

## 6.5 Problems and Solutions in Thai Parts Industries

This section describes problems common to Thai parts industries and considers countermeasures, based upon the results of quantitative and qualitative analyses on technology level. Both analyses pointed out almost the same problems over any production processes. The whole of Thai parts industries is now rated at 3.7 or in Grade C+. The Team considers it as the most urgent task for the parts industries to raise the score up to 4.0 (B) in the near future. If the overall technology reaches 4.0 (B), the number of companies in Grade A will probably be much greater.

### (1) Production facilities (with 4.1 marks)

Production facilities now exceed 4.0 in scoring. This indicates that many companies have purchased modern and proper facilities. The Team assesses that there is no significant weakness in production facilities, with the condition that Thai parts industries will continue to make reinvestments in order to renew these facilities.

### (2) Production technology (with 3.7 marks)

In Thailand, it is imperative to strengthen the software for production. The Team believes that the most urgent task for Thai parts industries is to improve the production technology in order to "reduce the ratio of rejected products". However, the reality is that a small change, for example, in die & mould design results in so many rejected products that foreign engineers must be invited to correct the defective design. It will be necessary to establish an educational system wherein experts visit plants under operation and teach the basic theory of production to employees working in the field. A method of "teaching tour" seems to have good effects.

### (3) Quality control equipment (with 3.8 marks)

Some sample plants were not equipped with instruments and tools necessary for inspection and other quality control operations. Others had more expensive machines than required, out of harmony with the others or lacking in necessary parts. In general, plants in developing countries tend to make investments in production facilities, but not in inspecting instruments that

make no direct contribution to increasing the production. Therefore, it is necessary to give a thorough education to managements by using techniques such as cost analysis in order to penetrate them with the notion that the production capacity is as good as increased, if improvements in a quality control technology can result in a reduction of rejected products.

On the other hand, middle and small businesses have not any fund enough to purchase expensive inspecting instruments. To give them financial and technical assistances, it may be necessary to strengthen public institutions in charge of inspection, to create special loans at low interests, and to establish a leasing system for machinery and equipment.

(4) Quality control system and its operation (with 3.4 marks)

Of all the rating items, this item was rated at the lowest level of marks. On the contrary, it may be considered that the primary priority should be given to this item, because there is still the largest room to improve the technology level with high efficiency. This item made the lowest score, because some of the sample companies have not yet established any standard and manuals for inspection and the quality of products as well as any quality control system or organization. Many companies in Thailand have performed only pre-delivery inspections to assure quality assurance, but not any inspection in the production & processing phase. Even if they inspected their products before delivery, they often did so only to exclude rejected products from shipments. No improvement has been made in their inspection processes, because the results of inspection were not fed back to designing departments and production lines. This situation has been caused by the managements and inspectors who did not fully understand the significance and purposes of the quality control and the inspections for quality assurance.

Movements such as QC and TQC seminars have been deployed in Thailand to spread the methodology of quality control and assurance among local companies. However, teaching general QC theories in seminars had had limited effects, because companies could not fully apply these general theories to their plants. Therefore, it is necessary to establish an educational system wherein experts visit plants and teach actual problems and their solutions as well as basic theories to employees working in the field. In short,

this is a simple method of education in the form of a teaching tour.

(5) Upgrading companies with a middle level of technology

Based upon the above-described views, it is necessary to focus the education and training on a group of companies in Grade C (with 3.0 to 3.7 marks), on the grounds that this group includes many companies, and that this group has great possibilities of improvement to push its grade relatively easily up to Grade B (with 4.0 marks). The group of companies in Grade C is weak in software, as described above. Therefore, it is necessary to teach thoroughly the basic theories of software to this group, that is, to promote the technology transfer from foreign companies to this group.

Note: Generally may think that scientific and mathematics abilities are considered to be required to understand "basic theories". However, the "basic theories" mean here those that people understand fully if they have the same scholastic ability as high-school graduates and have mastered the four rules of arithmetic.



**ATTACHMENT 6-1 RESULTS OF TECHNOLOGY DIAGNOSIS BY PROCESS (1/6)**  
(Foundry: Iron & Steel Casting)

Unit : marks (full mark = 5.0)

Company	Ownership <sup>*1</sup>	Employee	A. Production			B. Quality Control		Entire Company Average	Grade
			A-1 Facilities	A-2 Technology	B-1 Equipment	B-2 System			
1	J/V	75	4.2	3.2	3.8	3.0	3.6	C	
2	J/V	600	4.7	4.2	4.6	3.0	4.1	B	
3	Thai	598	5.0	4.8	5.0	4.0	4.7	A	
4	Thai	130	5.0	4.0	5.0	4.0	4.5	A	
5	Thai	240	4.7	4.2	4.2	3.0	4.0	B	
6	Thai	350	4.4	4.6	4.8	4.0	4.5	A	
7	Thai	600	4.8	4.2	4.2	4.0	4.3	B	
8	Thai	84	4.7	3.4	4.6	3.0	3.9	B	
9	Thai	45	3.0	2.0	1.6	1.0	1.9	D	
10	Thai	250	3.8	3.6	4.0	3.0	3.6	C	
11	Thai	60	3.8	3.4	2.6	3.0	3.2	C	
Process average			4.4	3.8	4.0	3.2	3.8	B	

Note: \*1 Thai = Thai 100%, F = Foreign 100%, J/V = Joint venture between Thai and Foreign  
Source: JICA Team's Plant Diagnosis

ATTACHMENT 6-1 RESULTS OF TECHNOLOGY DIAGNOSIS BY PROCESS (2/6)  
(Presswork)

Company	Ownership	Employee	A. Production			B. Quality Control		Company Average	Grade
			A-1 Facilities	A-2 Technology	B-1 Equipment	B-2 System			
1	J/V	520	3.4	3.2	2.8	2.8	3.1	C	
2	Thai	884	3.3	3.2	2.8	2.8	3.0	C	
3	Thai	674	3.3	3.2	3.6	3.5	3.4	C	
4	Thai	210	4.0	3.2	4.2	3.5	3.7	C	
5	Thai	1,115	4.0	4.0	4.2	4.2	4.1	B	
6	Thai	66	3.5	3.2	2.6	2.0	2.8	D	
7	Thai	300	4.0	3.2	4.2	3.6	3.8	B	
8	Thai	210	3.6	4.0	2.4	3.3	3.3	C	
9	Thai	238	3.9	3.2	3.2	2.5	3.2	C	
10	Thai	80	3.4	3.2	3.2	2.5	3.1	C	
11	Thai	160	4.1	4.2	4.2	3.0	3.9	B	
12	F	2,800	4.9	4.8	5.0	4.9	4.9	A	
13	J/V	250	4.4	4.0	4.2	4.5	4.3	B	
14	Thai	250	3.4	3.2	4.0	2.8	3.4	C	
Process average			3.8	3.6	3.6	3.3	3.6	C	

Note: \*1 Thai = Thai 100%, F = Foreign 100%, J/V = Joint venture between Thai and Foreign

Source: JICA Team's Plant Diagnosis

**ATTACHMENT 6-1 RESULTS OF TECHNOLOGY DIAGNOSIS BY PROCESS (3/6)**  
(Plastic Processing)

Unit : marks (full mark = 5.0)

Company	Ownership <sup>*1</sup>	Employee	A. Production			B. Quality Control		Entire Company Average	Grade
			A-1 Facilities	A-2 Technology	B-1 Equipment	B-2 System			
1	Thai	240	3.6	2.7	3.3	2.8	3.1	C	
2	J/V	170	3.7	4.3	2.7	4.4	3.8	B	
3	Thai	367	3.6	2.9	2.5	2.5	2.9	D	
4	Thai	750	4.0	3.4	3.4	3.8	3.7	C	
5	Thai	40	4.1	3.3	3.4	3.0	3.5	C	
6	Thai	90	2.7	2.4	3.3	1.9	2.6	D	
7	Thai	50	2.5	2.4	1.8	2.0	2.2	D	
8	Thai	2,200	3.4	3.0	3.4	2.9	3.2	C	
9	Thai	350	3.7	2.9	2.6	3.2	3.1	C	
10	J/V	50	4.8	4.7	4.5	4.6	4.7	A	
11	F	2,591	4.9	4.9	4.7	5.0	4.9	A	
12	Thai	50	3.2	2.8	2.3	2.7	2.8	D	
Process average			3.7	3.3	3.2	3.2	3.4	C	

Note: \*1 Thai = Thai 100%, F = Foreign 100%, J/V = Joint venture between Thai and Foreign

Source: JICA Team's Plant Diagnosis

ATTACHMENT 6-1 RESULTS OF TECHNOLOGY DIAGNOSIS BY PROCESS (4/6)  
(Rubber Processing)

Unit : marks (full mark = 5.0)

Company	Ownership <sup>*1</sup>	Employee	A. Production		B. Quality Control		Entire Company Average	Grade
			A-1 Facilities	A-2 Technology	B-1 Equipment	B-2 System		
1	J/V	500	3.4	3.5	3.2	3.5	3.4	C
2	J/V	1,094	4.0	4.0	4.0	4.0	4.0	B
3	Thai	250	3.2	1.9	3.0	2.3	2.6	D
4	Thai	45	3.0	3.2	3.0	3.0	3.1	C
5	Thai	150	3.2	3.0	3.2	2.9	3.1	C
6	J/V	750	4.9	4.6	5.0	5.0	4.9	A
Process average			3.6	3.4	3.6	3.5	3.5	C

Note: \*1 Thai = Thai 100%, F = Foreign 100%, J/V = Joint venture between Thai and Foreign

Source: JICA Team's Plant Diagnosis



**ATTACHMENT 6-1 RESULTS OF TECHNOLOGY DIAGNOSIS BY PROCESS (5/6)**  
**(Die-casting: Aluminum Alloy Casting)**

Unit : marks (full mark = 5.0)

Company	Ownership	*1 Employee	A. Production		B. Quality Control		Entire Company Average	Grade
			A-1 Facilities	A-2 Technology	B-1 Equipment	B-2 System		
1	J/V	230	5.0	4.4	5.0	5.0	4.9	A
2	J/V	600	5.0	4.6	5.0	4.0	4.7	A
3	J/V	235	5.0	4.4	5.0	4.0	4.6	A
4	Thai	534	5.0	4.4	5.0	3.0	4.4	B
5	J/V	1,500	5.0	4.6	4.6	4.0	4.6	A
6	Thai	700	5.0	4.0	n.a.	3.0	4.0	B
7	Thai	120	4.3	3.2	3.4	3.0	3.5	C
8	Thai	437	5.0	4.6	4.8	4.0	4.6	A
Process average			4.9	4.3	4.7	3.8	4.4	B

Note: \*1 Thai = Thai 100%, F = Foreign 100%, J/V = Joint venture between Thai and Foreign

Source: JICA Team's Plant Diagnosis

**ATTACHMENT 6-1 RESULTS OF TECHNOLOGY DIAGNOSIS BY PROCESS (6/6)**  
(Die-forging : steel)

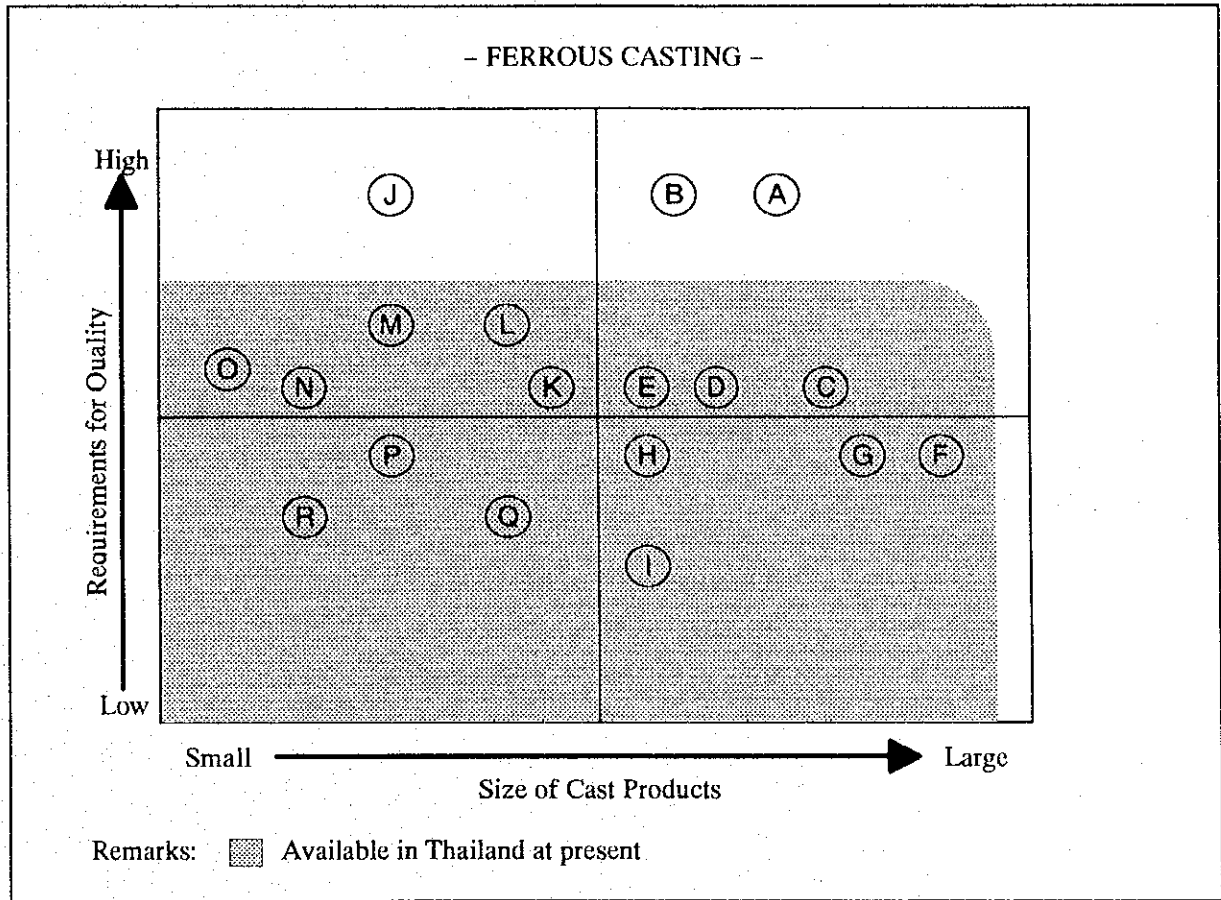
Unit : marks (full mark = 5.0)

Company	Ownership <sup>*1</sup>	Employee	A. Production			B. Quality Control			Entire Company Average	Grade
			A-1 Facilities	A-2 Technology	B-1 Equipment	B-2 System				
1	Thai	445	5.0	3.2	4.0	3.0	3.8	B		
2	Thai	130	4.0	3.4	2.5	3.0	3.2	C		
3	Thai	85	5.0	4.0	2.5	3.0	3.6	C		
4	Thai	132	5.0	4.0	4.5	4.0	4.4	B		
5	J/V	135	5.0	4.4	4.5	4.0	4.5	A		
Process average			4.8	3.8	3.6	3.4	3.9	B		

Note: \*1 Thai = Thai 100%, F = Foreign 100%, J/V = Joint venture between Thai and Foreign

Source: JICA Team's Plant Diagnosis

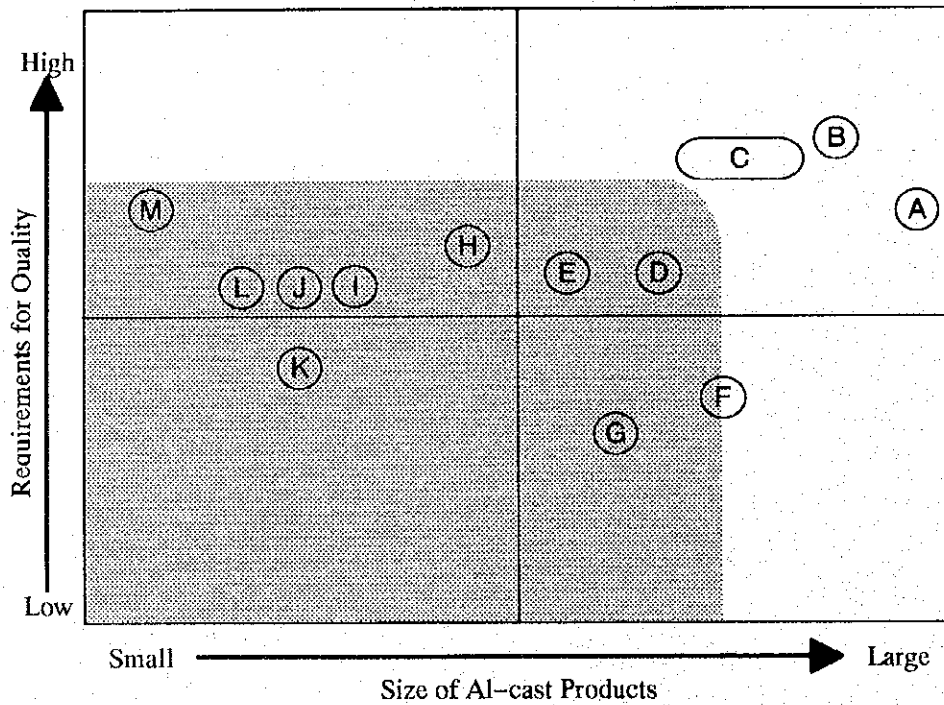
- FERROUS CASTING -



Representative cast products in categories

A	Cylinder block, car	J	Chill cam shaft, 1-ton pick-up
B	Cylinder head, car	K	Brake disc, car
C	Clutch housing, big truck	L	Exhaust manifold, car
D	Crank case, agricultured diesel engine	M	Cylinder head, agricultural diesel engine
E	Trunion brakel, truck; Spring brakel, truck; Seat trunion, truck	N	Engine bracket, car
F	Presswork die, car panels	O	Piston ring, car
G	Bed & column, machine tools	P	Compressor parts, refrigerator and air-con.
H	Brake drum, car; Flywheel, car	Q	Casing and bracket, small electric motor
I	Centrifugal pump, agriculture; Gate valve body, water supply	R	Pully, car

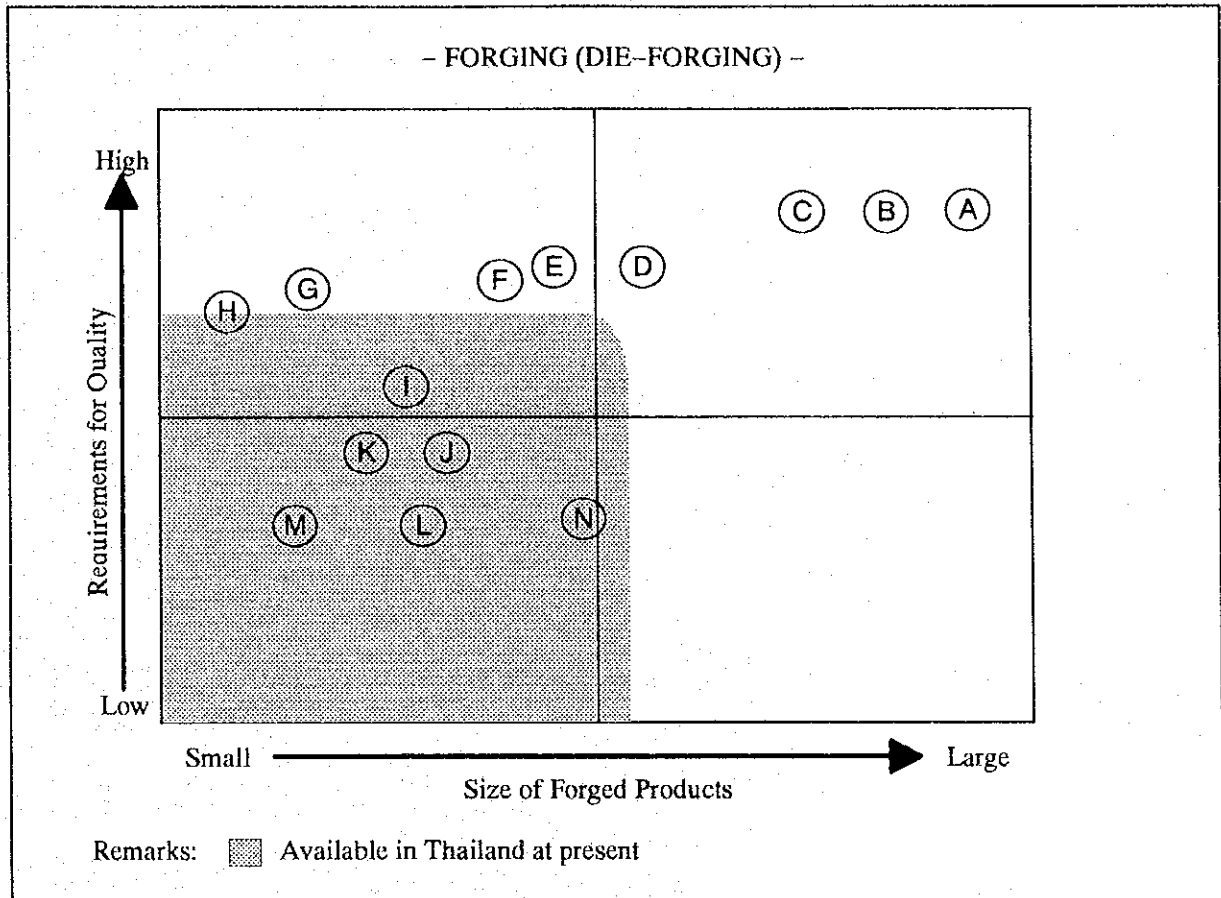
- ALUMINUM ALLOY CASTING -



Remarks:  Available in Thailand at present

Representative Al-cast products in categories

A	Transmission case, car	J	Engine cylinder, motor cycle
B	Cylinder block, car	K	Cylinder head, motor cycle; Crank case, motor cycle; Clutch housing motor, cycle
C	Cylinder head, car	L	Piston, car
D	Wheel, car (OEM)	M	Chassis, VTR, Parts, FDD; Cooling fan casing, OA equipment
E	Intake manifold, car		
F	Oil Pan, car engine		
G	Rocker cover, car; Clutch housing, car; Center housing, car; Extension housing, car		
H	Parts, Alternator and starter		
I	Parts, water pump and oil pump		



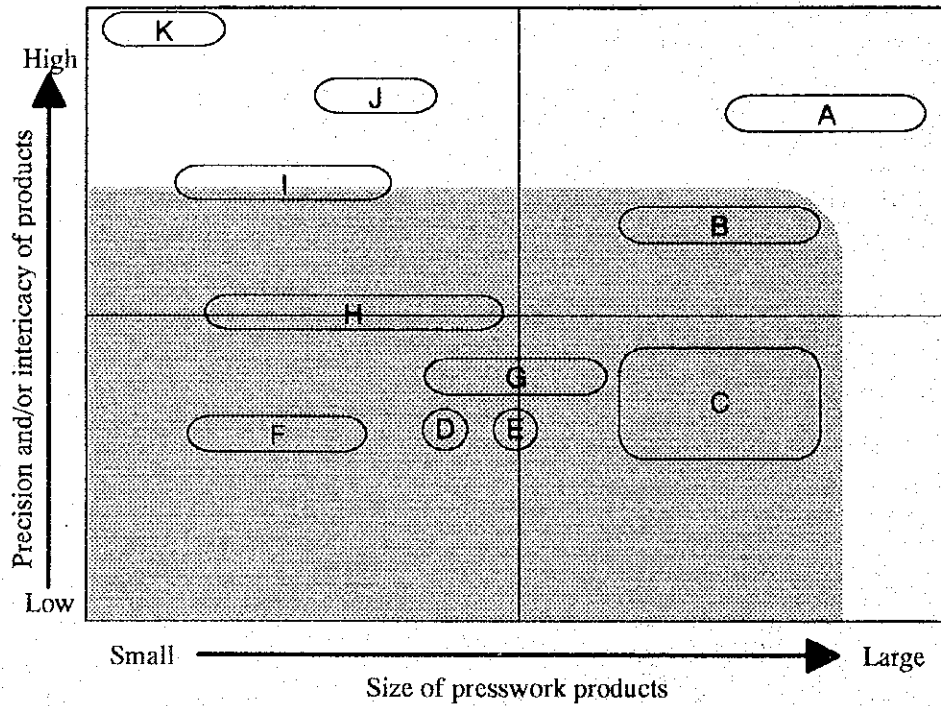
Representative forged products in categories

A	Front axle, 1-ton pickup	J	Agricultural diesel engine parts (Crank shaft, Connecting rod, Cam shaft, Rocker arm)
B	Drive gear, car	K	Motor cycle parts (Crank shaft, Connecting rod, Under bracket, Handle bracket, Kick starter)
C	Crank shaft, car	L	Conveyor chains, shackles, Hooks, Hand tools
D	Connecting rod, car	M	Hardware, electrical pole
E	Steering knuckle, car	N	Gear blank, industrial machinery
F	Wheel hub, car		
G	Small auto parts (rocker arm, shift fork)		
H	Engine valve, car		
I	Ball joint and Suspension tie rod, car (REM)		

ATTACHMENT 6-2 CLASSIFICATION OF COMPONENTS/PARTS BY TECHNOLOGICAL REQUIREMENTS (3/8)

(Die-forging)

- PRESSWORK -

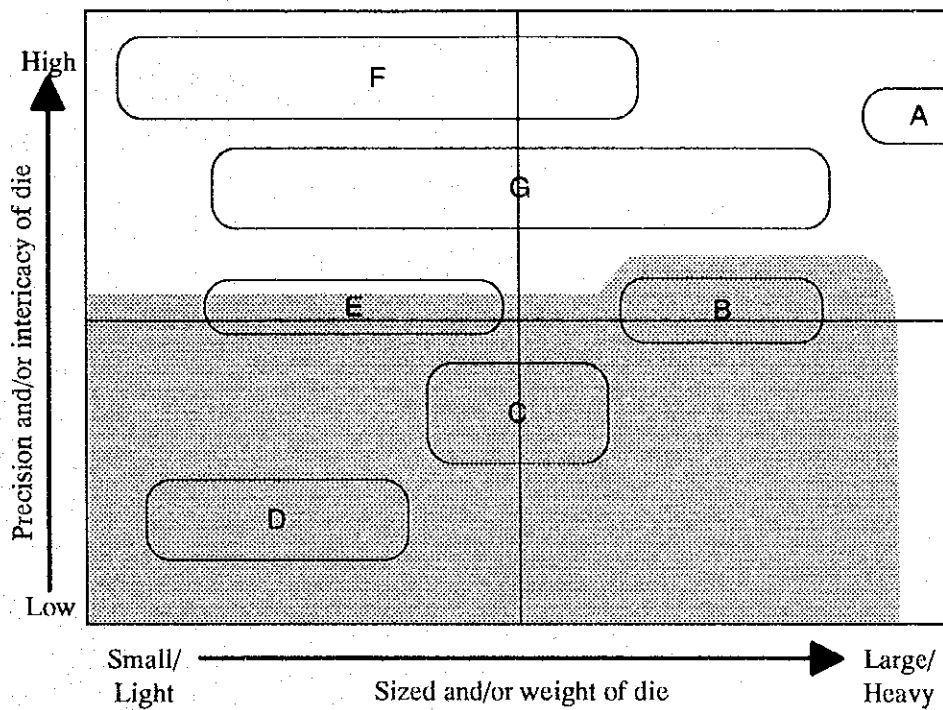


Remarks:  Available in Thailand at present

Representative presswork products in categories

A	Outer panels, p/c (Body, Roof, Door, Front fender, Trunk lid, Fender)	J	Functional parts, elect (Cam for fine blanking, Link, Gear, Lever)
B	Outer panels, c/v (- ditto -)	K	Precision electronic parts (IC lead frame, Terminal, Connector)
C	Inner panels, car (- ditto -)		
D	Radiator, car		
E	Fuel tank, car		
F	Bracket, Metal fittings	(Note) elect: Electrical/electronic equipment p/c: Passenger car c/v: Commercial vehicle rf: Refrigerator w/m: Washing machine	
G	Panels, rf; Washing tub, w/m		
H	Chassis & Deck, TV & VTR		
I	Motor parts, (Motor case, Motor core), elect		

- PRESS DIE-MAKING -

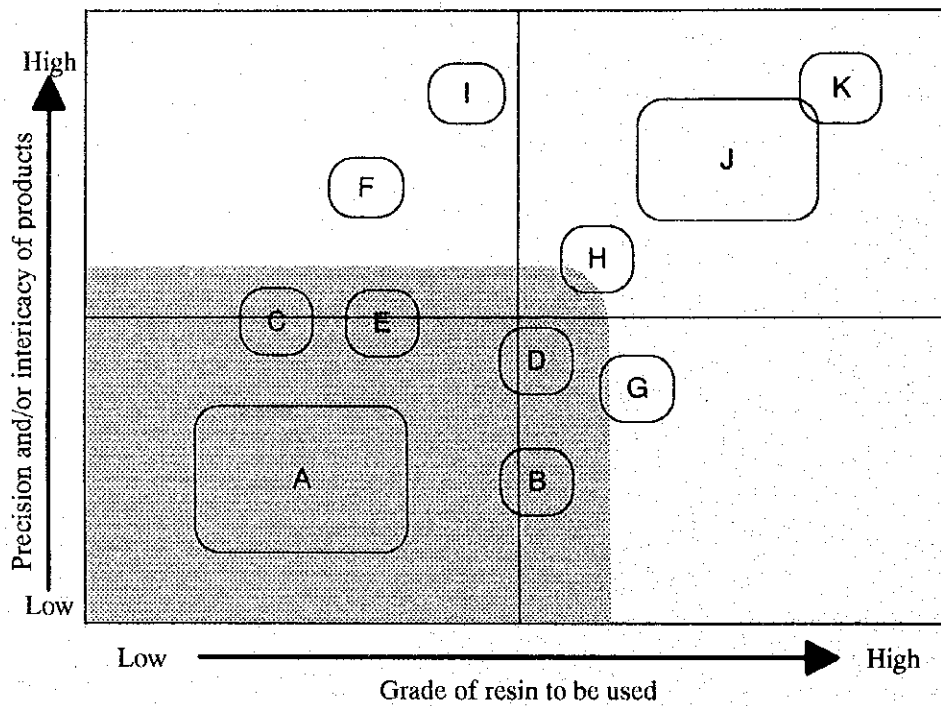


Remarks:  Available in Thailand at present

Types of press die in categories

A	Super large size die (Upper die weight > 20tf)		
B	Large size die (Upper die weight > 5 - 15 tf)		
C	Medium size die (Upper die weight > 2 - 5 tf)		
D	Block die (for general and small sized press products)		
E	Compound die		
F	Progressive die		
G	Transfer die, Die for robotic presswork		

- PLASTIC PROCESSING -

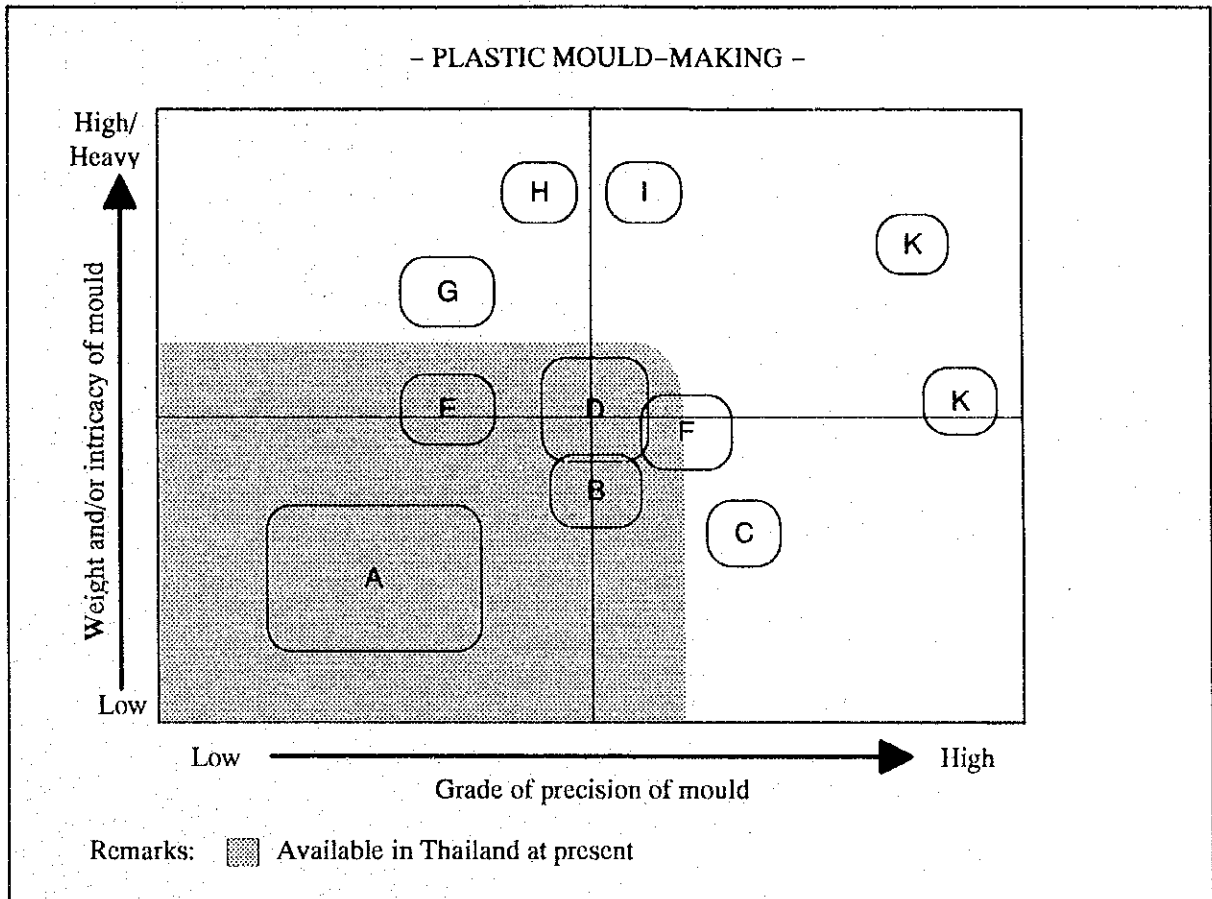


Remarks:  Available in Thailand at present

A	Central home appliances; Bottles (PP, PE, ABS); Ice tray (PP); Garnish, car (PP); Nozzle, v/c (PP)	J	Body, camera (PC); Gear, high quality (PA, POM); Connector (POM), Coil bobbin (PBT, PPS); Optical prism (PMMA); Lever, high quality (POM); Plate, CD (PMMA, PC)
B	Seat inner shell, car (ABS); Stand, w/m (PP); Crisper, ref (PS)	K	Nonspherical lens (PMMA); Polygon mirror (PMMA); Connector (PPS)
C	Parabolic antenna (ABS); Washing tub, w/m (5kg)(PP); Control panel, w/m (ABS)		
D	Cabinet, TV (Hi-PS); Back cover, TV (PP); Wheel cover, car (ABS, PPO)		
E	Front fender, car (PP); Leg shield, m/c (PP); Side cover, m/c (ABS)		
F	Washing tub, ref (7-8kg) (PP); Front & rear spoiler, car (ABS)		
G	Radiator fan, car (PA); Oil pan, car (PA); Fan frame, car (PPO)		
H	Casing, Telephone (ABS); Fuse box, car (PBT); Gear & lever, Low quality (POM)	(Note) ref:	Refrigerator
I	Bumper, car (PP); Dashboard, car (ABS); Console box, car (ABS); Front grill, car (ABS)	w/m:	Washing machine
		v/c:	Vacuum cleaner
		m/c:	Motor cycle

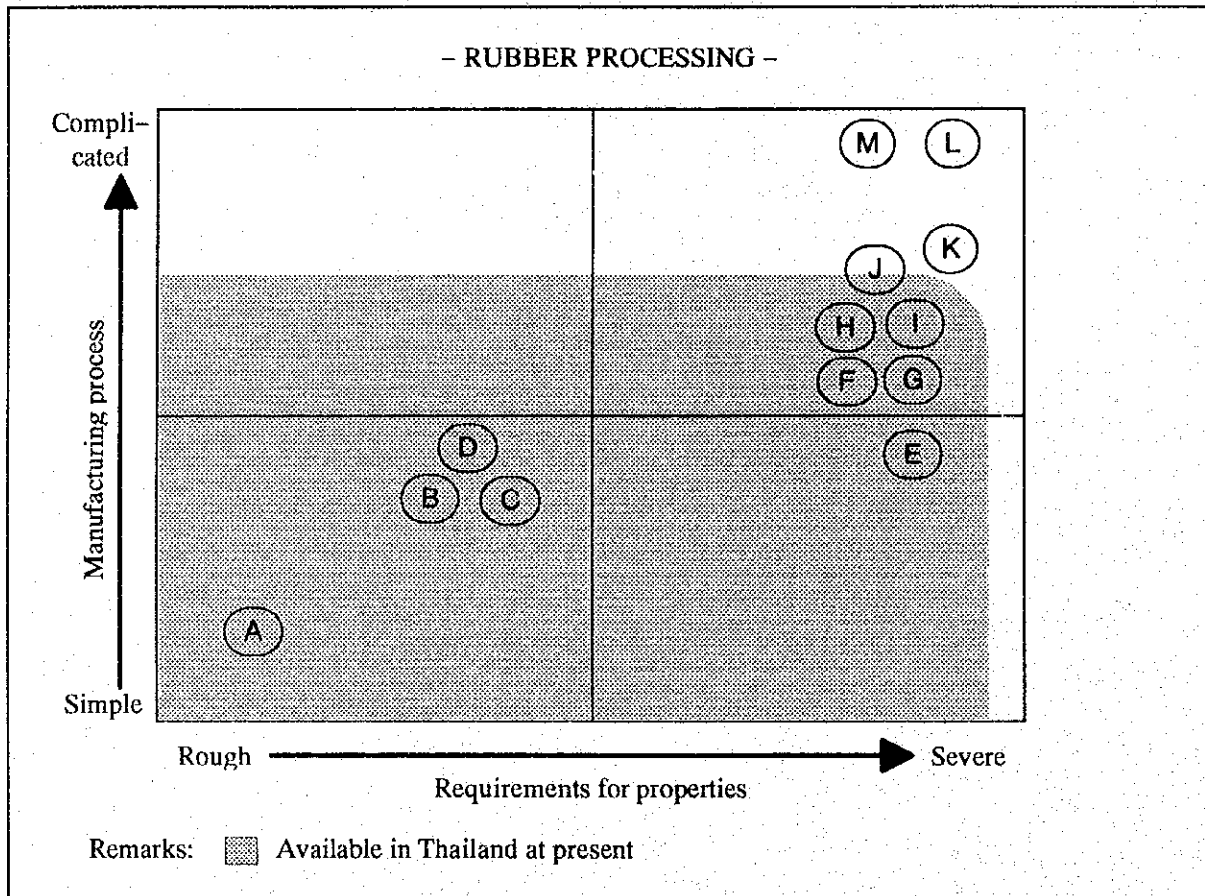
ATTACHMENT 6-2 CLASSIFICATION OF COMPONENTS/PARTS BY TECHNOLOGICAL REQUIREMENTS (6/8)  
(Plastic Processing)





Representative plastic moulds in categories (by name of products)

A	General home appliances; Covers, car	J	Body camera; Mechanical classics, VTR; Connector, big size
B	Crisper, Dew drop receiver & door, ref; Air below parts, car	K	Nonspherical lens; Polygon mirror; Connector; Optical prism; Plate, CD
C	Switch box (0.5 mm); Cup (0.65 mm)		
D	Cabinet, TV; Back cover, TV; Wheel cover, car; Case & handle, telephone		
E	Front tender, car; Side cover, chain cover, radiator fan & oil pan, m/c		
F	Electric fan, Tail lamp, car; Gear, Lever		
G	Twin-tub (5 - 8 kg), w/m; Single-tub; W/m		
H	Bumper, car; Front spoiler, car; Housing air con.	(Note)	Ref: Refrigerator
I	Front grille, car; Dashboard, car; Console box, car		m/c: Motorcycle
			w/m: Washing machine



Rubber processing products in categories

A	Mats, car; Goods (Rubber boat, life jacket), leisure	J	Timing belt (high quality), car
B	Insulation, electrical	K	CD lens holder, electronic
C	Waterproof consent, electrical	L	Semiconductive wire, car; Parts for biotechnology, parts for chemical plant
D	Waterproof switch, electrical	M	Medical supplies (catheter, blood transfusion)
E	Tyre, car		
F	Semiconductive switch, electronic		
G	Timing belt, OA equipment		
H	Feed roller, OA equipment		
I	Oil seal, car; Joint tube, car; Window rain cut, car		





## **Chapter 7 Questionnaire Survey of Supporting Industry in Thailand and Japan: Results and Analysis**

This survey employed a questionnaire and interviews to ascertain the worries and desires of companies belonging to supporting industry. To devise a master plan for fostering supporting industry, what is most important is to understand the needs of the related companies. Thus, under the guidance of the survey team, a Thai survey company, Advanced Research Group Co., Ltd. (ARG), interviewed Thai companies in supporting industry. In addition, questionnaires were given to supporting-industry companies (small and medium scale industry manufacturers of parts) of a third country that were presumably considering investing in Thailand. Based on the wishes of the Thai government, Japan, the country with the greatest influence and interest in supporting industry, was chosen as the third country.

### **7.1 Results and Analysis of Survey of Thai Companies**

#### **7.1.1 Survey method**

For this survey, 500 small and medium scale industry manufacturing companies (companies with 300 employees or less) that were thought to belong to the target industries – autoparts and electric/electronic parts – were selected from several corporate directories. Following the selection, a questionnaire with 14 questions was drawn up (see Appendix) and sent, together with an explanatory letter, to the companies. The directories used were the following.

- Board of Investment: Listing for Electronic/Electric companies registered
- Federation of Thai industry
- The Thai Tool and Die Industry Association Directory 1993/94
- Thailand Automotive Industry Directory 1993 (by Automotive Parts Manufacturers Association)
- Directory of Thailand Supporting Industry, 1993
- MIDI
- BOI unit for Industrial Linkage Department (BUILD)
- Department of Industrial Works, Ministry of Industry

After the questionnaires were sent, ARG telephoned the 500 companies and asked to visit them for an interview. The companies that agreed were then interviewed.

All together, 239 companies were interviewed and answered the questionnaire. After all of the questionnaires were collected, the survey team separated them into those from auto parts companies and those from electric/electronic parts companies; totaled the data for each category of company size, small (less than 50 employees), medium (50-199 employees) and large (more than 200 employees); and analyzed the data. The results were as stated below.

### 7.1.2 Outline of answering companies

As mentioned above, 239 companies answered the questionnaire. Their breakdown by industry is as follows.

-Manufacturers, primarily of auto parts	98
-Manufacturers, primarily of electric/electronic parts	141
	<hr/>
	239

After the questionnaires were collected, it was found that 11 of the auto parts companies were actually companies that specialized in manufacturing motorcycle parts, and that 7 of the electric/ electronic parts companies only made parts for electric industrial machinery. These companies were outside the survey's target industries; however, to better understand the intentions of supporting-industry companies in Thailand, their questionnaires were included in the analysis.

An outline of the answering companies is presented below. Not all of the companies answered all of the questions; the number of answers thus varies from question to question. In the analysis for each question, the proportions given are based on the number of companies (of each size and in total) that actually answered the question. In the table for each question, moreover, the number of answering companies is shown in parentheses.

#### (1) Corporate Scale by the Number of Employees

Table 7.1-1 SCALE BY NUMBER OF EMPLOYEES (%)

	Small	Medium	Large	Total
Automotive	21.4	48.0	30.6	100.0
Electrical/Electronic	10.6	50.4	39.0	100.0

As shown in Table 7.1-1, small and medium scale industry companies with less than 200 employees accounted for more than 60% of the respondents. The proportion of small companies with less than 50 employees was greater in the autoparts group than in the electric/electronic parts group.

(2) Proportion of Foreign Ownership

A joint-venture company is here taken to mean any company in which foreign capital, no matter how much, has been invested.

Table 7.1-2 OWNERSHIP (%)

	Automotive (98)	Electrical/Electronic (141)	Total (239)
Thai 100%	49.0	39.0	44.0
Foreign 1 - 49%	26.5	23.4	25.0
Foreign 51 - 100%	24.5	37.6	31.0
Total	100.0	100.0	100.0

As shown in Table 7.1-2, the proportion of joint-venture companies surpassed 50% in total. The electric/electronic parts group had more joint venture in terms of its share than the autoparts group. The proportion of companies with at least 51% foreign capital was 38% in the electric/electronic parts group while it was 25% in the autoparts group.

(3) Market for the Products

When the market for the products sold by the answering companies was categorized as either OEM and REM, it was found that 77% of all the companies in both groups were engaged in OEM in some form. The proportion of the electric/electronic parts group engaged only in OEM exceeded 60%. In contrast, over 60% of the autoparts companies were engaged in REM in some form, probably reflecting the growing after-market for autoparts (Table 7.1-3).

Table 7.1-3 MARKET FOR PRODUCTS (%)

	Automotive (98)	Electrical/Electronic (141)	Total (239)
OEM only	37.8	61.7	51.9
OEM & REM	41.8	17.0	27.2
REM only	20.4	21.3	20.9
Total	100.0	100.0	100.0

Table 7.1-4 classifies the 239 companies into primary suppliers of parts, secondary and more upstream suppliers of parts, and others. It was thus found that, of the 239 companies as a whole, 43% of the purchasers were primary suppliers while 39% were secondary or more upstream suppliers, both together comprising more than 82% of all the purchasers. When the different kinds of purchasers were broken down by group, moreover, it was found that there was a higher proportion of primary suppliers among the auto parts companies (53%), but a higher proportion of secondary and more upstream suppliers among the electric/electronic parts companies (45%).

Table 7.1-4 CLIENTS OF PRODUCTS (%)

	Automotive (98)	Electrical/Electronic (141)	Total (239)
Primary suppliers of parts	53.1	36.2	43.1
Secondary and more upstream suppliers of parts	31.6	44.7	39.3
Others	15.3	19.1	17.6
Total	100.0	100.0	100.0

(4) Production Process

As shown in Table 7.1-5, few companies specialized in only one process and most were engaged in multiple processes.

The electric/electronic parts group has a higher proportion on the companies engaged in multiple processes than the auto parts group.



Table 7.1-5 PRODUCTION PROCESSES (%)

Automotive (98)		Electrical/Electronic (141)	
Press	55.1	Assembly	62.4
Assembly	44.9	Press	34.8
Machining (incl. Die-making)	42.9	Machining (incl. Die-making)	28.4
Heat Treatment	31.6	Sheetwork/Welding	22.0
Casting	24.5	Heat Treatment	17.7
Forging	20.4	Plastic Molding	15.6
Sheetwork/Welding	16.3	Surface Treatment/Electroplating	9.9
Surface Treatment/Electroplating	15.3	Casting	5.7
Rubber Molding	15.3	Forging	5.7
Plastic Molding	12.2	Rubber Molding	3.5
Glasswork	2.0	Glasswork	0.7

### 7.1.3 Manufacturing facilities (Questions D3, D4, D5)

This article aims to grasp local manufacturers' needs to modernize their production facilities on the basis of valid answers to the following questions.

1. Self-evaluation of the existing production capacity
2. Intention to purchase new machinery and equipment
3. Problems with purchasing new machinery and equipment
4. Intention to purchase second-hand machinery and equipment

As shown in Table 7.1-6, more than 40% of the companies as a whole said that their production capacity was short of the current market demand.

Table 7.1-6 EVALUATION OF THE EXISTING PRODUCTION CAPACITY (%)

	Automotive (98)	Electrical/ Electronic (141)	Total (239)
Over capacity	6.5	5.0	5.4
Appropriate	51.9	52.7	52.3
Short capacity	41.6	42.3	42.3
Total	100.0	100.0	100.0

Table 7.1-7 concerns plans to purchase new machines and equipment. More than 25% of the respondents in each group said they had such a plan.

Table 7.1-7 PLAN TO PURCHASE NEW MACHINES AND EQUIPMENT (%)

	Automotive (97)	Electrical/Electronic (139)	Total (236)
Has a plan	26.8	25.9	26.3
Has no plan	73.2	74.1	73.7
Total	100.0	100.0	100.0

Table 7.1-8 pertains to problems with buying new machines and equipment. The top problem, given by more than 40% of the companies in both groups, was that the price was "too expensive." Next in order was "high interest rate on loans." Electric/electronic parts companies, more than auto parts companies, mentioned a "lack of capability and knowledge to operate modern machinery and equipment." (For this question, the companies were given 7 answers, including "Other," and were asked to choose the 2 that were most appropriate.)

Table 7.1-8 PROBLEMS WITH BUYING NEW AND MODERN MACHINES & EQUIPMENT (%)

	Automotive (98)	Electrical/Electronic (141)	Total (239)
Too expensive price	48.6	43.8	46.0
High interest rate of loans	30.6	37.5	34.7
Lack of capability & Knowledge to operate modern M & E	18.1	28.1	24.3
Insufficient market demand	19.4	15.6	17.2
Difficulty in borrowing money	18.1	15.6	16.7
Lack of info on modern M & E	12.5	14.6	13.8
Other	13.9	19.8	17.6

Table 7.1-9 concerns interest in buying second-hand machinery and equipment. As shown, 50% of the auto parts companies and 42% of the electric/electronic parts companies said that they had such interest.

Table 7.1-9 INTEREST IN BUYING SECOND-HAND MACHINES & EQUIPMENT (%)

	Automotive (98)	Electrical/Electronic (137)	Total (235)
Interested	50.0	42.3	45.5
Not interested	50.0	57.7	54.5

#### 7.1.4 Production technology and quality control (Questions E1, E2, E3, E4, E5, E6, F1)

This article aims to understand the current status of production technology and quality control in the local supporting industries, clarifying some critical points for improvement. The analysis is based on the valid answers which are given to the following questions by the respondents.

1. Claims lodged by customers
2. Industrial standards of products adopted
3. Contents of technical assistance offered now by foreign firms
4. Contents and forms of technical assistance desired
5. Methods of quality control

Table 7.1-10 deals with complaints from customers. As shown, the most frequent complaints were about "delivery" and "pricing". They were mentioned by more than 40% of the companies in both groups. "Pricing" was given by more than half of the auto parts companies. The third most-frequent complaint, specified by 32% of the auto parts companies and 35% of the electric/electronic parts companies, was "lack of production capacity." On the other hand, "quality" was mentioned relatively infrequently. (For this question, the companies were given 6 answers, including "Other," and were asked to choose the 2 that were most appropriate.)

Table 7.1-10 MOST SERIOUS OR FREQUENT COMPLAINTS LODGED BY CUSTOMERS (%)

	Automotive (84)	Electrical/Electronic (125)	Total (209)
Delivery (delay or inconsistent)	44.0	47.2	45.9
Pricing (high)	51.2	36.0	42.1
Production capacity (not enough to meet the demand)	32.1	35.2	34.0
Quality (low or uneven)	16.7	27.2	23.0
Technological capabilities (insufficient)	14.3	10.4	12.0
Other	7.1	4.8	5.7

Table 7.1-11 concerns the industrial standards used for manufacturing products. As shown, the most commonly used standards were the "customers' standards." This was the case with 58% of the auto parts companies and 56% of the electric/electronic parts companies. (For this question, the companies were given 7 answers, including "Other," and were asked to choose all that were appropriate.)

Table 7.1-11 INDUSTRIAL STANDARDS USUALLY USED (%)

	Automotive (93)	Electrical/Electronic (139)	Total (232)
Customers' standards	58.1	56.1	56.9
Foreign standards	35.5	41.7	39.2
International standards (ISO, IEC)	20.4	23.7	22.4
Thai industrial standards (TIS)	15.1	10.8	12.5
Others	1.1	0.7	0.9

Table 7.1-12 concerns the kinds of technical assistance that the companies were currently receiving from foreign companies. As shown, the most common kind of assistance was "training overseas," which was being received by more than 50% of the respondents in each group. In addition, more than 40% of the companies in both groups were receiving in-house advisory services. "Production licenses" were given to over 40% of the auto parts companies. (For this question, the companies were given 7 answers, including "Other," and were asked to choose all that were appropriate.)

Table 7.1-12 TECHNICAL ASSISTANCE FROM FOREIGN-BASED COMPANIES (%)

	Automotive (83)	Electrical/Electronic (124)	Total (207)
Training overseas	51.8	55.6	54.1
Advisory services as required	45.8	40.3	42.5
In-house advisory services	42.2	41.1	41.5
Extension advisory services	38.6	34.7	36.2
Production licenses	42.2	28.2	33.8
Training in Thailand	30.1	36.3	33.8
Others	3.6	5.6	4.8

The companies were asked what kinds of support they would want if cost were no object. The results obtained are shown in Table 7.1-13. The most frequent answer was "workshops on production technology," which was given by nearly 50% of the companies in each group. The second most-frequent answers were "training of key personnel in training centers of Thailand" and "training of key personnel overseas", each given by about 40% of both groups. "Strengthening of the various technical institutions and centers" was also requested by 30% of the companies in total. A difference between the two groups appeared with regard to "seminars for the introduction of new technologies" and "extension advisory services by consultants"; they were desired by 34% and 27% of the electric/electronic parts companies, respectively. The auto parts companies, on the other hand, had a much higher ratio of "offer of production licenses". (For this question, the companies were given 10 answers, including "Other," and were asked to choose the 3 that were most appropriate.)

Table 7.1-13 KINDS OF SUPPORTS DESIRED FOR TECHNOLOGY TRANSFER  
FROM OVERSEAS (%)

	Automotive (91)	Electrical/ Electronic (135)	Total (226)
Workshops for production technology easily applicable	47.3	48.9	48.2
Training of key persons overseas	36.3	39.3	38.1
Training of key persons in training centers in Thailand	37.4	37.8	37.6
Strengthening of technical centers in Thailand	33.0	26.7	29.2
Permanent advisory services by foreign consultants	26.4	25.2	25.7
Seminar for new technology	16.5	34.1	27.0
License production with training programs	27.5	17.0	21.2
Technological info through publications	18.7	25.2	22.6
Extension advisory services by consultants	14.3	27.4	22.1
Others	1.1	4.4	3.1

Table 7.1-14 concerns the forms of technical support desired in the future. As shown, more than 40% of the companies in both industries said they were interested in a "joint venture."

Table 7.1-14 DESIRABLE FORMS OF TECHNICAL ASSISTANCE/COOPERATION  
FROM OVERSEAS (%)

	Automotive (77)	Electrical/ Electronic (104)	Total (181)
Joint venture	42.9	43.3	43.1
Technical assistance	61.0	52.9	56.4
Other	9.1	17.3	13.8

Table 7.1-15 deals with quality control methods. As shown, more than 70% of the companies in each group had established a special department or division for quality control and inspection. More than half of the companies employed full-time inspection personnel. Those companies which had checked the quality of semi-finished products in each process exceeded 80% in the electric/electronic parts group. In addition, more than 40% of both groups had set up some kind of

quality control circle. (For this question, the companies were given 7 answers and asked to choose all that were appropriate.)

Table 7.1-15 WAYS OF QUALITY CONTROL (%)

	Automotive (98)	Electrical/ Electronic (140)	Total (238)
Department/division of quality control & inspection	74.5	72.9	73.5
Full-time inspectors	53.1	60.0	57.1
Quality control by workers	67.3	57.1	61.3
Quality control of finished products	59.2	60.0	59.7
Quality control of semi-finished products by process	67.3	80.7	75.2
QC circles	40.8	45.0	43.3
Proposal systems for improving production efficiency	51.0	35.0	41.6

### 7.1.5 Labor force and labor management (Questions G2, G3, G4, G5)

This article tries to have a better understanding of the current status of labor force and labor management, based on valid answers to the following questions.

1. Average number of working years of factory workers.
2. Problems with labor management.
3. Contents of education and training for employees.

As shown in Table 7.1-16, most of the respondents said that the average number of working years of their factory workers was "less than 5 years." When these companies and the companies answering "5 years to 10 years" are added together, it is found that the proportion of companies whose workers averaged up to 10 years of experience was 92% in the auto parts group and 95% in the electric/electronic parts group.

Table 7.1-16 AVERAGE NUMBER OF WORKING YEARS (%)

	Automotive (98)	Electrical/ Electronic (141)	Total (239)
Less than 5 years	64.3	78.2	72.4
5 years to 10 years	28.0	16.8	21.8
10 years to 15 years	5.2	3.1	3.8
15 years or more	2.5	1.9	2.0
Total	100.0	100.0	100.0

Table 7.1-17 pertains to problems with manpower recruitment and management. As shown, the biggest problems were "job hopping" and "difficulty in recruiting highly educated persons (e.g., engineers)". Next in order were "lack of discipline and morale" and "difficulty in training and educating employees in-house." (For this question, the companies were given 7 answers and asked to choose the 2 that were most appropriate.)

Table 7.1-17 PROBLEMS WITH LABOR MANAGEMENT (%)

	Automotive (91)	Electrical/ Electronic (123)	Total (214)
Job-hopping	54.9	49.6	51.9
Difficulty in recruiting highly educated persons	50.5	52.0	51.4
Lack of discipline/morale	45.1	33.3	38.3
Difficulty in training/ educating employees in-house	26.4	35.0	31.3
Increasing wages	24.2	24.4	24.3
Labor disputes/strikes	1.1	1.6	1.4
Other	3.3	5.7	4.7

Table 7.1-18 deals with methods of employee training and education. As shown, nearly 90% of the companies in both groups trained their workers either in-house or at the customer's factory. Also, more than 60% of the companies had their employees participate in outside seminars and workshops. (For this answer, the companies were given 5 answers, including "Other," and were asked to choose all that were appropriate.)



Table 7.1-18 METHODS FOR TRAINING OR EDUCATING EMPLOYEES (%)

	Automotive (97)	Electrical/ Electronic (140)	Total (237)
On-the-job training in-house or at customers' factories	87.6	87.1	87.3
Participation in seminars and workshops	67.0	64.3	65.4
Overseas training	45.4	45.7	45.6
Participation in training courses in schools	22.7	26.4	24.9
Others	6.2	0.0	2.5

### 7.1.6 Capital procurement (Questions H1, H2, H3, H6)

This article tries to clarify usage and problems as to capital procurement in the supporting industries. It also refers to their interest in the leasing system of machinery and equipment for smaller manufacturers.

Among outside capital procured, long-term funds (with repayment term of more than one year) accounted for 84% of total. More than 70% of the long-term funds were sourced by "commercial banks" whose interest rates per annum were 11.4% in the average. Next in order was "offshore centers" with 19%, followed by "non banks" with 6%. Their average interest rates were 8% per annum, some 3% lower than in "commercial banks". Among short-term funds (with repayment term of less than one year), on the other hand, "commercial banks" sourced two thirds of total and their annual interest rates were 8.8% on the average.

Table 7.1-19 shows the uses for the outside capital. Around 80% of the companies used it for "purchase of machinery and equipment." Next in order was "working capital," which was cited by nearly 60% of each group. The percentage of use for "relocation of factories" in the auto parts group was twice as high as in the electric/electronic parts group. (For this question, the companies were given 9 answers, including "Other," and were asked to choose all that were appropriate.)

Table 7.1-19 USE OF FUNDS BORROWED (%)

	Automotive (48)	Electrical/ Electronic (73)	Total (121)
Purchase of machinery / equipment	79.2	80.8	80.2
Working capital	60.4	54.8	57.0
Construction of factories	47.9	41.1	43.8
Purchase of inspection/ measuring equipment	25.0	26.0	25.6
Relocation of factories	22.9	11.0	15.7
R&D	10.4	15.1	13.2
Purchase of waste treatment facilities	10.4	13.7	12.4
Land acquisition	12.5	11.0	11.6
Other	4.2	11.0	8.3

Table 7.1-20 shows what kinds of problems the companies had encountered in raising money from outside. Many companies in both groups gave the same answers: "complicated procedures," "restrictions on the amount that can be borrowed," and "a lack of mortgages or collaterals".

Particularly, "complicated procedure" was pointed out by more than half of the companies in both groups. "Restrictions on the amount that can be borrowed" also accounted for nearly 50% in the auto parts group. Among the electric/electronic parts companies, on the other hand, a "lack of mortgages and collaterals" and "banks' unwillingness toward financing" reached 29% and 21%, respectively. This indicates that many of these companies cannot procure necessary funds because they are lacking in mortgages and collaterals.

Table 7.1-20 DIFFICULTIES IN BORROWING NECESSARY FUNDS (%)

	Automotive (43)	Electrical/ Electronic (53)	Total (96)
Complicated procedures	62.8	50.9	56.3
Restrictions on the amount that can be borrowed	46.5	35.8	40.6
Lack of mortgages or collaterals	23.3	28.8	26.3
Banks' unwillingness toward financing	7.0	20.8	14.6
Lack of official guarantee systems for mortgages or collaterals	4.7	5.7	5.2
Other	7.0	24.5	16.7

Table 7.1-21 concerns leasing programs for equipment and facilities. As shown, more than 60% of the companies in both groups said they were interested in such programs.

Table 7.1-21 INTEREST IN LEASING PROGRAMS FOR SMALL AND MEDIUM SCALE ENTERPRISES (%)

	Automobile (95)	Electrical/ Electronic (136)	Total (231)
Interested	65.3	58.1	61.0
Not interested	34.7	41.9	39.0
Total	100.0	100.0	100.0

#### 7.1.7 Linkage and subcontracting relationships (Questions I1, I2, I3, I4, I5)

Closer relationships between parts suppliers and their customers would play an important role in developing the supporting industries in Thailand. The analysis is based on valid answers which are given to the following questions by the respondents.

1. Contents of technical assistance offered now by customers.
2. Intention to start or expand subcontracting business.
3. Problems with promotion of subcontracting business.
4. Awareness of "BUILD" and intention to register at "BUILD".

Table 7.1-22 concerns the kinds of assistance that the companies were receiving from their customers. As shown, nearly 80% of the respondents were receiving technical assistance and more than 60% of them are supplied raw materials, moulds, jigs and so on. The electric/electronic parts group has a higher proportion of the companies receiving various kinds of assistance than the autoparts group. (For this question, the companies were given 6 answers, including "Other," and were asked to choose all that were appropriate.)

Table 7.1-22 KINDS OF ASSISTANCE/COOPERATION OFFERED BY CUSTOMERS (%)

	Automotive (85)	Electrical/ Electronic (115)	Total (200)
Technical assistance	75.0	80.9	78.5
Supply of materials, molds/dies, jigs, etc.	62.7	65.2	64.0
Managerial assistance	44.1	52.2	48.5
Training	41.0	42.6	42.0
Financial assistance	32.1	37.4	35.0
Others	2.4	2.6	2.5

Table 7.1-23 concerns the intention to start or expand subcontracting operations. As shown, around 40% of the companies in both groups said that they had such an intention.

Table 7.1-23 INTENTION TO START OR EXPAND SUBCONTRACTING  
BUSINESS(%)

	Automotive (98)	Electrical/ Electronic (138)	Total (236)
Intends to start/expand	43.9	37.0	39.8
No interest	45.9	52.9	50.0
Sufficient so far	10.2	10.1	10.2
Total	100.0	100.0	100.0

Table 7.1-24 deals with the difficulties in starting or expanding subcontracting operations. Roughly 40% of the respondents mentioned a "lack of information on potential customers". Next in order was the fact that "many customers have already established their own subcontracting networks", pointed out by more than 30% in each group. Moreover, about 30% in both groups cited an "insufficient production capacity to cope with large orders." (For this question, the companies were given 7 answers, including "Other," and were asked to choose the 2 that were most appropriate.)

Table 7.1-24 DIFFICULTIES IN STARTING OR EXPANDING SUBCONTRACTING BUSINESS (%)

	Automotive (52)	Electrical /Electronic (62)	Total (114)
Lack of information on potential customers	38.5	43.5	41.2
Many have already established their own subcontracting networks	34.6	33.9	34.2
Insufficient production capacity to cope with large orders	26.9	29.0	28.1
Lack of selling capability	26.9	25.8	26.3
No measures to contact potential customers	13.5	19.4	16.7
Lack of competitiveness of products	13.5	11.3	12.3
Others	7.7	12.9	10.5

As shown in Table 7.1-25, more than 40% in both groups said they knew about BUILD, a "matchmaking" system based on BOI. Few of the companies were registered with BUILD: only 4% of the auto parts companies and 12% of the electric/electronic parts companies. However, 42% of the auto parts companies and 35% of the electric/electronic parts companies said they intended to register in the future. It can be inferred that the majority of the companies who knew about BUILD but hadn't registered intended to register in the future.

Table 7.1-25 AWARENESS OF "BUILD" AND INTENTION TO REGISTER AT "BUILD" (%)

(1) AWARENESS OF "BUILD"

	Automotive (98)	Electrical /Electronic (138)	Total (236)
Knows BUILD	40.8	45.7	43.6
Does not know BUILD	59.2	54.3	56.4
Total	100.0	100.0	100.0

(2) INTENTION TO REGISTER AT "BUILD"

	Automotive (96)	Electrical /Electronic (129)	Total (225)
Intends to register at BUILD	41.7	34.9	37.8
No intention to do	54.2	53.5	53.8
Already registered	4.2	11.6	8.4
Total	100.0	100.0	100.0

**7.1.8 Export promotion (Questions J2, J3)**

This article tries to clarify the current status of export business in the supporting industries, based on valid answers to the following questions.

1. Intention to start or expand export
2. Target ratio of exports to total sales in the next 3 years
3. Impeditive factors with export promotion

Seventy-six percent of the companies said they intended to begin or expand export operations in the future. These companies were also asked what their target was for the ratio of exports to total sales. In both groups, as shown in Table 7.1-26, the most frequent answer was "10-20%." Next in order was "20-30%." The companies whose target proportion surpassed 80% accounted for nearly 20% in the electric/electronic parts group.

Table 7.1-26 TARGET RATIOS OF EXPORT TO TOTAL SALES (%)

	Automotive (61)	Electrical /Electronic (80)	Total (141)
less than 10%	4.9	3.8	4.3
10 - 20%	26.2	27.5	27.0
20 - 30%	19.7	22.5	21.3
30 - 40%	11.5	3.8	7.1
40 - 50%	16.4	11.3	13.5
50 - 60%	3.3	2.5	2.8
60 - 70%	4.9	0.0	2.1
70 - 80%	4.9	10.0	7.8
80 - 90%	0.0	3.8	2.1
90 - 100%	8.2	15.0	12.1

Table 7.1-27 deals with the difficulties in promoting exports. As shown, a "lack of marketing capability" and "unstable orders" were specified most in both groups, followed by "severe buyer requirements in quality, cost, and delivery. Among the auto parts group, other main difficulties were "insufficient production capacity" and "troublesome procedures including contracting"; (For this question, the companies were given 9 answers, including "Other," and were asked to choose all that were appropriate.)

Table 7.1-27 DIFFICULTIES IN PROMOTING EXPORT (%)

	Automotive (64)	Electrical /Electronic (89)	Total (153)
Marketing (market information)	43.8	48.3	46.4
Unstable orders	42.2	46.1	44.4
Severe requirement from buyers in quality, cost and delivery	35.9	37.1	36.6
Procedures for external trade	26.6	23.6	24.8
Insufficient production capacity	34.4	12.4	21.6
Intangible barriers (language, business customs, etc.)	14.1	16.9	15.7
Contract procedures	21.9	9.0	14.4
Financial problems	6.3	6.7	6.5
Others	14.1	9.0	11.1

### 7.1.9 Profile of owners or managing directors (Questions K1, K2, K3, K4, K5)

Entrepreneurship is an important point for industrial development. This article tries to profile the owners or managing directors of the companies engaged in the supporting industries. The analysis is based on the provenance, length of business careers, expertise, and educational background of the respondents. This article also examines their intention to participate in training programs for entrepreneurship.

Table 7.1-28 deals with the provenance of the owners or managing directors. As shown, the largest proportion of owners/managing directors had been "dispatched from foreign companies"; this was the case with 39% in the auto parts group and 49% in the electric/electronic parts one. Among the auto parts companies, the next most-frequent answer, given by 34%, was that management had been taken over by relatives of the previous owners or managing directors, outnumbering the

cases where owners or managing directors had been promoted from the ranks (30%) and the cases of spin-outs from domestic companies (23%). Among the electric/electronic parts companies, on the other hand, the second most-frequent answer was "promoted from the ranks" (30%); third was taking over management from a relative (21%); there were few cases of spin-outs from a domestic company (13%). When the answers are viewed according to company size, it is seen that the most frequent answer among the large companies, given by roughly 60% in both groups, was "dispatched from foreign companies". The proportion of owners or managing directors who were promoted from the ranks reached 36% in the large companies, more than twice as high as in the small companies. Among the small and medium scale companies, cases of succeeding to management through consanguinity were numerous, although the proportion of owners or managing directors dispatched from foreign companies was greater in the electric/electronic parts group than that of succeeding their family business.

Table 7.1-28 PROVENANCE OF OWNERS/MANAGING DIRECTORS (%)

	Automotive				Electrical/Electronic				Total			
	Small (21)	Medium (47)	Large (29)	Total (97)	Small (14)	Medium (71)	Large (55)	Total (140)	Small (35)	Medium (118)	Large (84)	Total (237)
Dispatched from foreign companies	23.8	36.2	55.2	39.2	35.7	42.3	61.8	49.3	28.6	39.8	59.5	45.1
Promoted from the ranks	23.8	31.9	31.0	29.9	7.1	28.2	38.2	30.0	17.1	29.7	35.7	30.0
Succeed its family business	33.3	40.4	24.1	34.0	50.0	21.1	12.7	20.7	40.0	28.8	16.7	26.2
Spin-out from a domestic company	23.8	29.8	10.3	22.7	7.1	16.9	9.1	12.9	17.1	22.0	9.5	16.9
Spin-out from a foreign-based company in Thailand	4.8	8.5	10.3	8.2	0.0	14.1	10.9	11.5	2.9	11.9	10.7	10.1
Spin-out from a governmental or public institution	0.0	0.0	0.0	0.0	0.0	4.2	3.6	3.6	0.0	2.5	2.4	2.1

Table 7.1-29 deals with the length of the business careers of the owners or managing directors. Among the companies as a whole, 10-20 years was most frequent. "More than 25 years" was also comparatively common, being given by 27% of the autoparts companies and 19% of the electric/electronic parts companies, although it was given by a still higher proportion of 29% in the large companies.



Table 7.1-29 CAREER OF OWNERS/MANAGING DIRECTORS IN THIS BUSINESS (%)

	Automotive				Electrical/Electronic				Total			
	Small (21)	Medium (46)	Large (28)	Total (95)	Small (13)	Medium (69)	Large (52)	Total (134)	Small (34)	Medium (115)	Large (80)	Total (229)
Less than 5 years	4.8	6.5	0.0	4.2	15.4	8.7	3.8	7.5	8.8	7.8	2.5	6.1
5 - 10 years	14.3	2.2	7.1	6.3	23.1	13.0	17.3	15.7	17.6	8.7	13.8	11.8
10 - 15 years	28.6	21.7	21.4	23.2	30.8	33.3	23.1	29.1	29.4	28.7	22.5	26.6
15 - 20 years	38.1	30.4	32.1	32.6	0.0	24.6	17.3	19.4	23.5	27.0	22.5	24.9
20 - 25 years	4.8	6.5	7.1	6.3	15.4	5.8	11.5	9.0	8.8	6.1	10.0	7.9
More than 25 years	9.6	32.6	32.1	27.4	15.4	14.5	26.9	19.4	11.8	21.7	28.8	22.7

Table 7.1-30 deals with the expertise of the owners or managing directors. The most common kind of expertise was "technical", mentioned by roughly 70% of the companies. Among the large companies, however, the proportion of executives with administrative or accounting expertise was higher than that of executives with technical background. On the other hand, technical expertise was overwhelmingly preponderant among the small companies, reaching 95% among those in the auto parts group.

Table 7.1-30 EXPERTISE OF OWNERS/MANAGING DIRECTORS (%)

	Automotive				Electrical/Electronic				Total			
	Small (20)	Medium (46)	Large (29)	Total (95)	Small (13)	Medium (69)	Large (55)	Total (137)	Small (33)	Medium (115)	Large (84)	Total (232)
Technical	95.0	63.0	65.5	70.5	84.6	68.1	61.8	67.2	90.9	66.1	63.1	68.5
Administrative /Accounting	25.0	58.7	69.0	54.7	46.2	47.8	65.5	54.7	33.3	52.2	66.7	54.7
Sales/marketing	35.0	50.0	37.9	43.2	53.8	40.6	41.8	42.3	42.4	44.3	40.5	42.7
Juristic	5.0	10.9	6.9	8.4	0.0	13.0	12.7	11.7	3.0	12.2	10.7	10.3
Other	5.0	4.3	0.0	3.2	0.0	0.0	0.0	0.0	3.0	1.7	0.0	1.3

Table 7.1-31 deals with the educational background of the owners and managing directors. As shown, 67% of the companies as a whole had executives who had received a university or college education abroad. The proportion of these executives exceeds 80% among the large companies. At the small companies, the proportion with a high school, vocational school, or lower education was still high: half of their owners or managing directors in the auto parts industry had graduated from such schools.

Table 7.1-31 EDUCATIONAL BACKGROUND OF OWNERS/MANAGING DIRECTORS (%)

	Automotive				Electrical/Electronic				Total			
	Small (18)	Medium (47)	Large (33)	Total (98)	Small (13)	Medium (70)	Large (54)	Total (137)	Small (31)	Medium (117)	Large (87)	Total (235)
Overseas university/ college	36.4	56.1	82.5	61.3	42.9	69.0	80.0	70.7	38.7	64.1	80.5	66.8
Thai diploma or above	13.6	21.1	5.0	14.3	21.4	21.1	10.9	17.1	16.1	21.4	9.2	15.7
Thai high school/ vocational school	22.7	15.8	7.5	14.3	21.4	4.2	7.3	7.1	22.6	8.5	6.9	10.2
Thai primary school/ lower secondary school	27.3	7.0	5.0	10.1	7.1	4.2	0.0	2.9	19.4	5.1	2.3	6.0
Other	0.0	0.0	0.0	0.0	7.1	1.4	1.8	2.1	3.2	0.9	1.1	1.3

Table 7.1-32 concerns the intention to participate in educational programs for owners or managing directors. Almost 70% of the respondents in both groups said that they had such an intention. Interest was higher among the small companies, expressed by nearly 80% of them.

Table 7.1-32 INTENTION TO PARTICIPATE IN EDUCATIONAL PROGRAMS FOR ENTREPRENEURSHIP (%)

	Automotive				Electrical/Electronic				Total			
	Small (21)	Medium (46)	Large (38)	Total (97)	Small (14)	Medium (69)	Large (50)	Total (133)	Small (35)	Medium (115)	Large (88)	Total (230)
Intends to participate in such programs	76.2	65.2	70.0	69.1	78.6	71.0	66.0	69.9	77.1	68.7	68.2	69.6
No intention to do so	23.8	34.8	30.0	30.9	21.4	29.0	34.0	30.1	22.9	31.3	31.8	30.4

### 7.1.10 Relocation plans (Questions L1, L3)

At present, the Thai government has encouraged the manufacturing firms to relocate their factories in the provinces to avoid their excessive concentration in the Bangkok Metropolitan Area. The supporting industries are forced to move their production bases outside this area. This article refers to their intention of relocation and its merits they expect.

Table 7.1-33 concerns the intention to relocate current factory facilities. As shown, 28% of the auto parts companies and 25% of the electric/electronic companies said they already had a plan to relocate. Moreover, 17% of the auto

parts companies and 13% of the electric/electronic companies said they were considering such a plan.

Table 7.1-33 INTENTION TO RELOCATE FACTORIES (%)

	Automotive(95)	Electrical/Electronic (139)	Total(234)
Has a plan	28.4	24.5	26.1
Under consideration	16.9	12.9	14.5
Has no plan	54.7	62.6	59.4
Total	100.0	100.0	100.0

Table 7.1-34 shows the main reasons for relocation. Among both groups, the most frequent reason was "expansion of production capacity." mentioned by over 80% of the companies. "More convenience with their customers" was mentioned by 34% of the auto parts companies. This seems to indicate that relocation of the assemblers of auto parts has encouraged these parts suppliers to relocate their factories. Among the electric/electronic group, on the other hand, nearly 30% of the companies pointed out "more attractive incentives", suggesting their intention to expand the export sales. (For this question, the companies were given 6 answers, including "Other," and were asked to choose all that were appropriate.)

Table 7.1-34 MAIN REASONS FOR RELOCATION (%)

	Automotive (41)	Electrical/Electronic (51)	Total (92)
Expansion of production capacity	85.4	82.4	83.7
More attractive incentives	17.1	29.4	23.9
More convenience with its customers	34.1	11.8	21.7
Improved infrastructure	14.6	23.5	19.6
In line with promotional policy of relocation	22.0	5.9	13.0
Other	2.4	7.8	5.4

### 7.1.11 Evaluation of Thai technical and training institutions (Questions M1, M3)

Several types of institutions for technical guidance and training have already set up in Thailand. It is of crucial importance for the supporting industries to make the most of these existing institutions. This article aims to understand their awareness toward each of these institutions and major difficulties they have faced in using the institutions.

As shown in Table 7.1-35, of all the technical and training institutions in Thailand, TPA was most popular and more than 80% of the companies as a whole knew of this institution. Next in order was TISI. MIDI was not well known among the electric/electronic parts companies. (For this answer, the companies were asked to indicate all of the 7 institutions that they knew.)

Table 7.1-35 AWARENESS OF TECHNICAL INSTITUTIONS IN THAILAND (%)

	Automotive(89)	Electrical /Electronic (127)	Total(216)
MIDI	55.1	39.4	45.8
TISI	71.9	67.7	69.4
ISTIC	31.5	26.3	28.2
TMDPC	46.1	31.5	37.5
TISTR	39.3	33.1	35.6
TPA	78.7	83.5	81.5
TIC	11.2	11.8	11.6

Table 7.1-36 concerns the difficulties in using the technical and training institutions in Thailand. Location - "They're too far away and difficult to use" - was a difficulty mentioned by 60% of the auto parts companies and 53% of the electric/electronic parts companies. A "lack of information about the services and functions offered" and "takes too much time" were also mentioned by more than 20% in both groups. (For this question, the companies were given 7 answers and asked to choose the 2 that were most appropriate.)

Table 7.1-36 DIFFICULTIES IN USING TECHNICAL INSTITUTIONS IN THAILAND (%)

	Automotive (42)	Electrical/Electronic (63)	Total (105)
Too far located	59.5	52.4	55.2
Lack of information on their services/functions	26.2	27.0	26.7
Too much time needed	21.4	25.4	23.8
Too expensive charges	21.4	17.5	19.0
Obsolete equipment and technology	19.0	15.9	17.1
Complicated procedures	4.8	7.9	6.7
Other	19.0	14.3	16.2

### 7.1.12 Top priority tasks for promoting business (Question N 1)

This article aims to clarify to what tasks the supporting industries have given top priority to promote their business. Each of the respondents is requested to single out a task they think most important among the following already referred to in this questionnaire survey.

1. Modernization of machines
2. Transfer of production technology
3. Upgrading of quality control
4. Upgrading of manpower
5. Making the most of institutional financing
6. Promotion of match-making and subcontracting
7. Promotion of direct export
8. Improvement of management
9. Making the most of technical and training institutions

As shown in Table 7.1-37, many of the respondents said they would give top priority to "upgrading of manpower" or "modernization of machines." They were mentioned by more than 20% of the companies in each group. In addition, more than 10% of the companies cited "transfer of production technology" or "upgrading of quality control" as top-priority tasks; the former was specified by 20% of the electric/electronic parts companies. On the other hand, a low degree of priority was given to "improvement of management," "promotion of matchmaking and subcontracting," and "making the most of technical and training institutions".

When the answers are viewed according to company size, it is found that "upgrading of quality control" was more frequently given by the large companies. On the other hand, the tasks that were more frequently mentioned by the small and medium scale companies included "modernization of machines" and "making the most of institutional financing".

Table 7.1-37 TOP PRIORITY TASKS TO PROMOTE BUSINESS (%)

	Automotive				Electrical/Electronic				Total			
	Small (21)	Medium (47)	Large (30)	Total (98)	Small (14)	Medium (69)	Large (55)	Total (138)	Small (35)	Medium (116)	Large (85)	Total (236)
Upgrading of manpower	28.6	31.9	23.3	28.6	7.1	27.5	25.5	24.6	20.0	29.3	24.7	26.3
Modernization of machines	23.8	25.5	23.3	24.5	35.7	21.7	23.6	23.9	28.6	23.3	23.5	24.2
Transfer of production technology	19.0	6.4	10.0	10.2	7.1	26.1	16.4	20.3	14.3	18.1	14.1	16.1
Upgrading of quality control	4.8	10.6	20.0	12.2	21.4	10.1	18.2	14.5	11.4	10.3	18.8	13.6
Making the most of institutional financing	14.3	8.5	6.7	9.2	14.3	2.9	5.5	5.1	14.3	5.2	5.9	6.8
Promotion of direct export	4.8	8.5	10.0	8.2	0.0	5.8	1.8	3.6	2.9	6.9	4.7	5.5
Improvement of management	0.0	0.0	3.3	1.0	7.1	5.8	1.8	4.3	2.9	3.4	2.4	3.0
Promotion of match- making/subcontracting	4.8	2.1	0.0	2.0	0.0	1.4	1.8	1.4	2.9	1.7	1.2	1.7
Making the most of technical/training institutions	0.0	2.1	0.0	1.0	7.1	0.0	1.8	1.4	2.9	0.9	1.2	1.3

### 7.1.13 General remark

As described before, this questionnaire survey aims to understand needs and problems in small and medium scale manufacturers engaged in the supporting industries in Thailand, reflecting these factors to formulate a master plan for developing these industries.

What they need most is clearly expressed as top priority tasks for developing their business in the previous article, 7.1.12. These top priority tasks include the following three points.

1. Modernization of production facilities
2. Upgrading of manpower
3. Promotion of technology transfer

As to modernization of production facilities, strong demand for second-hand machinery and equipment can be pointed out first. The survey shows that more than 45% of the respondents plan to buy second-hand production facilities while around 25% of them plan to buy new ones. This seems to be mainly due to a lack of investment funds and high interest rates in Thailand. At present, Thailand has no promotional privileges to introduce second-hand machinery and equipment, although it has so far granted some taxational incentives to import new ones. Taking account of the strong demand for second-hand production facilities, however, it could help local manufacturers modernize their factories if some incentives were given to introduce second-hand ones.

The second point is their strong interest in the leasing system for new machinery and equipment. About 60% of the respondents have found it instrumental in modernizing their factories. Leasing systems for small and medium scale manufacturers have been already introduced in Malaysia and Taiwan, contributed to development of their industrial sectors. Therefore, it is necessary for Thailand to examine these leasing systems.

The gist of upgrading manpower is to strengthen the local institutions for technical guidance and training. It includes the following three factors.

1. Upgrading and expansion of the programs for technical guidance and training.
2. Strengthening of publicity activities for the existing institutions.
3. Setting-up of new institutions or implementing of extension advisory services by the existing institutions.

According to the survey, many respondents point out a lack of engineers and technicians as well as a difficulty in educating and training their workers in-house. These complaints result in their strong demand for upgrading and expansion of the existing programs for technical guidance and training. To meet this demand, it is firstly needed to increase necessary staff or to make the most of the existing staff. Many respondents also mention the following two points as major problems with using the technical institutions; a lack of information on their services and their inconvenience in location. These complaints lead to great demand for increase of such institutions or extension advisory services by the existing ones.

The locational problem in particular, which is pointed out by more than half of the respondents, should be examined in a long-term perspective.

As to promotion of technology transfer, some 30% of the respondents give the first place to transfer of production technology or quality control technology. The respondents with more employees tend to give higher priority to improvement of quality control technology. One of the basic standpoints of this study is to understand technology transfer in the context of promotion of OEM, although it is given rather lower priority to in the results of the questionnaire survey. In other words, supporting industries would not develop unless secondary or tertiary parts makers tried to supply their products more under OEM to primary parts makers or assemblers to introduce their technology for production and quality control. According to the questionnaire survey, more than 40% of the respondents point out a lack of information on potential customers for OEM. Therefore, it is necessary first of all to strengthen BOI's information and match-making services for the purpose of promoting their OEM business.



## 7.2 Questionnaire to Japanese Companies: Results and Analysis

### 7.2.1 Purpose of questionnaire survey

The government of Thailand is fostering supporting industry as the main route to the country's future industrialization. As one means of fostering supporting industry, it is promoting investment and technical cooperation from Japan and the NIEs to Thailand. Thus, it is holding investment seminars in the various countries and appealing, especially to small and medium scale companies, to invest in Thailand. In this connection, the questionnaire discussed here was used to investigate the thinking of selected small and medium scale Japanese companies on the subject of future foreign investment. Its main purpose was to clarify how such potential investors view Thailand as a prospect for investment, and to provide information for the Thai government to use to attract foreign investment in the future.

### 7.2.2 The method of selecting questionnaire recipients and an outline of the answering companies

The questionnaire was distributed to companies selected from "Parts Industry," a directory of manufacturers of automotive and electrical/electronic parts. The distributees were limited to manufacturers; assembly companies of finished goods were excluded. The questionnaire was mailed and the answers were returned by mail. The questions are attached as an ANNEX VIII to this report.

The number of questionnaires sent and the number of answered questionnaires returned are as stated below. Due to problems with the directory, some questionnaires were sent to companies that are in non-manufacturing fields - sales, trading, etc. - and thus outside the focus of the survey. "Valid questionnaires" is the total number of answered questionnaires minus those from non-manufacturing companies.

	Autoparts companies	Electrical/electronic parts companies	Total
Questionnaires sent	3,635 (100%)	2,419 (100%)	6,054 (100%)
Answered questionnaires	618 (17%)	280 (12%)	898 (15%)
Valid questionnaires	578 (16%)	236 (10%)	814 (13%)

Considering the purpose of the questionnaire, it was not always necessary to compare and analyze the autoparts companies as against the electrical/electronic parts companies. For the most part, they could all be grouped together and collectively analyzed as the parts industry (supporting industry). However, in cases where there was a clear difference in the answers from the two fields, comment has been made to that effect. Moreover, the number of answers varies with the question.

(1) Size of answering companies (Q 1.1, 4)

Table 7.2-1 SIZE OF ANSWERING COMPANIES

No. of employees	Proportion of companies (%)
1,000 or more	11.0
501 - 1,000	8.6
301 - 500	6.5
11 - 300	70.5
10 or less	3.5
Total	100.0

Of the answering companies, 74% were small and medium scale concerns with 300 employees or less.

(2) Classification by type of subcontracting (Q 1.4)

The purchasers of the parts manufactured by the answering companies were classified as follows (multiple answers possible).

Table 7.2-2 PURCHASERS OF PRODUCTS OF ANSWERING COMPANIES

Type of linkage with purchaser	Proportion of companies (%)
Direct sales on general market	11.7
First-tier subcontractor	42.3
Second-tier subcontractor	39.3
Other	6.7
Total	100.0

The first-tier contractors (42.3%) and the second-tier contractors (39.3%) together accounted for 81.6% of the answering companies. In other words, the answering companies were predominantly OEM parts manufacturers.

(3) Industries of answering companies (Q1.2)

The industries of the answering companies were classified according to the type of processing involved (multiple answers possible), with the following results.

Table 7.2-3 DISTRIBUTION OF ANSWERING COMPANIES BY INDUSTRY

Type of processing	Proportion of companies (%)
A. Foundry (Casting)	4.9
B. Forging	4.4
C. Presswork	14.2
D. Plastic Processing	7.0
E. Rubber Processing	2.4
F. Machining	18.8
G. Heat treatment	6.3
H. Surface Treatment/ Electroplating (Coating)	8.0
I. Glasswork	1.2
J. Sheetwork/ Welding	9.3
K. Parts assembling	18.1
L. Others	5.4
Total	100.0

Machining was the largest classification, accounting for 18.8% of the companies. However, since multiple answers were given, not all of these companies were exclusively engaged in machining (die manufacturing, etc.). Some merely had foundry and forging plants with a machining division. Be that as it may, 12% of the electrical/electronic parts companies, and 20.4% of the autoparts companies, were engaged in some capacity in machining. The next largest classification, at 18.1%, was parts assembling. This field encompassed 27.1% of the electrical/electronic parts companies and 16.0% of the autoparts companies. The third largest classification, at 14.2%, was press working, involving 11.7% of the electrical/electronic parts companies and

14.8% of the autoparts companies. In the other types of processing, there were no notable distinctions between the two groups of companies.

(4) Overall analysis of distribution of answering companies

When the answering companies are classified by size – that is, according to their number of employees – it is found that 74% of them were small and medium scale concerns with 300 employees or less; moreover, 81.6% of them were subcontractors. From this it can be concluded that the results of the questionnaire reflect the opinions of "small-to-medium sized parts manufacturers," as was intended. Moreover, when the two groups of answering companies are broken down by type of processing, it is found that many of the autoparts companies were engaged in machining, while many of the electric and electronic parts companies were involved in parts assembling; from which it can be concluded that the distribution of the answering companies among the different types of processing industries also reflects the distinctive characteristics of the two groups of companies.

### 7.2.3 The current economic environment of the Japanese parts industry

It is said that, due to the appreciation of the yen and the skyrocketing of Japanese land prices and personnel expenses, industrial products manufactured in Japan are losing or have lost their price competitiveness on the international market. Given this situation, Japanese companies, one by one, beginning with the large companies with financial capabilities, have been diverting their manufacturing investments to Asia, Europe and the United States. Due to this foreign investment, it is said, there has been a hollowing out of industry in Japan, with the result that small and medium scale companies, especially those in the parts industry, have lost their domestic market and now find themselves in a dilemma. To find out what the actual situation was, we posed various questions in the questionnaire. The results were as described below.

(1) Effects from decrease in direct exports of finished products from Japan (Q2.1)

Due to a loss of price competitiveness caused by the strong yen and to trade friction problems caused by excessive exports from Japan, there is now a

trend that is working to reduce direct exports from Japan of finished automotives and electric and electronic equipment and products. With question Q2.1 we tried to find out what kind of effects this trend among parent corporations (large assembly/manufacturing companies) has had on the parts industry. The question was: "What kind of effects has the reduction in direct exports of finished products from Japan had on the domestic parts industry?" We asked the companies, in providing their answer, to look back at the last three years from the standpoint of the effects of this reduction on the monetary value of their sales (shipments). The results from their answers were as stated below. There were no conspicuous differences between the answers of the autoparts companies and those of the electric and electronic parts companies.

Table 7.2-4 MONETARY CHANGES FROM DECREASE IN DIRECT EXPORTS OF PARENT CORPORATIONS

Large or slight decrease	72.7%
No particular change	21.6%
Increase	5.7%
Total	100.0%

(2) Effects from foreign investment by parent corporations (Q2.2)

Parent corporations, the purchasers of the products produced by the parts industry, are moving their manufacturing bases abroad because of pressures from the strong yen and other reasons. We therefore asked the parts companies what kind of effects this has had on the monetary value of their sales (shipments). As with the previous question (Q2.1), there were no notable differences between the answers of the two groups of companies, which was presumably because this question asked almost the same thing as the last one, although from a different angle.

Table 7.2-5 CHANGES IN THE VALUE OF SHIPMENTS DUE TO PARENT CORPORATIONS MOVING THEIR OPERATIONS OVERSEAS

Large or slight decrease	67.4%
No particular change	27.5%
Increase	5.0%
Total	100.0%

(3) Effects from changes in parts procurement strategies of parent corporations

Parent corporations, in order to maintain their price competitiveness on the international market, are tending to shift towards obtaining their parts from abroad. We therefore asked the parts companies how this trend has affected the monetary value of their sales (shipments). The answers of the two groups of companies showed the same trend.

Table 7.2-6 CHANGES IN THE VALUE OF SHIPMENTS CAUSED BY FOREIGN PARTS PROCUREMENT STRATEGIES OF PARENT CORPORATIONS

Large or slight decrease	59.9%
No particular change	36.4%
Increase	3.7%
Total	100.0%

(4) Effects from changeover by parent corporations to procuring parts from abroad (Q2.4)

We asked the companies what the actual effects on their sales (shipments) had been from their purchasers (parent corporations) changing over to procuring parts from abroad. This question was similar to the previous one (Q2.3), but more specific.

Table 7.2-7 HAVE YOUR COMPANY'S PRODUCTS BEEN REPLACED WITH IMPORTED PARTS?

A large number of products have been replaced	2.6%
Some products have been replaced	39.7%
Basically no products have been replaced	57.7%
Total	100.0%

Of the answering companies, 42.3% said that at least some of their products had been replaced. When this 42.3% is analyzed, however, differences between the two groups of companies become apparent. Thus, of the autoparts companies, 37.8% said that either "A large number of products have been replaced" or "Some products have been replaced," whereas the same answers were given by 53.7% of the electric and electronic parts companies.

(5) What country's parts have replaced yours? (Q2.5)

This question was directed to the companies that, to the last question (Q2.4), answered that either a large number or some of their products had been replaced with parts procured from abroad. It asked simply, "Which foreign country was it?" Multiple answers were permitted. The answers were distributed differently among the two groups of companies, so for each group they were totalled separately and arranged in order of frequency.

Table 7.2-8 THE COUNTRY SUPPLYING THE REPLACEMENT PARTS

Autoparts			Electrical/Electronic Parts		
Country	Answering Companies	Distribution (%)	Country	Answering Companies	Distribution (%)
U.S.A.	131	35.7	Taiwan	54	17.0
Taiwan	46	12.5	Korea	43	13.6
<b>Thailand</b>	<b>43</b>	<b>11.7</b>	Malaysia	41	12.9
Korea	39	10.6	China	37	11.7
Europe	23	6.3	<b>Thailand</b>	<b>25</b>	<b>7.9</b>
Malaysia	21	5.7	Singapore	25	7.9
China	18	4.9	U.S.A.	25	7.9
Others	46	12.6	Others	67	22.0
Total	367	100.0	Total	317	100.0

(6) Overall analysis of current situation of Japanese parts companies

Of the answering companies, 72.7% said that the monetary value of their sales (shipments) of parts had decreased as a result of a decrease in the parent corporations' direct exports of finished products from Japan. Moreover, 67.4% said that the domestic parts market in Japan had shrunk and that the monetary value of their sales (shipments) in that market had decreased as a result of the parent corporation moving its production abroad. Thus, approximately 70% of the companies had, to one extent or another, lost their domestic Japanese market as a result of their parent corporations establishing overseas bases. The decline of the Japanese domestic market due to the hollowing-out of domestic industry is a phenomenon that is already under way.

However, there is another reason why Japan's parts manufacturers are losing their domestic market. Even if the parent corporations (the purchasers) were to keep their manufacturing bases inside Japan, there would still be the trend among them to switch to procuring parts from overseas. In response to question Q2.3, 59.9% of the companies said that the monetary value of their sales (shipments) had decreased as a result of the foreign parts procurement strategies of their parent corporations. However, when asked, in Q2.4, if even some of their products had actually been replaced by imports, only 42.3% of them answered affirmatively. It thus seems that the answers to the former question (Q2.3) contained somewhat of an exaggeration.

Regarding the question about which country was the origin of the imported replacement parts, the distribution of the answers among the autoparts companies was different than that among the electric and electronic parts companies. Among the autoparts companies, the United States was far and away the top answer (35.7%). This reflects the trade friction with the United States over autoparts, as well as the effort being made by Japanese auto makers to buy parts from the United States. Among the electric and electronic parts companies, the United States ranked only sixth (7.9%), again pointing up the uniqueness of the relationship between Japan and the United States as regards the autoparts industry.



Thailand was the third most frequent answer among the autoparts companies – 43 (11.7%) of whom mentioned it – as a country from which parts that replaced their own were imported. On the other hand, it was fifth among the electric and electronic parts companies (25 companies, 7.9%). There was also a clear difference between the autoparts companies and the electric and electronic parts companies as regards Malaysia and China. Malaysia was third among the electric and electronic parts companies (41 companies, 12.0%), but sixth among autoparts companies (21 companies, 5.9%); and China was fourth among the electric and electronic parts companies (37 companies, 11.7%), but sixth among autoparts companies (18 companies, 4.9%).

#### 7.2.4 Foreign investment trends among Japanese parts manufacturers

Small and medium scale manufacturers of parts are also trying to escape the pressures of the strong yen by investing abroad. This section analyzes the survey results related to the companies' attitudes towards investing abroad.

##### (1) Experience or not in investing abroad (Q4.1)

Table 7.2-9 FOREIGN INVESTMENT EXPERIENCE OF ANSWERING COMPANIES

Company size (Employees)	Foreign investment experience (Answering companies)		
	(With experience)	(Total answers)	(Proportion with experience)
1,001 or more	69	84	82.1%
501 - 1,000	31	68	45.6%
301 - 500	18	50	36.0%
11 - 300	69	546	12.6%
10 or less	1	30	3.3%
Total	188	778	24.2%

Of the 778 answering companies, 188 had experience in foreign investment. Proportionally, this was 24.2%. However, this 24.2% was not distributed evenly among the various-sized companies. Rather, the bigger the companies were, the greater was the proportion of them with experience in foreign investment. Of the companies with at least 1,001 employees, 82.1% had such experience. Conversely, as the companies were smaller, so did the proportion

of them with foreign investment experience. Of the largest group of answering companies, those with 11 to 300 employees, only 12.6% had such experience.

We asked the companies the names of the countries in which they had previously invested. The results from tallying their answers are as shown below (multiple answers possible).

Table 7.2-10 COUNTRIES IN WHICH INVESTMENTS WERE PREVIOUSLY MADE

Country/area	Autoparts		Electrical/Electronic parts		Total	
	(Nos.)	(Rank)	(Nos.)	(Rank)	(Nos.)	(Rank)
Western	<u>67</u>		<u>70</u>		<u>137</u>	
U.S.A	58	1	40	1	98	1
Europe	9	5	30	4	39	4
ASEAN	<u>43</u>		<u>92</u>		<u>135</u>	
<b>Thailand</b>	<b>21</b>	<b>2</b>	<b>14</b>	<b>8</b>	<b>35</b>	<b>5</b>
Malaysia	6	8	38	2	44	3
Indonesia	8	7	6	10	14	9
Philippines	6	8	6	10	12	11
Singapore	2	10	28	5	30	6
Far East	<u>31</u>		<u>64</u>		<u>95</u>	
Taiwan	21	2	31	3	52	2
Korea	10	4	20	6	30	6
Hong Kong	0	11	13	9	13	10
China	<u>9</u>	5	<u>19</u>	7	<u>28</u>	8
Others	<u>10</u>		<u>19</u>		<u>29</u>	
Total	160		264		424	

Among the autoparts companies, there was a direct correlation between the number of investments in a country and the number of cars produced there: the more cars produced, the more investments. Thus, the United States ranked first. Thailand and Taiwan shared second place (21 companies each). Among the electric and electronic parts companies, the United States ranked first and Malaysia second. Then came Taiwan and Europe. When the total number of investments is broken down by region, the West ranks first, ASEAN second, and the Asian NIEs third.

(2) Future plans for foreign investment (Q4.1)

We asked the companies whether they had plans to invest abroad in the near future. For the answer, we had them choose one of the following three alternatives.

- a) We presently have concrete plans to invest abroad.
- b) We haven't made any concrete decisions but we intend to invest abroad.
- c) At this point we haven't considered investing abroad.

The results were as follows (multiple answers possible).

Table 7.2-11 EXISTENCE OR NOT OF FOREIGN INVESTMENT PLANS AND INTEREST

Company size (Employees)	(a) Concrete plans (%)	(b) Intention (%)	(c) No consideration (%)	(d) Total answers (%)
1,001 or more	24 (28.6)	47 (56.0)	13 (15.4)	84 (100)
501 - 1,000	13 (19.1)	23 (33.8)	32 (47.1)	68 (100)
301 - 500	5 (10.4)	18 (37.5)	25 (52.1)	48 (100)
11 - 300	30 (5.6)	139 (25.9)	268 (68.5)	537 (100)
10 or less	0 (0)	7 (24.1)	22 (75.9)	29 (100)
Total	72 (9.4)	234 (30.5)	460 (60.1)	766 (100)

According to the totals, 72 companies (9.4%) said they "have concrete plans," and 234 companies (30.5%) said they "haven't decided anything yet but intend to invest." Combining these two groups reveals that 40% of the companies expressed a desire to invest abroad. The remaining 460 companies (60%) hadn't thought about foreign investment. The above table does not give a breakdown of the answers by company group. However, 33% of the autoparts companies expressed a desire to invest abroad ((a) + (b)), while a substantial 56.6% of the electric and electronic parts companies were similarly disposed.

The desire to invest was also linked to company size. The bigger the companies were, the greater was the proportion of them with that desire; conversely, the smaller the companies were, the smaller was that proportion. The answering companies included a large sampling of companies with 11 to

300 employees; of them, 36 had investment plans and 139 intended to invest.

(3) Target country for future investment (Q4.2.2)

We asked the companies that were undecided about the target country of future investment to give candidate countries (multiple answers possible). The results were as shown in the table below.

Table 7.2-12 CANDIDATE COUNTRIES FOR FUTURE FOREIGN INVESTMENT

Country/area	Autoparts		Electrical/Electronic parts		Total	
	(Nos.)	(Rank)	(Nos.)	(Rank)	(Nos.)	(Rank)
<u>Western</u>	<u>41</u>		<u>20</u>		<u>61</u>	
U.S.A	34	3	9	11	43	5
Europe	7	9	11	8	18	9
<u>ASEAN</u>	<u>140</u>		<u>141</u>		<u>281</u>	
<b>Thailand</b>	<b>54</b>	<b>2</b>	<b>26</b>	<b>3</b>	<b>80</b>	<b>2</b>
Malaysia	31	4	21	4	52	4
Indonesia	23	5	16	5	39	6
Philippines	16	6	11	8	27	8
Singapore	1	13	14	7	15	10
ASEAN, unspecified	15	7	53	2	68	3
<u>Far East</u>	<u>15</u>		<u>20</u>		<u>35</u>	
Taiwan	7	9	7	12	14	11
Korea	6	11	2	13	8	13
Hong Kong	2	12	11	8	13	12
<u>China</u>	<u>122</u>	<u>1</u>	<u>102</u>	<u>1</u>	<u>224</u>	<u>1</u>
<u>Others</u>	<u>32</u>		<u>46</u>		<u>78</u>	
Viet nam	14	8	16	5	30	7
Others	18		30		48	
<b>Total</b>	<b>350</b>		<b>329</b>		<b>679</b>	

China was the top-ranking candidate country; 224 companies expressed interest in it. Thailand was second, with 80 companies. Third, with 68 companies, was some as yet undecided country in the ASEAN region. Fourth was Malaysia, with 52 companies. Seventh, with 30 companies, was Vietnam, a country in which none of the companies had previously invested. The top-

ranking region was ASEAN (281 companies). Second was China (224 companies), followed by the Western (61 companies) and the Asian NIEs exclusive of Singapore (35 companies).

(4) The Reasons for wanting to invest abroad (Q5.1)

As shown in Table 7.2-11, 40% of the companies said they want to establish a production base overseas. Their reasons have been arranged in order of frequency in the following table (multiple answers possible).

Table 7.2-13 REASONS FOR CONSIDERING FOREIGN INVESTMENT

Order	Reason	Answering companies	Proportion (%)
1.	Decrease in price competitiveness due to strong yen.	255	(53.3)
2.	Hollowing out of domestic market due to parts-purchasing companies transferring their operations overseas.	184	(38.5)
3.	Increased cost of Japanese land, personnel, electricity, etc.	173	(36.2)
4.	We want to aggressively develop a foreign strategy.	162	(33.9)
5.	To comply with the demands of the purchasing company (parent corporation).	114	(23.8)
6.	Other	11	(2.3)
	Total answers (multiple answers included)	899	-
	No. of answering companies	478	
	Average No. of answers per company	1.9	

Each of these companies gave about 2 answers on a average, since the answers totaled 899 and 478 companies gave these answers. More than half of these companies pointed out "the stronger yen" as a major reason for their intention to make overseas investment. Other major reasons such as "Hollowing-out of the domestic market" and "the increasing production cost", also reflect a lowering of the international competitiveness of the Japanese parts industries.

(5) The breakdown of the companies considering Thailand for foreign investment (Q4.2.2)

As mentioned in section (3) above, 80 companies expressed interest in investing in Thailand. Let's look at how those companies break down. Of the 51 companies who answered "the ASEAN region" without naming a specific country of that region as an investment candidate country, there were probably some who would choose Thailand. However, this factor was not considered in connection with this question.

Table 7.2-14 BREAKDOWN OF COMPANIES CONSIDERING THAILAND AS A CANDIDATE FOR INVESTMENT

Company size (Employees)	Autoparts cos. (No. of companies)	Elec. parts cos. (No. of companies)	Total (No. of companies)
1,001 or more	6	11	17
501 - 1,000	5	1	6
301 - 500	1	2	3
11 - 300	41	1	42
10 or less	1	11	12
Total	54	26	80

Of the autoparts companies, those with up to 300 employees (companies that, by Japanese standards, belong to the small and medium scale category) were far and away the largest group, comprising 42 companies. Generally speaking, autoparts companies saw Thailand as a candidate for investment more than the electric and electronic parts companies did.

(6) Overall analysis of foreign investment trends

There were some striking differences between the distribution of answers as to the countries where previous investments were made, which was surveyed in section (1), and the distribution of answers as to candidate countries for future investments, surveyed in section (3).

- 1) Of the answering companies, 40% said they were thinking of investing abroad. China was far and away the country in which the most interest was expressed (224 companies). However, until now only 28 of the companies have invested there. Thailand was second as an investment candidate; it was mentioned by 80 companies (11.8%).
- 2) In keeping with past trends, the desire to invest in the ASEAN countries was strong. If the answers that mentioned the ASEAN region without naming a specific country are included, a total of 281 companies (41.4%) gave ASEAN as a future investment candidate.
- 3) The desire to invest in the Asian NIEs – Taiwan, Korea, Hong Kong – is on a downward trend. Eighty of the companies had previously invested in these countries, but only 35 showed interest in them for future investment. The desire to invest in Singapore, which was classified as an ASEAN country, is similarly declining.
- 4) As regards the Western countries, the desire to invest in the United States was still strong among the autoparts companies, but the electric and electronic parts companies showed little interest in investing there. Interest in investing in Europe was also low.
- 5) Vietnam was also among the candidates for future investment, 30 companies expressing interest in it. In the future Vietnam will probably receive much attention as a place for foreign investment.

One other point that should be noted is that, among the reasons for considering foreign investment, the No. 5 answer, given by 114 companies, was to comply with the demands of their parts purchasers (parent corporations). In the past, parts manufacturers tended to base their investment decisions on their own internal situations; basing these decisions on a parent corporation's demands was highly unusual. The change can be seen as resulting from efforts by parent corporations to increase their procurement of foreign parts so as to avoid the cost increases that would otherwise follow from procuring parts in Japan.

### 7.2.5 Interest in transferring (selling) technology to foreign companies (Q7)

In addition to foreign investment accompanied by stock ownership, another type of business cooperation with foreign countries is transferring (selling) technology to their companies. Of the companies in the survey, 188 (38.2%) had already done this.

And of these, 42 had provided technology to Thailand.

Of the answering companies, 198 (54.1%) said they would be interested in actively transferring technology in the future; and of them, 64 said they had Thailand in mind.

Table 7.2-15 RANKING OF (PAID) TECHNOLOGY TRANSFER COUNTRIES

Past transferees (No. of companies)		Future transfer candidates (No. of companies)	
Korea	77	China	140
Taiwan	76	<b>Thailand</b>	<b>93</b>
U.S.A.	67	Malaysia	83
Malaysia	57	Indonesia	56
<b>Thailand</b>	<b>30</b>	Taiwan	54
Europe	50	U.S.A.	42
Indonesia	30	Philippines	41
China	29	Korea	41
Philippines	11	Europe	31
Singapore	11	Singapore	31
Hong Kong	7	Hong Kong	23
Others	27	Others	18
<b>Total</b>	<b>188</b>	<b>Total</b>	<b>198</b>

There is a considerable difference between the countries that have received transfers in the past and the countries that were mentioned as prospective transfer candidates. The trend is similar to that seen in connection with past and prospective target countries for foreign investment. It is a trend towards China and the ASEAN countries.



## 7.2.6 The kind of investment environment desired in target countries of foreign investment, and an Evaluation of the investment environment in Thailand

- (1) The investment environment Factors that are given importance in making a foreign investment decision (Q5.3)

To find out what factors are given importance in the decision to invest in a foreign country, we gave the companies 15 possible answers, including "Other," and asked them to choose five. The totalled results are as presented below.

Table 7.2-16 THE INVESTMENT ENVIRONMENT FACTORS THAT ARE CONSIDERED IMPORTANT

Order	Factor (question number)	No. of answers	Proportion (%)
1.	The quality and cost of labor (3)	280	65.1
2.	The size of the country's market (1)	258	60.0
3.	The state of the infrastructure: industrial parks, roads, etc. (7)	231	53.7
4.	Availability of engineers and skilled workers (2)	200	46.5
5.	Local procurement of raw materials (4)	184	42.8
6.	Political stability (13)	140	32.6
7.	The existence of relevant companies: parts suppliers, etc. (5)	137	31.9
8.	The existence of a local partner (10)	135	31.4
9.	A favorable investment policy (8)	133	30.9
10.	The supply of electricity, water and other services (6)	121	28.1
11.	Feelings towards Japan, hospitality (12)	53	12.3
12.	Economic growing power, etc. (14)	36	8.4
13.	The state of the facilities at inspection agencies and testing sites (9)	13	3.0
14.	Financial conditions (11)	12	2.8
15.	Other (15)	1	nil
Grand Total 1-15		1,934	-
No. of answering companies		430	
Average No. of answers		4.5	

"The quality and cost of labor" and "the size of the country's market" are two

major factors which are given more importance. "The quality and cost of labor" was mentioned by 65% of the answering companies, and "the size of the country's market" by 60% of them. The next factor gives weight to "The state of the infrastructure: industrial parks, roads, etc." Interest then switches to factory operations, with importance being given to whether it is possible to obtain "engineers and skilled workers" or locally procure raw materials.

(2) Evaluation of the investment environment in Thailand (Q5.3)

The previous question did not designate the investment environment of any particular country. Rather, it sought to find out the investment environment factors that are generally given importance in making a foreign investment decision. Question Q5.3, on the other hand, sought to find out the companies' attitudes towards the investment environment in Thailand. For each of the investment environment factors in Table 7.2-16, we asked the companies to evaluate Thailand's investment environment as either "Good" or "Not Good." The results are shown in Table 7.2-17 by symbols whose meanings are as stated below.

Symbol	Meaning
○○	"Good" evaluations were at least 2 times greater than "Not Good."
○	"Good" evaluations were more than 1.1 but less than 2 times greater than "Not Good."
△	The difference between "Good" and "Not Good" was within 10%.
×	"Not Good" evaluations were more than 1.1 but less than 2 times greater than "Good."
××	"Not Good" evaluations were at least 2 times greater than "Good."

Table 7.2-17 EVALUATION OF THAILAND'S INVESTMENT ENVIRONMENT

Order	Factor (question numbers from Q5.3)	Evaluation of Thailand
1.	The quality and cost of labor (3)	○○
2.	The size of the country's market (1)	○○
3.	The state of the infrastructure: industrial parks, roads, etc. (7)	△
4.	Availability of engineers and skilled workers (2)	×
5.	Local procurement of raw materials (4)	××
6.	Political stability (13)	○○
7.	The existence of relevant companies: parts suppliers, etc. (5)	×
8.	The existence of a local partner (10)	△
9.	A favorable investment policy (8)	○
10.	The supply of electricity, water and other services (6)	○○
11.	Feelings towards Japan, hospitality (12)	○○
12.	Economic growing power, etc. (14)	○○
13.	The state of the facilities at inspection agencies and testing sites (9)	××
14.	Financial conditions (11)	××
15.	Other (15)	—

In the above table, the numbers under "Order" indicate the order of frequency with which the corresponding investment environment factors were cited by the answering companies, in their responses to the previous question, as being generally important in determining where to make a foreign investment. Let's see how Thailand was evaluated for the first 5 factors. With regard to "The quality and cost of labor," it was rated superior. It was also viewed favorably as a prospective country for investment because "the size of its market is big." In other words, Thailand is highly evaluated on these two factors which are given more importance in making a decision to invest in a foreign country. On the other hand, "The state of its infrastructure" is only somewhat advanced. Moreover, there was concern about the "Availability of engineers and skilled workers." The answering companies also said that the "Local procurement of raw materials" would probably be difficult, although it is something they would like to do.

With regard to the remaining factors, Thailand was given high marks for "Political stability," "The supply of electricity, water, etc.," "Feelings towards Japan," "Economic growing power," etc. However, concern was expressed

about "The facilities of inspection agencies," "Financial conditions," and "The existence of relevant companies." As regards "The existence of a local partner," the evaluation was neither favorable nor unfavorable. Moreover, there were no significant differences between the autoparts companies and the electric and electronic parts companies as regards the distribution of their respective evaluations.

### 7.2.7 Ideas and problems in foreign investment plans

This section analyzes what kinds of ideas and problems Japanese parts companies have when it comes to actually making foreign investments plans.

#### (1) Buyers (Market) for products (Q5.2)

We asked the companies, If you invested overseas somewhere, not necessarily in Thailand, where would you try to find buyers for the products that your foreign production base produced? The results were as shown in the table below (multiple answers possible).

Table 7.2-18 TARGET MARKET FOR PRODUCTS PRODUCED OVERSEAS

Target market	Autoparts		Elec. parts	
	Answers	Proportion (%)	Answers	Proportion (%)
The country's domestic market	185	62.9	93	50.5
Exporting to third country	78	26.5	94	51.1
Reverse importing into Japan	123	41.8	75	40.8
Other	6	2.0	4	1.6
Total No. of answers	392	-	265	-
No. of answering companies	294		184	
Average No. of answers per company	1.3		1.4	

Among the autoparts companies, the No. 1 answer, with 62.9%, was "The country's market." Among the electric and electronic parts companies, "Exporting to third countries," with 51.1%, barely exceeded "The country's market," with 50.5%. Among the autoparts companies, "Exporting to the third country" garnered 26.5%, lower than its 51.1% among the electric and

electronic parts companies. The ratios of "Reverse importing into Japan" were almost the same, given by 41.8% of the autoparts companies and 40.8% of the electric and electronic parts companies.

(2) The desired share of stock (Q2.2-3)

Developing countries frequently have a policy that attempts to keep the share of stock owned by foreign capital below 50%. Thailand, too, has such a policy, except in special circumstances (for example, all the products produced are exported, or the factory is built in an outlying location). To find out how this policy might be received by potential investors, we asked the companies what share of the stock they would want to own.

Table 7.2-19 DESIRED SHARE OF STOCK HOLDING

Proportion of stock	Answering companies	Proportion (%)
100%	88	23.8
more than 50%	187	50.7
less than 50%	94	25.5
Total	369	100.0

Of the answering companies, 23.8% said they would want to own 100% of the stock, and 50.7% said they would want to own more than 50%. Thus, a total of 74.5% would want to own a majority of the stock and have the right to control business.

(3) Method of procuring machinery and equipment (Q4.2.2-4)

We asked the companies whether they would want to bring in used machinery from Japan if they made a foreign investment. In developing countries it is frequently the case that used machinery is not afforded special benefits such as import tax exemptions. That was the reason for this question. There were no significant differences between the answers of the autoparts companies and those of the electric and electronic parts companies. Moreover, there weren't any particular differences in answers due to company size. Therefore, the results were combined together, as presented in the following table.

Table 3.3-20 MACHINERY AND EQUIPMENT PROCUREMENT PLAN  
FOR A FOREIGN INVESTMENT

	Answering companies	Proportion (%)
We will buy all new machinery	59	21.1
We will import all used machinery	61	21.9
We will mix new and used machinery	159	57.0
Total	279	100.0

Of the answering companies, 21.9% said they would acquire only used machinery, and 57.0% said they would mix new and used machinery. Thus, more than 78.9% said they would want to bring in at least some used machinery.

(4) Method of acquisition of land and factory building (Q4.2.2-4)

If the companies were to establish a new production base abroad, how would they obtain the related land and factory? For purposes of reference, we also asked what kind of industrial park or location they would want the country receiving the investment to provide. Generally speaking, there were three approaches to the issue of land and factory.

- (a) Buy the land and build a factory designed by one's own company (with everything becoming one's own property).
- (b) Buy a factory of a standard design (a ready-built type of factory) (with it becoming one's own property).
- (c) Lease floor space in an apartment-type factory (no proprietary rights).

There were no marked differences between the answers of the two groups of companies. However, answers differed significantly based on company size.

Table 7.2-21 LAND AND FACTORY ACQUISITION PLANS ACCORDING TO COMPANY SIZE

Land, factory acquisition method	At least 301 employees		300 employees or less		Total	
	Companies	Proportion (%)	Companies	Proportion (%)	Companies	Proportion (%)
Purchase land, design factory	56	(43.4)	58	(22.1)	114	(29.1)
Standard design, ready-built factory	18	(14.0)	57	(21.8)	75	(19.2)
Lease floor in apartment-type factory	26	(20.1)	115	(43.9)	141	(36.1)
Other	29	(22.5)	32	(12.2)	61	(15.6)
Total	129	(100.0)	262	(100.0)	391	(100.0)

Among companies with at least 301 employees, the No. 1 answer, given by 43.4%, was, "We want to buy the land and have a factory of our own design." Among small and medium scale companies with 300 employees or less, the No. 1 answer, given 43.9%, was, "Lease floor space in an apartment-type factory." This was the major point of contrast between the bigger and smaller companies. When all the companies are taken together, the No. 1 answer, given by 36.1%, was, "Lease floor space in an apartment-type factory." A ready-built factory with a standard design was the least popular alternative.

(5) Problems during the preparatory stage for a foreign investment (Q5.4)

When a company wants to make a foreign investment, no matter in what country, it first has to make various preparations. The majority of manufacturers in the parts industry are small and medium scale companies, and in this questionnaire too, as was mentioned earlier, 74% of the answering companies were small and medium scale companies with 300 employees or less - companies that tend to lack financial power and personnel. This question asked these respondents what kinds of concerns and worries they might have during the stage prior to deciding a foreign investment. Thailand will perhaps be able to use the results from this answer in determining what kinds of steps to take to attract foreign companies in the future.

The companies were given 11 answers, including "Other," and were asked to choose three. There were no significant differences in the answers between the two groups of companies or based on company size.

Table 7.2-22 SUBJECTS OF CONCERN DURING THE PREPARATORY STAGES FOR A FOREIGN INVESTMENT

Order	Subject (question number)	Answers	Proportion (%)
1.	Management of local employees	210	50.7
2.	Lack of temporary and long-term personnel from Japan	178	43.0
3.	Lack of investment capital	135	32.7
4.	Ignorance about local legal and accounting procedures	123	29.7
5.	Inability to pre-determine buyers of products	97	23.4
6.	Unfamiliarity with how to conduct pre-investment survey (F/S)	79	19.1
7.	Unfamiliarity with how to look for a partner	79	19.1
8.	Safety of personnel from Japan and education of their children	76	18.4
9.	Dissatisfaction that the proportion of stock is less than 50%	41	9.9
10.	The absence of a local party to cooperate in a local survey	22	5.3
11.	Other	20	4.8
Total (1-11)		1,060	-
No. of answering companies		482	
Average No. of answers per company		2.2	

(6) Desire to register in BUILD

We asked the companies whether they would want to register in BUILD for purposes of looking for a local partner. A total of 82 answered affirmatively.

(7) Overall analysis of foreign investment plans

A question was made : If you were to establish a production base abroad, where would you find markets? Among the autoparts companies, the No. 1 answer, given by 62.9%, was in the domestic market of the investment country, while the No. 2 answer (41.8%) was reverse importing to Japan. Among the electric and electronic parts companies, on the other hand, the No. 1 answer (51.5%) was exporting to a third country, while the No. 2 answer (50.5%) was the investment country's domestic market: the No. 1 and No. 2 answers were given in almost equal proportions. The disparity between the answers from the two groups arises from the fact that, in every developing country, the market, with regard to the automotive industry, is closed in that there are restrictions on the importation of finished cars. It probably also reflects the circumstance that, due to such restrictions, the exporting of OEM



autoparts to a third country is difficult, and even if one does export them, it will be limited to the after market.

With regard to the desired proportion of stock, 74.5% of the answering companies said they would want to retain more than 50% of the stock and have the right to control business. By contrast, many countries, including Thailand, have a policy that seeks to restrict the proportion of stock held by foreign capital to less than 50%. Whether these countries relax this policy or not is something that will probably affect their competitive ability to attract foreign capital.

When it comes to establishing a factory abroad, more than 78.9% of the companies said that, for their equipment, they would want to use at least some used machinery. It can be assumed that what they had in mind was transferring the machinery currently being used at their factories in Japan. Of these companies, 21.9% said they would want to bring in all used machinery. A few even said they were thinking of transferring their entire factories, as is, overseas. From this it can be inferred that some companies, due to the pressures from the strong yen, have already concluded that they have no choice but to discontinue production in Japan.

In the answers about land and factory acquisition plans, the No. 1 answer among all the companies, given by 36.1%, was that they would want to rent floor space in an apartment-type factory. This is probably because of a desire to reduce start-up costs as much as possible and avoid risk.

With regard to problems during the preparatory stage of a foreign investment, it is obvious that the companies mentioning either a shortage of personnel (43.0%), a shortage of capital (32.6%), or the inability to pre-determine the buyers (23.4%), were worried about their company's lack of strength.

Worries related to after the start of operations were mentioned by 38.6% of the companies. The subjects of concern included labor management (50.7%), ignorance about local legal and accounting procedures (29.7%), and the safety of personnel from Japan and the education of their children (18.4%). Main problems during the project design stage included unfamiliarity with how to do an F/S (19.1%), unfamiliarity with how to look for a partner

(19.1%), and lack of knowledge about how to go about finding someone to cooperate in a local survey (5.3%).

We believe that the government of Thailand can effectively refer to the results of this questionnaire as it considers what it should do, and what it can do, to attract the investments of small and medium scale Japanese parts companies (and presumably the parts companies of other countries as well). The success that Thailand has had until now in attracting foreign investment has mainly been with large, powerful companies. However, in the future its focus will be on attracting secondary industry (small and medium scale companies). Based on the answers to the questionnaire, it can probably be said that, if Thailand maintains the same policy for attracting foreign investment that it has followed in the past, there is a risk that various problems will occur.





## Chapter 8    Relative Position and Competitiveness of Thailand in ASEAN

### 8.1    Automotive and Electrical/Electronic Industries in ASEAN

#### 8.1.1    Automotive industry in ASEAN

Among the ASEAN countries, those that assemble automotive are Thailand, Indonesia, Malaysia and the Philippines. With regard to the overall situation of these automotive assembling in the ASEAN region may be stated that 1) too many manufacturers are competing in small markets, 2) each country places restrictions on the importation of complete built-up vehicles in order to promote domestic production, 3) Japanese-affiliated companies have in aggregate a share exceeding 90% in ASEAN region, and 4) some manufacturers are implementing BBC scheme. In keeping with the agreement that became effective in the region in January of 1993, creating the Asian Free Trade Area (AFTA), the practice of each country's assembling vehicles must come under review, as a start is made on a new geographical specialization (or division of production work) within the region. Table 8.1-1 gives the sales in each country from 1988 to 1993. Because each country had adopted restrictions on importation of complete built-up vehicles, regardless of the export number, sales figures may be taken as representative of domestic production.

Table 8.1-1    TRENDS IN SALES OF AUTOMOTIVES IN ASEAN  
COUNTRIES

	Unit: Automotives					
	1988	1989	1990	1991	1992	1993
Indonesia	152,848	178,792	275,471	263,073	172,898	214,295
Thailand	146,492	208,243	304,071	268,560	362,987	456,461
Philippines	17,456	46,101	54,374	46,605	41,855	83,636
Malaysia	68,710	122,704	186,390	201,481	158,106	180,367
Singapore	31,389	38,784	35,725	32,496	31,055	43,109
ASEAN	416,895	594,624	856,031	812,215	766,901	977,868

Source: "Automobile Statistics of Main Countries" Japan Automobile Manufacturers Association, 1994

Next, a look at the trends in the population per car owned in ASEAN in Table 8.1-2 shows that there was a high average annual growth in ownership of 7.6 percent over the 11 years from 1980 to 1991. In 1980, there was one car per 65.3 people, but by 1991 this had changed to one car per 37.0. This is still low compared with the average rate for the world as a whole as of the end of 1991, that is, one car per 8.6 persons, so there may still be considered to be tremendous potential demand. By country, the rate of ownership was the highest in Malaysia, one car per 7.4 persons, which is higher than the world average. The rate in Indonesia rapidly improved from one car per 114.0 to one car per 62.6, but the rate of ownership in 1991 was still no more than the level of Thailand before 1980. The fastest change in ASEAN has been shown by Thailand. In 1980, the level was one car per 53.0 persons, no different from the Philippines, but growth averaged 14.9 percent from 1985 to 1991, much faster than the 8.1 percent for ASEAN as a whole, and so ownership reached one car per 19.9 persons in 1990.

Table 8.1-2 POPULATION PER CAR OWNED IN ASEAN COUNTRIES

	1980	1985	1989	1990	1991	Unit: person/unit	
						Annual average growth in cars owned (%)	
						1980-85	1985-91
ASEAN	65.3	51.9	43.2	36.5	37.0	7.1	8.1
Thailand	53.0	43.5	24.7	19.9	20.9	6.1	14.9
Indonesia	114.0	82.1	69.1	64.7	62.6	9.2	7.0
Malaysia	15.3	10.8	9.4	7.3	7.4	10.1	9.2
Philippines	56.6	62.0	109.6	101.8	102.2	0.7	-5.8

Source: "Automotive Statistics of Main Countries" Japan Automotive Manufacturers Association

Projections of international organizations and research organizations all concur that ASEAN will continue to enjoy economic growth. If demand continues by the average annual 15 percent of the past seven years, then the number of cars sold in ASEAN in the year 2000 will grow to about 2.4 million. The biggest possibilities for growth in car ownership will be in Thailand, Indonesia, and Malaysia. Factors in demand growth will be the urban road networks and other infrastructure, elimination of income disparities and regional disparities, and reduced relative prices in relation to income.

Outline of automotive industry in each ASEAN country beside of Thailand can be summarized as follows:

(1) Indonesia's automotive industry

The Indonesian government has sought to develop the automotive industry through reliance on private capital since the prohibition (in principle) of importation of complete built-up assembled vehicles in 1967. Sales in 1990 were 270,000, but in 1992 sales fell to the 170,000 level owing to a weakening of economic growth and, in keeping with a tight credit policy, an increase in tax placed on commercial vehicles. Then sales was gradually recovered in 1993 and expected to be more than 300,000 in 1994. Eighty percent domestic production and sales is accounted for by commercial vehicles, and 80% of production and sales is by four Japanese companies.

As of 1993, there were ten Japanese-affiliated assemblers, eight American- or European-affiliated, all 18 of which were engaged in assembly through joint ventures with three Indonesian-owned companies. In addition, there were one Korean and one American assembler that already have begun plans for local production. It is characteristics of the Indonesian situation that there are more than 20 companies present, despite the small scale of the market.

(2) Malaysia's automotive industry

The start of the automotive industry in Malaysia dates to the adoption of an import substitution policy during the 1960s. Actual production, however, can be said to have started with the Saga passenger car, produced by the Perusahaan Otomobil Nasional Berhad (Proton), established in 1983. The number of new vehicles sold reached the level of 180,000 in 1990, and was 200,000 in 1991. Thereafter, the adoption of an excise tax in 1992 resulted in depressing sales to somewhat less than 160,000, but in 1993 volume was recovered to the 180,000 level. Passenger cars account for about 65% of domestic production (1991). Proton has a share of about 65% of the market.

Importation of complete built-up vehicles is in principle prohibited at the present time. There are ten companies other than Proton that assemble knocked down vehicles. The number of assemblers was to be reduced to

three, including Proton, by 1995, according to the Industrial Master Plan announced by the government in 1986. Subsequently, weaker economic growth and the small scale of the domestic market led to the plan was lost reality and cancellation of this plan, that was substituted by a Local Content Program intended to promote the development of parts makers. Production plans announced to date are for a 660cc class passenger car to be made starting in July, 1994, by a joint venture that has Daihatsu, a Japanese company, as one of the partners, as well as a plan for production of a one-ton pickup truck by a joint venture that includes Hyundai, a Korean company and a joint venture with Citroen, France.

The Local Content Program adopted in 1989 included a Mandatory Deletion Program by which 29 items were designated for production in Malaysia, and the program is being carried out by assignment by the government of a numerical score to each part for calculation of local content according to the Given Percentage Program. As of the end of 1993, local content is about 80% in the case of Proton, and 40% for the other automotive assemblers in Malaysia. The government, therefore, has made it mandatory for the latter group of assemblers to attain a ratio of 60% for passenger cars and 45% for commercial vehicles by 1996.

### (3) The Philippines' automotive industry

The industry in the Philippines is the ASEAN region's oldest, having been established with the start of assembly in 1951. The quantity of production, however, peaked at about 70,000 in 1978, after which it declined in reaction to weakening of the economy, political turmoil, and restricted availability of foreign currency, leading to production of 7,422 vehicles in 1987. The business environment began to improve in 1988 and by 1993 production had recovered to about 80,000. During this period, the share of passenger car production in the total has been high.

At the peak in 1978, there were five companies (two American and three Japanese) engaged in assembly work, and by a decade later two additional Japanese companies entered the market through joint ventures (Nissan - PNI and Mitsubishi - PAMCOR). The government at present prohibits, in principle, importation of complete built-up vehicles and most of domestic