

3. BUSINESS OPERATIONS OF ASSEMBLERS IN THE ASIAN REGION

3.1 THE AUTOMOTIVE INDUSTRY

3.1.1 Automobile Assemblers

Recent changes in the automotive business in the Asian region are: the rapid expansion of demand in China and the ASEAN region; and the progress of mutual complementation of automotive parts and components in the ASEAN region.

The demand for automobiles in the ASEAN region has been steadily expanding keeping pace with its economic growth. Total automobile sales in the Asian region excluding Japan was 5.4 million units in 1994, an increase of 7.7% from the previous year. The demand both in China and in Korea has reached around the level of 1.5 million units a year. That in Thailand is reaching 0.5 million units a year. In recent years, Indonesia and Malaysia have experienced a rapid rise in the demand.

In 1988, ASEAN member countries agreed to establish the Brand-to-Brand Complementation Scheme for the purpose of strengthening the competitiveness of the ASEAN in the world automobile market. Under this scheme, specific automotive parts and components production would be concentrated in a limited number of countries and supplied to other countries. In 1992, the Agreement on Common Effective Preferential Tariff was signed as a step toward realizing the ASEAN Free Trade Area. The step-by-step reduction of tariffs among ASEAN countries is to be carried out in 15 years based on this agreement.

Major automobile manufacturers have faced the necessity of reviewing their business strategies toward the Asian area in order to respond to the changes in the business environment in this area. The future direction of major automobile manufacturers' business strategy toward the Asian area is as follows:

- i. Active entry into potential markets

Market entry into such potential markets as China, Vietnam, and India is one of the current issues for automotive manufacturers. They are making active approaches to these markets. At the same time, they are expanding existing production bases in the growing markets in the Asian region.

It is anticipated that price competition will intensify in the Asian market because Mitsubishi Motors is decreasing its cost competitiveness due to the Yen appreciation and because American and European automobile manufacturers plan to enter the Asian market with their compact cars.

ii. Manufacture of an Asian Car

Automobile manufacturers consider that the introduction of a low-priced and practical car into the Asian market is necessary in order to survive in the expanding Asian market. Japanese automobile manufacturers are introducing so-called Asian cars, which are developed specifically for the Asian market and produced at production bases in the Asian area.

According to the Asian car plans of major Japanese automobile manufacturers, the production in Thailand goes ahead of other countries. Although there will be production in individual ASEAN countries in the future, it is anticipated that Thailand will be the major supplying source of parts and components. Procurement from Malaysia will also be of importance because the economies of scale of parts production in Malaysia will be achieved through National Car Projects.

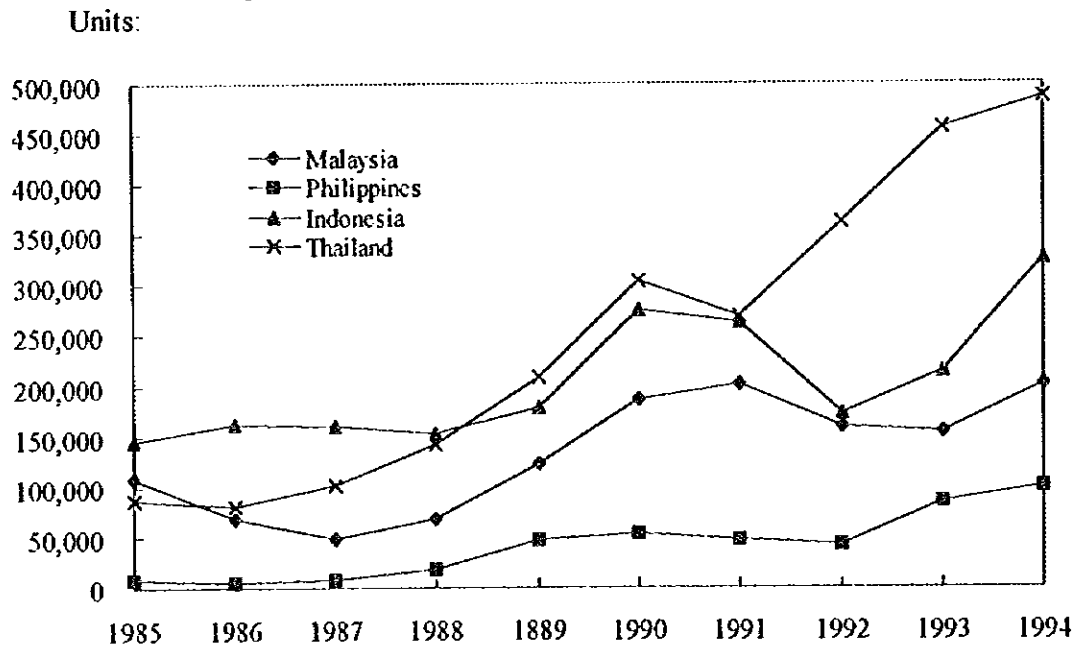
iii. Reduction of production cost through the enlargement of local procurement

The KD production cost at Japanese automobile manufacturers in Asian countries has been increasing due to the rise in import prices of KD parts reflecting the Yen appreciation. The need to reduce production cost in these countries is high among Japanese automobile manufacturers. They are setting up a system to procure from the cheapest source of parts and materials instead of buying from Japan.

iv. Establishment of a mutual complementation system in the Asian area

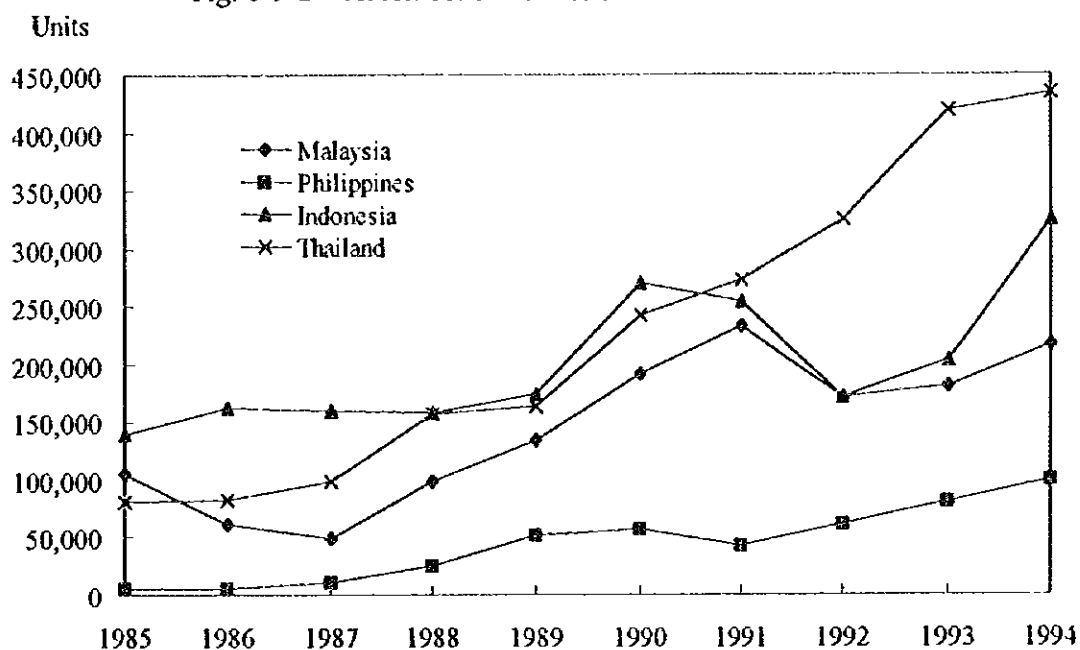
Facing the needs of procuring more parts and components within the ASEAN region and making Asian cars, automobile manufacturers which have set up production bases in the Asian area have started to set up a system to supply parts and components mutually among production bases in this area instead of manufacturing all parts and components within an individual country. Taking into consideration the future of mutual complementation in the Asian area and the future market growth prospects of individual Asian countries, they are establishing this mutual complementation system.

Fig. 8-3-1 Automobile Sales in ASEAN Countries



Source: *Syuyo Koku Jidosha Tokei (Automobile Statistics of Major Countries)*,
Japan Automobile Manufacturers Association, Inc.
Jidosha Sangyo Handbook (Automotive Industry Handbook),
Nikkan Jidosha Sangyo Shimbunsha

Fig. 8-3-2 Automobile Production in ASEAN Countries



Source: *Syuyo Koku Jidosha Tokei (Automobile Statistics of Major Countries)*,
Japan Automobile Manufacturers Association, Inc.
Jidosha Sangyo Handbook (Automotive Industry Handbook),
Nikkan Jidosha Sangyo Shimbunsha

Table 8-3-1 Trend of Asian Car Production by Major Japanese Automotive Manufacturers

Outline of Asian Car Plans	
Toyota Motor Corporation	<p>Toyota's Asian car is a small size car (1,300 - 1,500 cc) based on the Tercel. The production will start in Thailand at the end of 1997. In 1998, production will also start in Indonesia and the Philippines. In 2000, the production amount will be 120,000 units in Thailand, 90,000 units in Indonesia, and 12,000 units in the Philippines.</p> <p>In order that Asian cars can achieve mass sales, prices should be set at a level that ordinary consumers can purchase. Prices for the Thai market will be less than 400,000 Baht. Toyota considered that drastic cost reduction within the ASEAN region is necessary for low prices. Simplification of parts and components and increase in local procurement will be pursued.</p>
Nissan Motor Co., Ltd.	<p>Nissan has produced AD Resort as a special car for the Asian market since 1993.</p> <p>In 1999, Nissan will start the production of a new Asian car in Thailand, Indonesia, the Philippines, Malaysia, and Taiwan.</p> <p>The new model will be based on the Sunny, a model of which will be changed in Japan at the beginning of 1998. This Asian car will be in the 1,500 cc class. For Thailand, the prices will be less than 400,000 Baht, 20 -40% cheaper than those of existing Sunny's sold in the country.</p> <p>The model will adopt specifications for the Asian region and local procurement will be increased. The local content ratio will be raised to 70 - 80%. The above countries will share the parts and components production.</p>
Honda Motor Co., Ltd.	<p>Honda started the production of an Asian car in Thailand in April, 1996. Production will also be started in the Philippines and Malaysia in the latter half of 1996, and in India in 1997. They plan to produce totally 200,000 - 300,000 units in 2000.</p>

Source: *Nihon Keizai Shimbun*

3.1.2 Automotive Parts and Components Manufacturers

(1) Outline of Business Operations of Japanese Automotive Parts and Components Manufacturers

An increasing number of automotive parts manufacturers have been investing into the Asian area in response to enlarged business operations in this area by automobile manufacturers. Fig. 7-3-3 shows the number of overseas subsidiaries of Japanese automotive parts and components manufacturers by region.

How to supply spare parts for exported Japanese automobiles was the main issue of

overseas business operations of automotive parts manufacturers before. The current issues of their overseas business operations are:

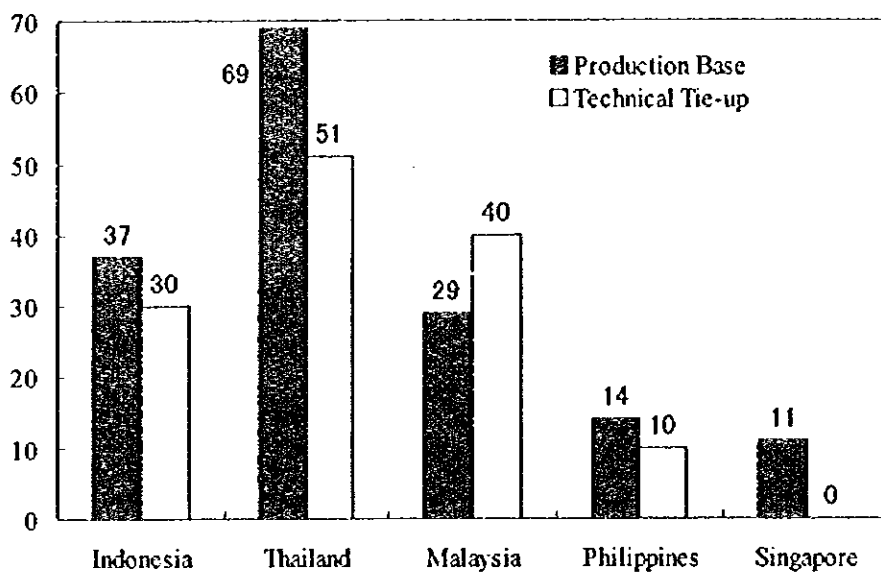
- i. How to be involved in local production systems at Japanese automobile manufacturers' overseas production bases;
- ii. How to respond to local content policy and national car projects in developing countries and requests for the participation of Japanese automobile manufacturers; and
- iii. How to find new customers in the world market beyond the existing relationships with automobile manufacturers.

In ASEAN countries, automotive manufacturers were obliged to choose CKD production due to bans and/or high import tariffs on completely built-up unit imports. Automotive manufacturers have been required to increase their local content in line with the local content regulations of these countries. Therefore, in many cases, parts manufacturers made investments in the Asian area on the basis of requests from automobile manufacturers which were required to increase the use of local parts and components in this area.

Automotive parts manufacturers are experiencing big changes in the business environment around the Asian area. They are: i) ASEAN countries have introduced the BBC scheme and CEPT scheme; ii) Japanese automotive manufacturers have started Asian car plans; and iii) Japanese automotive manufacturers in the Asian area are looking for low-cost suppliers instead of Japanese suppliers due to the Yen appreciation.

Under these circumstances, an increasing number of Japanese automotive parts and components suppliers are investing in the Asian region, in order to obtain new markets and new customers, as well as to maintain existing customers.

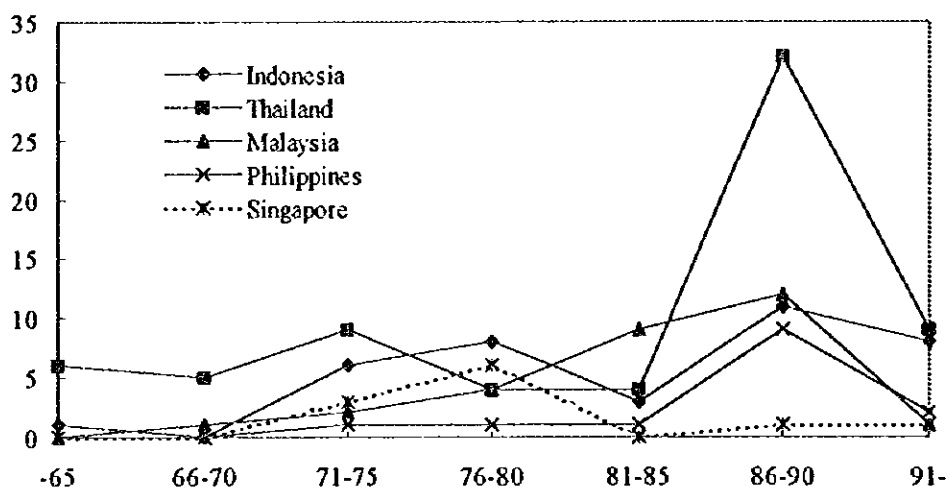
Fig. 8-3-3 Operation in the ASEAN Countries by Japanese Automotive Parts and Components Suppliers



Note : As of April, 1994.

Source: *Activities in the ASEAN by Japanese Auto Parts Manufacturers*, Japan Auto Parts Industries Association

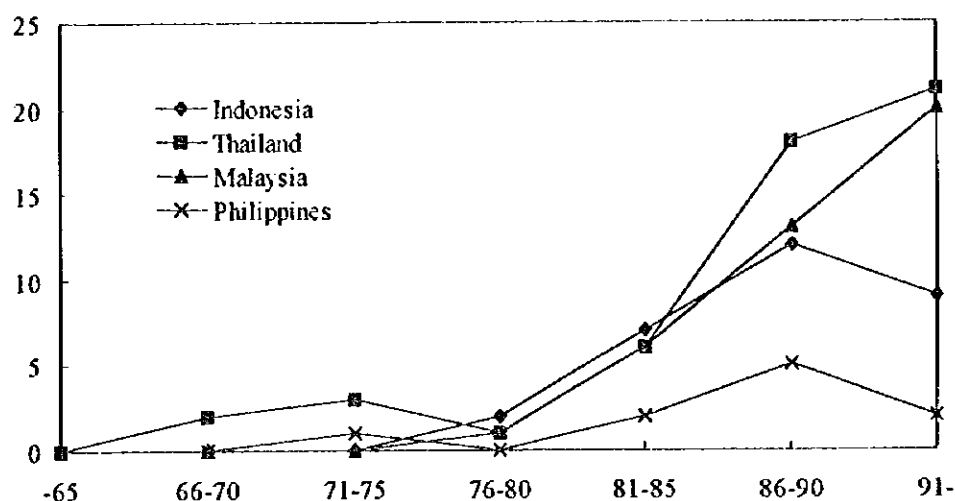
Fig. 8-3-4 Establishment of Production Bases in the ASEAN Countries by Period



Note : As of April, 1994.

Source: *Activities in the ASEAN by Japanese Auto Parts Manufacturers*, Japan Auto Parts Industries Association

Fig. 8-3-5 Technological Collaborations in ASEAN Countries by Japanese Automotive Parts and Components Suppliers by Period



Note : As of April, 1994.

Source: *Activities in the ASEAN by Japanese Auto Parts Manufacturers*, Japan Auto Parts Industries Association

Table 8-3-2 Product Items Which Japanese Automotive Parts Manufacturers Produce or Provide Technological Collaboration in ASEAN Countries

(Unit: No. of Companies)

	Indonesia	Thailand	Malaysia	Philippines	Singapore	Total
1 Engine Parts	24	49	13	4	8	98
2 Electric System (1) Starters, Alternators, Plugs, CU, etc.	6	11	6	2	0	25
3 Electric System (2) Wipers, Lamps, Meters, Harnesses, etc.	9	13	13	9	0	44
4 Driving, Power Transmission, & Steering Parts	14	28	7	2	1	52
5 Suspension & Brake Parts	16	19	14	3	0	52
6 Body Parts	11	27	20	2	0	60
7 Accessories (AC, Audio)	6	14	15	6	9	50
8 Others*	8	9	3	2	1	23
9 Motorcycle Parts	6	17	7	0	0	30
Total	100	187	98	30	19	434

Note: Establishment of production bases and technological collaborations by members of the Japan Auto Parts Industries.

*Others include batteries, tires, die making, machining, etc.

Source: *Activities in the ASEAN by Japanese Auto Parts Manufacturers*, Japan Auto Parts Industries Association

3.2 THE ELECTRICAL AND ELECTRONIC INDUSTRY

3.2.1 Assembling Manufacturers

(1) Trend of Business Operation in the Asian Region by Japanese Electrical and Electronic Assemblers

The trend of business operations by Japanese electrical and electronic manufacturers can be summarized as follows:

In the 1960s

During this period, Japanese electrical and electronic manufacturers extended their businesses into the Asian region with the purpose of securing local markets in this region. They started the production of such items for local markets as transistor radios, black and white TVs, refrigerators, washing machines, and electronic parts such as resistors and motors. Their overseas production was mainly assembly and the items produced were mostly labor intensive items.

Investments were made in neighboring countries such as Taiwan and Korea, and ASEAN countries. These countries introduced measures necessary to receive foreign investments with the preparation of investment promotion policies. Japanese investments concentrated especially in Taiwan. Such factors as Taiwan's introduction of foreign investment incentives ahead of other countries, its location close to Japan, and historical relation with Japan attracted investments from Japan. With the establishment of the export processing zone, Japanese manufacturers came to position Taiwan as export bases to the U.S. market in the latter half of the 1960s.

In the 1970's

In 1970, Japan adopted a floating exchange rate system and, since then, the yen has continued to become stronger. This accelerated the establishment of overseas production bases by Japanese electrical and electronic manufacturers in the first half of the 1970s. They set up production bases in the ASEAN region, where labor cost was far cheaper

than that of Japan because the production in Japan lost cost competitiveness due to the stronger yen and rises in labor cost. They exported from those production bases to U.S. and European markets. During this period, approximately 70% of overseas investments by Japanese electrical and electronic manufacturers were directed to the Asian region, especially those countries which were institutionally ready to receive foreign investments and politically stable were. Korea, Singapore, and Malaysia became major target countries following Taiwan.

However, Japanese investments in the Asian countries decreased significantly after 1974 for the following reasons:

- They could not afford to invest abroad because of the domestic recession after the Oil Crisis.
- There was rising criticism of the excessive presence of the Japanese economy in the Asian countries.
- Some countries introduced restrictions on foreign investments.

Singapore, which took an open door policy, occupied a larger share of investments into the Asian countries in this period.

In the 1980s

In the first half 1980s, investments into the Asian region calmed down because major manufacturers had already made investments. Investments to China increased after the announcement of its open policy in 1979. At the same time, at the production bases in the Asian region, the diversification of production items progressed.

In the latter half of the 1980s, Japanese electrical and electronic manufacturers again started to set up production bases in the Asian region in response to the sharp rise in the yen after the Plaza agreement in 1985. They shifted their investments from such countries as Korea and Taiwan where the labor costs were rising and the exchange rates against the US dollar were revaluated, to the ASEAN countries. They directed their attention especially to Thailand and Malaysia which offered active foreign investment promotion policies. During this period, there was progress in the division of production in the Asian region which allocated low grade products of low value added to the ASEAN

countries and relatively high value added products, such as semiconductors and unit components, to NIES.

In the 1990s

In the beginning of the 1990s, the Japan economy was hit by a deep recession stemming from the end of the bubble economy. Japanese manufacturers suffered from bad business performance and decreased their overseas investments. However, they have faced the necessity of expanding their overseas production for the purpose of cost reduction in response to the yen valuation since 1993.

The number of items produced at overseas production bases has been increasing and the global division of production has become more outstanding. In the Asian region, the regional division of production is being established in the manner that they allocate the production according to the types of products, from high value added to labor intensive, to NIES, ASEAN and China in that order.

Table 8-3-3 Establishment of Affiliated Companies in Asian Countries
by Japanese Electrical and Electronic Manufacturers by Period
(Consumer Electrical and Electronic Equipment)

(Unit: No. of Companies)

Period	Korea	China	Taiwan	Thailand	Singapore	Malaysia	Philippines	Indonesia
- 1965	0	0	4	3	0	2	0	0
1966 - 70	0	0	4	2	2	2	2	2
1971 - 75	4	0	4	1	5	3	0	1
1976 - 80	0	0	1	1	5	1	0	1
1981 - 85	0	4	2	2	0	2	1	1
1986 - 90	2	2	5	12	5	26	2	1
1991 - 95	0	33	2	4	1	3	1	10
Total	6	39	22	25	18	39	6	16

Source: *List of Foreign Affiliates 1995*, Electronic Industries Association of Japan, October, 1995

Table 8-3-4 Establishment of Affiliated Companies in Asian Countries
by Japanese Electrical and Electronic Manufacturers by Period
(Industrial Use Electrical and Electronic Equipment)

(Unit: No. of Companies)

Period	Korea	China	Taiwan	Thailand	Singapore	Malaysia	Philippines	Indonesia
- 1965	1	0	1	0	0	1	0	0
1966 - 70	0	0	5	0	0	0	0	0
1971 - 75	2	0	3	0	3	2	0	0
1976 - 80	2	0	0	1	2	2	0	0
1981 - 85	0	5	0	0	0	1	0	1
1986 - 90	4	4	2	11	1	10	4	0
1991 - 95	1	20	3	0	2	2	2	1
Total	10	29	14	12	8	18	6	2

Source: *List of Foreign Affiliates 1995*, Electronic Industries Association of Japan, October, 1995

(2) Recent Trend of Production in the Asian Region by Japanese Electrical and Electronic Manufacturers

Product items of Japanese electrical and electronic manufacturers in the Asian region are shown in Table 8-3-5. For some items such as TVs, overseas production has exceeded that in Japan.

The characteristics of the division of production in the Asian region which is currently promoted by Japanese manufacturers are as follows.

i. Increase in exports to Japan

They are shifting the production for the Japanese market to the ASEAN and China, which have been export bases to the U.S. and Europe markets. They are increasing their imports from these countries for the Japanese market. The production of middle level products, such as medium size TVs and VTRs, is currently shifted to the ASEAN reflecting the fact that Japanese consumers have become price conscious even for middle level products and that the level of production technologies and the supporting industries have been developed.

ii. Transfer of the production of lower level products to labor abundant countries

Labor cost is rising in Malaysia and Thailand, which tend to specialize in middle

level products. Accordingly, manufacturers are transferring the production of lower level product to such countries as Indonesia and China, which have an abundant labor force.

iii. **Production Expansion in China**

Manufacturers are actively setting up factories in China aiming at the huge and expanding market.

Table 8-3-5 Product Items Produced by Japanese Electrical and Electronic Manufacturers in the Asian Region

(Unit: No. of Companies)

	Korea	China	Taiwan	Thailand	Singapore	Malaysia	Philippines	Indonesia	
Consumer Electrical and Electronic Equipment	TVs	0	4	6	10	6	8	3	5
	VTRs	0	5	5	0	2	8	2	2
	Radios	0	2	2	0	3	4	1	1
	Headphone Stereos	0	1	1	0	2	2	1	0
	Cassette Tape Recorders with Radios	2	2	1	1	3	5	0	2
	Other Tape Recorders	2	5	3	0	5	5	1	1
	Stereos	2	4	3	1	6	10	0	2
	CD Players	0	1	2	0	4	6	0	0
	Hi-Fi Speaker Systems	0	1	0	0	1	0	3	0
	Car Audios	0	2	1	2	3	5	1	0
	Other Consumer Electronic Equipment	2	2	2	0	3	6	0	1
	Electric Cookers	0	2	1	1	1	0	2	0
	Fans	0	1	0	5	0	2	2	2
	Refrigerators	0	0	3	8	0	3	2	4
	Washing Machines	0	2	2	4	1	2	1	2
	ACs	0	6	5	8	1	5	0	3
	Compressors	0	3	2	3	2	5	2	1
	Other Home Appliances	2	12	10	12	5	8	6	9
	Consumer Electrical and Electronic Equipment	6	39	22	25	18	39	1	16
	Industrial Electronic Equipment	Telephones	3	2	5	2	1	5	1
Portable Telephones		0	2	0	1	0	0	1	0
Pagers		0	2	1	0	0	0	0	0
FAXs		2	1	2	1	1	1	2	0
Other Communication Equipment		0	2	2	1	1	4	0	0
PCs		0	1	1	0	0	0	0	0
Computer Main Frames		0	1	0	0	0	0	3	0
Data Storage Device for Computers		2	3	2	2	0	4	0	0
Printing Device for Computers		1	3	0	2	0	0	0	1
Other Computer Devices for Computers		0	1	4	0	2	2	0	0
Other Applied Electronic Equipment		2	5	3	2	1	1	0	0
Electronic Measuring Devices		2	3	1	2	1	0	0	1
Calculators		1	2	0	0	0	2	0	0
Photocopiers		1	3	0	1	0	0	0	0
Other OA Equipment		1	1	1	2	1	1	0	0
Industrial Electronic Equipment		10	29	14	12	8	18	6	2

Source: *List of Foreign Affiliates 1995*, Electronic Industries Association of Japan, October, 1995

Table 8-3-6 Ratios of Production in the Asian Countries
of Japanese Electrical and Electronic Manufacturers

	Ratio of Production in Asia Other than Japan (Production in Japan = 100)		Changes in Production (1992/94) (%)	
	FY 1992	FY 1994	Asia	Japan
AV Equipment	48	127	58	-40
Parts for AV Equipment	30	43	28	-11
Home Appliances	21	29	23	-10
Parts for Home Appliances	48	73	30	-14
OA Equipment	12	18	57	2
Parts for OA Equipment	9	13	58	11
FAXs	11	14	40	5
Parts for FAXs	20	28	57	14
Semiconductors	6	11	99	14
Other Electronic Parts	33	42	26	1

Note: Based on the questionnaires returned from 144 companies which operate in the Asian region. On a production value basis.

Source: *Situation of Division of Production in Asia of Japanese Machinery Industry*, Japan Machinery Exporters' Association

3.2.2 The Electrical and Electronic Parts Manufacturers

(1) Business Operation of Japanese Electrical and Electronic Parts Manufacturers in the Asian Region

Table 8-3-7 & 8 show the situation of business operations of Japanese electrical and electronic parts manufacturers in the Asian region.

Electrical and electronic assemblers operating in the ASEAN are enlarging the necessity of increasing local procurement according to the production expansion and diversification of product items. Overseas production by Japanese parts manufacturers is also expanding to meet assemblers' demands. High value added key parts, such as medium size CRTs and magnetic heads, are produced in this region. However, under the current circumstances, parts manufacturers operating in this region can not meet the demands of assemblers.

Parts manufacturers consider their overseas plants as production bases only for regional markets and they basically do not export to Japan

Overseas production by parts manufacturers is usually done by automotive production system. Many have introduced the latest facilities and equipment from Japan. The production system in ASEAN is similar to that in Japan except that certain processes are not automated such as supply of materials to machinery, transport of works-in-progress and finished goods, inspection and packing

Parts manufacturers in the Asian region mostly depend on imports, mainly from Japan, for materials because there are few material suppliers in the country and their quality is not reliable. They also, in most cases, depend on headquarters in Japan for designing.

Table 8-3-7 Establishment of Affiliated Companies in Asian Countries
by Japanese Electrical and Electronic Manufacturers by Period
(Electronic Parts and Devices)

(Unit: Companies)

Period	Korea	China	Taiwan	Thailand	Singapore	Malaysia	Philippines	Indonesia
- 1965	0	0	4	0	0	0	0	0
1966 - 70	3	0	18	2	0	0	0	0
1971 - 75	23	0	17	0	10	10	0	1
1976 - 80	3	0	7	1	21	5	3	0
1981 - 85	4	4	3	3	4	2	1	0
1986 - 90	15	12	9	33	15	62	6	1
1991 - 95	0	64	3	10	4	22	6	19
Total	48	80	61	21	54	101	16	21

Source: *List of Foreign Affiliates 1995*, Electronic Industries Association of Japan, October, 1995

Table 8-3-8 Product Items Produced by Japanese Electrical and Electronic Parts Manufacturers in the Asian Region

(Unit: No. of Companies)

	Korea	China	Taiwan	Thailand	Singapore	Malaysia	Philippines	Indonesia	
Electronic Parts and Devices	Resistors	5	5	12	4	1	8	1	2
	Capacitors	12	5	10	4	8	11	1	2
	Transformers	10	12	14	6	6	27	2	3
	Audio Parts	3	3	3	0	3	3	1	2
	Magnetic Heads	6	4	4	2	2	4	2	1
	Small Size Motors	2	11	5	4	1	8	1	1
	Connectors	8	6	3	1	2	5	2	2
	Switches	8	10	4	1	1	8	1	3
	Small Functional Parts	5	12	8	0	6	12	1	0
	Unit Parts	12	18	9	7	7	16	3	0
	Magnetic Recording Media	0	0	0	2	0	2	0	0
	Other Electronic Parts	14	32	13	25	19	33	2	7
	Semiconductors	3	3	4	6	3	8	4	0
	ICs	6	3	3	4	5	7	2	0
	CRTs for TVs	0	2	0	1	2	1	0	1
	Other Electronic Devices	2	8	9	6	3	4	1	3
Total	48	80	61	49	54	101	16	21	

Source: *List of Foreign Affiliates 1995*, Electronic Industries Association of Japan, October, 1995

3.3 The Machinery Industry

Japanese manufacturers in the general machinery industry including industrial machinery, machine tools, construction machinery, and precision machinery have been not active in investments into the Asian region compared with the automobile industry and the electrical and electronic industry. This is mainly because they can not enjoy the economies of scale in overseas production due to the following:

- i. Their production mode is large variety and small volume production.
- ii. Non-price factors such as technology, durability, and after-sale service are important competitive factors.
- iii. Most of the manufacturers are medium scale.

However, an increasing number of manufacturers have started plans to start overseas production, especially in China, responding to the demand expansion in the Asian region, where the industrialization is advancing dynamically. Decreasing profits due to the strong yen is another reason for a gradual rise in their overseas production ratio.

Table 8-3-9 Number of Affiliated Companies of Japanese General Machinery Manufacturers in ASEAN Countries by Period of Establishment

	1991 or Before	1992	1993	1994	1995	Total
Thailand	38	2	2	1	1	44
Singapore	25	1	1	0	1	28
Malaysia	10	1	0	2	0	13
Philippines	5	0	0	0	2	7
Indonesia	16	0	1	0	0	17

Source: *List of Japanese Companies Investing in ASEAN* (ASEAN Shinshutsu Kigyo Soran 96), Tokyo Keizai Shimposha

Generally speaking, investments were concentrated during the period from 1986 to 1991. According to the questionnaires given to machinery manufacturers in ASEAN countries, major reasons for investments or choosing the country were: local market expansion, response to the strong yen, lower cost, stable political situation, and future potential for Thailand; attractive investment incentives, lower cost, and stable political situation for Malaysia; and local market expansion and future potential for Indonesia.

4. INDUSTRIAL POLICIES IN THE ASIAN REGION

4.1 AUTOMOTIVE INDUSTRY DEVELOPMENT POLICIES

4.1.1 Overview of Automotive Industry Development Policies in the Asian Countries

The direction of the automotive industry policies in ASEAN countries has tended toward the liberalization of the market. As background for this liberalization trend, GATT's requirement for market liberalization and the introduction of the CEPT system in the ASEAN can be pointed out.

ASEAN countries have been relaxing regulations on the automotive industry through such measures as the lifting of the ban on CBU (completely build-up) unit imports, reduction of import tariffs on CBU and CKD kits, and relaxation of regulations on local content. At the same time, these countries have been introducing incentives to localization and to exporting companies with a view to developing the automotive industry.

They are taking more flexible approaches to the promotion of local content, for example, through the provision of export credit and the application of the BBC scheme. Automobile manufacturers have been obliged to concentrate on specific market segments and specific models in order to achieve local content targets in such countries as Thailand and Indonesia. However, with the more flexible localization approaches, they tend to reduce the concentration on specific models

Major indicators and policies related to the automotive industry in ASEAN countries excluding Singapore are shown in Table 8-4-1 and 2.

Table 8-4-1 Major Indicators of the Automotive Industry in Major Asian Countries

	Indonesia	Thailand	Malaysia	Philippines	China
Automobile Production (1994) (Units)	325,021	434,001	216,488	100,098	1,338,500
Passenger Vehicles	41,807	109,830	172,654	57,818	247,600
Commercial Vehicles	283,214	324,171	43,834	42,280	1,090,900
No. of Automobiles Registered (1994) (Units)	3,231,363	2,847,939	2,884,322	1,555,291	8,175,835
Passenger Vehicles	1,676,781	1,041,246	2,370,038	531,240	2,448,023
Commercial Vehicles	1,554,582	1,806,693	514,284	1,024,051	5,727,812
Population per Passenger Vehicle (1993) (Persons)	119.5	17.5	8.1	131.4	486.3
Automobile Imports (1994) (Units)	59,301	104,699	131,116	48,157	111,544
Passenger Vehicles	38,105	66,679	58,131	34,149	62,454
Commercial Vehicles	21,196	38,020	72,985	14,008	49,090

Source: *Automotive Industry Handbook*, Daily Automobile Journal, *Automotive Statistics of Major Countries*, Japan Automotive Manufacturers Association

Table 8-4-2 Outline of Automotive Industry Policies in Major Asian Countries

	Indonesia	Thailand	Malaysia	Philippines	China
Restriction on CBU Unit Imports	Liberalized.	Free. License is necessary for KD imports.	Principally prohibited.	Liberalized.	Only import license holders can import.
Import Duty on CBU Units	Passenger vehicles: 125 - 200% Commercial Vehicles: 5 - 105%	Passenger vehicles: Exceeding 2.0l- 220%, Less than 2.0l: 180%, Commercial Vehicles: 60%	Passenger vehicles: 140~ 200% Commercial Vehicles: 0% 4WD: 50%	Passenger vehicles: 40% Commercial Vehicles: 20- 40%	Passenger vehicles: Exceeding 20l-220%, less than 2.0l- 180% Trucks: 50%
Taxes on Automobile Sales	Luxury Taxes for Passenger vehicles exceeding 1,600CC: 35%, those 1,600CC or less and some commercial vehicles: 20% or 35% according to local content	Excise Duty Passenger vehicles: less than 2.4l- 35.75%, 2.4l or more- 41.8%	Excise Duty: 25- 65% for passenger vehicles & 15% for commercial vehicles. Sales Tax: 10%	Value Added Tax: 10%	40,000 yuans per one imported vehicle. In addition, industry and commerce unity tax and local value added tax are imposed.
Import Duty on KD Parts	0 - 65% (Parts: 0 - 25%)	20.0% (Parts: 15 - 60%)	Passenger Vehicles: 42.0% Commercial Vehicles: 5.0%	3.0%	
Localization Target	Reduced import duty on parts according to localization ratio.	Passenger vehicles: 54% Commercial vehicles: 65% (chassis basis) Assembly for engines for pick-up trucks: 70% since 1995	Mandatory Deletion Items: 30 items. Local Content Target: Passenger vehicles (1,850cc or less) 60% in 96 Passenger vehicles (more than 1,850 cc) & 2.5t commercial vehicles 45% in 96	Localization ratio are as follows: Passenger vehicles: 40% Commercial vehicles: 13.77% - 45%	Foreign currency for KD parts must be obtained by exports. When localization ratio exceeds 50%, import license is not necessary for parts imports.

Source: *Automotive Industry Handbook*, Daily Automobile Journal, *Automotive Statistics of Major Countries*, Japan Automotive Manufacturers Association, The Japanese Chamber of Commerce and Industry of the Philippines, Inc.

4.1.2 Automotive Industry Development Policies in Thailand

(1) Automobile Industry Development Policies

The Thai government had banned imports of passenger vehicles of 2.3 litres or less and large-sized buses since 1978 as part of their protective measures for the domestic automobile industry. The government lifted the ban on imports of CBU units and reduced import duties on CBU units and CKD kits in 1991 and 1992. The tax differential between passenger vehicles and commercial vehicles has been reduced with the introduction of new tariffs although commercial vehicles had received preferential treatment.

Table 8-4-3 Import Duty on Automobiles and CKD Kits

	Passenger Vehicles			Pick-up Trucks	
	CBU Units		CKD Kits	CBU Units	CKD Kits
	2.3 litres or less	Over 2.3 litres			
Before Jul., 1991	180%	300%	112%	120%	30%
After Jul., 1991	60%	100%	20%	60%	20%
After Jan., 1992	42%	68.5%	20%	60%	20%

Source: Forin

A 7% value-added tax (VAT) is imposed on automobiles and automotive parts and components. CBU units and CKD kits of passenger vehicles, station wagons, and jeeps are subject to an excise tax of 32.5% for engines of 2,400 cc or less, or 38% for those exceeding 2,400 cc; and a municipal tax of 3.25% for 2,400 cc or less, or 3.8% above 2,400 cc.

Passenger vehicle assembly plants needed a license for establishment in Thailand. A complete ban was placed on new passenger vehicle assembly plants in 1979 although a limit or ban was not placed on the establishment of new assembly plants of trucks, buses, pick-up trucks of 4 tons or less, or motorcycles. However, the ban on the establishment of new passenger vehicle assembly plants was lifted in November, 1993.

In April, 1994, the Thai government announced incentives for automobile assembly plants in order to invite foreign investments and promote exports. An outline of the

new incentives is as follows:

i. Incentives by region

- Zone 1 (6 provinces around Bangkok)

No incentives

- Zone 2 (10 provinces around Zone 1)

7 year exemption of corporate income tax for export income

50% import duty reduction on machinery

- Zone 3 (Other provinces and Laem Chabang Industrial Estate)

8 year exemption of corporate income tax for export income

Full import duty exemption on machinery

Deduction from the taxable income of 25% of the expenses for water supply, electricity and transportation

- ii. Import duty reduction for materials for a company which exports more than 1,000 units annually

- iii. Exemption of corporate income taxes for export income for a company which moves to a local area

(2) Local Automotive Parts and Components Industry Development

Local content requirements for vehicles in Thailand are decided on the basis of the parts lists for local content calculation formulated by the government. They are 54% for passenger vehicles and 65 - 80% for commercial vehicles.

The local content requirement of Thailand is administered on the basis of the given-percent system. The Ministry of Industry formulated the lists in which automotive parts are classified and each part is given a localisation ration in percent form. As for passenger vehicles, parts are classified into 21 categories, into 75 sub-categories, and into 299 items. Each item is given its localisation ratio in percent and the sum of these ratios is 100 percent. In addition, there is a list of 29 items to be localized compulsorily and the total of localisation ratios of compulsory items is 20.07%.

In 1989, the Thai government started the local engine production program for small-

sized commercial vehicles. The local content requirement for engines was set at 20% for 1989 and it will be increased consecutively by 10% annually so that it will reach 80% within 7 years.

Since September, 1993, Thai government has introduced new incentives for the supporting industries. Priority industries can receive such incentives as 8 year exemption of corporate income tax, import duty exemption on machinery, and 100% foreign equity. The following 14 industries are designated as priority industries:

Molds and dies, jigs, forging, casting (by induction furnace), tools, cutting tools, grinders, surface treatment, heat treatment, sensors of precision machinery, electronics connectors, nickel cadmium batteries, and engineering plastic parts.

In June, 1994, investment incentives were applied to 20 industries locating in Zone 2, including tires and automotive parts and components, which had been subjected to incentives only when located in Zone 3.

4.1.3 Automotive Industry Development Policies in Malaysia

(1) Automobile Industry Development Policies

a. Import Restriction on CBU Units

Imports of all categories of CBU motor vehicles (other than special purpose vehicles), are restricted. Up to 1991, the ceiling of CBU imports was 10% of the total production a year. However, since 1991, CBU imports have been reduced consecutively by 1% so that by 1996 imports will be reduced to 5% of the total production.

Import duties on CBU imports are as shown in Table 8-4-4.

Table 8-4-4 Import Duty on CBU Unit Imports of Vehicles

Passenger Vehicles			Commercial Vehicles
Engine Capacity	Less than 1,800 cc	140%	35%
	1,800 cc < 2,500 cc	170%	
	2,500 cc and above	200%	

Source: Ministry of International Trade and Industry

b. Automobile Assembly License

Motor vehicle assembly licenses have been given to limited assembly plants for the purpose of developing local assemblers.

c. Preference to the National Car Projects

Since 1982, the national car plan became the focal point of the automobile industry policies and PROTON, a joint venture with Mitsubishi Motors Corporation, Japan, was established. PROTON started the production of PROTON SAGA, a small sized passenger vehicle. PROTON expanded the market share on behalf of various incentives. PROTON went into the black in 1990 and was listed in 1992.

A 42% import duty is imposed on imported CKD parts in Malaysia. In support of the National Car Project, PROTON was initially granted a full exemption from import duty on imported CKD parts. In 1991, the import duty was imposed at 13%. In addition, a 50% exemption from excise duty has been granted to PROTON.

d. Sales Prices of Vehicles

Motor vehicle prices are under the control of the Government in order to benefit consumers. The price of each model of automobile has to be approved by the Ministry of International Trade and Industry. The net selling price can be applied on the basis of all the cost items such as imported CKD cost, direct labor cost, plant cost, marketing & administration cost, margins, etc.

(2) Automotive Parts and Components Industry Development

a. MDP (Mandatory Deletion Programme)

The Mandatory Deletion Programme (MDP) was introduced in 1979 to protect and promote local automotive parts and components industry. Since then, a total of 30 components have been designated as mandatory localized items, and assemblers have to delete these items from their CKD packages so that local procurement can be done.

b. Local Material Content Policy (LMCP)

The Local Material Content Policy (LMCP), which became effective in 1992, targets the localization level of 45 - 60%, varying with the types of automobile, within five years. In this program, each of the designated automotive parts and components, which total more than 300 items, has a certain point (%) set by the Government, and the degree of the localisation of each car model is calculated by the summation of the points of all localised parts and components used for the model. According to this policy, automobile assemblers and franchise holders are under obligation to increase the level of local content of each category of vehicle to achieve the targets set by the Government as shown below. The thirty items which are designated as MDP items jointly represent approximately 30 points of localisation for passenger cars and approximately 25 points for commercial vehicles.

Table 8-4-5 Local Material Content Policy

Unit: LMCP Points

Achievement Date	Category I Passenger Vehicles: 1,850cc or Less	Category II Passenger Vehicles: 1,851 - 2,850 cc Commercial Vehicles: GVW 2,500 kg or Less	Category III Passenger Vehicles: 2,851 cc or More Commercial Vehicles: GVW 2,501 kg or More
Jan. 1, 1992	0	20	MDP Items
Jan. 1, 1993	40	30	MDP Items
Jan. 1, 1994	50	35	MDP Items
Jan. 1, 1995	55	40	MDP Items
Jan. 1, 1996	60	45	MDP Items

Source: MIDA

c. Export Credit

The Government gives automobile assemblers localisation points related to the export of automotive parts. Under this scheme, assemblers can increase their localization points through the expansion of parts export. The maximum points to be given to assemblers is 20%, calculated based on the following formula.

$$\frac{(\text{Total FOB value of automotive parts exported by the company})}{(\text{Total FOB value of CKD packs imported by the company})} \times 100\%$$

4.1.4 Automotive Industry Development Policies In the Philippines

(1) Automobile Industry Development Policies

The Philippine government announced the Car Developing Program (CDP) for passenger vehicles in 1987, and the Commercial Vehicle Developing Program (CVDP) for commercial vehicles in 1988 for the promotion of localisation and protection of local assemblers. The participants in these programs were approved. At present, the original CDP is classified under the Category III of the current CDP.

In March, 1990, the Philippine government started the People's Car Program (PCP) with the purpose of supplying low-priced passenger cars so that a wider range of the population could afford a passenger car. Under this Program, assemblers approved as PCP participants were admitted to assemble passenger cars of 1.2 liters or less. The PCP participants are currently classified under the category I of PCP.

In December, 1992, Luxury Car Program was started for the production of passenger vehicles of 2.19 liter or more. Under this program (Category III of CDP), five assemblers were approved.

In 1995, the Philippines government changed its automobile industry development policy towards the direction of liberalization responding such regional trade liberalization trend as AFTA. In August, 1995, import duties on CKD parts were reduced. In February, 1996, the new automobile industry development policy was approved by the president and various regulations concerning the manufacture of automobiles were revised.

(2) Automotive Parts and Components Industry Development Policy

The Philippine government has set targets of localisation by type of automobile. The localisation target of passenger cars under CDP was set at 40%. Commercial vehicles are also subject to the localisation targets and the targets are as follows:

Table 8-4-6 Localisation Targets of Commercial Vehicles in the Philippines

Category	Localisation Target
CVDP Category I: Asian Utility Vehicle of GVW 3.0 tons or less	45.00%
CVDP Category II: Small truck, van, and 4WD vehicle of GVW 3.0 tons or less	45.00%
CVDP Category III: Truck and bus of GVW 3.001 - 6.0 tons	21.90%
CVDP Category IV: Truck and bus of GVW 6.001 - 18.0 tons	
(A) GVW 6.001 - 9.0 tons	21.44%
(B) GVW 9.001 - 12.0 tons	22.24%
(C) GVW 12.001 - 15.0 tons	13.53%
(D) GVW 15.001 - 18.0 tons	13.77%
CVDP Category V: Truck and bus of GVW 18.0 tons or more or special purpose vehicle	13.77%

Source: The Japanese Chamber of Commerce and Industry of the Philippines, Inc.

Under the CDP and CVDP, automobile assemblers are obliged to gain foreign currencies necessary for CKD imports through their exports of automotive parts and CBUs. The ratios of exports to CKD imports are required to satisfy the ratios shown in the following table.

Table 8-4-7 Required Ratios of Exports for CKD Imports

	1992	1993	1994	1995	1996	1997	1998	1999	2000
CDP I	50%	50%	50%	75%	5%	7.5%	7.5%	15%	15%
CDP II	50%	50%	50%	75%	45%	45%	50%	50%	50%
CDP III	-	100%	100%	100%	75%	75%	75%	75%	75%
CVDP I & II	25%	25%	25%	25%	5%	7.5%	7.5%	15%	15%
CVDP III & IV					5%	5%	5%	5%	5%

Source: The Japanese Chamber of Commerce and Industry of the Philippines, Inc.

4.2 INVESTMENT AND EXPORT PROMOTION POLICIES IN THREE ASEAN COUNTRIES

ASEAN countries shifted their industrial policies from import-substitution policies to open policies emphasizing foreign investment promotion in the later half of the 1960s. During the period 1967 - 68, they laid legal foundations for investment promotion. In the 1970s, they were selective for foreign investment promotion by restricting equity ratios and specifying priority industries and promoted export-oriented development.

In the latter half of the 1980s, ASEAN countries introduced deregulation policies for the purpose of strengthening export competitiveness. They took such actions as import duty reduction, preference to export industries, and preparation of export processing zones.

The progress of the electrical and electronic industries in ASEAN countries has corresponded to the development of these investment promotion policies. These industries laid the basis during the period of import-substitution policies. They moved to the stage of expansion when the governments turned to export-oriented development policies which promoted foreign investments. At the period of import substitution, the production of home appliances for the domestic markets was given priority. At the period of export-oriented development, the governments adopted various measures to promote foreign investment, such as provision of incentives and establishment of industrial estates. Investments have been made in more varied areas such as electronic components, and communication and information equipment. At the same time, the degree of development of the electrical and electronic industry and the level of foreign investments vary according to the period when the governments changed their policies and other aspects of the investment climate such as infrastructure and political situation.

Malaysia, Thailand, and the Philippines are all striving for export-oriented economic growth. They have enacted thorough foreign investment-related legislation in order to attract foreign capital and nurture export industries, and they have erected a solid foundation for the growth of the automobile industry as well as for the electrical and electronic industry. Malaysia, the Philippines, and Thailand are all achieving success in fostering these industries, and in

recent years they have also been taking steps to develop the components industries and other secondary industries which support these sectors.

Table 8-4-8 Investment Environment of Major ASEAN Countries

	Indonesia	Thailand	Malaysia	Philippines
Corporate Income Tax	30% (for the part exceeding Rp. 50 million)	30%	30%	35%
Value Added Tax, Excise Duty, etc.	Value added tax: 10%, Luxury tax: 10 - 35% (for home appliances, cosmetics, etc.)	Value added tax: 7%	Excise duty: 5 - 10% Sales tax: 4 - 12% (automobile, beer, etc.)	Value added tax: 10% Excise duty: Automobiles(15 - 100%), beer, etc.
Investment Incentives	The introduction of tax holiday for specific industries was announced in July, 1976.	Corporate tax exemption for 3 - 8 years for companies locating in the 2 nd and 3 rd districts	Corporate tax exemption for Pioneer Status (PS) Company, and Investment Tax Allowance Company (ITA)	Corporate tax exemption for priority industries for 4 - 6 years (if certain conditions met, expanded up to 8 years)
Industries Promoted	Specific industries subject to tax holiday are under examination. Incentives are given to companies locating in areas other than Java and Bali Islands.	Automotive, electrical & electronic, machinery and parts industries are designated promoted industries. Locating in 2 nd or 3 rd district is required for incentives.	Automotive, electrical & electronic, machinery and parts industries are subject to PS and ITA.	Foreign companies exporting 70% or more products can receive incentives for metal processing, automotive parts, electronics and communication equipment & parts. As for metal processing and automotive parts, location outside Manila is required.
Restrictions on Equity Ratio	Principally no restrictions. 100% foreign companies must transfer a part of their equity to the Indonesian side within 15 years.	As for companies which receive incentives, the majority is permitted if exporting 50% or more products, and 100% equity if exporting 80% or more. No restrictions for companies which do not receive incentives.	Equity ratio is controlled according to export ratio and type of industry. Foreign equity of 100% is permitted for companies exporting 80% or more products, or those exporting 50% or more and satisfying certain conditions.	Companies receiving incentives, excluding 100% exporting companies, must reduce their equity ratio to 40% within 30 years. There is no restriction on equity ratio for companies which do not receive incentives.
Wages (Monthly) (US\$, Nov. 1995)	General worker: 100-200 Engineer: 220-570 Middle manager: 410-1,100 (Jakarta)	General worker: 160-310 Engineer: 420-610 Middle manager: 932-1,880 (Bangkok)	General worker: - 290 Engineer: 740-1,440 Middle manager: 1,120-2,450 (Kuala Lumpur)	General worker: 160-220 Engineer: 230-270 Middle manager: 310-700 (Manila)
Purchasing Price of Industrial Estate (US\$,m ²)	60-66 (Jakarta)	82.5 (Bangkok)	85-128 (Kuala Lumpur)	3.6 (Manila) (Lent for a year)

Source: *Asian Business Guidebook (Asia Jigyo Tenkai Gaido)*, JAIC, September, 1994
Tsusho Koho, JETRO, November 13, 1995

4.2.1 Investment and Export Promotion Policies in Thailand

The cornerstone of Thailand's export and investment promotion policy is attracting export-oriented foreign capital enterprises by means of deregulation, and reducing production costs and increasing international competitiveness through import liberalization. Through the "Investment Stimulation Law" of 1977 and the "Revised Investment Stimulation Law" of 1991, Thailand's Board of Investment (BOI) provides export-oriented companies with various preferences, including exemptions from import duties on raw materials and components. The actual preferences differ according to "investment incentive industries," location of operations, export ratio, and other conditions. In an effort to eliminate traffic congestion and other infrastructure-related problems caused by excessively heavy concentration of business and population in the capital Bangkok, the government is trying to entice companies to locate in outlying regions. The country is divided into three different zones according to the distance from Bangkok, and very generous incentives are offered to companies which locate in Zone 3, the areas farthest from the capital.

Additionally, in 1993 the following incentives were adopted in order to promote exports:

- foreign interests may own all of the stock of companies which export 80% or more of their product
- projects located in Zone 1 which export 80% or more of their product are exempt from corporate income taxes for a period of three years. If such companies are located in Zone 2, this period is extended to seven years

Then, in October 1993 and June 1994, respectively, new incentive programs were implemented to stimulate investment in molding and other metal processing sectors, and, as a means of nurturing a components manufacturing industry, investment in 10 industry sectors such as tools and dies, surface processing, and so on. These incentive programs were designed to reinforce subcontract industries which support the automobile, electrical/electronics, and other assembly and export industries. Half of all foreign investment is by export-oriented Japanese and Japanese-affiliated companies.

4.2.2 Investment and Export Promotion Policies in Malaysia

In September of 1971 the "Investment Stimulation Law", which emphasized labor-intensive, export-oriented investment, was enacted. That same year, off-shore manufacturing was encouraged through the enactment of the "Free Trade Zone Law". Malaysia's investment climate was further improved by the simplification of customs procedures. At the present time, the investment promotion law of 1986 is applicable. Export-oriented economic policies continue intact, and companies recognized as contributing to the national interest or to exports are given special privileges as "pioneer companies". Pioneer companies are eligible for reduced income tax rates, investment tax deductions, and other incentives.

In pursuit of more advanced industry, high-tech industry stimulation measures were launched in 1994, and various incentives were established, including five-year income tax exemptions, investment tax deductions, and so on. High-tech enterprises are defined as companies whose R&D expenditures total 1% of gross annual sales, 7% of employees are engineering specialists, and so on. The following ten sectors have been designated as high-tech industries. Malaysia also offers income tax and investment tax incentives for R&D companies. The few sectors are:

semiconductors, medical/scientific devices, bio-technology, automation technology, fiber optics, new materials, opto-electronics, software development, new energies, and aircraft

Foreign ownership limits are determined according to export ratios. For instance, companies which export 80% or more of their product can be 100% foreign owned. Investment incentives are selective depending on the industry sector.

As part of its Bumiputra policy (policy to boost the status of the indigenous Malay ethnic group), the government implemented a plan to nurture local vendors, and is soliciting the cooperation of local foreign-capital companies in developing approximately 100 companies with Malay ownership of 70% or more.

4.2.3 Investment and Export Promotion Policies in the Philippines

Foreign direct investment in the Philippines is regulated by the "Omnibus Investment Law" of 1987 and the "Foreign Investment Law" of 1991. Incentive programs differ depending on which agency has jurisdiction-- the Board of Investment (BOI) or the Economic Zones Agency (PEZA). In the case of companies registered with the BOI (divided into pioneer companies and non-pioneer companies), pioneer companies are eligible to receive a number of incentives, including exemption from income taxes for the first six years of operation, application of reduced tariff rates on imported capital goods, duty exemptions on imported raw materials, approval to hire foreign workers, and so on. Companies registered with PEZA (export companies) are also given attractive incentives, such as exemption from income taxes for up to eight years, exemption from import duties on capital goods and components, permanent resident status for foreign investors and their families, and repatriation of profits without the approval of the central bank.

In addition, pioneer companies, non-pioneer companies with export ratios of 70% or higher, and companies located in export processing zones are all allowed to have 100% foreign ownership. Companies in the automobile industry are required to achieve a phased increase in domestic content ratios, and automobile assembly companies must obtain foreign currency by exporting automobile components equivalent to a designated percentage of the value of their component imports.

Finally, PEZA was established in February of 1995, and absorbed the Export Processing Zone Agency (EPZA). In addition to managing the existing export processing zones (EPZ), PEZA also has jurisdiction over newly-created "special economic zones" called 'eco-zones'.

5. MATERIAL PROCESSING INDUSTRIES IN ASIA

5.1 CASTING INDUSTRY

5.1.1 Thailand

Official statistics on the casting industry in Thailand have been poorly organized, just as is seen with other ASEAN countries. According to a survey by MIDI, the number of companies in the casting industry is approximately 500. Many of them are small, and concentrated in Bangkok and its outskirts.

The casting industry used to serve chiefly the agricultural machinery industry and the mining machinery industry, but the customer industries have been gradually shifted to the automotive related industry and the construction machinery industry. The production volume has shown a very rapid growth in recent years with a rapid increase of foreign investments into the industry. Today, the total domestic output is estimated at around 500 to 700 thousand tons per year, which is the largest in the ASEAN countries.

Foreign casting companies have begun to produce automotive parts and components such as engine blocks and cylinder heads, and contribute to the localization of automotive parts and components. However, most domestic casting companies have not reached the level that can satisfy the requirements of the automotive industry because they still have problems both in production facilities and production technology. In addition, the casting industry does not have cost competitiveness as the cost of energy is relatively high, and many raw materials are imported.

5.1.2 Malaysia

There are about 160 casting companies in Malaysia based on the directory of FOMFEIA, an industry organization. Roughly half of them are located in Kuala Lumpur and the state of Selangor. The total supply of casting products in the country is estimated at around 70 thousand tons per year, and a part of them are exported to Singapore and Indonesia.

The majority of casting companies use old-fashioned single function machines, and they are far behind in the adoption of automated processing systems as well as the mechanization of production. Most companies except for some large scale companies and those who produce automotive parts have little interest in quality, and few have established a strict quality inspection system. Sand and scrap are available in the country, but pig iron is imported from China, Brazil, Japan, etc.

5.1.3 Philippines

There are approximately 150 casting companies in the Philippines according to the member list of PMAI, an industrial organization. About 100 of them are actually in operation. The majority of companies are located in Luzon island where the capital of the country, Manila, is located. The annual production of iron casting is about 60 thousand tons, and cast products are used for automotive parts (except for engine parts, and are used mainly for after sales service parts), various kinds of machinery, bearings, propellers, etc. A little more than 10 companies including some companies related to giant industrial families have a monthly production capacity beyond 100 tons, but the majority of companies have a small production capacity of less than 50 tons per month.

Few companies have proceeded with the mechanization and the automation of production facilities. Employees also are not conscious about safety, quality, or cost. In addition, only a few managers and engineers are familiar with the basic technology of casting. As a result, the quality level of casting products is, in general, very bad. However, casting products made by several companies who produce casting parts for the automobile industry are not bad. Sand and scrap are mainly imported from Taiwan although these materials in poor quality can be procured within the country. Pig iron is chiefly imported from Brazil and China.

5.1.4 Vietnam

The casting industry in Vietnam is concentrated in Ho Chi Minh City and Hanoi. In Ho Chi

Minh City and its outskirts, there are about 300 casting companies, and they turn out roughly 3,000 tons per month.

There are few specialized casting companies in the country. In most cases, machining companies have casting shops within the factories, and produce casting products for themselves.

Many production facilities are very old, having been made in the 1970s, and have been neither well maintained nor renovated. Machines made in the Soviet Union are widely used. Most factories are not equipped with adequate machinery, and lack inspection equipment. The quality of main and auxiliary materials is not properly managed, but is narrowly controlled by the experience which has been accumulated at the casting shops. In recent years, because the market has been invaded by Chinese products, the demand for domestic casting products has not shown an increase. Raw materials are imported since domestic materials have problems both in quality and quantity. Pig iron is mostly imported from Brazil and Korea.

5.2 FORGING INDUSTRY

5.2.1 Thailand

There are about ten major forging companies in Thailand. Most of them are relatively new, having been established in the last several years. The total output of forging products in the country is estimated at around 50 to 60 thousand tons per year. The forging industry in Thailand has grown to become the largest among ASEAN as the automotive industry in Thailand has expanded very rapidly in recent years.

Most production technologies have been introduced from Japanese affiliated automobile assemblers and Japanese affiliated forging manufacturers. Most production facilities are used ones, and dies are supplied by customers or imported from Japan and Taiwan. Steel materials are also mostly imported from Japan.

The government encourages automobile assemblers to increase the localization of parts and components, and Japanese affiliated automobile assemblers are trying to localize automotive parts such as crankshafts, connecting rods, and axle shafts. Subsequently, technical collaboration between domestic forging companies and Japanese forging companies is becoming active. Japanese forging companies are also accelerating direct investments into the country.

5.2.2 Malaysia

In Malaysia, the forging industry has not yet developed. According to MIDA, several forging companies have been authorized, but they have not yet come into being.

5.2.3 Philippines

There are seven major forging companies in the Philippines according to research conducted by MIRDC. Among them, only two companies are solely engaged in forging while the other companies do forging as a side job and are producing parts such as bolts, nuts, and

grinding balls.

The total production volume of forging products in the Philippines is about 60 thousand tons per year, and a wide range of products including automotive components, heavy industrial parts, and hand tools are currently produced. Large-sized forging products have not been produced.

Only three companies have press machines, and conduct pattern forging. These companies are equipped with heat treatment facilities for dies, and the quality level of their products is considered to be medium. Steel materials are all imported.

Aichi Seiko of Japan plans to buy Philippine Forge, and expand the production to 5,000 tons per year in 2000 in order to meet the demand for automotive forging parts in Southeast Asia.

5.2.4 Vietnam

There are no modern forging factories in Vietnam because the machinery industry on the whole has not yet been developed. The state-owned machinery factory has in-house forging shops, and they produce a small amount of forging parts such as diesel engine parts, bicycle parts, and textile machinery parts. There are some forging companies who are specialized in forging. They chiefly produce cutlery and agricultural implements.

5.3 METAL PRESS WORK AND DIE MAKING INDUSTRIES

5.3.1 Thailand

Most press work products produced in Thailand are automotive related parts. A substantial number of automotive parts except for external panels for passenger cars and large-sized buses have been localized. On the other hand, precision press parts used for electric and electronic parts are small in quantity. For that reason, the production of precision dies and the field of high speed precise machining are substantially behind.

Most press machines are imported used ones and are very old. Most small- and medium-sized press machines are also old, and the quality of products is not stable since the basic technology on press work is lacking. There are many press machine manufacturers in the country, and they produce chiefly old fashioned mechanical press machines.

There are approximately 160 press die manufacturers in the country. About 80% of them are small scale companies with not more than 100 employees. Japanese press die manufacturers have actively invested in this country recently, and today large-sized press dies for the automotive industry are produced locally. On the other hand, domestic press die manufacturers import expensive die materials from Japan, and produce press dies using machines imported from Taiwan, Singapore, China, etc. They lack engineers who can design dies. In addition, they are not able to invest in new production facilities because of their relatively small business size.

5.3.2 Malaysia

The press die industry in Malaysia is in striking contrast with that in Thailand. Most large-sized press dies for automobile assemblers which include PROTON are imported from Japan. The degree of localization of dies in Malaysia is much lower than that in Thailand. However, in the field of precise press work, i.e., progressive processing with progressive dies, Malaysia is ahead of Thailand. Major products of precise work are medium, small, and very small in size. In this field, Malaysia may be the most advanced country among the

ASEAN countries.

There is not a press machine manufacturer in the country. Die making facilities, press machines, and their auxiliary equipment are mostly made in Japan. Most press parts are supplied to Japanese affiliated electric and electronic manufacturers and Japanese affiliated telecommunication equipment manufacturers.

Die related manufacturers are concentrated in Kuala Lumpur and the state of Selangor. There are approximately 380 companies, including press dies and plastic molds, in the industry.

Domestic press dies and stamping dies are used for products which are small in size and do not require critical accuracy, while large-sized press dies with high accuracy and complex structure used for automotive body parts are produced in-house by foreign affiliated press die manufacturers or are imported from Japan, Taiwan, etc.

The production level of press dies is very high at a Matsushita affiliated die manufacturer, followed by foreign affiliated die manufacturers, and then domestic die manufacturers. Some factories have the latest type of machine tools, but few are equipped with three-dimensional measuring equipment. Materials for dies are all imported from countries such as Sweden, Germany, and Japan. Most standard die parts are also imported from Germany, Japan, etc.

5.3.3 Philippines

The press industry in the Philippines is behind that of the other ASEAN countries except for in-house press work within foreign affiliated companies. The press work industry is going to grow as major customers of the press products, i.e., the automotive industry and the consumer electric and electronic industry, maintain their sound expansion.

A variety of press parts from small to large in size are locally produced, and the demand is also expanding. However, these parts are not good, quality-wise. Many old obsolete

press machines are still operating. Most press dies are block type with single function. In addition, most dies are not properly heat treated. There are two press machine manufacturers, and they produce small old fashioned machines.

5.4 PLASTIC MOLDING AND MOLD MAKING INDUSTRIES

5.4.1 Thailand

In Thailand, more factories than in any other country in ASEAN are engaged in plastic injection molding and mold making. However, the technology level has not reached a level which fully satisfies the specifications of customers. This is considered to be attributed to the lack of trouble shooting capability, the underdeveloped education system of mold maintenance skill in the country, and so on.

At present, standard resins are widely used as the material of plastic injection molding. However, plastic injection products which use engineering plastic resins such as PBT, POM, PC, and PA66 are predicted to increase in the future. Therefore, plastic injection technology and mold design technology to use engineering plastic resins would be needed.

5.4.2 Malaysia

In Malaysia, the plastic injection molding industry and the mold making industry have been actively developed by the government to reach the top level in the ASEAN countries as Singapore has done. Especially, the introduction of plastic molding technology for electric and electronic parts has been encouraged, and the development of human resources has been attempted for a long time. As a result, many excellent plastic molding companies have grown up in Kuala Lumpur, Penang, Butterworth, and Johor. Engineering plastic molding companies have also emerged.

Mold makers are located in the same areas as plastic molding companies. In Malaysia, the localization of molds for plastic molding started earlier than dies for metal processing. In recent years, molds and dies for the production of parts such as cabinets and back covers of ordinary TVs, and automotive wheel covers are produced locally. However, molds for plastic cabinets and covers of large-sized TVs, automotive bumpers, and instrument panels are not produced by domestic companies but by foreign affiliated companies at their in-house die and mold making shops, or are imported from Japan, Singapore, etc.

5.4.3 Singapore

In Singapore, there are approximately 270 companies and 3,000 employees in the mold making industry. Among them, 50 companies are said to be exclusively engaged in mold making. The major customers of molds are press work companies and the plastic molding companies in the electronic industry and the light industry.

Mold making companies, in general, are capital intensive with a high technology level. Most of them are equipped with the latest production technology such as CAD, CAM, and CNC machine tools, and are considered to be at a high level in Asia. Many companies which receive technical assistance from overseas companies export molds for plastic injection molding to Asia, Europe, and the U.S.A.

The production of molds in Singapore is small, covering about 50% of the whole domestic demand. The country depends on imported molds for the rest of the demand. By size, small molds which weigh less than 1,000 kgs are produced locally, but large molds which weigh more than 10,000 kgs are mostly supplied from Taiwan and Hong Kong.

The most critical problem for the mold making industry is high production costs, and the production is being transferred to foreign countries such as Indonesia, Malaysia, and China. The high production costs are caused by the lack of experienced specialists. The government is trying to improve the level of techniques especially in the fields of mold making and CAD/CAM.

SPETA is the industrial association in the industry in Singapore. The association is functioning actively, collaborating with mold making industries all over the world. There is a vocational school of mold making, PEI. PEI owns the latest machine tools, and grants its graduates certificates in technical skill.

As shown in Table 8-5-1 which summarizes the wages of Singapore companies by the type of job, those of technicians are higher than those of office workers. Table 8-5-2 compares

the present situations of mold making industries in Asia.

Table 8-5-1 Wage Level by Type of Job in Singapore (30 years old)

(Unit: Singapore \$)

Type of Job	Final Education	Average Monthly Wage
Office clerk	Junior high school	1,038
	High school	1,116
Technician	Vocational school	1,097
	Two-year college	1,494
Engineer	Two-year college	1,868
	College	2,227
Office supervisor	High school	1,701
	Two-year college	1,723
	College	2,199
Manager	Junior high/High school	2,863
	Two-year college	2,962
	College	3,181

Note: The above wages include food allowances and regular attendance allowances.

Table 8-5-2 Mold Making Industries in Asia

Area	Size	Structure	Characteristic
Korea	Year: 1994 Prod.: US\$ 1,200 mill. Expo.: US\$ 210 mill. Impo.: US\$ 190 mill.	300 exclusive mold makers 83%: less than 20 employees 12%: 20 to 49 employees 5%: more than 49 employees Total employment: 26,000	<ul style="list-style-type: none"> - The industry began expansion in late 1970s. In 1980s, technology was improved, and started the exportation to Japan and the U.S.A. - Financial combines produce high level molds for themselves. - Lack of talented people.
Taiwan	Year: 1994 Prod.: NT\$ 35.6 bill. Expo.: NT\$ 8.7 bill. Impo.: NT\$ 3.4 bill.	3,500 mold makers 70%: less than 11 employees 26%: 11 to 30 employees 4%: more than 30 employees Total employment: 19,000	<ul style="list-style-type: none"> - Large-scale mold factories affiliate large-scale companies. 60% of the total production is used internally. - Import raw material. - Lack of talented people.
Hong Kong	Year: 1988 Expo.: HK\$ 1 bill.	2,400 factories 65%: less than 11 employees Total employment: 20,000	<ul style="list-style-type: none"> - Domestic production covers 60% of the total demand. - Level of molds is low because of the absence of heavy industry in the country. - Insufficient financing to purchase the latest machines. - Expansion to China is in order to seek lower labor cost.
Singapore	Prod.: US\$ 90 mill.	270 mold makers Total employment: 3,000	<ul style="list-style-type: none"> - Major customer is the electronics industry. - Most mold makers are small-scale and capital-intensive. - Domestic production covers 50% of the total demand.
Malaysia	Year: 1987 (estimate) Prod.: M\$ 201 mill. Expo.: M\$ 2,549 Impo.: M\$ 105,680 thousand	60 mold makers (one half of them do plastic injection molding) 80%: 20 to 30 employees	<ul style="list-style-type: none"> - Import raw material. - Lack of skilled workers. - Matsushita's vendors have the same technology level as Singapore companies. - Large-scale molds are imported.
Thailand	Year: 1991 Prod.: B 1.8 bill. Expo.: B 468 mill. Impo.: B 3.6 bill.	500 factories 70 to 80%: less than 11 employees	<ul style="list-style-type: none"> - 60% of the mold makers were established about 10 years ago in line with governmental industry development. - Majority of mold makers are located in Bangkok and its outskirts. - Many companies use Taiwanese and Chinese machine tools. - Lack of engineers.
Indonesia	Year: 1987 Expo.: US\$ 20 thousand Impo.: US\$ 21,140 thousand	Major molding makers: 17 (9 out of 17 sell molds to outside companies)	<ul style="list-style-type: none"> - Except for a few foreign affiliated companies, there are a few exclusive mold makers. Their technology level is low. - Domestic molds are mainly used for the production of sundry goods. High level molds are imported from Taiwan and Korea. The highest level molds are imported from Japan and Australia.
China	Year: 1993 Prod.: US\$ 2.1 bill.	200 exclusive mold makers (in addition, there are mold makers who produce molds for themselves)	<ul style="list-style-type: none"> - There are a few exclusive mold makers. Foreign investment in the field is expanding. - Lack of management capability and technology, which is necessary for modernization. - Precision molds are imported.

Source: "Asia Molds and Dies Conference", Molds and Dies Association

In the meantime, there are approximately 500 plastic molding manufacturers in Singapore, and they employ around 16,000 people.

The size of plastic molding manufacturers is relatively small. They mostly produce items for the electric and electronic industry. In recent years, as electric and electronic manufacturers continue to move to Indonesia and Malaysia, plastic molding manufacturers are shifting their factories to these countries.

The demand for plastic molding products in Singapore is regarded as being saturated, and further expansion cannot be expected. In addition, under the situation where labor intensive industry is subject to a higher level of tax in Singapore, the plastic molding industry, except for those companies who produce engineering plastic products, are considered to decrease gradually.

a. Plastic parts for electric and electronic products

The computer market in Singapore is saturated. In addition, the production of audio visual products such as radio cassette players is moving to Malaysia. As a result, the domestic demand for electric and electronic plastic parts is considered to decrease. However, the total production size of plastic parts in terms of value is forecast to stay as it is now because the demand for engineering plastic parts, such as switches, relays, stoppers, holders for household electric products and audio products, is increasing.

b. Plastic sundry goods and toys

Approximately 10% of the plastic sundry goods needed are produced in the country, and the rest of the demand is filled by imports.

The trade development commission of Singapore invites designers of plastic products, and tries to improve the technology level of plastic sundry goods manufacturers so that they can export their products.

6. EVALUATION OF RELATIVE SUPERIORITY AND INTERNATIONAL COMPETITIVENESS OF INDONESIA'S PARTS MANUFACTURING INDUSTRY

6.1. RELATIVE SUPERIORITY OF MACHINE TRADE BY ASEAN COUNTRIES IN THE ADVANCED NATIONS MARKET

In regards to machine trade with the advanced nations by the four ASEAN nations plus Korea, Taiwan and China, for a total of seven nations, relative superiority can be viewed by item (SITC 2 digits category) for exports by country using OECD statistics.

Relative superiority is determined by comparing trade specialization coefficients, that is: $[(\text{OECD import value} - \text{OECD export value}) / (\text{OECD import value} + \text{OECD export value})] \times 100$. Trade specialization coefficients can range from 100 to - 100. A coefficient in the range of 100 to zero indicates that in the realm of OECD trade the ASEAN nations are exporting nations of the product being considered. From zero to - 100 indicates that they are importing nations.

Since OECD statistics are being used, imports and exports, as denoted in the figures and tables, are imports and exports from an OECD standpoint. OECD imports thus denote exports by developing countries.

6.1.1 Competition among East Asian Nations in Machine Trade in the Advanced Nations Market

From a comparison of the major items of machine trade by east Asian nations with the advanced nations, the following distinctive features can be noted (See Table 8-6-1).

(1) Power Machinery and Parts

As of 1993, none of the developing countries were net exporters of power machinery and parts, but China achieved substantial growth in its exports from the 1980s. In 1993, the

value of its exports in this category reached approximately 500 million US dollars, making it the largest exporter of power machinery and parts among the seven nations. Exports by Thailand and Malaysia increased rapidly in the 1990s, but export values still remain low. Export capacities of Taiwan and Korea dropped, exhibiting negative growth in the 1990s. Exports by Indonesia and the Philippines have grown, but monetary sums are still low.

(2) Industrial Machinery and Parts

As of 1993, the advanced nations had extensive export capabilities in this category but there were no net exporters among the developing nations. Exports by Taiwan accounted for an overwhelmingly large portion of total exports by the developing nations, but Taiwan's exporting capacity has been declining somewhat. (The value of its exports in 1993 was approximately 865 million dollars.) From 1985, Thailand's exports continued to grow at an average annual rate of over 60 percent, but the value of its exports has remained low. Among the ASEAN nations, however, Thailand is the greatest in terms of export value.

In this category, the growth in exports by China has been substantial, and in terms of export value, it ranks in third place after Korea, but of the seven nations, China is the largest in terms of import value. There are almost no exports of industrial machinery and parts from Indonesia or the Philippines.

(3) Metal Processing Machinery and Parts

In this category, the value of Taiwan's exports was large at 340 million dollars in 1993, but overall growth in such exports in the 1990s turned negative for Taiwan, as it did for Korea. Taiwan's imports of metal processing machinery and parts expanded so that the nation shifted from net exporter to net importer status. The growth in China's exports also stagnated in the 1990s while imports increased extensively. This is ascribed to expanded investments in plant and equipment in line with the advancements of foreign capital invested in China.

From the year 1985, Thailand's exports have continued to expand at an average annual rate of well over 30 percent, making Thailand the leading exporter in this category among the ASEAN nations. Nevertheless, the value of Thailand's imports has reached over 17 times the value of its exports. The three nations of Indonesia, Thailand and the Philippines still have no export capacity in this category.

(4) General Machinery and Parts

In this category, Taiwan's exports were the largest in 1993 at 1,660 million dollars, but the margin of growth in this export category has been shrinking. China's exports increased dramatically from the 1980s, reaching 960 million dollars in 1993, placing China ahead of Korea and just behind Taiwan in this category.

Among the ASEAN nations, Thailand's exports were the largest, but so were its imports. Indonesia and the Philippines have almost no export capacity in this category.

(5) Business Machines and Parts

As of 1993, all of the seven nations except Indonesia were net exporters of business machines and parts. Taiwan's export capacity was the greatest, reaching an export value of 11, 060 million dollars in 1993. Its share of the total OECD import value is also large at 8 percent.

Among the ASEAN nations, Malaysia and Thailand exhibit substantial export capacities. In the 1990s, Malaysia, in particular, showed an average annual growth rate of 96 percent. Indonesia's average annual growth in the 1990s has been about 360%. Accordingly, only a little more growth is needed for it to become a net exporter.

(6) Communications Equipment and Parts

As of 1993, each of the seven nations, including Indonesia, was a net exporter of com-

munications equipment and parts. In 1993, Malaysia became the largest exporter (export value of 5,300 million dollars), outstripping Korea, Taiwan and China. In the 1990s, growth in this category of exports by Korea and Taiwan turned negative. This trend is ascribed to more and more transfers of production bases to ASEAN nations.

Exports by China have continued to expand, reaching a value of 4,700 million dollars in 1993. Every year since 1985, Indonesia's exports in this category have continued to double or increase even more, swelling to 780 million dollars in 1993.

(7) Electrical Machinery and Parts

Korea and Taiwan are the two leaders in this category, but Malaysia achieved a comparable scale in 1993. (Export values were: Korea: 6,800 million dollars; Taiwan: 6,100 million dollars; Malaysia: 5,700 million dollars). Exports from Korea are increasing but Taiwan has shifted from net exporter status in the 1980s to being a net importer in the 90s.

Indonesian exports exhibited substantial growth at a yearly average of 72 percent in the 1990s, but export values are still low. The three net exporters in 1993 were China, Korea and Malaysia.

(8) Automobiles and Parts

Except for Korea, all the countries under study were importers of automobiles and parts in 1993. Korea became an exporting nation in the 1980s because it had implemented import restrictions on automobiles in order to protect its own national industry. Exports of passenger cars, in particular, have been substantial. The value of exports from Taiwan reached 2,300 million dollars in 1993, surpassing the figure for Korea, but the export items were mostly parts. Nevertheless, the value of Taiwan's imports in this category has surpassed that of its exports.

(Unit: Million US\$, %)

Table 8-6-1 OECD Machine Trade with East Asia

Code No.	Category by Importing Country	1985					1990					1993				
		Exports	Imports	Trade Specialization Coefficient	Average Yearly Growth Rate	Imports	Exports	Imports	Trade Specialization Coefficient	Average Yearly Growth Rate	Imports	Exports	Imports	Trade Specialization Coefficient	Average Yearly Growth Rate	
SITC71	Power Machinery/ Parts	34,669.6	28,595.3	-9.6	70,956.7	15.4	58,071.1	15.2	80,179.2	4.2	62,086.9	4.2	62,086.9	2.3	-12.7	
	Indonesia	227.7	1.9	-98.3	632.0	22.7	12.3	45.3	979.7	15.7	22.4	15.7	22.4	22.1	-95.5	
	Thailand	163.4	7.9	-90.8	1,046.2	45.0	95.7	64.7	1,171.2	3.8	224.6	3.8	224.6	32.9	-67.8	
	Malaysia	183.6	35.2	-67.8	351.2	13.9	43.2	4.2	963.5	40.0	172.0	40.0	172.0	58.5	-69.7	
	Philippines	117.0	26.9	-62.6	357.4	25.0	7.9	-21.7	1,074.4	44.3	23.2	44.3	23.2	43.2	-95.8	
	Korea	534.3	62.6	-79.0	1,199.9	17.6	310.1	37.7	1,578.8	9.6	282.6	9.6	282.6	-3.0	-69.6	
	Taiwan	429.3	158.5	-46.1	1,104.4	20.8	310.6	14.4	1,282.6	5.1	287.3	5.1	287.3	-2.6	-63.4	
	China	385.0	9.6	-95.1	1,243.9	26.4	227.0	88.3	1,745.7	12.0	489.7	12.0	489.7	29.2	-56.2	
SITC72	Industrial Machinery/ Parts	51,410.4	33,668.4	-20.9	108,557.8	16.1	75,172.1	17.4	106,421.4	-0.7	60,636.5	-0.7	60,636.5	-6.9	-27.4	
	Indonesia	397.7	0.4	-99.8	1,900.4	36.7	3.7	56.0	1,679.7	-4.0	6.4	-4.0	6.4	20.0	-99.2	
	Thailand	262.3	0.8	-99.4	1,773.6	46.6	9.3	63.3	2,032.5	4.6	43.7	4.6	43.7	67.5	-95.8	
	Malaysia	369.6	6.2	-96.7	1,037.9	22.9	16.6	21.8	1,254.0	6.5	16.3	6.5	16.3	-0.6	-97.4	
	Philippines	96.8	3.4	-93.2	362.0	30.2	4.3	4.8	474.1	9.4	4.3	9.4	4.3	0.0	-98.2	
	Korea	980.1	37.3	-92.7	3,429.2	28.5	233.8	44.4	3,469.3	0.4	307.1	0.4	307.1	9.5	-83.7	
	Taiwan	682.7	305.9	-38.1	1,917.0	22.9	742.5	19.4	2,511.9	9.4	865.1	9.4	865.1	5.2	-48.8	
	China	2,607.2	10.3	-99.2	2,037.4	-4.8	66.7	45.3	4,949.8	34.4	171.1	34.4	171.1	36.9	-93.3	
SITC73	Metal Processing Machinery/ Parts	12,403.1	9,024.3	-15.8	27,986.9	17.7	21,078.4	18.5	23,479.4	-5.7	14,035.2	-5.7	14,035.2	-12.7	-25.2	
	Indonesia	107.0	0.1	99.9	192.1	12.4	0.4	51.6	208.3	2.7	1.2	2.7	1.2	44.2	-98.9	
	Thailand	69.8	0.2	-99.4	357.9	38.7	14.2	134.6	570.3	16.8	33.0	16.8	33.0	32.5	-89.1	
	Malaysia	56.8	0.2	-99.3	228.1	32.1	2.9	70.7	342.6	14.5	3.4	14.5	3.4	5.4	-98.0	
	Philippines	41.0	0.2	-99.0	102.3	20.1	1.8	55.2	134.0	9.4	2.5	9.4	2.5	11.6	-96.3	
	Korea	409.6	25.0	-88.5	1,298.1	25.9	118.4	36.5	1,093.9	-5.5	77.0	-5.5	77.0	-13.4	-86.8	
	Taiwan	141.8	234.6	24.7	562.6	31.7	511.7	16.9	971.7	20.0	342.5	20.0	342.5	-12.5	-47.9	
	China	517.7	10.5	-96.0	547.6	1.1	101.5	57.4	1,618.4	43.5	122.0	43.5	122.0	6.3	-86.0	
SITC74	General Machinery/ Parts	49,948.4	35,288.2	-17.2	116,217.0	18.4	91,280.8	20.9	125,419.6	2.6	86,727.2	2.6	86,727.2	-1.7	-18.2	
	Indonesia	485.6	0.7	-99.7	959.7	14.6	15.2	85.1	1,489.8	15.8	29.2	15.8	29.2	24.3	-96.2	
	Thailand	310.2	64.5	-65.6	1,406.9	35.3	290.6	35.1	2,118.6	14.6	479.9	14.6	479.9	18.2	-63.1	
	Malaysia	312.6	12.8	-92.1	800.9	20.7	144.3	62.3	1,567.2	25.1	320.3	25.1	320.3	30.4	-66.1	
	Philippines	98.1	3.7	-92.7	416.5	33.5	11.4	25.2	599.9	12.9	21.6	12.9	21.6	23.7	-93.0	
	Korea	1,065.9	127.1	-78.7	3,651.5	27.9	797.4	44.4	3,591.2	-0.6	703.2	-0.6	703.2	-4.1	-67.3	
	Taiwan	487.8	382.3	-12.1	2,247.5	35.7	1,492.4	31.3	2,933.9	9.3	1,655.5	9.3	1,655.5	3.5	-27.9	
	China	1,231.6	21.5	-96.6	1,491.7	3.9	532.7	90.0	3,496.6	32.8	964.2	32.8	964.2	21.9	-56.8	

Source: OECD Statistics

Table 8-6-1 OECD Machine Trade with East Asia (Continued)

(Unit: Million US\$, %)

Code No.	Category by Importing Country	1985				1990				1993				
		Exports	Imports	Trade Specialization Coefficient	Average Yearly Growth Rate	Exports	Imports	Trade Specialization Coefficient	Average Yearly Growth Rate	Exports	Imports	Trade Specialization Coefficient	Average Yearly Growth Rate	
SITC75	Business Machines/ Parts	48,469.7	47,793.2	-0.7	101,029.4	15.8	113,931.9	19.0	6.0	115,323.5	4.5	138,171.4	6.6	9.0
	Indonesia	68.2	1.1	-96.8	162.1	18.9	2.1	13.8	-97.4	106.3	-13.1	99.2	261.5	-3.5
	Thailand	88.7	33.2	-45.5	326.5	29.8	853.0	91.4	44.6	592.1	21.9	2,223.8	37.6	57.9
	Malaysia	95.0	50.8	-30.3	241.6	20.5	338.6	46.1	16.7	492.4	26.8	2,562.3	96.3	67.8
	Philippines	54.6	11.1	-66.2	175.8	26.3	219.4	81.6	11.0	241.9	11.2	526.9	33.9	37.1
	Korea	464.9	579.2	10.9	1,282.7	22.5	2,465.5	33.6	31.6	1,212.1	-1.9	3,609.0	13.5	49.7
	Taiwan	400.2	1,361.6	54.6	1,192.1	24.4	6,994.9	38.7	70.9	1,486.6	7.6	11,063.7	16.5	76.3
	China	423.4	4.9	-97.7	266.5	-8.8	276.4	124.0	1.8	572.6	29.0	1,810.5	87.1	51.9
SITC76	Communication Equipment/ Parts	39,778.4	36,873.3	-3.8	70,693.1	12.2	72,313.4	14.4	1.1	78,682.5	3.6	78,981.1	3.0	0.2
	Indonesia	209.5	1.2	-98.9	349.1	10.8	53.7	113.9	-73.3	646.0	22.8	775.4	143.5	9.1
	Thailand	191.2	3.7	-96.2	635.4	27.1	833.1	195.5	13.5	836.6	9.6	1,646.2	25.5	32.6
	Malaysia	353.0	384.7	4.3	573.1	10.2	2,315.1	43.2	60.3	1,354.6	33.2	5,306.6	31.9	59.3
	Philippines	87.5	22.5	-59.1	201.5	18.2	289.3	66.7	17.9	368.0	22.2	626.7	29.4	26.0
	Korea	629.0	1,824.8	48.7	958.1	8.8	4,354.0	19.0	63.9	1,134.2	5.8	4,235.0	-0.9	57.8
	Taiwan	436.9	2,313.2	68.2	1,542.3	28.7	2,975.1	5.2	31.7	1,404.1	-3.1	2,454.8	-6.2	27.2
	China	1,696.1	58.6	-93.3	1,196.3	-6.7	2,534.5	112.4	35.9	3,773.0	46.7	4,717.6	23.0	11.1
SITC77	Electrical Machinery/ Parts	61,633.4	57,136.8	-5.8	145,808.6	18.8	136,537.6	19.0	-3.3	181,305.6	7.5	161,095.4	5.7	-5.9
	Indonesia	349.4	41.4	-78.8	562.5	10.0	48.6	3.3	-84.1	1,241.6	30.2	248.8	72.3	-66.6
	Thailand	339.8	249.3	-15.4	1,793.1	39.5	1,070.4	33.8	-25.2	2,906.0	17.5	1,874.4	20.5	-21.6
	Malaysia	1,351.7	1,714.4	11.8	3,295.3	19.5	3,136.5	12.8	-2.5	5,698.2	20.0	5,731.6	22.3	0.3
	Philippines	674.4	827.5	10.2	1,324.0	14.4	1,195.1	7.6	-5.1	2,379.3	21.6	2,154.6	21.7	-5.0
	Korea	1,713.4	1,594.5	-3.6	4,605.8	21.9	4,618.8	23.7	0.1	6,257.6	10.8	6,774.8	13.6	4.0
	Taiwan	1,473.8	2,015.7	15.5	4,878.6	27.0	4,704.2	18.5	-1.8	7,635.5	16.1	6,103.3	9.1	-11.2
	China	1,058.1	32.4	-94.1	1,108.1	0.7	1,217.7	106.5	4.7	1,979.9	21.3	3,712.8	45.0	30.4
SITC78	Automobiles/ Parts	152,332.3	135,040.3	-6.0	288,862.6	13.6	259,644.5	14.0	-5.3	310,587.0	2.5	266,970.9	0.9	-7.6
	Indonesia	358.2	0.3	-99.8	1,165.2	26.6	21.0	133.9	-96.5	992.8	-5.2	87.7	61.0	-83.8
	Thailand	388.9	3.1	-98.4	2,187.1	41.3	89.8	96.1	-92.1	3,214.9	13.7	184.5	27.1	-89.1
	Malaysia	520.6	6.8	-97.4	1,148.2	17.1	102.4	72.0	-83.6	1,146.1	-0.1	245.0	33.7	-64.8
	Philippines	77.2	17.8	-62.5	550.8	48.1	29.7	10.8	-89.8	859.0	16.0	53.5	21.7	-88.3
	Korea	301.2	570.7	30.9	949.2	25.8	1,900.8	27.2	33.4	1,054.4	3.6	2,277.4	6.2	36.7
	Taiwan	510.4	572.6	5.7	2,754.0	40.1	1,900.5	27.1	-18.3	4,258.3	15.6	2,310.8	6.7	-29.6
	China	2,172.9	5.7	-99.5	624.6	-22.1	183.6	100.3	-54.6	4,267.3	89.8	492.3	38.9	-79.3

Source: OECD Statistics

Among the ASEAN nations, Malaysia, which has been promoting exports of the "Proton" passenger car, has had the largest volume of exports in this category. Its exports stood at 250 million dollars in 1993, but imports were also large at 1,150 million dollars. Indonesia's exports have been increasing but the nation is still a net importer in this category.

6.1.2 Competition among ASEAN Countries in Electrical and Electronic Products Trades with the Advanced Countries

Looking at the growth in exports of machine products (excluding parts) by the ASEAN nations to the advanced nations, the following distinctive features can be noted from a comparison by item, in view of the status of competition, using OECD trade statistics (SITC 3-digits category, REV. 3).

Comparisons were made of a total of six nations, the four ASEAN nations plus Taiwan and Korea. China was not included. (See Tables 8-6-2 to 8-6-6 and Figures 8-6-1 to 8-6-16.)

(1) Business Machines

In the 1980s, Taiwan and Korea had great capacities for exporting business machines, but in 1989, exports from Malaysia and Thailand increased substantially, and in the 1990s, there has been a reverse in the exporting capabilities of Malaysia and Thailand as opposed to Taiwan and Korea. Exports from Indonesia also increased in 1991 and 1992, and the country became a net exporter in 1993.

(2) Computers and Peripheral Equipment

Taiwan and Korea were the first to become net exporters of computers and peripheral equipment, but in the 1990s, the ASEAN countries, except for Indonesia, also became exporters. Indonesia increased its exports in 1992 and 1993, establishing itself as a net exporter in 1993.

(3) Radios and Televisions

In the case of radio, all the ASEAN nations, including Indonesia and Thailand, had been importers, but they became net exporters in 1989. Taiwan and Korea were early in becoming exporters, but in the 1990s, Taiwan has been losing its exporting capacity.

With televisions, Taiwan's loss of exporting capacity is even more evident. It switched to being a net importer in 1993. This is seen as the result of Taiwanese companies shifting their production bases to ASEAN nations.

Indonesia has a high capacity for exporting not only radios but also televisions. It became a top-class exporter in 1993.

(4) Tape Recorders and Videos

Taiwan and Korea were the first to achieve growth in exports of tape recorders and videos. Among the ASEAN countries, Malaysia was the first to become an exporter, in 1988. In this field also, Taiwan's exporting capacity has been dropping during the 1990s.

Thailand became an exporter in 1989; the Philippines in 1991, and Indonesia in 1992. Foreign capital investments accounted in large measure for exports from each of these nations. The time periods mentioned above reflect the different periods when foreign investments were made in each nation.

(5) Communications Equipment

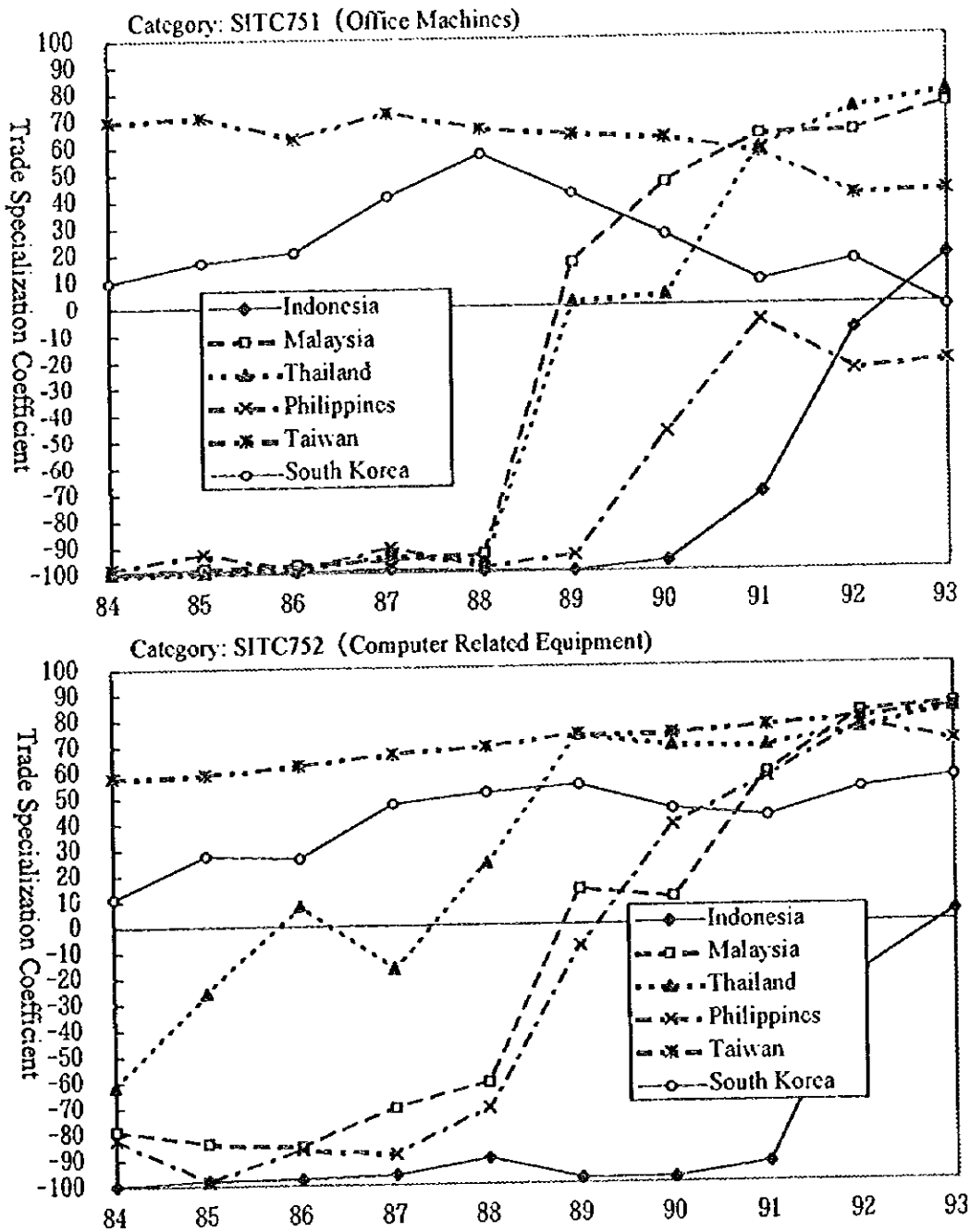
Taiwan was earliest in achieving growth in exports of communications equipment but Korea expanded its exports in this category to the point that it overtook Taiwan. Nevertheless, Korea's export capacity in communications equipment is small in comparison to other AV equipment. Among ASEAN nations, Malaysia and the Philippines were the first to expand exports of communications equipment, becoming net exporters in

1989, but now imports and exports are balanced. Thailand's exports swelled dramatically from 1989 to 1991. Indonesia increased its exports in the 1990s, but its export capacity is still weak and the country is still a net importer.

(6) Home Electrical Appliances

Korea and Taiwan were earliest in expanding exports of home electrical appliances, but in the 1990s, their export capacities have been trending downward. Among ASEAN nations, Malaysia was the first to boost exports, but thereafter its export capacity dropped, while Thailand's exports increased rapidly from 1988 to 1989. Indonesia has been the latest to export such appliances, and in 1993, its exports and imports became balanced.

Fig. 8-6-1 ASEAN Countries' Competitiveness in Electrical and Electronic Equipment among Developed Countries

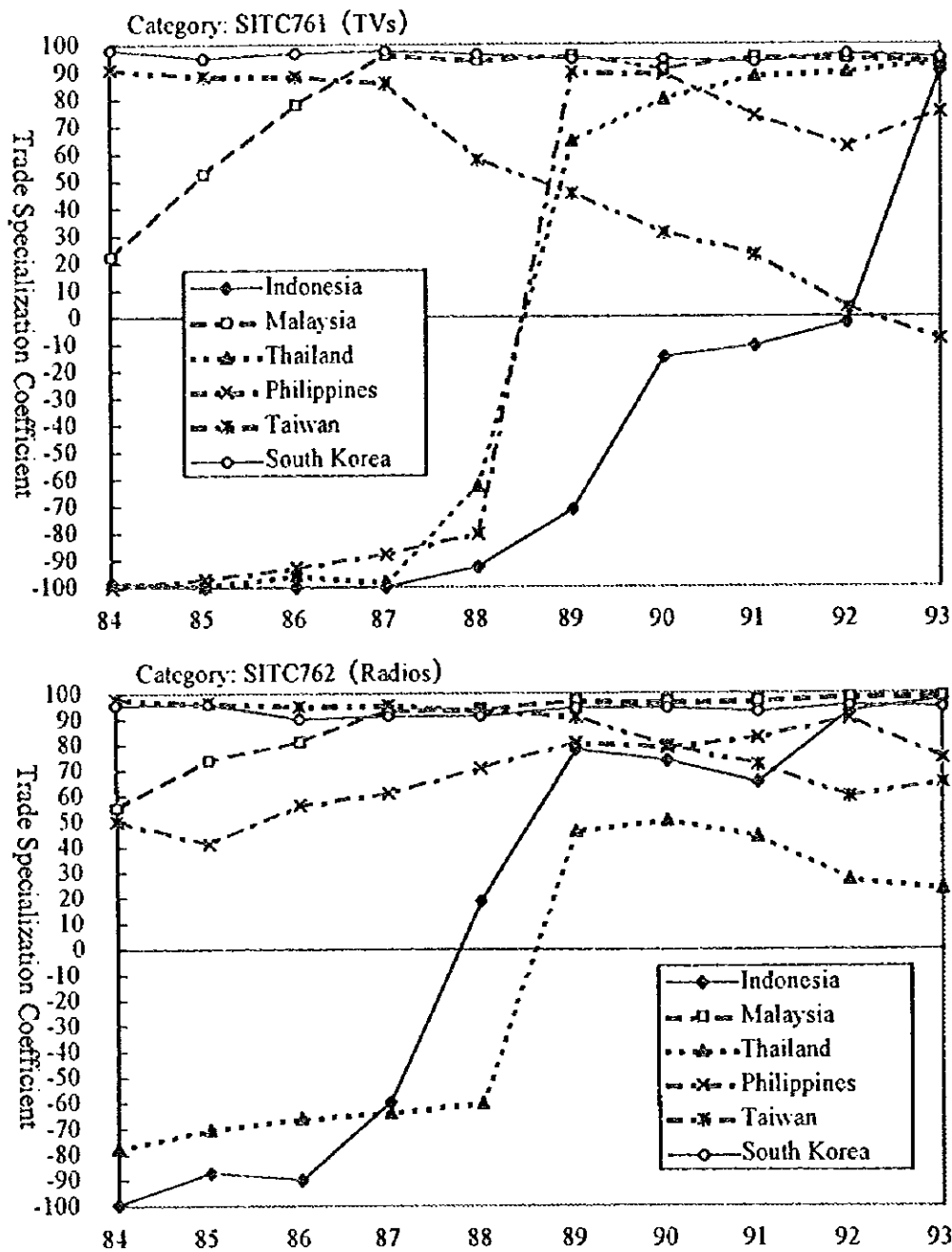


Note: 1. Categories are according to SITC 3 digit classification.
 2. Trade specialization coefficients are determined as follows:

$$\frac{[(Exports - Imports) \div (Imports + Exports)] \times 100}$$

 Source: OECD Statistics and ITI (International Trade and Investment Research Center), Japan

Fig. 8-6-1 ASEAN Countries' Competitiveness in Electrical and Electronic Equipment among Developed Countries (Continued)



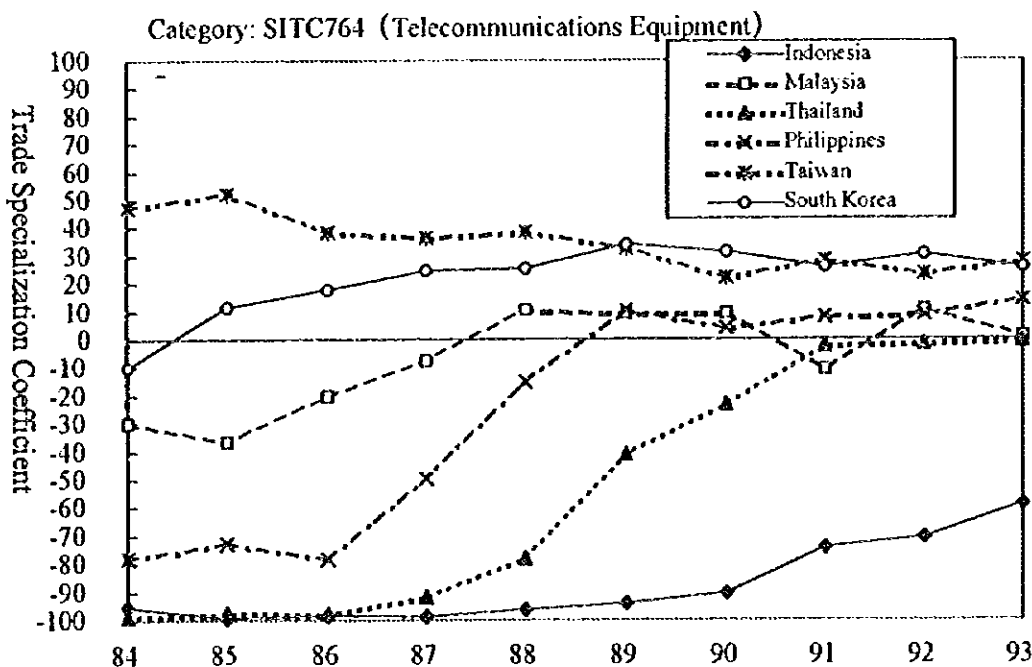
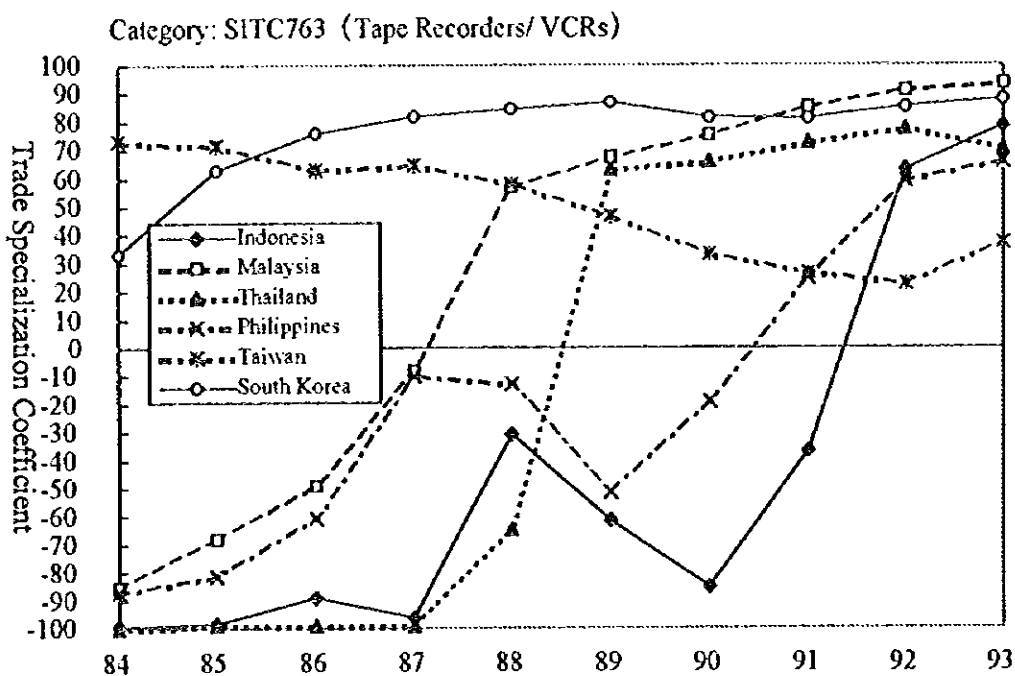
Note: 1. Categories are according to SITC 3 digit classification.

2. Trade specialization coefficients are determined as follows:

$$\frac{[(Exports - Imports) \div (Imports + Exports)] \times 100}$$

Source: OECD Statistics and IIT (International Trade and Investment Research Center), Japan

Fig. 8-6-1 ASEAN Countries' Competitiveness in Electrical and Electronic Equipment among Developed Countries (Continued)



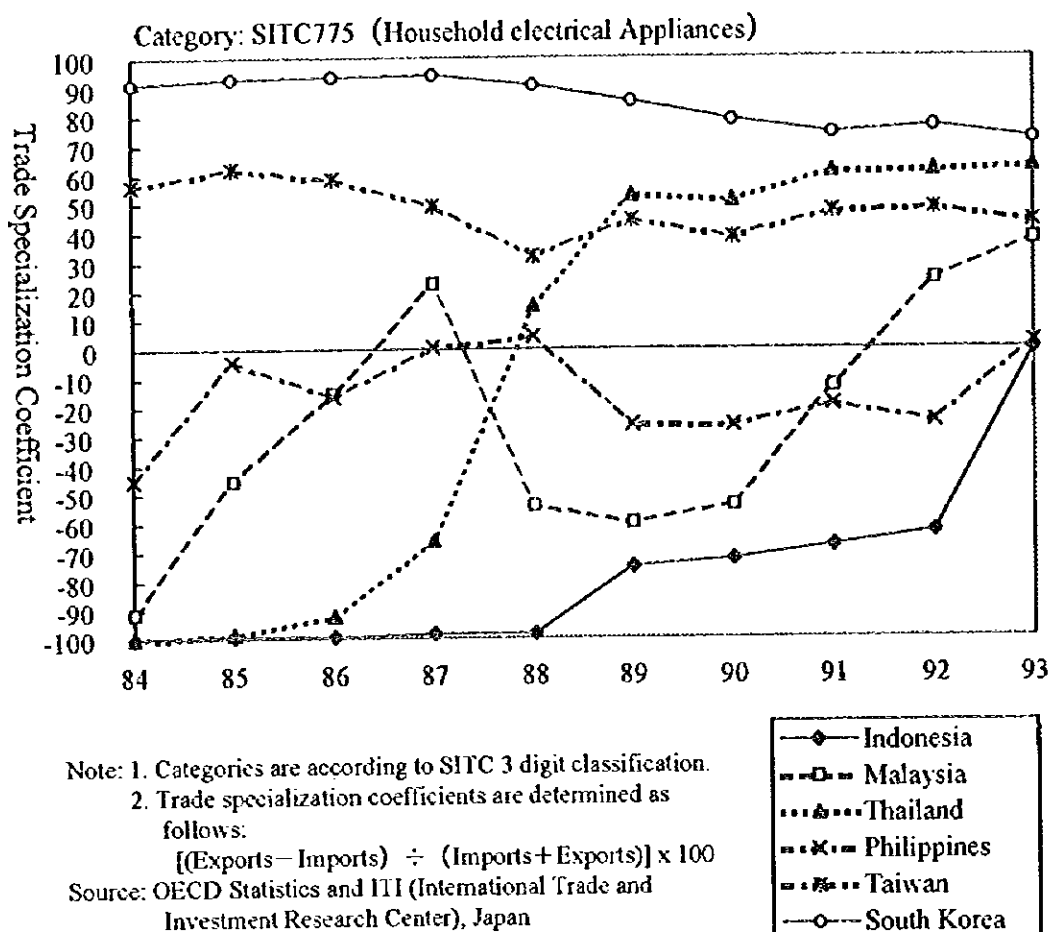
Note: 1. Categories are according to SITC 3 digit classification.

2. Trade specialization coefficients are determined as follows:

$$\frac{[(\text{Exports} - \text{Imports}) \div (\text{Imports} + \text{Exports})] \times 100}$$

Source: OECD Statistics and ITI (International Trade and Investment Research Center), Japan

Fig. 8-6-1 ASEAN Countries' Competitiveness in Electrical and Electronic Equipment among Developed Countries (Continued)



6.1.3 Exports of Machine Parts by ASEAN Nations to the Advanced Nations

Generally speaking, the developing countries import parts from the advanced nations, assemble them, then export them as finished products. Exports of parts to the advanced nations, therefore, are not very extensive. Usually, the bulk of parts exports by developing nations are directed at other developing nations. Once into the 1990s, however, there have been cases in which parts are imported from developing nations and assembled in advanced nations, so that parts exports have slowly started to climb. Multinational corporations have invested in developing countries in order to have parts, such as semi-conductors, assembled in these countries, and then exported. The nature of their investments, therefore, has varied with particular parts.

In regards to the major machine parts, the unique features of exports by the ASEAN nations to the advanced nations can be noted as follows. (See Fig. 8-6-2 to 4)

(1) Automotive Parts (Not Including Engines)

Taiwan, Korea and the Philippines were the first to achieve growth in exports of automotive parts, but imports in these countries are still greater than exports. The other countries are complete importers. In the wake of political instability in the Philippines, its exports dropped from the second half of the 1980s, but in the 1990s they have begun to exhibit steady recovery.

Indonesia is a net importer but its exports increased in 1992 and 1993. In Malaysia and Thailand as well, the percentage of imports is overwhelmingly large.

(2) Electrical and Electronic Parts

a. Electrical parts (switches, printed boards, resistors, etc.)

Taiwan's imports and exports of electrical parts are even in volume. Korea also exports large volumes but its imports are still larger. The four ASEAN nations are all net importers of electrical parts, but large volumes are exported from Malaysia and Thailand, while exports from Indonesia and the Philippines are sparse. Indonesia is the largest importer but its exports increased in 1992 and 1993.

b. Electronic parts (cathode ray tubes, semiconductors, etc.)

As of 1993, Korea, Malaysia and the Philippines were exporters while Indonesia, Thailand and Taiwan were importers of electronic parts. Despite the breakdown into importers and exporters, the margins of difference were not as great as with other parts. During the second half of the 1980s, Indonesia and Thailand shifted from exporter to importer status.

c. Business machines and computer parts and accessories

In this category, Taiwan's export capacity stands out from that of the other nations. Korea became an exporter in 1992 and 1993. Malaysia shifted from exporter to importer status in 1986, but then became a net exporter again in the 1990s. Thailand also became an exporter in the 1990s, but imports by both these countries are extensive. In 1993, Indonesia and the Philippines were importers, but Indonesia's imports have been the greater of the two. Indonesia's exports increased from 1991 to 1993.

(3) Machine Parts

a. Internal combustion engines

Taiwan and Korea are importers with little capacity to export internal combustion engines. All four ASEAN nations are also importers, but Thailand's export capacity is somewhat large.

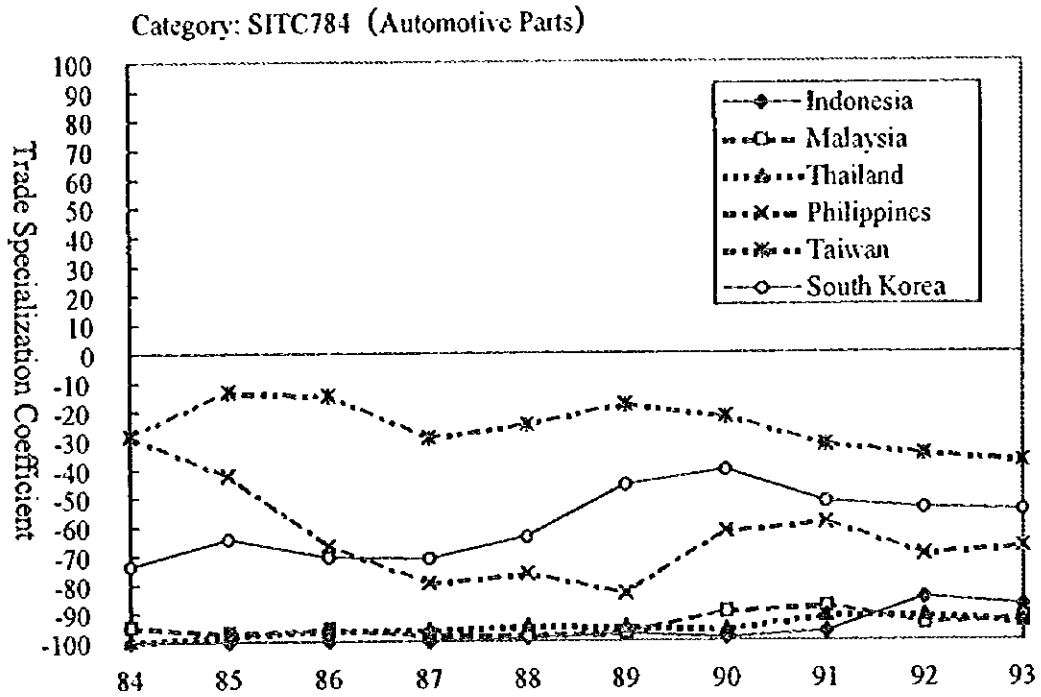
b. Pumps and compressors

In 1989, Taiwan shifted from exporter to importer status in this category. Korea also has little or no export capacity. All the ASEAN nations are importers, too, but Thailand and Malaysia have some degree of export capacity. The Philippines and Indonesia are complete importers.

c. Non-electrical machine parts (cocks, valves, molds, etc.)

Taiwan and Korea are importers but Taiwan's export capacity in this category is large. Among the ASEAN nations, Thailand's export capacity is large. The Philippines, Malaysia and Indonesia are complete importers.

Fig. 8-6-2 ASEAN Countries' Competitiveness in Automotive Parts among Developed Countries



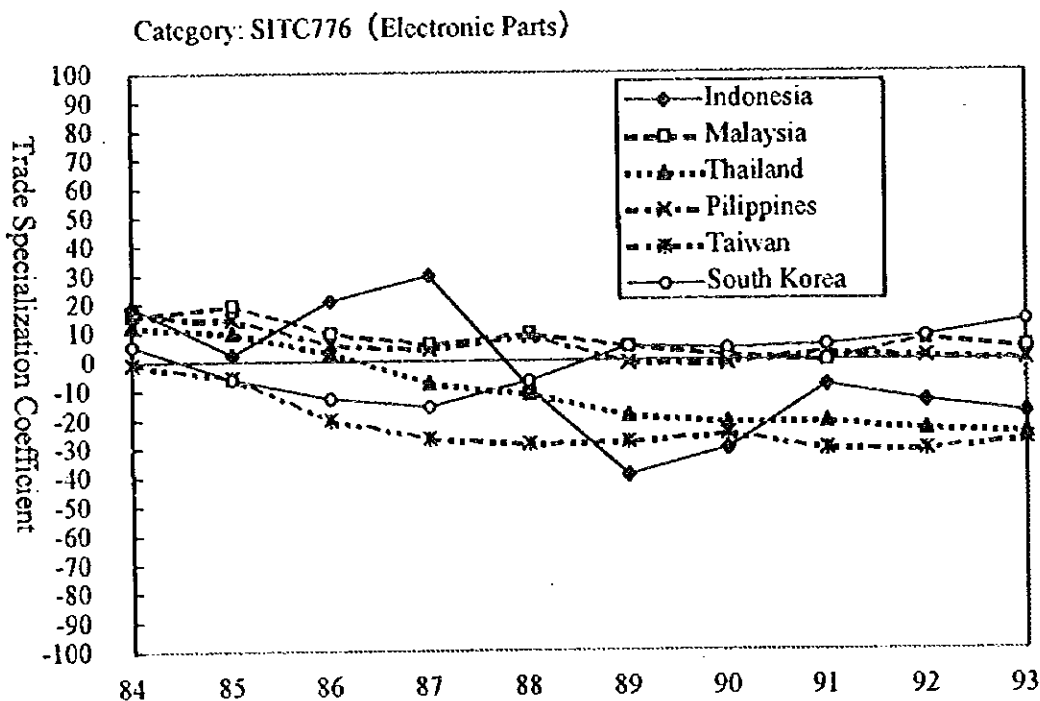
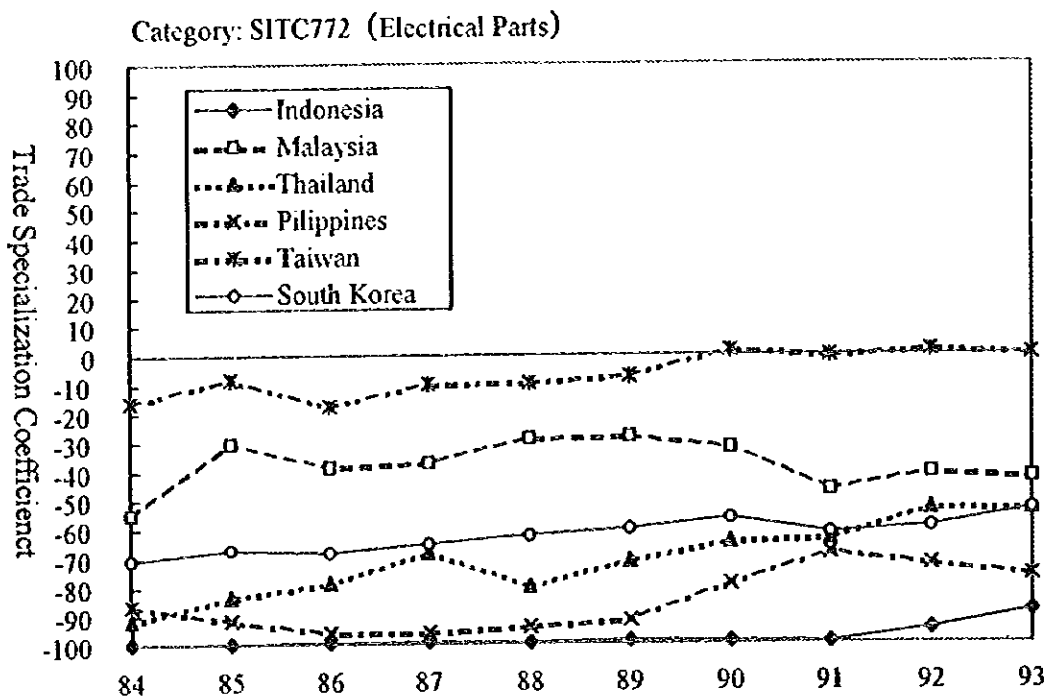
Note: 1. Categories are according to SITC 3 digit classification.

2. Trade specialization coefficients are determined as follows:

$$\{(\text{Exports} - \text{Imports}) \div (\text{Imports} + \text{Exports})\} \times 100$$

Source: OECD Statistics and ITI (International Trade and Investment Research Center), Japan

Fig. 8-6-3 ASEAN Countries' Competitiveness in Electrical and Electronic Parts among Developed Countries



Note: 1. Categories are according to SITC 3 digit classification.

2. Trade specialization coefficients are determined as follows:

$$\frac{[(\text{Exports} - \text{Imports}) \div (\text{Imports} + \text{Exports})] \times 100}{}$$

Source: OECD Statistics and ITI (International Trade and Investment Research Center), Japan

Fig. 8-6-3 ASEAN Countries' Competitiveness in Electrical and Electronic Parts among Developed Countries (Continued)

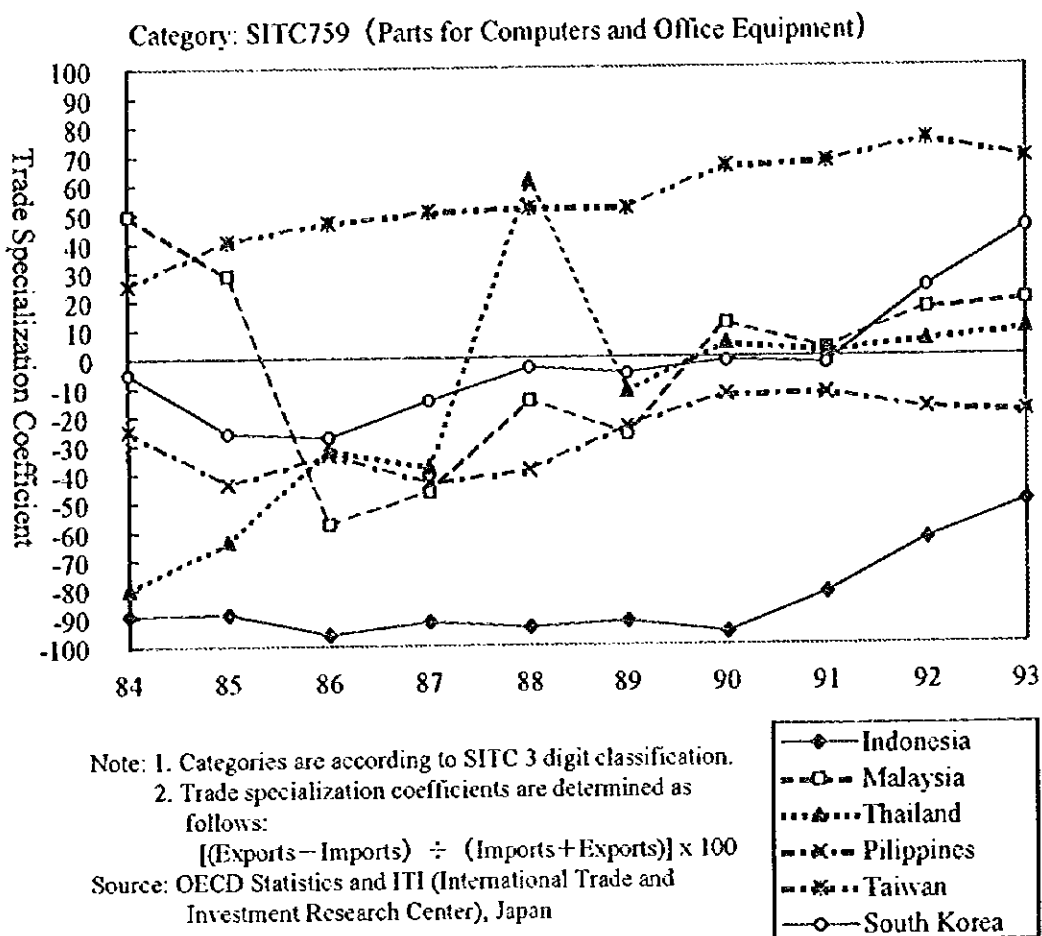
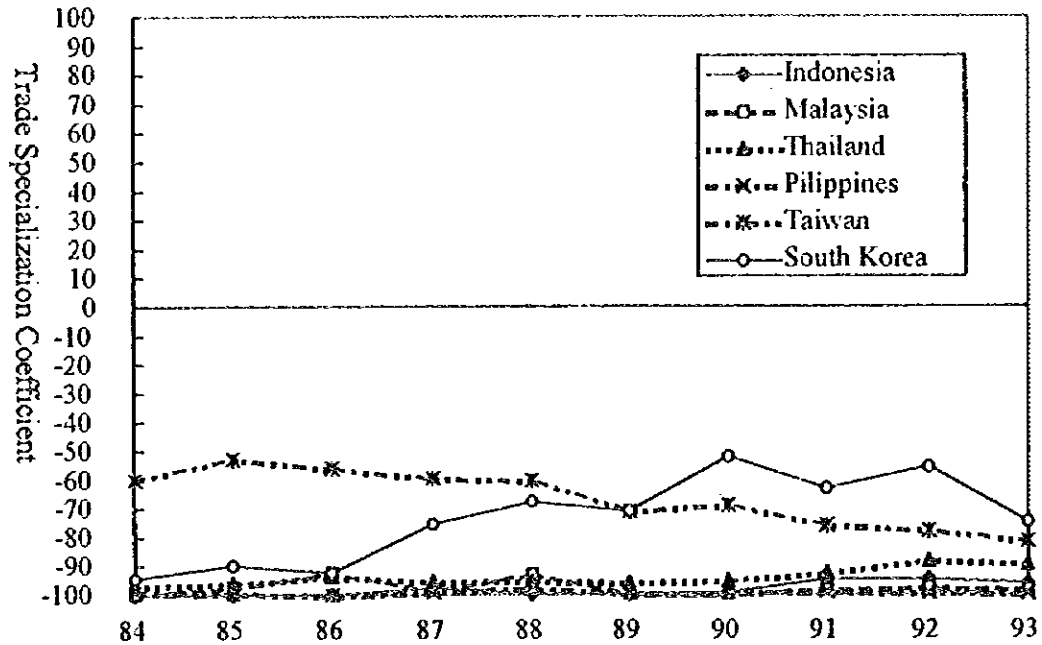
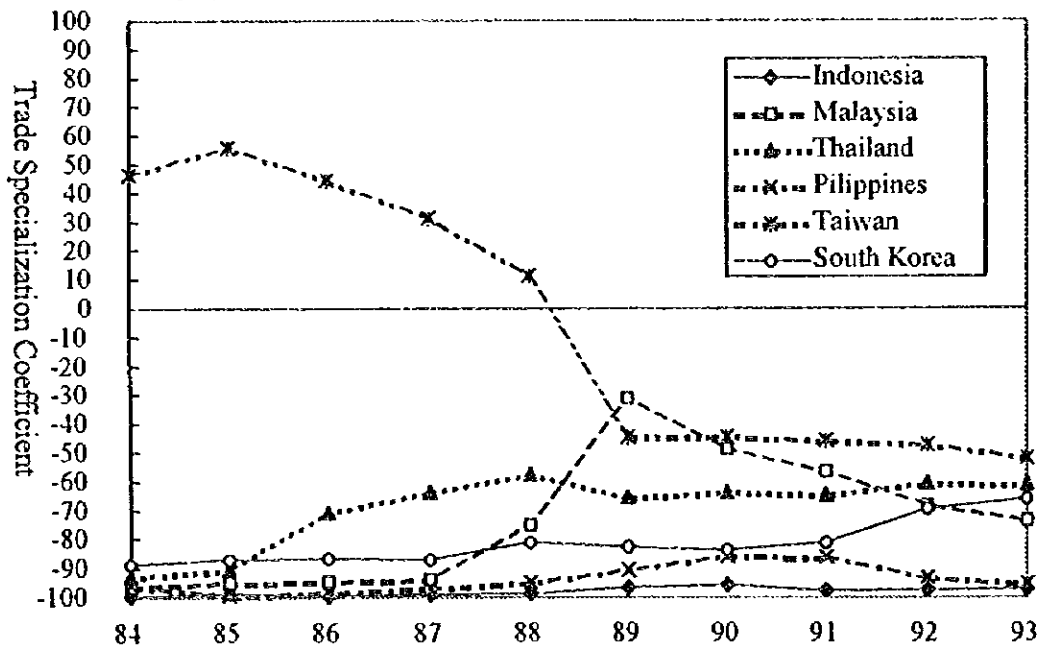


Fig. 8-6-4 ASEAN Countries' Competitiveness in Machinery Parts among Developed Countries

Category: SITC713 (Internal Combustion Piston Engines)



Category: SITC743 (Pumps and Compressors)



Note: 1. Categories are according to SITC 3 digit classification.

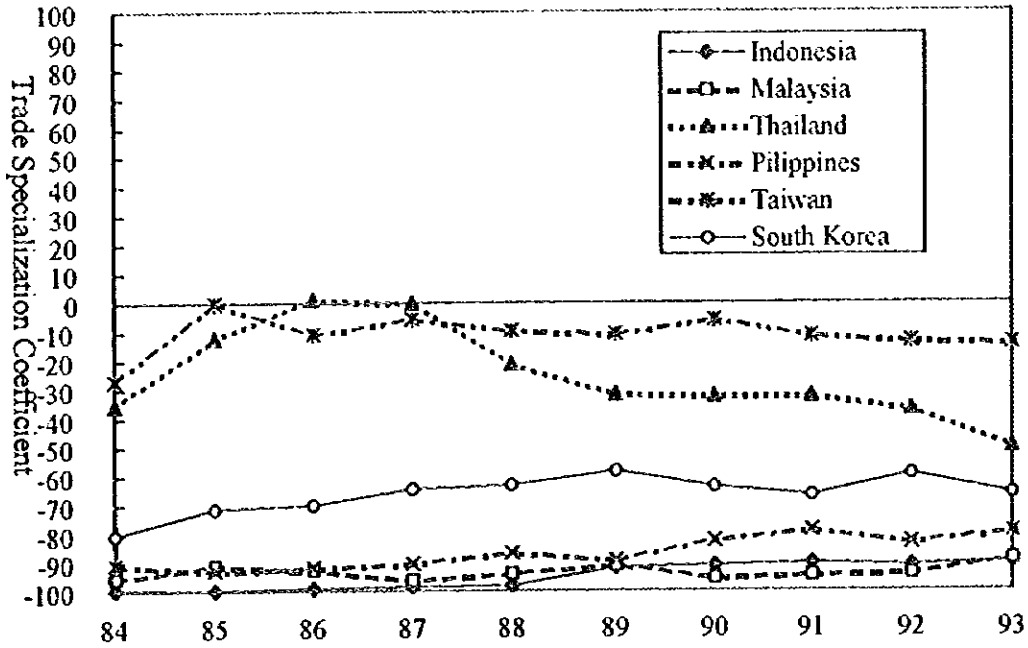
2. Trade specialization coefficients are determined as follows:

$$\frac{[\text{Exports} - \text{Imports}] \div (\text{Imports} + \text{Exports}) \times 100}$$

Source: OECD Statistics and ITI (International Trade and Investment Research Center), Japan

Fig. 8-6-4 ASEAN Countries' Competitiveness in Machinery Parts among Developed Countries (Continued)

Category: SITC749 (Non-electric Machine Parts)



Note: 1. Categories are according to SITC 3 digit classification.

2. Trade specialization coefficients are determined as follows:

$$\frac{[(\text{Exports} - \text{Imports}) \div (\text{Imports} + \text{Exports})] \times 100}$$

Source: OECD Statistics and ITI (International Trade and Investment Research Center), Japan

6.2. MACHINE PARTS TRADE IN INDONESIA - COMPARISON WITH OTHER ASEAN NATIONS BY EXPORT ITEM

Using trade statistics by country, the capacity of each ASEAN country to export machine parts is compared by item based on the coefficient of trade specialization. For item category, HS 6-digits (equivalent to SITC 5-digits category) was used. The time periods of comparison are 1990 and 1994, but for the Philippines alone, 1991 statistics (SITC RIV.3) were used. The reason is that the item categories in 1990 statistics, at SITC REV. 2, were somewhat varied. The results of comparison are shown in Fig. 8-6-5 to 9.

Concerning automotive parts, electrical and electronic parts, and machine parts, product groups of export items and exportable items as of 1994 are listed by country. Export items are those with a coefficient of trade specialization ranging from zero to 100 (items of greater export value than import value). Exportable items are those with a trade specialization coefficient anywhere from zero to minus 50. The coefficient of trade specialization does not necessarily always indicate development of exports in stages, but as noted above, there are products that serve as development indices by item.

After the item name, an indication is given of whether or not conditions are the same as in 1990. If conditions are the same, the item is ranked as an export item.

6.2.1 Automotive Parts (18 Target Items of Comparison)

Among the ASEAN nations, Thailand has the greatest export capacity in automotive parts. Indonesia recently has been increasing its exports of internal combustion engines, oil filters, wire harnesses and other items not included here.

(1) Indonesia

Export items (No items in 1990; two items in 1994)	Wheels, radiators
Exportable items (One item in 1994)	Body-related parts

(2) Malaysia

Export items (One item in 1990; two items in 1994)	Bumpers, steering wheels
Exportable items (Two items in 1994)	Body-related parts, radiators

(3) Thailand

Export items (Two items in 1990; eight items in 1994)	Safety belts, brake linings, brakes, non-driving axles, shock absorbers, radiators (same item as in 1990), exhaust pipes, clutches
Exportable items (Four items in 1994)	Body-related parts, drive-axles, wheels, steering wheels

(4) Philippines

Export items (One item in 1991; five items in 1994)	Brakes, gear boxes (same item as in 1991), wheels, radiators (same items as in 1991), exhaust pipes (same item as in 1991)
Exportable items (One item in 1994)	Passenger car bodies

6.2.2 Electrical and Electronic Parts (53 target items of comparison)

In electrical and electronic parts, Malaysia's export capacity has been large since the 1980s, but in the 1990s, Indonesia's exports have exhibited dramatic growth. Export capacity is also large in Thailand and the Philippines. Foreign capital has contributed greatly to exports of electrical and electronic parts, and the ASEAN nations are now establishing a worldwide export base.

(1) Indonesia

Export items (One item in 1990; thirteen	Word processor and printer parts, electronic calculating machine parts, computer parts, speakers (same item as in 1990), head-phones/earphones, pickup cartridges, magnetic heads, potentiome-
--	--

items in 1994)	ters, resistor parts, piezoelectric crystals, transistor parts, monolithic ICs, other ICs.
Exportable items (Seven items in 1994)	Amplifiers, parts for amplifiers and speakers, TV and video parts, tantalum fixed capacitors, variable capacitors, fixed resistors, connectors

(2) Malaysia

Export items (Twelve items in 1990; twelve items in 1994)	Word processor and printer parts (same items as in 1990), electronic calculating machine parts, microphones, speakers, amplifiers (same items as in 1990), CRTs for color TV, CRTs for black and white TV, transistors (same items as in 1990) thyristors (same items as in 1990), piezoelectric crystals (same items as in 1990), hybrid ICs (same items as in 1990), other ICs (same items as in 1990)
Exportable items (Fifteen items in 1994)	Other parts for printers, etc., parts for telephones, etc., amplifier and speaker parts, TV and video parts, magnetic heads, fixed capacitors made of ceramic or plastic, fixed resistors, other variable resistors, printed boards, fuses, automatic circuit breakers, other breakers, connectors, other CRTs, monolithic ICs

(3) Thailand

Export items (Nine items in 1990; fourteen items in 1994)	Other computer parts/accessories, speakers (same items as in 1990), headphones/earphones (same items as in 1990), amplifiers, magnetic heads (same items as in 1990) fixed capacitors (same items as in 1990), other variable capacitors (same items as in 1990), printed boards, other electrical switches (same items as in 1990), other electrical breakers, relays and thyristors (same items as in 1990), piezoelectric crystals, monolithic ICs
Exportable items (Thirteen items in 1994)	Parts for word processors/ printers, computer parts, microphones, TV and video parts, tantalum fixed capacitors, fixed capacitors made of ceramic or plastic, variable capacitors, electrical capacitor parts, electrical switches, CRTs for color TV, amplifier valves and tubes, transistors, other ICs

(4) Philippines

Export items (Seven items in 1991; ten items in 1994)	Speakers (same items as in 1990), headphones/earphones, amplifiers, fixed resistors, CRTs for black and white TV, transistors (same items as in 1990) thyristors, other semiconductor devices (same items as in 1990), transistor parts (same items as in 1990), other ICs
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Exportable items (Six items in 1994)	Speaker and amplifier parts, TV and video parts, fixed capacitors made of ceramic or plastic, variable capacitors, printed board, piezoelectric crystals
--------------------------------------	--

6.2.3 Machine Parts (33 Target Items of Comparison)

In all the developing countries, capacity to export machine parts is low. This is ascribed to the fact that advancements by international corporations have not been widely noted. Among the machine tool makers in Japan, it is believed by some that the high yen can be offset with technological capacity, without advancing into developing countries. In general, there is not much enthusiasm about investing in developing countries, and there has been little transfer of production to them. This is what distinguishes machine parts from electrical and electronic parts.

(1) Indonesia

Export items (No items in 1990; one item in 1994)	Oil filters for internal combustion engines
Exportable items (Two items in 1994)	Air filters for internal combustion engines, check valves

(2) Malaysia

Export items (One item in 1990; the same single item in 1994)	Compressors for refrigerator (Same item as in 1990)
Exportable items (Four items in 1990)	Manual air pumps, mold patterns, other metal dies, ball bearings

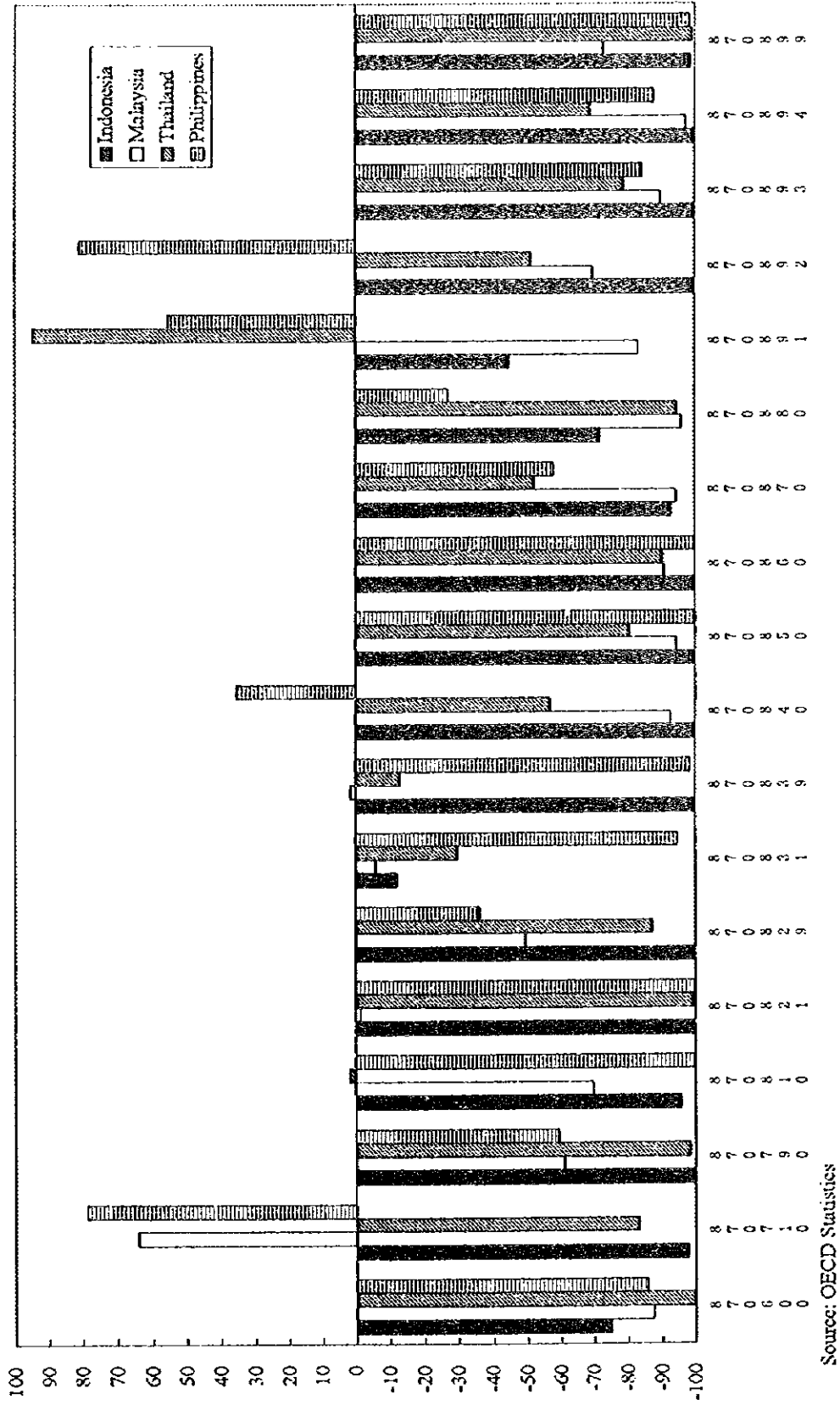
(3) Thailand

Export items (Two items in 1990; three items in 1994)	Marine engines (Same items as in 1990), oil filters for internal combustion engines, ball bearings (Same items as in 1990)
Exportable items (Three items in 1994)	Air filters for internal combustion engines, pressure reducing valves, valve and cock parts

(4) Philippines

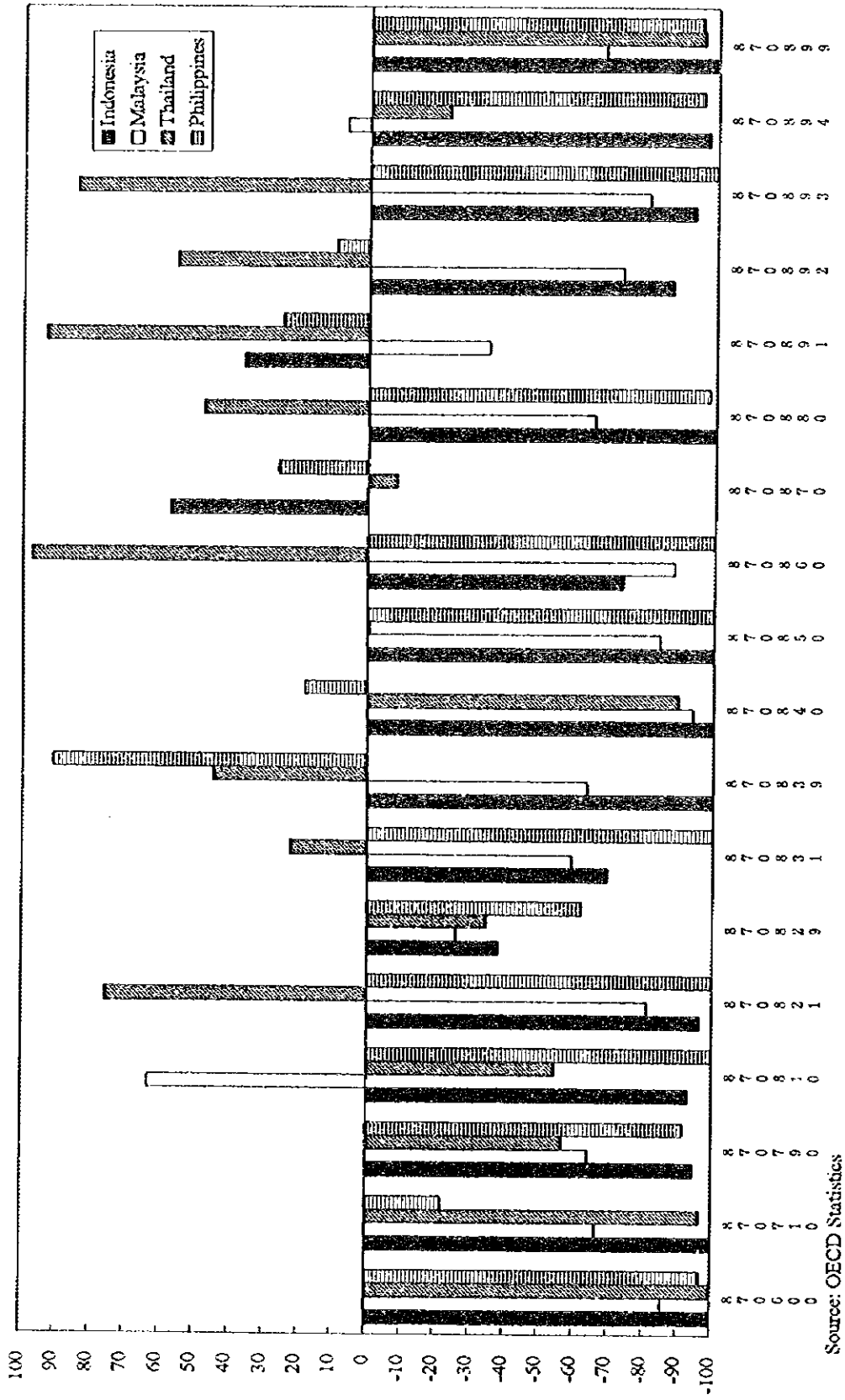
Export items (One item in 1991; one item in 1994)	Oil filters for internal combustion engines
Exportable items (Three items in 1994)	Drinking water purification filters, air filters for internal combustion engines, check valves

Fig. 8-6-5 Export Competitiveness of ASEAN Countries for Automotive Parts in Terms of Trade Specialization Coefficient (1990)



Source: OECD Statistics

Fig. 8-6-6 Export Competitiveness of ASEAN Countries for Automotive Parts in Terms of Trade Specialization Coefficient (1994)



Source: OECD Statistics

Note: Automotive Parts - Part Names and HS Numbers

Part Name	HS No.
Chassis	870600
Bodies for motor cars	870710
Bodies for commercial vehicles	870790
Bumpers and parts	870810
Safety seat belts	870821
Other parts of bodies	870829
Mounted brake lining	870831
Brakes & parts	870839
Gear boxes	870840
Drive-axes	870850
Non-driving axles	870860
Road wheels	870870
Suspension shock-absorbers	870880
Radiators	870891
Exhaust pipes	870892
Clutches	870893
Steering wheels	870894
Other parts for assembling	870899

Fig. 8-6-7 Export Competitiveness of ASEAN Countries for Electrical and Electronic Parts in Terms of Trade Specialization Coefficient (1990)

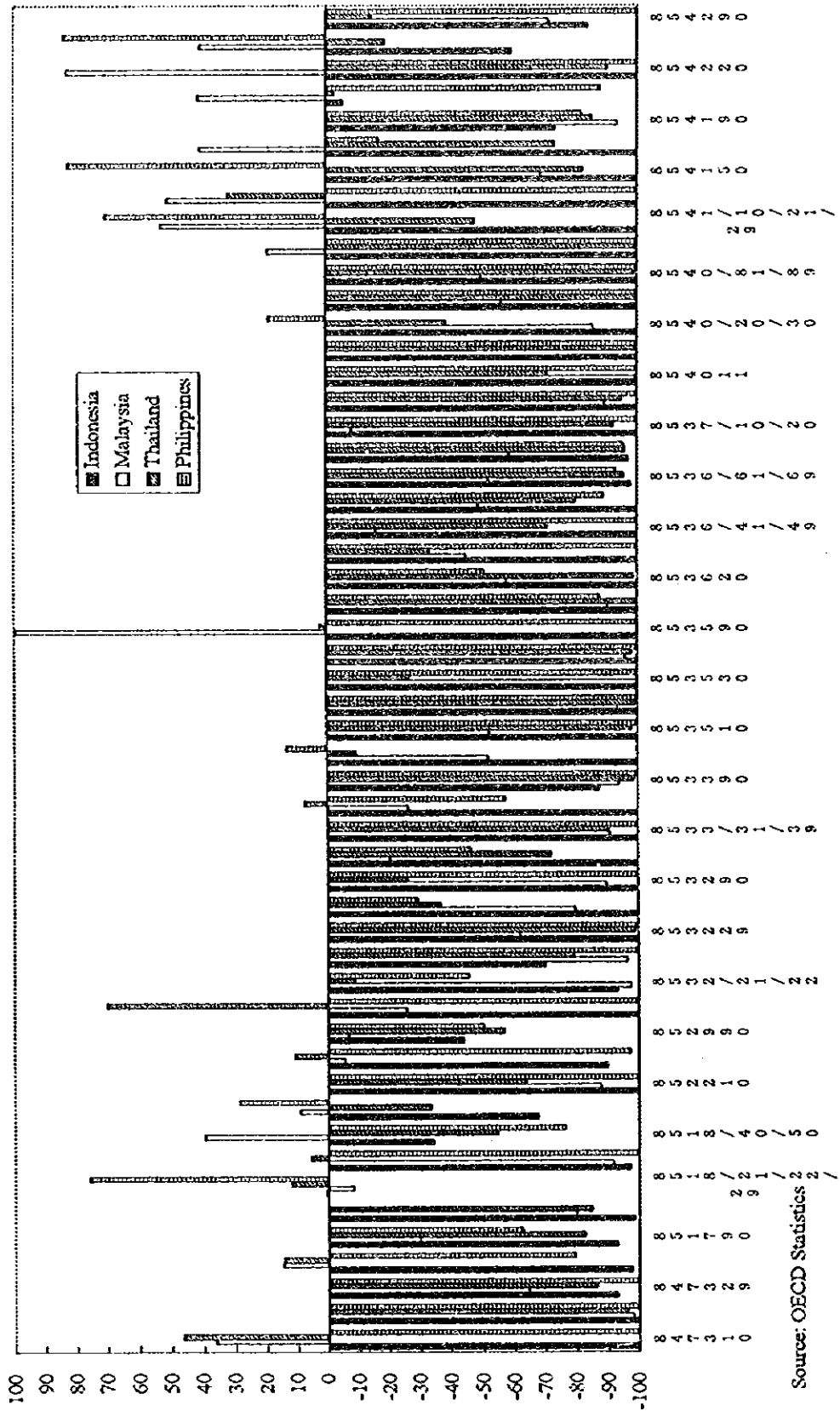
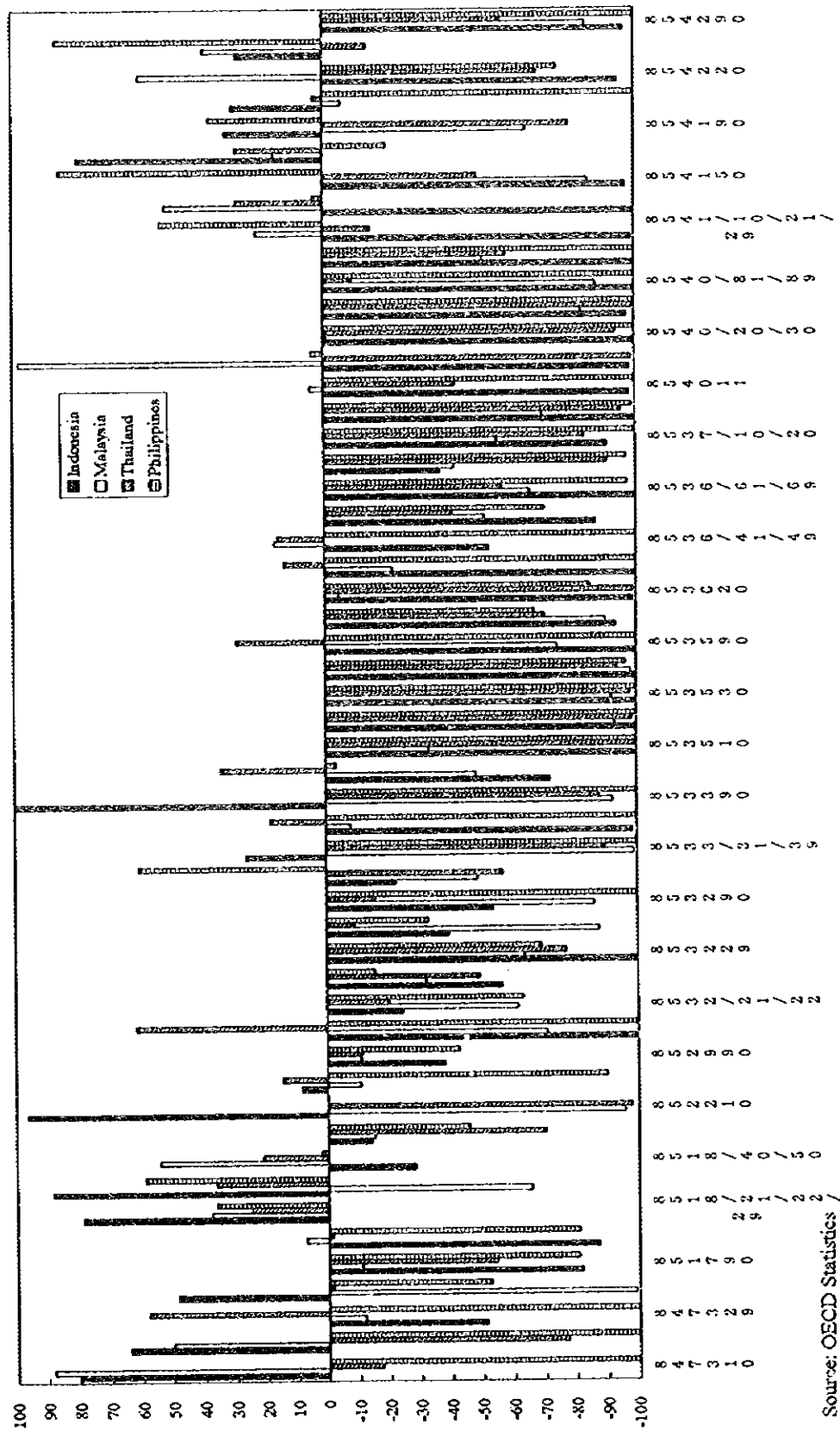


Fig. 8-6-8 Export Competitiveness of ASEAN Countries for Electrical and Electronic Parts in terms of Trade Specialization Coefficient (1994)



Note: Electrical and Electronic Parts - Part Names and HS Numbers

Part Name	HS No.	Part Name	HS No.
Parts & accessories of word-processors, printers	847310	Lightning arresters	853540
Parts & accessories of electronic calculators	847321	Other electrical switches	853590
Other parts & accessories	847329	Fuses for voltage < 1000V	853610
Parts of automatic data processors, cash registers	847330/40	Automatic circuits breakers for voltage < 1000V	853620
Parts of electric apparatus for line telephony	851790	Other apparatus	853630
Microphones	851810	Relays	853641/49
Loudspeakers	851821/22/29	Make & brake switches	853650
Headphones, earphones	851830	Lampholders, plugs, sockets	853661/69
Electric amplifiers, sets	851840/50	Connectors & others < 1000V	853690
Parts of speakers & amp.	851890	Boards, panels	853710/20
Pick-up cartridges	852210	Console, desks, cabinets	853810/90
Magnetic heads for recording	852290	Color TV tubes	854011
Parts for TV, VIDEO	852990	B/W TV tubes	854012
Fixed capacitors > 0.5 KVAR	853210	Other ray-cathode tubes	854020/30
Fixed capacitors of Tantalum	853221/22	Microwave tubes	854041/42/49
Fixed capacitors of ceramic, plastic of dielectric	853223/24/25	Amplifier valves & tubes	854081/89
Other fixed capacitors	853229	Parts of cathode-ray tubes	854091/99
Variable capacitors	853230	Diodes, transistors	854110/21/29
Parts of electric capacitors	853290	Thyristors, diacs & triacs	854130/40
Fixed resistors	853310/21/29	Other semiconductor devices	854150
Potentiometers	853331/39	Piezo-electric crystals	854160
Other variable resistors	853340	Parts of diodes, transistor	854190
Parts of electrical resistor	853390	Monolithic IC	854211/19
Printed circuits	853400	Hybrid IC	854220
Fuses	853510	Other electronic IC	854280
Automatic circuits breakers for voltage < 72.5 KV	853521/29	Parts of IC	854290
Isolating switches	853530		

Fig. 8-6-9 Export Competitiveness of ASEAN Countries for Machinery Parts in Terms of Trade Specialization Coefficient (1990)

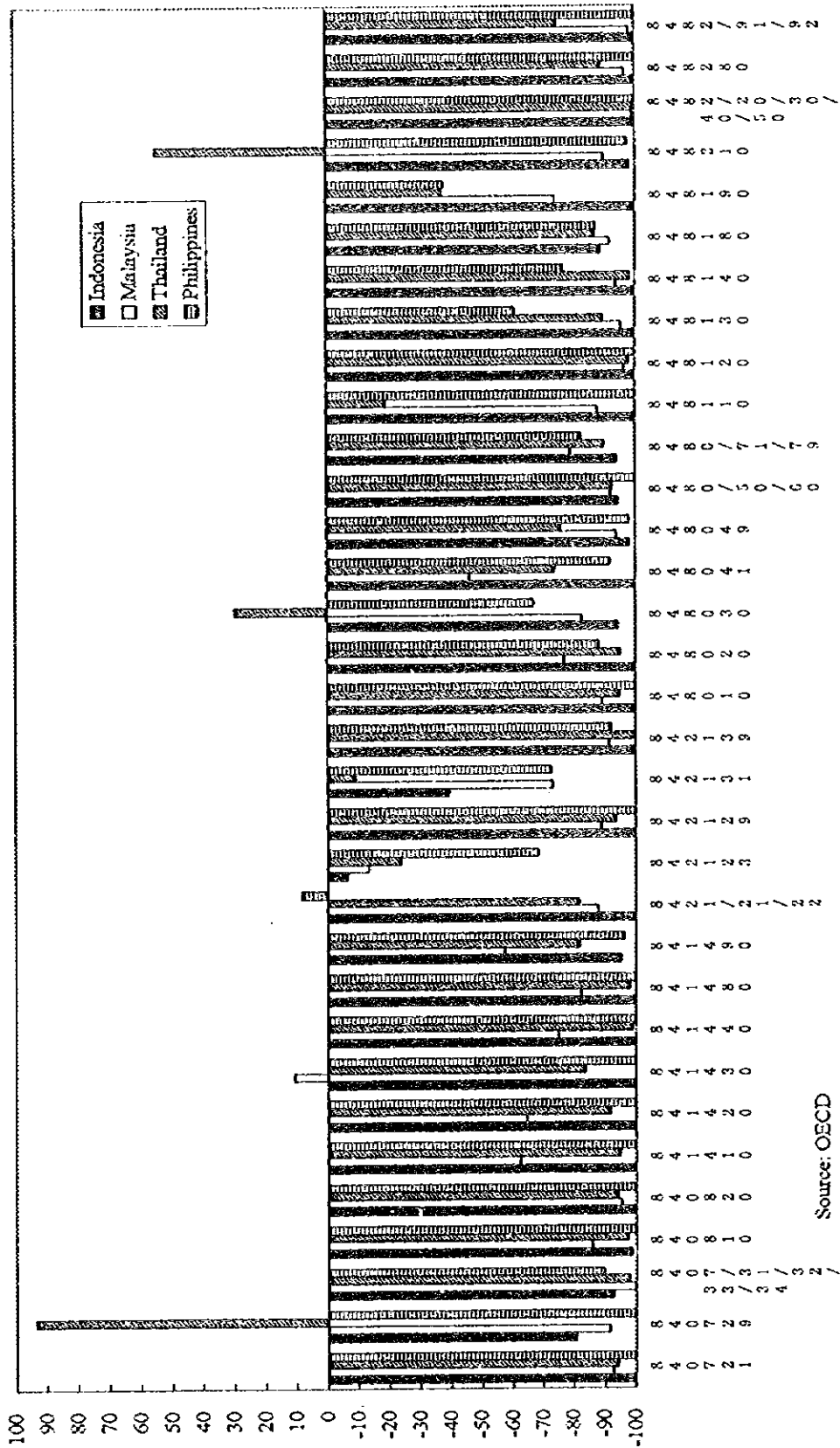
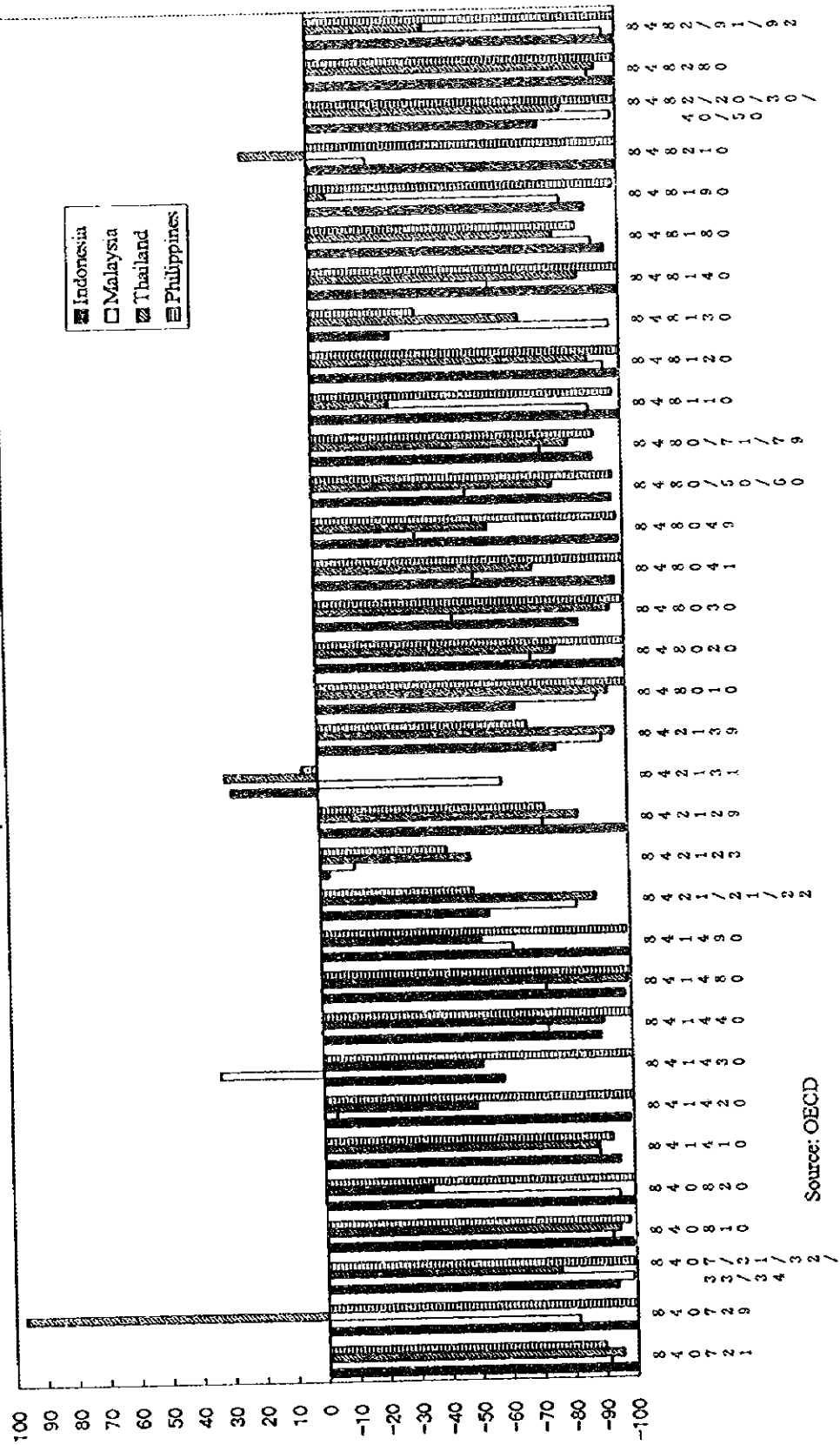


Fig. 8-6-10 Export Competitiveness of ASEAN Countries for Machinery Parts in Terms of Trade Specialization Coefficient (1994)



Note: Machinery Parts - Part Names and HS Numbers

Part Name	HS No.	Part Name	HS No.
Outboard motors	840721	Mould bases	848020
Marine propulsion engines	840729	Moulding patterns	848030
Reciprocating piston eng.	840731/32/33/34	Injection types of moulds for metal or metal carbides	848041
Marine propul. eng. < 750K	840810	Other moulds for metal	848049
Eng. for propul. of vehicles	840820	Moulds for glass, minerals	848050/60
Vacuum pumps	841410	Moulds for rubber, plastics	848071/79
Hand air pumps	841420	Pressure-reducing valves	848110
Compressor used in refrig.	741430	Valves for pneumatics transmissions	848120
Air compressor for towing	841440	Check valves	848130
Other pumps & compressors	841480	Safety valves	848140
Parts of pumps & compress.	841490	Taps, cocks, other valves	848180
Mach. for filtering beverage	842121/22	Parts of valves, taps, cocks	848190
Air filters for int. com. eng.	842123	Ball bearings	848210
Filters for industrial use	842129	Roller bearings	848220/30/40/50
Oil filters for int. com. eng.	842131	Combined ball, roller bear.	848280
Gas filters for industry	842139	Parts of ball, roller bear.	848291/92
Moulding boxes for metal foundry	848010		

6.3. EVALUATION OF PRICE COMPETITIVENESS FOR REPRESENTATIVE CASTING PARTS

The case study was conducted by selecting representative casting parts for automobiles as shown in Fig. 8-6-10 in order to evaluate the price competitiveness of Indonesian products.

6.3.1 Evaluation Method

The evaluation of price competitiveness was carried out according to the following steps:

- Step 1: To select products to be evaluated and set conditions for evaluation, such as production conditions.
- Step 2: To calculate ex-factory prices in cases where they are produced in several countries.
- Step 3: To compare the results and consider major reasons for differences.

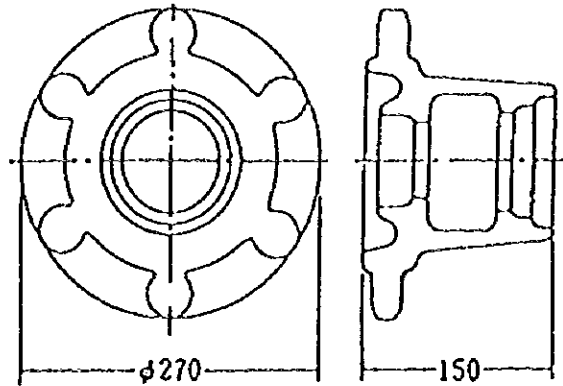
Ex-factory prices in several Asian countries are calculated by foundry specialists working in foundries in Japan, based on accumulated data concerning production in these countries. These specialists have more than ten years of experience in foundry production and more than five years of experience in the purchase of casting parts for machinery from overseas.

6.3.2 Conditions for the Evaluation

(1) Selected Products for the Evaluation

- Name of parts: Hubs for automobiles
- Weight: 13kg
- Materials: FC250 and FCD450
- Shape and size: As shown in Fig. 8-6-11.

Fig 8-6-11 Shape and Size of Selected Products



(2) Production Conditions

- | | |
|----------------------------------|--|
| - Production volume: | 500 pieces per month |
| - No. of pieces per molding box: | 2 pieces |
| - Yield: | 85% for FC250 and 70% for FCD450 |
| - Molding method: | Greensand mold for main mold and shell mold for core |
| - Machining of casting products: | Machining is not carried out. |
| - Expenses for patterns: | They are not included assuming that they are separately charged. |

6.3.3 Results of Evaluation

Ex-factory prices calculated for subject products in major Asian countries are shown in Table 8-6-2.

Table 8-6-2 Comparison of Ex-factory Prices of Selected Products

Producing Country	FC250			FCD450		
	Price per kg (¥/kg)	Price per Piece (¥/piece)	Comparison of Prices*	Price per kg (¥/kg)	Price per Piece (¥/piece)	Comparison of Prices*
Japan	165 (160~170)	2,145	100	185 (180~190)	2,405	100
Indonesia	120 (115~125)	1,560	73	135 (130~140)	1,755	73
Thailand	120 (115~125)	1,560	73	135 (130~140)	1,755	73
China	90 (85~95)	1,170	55	105 (100~110)	1,365	57

Note: * Japan = 100

Source: JICA Study Team

From the above results, the following are pointed out:

- i. Products manufactured in Indonesia and Thailand are approximately 30% cheaper and products in China are more than 40% cheaper than those in Japan.
- ii. The main reasons for Chinese casting products having the cheapest prices are as follows:
 - Indonesia and Thailand import major raw materials such as iron and alloys, although they procure casting sands domestically. Their costs for raw materials are higher. However, raw materials are available in China and its costs are cheaper.
 - Labor costs in China are low.
 - Capital investments by Chinese foundries in local areas are small and their investment cost is small.
- iii. Chinese foundries, in many cases, decide their prices flexibly responding to the market, and do not decide their prices based on the manufacturing costs of products. It is not clear how to include such expenses as depreciation expenses, sickness allowance for employees, allowances for infants, and pension allowances. Therefore, there is a possibility of future rise in prices of Chinese casting products.

- iv. The products evaluated are small sized products for mass production, and they are produced by hand molding. As for medium and large sized parts such as balance weights for forklifts and large specials tubes for water pipes, the cost advantages of Indonesian products against Japanese products are larger and the export potentials to the Japanese market are also larger.
- v. Indonesian casting products will face more severe competition from other east Asian countries. It is necessary for the Indonesian foundry industry to make progress with the localization of major raw materials and production equipment and increase its price competitiveness.
- vi. Transport costs to Japan from harbors in Asian countries are as shown in Table 8-6-3. When a Japanese buyer purchases Indonesian products, prices at the delivery to the buyer are ¥150 per kg (¥120 per kg + ¥30/kg) for FC250 products. If such a buyer is located far from a Japanese harbor, and therefore, the cost of inland freight increases, there is no cost advantage for imports of casting products from Indonesia and Thailand.

Table 8-6-3 Transport Expenses to Import to Japan

Items	Amount
- Freight	¥5 - 7/kg
- Import Duty	¥3/kg
- Inland Freight	¥8 - 13/kg
- Commission to Trader	¥9 - 12/kg (7 - 10%)
Total	¥25 - 35/kg (¥30/kg on average)

Source: JICA Study Team

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