send staff to the car maker factory and rework there.
- iii. If delivery trouble stops the assembly line, suppliers are sometimes required to compensate for the opportunity cost.

Export oriented companies, therefore, have to set up a delivery supporting system with the collaboration of a parent company or a technical assistance partner in target countries for export.

4.5. DEVELOPING PRODUCTS AND DESIGNS

Most automotive parts suppliers in Japan except for some in general purpose parts are involved in a "design in" development process with car makers. Fig. 3-4-12 is a typical development schedule in Japan. Generally speaking, engineers of parts suppliers are stationed at the car makers, for three months to one year, 24 months to 36 months prior to the launching. The former period is called the "co-development period" where suppliers help a car maker to decide on basic specifications, and the latter half period is called the "co-design period" where suppliers decide on the detailed design. Malaysian companies which plan a massive OEM supply have to meet car maker's requirements for development by fully utilizing a base in the target company.

Fig. 3-4-12 Development Schedule of New Models

Timing (mos. to go)	Schedule/ Event		
	Co-development with suppliers		
36 mos.	-Development declaration	-Concept drawing	-Selecting suppliers
			-Co-development with suppliers
30 mos.	-Basic concept	↓	↓
	-Model decision	-Sketch drawing	(-Selecting suppliers)
24 mos.			-Co-development with suppliers
	-Trial drawing	↓	↓
18 mos.			
	-Production drawing		
12 mos.			

5. SCENARIO FOR DEVELOPMENT OF EXPORT-ORIENTED COMPONENTS

5.1. BACKGROUND

5.1.1 Global Trend

(1) Changes in Purchasing Policies of Car Makers in the World

The future direction of world car makers' purchasing policies is that they will become similar to that which Japanese car makers have been long using, i.e., putting emphasis on long-term relationships with selected suppliers. For example, the success of Chrysler's Neon is derived from joint VE activities by both car makers and reliable suppliers from the stage of design conceptualisation. The conventional purchasing method of the Big 3 in the U.S., where parts are purchased from the most price competitive supplier among several competing companies, can not be seen in their recent purchasing behaviours. Even if the Japanese purchasing system, KEIRETSU, is criticised, relationships between car makers and suppliers are becoming tighter physically and psychologically.

(2) Closer relationship between car makers and suppliers

As table 3-5-1 shows, the transaction system of OEM export of automotive parts, which are intermediate goods, is more complicated than the export of consumer goods such as electronics products or automotive parts for REM because the former has to trade directly with customers meeting their various requirements. Therefore, most exporters have delivery and/or production bases in the form of a parent company, joint venture partner, or technical assistance partner in an importing country. Exports under the BBC scheme are not an exception because exporting brand holders have their own delivery/production bases in importing countries.

If such longer-term criteria as D(development) and M(management) are to be more emphasised, the importance of the above mentioned bases will significantly increase. Under this situation, how to fully utilise management resources, including global networks such as overseas business bases, is a key success factor for export-oriented parts manufacturers. The scenario of export promotion

should be formulated in the same direction.

Table 3-5-1 Features of Export of Intermediate Goods and Consumer Goods

	Product type	Evaluation Criteria	Features of Trade
Intermediate goods	Automotive parts	QCDDM *	Direct trade with buyer for OEM
Consumer goods	Automotive parts for REM Electric products	QC	Indirect trade through agent and trader

Note: * Q=quality, C=cost, D=delivery, D=development, M=management

5.1.2. Environmental Changes from the Viewpoint of Malaysia and Other ASEAN Countries

(1) Changes in the Rules of Competition

The following are three levels of competition of automotive parts manufacturers.

- A. Competition within domestic market
- B. Competition in ASEAN and neighbouring countries
- C. Competition in the global market

Parts suppliers in the ASEAN region have been able to concentrate on the competition in their own domestic market because the high import tariffs protect domestic markets from the threat of foreign competitors. However, when individual ASEAN countries reduce tariff rates according to CEPT for the creation of AFTA in the near future, parts suppliers will be exposed to competition with suppliers in other ASEAN countries. The competition level is shifting from a competition within a domestic market to competition in the ASEAN region.

As is mentioned later, Japanese car makers are trying to increase imports from Asian countries to reduce procurement costs due to the Yen appreciation, which, in turn, leads Japanese suppliers to invest in Asian countries for production bases and to start exports. As a result, differences in competition level within advanced countries and within the ASEAN region are expected to

become more less. Therefore, competitiveness in the world market is an essential condition to survive for parts suppliers in the ASEAN countries. In developing the export-oriented components industry, it is necessary to consider the necessity of achieving competitiveness against suppliers in advanced countries.

(2) Limited Areas Where Malaysia's Suppliers Have Competitive Advantages

As mentioned in Section 1, no other components are more competitive than electric and electronics components in Malaysia. Companies which currently engage in the production of these components in Malaysia were established with the purpose of exporting to advanced countries. They have grown up to be internationally competitive exporting companies because they targeted advanced countries, the markets of which are larger than those in ASEAN countries. The reason Malaysia could invite investments in this area was that both parties, exporting companies and Malaysia, the host country, could benefit from the investments. There are no other cases of this type which have achieved the success of the electric and electronics components area.

Indeed, some manufacturers of steering gears and shock absorbers in Malaysia export to other ASEAN countries. However, since their products are basically for non-PROTON manufacturers with a limited market, they can not grow enough to establish a supplying base in the ASEAN region due to their small volume of production. As a result, Malaysia has deficits in automotive parts trades with other ASEAN countries, for example, Thailand.

The Malaysian Government has been developing automotive parts manufacturers in the light of three principles. First, achieving a high localisation level; second, introducing foreign investments and the latest production technology; and third, developing local manufacturers. These measures have contributed a lot to the high localisation level achieved by Malaysian cars, especially PROTON. On the other hand, these policies are one of the reasons that there are few suppliers with high exporting capability. They, in a sense, have led to delays in improving indigenous R&D capability, developing internationally competitive automotive parts manufacturers, and raising local content at a material level. Malaysia, which has achieved high localisation, should take the next step aiming to achieve international competitiveness through the construction of a strong industry structure.

5.1.3. Mutual Relationship between Automotive Industries in Asian Countries and Japanese Automotive Components Manufacturers

Japanese auto makers are aggressively trying to increase parts imports. The purpose of imports varies according to regions. As for the U.S. market, the purpose of imports is to narrow the trade imbalance between Japan and the U.S. As for the Asian market, the main purpose is to reduce manufacturing cost. Parts suppliers in Japan are strongly required to lower their selling prices by auto makers. They are increasing imports from Asian countries in response to these requirements. The recent Yen appreciation has accelerated this movement. As a result, the division of automotive parts production in the Asian region, in which Japanese and Asian manufacturers are vertically and horizontally integrated, will be established by the year 2000.

On the other hand, most governments, which consider the supporting industry development as the key of their industrial policy, place emphasis on investment promotion, especially investments by Japanese automotive parts manufacturers. Therefore, the next five years is an important period, for both Japanese automotive parts manufacturers and individual supporting industries in Asian countries, which may well determine their future.

Table 3-5-2 illustrates how Asian countries' purpose of inviting investments and Japanese parts manufacturers' needs of investment in these countries match.

Table 3-5-2 Mutual Relationship between Japanese Suppliers and Asian Countries

Area	Asian Countries	Japanese Suppliers
Needs	Need for the enhancement of the industry Need for the promotion of exports	Need for investment in Asia
Resource	-growing market -positioned as leading industry -geographically close to Japan	-technology -management technique by close relationship between car maker and suppliers -past experiences
Factors Affecting Relationship Between 2 Areas	<u>Pull Factors</u> -promote technology transfer -strengthen industry structure -enhance cost competitiveness -obtain Japanese style management -human resource development -increasing value added -developing competitive local suppliers	<u>Push Factors</u> -yen appreciation -reduce trade surplus -reduce procurement cost

5.2. MEASURES TO BE TAKEN

5.2.1. Promotion of Foreign Investment by Export-Oriented Manufacturers

Table 3-5-3 shows the examples of automotive parts imports by major Japanese parts manufacturers in 1994. Japanese parts manufacturers import mostly from their own production bases or local companies on a consignment basis.

Table 3-5-3 Recent Trend of Imports by Japanese Automotive Parts Manufacturers

Parts Suppliers	Products	Import Country	Remarks
ASAHI TECH	Aluminum die cast	Thailand	Vertical integration between Japan and Thailand.
KOITO	Lamps	China	
TOSOKU	Electro-magnetic parts	Vietnam	Purchasing from consignee.
ALPINE	Car audios	China	
IZUMI	Pistons	Thailand, Indonesia	
DAIKIN	Springs	UK, Germany	Purchasing from local suppliers.
	Ductile die cast	US	
	Forging	India	
	Aluminum die cast	Australia	
CHUO SPRING	Leaf springs	Indonesia	
	Brake cable parts	US	
TOKAI RUBBER	Rubber protectors	China	Purchasing from consignee.
TOKAI RIKA	Seat belts	Thailand	Establishing J/V with Toyota Boseki.
TOKYO BUHIN	Brake parts	Korea	Purchasing from technical assistance partner.
TOYO SEAT	Seat adjusters	China	
TOCHIGI FUJI	Casting materials	Indonesia	
NIKKO DENKO	Material for yokes	China	
	Magnet switches	Indonesia	
NIHON HATSUJO	Spring materials	Korea, Taiwan	
PIONEER	car audios	Malaysia, Thailand, Indonesia	Purchasing from consignee.
FUJITSU TEN	Car audios	Philippine	
MIKUNI	Carburetors	Thailand	
MITSUBA ELEC.	Motors	US	
RIKEN	Die casting	Indonesia	

According to the questionnaire survey conducted by the JICA Study Team, covering 592 Japanese automotive parts suppliers, 278 companies have a plan for foreign investments, out of which 39 companies consider Malaysia as one of the target countries both for production and as an export base. The results of questionnaires are shown in Table 3-5-4. Among the 39 companies, only eight companies consider Malaysia as the sole target country.

Table 3-5-4 Breakdown of Respondents Interested in Malaysia

Target Countries	Respondent
Malaysia	8 companies
Countries including Malaysia	22* companies
Overall southeast Asia	9 companies
Total	39 companies

Note: *Breakdown of 22 companies (plural response)

China	15 companies
Thailand	9 companies
Indonesia	7 companies
US	3 companies
Philippines	2 companies
Vietnam	2 companies
Others	4 companies

Source: Questionnaire Survey to Japanese Automotive Parts Suppliers, JICA Study Team

Taking into consideration the current situation of Japanese potential partners, the following two promotional measures are recommended for two reasons: taking away the factors which hinder foreign investments, and gaining priority as an investment target country of potential partners.

- i. To alleviate the controls on foreign investments.
- ii. To focus the investment promotion targeting major automotive parts manufacturers with high export competitiveness which are not under the strong influence of car makers' suppliers groups.

(1) Deregulation of Foreign Equity Restriction

Foreign companies investing in the Asian region compare investment conditions of major target countries. The items to be evaluated are investment-related laws such as tax incentives, foreign equity restrictions, foreign exchange control, and finance systems as well as the business environment such as market and labour conditions. Among other things, foreign equity restriction is an important factor which discourages investment because it takes flexibility away from management. Malaysia's investment incentives and investment-related laws have been attractive to foreign investors compared with neighbouring countries and this has contributed to large investments directed to Malaysia, especially in the area of the electric and electronics industry. However, Malaysia is losing this advantage because the neighbouring countries have been reviewing their investment incentives and investment-related laws.

Malaysia's restriction on foreign equity is the most severe among major Asian countries as shown in Table 3-5-5. This is one of the bottlenecks of inviting foreign investments by automotive parts manufacturers. Most foreign companies are not allowed to establish a 100% owned company because it is difficult for them to achieve an export ratio of more than 80%, which is the condition for the establishment of a 100% owned company. It is desirable that the Malaysian government offer foreign equity conditions similar to those of Thailand.

Table 3-5-5 Foreign Equity Restriction of Major Asian Countries

Malaysia	<u>Ratio of Export to Sales</u>	<u>Max. Foreign Equity</u>
	more than 80%	100%
	51% to 79%	100% under certain conditions
	20% to 50%	51%
	less than 20%	30%
	(indirect export is not regarded as export)	
Thailand	<u>Ratio of Export to Sales</u>	<u>Max. Foreign Equity</u>
	More than 80%	100%
	More than 50%	80%
	Less than 50%	49%
	(whether indirect export is admitted as export or not is determined by BOI on a project basis)	
	Companies of the "specially important industries" such as the supporting industry are allowed to be 100% foreign owned. The automotive supporting industry includes the mould, die, jig, forging, die casting, sintering, heat treatment, plating, cutting tool, and grinding tool industries (effective June 1994).	
Indonesia	The government drastically changed its foreign equity restriction policy with the announcement of the deregulation measures in June 1994.	
	<u>New Regulation</u>	
	There are two types of foreign companies, a 100% foreign owned company and a joint venture, the foreign equity of which is up to 95%. A 100% foreign owned company is obliged to transfer a part of its shares to local companies and/or individuals in 15 years.	
	("A part of share" means a minimum of 1 share.)	
Philippines	<u>Foreign Company Which Receives Tax Incentives</u>	
	A company to be set up must be transformed to a domestic company (less than 40% foreign equity) in, in principle, 30 years. A 100% export company is the exception to the above rule.	
	<u>Foreign Company Which Does Not Receive Tax Incentives</u>	
	It is allowed to have 100% foreign equity as long as its line of business is not included in the Negative List of Foreign Investment Law in 1991.	
China	Manufacturing companies are allowed to be 100% foreign owned. There are a few restrictions on other industries.	

Source: The Guide Book of Asian Business, Japan Asia Investment Company, 1994

(2) Promotion for Top Companies' Foreign Investment

Table 3-5-6 shows the breakdown by number of employees of 39 companies which have an interest in investment in Malaysia.

Table 3-5-6 Scale of 39 Companies Interested in Malaysia

No. of Employees	No. of Companies
50 persons or less	11
From 51 to 100 persons	7
From 101 to 300 persons	6
From 301 to 500 persons	2
From 501 to 1,000 persons	6
From 1,001 to 2,000 persons	4
2,001 persons or more	3

Source: Questionnaire Survey to Japanese Automotive Parts Suppliers, JICA Study Team

As is shown in the above table, about half of the respondent firms are small in size with less than 100 employees. Most of such small companies are thought to be second and third tier OEM suppliers whose management is relatively weak or REM suppliers because Japanese car makers usually deal with selected medium or large scale suppliers for the efficiency in procurement and development of new models. In other words, there are few leading suppliers which are interested in Malaysia among the respondent companies.

In order for the Malaysian government to boost exports, it is certainly necessary to invite large scale independent component manufacturers, most desirably top companies, from all over the world, in addition to promoting small and medium companies' investments, by improving foreign investment related laws and the investment climate. An important point is to offer a good business opportunity for new comers, by creating free competition even in the area of localised automotive parts, if the existing suppliers do not have the competitiveness sufficient to export.

The priority product items for investment promotion can be selected from the following conditions:

- Parts which are mainly manufactured by large-size manufacturers
- Parts which are classified as export-oriented components in Table 3-2-1.
- Parts of which top companies have not invested in Malaysia.

The major parts and components which satisfy the above conditions are as follows:

tyres, bearings, clutches, lamps, gaskets, oil filters, oil seals, fuel injection equipment, turbo chargers, gear boxes, control units, relays, coil springs, wiper blades, fasteners

It is recommended that priority be placed on the above items at the selection of investment promotion targets among major independent parts suppliers.

5.2.2. Diversification of Electronics Components Production in Malaysia

According to the field survey conducted by the JICA Study Team, there is no other field than the electronics industry in which Malaysia has a competitive edge over advanced countries as well as the neighbouring countries. In the automotive industry, Malaysia has production bases in radios and car stereo exports, which take advantage of the developed supporting industries of the electric and electronics industry. In future, more emphasis has to be placed on electronic components which are the key for basic performance of cars, taking into consideration the following trend.

Key words toward the 21st century in developing new cars are safety, energy saving, and protection of environment. Safety is sometimes inconsistent with energy saving because putting more devices for safety in cars leads to heavier cars. Emission control and freon problems are also other critical issues to be solved urgently. Existing technologies, or such technologies as can be improved from existing technologies, can not solve these issues. In the course of tackling these problems, existing mechanically controlled devices will be replaced by electronically controlled devices, which considerably affect the competitiveness of cars.

The following are major items of the control units component group, which electronically control various functions of the automobile. The Malaysian government should try to invite foreign companies in this field as export oriented manufacturers.

Engine Control Unit

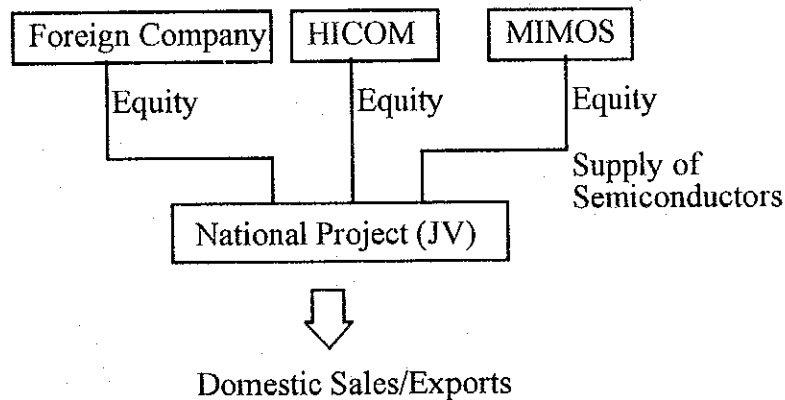
Power Steering Control Unit

Transmission Control Unit
ABS Control Unit
A/C control Unit

Door Mirror Control Unit
Door Lock Control Unit
Relays

It is also recommended to consider the idea that the Malaysian government take the initiative and become involved in setting up a production base for the export of these control units by its own equity participation. An example of a control unit production under the initiative of the government is as shown in the following figure. There is a possibility that MIMOS, which plans to produce semiconductors in the near future, will supply semiconductors to a government joint venture company for control unit production.

Fig.3-5-1 Concept of Joint Production of Control Units



5.2.3. Restructuring of Industry Structure and Government's Support for Restructuring

The creation of AFTA will offer an opportunity for and threat to the automotive parts industry: more export opportunity and the threat of more severe competition with imports. The balance of automotive parts trade will be, in the long run, determined by the extent to which the players in the industry can become competitive in the global marketplace. Therefore, the government's export promotion measures should be taken from the viewpoint of how to establish the industry's competitiveness for the long term. At the individual company level, efforts to strengthen management capabilities are important to gain competitiveness. However, at the same time, from the macro perspective, the restructuring of the automotive parts industry is also important for competitiveness. The government, as well as car makers, should play an important role in this area.

There are cases where several local companies share the domestic market of specific items with small sales volume for each under moderate competition. This situation hinders the realisation of an efficient industrial structure.

The following example of seat belt production shows how the efficiency of the Malaysian automotive parts industry is hindered by the production by multiple small companies and the how the restructuring of the industry is needed.

Case of Seat Belts

- The seat belt industry consists of three suppliers. Company A got a manufacturing license in 1976. This company had monopolised the market for several years until Company B entered the market in the early 1980s and Company C in 1985.

	<u>Establishment</u>	<u>Market Share (PROTON's Purchase)</u>
Company A	1975	30%
Company B	1980	40%
<u>Company C</u>	<u>1985</u>	<u>30%</u>

- In spite of the small market size, RM 40 million a year, three suppliers have a fixed market share, resulting in no competition. Each supplier respectively has technical assistance from a foreign company. Therefore, the purchase of testing equipment and royalty payment overlap at the industry level.
- Company A, established earliest among three, has a low level of quality assurance system with a process defect rate of 5 to 13 percent. Productivity of this company is also low.

The government and car makers have to analyse the industrial structures of these types of industries, such as air conditioners, stamping, etc., and prepare necessary measures to tackle this problem.

(1) Restructuring Measures

1) Promotion of Restructuring through Purchasing Policy of Car Makers

The following measures should be taken by car makers for the restructuring of the industry. These measures should be flexibly put into practice according to the situation of individual parts groups, such as future direction of development, foreign competitors' position, etc., after evaluating competitiveness.

- i. To reduce the number of suppliers per individual item.

The purposes of this measure are to realise economies of scale and to eliminate noncompetitive suppliers.

- ii. To diversify supply sources for parts which a limited number of suppliers currently supply.

The purpose of this measure is to make the market mechanism function better in parts supply.

- iii. To increase purchase in the form of component systems, and develop second-tier suppliers to become first-tier ones. The purpose of this measure is to make their production systems more efficient and enhance their development capability.

2) Promotion of Alliances among Parts Suppliers

In order to enhance competitiveness, alliances among local companies as, well as alliances with foreign companies, should be promoted. The types of alliance to be promoted are i) promotion of joint development, and ii) promotion of mergers and acquisitions.

- i. Promotion of Joint Development

In order to enhance development capabilities, it is very effective to develop several related components together as a large group rather than develop each part independently. Taking electronically controlled suspension for example, strategic alliances between suspension manufacturers and electronics manufacturers can have a synergistic effect. The government and car makers should take the initiative in organizing this kind of alliance, based on the analysis of what kinds of alliances are strategically critical for the future development of

important components. Especially, the fusion of mechanically functioning components and electronically functioning components will be a key issue in the development strategy in the area of automobile technology. In the case of Japan, the government encouraged R&D activities by both industries with the introduction of the Machine and Electronics Industry Promotion Act, known as KIDENHO, in 1971, which combined the former Machine Industry Promotion Act and Electronics Industry Promotion Act. This Act resulted in active R&D activities combining these two areas, and the establishment of systematic groups, which engaged in systematisation of technologies in the two areas.

ii. Promotion of Integration of Existing Companies

The integration of local companies has the following advantages in improving the efficiency of the automotive parts industry and promoting exports.

- a. Integration enhances competitiveness because it brings about the economies of scale. They cut down the fixed cost and create a synergistic effect.
- b. Integration stabilises the management foundation by enlarging the size of a company. This results in a management foundation which can stand the fluctuations of export markets.
- c. The expansion of a company through integration increases the company's credibility among buyers.

Considering the above mentioned advantages, it is essential to enlarge the size of local companies through their integration for the enhancement of export competitiveness. The fact, as shown in Fig. 3-1-10, that exporting companies are, in general, larger than non-exporting companies supports this direction.

(2) Legal Measures to Promote Restructuring

Another government function in the restructuring process is to provide an institutional setting to facilitate the restructuring. The measures to be examined are as follows:

- i. Tax Incentives for Business Change

In case a company having suffered a significant sales drop due to the structural change of the industry, wishes to pull out of the current business and seek other business opportunity, this company can receive tax incentives for such a change and/or soft loans from public financial institutions.

ii. Tax Incentives for Alliances

In case a company, for the purpose of expanding its production scale and/or improving productivity or technology, wants to merge, invest in another company, or establish a joint venture, this company can receive the following tax incentives:

- income tax reduction or exemption on liquidation income accrued by mergers and acquisitions
- recognition of income accrued by equity participation as non-taxable income
- registration tax reduction on the establishment of a corporation, issuing new shares, or acquisition of real estate in relation to the restructuring

iii. Exception to Taxation on Real Estate

In case a company sells real estate, for the above purposes, and purchases substitute real estate, this company's capital gain on the real estate sale is not deemed taxable income.

5.2.4. Support for Overseas Market Development Activities

Now that direct financial support for exporters cannot be strengthened further, measures to give support for market development activities become increasingly important for export promotion. Actually some automotive parts manufacturers who are actively trying to expand exports are eagerly expecting this kind of support.

Exporting manufacturers are classified into the following three types in 2.2.1 of this chapter.

Type (1) Manufacturers whose original purpose of establishment is to export to foreign

markets, including developed countries

Type (2) Manufacturers who have production bases in the ASEAN region with the original purpose of supplying parts to the Malaysian and other ASEAN countries' markets

Type (3) Local entrepreneurial enterprises

Among these types of companies, Type (3) manufacturers particularly need this kind of support because they do not have an international network with much expertise in market development.

The government has already set up new organisations and premises such as MATRADE and MTDCR to facilitate Malaysian manufacturers' overseas market development activities. Since they were recently established, however, they are still strengthening their organisation and function. In order to promote exports of automotive parts, strengthening of the following activities are required.

(1) Collection and Provision of Overseas Information

- a. Collection of basic information such as statistics (production, sales and trade), tariff schedules, other printed matters related to automotive parts, etc.
- b. Studying the markets and industries in order to collect detailed information specified by commodities, countries or areas and providing analyses based on the collected information.

It is necessary for automotive parts manufacturers to be equipped with proper information to design market development strategies. Especially, the strengthening of b. should be achieved as soon as possible.

(2) Overseas Dissemination

- a. Participation in international trade fairs
- b. Utilisation of overseas premises for exhibition

Positive dissemination activities are necessary to receive more recognition and to improve the image of Malaysian automotive parts. In order to heighten the effect, it is necessary to participate in special

trade fairs. Collective participation and promotion is also necessary to higher effectiveness.

(3) Positive Business Exchanges with Potential Users and Partners

- a. Sending missions organised only by automotive parts manufacturers for the purpose of holding business meetings with foreign manufacturers.
- b. Efficient utilisation of matching systems for the promotion of trade and investment. Placement and on-the-spot provision of Malaysian exporters' company data utilizing overseas branches of Malaysian organisations and local organisations.
- c. Utilisation of overseas business supporting premises.

Business exchanges with overseas potential importers and/ or partners should be strengthened. Automotive parts manufacturers who export their products to the unstable REM market should endeavour to tie-up with reliable overseas manufacturers in respect to capital and technology. The establishment of a strong relationship with a leading manufacturer forms the foundation for participation in the global network for automotive parts production and sales. Therefore, objectives of the activities cited above shall not only be promoting exports, but introducing capital and technology.

MATRADE, MIDA and MTDCR should make efforts to strengthen their functions and cooperation with each other in order to give proper support to these activities.

Fiscal incentives given to overseas marketing activities (Double Deduction and ITAF 4) can effectively support the activities of small scale enterprises, though they cannot save exporters from having to spend a large amount of money. Related organisations should give applicants proper advice and make efforts to shorten handling time.

It should be noted that supporting measures by the government make sense on condition that automotive parts manufacturers help themselves to tackle overseas market development. Before anything else, it is necessary for automotive parts manufacturers to organise themselves for the purpose of export promotion.

5.2.5. Measures to Enhance Management Capabilities of Export-Oriented Parts Manufacturers

In addition to the promotional measures for restructuring the industry, which are to be promoted by the Government and the automobile manufacturers, and those for export promotion, which are to be initiated by the Government, such measures as directly support for the improvement in management capabilities of export-oriented parts manufacturers are of importance from the aspect of management reform.

Malaysian export-oriented parts manufacturers have problems in the area of such soft technologies as manpower, management, know-how, etc., rather than hard technologies, such as machinery and equipment, or financing. More specifically, they have a lot of problems in management systems and know-how related to cost, quality, product development & design, etc. In spite of the industry's constraints such as the limited size of market, and the unavailability of local materials, these problems, to a large extent, can be solved through efforts to improve management capabilities, and to promote cooperation with automobile manufacturers.

In addition, from the long-term perspective, Malaysian parts manufacturers are expected to move on to more value-added businesses because of the shortage of manpower and the resultant rise in wages.

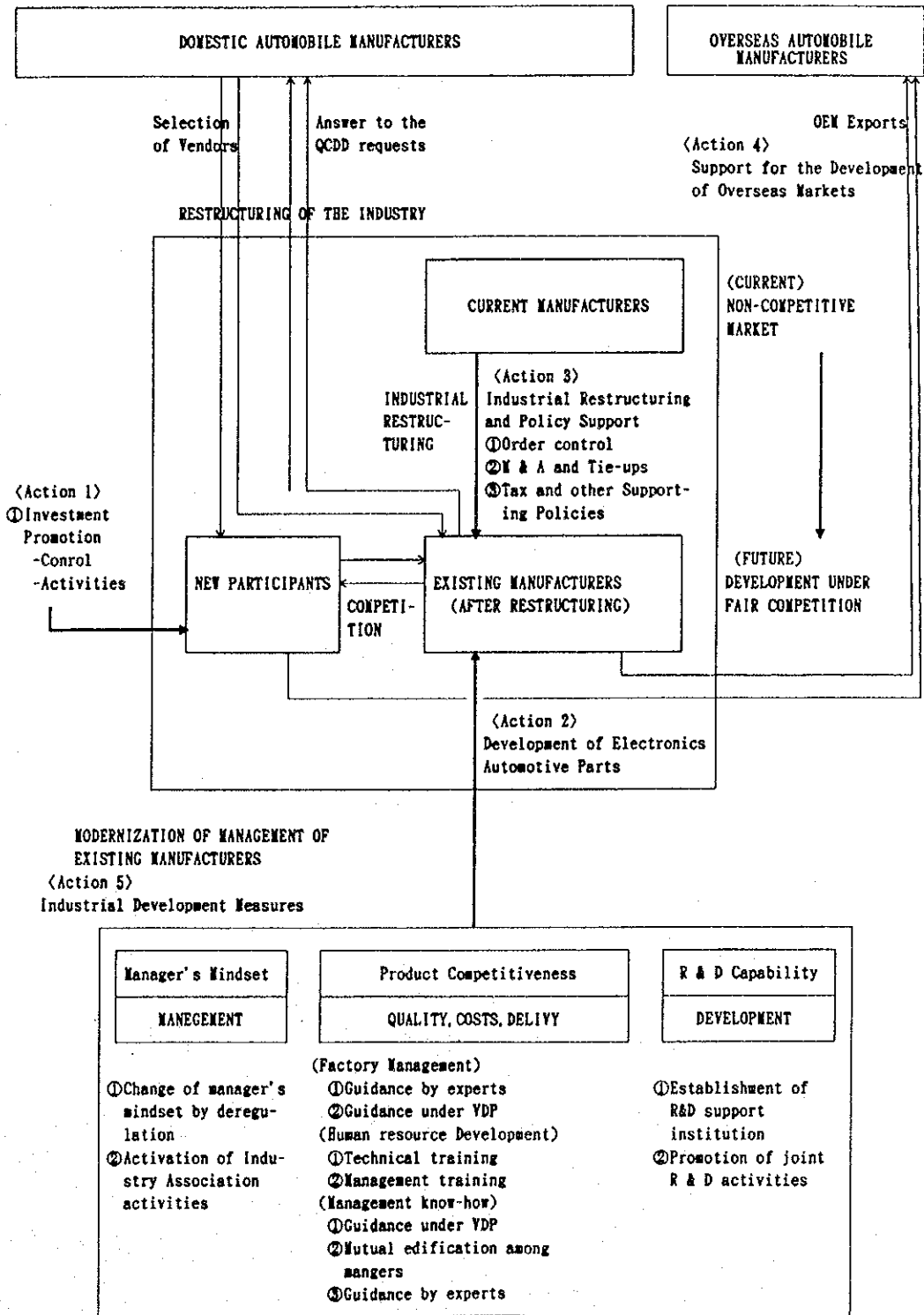
In consideration of the above, it is recommended that promotional measures to enhance the management capabilities of Malaysian parts manufacturers be applied from the following three aspects:

- To change management attitudes, motivation and style
- To improve product competitiveness
- To improve new product development capability

The framework of these measures is shown in Fig. 3-5-2.

These measures should emphasise the development of competent manpower because they are key for actualising the enhancement of management capabilities and carrying out successful business operations in the future.

Fig. 3-5-2 Framework of Measures for the Promotion of Export-oriented Manufacturers



CHAPTER 4. DEVELOPMENT OF THE ENGINEERING SUBSECTORS

1. DEFINITION OF THE ENGINEERING SUBSECTORS

The automobile industry is made up of assemblers, representing the summit of the production process, and many companies below which supply them with a variety of parts. In Japan, parts manufacturers who directly supply assemblers with parts are generally called first tier suppliers, while manufacturers who supply parts, such as casting materials and processed parts to be assembled, or render services, such as heat treatment, to these first tier companies are called second tier companies. In other words, second tier companies are regarded as being a company group which plays a processing role in the production process of automotive parts manufacturing.

Although the history of the automobile industry in Malaysia is still short, a very wide range of parts have been manufactured in terms of the number of items, and presently the level of localization has reached approximately 80%. Most of them are manufactured by automotive parts manufacturers in line with the governmental policy on the development of the automotive parts industry, while some parts are manufactured by a national car company, PROTON, internally. In other words, the development of so called first tier companies has been actively conducted. However, second tier companies are often regarded as being under developed by first tier companies, and some first tier companies, therefore, carry out certain processes internally instead of subcontracting them to second tier companies.

Considering this situation, in the first phase study, the following fields were chosen among those which were taken by second tier companies as priority fields to be developed.

Casting, Forging, Heat treatment, Surface treatment, Machining, Die making, and Jig production

Although these fields are mainly carried out by second tier companies, they are not simply defined as those of second tier companies, and above all, there is no general terminology to define these fields. Therefore, in this report, the terminology, "engineering subsectors" is used to define them.

In the second phase study, both first tier companies which deal with these fields and second tier companies were surveyed, putting priority on the latter.

2. PRESENT SITUATION AND ISSUES OF THE ENGINEERING SUBSECTORS

2.1. STRUCTURE OF SUPPORTING INDUSTRIES

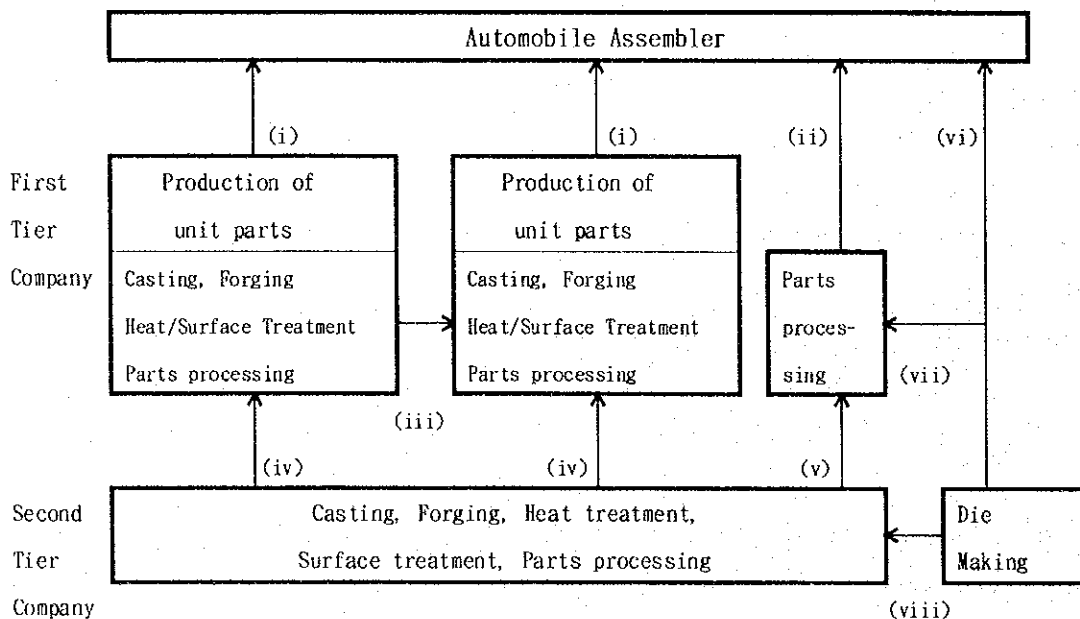
2.1.1. Structure of the automobile industry based on business relationship

(1) Business structure

In Japan, business relations between automobile assemblers and first tier companies have become firm, and these kinds of relations have been called the Keiretsu System, an affiliation among automobile assemblers. This sort of system also has progressed between first tier companies and those second tier companies which deal with them. The system has worked to improve quality, increase cost competitiveness, and increase the efficiency of the performance of affiliated company groups. However, as the automobile industry progresses, both first tier companies and second tier companies are going to become more independent from assemblers.

Business relations in the Malaysian automobile industry are basically the same as those in Japan as described as follows:

Fig. 4-2-1 Conceptual Business Relations in the Automotive Industry



The above illustration is further explained as follows:

Channel (i) shows relations where parts manufacturers supply assemblers with unit parts that have specific functions such as radiators and air conditioners. These first tier companies tend to do the same jobs as are done by second tier companies.

Channel (ii) shows relations where parts manufacturers manufacture simple parts such as press parts, plastic parts and rubber parts, and supply them to assemblers. These first tier companies conduct the same jobs as those of second tier companies, but supply the assemblers directly.

Channel (iii) shows relations where first tier companies subcontract service jobs such as the preparation of raw cast and plating to other first tier companies. Services such as machining, pressing, plastic forming, and rubber forming are often subcontracted.

Channel (iv) shows relations of subcontracting. There are many cases of subcontracting.

Channel (v) shows relations where, for instance, press companies subcontract a part of their press jobs to second tier companies.

Channels (vi), (vii) and (viii) show relations where die makers supply dies to assemblers, first tier companies, and second tier companies.

(2) Size of business relations

1) Relations with automobile assemblers

Table 4-2-1 shows the number of first tier companies by the number of assemblers they deal with.

Table 4-2-1 Relations between Assemblers and First Tier Companies

Number of assemblers	Number of first tier companies
1	102
2	33
3	20
4	8
5	7
6	7
7	10
8	9
9	2
Total	198

Note: Assemblers are made up of PROTON, PERODUA, OASB, TCMA, ASSB, AMI, SMA, AMM, and CCB

Source: The First Phase Study in Malaysia

Out of 198 first tier companies, 102 companies, or 52% of the total, deal with one assembler. One hundred and fifty-five companies, which accounts for approximately 80% of the total, deal with one to three assemblers. Table 4-2-2 shows that 48 companies out of these 102 companies, or approximately 50%, deal solely with PROTON.

Table 4-2-2 Number of First Tier Companies which Deal with One Company

Customer	Number of Companies
PROTON	48
AMM	14
TCMA	13
Other	27
Total:	102

Source: The First Phase Study in Malaysia

The above results do not indicate that the Keiretsu Systems have worked but rather that automobile assemblers have nurtured automotive parts companies.

Approximately one half of the total first tier companies deal with many assemblers. Among them, the following two companies deal with all the automobile assemblers.

<u>Name of Company</u>	<u>Major Products</u>
Perusahaan Dapat Sdn. Bhd.	Seat belt
United Sanoh Industries Sdn. Bhd.	Fuel tubing

The business channels of the above two companies correspond to (i) and (ii) in Fig. 4-2-1.

2) Subcontracting by the first tier companies

Business relations between first tier companies are depicted as (iii) in Fig. 4-2-1. Twenty-one companies out of 52 first tier companies which responded that they subcontracted to other companies had business relations with other first tier companies. This number represents approximately 40% of the total, and indicates that a substantial percentage of first tier companies deal with other first tier companies.

Forty-eight companies out of the 52 first tier companies, which represent approximately 90% of the total, have business relations with second tier companies. In other words, almost all first tier companies use second tier companies when they subcontract to other companies. These relations correspond to (iv), (v) and (vii) in Fig. 4-2-1. (also refer to Table 4-2-3)

Table 4-2-3 Number of First Tier Companies by Subcontracting Type

Type of Subcontracting	Number of Companies
First tier company	21 out of 52
Second tier company	48 out of 52

Source: The First Phase Study in Malaysia

The number of subcontract companies which first tier companies deal with varies widely depending on the size and the business line of the first tier company. Some companies deal with only one

subcontractor, while some deal with no less than 40 subcontractors. Among first tier companies which do business such as (iii), (iv), (v) and (vii) in Fig. 4-2-1, the following companies deal with many second tier companies.

<u>Company</u>	<u>Number of subcontract Second Tier Companies</u>
Brimal Holdings Sdn. Bhd.	41
Nippondenso (Malaysia) Sdn. Bhd.	40
Car Seats (Malaysia) Sdn. Bhd.	30
Kayaba (Malaysia) Sdn. Bhd.	23
Patco Malaysia Bhd.	20
Sanden Air Conditioning (Malaysia) Sdn. Bhd.	20

3) Business involving the second tier companies

On the other hand, the number of second tier companies and the number of first tier companies with which they deal is as follows:

Table 4-2-4 Business Relations of Second Tier Companies with First Tier Companies

Number of second tier companies	Number of first tier companies dealt with	Automotive parts as a percentage of total revenue
17	1 to 5	5 to 100%
6	6 to 10	15 to 100%
1	15	40%
Total 24		

Note: Second tier companies include 3 press forming companies and 1 plastic forming company
Source: The Second Phase Study in Malaysia

As shown in Table 4-2-4, many second tier companies deal with not more than 5 first tier companies. Although the percentage of automotive parts sales relative to total revenue at second tier companies varies depending on the company, a weighted average percentage is 24%. Besides

the automobile industry, they mainly sell to the electronics/electric industry as shown in Table 4-2-5.

Table 4-2-5 Sales of Second Tier Companies
Except for the Automobile Industry

Industry	Number of Second Tier Companies
Electronics/electronic	14
Machinery/maintenance	2
Bicycles	1
Screws	1

Note: Second tier companies include 3 press forming companies and 1 plastic forming company

Source: The Second Phase Study in Malaysia

4) Summary of business of the second tier companies

The situation mentioned in this section is summarized as follows:

- (i) A wide variety of transactions were observed between automobile assemblers and first tier companies.
- (ii) Many first tier companies subcontract among each other.
- (iii) Many business relations were observed between first tier and second tier companies.
- (iv) Despite the above, second tier companies depend considerably on the electronics/electric industry.

This kind of industrial structure is considered to stem from the rapid progress of the localization of parts by the Malaysian automobile industry, which first started with CKD production. In other words, although both first tier companies and second tier companies have grown rapidly, still the quality of the latter has not reached the level of sufficiency requested by the former. This may have increased business relations among first tier companies. The second tier companies have been nurtured by the electronics/electric industry, which preceded the automobile industry, because the automobile industry has been unable to do so. However, it is important for the automobile industry to endeavor to develop the engineering subsectors for the future.

(3) Evaluation of subcontract companies

Table 4-2-6 shows how first tier companies evaluated subcontract companies. In this table, the evaluation was made based on three point grading, where grade 3 is the highest. An asterisk indicates relatively weak points. This table may be interpreted as follows:

(i) Problems exist in technology and management as a whole.

This may indicate that first tier companies have trouble in getting good quality and smooth delivery of subcontracted parts.

(ii) The factory management of dies is considered to be poor.

It seems that die makers are not able to carry out sufficient factory management of dies because the majority of them are small.

(iii) The quality of cast iron does not meet requirements.

Considering the fact that cast iron was evaluated higher than any other evaluation items except for quality, it is understood that the problem in quality is critical. The same sort of response was obtained through the field interviews, too.

(iv) Die cast products were evaluated as expensive.

(v) Painting was evaluated to have delivery and cost problems.

A considerable portion of painting is carried out internally at first tier companies. Exclusive painting companies tend to lack processing capacity, and this may further weaken both delivery and cost competitiveness.

Although problems differ depending on the field, subcontract companies which are related to engineering subsectors, as a whole, are requested to improve their technology and management skills.

Table 4-2-6: Evaluation of Subcontract Companies

Field	Quality	Capacity	Delivery	Price	Technology	Management	Entrepreneurship	Average	Number of Subcontractors
Die Making	2.5	2.5	2.4	2.3	2.2	*2.1	2.2	2.3	2 2
Casting	*2.3	2.7	2.7	2.7	2.7	2.7	*2.0	2.5	3
Die Casting	3.0	3.0	2.7	*2.3	2.7	2.7	*2.0	2.6	3
Cold Forming	3.0	3.0	2.0	2.0	*2.0	*2.0	3.0	2.4	1
Heat Treatment	2.5	2.8	2.5	2.0	*2.0	*2.0	*2.0	2.3	4
Plating	2.4	2.8	2.5	2.3	*2.1	*2.1	*2.1	2.3	1 2
Painting	2.4	*2.2	*2.0	*2.0	2.4	2.2	*2.0	2.2	5
Machining	2.3	2.3	2.6	2.3	*2.2	*2.2	*2.2	2.3	1 8
Pressing	2.5	2.6	2.4	2.3	*2.1	2.3	2.2	2.3	2 4
Plastic Forming	2.5	2.7	2.5	2.3	*2.0	*2.1	2.2	2.3	2 1
Rubber Forming	2.9	3.0	2.6	2.3	*2.2	2.5	2.4	2.6	1 0
Jig Making	2.5	2.5	2.3	2.2	*1.8	2.2	2.2	2.2	6
Assembly	2.4	2.4	2.4	2.1	*1.6	2.1	*1.9	2.1	7
Average	2.5	2.6	2.4	2.3	*2.1	*2.2	*2.2	2.3	1 3 6

- Note: 1. Grade 1 means poor, 2, average, and 3, good.
 2. A company may be double listed in different fields.
 3. Subcontract companies include some first tier companies.
 Source: The First Phase Study in Malaysia

2.1.2. Formation of industrial groups among automotive parts manufacturers

(1) Structure of automotive parts production by HICOM

HICOM was established in 1980 in line with the Malaysian governmental policy to construct a modern industrial nation. HICOM has established 17 automotive parts manufacturers in a variety of fields, some of which are concerned with engineering subsectors. They are listed as follows:

Field	Company
Moulding dies for plastic injection	Acplas Industries Sdn. Bhd.
Cast iron	HICOM Engineering Sdn. Bhd.
Aluminum casting	Aluminium Alloy Castings Sdn. Bhd.

Die casting
Hot forging

HICOM Transmission Sdn. Bhd.
HICOM Diecastings Sdn. Bhd.
Bertool (M) Sdn. Bhd.

These companies are expected to lead engineering subsectors in Malaysia. The formation of the HICOM group is regarded as being a significant step in the Malaysian automotive parts industry. PROTON also has established an inhouse cast iron plant, which started operation in July, 1994.

(2) Formation of industrial groups by automotive parts manufacturers

Some automotive parts manufacturers were set up independently, and are operating independently, but many companies, which interrelate with one another, have formed industrial groups. In several groups, there is one company which produces dies. Two examples are as follows:

Example 1: APM group:

APM group was established in 1971. Headed by Auto Parts Manufacturers Co., Sdn. Bhd., this group is comprised of 14 companies, each of which has the name APM. The group is relatively big. One of the group companies, APM Tooling Centre Sdn. Bhd., was established in 1991, and produces dies and jigs.

Example 2: USRA group:

USRA group has diversified to many fields such as the construction industry besides the automotive parts industry. In the automotive parts industry, they produce plastic parts and press parts, and among the group, they established Thermo Tools Sdn. Bhd. in 1992 to produce dies and jigs.

In the meantime, most of the second tier companies studied in the second phase survey do not belong to groups as shown in Table 4-2-7.

Table 4-2-7 Status of Second Tier Companies

Relation with Groups	Number of Companies
Belong to groups	3
Not belong to groups	17

Source: The Second Phase Study in Malaysia

Companies belonging to certain groups are considered to have strong financing, superior technology, and modern management compared to independent small-and-medium-scale companies. Also, they exchange information with one another within a group. However, most companies in the engineering subsectors are independent small-and-medium-scale companies, and therefore in order to develop them, understanding this industrial structure is necessary.

2.1.3. Automotive parts manufacturers based on the source of technology

Automotive parts manufacturers are classified into three types by the source of technologies as follows:

- (i) Those which import technologies with capital from foreign companies (including wholly owned companies)
- (ii) Those which obtain technologies through securing agreements with foreign companies
- (iii) Those which develop their own technologies based on business experience with other companies

Technologies here mean "product technology," "process technology," and "management technology." Product technology is the technology regarding products, which includes material selection and product design. Process technology is the technology of processing, automation, CAD/CAM, and the like. Management technology is the technology of production control, quality control, personnel management, and the like.

Types (i) and (ii) mentioned above were observed in many first tier companies. These companies, in many cases, have introduced not only product technology but also process technology and management technology, which resulted in good quality production.

On the other hand, many second tier companies in the engineering subsectors fall in type (iii), where they mainly have introduced process technology. Specific sources of technologies made clear during the second phase study in Malaysia are as follows:

Table 4-2-8 Sources of Technology

Source	Number of Companies
Suppliers of equipment and raw material	10
Experience obtained through work for other companies	7
Friends, books, and magazines	4
Vocational schools and SIRIM	4
Engineers of customers	1
Engineers from foreign parent companies	1

Note: Twenty engineering subsector companies responded. Totals vary because of multiple answers.

Source: Questionnaire Survey

The above indicates that systematic guidance to develop the technology of engineering subsectors is necessary.

2.2. CHARACTERISTICS AND CURRENT SITUATION OF ENGINEERING SUBSECTORS BY MAJOR PRODUCTION PROCESS

The Study Team visited second tier companies and first tier companies, which were dealing with the engineering subsectors. Because the number of companies visited was limited, the study was principally focused on the grasping of the characteristics and the current situation of the whole

industry. The results of the questionnaire survey, which was separately carried out, were used to supplement the study.

2.2.1. Die-making industry

(1) Overview of the industry

It is said that there are more than 1,000 die makers in Malaysia. Although this number is not endorsed because there are no reliable statistics available, it is correct to say that there are a lot of companies in the industry. Geographically, approximately 80% of them are said to be located in Selangor and Kuala Lumpur. As in Japan, in Malaysia, too, most of the die makers are small.

Table 4-2-9(1) Size of Die Makers

Paid Up Capital	Number of Companies
RM80,000	1
RM400,000 to 500,000	3
RM700,000	1

Source: Questionnaire Survey

Table 4-2-9(2) Size of Die Makers

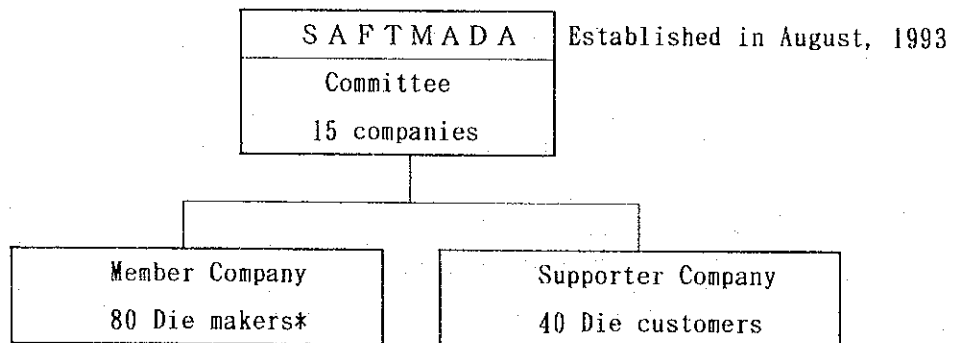
Number of Employees	Number of Companies
13 to 16	3
20 to 22	2

Source: Questionnaire Survey

Besides, there are some cases where large-scale manufacturers, which are engaged in plastic moulding or die casting such as Malaysian Die-casting Ind. Sdn. Bhd., produce dies internally, but still most dies are produced by independent small-and-medium-scale die makers.

SIRIM, as a governmental research laboratory, has been carrying out various activities in the industry considering the importance of die making as an engineering subsector. Based on that understanding, the die making industry was chosen as one of the priority industries in the Industrial Development Study five years ago. Also, a die making expert was invited to SIRIM three years ago to educate SIRIM people so that they can educate the industry. Responding to these activities, the die making industry established the die industrial association in August, 1993. This association is called "Selangor and Federal Territory Mould and Die Association" or SAFTMADA for short.

Fig. 4-2-2 Organisation of SAFTMADA



Note: * The number of companies are planned to increase to 150 by July, 1995.

Eighty companies located in Selangor and Kuala Lumpur have so far joined the association, and it is managed by 15 committee companies. Forty die customers also have joined the association as supporter companies. The association actually began operations in August, 1994, and it has so far organized a factory visit to some Singapore factories and held a seminar about metal stamping dies. The association plans to expand its member companies to 150 by July, 1995, to increase activities, and to provide various supports to member companies so that they may develop. The association expects to have a dialogue with the Government in order to further develop the industry.

The electronics/electric industry is concentrated in Penang, and many plastic forming companies are located there. Taking advantage of this geographical location, the Mould School was

established in January, 1995 in order to educate engineers for mould making. Curriculums cover three years, and 50 students study each school year. The curriculums are made up of both theory and practice, including the operation of a CAD system. This project has been carried out by Sunny Precision (M) Sdn. Bhd. in cooperation with Penang Skills Development Centre (PSDC for short), with the support of the Penang State Government.

(2) Current situation of the die making industry by type

A wide variety of press/stamping dies are manufactured, and no critical problems have so far arisen. The Study Team observed this situation in both the first phase survey, and the second phase survey. This was confirmed by the fact that the customers of press parts, which subcontracted parts processing to second tier companies, had no problems with the quality of parts, and therefore they did not even try to learn who made the dies used for the press/stamping.

A wide range of plastic moulds are produced in Malaysia, as with press/stamping dies. The plastic mould industry, similar to the press/stamping die industry, has grown with the development of the electronics/electric industry. The Study Team visited and interviewed Sun Tong Seng Mould-Tech Sdn. Bhd. The product quality of the company was evaluated as being good by one of their major customers, Nippondenso (M) Sdn. Bhd. Sun Tong Seng can conduct designing of dies to the drawing of parts supplied by their customers. They have been equipped with a CAD/CAM system for three years, and for the production of dies, they could even use CAD data supplied by their customers. The sales to the automobile industry relative to the total sales of the company are 20%. Most companies in the industry are small except for the following four companies.

- (i) Sun Tong Seng Mould-Tech Sdn. Bhd.
- (ii) P&S Mechanical Engineering Sdn. Bhd.
- (iii) DR Engineering Sdn. Bhd.
- (iv) Sun Plus Engineering Sdn. Bhd.

Because die casting moulds are used under heat and high pressure, which is much more severe than that for plastic moulds, the production of moulds requires higher technology. For that reason, complicated moulds in design such as that for alternator frames are imported from foreign countries such as Thailand and Taiwan R.O.C. Even simple moulds are often procured from

Taiwanese manufacturers because only a few companies can do them in Malaysia.

Among dies for stamp forging, Usaha Amal Sdn. Bhd. produces dies for hot forging. According to an evaluation by its customers, the company is considered to apply its technology of the press/stamping dies well in the production of stamp forging dies.

There are no automotive parts presently produced by cold forming. Therefore, dies for cold forming are not manufactured in Malaysia. According to an expert of TRW Steering & Suspension Sdn. Bhd., which is an exclusive cold forming manufacturer, the technology transfer of die production for cold forming could be made in one year although production is not currently done.

Component parts of dies such as mould bases and die sets are produced and supplied together with guide posts, pins, bushings, punches, and other various parts. Kejuruteraan PME Sdn. Bhd. is considered to be the only company in Malaysia to produce and supply these products.

Many die makers also produce jigs. The idea and design of jigs, however, are generally supplied by customers. This is because jigs are designed based on the know-how of customers which reflects factors such as the characteristics of various production processes.

(3) Major issues in the die making industry

Present issues observed in the die making industry are summarized into four as follows:

1) Necessity of better production facilities

Although many of the latest machines such as CNC machining centres have been introduced, die makers need much newer facilities to expand their business and increase the level of automation. To respond to the labour shortage, some companies intend to proceed with semi-automation with computers. This kind of modernization, however, requires significant investment. Three companies out of five which responded to the questionnaire survey expect to receive easier financing for the purchase of such facilities. The results of the questionnaire survey were summarized as follows:

Table 4-2-10 Production Facility

Company	Present Facility	Investment Plan	Financing
A	CNC milling, EDM	Wire cut	
B	CNC machining centre, EDM	CAD/CAM	Problem
C	CNC wire cut, EDM	CNC M/C	Difficult
D	Milling, Lathe, 100t press	Wire cut	
E	CNC machining centre, EDM	CNC machine	Not easy

Source: Questionnaire Survey

2) Lack of experienced workers

Die making requires not only machining but also the polishing of the die surface by hand. Besides, because dies are not a kind of mass produced product, simple workers cannot be utilized. In addition, the poor working environment deters newcomers from working in the industry. In order to improve the situation, measurements such as the establishment of education/training centres on machining as well as the relaxation of regulations on the employment of foreign workers is requested. The results of the questionnaire survey on the matter are summarized as follows:

Table 4-2-11 Worker Problems of Die Makers

Problem/Request	Number of Companies
(i) Educates newcomers because it is difficult to secure skilled workers	1
(ii) Newcomers have shares of the company so that they are motivated	1
(iii) Employs 3 Indian designers	1
(iv) Requests an education/training centre of machining	2
(v) Requests the relaxing of regulations on hiring foreigners	1

Source: Questionnaire Survey

3) Lack of the production technology of sophisticated dies

The present technology level of die making has not reached a high enough level to produce moulds for plastics or die casting. For instance, PROTON imported dies for casting, and operation started recently. On the other hand, there is a lack of design engineers, and as a result, technology information is provided by the suppliers of production facilities. Considering the situation, the provision of the latest technology information and technical assistance are requested by the industry. The results of the questionnaire survey on the matter are summarized as follows:

Table 4-2-12 Request for Technology

Technology	Number of Company
Latest technology	1
Technology transfer from advanced countries	1
Technical support	1
Technology to operate the latest equipment	1

Source: Questionnaire Survey.

4) Weak relations between governmental organizations and the industrial association

The die making industry is positioned as one of the most important industries by the Malaysian Government. Yet, the industry association has not grown to give the industry a wide range of assistance. The association expects to hold a dialogue with governmental organizations so as to expand its activities effectively.

2.2.2. Casting industry

(1) Overview of the industry

The casting industry in Malaysia has a long history because cast parts used to be used as key parts to build various types of machinery used for tin mining and natural rubber processing, both of

which used to be major industries in the country. In its long history, the industrial association as well as the nation-wide association and an independent association with each state have been organized. The casting industry has long maintained a technology level where not only iron casting but also steel casting, aluminum gravity casting, and die casting are produced. However, because the level of technology that is requested by the automobile industry is much higher, HICOM must have established its affiliated new companies to produce automotive cast parts.

(2) Current situation of the casting industry by technology type

In July 1994, PROTON's casting plant started the production of cylinder blocks and bearing caps, which are major iron casting items. Quality is one of the most important criteria for automotive parts. In this sense, casting parts produced by the plant are good in quality showing a 5% defect rate as cast, and a 1% defect rate at the finishing stage. They plan to produce brake drums and brake discs in July, 1995, and crank shafts in July, 1996. HICOM Engineering Sdn. Bhd. has already started the production of exhaust manifolds and clutch pressure plates. Based on the results of the questionnaire survey, only the following three companies produce small casting parts such as brackets.

- (i) Sapura Foundry Sdn. Bhd.
- (ii) Yodoshi Malleable (M) Sdn. Bhd.
- (iii) Anshin Casting Ind. Sdn. Bhd.

Casting parts produced by companies other than PROTON are supplied to an automotive parts manufacturer for machining. According to this company, the quality of these casting parts is not good. Many defects are found after the parts are machined, sometimes showing a 10% or higher defect rate. Critical defects such as wrong dimensions also are found. It is necessary for these companies to take measures to counter the problem.

There are many die casting companies in Malaysia, but most of them produce parts for the electronics/electric industry. Only three companies produce die casting parts for the automobile industry, and the number of automotive parts items is small. The names of these three companies are as follows:

- (i) HICOM Diecastings Sdn. Bhd.
- (ii) Teknikast Sdn. Bhd.

(iii) Malaysian Die-casting Industries Sdn. Bhd.

At the companies which the Study Team visited, sales of automotive parts represented approximately 10% of their total revenue. On the other hand, many motorcycle die casting parts are produced. Die casting companies have problems such as rises in both material costs and die costs, the shortage of engineers, and the lack of testing/inspection organizations although they receive lots of inquiries from customers about products. They even use a testing/inspection institution located in Singapore for the analysis of aluminium material at the time of purchase. Aluminium material is either imported or procured domestically. However, domestic aluminum material has shown a sudden rise recently. In the meanwhile, most dies are imported, and therefore some companies tend to produce die casting parts only when monthly demand becomes more than 1,000 units, which is the break-even point. Some companies hold the opinion that less expensive dies should be used to reduce the production costs of die casting parts, sacrificing die life. On the other hand, users of aluminum die casting parts pointed out that technical problems such as burrs and wrong dimensions, which are considered to stem from the insufficient maintenance capability of dies, sometimes arise.

(3) Major issues in the casting industry

Current issues observed in the casting industry are categorized into three groups as follows:

1) Poor quality of products

Casting parts tend to have cavities inside the products because of the gas that is generated in the casting process. These cavities cannot be found unless the parts are machined or specially inspected. Customers complain that they often find such cavities after they machine the parts. In addition, the poor maintenance of dies during operation is pointed out. Both problems increase the costs of casting parts, and therefore measures to improve the quality of parts are urgently requested. Specific problems pointed out by the companies visited are as follows:

Table 4-2-13 Problems in Quality

Problem	Degree of Defect
Clutch pressure plate	10% internal defect at machining
Alternator pulley	10% internal defect at machining
Compressor bracket	incorrect dimensions
Die casting parts	burrs and wrong dimensions

Source: The Second Phase Study in Malaysia

2) Lack of experienced engineers

Automotive parts manufacturers recognize the importance of the development of duties conducted by engineers such as quality improvement and production control. Considering this, systematic education and training of engineers is needed urgently. One Japanese affiliated company employs Japanese engineers, who have lots of experience in the industry in Japan and desire to use their expertise for the development of the industry in Malaysia. These kinds of measures may be effective, but may raise another problem as to whether they will prove to be beneficial.

3) Lack of testing and inspection organizations

SIRIM is not a usual research laboratory, but it supports private companies in technical fields. One field which it supports is material analysis and hardness testing, but some companies pointed out that such service had little practical value. For instance, it takes 2 to 3 weeks for SIRIM to analyze the components of aluminum ingots at the point of purchase. As a result, die casting companies have to ask a Singapore company to do it. The same kind of complaint was given on the hardness test of dies.

2.2.3. Forging industry

(1) Overview of the industry

Forging parts are generally used to maintain the strength of the material and to reduce the loss of

both material, which is usually created as a bi-product in the cutting process, and production time. However, the production facilities of stamp forging are basically designed to suit mass production, and investment costs are significant. For that reason, the forging industry has not developed in Malaysia. Hot stamp forging is, as mentioned before, conducted by a HICOM subsidiary, but cold stamp forming has not yet been conducted for the production of automotive parts in Malaysia.

(2) Current situation of the forging industry by technology type

Bertool (M) Sdn. Bhd. is the only company producing hot stamp forging products in Malaysia. The company produces automotive parts such as front hubs and tie rod ends. The tie rod ends are then heat treated by Yongshen Heat Treatment Sdn. Bhd., and are machined and assembled into finished components by TRW Steering & Suspension Sdn. Bhd. As exemplified in this case where the forging products go through several production processes, the quality of forging parts could be evaluated by parts assemblers. The quality of the tie rod ends is evaluated as being good by TRW.

There are approximately 35 companies which are engaged in cold stamp forming including Belton Sdn. Bhd., and Power Steel and Electro Plating Works Sdn. Bhd. Products presently produced by the cold stamp forming process include such parts as some parts for the automobile industry, and bolts for the construction industry and the electric industry. Automotive parts processed by stamp forging or high-tensile bolts have not been produced in Malaysia. However, TRW Steering & Suspension Sdn. Bhd. plans to start the production of automotive parts by the cold stamp forming process in October, 1995. TRW plans to procure necessary production facilities from its worldwide factories. A large quantity of automotive parts is forecast to be produced, and therefore the company plans to export some of the products. According to a certain automotive parts manufacturer, one of 35 cold stamp forming companies in Malaysia had undertaken a feasibility study on the production of cold stamp formed automotive parts by adopting new facilities, but the result of the study was not feasible mainly because of the substantial depreciation costs required.

(3) Major issues in the forging industry

1) High production costs

Hot stamp forging is a production system suitable for mass production, and it requires substantial

investment costs. Therefore, in the selection of production items, it is important to consider whether the items can be sold not only in the domestic market but also in the foreign market. It may be meaningful to adopt less expensive dies at the cost of die life, or to intensively streamline manpower from the beginning of the operation.

2.2.4. Heat treatment industry

(1) Overview of the industry

First tier companies tend to have in-house heat treatment facilities when their main production items need to be heat treated. For instance, both Asian Driveshaft Sdn. Bhd. and Sapura Machining Corporation Sdn. Bhd. are equipped with high frequency induction furnaces. Similarly, there are many companies which carry out the heat treatment process on their production lines, and these processes are generally operated properly. On the other hand, small parts in large quantity are heat treated by independent exclusive heat treatment companies. Although there are many companies exclusively engaged in heat treatment, most of them are said to do simple water quenching except for the following 3 companies which do various types of heat treatment.

- (i) Yongshen Heat Treatment Sdn. Bhd.
- (ii) M.R. Heat Treaters Sdn. Bhd.
- (iii) Yeh Chang Heat Treatment (M) Sdn. Bhd.

(2) Current situation of the heat treatment industry

One large scale company visited said that sales of automotive parts related heat treatment amounted to 15% to 20% as a percentage of total revenue. Automotive parts such as ball joints, door locks, safety belt tongues, and jigs are processed there. The company mainly serves the electronics/electric industry and the motorcycle industry in addition to the automobile industry. They introduced heat treatment technology from Taiwan. The demand for heat treatment is upward, and the company plans to double their heat treatment facilities in the near future so as to meet the demand. The quality of heat treatment is determined by whether hardness is uniform or not on the surface of the processed parts. In this respect, customers of the company were not satisfied. The

Study Team observed that the company kept operating although the set temperatures of their continuous furnace were not maintained. It is considered that this kind of poor furnace management brought about uneven hardness, which led to customers being suspicious of the company. Considering the situation in the industry, an Australian exclusive heat treatment company is considering inroads into Malaysia in the near future.

(3) Major issues in the heat treatment industry

Current issues surrounding the heat treatment industry are summarized into four groups as follows:

1) Poor quality

Poor quality is considered to be one of the most critical problems in the industry. According to a heat treatment company, many customers lack heat treatment knowledge. This kind of customers' ignorance on quality may cause the slow reaction of heat treatment companies on quality improvement. On the other hand, foreign affiliated parts manufacturers generally keep engineers who are well acquainted with heat treatment, and they often complain about the poor quality of local heat treatment. The following comments about the quality of local heat treatment were obtained from two companies visited.

- (i) There is no heat treatment company to heat treat a large quantity of small parts with stable quality.
- (ii) Tools are heat treated by a local company, but the specified hardness cannot be achieved.

The motivation for quality improvement may derive from the critical complaints from customers. From this point of view, it is necessary to provide intensive education on heat treatment to many people.

2) Lack of engineers

At one of the heat treatment companies, employees in technical fields, technicians and workers receive in-house education concerning basic metallurgy. The company spends no less than 5 years to educate them since they have not received sufficient education at schools. There are some training

programs and seminars organized with support from the Government, but these are regarded as being insufficient. Two companies which responded to the questionnaire survey participated in training programmes and seminars supported by the Government. They need higher education on metallurgy and heat treatment open to the public, and request that the Government undertake a thorough examination of the education and training system in Malaysia including the school system.

3) Poor management

Because the heat treatment industry is a type of subcontract industry that requires substantial investments, the industry is strongly affected by order quantity from customers and their delivery schedule. The Study Team observed that a certain company, which dealt with 3 automotive parts manufacturers, had received lots of orders in the previous month, but did not receive any order the next month. This order fluctuation is considered to result from the poor management of automotive parts manufacturers since automobile assemblers conclude contracts with them based on a stable monthly delivery schedule. This sort of poor management further affects the quality and the costs of heat treatment. In Table 4-2-6, second tier companies were evaluated as being poor in management by first tier companies, but first tier companies, too, show poor management capability.

4) Poor power supply

A substantial number of companies complained about the poor supply of electricity in Malaysia in the questionnaire survey, which is summarized as follows:

Table 4-2-14 Problem in Power Supply

Location	Have Problem	Do not Have Problem	Total
Klang	5	4	9
Seri Kembangan	2	1	3
Puchong	1	1	2
Other	0	15	15
Grand Total:	8	21	29

Source: Questionnaire Survey

Twenty-nine companies including those which are not only in the engineering subsectors but in fields such as press/stamping responded to the questionnaire survey. The results of the survey revealed that 8 companies out of 29 complained about poor electric power supply. Both of the two heat treatment companies which responded to the survey also pointed out the same problem that the electricity is cut off approximately twice a month in addition to regular power shortages and voltage drops. Geographically, those companies which are located in Klang, Seri Kembangan, and Puchong pointed out the problems although some 6 companies in the same regions did not complain.

2.2.5. Surface treatment industry

(1) Overview of the industry

There are two kinds of surface treatment: plating and coating. Approximately 150 companies which are specialists in the field, are said to be located in Malaysia. Most companies are small in size, employing 20 to 30 employees. The smallest companies employ only a couple of workers, and do surface treatment by hand. There is one company which employs a little less than 200 people, but the company is regarded as being an exceptional case. Most companies are located in Klang. Specific jobs done by them include plating jobs such as zinc plating, copper plating, chrome plating and nickel plating, and coating jobs such as electric deposit coating and spraying. Because most plating is electric plating, plating companies are usually called Electro-Platers.

Plating companies are classified into 3 categories: exclusive plating companies, plating companies with coating capability, and exclusive coating companies. An industrial association, Malaysia Metal Finishing Society, has been established in the industry, and 23 Electro-Platers have so far joined.

(2) Current situation of the surface treatment industry

Four out of the six companies surveyed are strongly related to the automobile industry, and their sales in the industry as a percentage of total revenue reach some 70% while sales for the other two companies are 20%. Small parts such as bolts, hinges, covers, and shafts are among the major automotive parts on which surface treatment is done. Small companies which employ less than 10 employees are facing problems concerning how to proceed with automation to replace the present labour intensive work. This may work as a measure against the labour shortage problem, but it requires substantial capital investments. Companies which employ 20 to 40 people have already invested in surface treatment facilities, but are concerned with the further modernization of them. The company visited in the second phase study was large, and was equipped with automated facilities. The results of the questionnaire survey and the interview survey are summarized as follows:

Table 4-2-15 Plan/Problem by the Size of Company

Employee Size	Number	Plan/Problem	Financing
less than 10	2	Automation*1	Difficult
20 to 40	3	Automation*2	Difficult
170	1	Sludge disposal	

Note 1: Introduction of automation to replace workers.

Note 2: One company plans to install water treatment equipment while two companies plan to move to new sites

Source: The Second Phase Study in Malaysia; Questionnaire Survey

The second phase study is focused on how small-and-medium companies obtain technology despite the short history of technology. The following are the major findings in this respect.

- (i) MARA has plating classes, and approximately 15 graduates from the school have entered the surface treatment industry every year since 1981. Those graduates are well utilized by the industry.
- (ii) Many companies obtain technology from suppliers of chemicals.
- (iii) One company obtains technology from SIRIM.
- (iv) One small company does not have convenient sources of information.

The surface treatment industry has labour force shortage problems just as other engineering subsector industries do. In general, management believes high wages are paid for low productivity in order for employees to keep working in the poor working environment of plating factories. However, the magnitude of the problem differs widely depending on the company. For instance, the company visited did not have this sort of problem. The results of the questionnaire survey are summarized as follows:

Table 4-2-16 Labour Problem in Small- and Medium- Surface Treatment Companies

Problem	Number of Companies
Lack of workers including skilled workers	5
Higher wages are requested because of short labour	2
Low productivity relative to high wages	1

Note: Five companies responded to the questionnaire survey.

Source: Questionnaire Survey

The plating industry is especially concerned with water pollution. One company among the companies surveyed had a plan to install drainage treatment facilities. Two companies also had plans to move to new places to counter drainage problems. The industrial association has continued its discussion on factory transfers to solve the drainage problem. However, the association only presented several subordinate problems, and the discussion has nearly stopped. These problems are as follows:

- (i) New location may be too far from present customers to keep business
- (ii) Workers may quit work claiming not to commute to new location
- (iii) Needs substantial capital investments in land, housings, and drainage treatment facilities

- (iv) Competition may become fierce because competitors in the industry gather close
- (v) Companies without successors may hate new investments

On the other hand, large scale companies have already installed drainage treatment equipment, and do not have problems similar to those mentioned above, but have different problems. Sludge disposal generated by drainage treatment is a problem for them. There are no sludge treatment sites in Malaysia although one has been planned for long time. For that reason, some companies have been obliged to keep sludge in oil drums at their factories for more than 10 years.

In the first phase study, one safety seat belt manufacturer intended to set up a plating process internally because of the poor quality of the plating done by its subcontractor. This small scale subcontractor could not satisfy its customer because of the lack of technology. Unless the companies have good facilities and technology, customers' satisfaction cannot be obtained in this industry. Currently, there are about five large companies in the industry, which could make necessary investments. The Study Team heard the opinion that, in the future, only these companies may solve the drainage problem and survive. The major companies of the above five are as follows:

- (i) Dipsol Chemicals (M) Sdn. Bhd.
- (ii) Auto Reka (M) Sdn. Bhd.
- (iii) Kilang Sadur Letrik Quality

(3) Major issues in the surface treatment industry

Issues surrounding the industry are summarized into four groups as follows:

1) Lack of technology information sources

Especially, small companies have difficulties getting technology information. Various measures to obtain a variety of information from sources other than the suppliers of chemicals must be instituted. (Refer to column (2) of this section)

2) Shortage of modernization funds

Many small-and-medium companies want to invest in modern facilities, but they do not have sufficient funds on their own. (Refer to Table 4-2-15)

3) Insufficient measures against labour and wage problems

Many companies are considering the promotion of automation of their facilities in order to improve work environment and work efficiency. (Refer to Tables 4-2-15 and 4-2-16)

4) Delay of drainage treatment measures

Various measures to counter the drainage problem and to protect the environment have been discussed. Factory transfer does not necessarily solve the problem but creates other problems as mentioned before. Therefore, in-depth discussion from various aspects is necessary. Also, the establishment of a sludge treatment site should be urgently discussed. (Refer to Table 4-2-15 and column (2) of this section)

2.2.6. Machining industry

(1) Overview of the industry

Automotive parts such as crank shafts, which are large and need precision machining, are machined by PROTON. PROTON's brief history of machining is as follows:

(i) Phase 1 (Beginning in 1991)

Flywheels, Exhaust manifolds (The machining of flywheels and exhaust manifolds has been transferred from PROTON to HICOM Engineering Sdn. Bhd.)

(ii) Phase 2 (Beginning in early 1993)

Cam shafts, Crank shafts

(iii) Phase 3 (Beginning in early 1994)

Cylinder blocks, Bearing caps

Besides PROTON, some companies among the first tier companies machine and produce precision parts. For instance, shafts for rocker arms are produced by Sapura Machining Corporation Sdn. Bhd.

In this industry, second tier companies complement first tier companies through the machining of small parts such as brackets, spacers and rods. Second tier companies in the machining industry are considered to have grown in the past 5 years compared to the situation in 1989 where few companies were said to machine brackets based on stipulated dimensions.

(2) Current situation of the machining industry

Nine companies were surveyed by the Study Team in the second phase study. All the companies except for one are small in size, employing 10 to 40 employees.

They machine mainly small parts such as brackets which do not require precision machining. Four companies are fully engaged in the machining of automotive parts. This means that the machining industry is headed by the automobile industry. Customers of the machining industry include Nippondenso (M) Sdn. Bhd. and Kayaba (M) Sdn. Bhd. They are trying to increase the procurement of domestic parts, but they must depend on imported parts because of quality and cost. The results of the interview survey and the questionnaire survey are summarized as follows:

Table 4-2-17 Customers of the Machining Industry

Size of Company	Automotive Parts Related Sales	Number of Companies	Major Customer
10 to 40	100%	4	Lifelong Stainless, APM Spring
10 to 40	5 to 50%	4	Kayaba, Nippondenso, Car Seats (M)
170	30%	1	Brimal Holdings, Auto Parts Mfg.

Source: Questionnaire Survey and the Second Phase Study in Malaysia

Except for the automobile industry, the electronics/electric industry is the largest user segment of the machining industry. One company deals with the maintenance companies of machinery. This company envisages the expansion of its business to press parts and plastic parts. On the contrary, companies which are fully engaged with the automobile industry are not active. They just wait for orders from their customers to expand their business. The results of the questionnaire survey are summarized as follows:

Table 4-2-18 Expansion Plan of the Machining Industry

Automotive Parts Related Sales	Future Expansion Plan	Number of Companies
100%	Follow customers	4
5 to 50%	Press parts, Plastic parts	2
5 to 50%	Precise high valued volume parts	1
5 to 50%	High level jigs	1

Source: Questionnaire Survey

Some companies are equipped with CNC lathes and CNC machining centres, but some are equipped with obsolete machines. A large-scale company visited is mostly equipped with old machinery. Considering the situation, every company intends to purchase CNC lathes and CNC milling machines, and wishes to study the technology of numerical control. One company had the opinion that foreign companies should invest in the industry more so as to they can increase the overall level of the industry. Machining technology is generally provided by the suppliers of machinery, but about one half of the companies have gained such technology from companies in the electronics/electric industry. In the meantime, most of the machinery is Japanese made, and some is Taiwanese made. The results of the questionnaire survey are summarized as follows:

Table 4-2-19 Facility and Technology of the Machining Industry

Type of Company	Number of Companies	Facility Needed	Technology Needed
Started operation with used machinery	1	CNC lathe; CNC milling machine	NC
Started operation with used machinery	1	(none)	NC
Started operation with new machinery	3	CNC lathe; CNC milling machine	NC
Started operation with new machinery	2	CNC lathe; CNC milling machine	(none)
Started operation with new machinery	1	Injection moulding machine; Press	Automation

Source: Questionnaire Survey

Job hopping is common in every industry including the first tier companies. Some companies which offer employees simple boring work with a poor working environment seem to suffer more from the job hopping of their employees. In the machining industry, work is generally not simple or boring, but workers prefer working for large-scale companies to small-scale companies. Accordingly, in this industry, the recruitment of workers is difficult while job hopping is prevalent. Corresponding to the situation, companies in the industry take measures such as the employment of foreign workers or relatives as well as wage hikes. As a result of high wages which are paid for low productivity, many companies are experiencing difficulties in correcting the imbalance between wages and productivity. The results of the questionnaire survey are summarized as follows:

Table 4-2-20 Labour Problem in the Machining Industry

Problem	Measure	Number of Companies
Difficult to hire, and high job hopping	Hire foreign workers	2
	Hire relatives	1
	Increase wages	3
High wages do not meet low productivity	Increase wages	1
	Overtime wages	3
	Lower annual increases	1

Source: Questionnaire Survey

(3) Major issues in the machining industry

Current issues observed in the machining industry are summarized as follows:

1) Lack of technology

The demand of machining is considered to increase with the improvement of technology. At present, state-of-the-art machinery has been introduced to a few companies, but most companies have limited chances to gain access to information to develop their technology. This situation must be improved urgently. Investments from foreign countries are considered to work effectively

for technology dissemination as has often been observed in the first tier industry. Daily contacts with customers and the establishment of education/training systems are also useful. Because some companies do not even know how to carry out these measures, support in this area is requested.

2) Insufficient productivity improvement

Wage hikes, which are prevalent during a high speed growing period, should be compensated with increases of productivity. The problem cannot be solved simply by the reformation of the wage system. Common measures taken in this industry are not to change wage levels but to increase actual wages by increasing various incentives and overtime wages. Not only the modernization of facilities but also the education of managers as well as the modernization of management, which includes the improvement of factory layouts, the increase of facility utilization, and the streamlining of employee assignments by the development of multi-duty workers are strongly required.

3. SYSTEMS AND SCHEMES RELATED TO DEVELOPMENT OF ENGINEERING SUBSECTORS AND THEIR MANAGEMENT PROBLEMS

3.1. SCHEMES FOR DEVELOPMENT OF SMALL- AND MEDIUM-SCALE COMPANIES

There have been various schemes for the development of small- and medium-scale industries (SMIs) in the areas of financing and technology support. The above analysis was conducted in the first phase study from the viewpoint of the governmental side which carries out the schemes, while the following analysis of systems and schemes will be conducted from the standpoint of the engineering subsectors.

The problems for SMIs, especially the engineering subsectors, are shown in the above section. These problems can be roughly divided into two: problems which should be solved by companies themselves and problems which can be solved by governmental support.

(1) Security of Employees

The problems with security of employees are the following:

- * Difficulty of securing new workers
- * Job hopping
- * Difficulty of securing engineers and skilled workers
- * Difficulty of upgrading levels of engineers and skilled workers

Table 4-3-1: Problems with Security of Employees for the Engineering Subsectors

Problem	Current Situation	Governmental Support	Problems for Governments
Difficulty of securing new workers	DDH image(dirty, dangerous and hard), low wages, boring work	No	These are not governmental problems, rather ones which should be solved by companies themselves. Hiring of foreign employees is accepted to some extent by the government.
Job hopping	There is much job hopping by unskilled workers because of the DDH image, low wages and boring work.	No	This cannot be said to be a governmental problem.
Difficulty of securing engineers and skilled workers	The number of engineers and skilled workers is very small, especially in the field of cast production and heat treatment. They have few opportunities to learn before entering companies.	Yes	Politech and vocational schools are being established throughout the country, but they do not seem to satisfy the needs of private companies.
Difficulty of upgrading levels of engineers and skilled workers	There are few training institutions whose theoretical and practical training are balanced.	Yes	While there are some support from government and joint ventures with private companies such as GMI and PSDC, they do not seem to fit in with the needs of private companies. The cast manufacturing association conducts education and training for engineers and skilled workers by themselves, but they are not at sufficient levels.

There is a limitation on the effectiveness of governmental measures for the security of employees. That is because there are few measures which can have a direct impact on the security of employees. At present, to some extent the government accepts SMIs' hiring of foreign workers to deal with this problem, but this cannot be said to be a drastic solution. First of all, basically, labour management should be improved in SMIs. Specific items would be shortening working hours, improving office amenities, organising fringe benefits, increasing workers' morale, and the like. Moreover, DDH(Dirty, Dangerous and Hard) images of SMIs should be improved. At the moment, there are no governmental schemes or systems which specifically address these factors. Rather, it is thought that most of those problems could be solved to some extent through the existing general schemes which are being carried out in order to modernize SMIs and strengthen their management bases.

It can be said that there are many systems and schemes to secure engineers and skilled workers and to upgrade the levels of their skills. Based on this survey, however, it was pointed out that many companies do not utilise them so often. Moreover, the satisfaction levels of SMIs in the engineering subsector for these governmental systems and schemes are low, although the governmental side reports that it has been revising their curriculums of schemes in response to the needs of SMIs.

(2) Technologies

Most of the technologies which are required in the engineering subsectors have already been established. Therefore, the problem is how to gain access to these established technologies and where to acquire technological sources. The present systems and schemes concerning those themes are technology transfer by SIRIM, spread of ISO9000 (the ITAF Scheme, Joint Research Program, and so on) and technology support or transfer from anchor companies through VDP.

Users of such systems and schemes are dissatisfied with the following.

- * time-consuming procedures for application
- * difficulty of utilising these systems and schemes
- * unreliability of technology suppliers, etc.

Of course, the above problems are not common for all the SMIs. However, it is a fact that there are many SMIs which are not positive toward utilising these systems and schemes.

Table 4-3-2: Problems of Technologies for the Engineering Subsectors

Theme	Current Situation	Governmentall Support	Problems for Governments
Access to technologies	The engineering subsectors are introducing technologies from companies from which they purchase machinery and equipment. Therefore, there is a limitation on how the technologies are learned. Some companies can study technologies under VDP of big companies, but many small- and medium-scale companies in the engineering subsectors cannot utilise the VDP. Moreover, those companies have difficulty applying for ITAF.	Yes	<p>The VDP is to develop the supporting sector, mainly primary subcontractors. Secondary subcontractors did not participate in this program. Technologies in the engineering subsectors are developed mainly by small- and medium-scale companies even in foreign countries. The government did not invite those foreign companies to the engineering subsectors.</p> <p>The ITAF has been utilised since its establishment, but its application areas are not wide. There are many small- and medium-scale companies which were rejected by the ITAF, but the contents of appraisals by the ITAF were unknown to the applicants. The reasons for rejection by the ITAF should be made known to the applicants.</p>
Sources of technologies	Technology sources are companies from which they purchase machinery and equipment, overseas tie-up companies and their parent companies, and public research institutes such as SIRIM. In some cases, however, public research institutes do not satisfy the needs of companies. It is difficult to seek technology sources in foreign countries.	Yes	SIRIM conducts technology transfer at the request of small- and medium-scale companies. Moreover, SIRIM is doing sample production for them, but it does not necessarily satisfy the needs of private companies. There are no special schemes for technological tie-ups with foreign companies.

(3) Financing

The soft loan systems for SMIs are for three types of companies: general companies, companies in specific industries and Bumiputra companies. The soft loan system available in the engineering subsectors is one for general companies or for Bumiputra companies (if applying companies are Bumiputra). The purpose of soft loan is for SMIs to finance purchasing machinery or component parts in order to improve product quality and factory productivity. Therefore, the application areas of this loan are mainly the financing of facilities investments. In this interview survey, however,

it was pointed out that it is difficult to apply for this loan system and that especially, small companies could not utilise this system. The loan system for SMIs just started in 1993, so it is thought that the governmental side is not used to handling the procedures of this loan system and requires an unnecessarily high number of documents from applicants. Improvement of procedures for this loan system is an urgent problem because easy access to utilisation of the Soft Loan system is thought to be a very effective measure for developing SMIs. In this case, it is necessary for financial institutions handling the soft loan to take into account developing specialists in the area of financing and accounting for SMIs. In 1993, RM 5 million was subsidized from MITI to MIDF which is in charge of the soft loan. However, it is necessary to check if this amount is sufficient for the fund demands of SMIs in the future. The balance of loans of MIDF other than the soft loan is RM 1,185.7 million for companies whose borrowing amount is less than RM 3 million, which is more than 50% of the total finances loaned to them (RM 965.3 million for companies whose borrowing amount is over RM 3 million as of 1993 March). The number of companies whose borrowing amount is less than RM 5 million is the largest. Moreover, the Japan-ASEAN Development Fund was established on a general scheme basis. This fund is utilised for the restructuring of three industries (engineering and machinery, apparel and wood). Based on the MITI annual report(1994), however, it is pointed out that the interest rate of this fund is very high for users and many of them are negative about utilising this fund.

Organising financial systems and schemes for developing SMIs has just started in Malaysia. Therefore, the utilisation rate of these systems and schemes for SMIs is still at a low level. Moreover, it is thought that the financial support by the government tends to be concentrated on the funds for financing facilities investments. However, it is also necessary to finance securing new workers, working capital and the like. Moreover, establishing financial institutions which specialise in SMIs should be taken into consideration. In Japan, there are three financial institutions which specialise in financing for small- and medium-scale companies. They are Small Business Finance Corporation, People's Finance Corporation and Central Bank for Commercial and Industrial Cooperatives. These three financial institutions have specialists about the management of small- and medium-scale companies, especially financing and accounting, and they assist top management of those companies in various areas.

(4) Competitiveness

Competitiveness could be developed only in competitive situations. Therefore, it is necessary to create an open market in which the principle of competitiveness can work. On the other hand, the governmental side cannot help hesitating to make a market perfectly free to some extent in situations in which the borderless economy is proceeding. Especially, it is necessary for developing countries which have new domestic entrants and growing companies to protect those companies to some extent in order that they may develop. The Malaysian government has been supporting the automotive parts industry by introducing the NLCP system to develop the automobile industry as a strategic industry in Malaysia. It is a fact that the engineering subsectors have been growing in this scheme. However, the NLCP system is to be abolished in the near future. At that time, the Malaysian automotive industry will have no choice but to be involved in the international competition. It is pointed out that at present some companies in Malaysia use more expensive domestic parts than foreign parts. The Malaysian companies should try to improve their competitiveness by the time the market is internationalized and becomes open to foreign companies.

On the other hand, the government side is thinking that modernizing and restructuring SMIs is an urgent theme in Malaysia and that the Malaysian companies should hold the greatest share of the domestic market while the NLCP system is valid. In this survey, however, it was found that many Malaysian companies are not afraid of the future open market. The Malaysian government reduced import tariffs, but this does not seem to be an effective stimulus for those companies to prepare for the future competitive market. From now on, the Malaysian market will become internationalized at a more accelerated tempo along with growth of the economy. Therefore, the Malaysian government should take some steps to motivate Malaysian companies to be active in dealing with the market trends. Further, the Malaysian government should get top management of those companies to become aware of the impacts of open markets on them and organise research departments in industrial associations which specialise in open markets.

(5) Others

The other problem in the engineering subsectors is fluctuation of demand. This cannot be solved by any means such as systems and schemes. Therefore, there are no effective governmental

systems and schemes. There is no room for governmental involvement because this problem is caused by economic fluctuations. However, it is necessary for the government to set the regulations for adjusting the transactions between parent companies and their subcontractors if the former imposes excessively unfavorable transaction terms on the latter.

3.2. SUPPORT SYSTEMS FOR IMPROVEMENT OF MANAGEMENT CAPABILITIES AND THEIR PROBLEMS

The improvement of management capabilities is positioned as a program of human resource development for SMIs. The institutions which carry out this program are NPC, MEDEC, MARA, SIRIM, CIAST, FMM, and so on. Except for NPC and FMM, those institutions emphasize the education of engineers and skilled workers, so their support for the improvement of management capabilities is insufficient for the top management of SMIs. Further, support from overseas focuses on the improvement of engineers' capabilities rather than on general management capabilities of top management.

It is pointed out that many of the small- and medium-scale companies in the engineering subsectors are family companies which are not so conscious of modern general management. Therefore, top management of those companies does not seem to think about the necessity of making investments in improving general management capabilities. Moreover, many of the seminars on this theme are conducted on a short-term and charge basis.

It can be said that at present the government has not organized support systems for the improvement of general management capabilities of SMIs. Especially, there are almost no governmental measures for top management. In contrast to this, in Japan there are various seminars and training courses which range from 2 days to one year, for the improvement of general management capabilities for small- and medium-scale companies, successors and general managers. Moreover, there are various training courses for educating instructors for small industry in regional governments, industrial associations and small- and medium-scale companies' associations, in addition to those for private companies.

3.3. SUPPORT BY ASSEMBLERS AND RELATED ISSUES

3.3.1. Support by automobile assemblers

(1) Overview

Taking the importance of the development of the automotive parts industry into consideration, the Government put the Vendor Development Programme (VDP) scheme into effect. In this plan, large scale companies are requested to develop small-and-medium scale companies as anchor companies, and PROTON and PERODUA were nominated as anchor companies in the automobile industry in 1988 and 1994, respectively.

The main objective of the VDP is that the Malaysian small-and-medium companies which have potential but lack technical, financial and managerial support will be nurtured by anchor companies so that they can become reliable manufacturers and suppliers of automotive parts. PERODUA has not supported any company because the company has not been in operation for very long. On the other hand, to date, a total of 19 companies have utilized the VDP scheme for PROTON. Although the VDP scheme has contributed much to the development of vendors, it has not been well utilized by engineering subsectors for the following reasons.

- (i) The scheme is basically not open to non-Bumiputera companies, which occupy the majority of the engineering subsectors.
- (ii) It is difficult for engineering subsectors, as sub-vendors, to utilize the scheme because it was originally designed to support the first tier companies.

In consideration of this, PROTON is working in cooperation with its first tier companies to develop the engineering subsectors by conducting a diagnosis of the technology owned by them. Another case of PROTON's support to the engineering subsectors is that periodical technical discussions among PROTON, first tier companies and second tier companies are held when some special machining is required to develop new parts. However, this kind of support by PROTON for the engineering subsectors is rare. In many cases, PROTON does not have the specific technologies required by the engineering subsectors, thus it cannot provide sufficient support to them. Therefore, active support by a third party including public institutions is considered to be necessary for the further development of the engineering subsectors.

None of the other automobile assemblers besides PROTON has had a systematic development programme with the engineering subsectors. One of the assemblers intends to build its own cooperative association within its vendors, but the plan has not yet been realized.

(2) Issues of concern to the assemblers

1) Necessity of the expansion of the VDP scheme

The VDP scheme has worked well, and has successfully contributed to the increase of localization of PROTON. There is no doubt that the scheme has substantially helped the automotive parts industry in Malaysia to develop. Other automobile assemblers also use parts manufactured by PROTON vendors, and are generally satisfied with the quality of the supplied parts. However, the development of the first tier companies does not necessarily contribute to the development of the second tier companies. Considering this situation, some assemblers are trying to give support to second tier companies. This suggests that the establishment of a comprehensive supporting system to the second tier companies would be beneficial.

3.3.2. Support by automotive parts manufacturers and related problems

(1) Current situation of support

Table 4-3-3 shows the results of the questionnaire survey concerning support provided by first tier companies to the engineering subsectors. As shown in the table, seven companies out of 20 responded that they received support from first tier companies while the remaining 13 companies responded that they did not receive any support. The former seven companies all received technical support.

Table 4-3-3 Support from First Tier Companies

Result	Number of Company
Receive support	7
Do not receive support	13
Total:	20

Source: The second phase questionnaire survey

The Study Team heard similar opinions when they visited second tier companies. In addition, support for the engineering subsectors by first tier companies in the fields of management and financing are hardly ever observed. Instead, the first tier companies usually give support to the engineering subsectors on problems concerning quality control and production technology. Only a few companies receive routine support from first tier companies but many receive such support only when quality problems arise. Other support includes the transfer of technical know-how, and discussion on technical matters. On the whole, support is provided through the resolution of quality problems which are found when products are inspected upon receipt, or when the parts and services are ordered.

Some companies in the engineering subsectors are affiliated with first tier companies. These engineering subsector companies usually receive a wide range of support such as quality control and productivity improvement within their groups. On the other hand, some foreign affiliated companies periodically evaluate the technology level of their subcontractors, which are second tier companies, and provide mainly quality control guidance. In the meanwhile, many engineering subsector companies have introduced technology from suppliers through which they bought production facilities.

(2) Issues concerning support

1) Lack of systematic support

Second tier companies do not deal with automobile assemblers but deal with first tier companies.

Therefore, technical support to second tier companies may be effective if it is done by first tier companies which have direct relations with them and are well acquainted with the necessary technology. The support of automobile assemblers has been focussed on the development of first tier companies, and some companies have been developed. These first tier companies presently provide ad hoc support to second tier companies. It is, however, necessary for them to consider the provision of more systematic support so that the development of the second tier companies can be further achieved.

4. POSSIBILITY OF INVESTMENT AND TECHNICAL TRANSFER BY OVERSEAS ENGINEERING SUBSECTORS

The possibility of investment and technical transfer was surveyed by the questionnaire survey of automotive parts manufacturers in Japan. The Japanese Engineering subsectors are those that answered they supplied their products to 1st-tier or 2nd-tier vendors in the questionnaire. In other words, companies that supply to 1st-tier vendors are 2nd-tier vendors and those supply to 2nd-tier vendors are 3rd-tier vendors. The number of companies which answered is 317 for 2nd-tier vendors and 63 for 3rd-tier vendors.

4.1. OVERSEAS INVESTMENT PLANS OF JAPANESE ENGINEERING SUBSECTORS

Table 4-4-1 shows future overseas investment plans of Japanese engineering subsectors.

Table 4-4-1 Future Overseas Investment Plans of Japanese Engineering Subsectors

(Unit: No. of Companies)

	2nd-tier vendors		3rd-tier vendors	
	No.	%	No.	%
Specific overseas investment planned	16	5.0%	1	1.6%
Overseas investment thought necessary, but no specific plan	116	36.6%	24	38.1%
No overseas investment considered	185	58.4%	38	60.3%
Total number of responding companies	317	100.0%	63	100.0%

Source: Questionnaire Survey of Automotive Parts Manufacturers in Japan, 1994, JICA Study Team

Only sixteen 2nd-tier vendors and one 3rd-tier vendors have a specific overseas investment plans. However, 116 2nd-tier vendors and 24 3rd-tier vendors think overseas investment necessary and they are also considering overseas investment, though they do not have a specific plan currently. When the number of companies that have a specific plan and the number of those that think overseas investment necessary are totaled, it amounts to 95.0% of 2nd-tier vendors and 98.4% of 3rd-tier vendors. One of the most important points of attracting Japanese engineering

subsectors to invest in Malaysia is approaching not only companies that have a specific overseas investment plan but also those that think it necessary though no specific plan is being considered and selecting those that will contribute to the development of the key component industry in Malaysia.

Table 4-4-2 shows the result of the questionnaire survey concerning problem areas of overseas investment as expressed by the Japanese engineering subsectors.

Two kinds of problem areas for overseas investment are intermixed in the question. One is problems which should be solved by a company itself, the other is problems which can be improved or solved more easily by the characteristics, policies or help the investing country. Discussion is focused on the latter problems as follows.

Table 4-4-2 Problem Areas of Overseas Investment

(Unit: No. of Companies)

	2nd-tier vendors		3rd-tier vendors	
	No.	%	No.	%
Insufficient cooperation from foreign governments for investment survey	6	4.7%	0	-
Not familiar with investment feasibility study	23	18.0%	3	14.3%
Lack of appropriate expatriates from Japan for factory management	69	53.9%	9	42.9%
Restriction on percentage of share holding for 100% or over 50%	13	10.2%	2	9.5%
Not familiar with looking for good local partners	31	24.2%	4	19.0%
Insufficient funds for investment	58	45.3%	12	57.1%
Uncertain customers for products	34	26.6%	7	33.3%
Not familiar with human resource management because of different language and customs	65	50.8%	11	52.4%
Not familiar with investment procedures, laws and accounting systems	49	38.3%	7	33.3%
Security of expatriates and education of children	27	21.1%	3	14.3%
Others	7	5.5%	0	-
Total number of responding companies	128	100.0%	21	100.0%

Note: The number of responses is more than the total number of responding companies because of multiple responses.

Source: Questionnaire Survey of Automotive Parts Manufacturers in Japan, 1994, JICA Study Team

Insufficient funds for investment, lack of experience for human resource management and lack of expatriates from Japan are chosen especially by many companies. Because the size of capitals and employees is comparatively small among Japanese manufacturers, many Japanese engineering subsectors have problems concerning restrictions on funds for investment and limitation of human resources, and as a result many companies indicated the above mentioned three areas as big

problems.

First of all, insufficiencies of investment funds can be covered and the total amount of initial investment can be reduced by investment incentives of a host country. Secondly, difficulties in human resource management mainly caused by the differences between languages are relatively low compared with other non-English speaking countries, because English can be widely used as a means of communication in Malaysia. Finally, open programmes such as those organized by OVTA in Japan can be used for training for expatriates from Japan, though such a kind of training must essentially be conducted by a company itself.

In addition, guidance on investment procedures, laws and accounting systems as well as introduction of reliable investment partners can be covered by MIDA.

Moreover, holding over 50% of the shares of a joint venture company is possible in Malaysia under some conditions, and the security of expatriates and the education of children rose little problem in Malaysia.

4.2. ATTITUDE OF JAPANESE ENGINEERING SUBSECTORS TOWARDS OVERSEAS INVESTMENT

4.2.1. Overseas Investment Plans

Table 4-4-3 shows probable countries or regions for target of overseas investment indicated by the companies that have specific overseas investment plans or that think overseas investment necessary.

Table 4-4-3 Countries or Regions for Target of Overseas Investment

(Unit: No. of Companies)

	2nd-tier vendors		3rd-tier vendors	
	No.	%	No.	%
Malaysia	15	12.8%	3	13.0%
Thailand	33	28.2%	6	26.1%
Indonesia	12	10.3%	2	8.7%
Philippines	8	6.8%	4	17.4%
Singapore	0	-	0	-
Taiwan	3	2.6%	0	-
South Korea	4	3.4%	3	13.0%
China	65	55.6%	14	60.9%
Hong Kong	1	0.9%	0	-
North America	18	15.4%	0	-
Europe	5	4.3%	0	-
Others	24	20.5%	10	43.5%
Total Number of Responded Companies	117	100.0%	23	100.0%

Note: The number of responses is more than the total number of responding companies because of multiple responses.

Source: Questionnaire Survey of Automotive Parts Manufacturers in Japan, 1994, JICA Study Team

China is chosen by 55.6% of the 2nd-tier vendors and 60.9% of the 3rd-tier vendors. Thailand is next most popular after China, chosen by 28.2% of the 2nd-tier vendors and 26.1% of the 3rd-tier vendors.

Malaysia is chosen by 12.8% of the 2nd-tier vendors and 13.0% of the 3rd-tier vendors. It is the fourth popular after North America in the case of the 2nd-tier vendors and after Philippines in the case of 3rd-tier vendors. Though Malaysia seems relatively popular as a target of investment, the number of companies that chose Malaysia is only eighteen (fourteen 2nd-tier vendors and four 3rd-tier vendors).

4.2.2. Reasons and Motivations of Overseas Investment

Table 4-4-4 shows reasons and motivations of overseas investment as mentioned by the Japanese engineering subsectors.

Table 4-4-4 Reasons and Motivations of Overseas Investment

(Unit: No. of Companies)

	2nd-tier vendors		3rd-tier vendors	
	No.	%	No.	%
Decrease in price competitiveness of products manufactured in Japan because of stronger yen	82	54.8%	14	51.9%
Higher costs for land, labour and electricity in Japan	58	38.4%	12	44.4%
Decrease in market size in Japan caused by customers' (principals') overseas production	78	51.7%	6	22.2%
Response to customers' (principals') request to start manufacturing overseas	43	28.5%	7	25.9%
One aspect of positive overseas strategy	35	23.2%	8	29.6%
Others	3	2.0%	2	7.4%
Total number of responding companies	151	100.0%	27	100.0%

Note: The number of responses is more than the total number of responding companies because of multiple responses.

Source: Questionnaire Survey of Automotive Parts Manufacturers in Japan, 1994, JICA Study Team

The decrease in price competitiveness of products manufactured in Japan because of the strengthening of the yen is chosen by the largest number of both 2nd-tier vendors (54.3%) and 3rd-tier vendors (61.8%). Higher costs for land, labour and electricity in Japan is also chosen by comparatively many companies. Production in Japan is losing its price competitiveness and manufacturers are considering overseas investment to recover price competitiveness. In this sense, one of the most important criteria is that many Japanese manufacturers select a country or a region

where they can manufacture their products at competitive costs.

The response rate of decrease in market size in Japan caused by customers' (principals') overseas production is much different between the 2nd-tier vendors and the 3rd-tier vendors. It is 51.7% and almost as high as the rate of strengthening of the yen in the case of the 2nd-tier vendors, while it is the relatively low rate of 22.2% in the case of the 3rd-tier vendors. Difference of overseas activities between 1st-tier and 2nd-tier vendors (i.e. the overseas production rate of the former is generally higher than the latter) that are supplied by the surveyed 2nd-tier and 3rd-tier vendors respectively is estimated to reflect the result.

The response rates of response to customers' (principals') request to start manufacturing overseas and one aspect of positive overseas strategy are more than one-fourth in both vendors and show the same tendency. However, characteristics of corporate policies symbolized by these two responses are very different and the former is a dependent policy on customers' (principals') and the latter is an independent one.

4.2.3. Selection Criteria of a Host Country for Investment

Table 4-4-5 shows important selection criteria of a host country for investment.

Table 4-4-5 Important Selection Criteria of a Host Country for Investment

(Unit: No. of Companies)

	2nd-tier vendors		3rd-tier vendors	
	No.	%	No.	%
Existence of domestic customers or market	89	67.4%	13	54.2%
Secure employment of engineers and skilled workers	67	50.8%	10	41.7%
Competitiveness in labour quality and cost	91	68.9%	13	54.2%
Secure procurement of raw materials	71	53.8%	13	54.2%
Existence of related industry such as parts suppliers	48	36.4%	3	12.5%
Procurement of factory site at a reasonable cost	38	28.8%	9	25.0%
Sufficient infrastructure such as electricity, water, transportation and communication	90	68.2%	19	79.2%
Competitive foreign investment incentives	49	37.1%	9	37.5%
Readiness of R&D and testing facilities	3	2.3%	2	8.3%
Existence of reliable local partners	52	39.4%	10	41.7%
Competitive financial situation such as low interest rates	5	3.8%	0	-
People's good feeling to Japan / Eagerness for inviting foreign investment	19	14.4%	4	16.7%
Political stability	58	43.9%	11	45.8%
Economic growth potential and low inflation rate	17	12.9%	4	16.7%
Total number of companies responding	132	100.0%	27	100.0%

Note: The number of responses is more than the total number of responding companies because of multiple responses.

Source: Questionnaire Survey of Automotive Parts Manufacturers in Japan, 1994, JICA Study Team

Sufficient infrastructure such as electricity, water, transportation and communication, competitiveness in labour quality and cost, existence of domestic customers or market and secure procurement of raw materials are chosen by more than 50% of both kinds of vendors. Many companies think these criteria most important when they consider overseas investment. Secure employment of engineers and skilled workers, political stability, existence of reliable local partners and competitive foreign investment incentives were indicated by comparatively many companies.

These criteria also cannot be ignored when the Japanese engineering subsectors plan overseas investment. On the other hand, a competitive financial situation such as low interest rates, and readiness of R&D and testing facilities were chosen by less than 10% of the total responding companies.

Table 4-4-6 shows evaluation of Malaysia by scoring criteria shown in Table 4-4-5 with any of comparatively excellent, good and some difficulty found.

Table 4-4-6 Evaluation of Malaysia as a Target for Investment

(Unit: No. of Companies)

	2nd-tier vendors		3rd-tier vendors	
	No.	%	No.	%
Existence of domestic customers or market				
-Comparatively excellent	33	36.3%	6	37.5%
-Good	33	36.3%	7	43.8%
-Some difficulty found	25	27.5%	3	18.8%
Total number of companies Responding	91	100.0%	16	100.0%
Secure employment of engineers and skilled workers				
-Comparatively excellent	16	20.0%	4	26.7%
-Good	35	43.8%	5	33.3%
-Some difficulty found	29	36.3%	6	40.0%
Total number of companies Responding	80	100.0%	15	100.0%
Competitiveness in labour quality and cost				
-Comparatively excellent	50	56.8%	7	36.6%
-Good	29	33.0%	8	42.1%
-Some difficulty found	9	10.2%	4	21.1%
Total number of companies Responding	88	100.0%	19	100.0%
Secure procurement of raw materials				
-Comparatively excellent	8	10.0%	1	5.3%
-Good	36	45.0%	11	57.9%
-Some difficulty found	36	45.0%	7	36.8%
Total number of companies Responding	80	100.0%	19	100.0%

Existence of related industry such as parts suppliers				
-Comparatively excellent	11	14.9%	0	-
-Good	31	41.9%	6	46.2%
-Some difficulty found	32	43.2%	7	53.8%
Total number of companies Responding	74	100.0%	13	100.0%
Procurement of factory site at a reasonable cost				
-Comparatively excellent	35	52.2%	9	60.0%
-Good	24	35.8%	6	40.0%
-Some difficulty found	8	11.9%	0	-
Total number of companies Responding	67	100.0%	15	100.0%
Sufficient infrastructure such as electricity, water, transportation and communication				
-Comparatively excellent	26	28.9%	2	30.0%
-Good	45	50.0%	10	55.0%
-Some difficulty found	19	21.1%	2	15.0%
Total number of companies Responding	90	100.0%	14	100.0%
Competitive foreign investment incentives				
-Comparatively excellent	19	25.3%	2	14.3%
-Good	45	60.0%	10	71.4%
-Some difficulty found	11	14.7%	2	14.3%
Total number of companies Responding	75	100.0%	14	100.0%
Readiness of R&D and testing facilities				
-Comparatively excellent	2	3.7%	2	16.7%
-Good	25	46.3%	5	41.7%
-Some difficulty found	27	50.0%	5	41.7%
Total number of companies Responding	54	100.0%	12	100.0%
Existence of reliable local partners				
-Comparatively excellent	10	14.1%	1	6.7%
-Good	39	54.9%	8	53.3%
-Some difficulty found	22	31.0%	6	40.0%
Total number of companies Responding	71	100.0%	15	100.0%

Competitive financial situation such as low interest rates				
-Comparatively excellent	3	5.8%	1	9.1%
-Good	31	59.6%	5	45.5%
-Some difficulty found	18	34.6%	5	45.5%
Total number of companies Responding	52	100.0%	11	100.0%
People's good feeling to Japan / Eagerness for inviting foreign investment				
-Comparatively excellent	34	53.1%	7	53.8%
-Good	25	39.1%	5	38.5%
-Some difficulty found	5	7.8%	1	7.7%
Total number of companies Responding	64	100.0%	13	100.0%
Political stability				
-Comparatively excellent	52	67.5%	13	81.3%
-Good	19	24.7%	3	18.8%
-Some difficulty found	6	7.8%	0	-
Total number of companies Responding	77	100.0%	16	100.0%
Economic growth potential and low inflation rate				
-Comparatively excellent	25	47.2%	5	50.0%
-Good	23	43.4%	4	40.0%
-Some difficulty found	5	9.4%	1	10.0%
Total number of companies Responding	53	100.0%	10	100.0%

Source: Questionnaire Survey of Automotive Parts Manufacturers in Japan, 1994, JICA Study Team

When criteria whose total response rate of "comparatively excellent" and "good" is over 90% and whose response rate of "comparatively excellent" is more than that of "some difficulty found" are regarded as especially high evaluated criteria for Malaysia, evaluation of Malaysia is especially high about political stability, people's good feeling to Japan / eagerness for inviting foreign investment and economic growth potential and low inflation rate. Malaysia is highly evaluated by its political and economic stability and eagerness for inviting Japanese manufacturers.

Procurement of factory site at a reasonable cost, competitive foreign investment incentives,

competitiveness in labour quality and cost, sufficient infrastructure such as electricity, water, transportation and communication and existence of domestic customers or market were indicated by comparatively many companies and regarded as relatively high evaluated criteria for Malaysia, because the sum of "comparatively excellent" and "good" is more than 75% and the response rates of "comparatively excellent" exceeded that of "some difficulty found".

On the contrary, when criteria whose total response rate of "some difficulty found" and "good" is over 90% and whose response rate of "some difficulty found" is more than that of "comparatively excellent" are regarded as especially low evaluated criteria for Malaysia, secure procurement of raw materials and competitive financial situation such as low interest rates are poorly evaluated.

In addition, existence of related industry such as parts suppliers, readiness of R&D and testing facilities, existence of reliable local partners and secure employment of engineers and skilled workers were indicated by comparatively many companies and regarded as relatively low evaluated criteria for Malaysia, because the sum of "some difficulty found" and "good" is more than 70% and the response rates of "some difficulty found" exceeded that of "comparatively excellent".

For the promotion of inviting Japanese engineering subsectors to Malaysia, further improvements of not only low evaluated criteria but also highly evaluated ones are necessary. The following improvements can be covered especially by Malaysian policies, though they are improvements only for problems concerning promotion of inviting overseas engineering subsectors.

(1) Improvements for articles of which evaluation of Malaysia is low

- 1) Increase in the number of and improvement in ability of engineers and skilled workers
- 2) Smooth supply of necessary parts and components by developing domestic manufacturers and by promoting invitation of overseas manufacturers
- 3) Improvement of part supply
- 4) Improvement of R&D and testing facilities
- 5) Improvement of the introduction system of reliable Malaysian partners to overseas manufacturers that want to invest in Malaysia
- 6) Improvement of financial situations such as reduction of interest rates and flexibility of