

2.4 Tax System and Preferential Tariff in ASEAN

2.4.1 Characteristics of the present domestic tax structure

(1) Present Tax Structure

The current Tax Structure of Thailand can be outlined as follows.

Main domestic taxes:

- 1) Personal income tax; net income x 5 to 37%
(progressive tax with five tax categories)
- 2) corporate income tax; net income x 30%
(uniformly applied)
- 3) value added tax; 7% (standard rate)
0-1.5% (reduced rate)
- 4) remittance tax; untaxed amount remitted x 10%
(not applied in the case of dividend or interest remittances)
- 5) special business tax; exacted from financial business firms in place of VAT
- 6) customs duties ; refer to (2) below

Other taxes:

- 7) oil revenue tax; net income x 50% (in the case of firms holding oil drilling rights)
- 8) revenue stamp tax; in accordance with regulations governing the exaction of revenue stamp tax rates
- 9) excise tax ; exacted on oil products, tobacco, liquour and spirits, soft drinks, cement, electronic goods and automotives.
- 10) land development tax; assessed land valuation x 0.25 to 0.95% (local tax)
- 11) real estate tax; real estate value x 12.5% (local tax)

Particular characteristics of the Thai tax structure are the low ratio of direct taxes and the high share of overall taxation accounted for by indirect taxes such as VAT and customs duties. The ratio of direct to indirect tax over the last few years is estimated to be around 30 : 70. However the relative importance of corporate tax revenue has grown in recent years as a result of the favorable economic climate which has been prevailing in the Thai economy. Since an invoice method was introduced when value added tax was introduced in 1992 it has been easy to grasp inter firm transactions and the

resulting clarity in tax amounts has been received favorably among entrepreneurs.

Further Thailand has signed bilateral agreements to avoid double taxation with 25 other countries including Japan.

(2) Customs Duties

Reforms of the system of customs duties in Thailand are in progress as a result of the agreement accorded by the Thai government to the Common Effective Preferential Tariff (CEPT) program for setting up a free trade zone in the ASEAN area. This agreement was reached at the top level ASEAN Summit held in January, 1992 and as a result of the final agreement negotiations of the Uruguay round held at the end of 1993. The basic policy underlying reforms is the transition from protection to free trade. In concrete terms this will mean that the current tariff rates are to be reduced to levels between 0 and 30% over the next five years (with six tax rate categories of 0%, 1%, 5%, 10%, 20%, and 30%). According to the Fiscal and Tax Policy Division of the Ministry of Finance the overall policy to be implemented in exaction of taxes on manufactured products is that raw materials will be taxed at between 1-5%, intermediate processed goods at 10% and finished manufactured products at 20% levels.

Since the CEPT Agreement gives a fifteen year preparatory period from January 1993 for reducing tax rates to a level of 0-5%, the policy of the Thai government can be seen as proceeding independently in the same general direction.

Evaluation and implementation of tax reductions on individual items has already started, beginning with the reduction of customs duties exacted on 25 items of their on and steel sector to a uniform rate of 20% from the previous average of 35%.

The following is a summary of customs duty rates concerning automotives, electrical and electronic industries in the context outlined above.

1) Customs Duties for Automotive and Parts

Customs duties placed on automobiles and automotive parts changed considerably after July, 1991. Up to that time imports of Completed Built-Up automobiles (CBU) and Complete Knock Down (CKD) had been taxed at the high rates of more than 300% and 112% respectively, as part of government policy to protect the domestic automotive industry. However tax rates were considerably reduced after July, 1991 and tax schedules reformed with the aim of upgrading the productivity of domestic automotive industries to ensure they could face the challenge of international competition. Currently in the provisionally named Chapter 87 Sub committee representatives of the Ministry of Finance and of the Ministry of Industry are jointly considering issues of tax schedules for CKD and CBU as well as the possibility of reducing Table taxes on imported automotive parts. At present hearings are being conducted to collect the opinions of specialists of the private and academic sectors, but conflicting interests of assemblers and parts suppliers renders progress slow. Table 2.4-1 indicates the current tax schedules imposed on automobiles in Thailand.

2) Customs Duties on Electrical and Electronic Products

To date in Thailand very high duties have been placed on electrical and electronic products (including parts) with a view to protecting domestic industries, and this is particularly true with regard to the duties imposed on imports of finished manufactured products. However, since domestic manufacturers are now more competitive internationally and in line with the overall CEPT-AFTA scheme which clearly outlines reductions in duties on electronic and electrical products the current trend is towards large reductions in existing duties. In general it is scheduled to reduce the duties in this sector from their current level in excess of 30% down to minimum 5%. Table 2.4-2 shows customs duties for major electric and electronic home appliances.

Table 2.4-1 AUTOMOTIVE TAX SCHEDULES

	Categorie	Import Duty	Excise Tax	VAT
CKD	Passenger car over 3000cc	20%	45%	7%
	Passenger car over 2401cc - 3000cc	20%	38%	7%
	Passenger car under 2400cc	20%	32.5%	7%
	Off-road passenger car	20%	27%	7%
	Pick up	20%		7%
	Blind van	20%		7%
	Glass van (Bus)	20%		7%
	Big truck	10%		7%
CBU	Passenger car over 3000cc	68.5%	38%	7%
	Passenger car over 2401cc - 3000cc	68.5%	32.5%	7%
	Passenger car under 2400cc	42%	32.5%	7%
	Off-road passenger car over 2400cc	68.5%	27%	7%
	Under 2400cc	42%	27%	7%
	Pick up	60%		7%
	Blind van	60%		7%
	Glass van (Bus)	40%		7%
Big truck	40%		7%	

Note: Excise Tax = $\{CIF + (CIF \times \text{Import Duty})\} \times \frac{41.8}{58.2}$

The excise is imposed in accordance with to the capacity of motor engine.

Source: OIE

Table 2.4-2 CUSTOM TARIFF FOR MAJOR ELECTRIC
ELECTRONIC HOME APPLIANCES (1992)

HS Code	Commodities	Import Duty
8414.15	Electric Fans	50
8415.10	Room Air Conditioners (Window type)	60
.90	Room Air Conditioners Parts	30
8418.10	Refrigerator (Household type)	60
8450.	Washing Machines, not exceeding 10kg	60
	Washing Machines, exceeding 10kg	20
8450.11	Washing Machines, Fully-automatic	80
8509.10	Vacuum Cleaners	50
8516.40	Electric Irons	40
.50	Microwave Ovens	40
.72	Toasters	40
8519.	Cassette Players	50
8521.	Video Recording Apparatus	30
8528.10	TV (Color)	40
.20	TV (Black & White)	40
8529.	TV Parts	5 ~ 40

Note: The Classification of commodities is based on the Harmonized System.

Source: Customs Tariff of Thailand

The question of customs duties in the electrical/electronic industries is seen in a very different depending on whether one emphasizes the domestic market or the export market. For example, the export orientated electrical and electronics goods manufacturers which have developed while receiving the BOI investment incentives have not been greatly affected by the high customs duties. However, the manufacturers whose output has been orientated to the domestic market have been protected by the high customs duties but have also suffered from the increased costs of parts which have resulted from excise duties.

3) Problem Points with the Current Customs System

The aspects of the present duty system which the Automotive industry see as problems differ from the aspects which the Electrical and Electronic industry find troublesome. The following is a brief summary of the main

problem points as seen from the viewpoint of these two industrial sectors. A detailed analysis will be found in later chapters.

Automotive Industry

- a) The customs policies regarding CKD and CBU lack consistency and the system makes it difficult for assemblers to decide on making investments. In other words, it is difficult to decide whether to undertake local production or import sales.
- b) The level of tariffs levied against materials or parts for automotive parts are high compared to the tariffs on imports of the corresponding CKD parts. At present tariffs on CKD imports are 20% in the case of passenger cars but tariffs are 25-35% in the case of imported finished metal or plastic parts.

Electrical and Electronics Industries

- a) The tariff rates levied on parts are high compared to the tariff rates levied on finished products.
- b) Procedures for securing tax rebates are complicated and troublesome and the merits of this system are not sufficiently realized.

In addition to the above problems, a problem common to both industries is the fact that customs authorities apply the same uniform rate of tax against parts and against the imported raw materials which are needed for their production so that a very high level of customs duty results.

For example customs duty on a small motor is 35% while the rate of duty on the parts needed to manufacture the motor is set at 5%. However if this is imported as copper wire the rate of duty becomes 35%. In the case of certain parts it is difficult to prove that these will be used for a specific purpose and the resulting inconsistencies and confusion are pointed to as a problem of the existing system.

2.4.2 Customs duties and the division of labor in the ASEAN

(1) CEPT-AFTA

The aim of creating the ASEAN Free Trade Area (AFTA) over a fifteen year period starting from January 1st, 1993 was agreed upon at the ASEAN Summit held in January, 1992. In order to realize AFTA it was also agreed to implement a Common Effective Preferential Tariff (CEPT) program. The CEPT program will reduce customs duties on all finished manufactured products (including processed agricultural goods) in the ASEAN region to within 0-5% over a fifteen year period commencing January, 1993. It is expected that manufacturing industries will see an intensification of regional division of labor and the restructuring and realignment of production bases within the ASEAN region as this program is furthered. Already member countries have issued programs for reducing customs duties and have started implementing these. The following Table 2.4-3 indicates the number of items concerned by country, although some items have been excluded as special exceptions or because preparations for inclusion in the CEPT program have not been completed.

Table 2.4-3 ITEMS BY COUNTRY CONCERNED
IN THE CEPT-AFTA PROGRAM

	items concerned by excluded		
	items	tariff reductions (figures in brackets fast track items)	excluded items
Thailand	4,700	(1,936)	500
Indonesia	7,453	(3,165)	1,769
Philippines	4,112	(862)	1,449
Malaysia	10,146	(3,251)	1,600
Singapore	5,714	(2,200)	118
Brunei	6,183	(1,826)	361

Remark: Program items shall be reexamine by each country.

Under the CEPT Program the reduction of customs duties will be applied at differing speeds depending on the category of items; with some items being classified as normal track (general) items and others as fast track (given priority for reduction).

Fast Track Program

The 1936 items from 15 industrial sectors which come under this category will have their customs reduced to between 0-5% within 10 years in the case of items currently taxed at rates superior to 20% and within 7 years in the case of items currently taxed at rates below 20%. The fifteen sectors concerned are as follows;

- vegetable oils
- medical products
- rubber products
- textiles
- copper electrodes
- woodwork products and cane furniture
- electronic products
- cement
- fertilizers
- leather goods
- ceramics, glass
- chemical products
- plastics
- paper and pulp
- precious metals and stones

The Normal Track Program

This category covers 2,764 items of manufactured goods not among the fifteen sectors mentioned in the previous section. Items will have tariffs reduced to within 0-5% within a fifteen year period in the case of items currently taxed at a rate superior to 20% and within 10 years in the case of items which are currently taxed at a rate below 20%.

Figure 2.4-1 shows the Overall schedule for the tariff reductions forming part of the CEPT program as announced by the Thai government. Thailand has already gone ahead with tariff reductions in advance of the CEPT program in the case of plastics and some chemical products because of complaints received from sections of domestic industry. Thailand is expected to implement the tariff reduction program by and large within schedule deadlines.

Further, automobiles are not concerned by the CEPT Schedule since these come under the category of items excluded from consideration.

	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Fast Track Tariff Rate $\geq 20\%$											0-5%					
Existing Tariff Rate																
Above 30%	30%	25%	25%	25%	20%	20%	15%	15%	10%	10%	10%	0-5%				
26~30%	25%	25%	20%	20%	15%	15%	10%	10%	10%	10%	0-5%					
21~25%	20%	20%	15%	15%	10%	10%	0-5%									
Fast Track Tariff Rate $\leq 20\%$							0-5%									
Existing Tariff Rate																
20%	20%	15%	15%	10%	10%	10%	10%	0-5%								
15~19%	15%	15%	10%	10%	10%	10%	10%	0-5%								
10~14%	10%	10%	0-5%													
6~9%	0-5%															
5% or below	0-5%															
Normal Track Tariff Rate $\geq 20\%$																
Existing Tariff Rate																
Above 30%	30%	30%	30%	30%	30%	25%	25%	20%	20%	20%	20%	15%	15%	10%	10%	0-5%
26~30%	30%	30%	30%	30%	30%	25%	25%	20%	20%	20%	15%	10%	10%	0-5%		
21~25%	30%	30%	30%	30%	30%	20%	20%	15%	15%	10%	10%	0-5%				
Normal Track Tariff Rate $\leq 20\%$																
Existing Tariff Rate																
20%		20%			20%	20%	15%	15%	10%	10%	0-5%					
15~19%		20%			20%	20%	15%	15%	10%	10%	0-5%					
10~14%					10%	10%	10%	10%	0-5%							
6~9%					0-5%											
5% or below	0-5%															

Figure 2.4-1 GENERAL FORMULA OF THAI TARIFF REDUCTION PROGRAM FOR CEPT

(2) Outline and Current Situation of the Brand to Brand Complementation (BBC) Scheme

The basic framework of the Brand to Brand Complementation Scheme was agreed upon among the ASEAN member countries in 1981 and since that date the Memorandum concerning this agreement was signed in 1988 which officially initiated a BBC scheme in the automotive industry. The agreement itself seeks to utilize the special characteristics of the ASEAN region and to do this by promoting the internal division of labor within the region so that member countries produce those parts which they are best adapted to make and trade these among themselves so that overall trade and economic prosperity is promoted.

In concrete terms the ASEAN member countries provide support through reduction of preferential tax and addition to local content items for the schemes of mutually complementing parts production which the various car manufacturers draw up for the ASEAN region as a whole. Since the system offers merits of market scale to the automotive manufacturers and production schedules is not bound by the usual local content restrictions. Therefore the system made possible manufacturers to cope with uneconomical market scale. Now manufacturers applies the system actively.

An OEM manufacturer which is the Brand Owner wishing to take part must present details of the model, brand name, design, necessary parts and countries scheduled to take part in manufacturing operations to the Committee on Industry, Minerals and Energy (COIME) which acts as the administrative office of the BBC, and once the approval of the countries concerned has been obtained the COIME will give approval for the BBC scheme. After getting BBC approval the following advantages are enjoyed;

- the maximum import duty which can be imposed is reduced by 50%
- imported parts are treated as locally supplied parts (treated the same as domestically manufactured products)

At this present date of September, 1993 the following seven companies have received approvals for a total of 27 undertakings.

- Mitsubishi	6 undertakings
- Volvo	6 undertakings (new applications scheduled)
- Mercedes Benz	2 undertakings
- Toyota	7 undertakings (new applications scheduled)
- Nissan	4 undertakings (new applications scheduled)
- DAF	1 undertaking
- Renault	1 undertaking

Although the approval of the countries concerned is necessary to the BBC scheme in actual practice approval largely depends on the enthusiasm and initiative of the manufacturer concerned.

However, it is clear that in the meantime the BBC scheme will contribute and give impetus to the horizontal division of labor within the ASEAN region.

2.4.3 Policy for promoting local content ratio

(1) Outline of Local Content Regulation

The local content regulation is a system which makes it compulsory for manufacturers to ensure a certain level of domestically supplied content (either in terms of regulations concerning the ratio of domestic content to the total content or of cost expended on the local content in ratio to the total cost). The system aims to reduce reliance on imported parts and so promote domestic parts manufacturers, and also thereby to reduce the outflow of currency. The restrictions in Thailand concerning the local content of automotive parts were established in 1973. On the other hand there are no such restrictions pertaining to electrical or electronics goods.

Table 2.4-4 summarizes the framework and details of the local content restrictions for automotive parts. Automotives are classified into five classes but distinctions are not made according to the series or model under consideration. The local content to be met is not calculated in money terms but the local content to be met by each item is calculated on a points-per-parts basis.

Table 2.4-5 shows the details for parts which constitute the minimum requirement in car assembly as per Parts Table A. Domestic supply of 28 of the parts listed here is required, and these parts alone constitute 27.07% of the

local content of a passenger car which is required to have more than 54% local content in total. These parts can generally be met to required technical standards by Thai parts manufacturers (including foreign affiliates).

The local content restrictions can be said to have been effective in so far as they widened and strengthened the base of supporting industries serving the automotive parts industries in Thailand. However, Assembly manufacturers obliged to use domestically manufactured parts to clear restriction requirements were sometimes dissatisfied with the quality and cost aspects of locally supplied parts. As a result many such firms are currently aiming at increasing their own in-house supply ratios or seek to parts manufacturers which they do regular business in home country to invest in Thailand.

According to the view of the Office of Industrial Economics of the MOI which is responsible for administering the local content regulations there is an increasing need to bring the policy of local content into line with GATT rulings and the trend will be to do away with such restrictions. Hereafter it will be necessary to review the local content percentages set for individual parts and promote industrial operations with a greater emphasis on the value added of each part.

Table 2.4-4 LOCAL CONTENT REQUIREMENTS

Type of Vehicles	LC Requirements	Remarks
Passenger Car	54%	Assemblers must use any parts in Table A ^{1/} and Table B ^{2/}
Pick-up Truck	65~80% (Depending on the type of Pick-up Truck)	Truck with engines from 1000cc must use local produced engine
Big Truck and Bus Imported CKD of		
-Chassis with engine	40%	Assemblers must use local produced radiator, muffler and pipe, battery, leaf spring, tire and tube, safety glass and brake drum
-Chassis with engine and wind shield	45%	
-Chassis with engine and cab	50%	

Notes: ^{1/} Table A: 28 components and parts that must be used, which accounts for 27.07%.

^{2/} Table B: 146 components and parts, in addition to those in Table A, for alternative use in assembling, the total value of both Tables must be not less than 54 percent.

(2) BOI Promotion Project

The project is designed to encourage localization of specific components and parts other than automotive parts by granting BOI privileges to manufacturers who are in return required to increase local contents of the said components and parts. Notably, BOI's approval is granted to a limited number of companies selected in consideration to relevant market size. The picture tubes by banning imports of components and applying high tariff rates. The BOI privileges are considered to be temporary in nature. Note that a company that produces a component eligible for the BOI privileges but do not need them for any reason can produce it locally by obtaining MOI's approval.

Examples of BOI promotion projects in the electrical and electronic industry are TV picture tubes (1 manufacturer), compressors for air-conditioners (3 manufacturers), compressors for refrigerators (2 manufacturers), and evaporators for refrigerators (1 manufacture).

Localization of automotive parts has progressed within the framework of local content requirements discussed in (1) above. In addition, special BOI privileges are granted to specific automotive parts. A primary example is diesel engines for pick up trucks.

Note: Some diesel engines are produced under the MOI-approved project without the BOI privileges.

Table 2.4-5 LIST OF COMPONENTS AND PARTS IN TABLE A

Major Group	Sub-Group	Component/Part	Given Percentage
1. Base engine	Others	Oil lever gauge	0.25
2. Other engine components	Cooling system	Radiator	0.76
	Lubrication system	Oil filter	0.15
3. Electrical component	Charging system	Alternator	0.87
		Battery	0.50
	Starting system	Starter motor	0.93
		Switch magnetic assy	0.25
	Others	Horn	0.23
		Battery holder	0.07
4. Wiring	Wiring harness	Chassis wiring harness	1.00
		Sub wiring harness	0.50
		Battery cable	0.08
	Cable	Body ground cable	0.07
5. Exhaust system	Muffler	Muffler	0.90
		Exhaust pipe	0.50
	Tailpipe	Tail pipe	0.55
6. General chassis components	Wheel & tyre	Wheel	1.87
		Tyre & tube	3.00
	Other	Paint & thinner	4.50
7. Trim panel Soft panel	Interior component	Carpet & floor mat	1.00
	Luggage component	Jack assy	0.15
8. Seat	Frame Cover	Seat frame	2.18
		Seat cover	1.44
		Foam & pad	0.88
9. Glasses	Glass door	Glass door	0.91
		Wind shield	0.75
10. Suspension	Rear suspension	Rear spring (leaf or coil)	0.78
11. Convenient and accessory equipment	Convenient and accessory equipment	Radio	2.00
		Total	27.07

2.5 Promotion Policies for Industrial Standards and Occupational Skill Standards

2.5.1 Industrial standards

(1) Current Situation regarding Industrial Standards

In accordance with the Industrial Product Standards Act which was passed in 1968, the Thai Industrial Standards Institute (TISI) is responsible for setting, diffusing and testing Thai industrial standards.

As of the end of 1992 items for which Thai Industrial Standards (TIS) have been set and are in force numbered 1,282 of which 56 items concern automotive related items and 79 concern electrical items.

Products which meet with the MOI standards are assured of satisfactory product quality, reliability and safety, and there are 3 automotive items (to which one more item is scheduled to be added soon) and 10 electrical items which are required to obtain the mark of approval.

1) Compulsory Standards

Electrical items

- electric fan
- fluorescent light ballast
- electric iron
- fluorescent lighting
- incandescent lighting
- tubular fluorescent light holder and starter holder
- low distribution link fuses
- PVC insulated cables and flexible cords
- fluorescent light starters
- PVC insulated aluminum cables

Automotive items

- automotive safety glass; laminated safety glass
- automotive safety glass; tempered safety glass
- automotive safety glass; zone tempered safety glass
- muffler (scheduled for addition in 1994)

In addition to the above compulsory standards there are a number of voluntary standards which are used when guarantees of product quality, etc. are desired by the manufacturer of such items.

2) ISO

At present the TIS do not seem to have reached a wide level of diffusion in Thailand. One reason for this is that export orientated firms tend to give priority to the standards of the target countries. If the standards required for Japan or the U.S.A. are met then even if part of output is sold domestically consumers find standards entirely acceptable.

The TISI with an eye on bringing Thai products up to international levels is furthering the unification of the TIS system with the ISO which represent international standards. Thus by bringing domestic Thai goods (including those of export orientated firms) into line with ISO standards the general standardization of Thai industrial products on a par with international levels will gradually be realized. With the above in mind work is going ahead at present with the preparation of standards.

(2) Methods of diffusing Industrial Standards

The TISI is the central body responsible for diffusing industrial standards. It has set up a TISI Information Center in Bangkok which provides information not only concerning the TIS but also overseas standards, etc. The TISI also informs the public of general trends, etc. through the regular publication of a newsletter. It is therefore relatively easy to obtain information concerning industrial standards in Bangkok but since the provinces are not equipped with information centers this poses problems to the furthering of standardization.

At present the main channel constantly concerned with diffusion of standards is formed by the Industrial Provincial Offices of the MOI which provide information services. Further diffusion activities include the seminars and training programs carried out by the Industrial Development Division (IDD) and the Thailand Management Development and Productivity Center (TMDPC) also administered by the MOI.

2.5.2 Outline and problems of national trade standard and testing system

(1) Outline of National Trade Standard and Testing System

1971 when skill standards were established for electric welders, turners and electric wirers. In 1986, the Center for Vocational Training was upgraded to the National Institute for Skill Development (NISD) (which is now attached to the Department of Skill Development in the Ministry of Labour and Social Welfare). At the same time, the Committee on National Trade Standard was established to make preparations for introducing full-scale National Trade Standard and Testing system in the country. The National Trade Standard and Testing System is outlined below.

Designation: The National Trade Standard and Testing

Responsible agency: Occupational Skill Standards Division, Department of Skill Development (DSD), Ministry of Labour and Social Welfare.

Excuting places: Regional Institutes for Skill Development (1 unit in each of 10 regions in the country).The examination is made at any time throughout the year.

Task forces A task force of 10 to 15 members is installed by trade within the Committee of National Trade Standard. Each task force is made up by 70% of experts in the private sector and 30% of representatives of administrative and other organs, and prepares trade standards and a questionnaire of examination.

Skill classification: Every skill is divided into 3 Grades, of which the lowest is Grade 3.

Qualifications for examination: In principle, any person that has completed the obligatory education is qualified for examination in Grade 3. Any person that has no certificate for the obligatory education completed is qualified or not for examination depending on his or her years of experience in the desired trade for examination. Any person is qualified for the examination of Grade 2 or 1 in the desired trade in principle, if he or she has been experienced in the trade at least for 1 year after he or she passed the examination in grade 1. Any person is qualified for examination in a higher grade, if his or her results of examination in any lower class are at least 80 points.

Rating: Examinees must go through an academic examination and a practical skill examination, of which the results are generally rated in the ratio of 50:50. In some trades, the ratio is 20:80, attaching a greater importance to practical skills. Those who passed the examinations are licensed.

Examination fee: 100 bahts for grade 3, 150 bahts for grade 2 and 200 bahts for grade 1.

Trades: As of the end of 1993, the National Trade Standard and Testing System covers 31 trades:
Electric welder, turner, electric wirer, radio & television assembler, brick/block layer, plasterer, carpenter, automotive mechanic, technical worker for air conditioning equipment, plumber, machineworker, gas welder, electric equipment assembler, interior decorator, machine draftsman, automotive painter, furniture maker, reinforced-concrete worker, bicycle mechanic, painter, machine assembler, automotive body repairer, dressmaker, heavy-machine assembler, heavy-machine operator, electric engineer, metal grinder, tiler, joiner, sheet metal worker, and room attendant.
8 additional trades are now under examination.

No. of examines: The number of examinees was 1,702 in 1992 and 1,917 in 1993.

Ratio of successful: The ratio of successful examinees was 45% to 50% for Classes 2 and 3 and within 10% for Class 1 in the same period.

(2) Problems to the National Trade Standard and Testing System in Thailand

In Thailand, the National Trade Standard and Testing System has been operated almost in the same way as in Japan and other countries, though it does not yet spread largely in industries. There are several problems that must be solved to spread this system further in industries.

The first problem is a small number of trades for testing. The number of trades is very small in production plants. The system does not cover, for example, casting, forging, metal heat treatment, metal pressing, machine inspection, metal molding, plastic molding and rubber molding. Considering the recent industrial development in Thailand, it seems that the lack of any skill licensing system for these trades may place a serious obstacle to the future skill development and settlement in industries. Especially, supporting industries such as metal working and machine industries cannot be fostered without the development of technologies and skills, and depends largely on skills. The National Trade Standard and Testing System must cover dangerous trades with priority, because they require the utmost safety in operations. Therefore, the first challenge to Thailand is how to apply the National Trade Standard and Testing System to trades in production plants.

The second problem is that the places of examination are limited to the Regional Institutes for Skill Development installed in 10 regions. To spread the significance of the System more largely, it is necessary to use more places of examination. Besides, equipment and tools must be prepared in the places of examination. It is also pointed out as an issue that some institutes now use an obsolete equipment for examination. To increase the examination facilities within the limited budget, it may be one of options to use vocational training institutes controlled by other government agencies as well as universities' and private companies' facilities. Therefore, the second

challenges to Thailand are to spread the National Trade Standard and Testing System throughout the country, especially in the private sector, and to introduce an in-house skill testing and certificating system into the appointed private companies under the direction and authorization of the Ministry of Labour and Social Welfare in order to complement the execution of the National System.

The third or final problem is that there is no movement for elevating the economic and social status of technical workers. In production fields, there are few indications that technical workers are correctly appraised or respected, though employees with higher education such as graduates from the departments of technology in universities are well treated. In these circumstances, the third challenge to Thailand is to improve the treatment of technical workers (craftsmen) licensed under the National Trade Standard and Testing System in order to motivate workers more highly to learn skills and more generally, to accumulate more skills in the Thai society.

Chapter 3 Policy Implementation System for Supporting Industry Development

3.1 Policy Implementation System

3.1.1 Government bodies

(1) Central governmental bodies

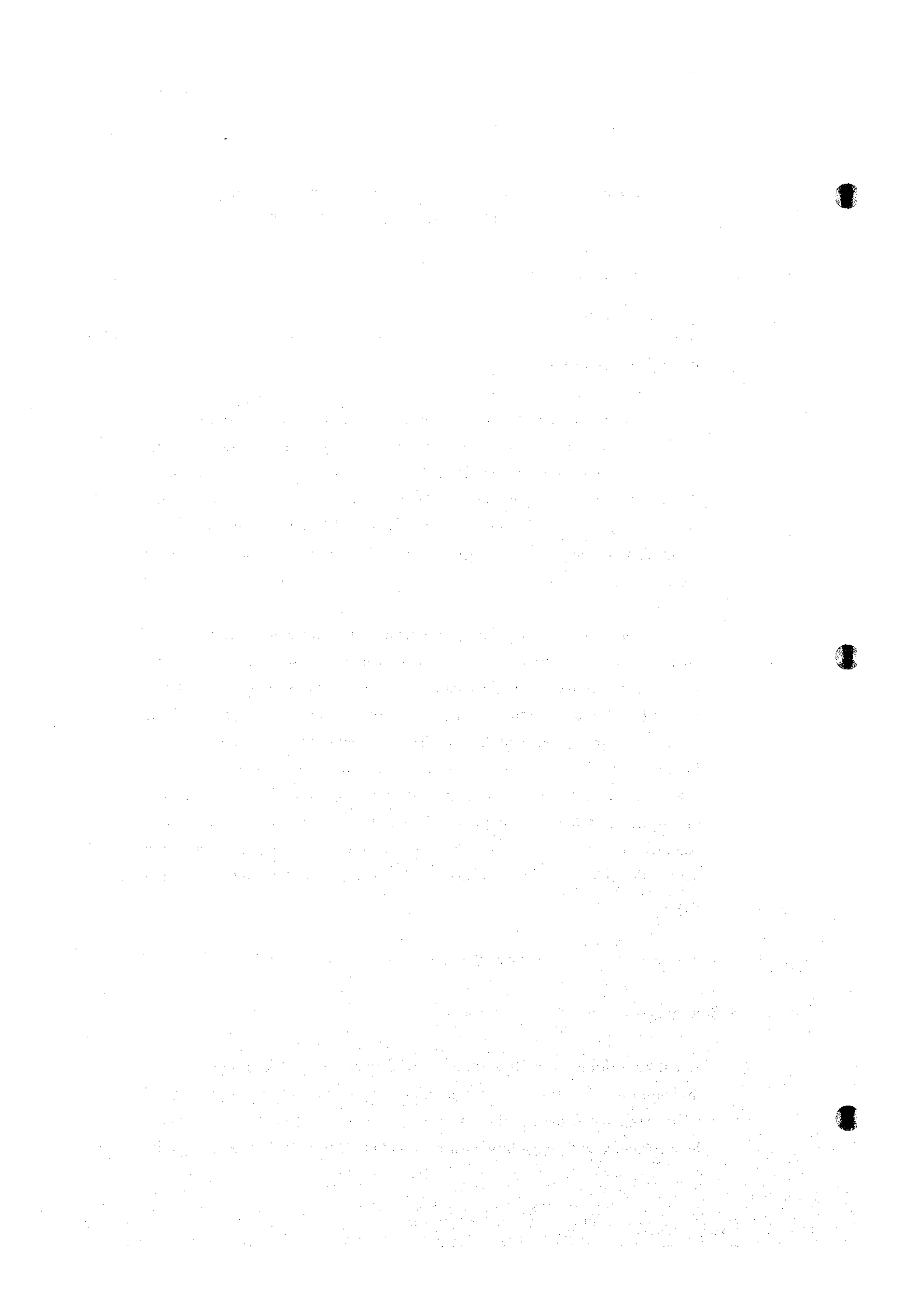
At present in Thailand the government is composed of the Prime Minister's Office and 14 ministerial offices. Under these there are 150 departments which carry out the actual implementation of policies. Figure 3.1-1 shows the ministries and departments directly or indirectly concerned in the administration of the industrial development policies (including those for promotion of the small and medium scale industries and for the regional industries) outlined above.

In Thailand there is no special governmental office for administration of the small and medium scale industries such as exists in some other countries. However, it is evident that the Ministry of Industry forms the central pillar of the system for administration of policies of industrial promotion. Other ministries support the activities of the MOI indirectly. Examples of such indirect support are the activities of the Ministry of Labor and the Ministry of Education in the nurture of personnel resources, the activities of the Ministry of Finance and the Central Bank in the field of state finance, money and banking, the activities of the Board of Investment placed under the Prime Minister's Office and the Ministry of Commerce regarding investment and trade, etc.

The functions of each department and division are summarized in table 3.1-1.

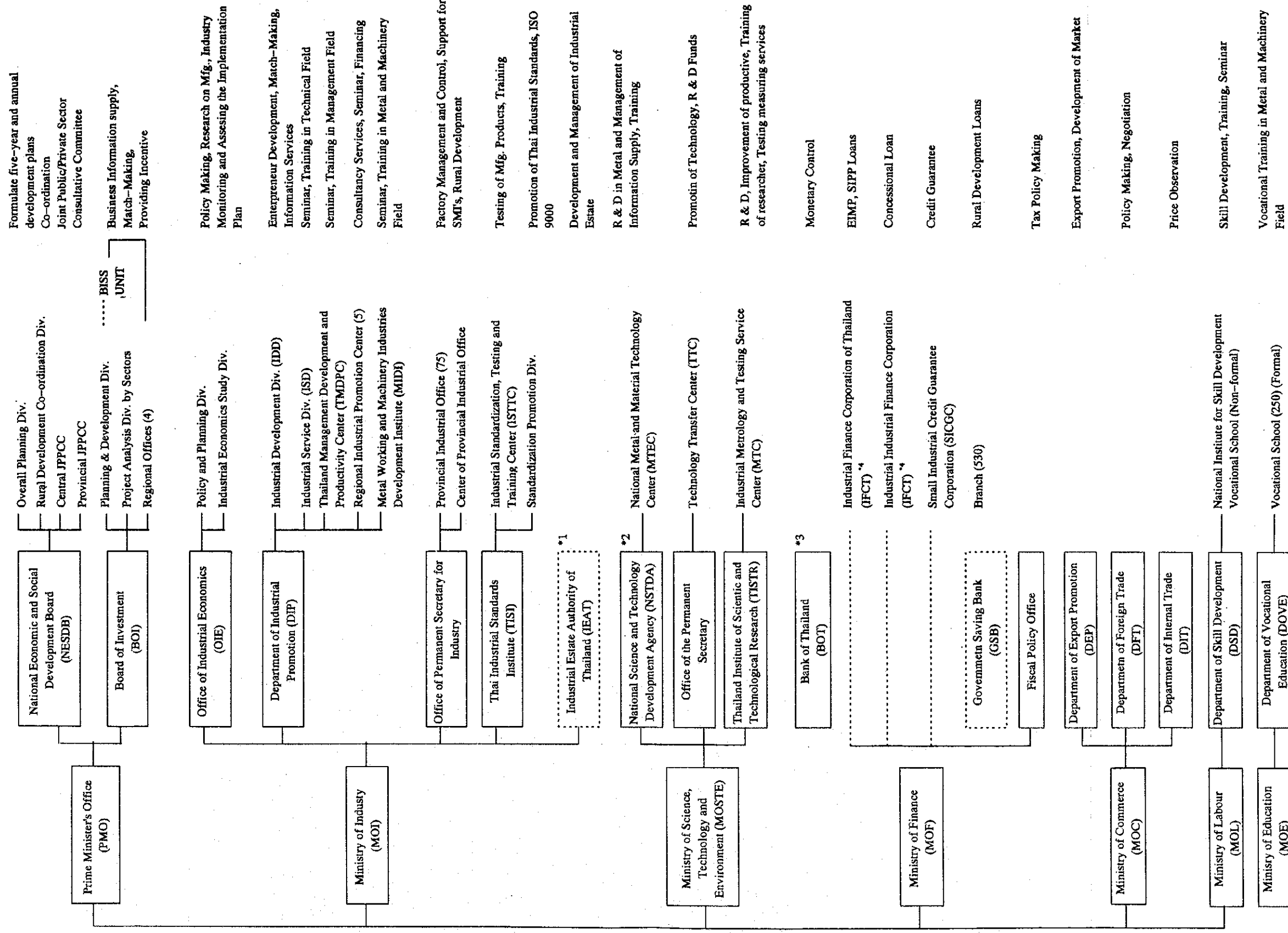
(2) Regional administrative organization

Local governmental bodies are organized in each regional administrative division to carry out local administration and these are all under the control of the Ministry of the Interior. The administrative divisions are determined in accordance with the administrative level and are classified as changwats



Organization

Principle Functions for Industrial Development



Note: The Chart shows governmental institutions related to small and medium industries development.

*1. Semi-public government agency

*2. Autonomies organization operating under MOSTE

*3. Independent Public Agency

*4. Private sector organization under a special law

Figure 3.1-1 GOVERNMENT ORGANIZATION CHART RELATED TO INDUSTRIAL DEVELOPMENT

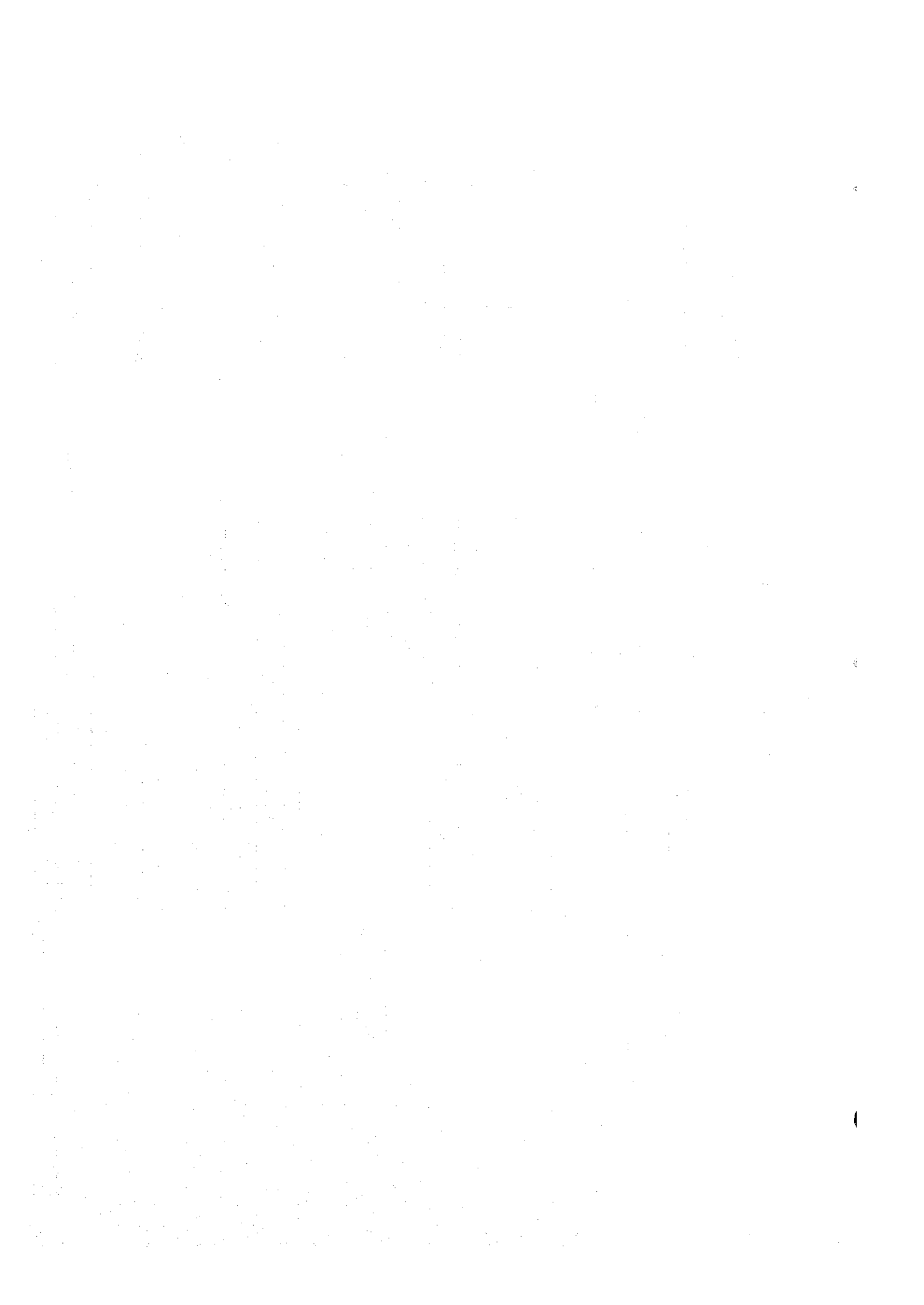


Table 3.1-1 ROLE AND FUNCTION OF KEY AGENCIES RELATED TO INDUSTRIAL DEVELOPMENT

Role	Policy Targets	Investment	Rural Development	SMI's Development	Export	Human Resource	Tech. & Environ. Development	Industrial Estate Development
Policy Making	NESDB, BOI	NESDB, BOI	NESDB, DIP, OIE	NESDB, DIP, OIE	NESDB, MOC	NESDB, MOI, MOE, DIP	NESDB, MOE, MSTE	NESDB, IEAT
Study & Research	- ditto -	- ditto -	- ditto -	- ditto -	- ditto -	- ditto -	- ditto -	- ditto -
Programme Implementation Promotion (Key Agency)	BOI, IDD	BOI, IDD	MOI (DIP, OIE)	MOI (DIP, OIE)	DEP	MIL, MOE, MSTE, DIP	MOI, MSTE	IEAT
Financial Support	IFCT	IFCT	IFCT, GSR	SIFC, IFCT			TTC, MTEC	
Fiscal & Tax Support	BOI, MOF	BOI, MOF	BOI, MOF	BOI, SICGC	BOI		BOI	
Information Supply	BOI, IDD, IFCT	BOI, IDD, IFCT	MOI (DIP), BOI	MOI, DIP, BOI	DEP	MOL, MOE, DIP	IDD, TMDPC, MID1, TISI, NSIDA, DSD	
Seminar & Training	BOI, IDD, IFCT	BOI, IDD, IFCT	DIP, PIO	BOI, IFCT, DIP	DEP	IDD, TMDPC, MID1, DSD, DOVE, ISD	TMDPC, MID1, DSD, MTEC, TTC, DOVE, ISD	IEAT, BOI

(provinces), umphurs (counties), tumbols (districts) and Moo burns (villages). At the present date of November, 1993 the total number of provinces in Thailand numbered 75 provinces (including three provinces newly created) and the Metropolitan Area of Bangkok.

The Ministry of Industry has its own regional administrative organization which is responsible for carrying out administration of industrial development. In actual practice the Provincial Industrial Offices (PIO) found in every province and act as liaison offices (please refer to figure 3.1-2). The main activities of the PIO include 1) administration and supervision of factories, 2) nurture and support of regional entrepreneurs and 3) promotion and support of cottage industries. Each PIO has on average a staff of between 10 and 14 personnel, two of whom are technical industrial officers chiefly concerned with promotion of regional industries. Activities 2) and 3) above are chiefly implemented through seminars and similar programs carried out in close cooperation with the various divisions under the Department of Industrial Promotion.

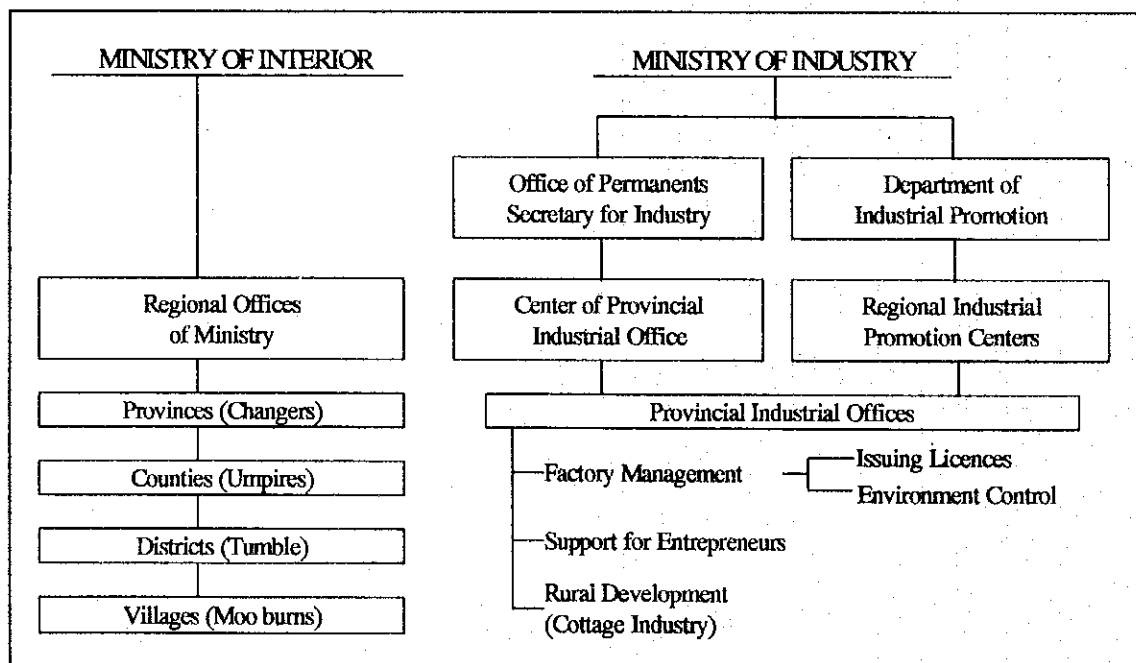


Figure 3.1-2 REGIONAL ADMINISTRATIVE ORGANIZATION

3.1.2 Linkages between government and the private sector

(1) Private sector organizations

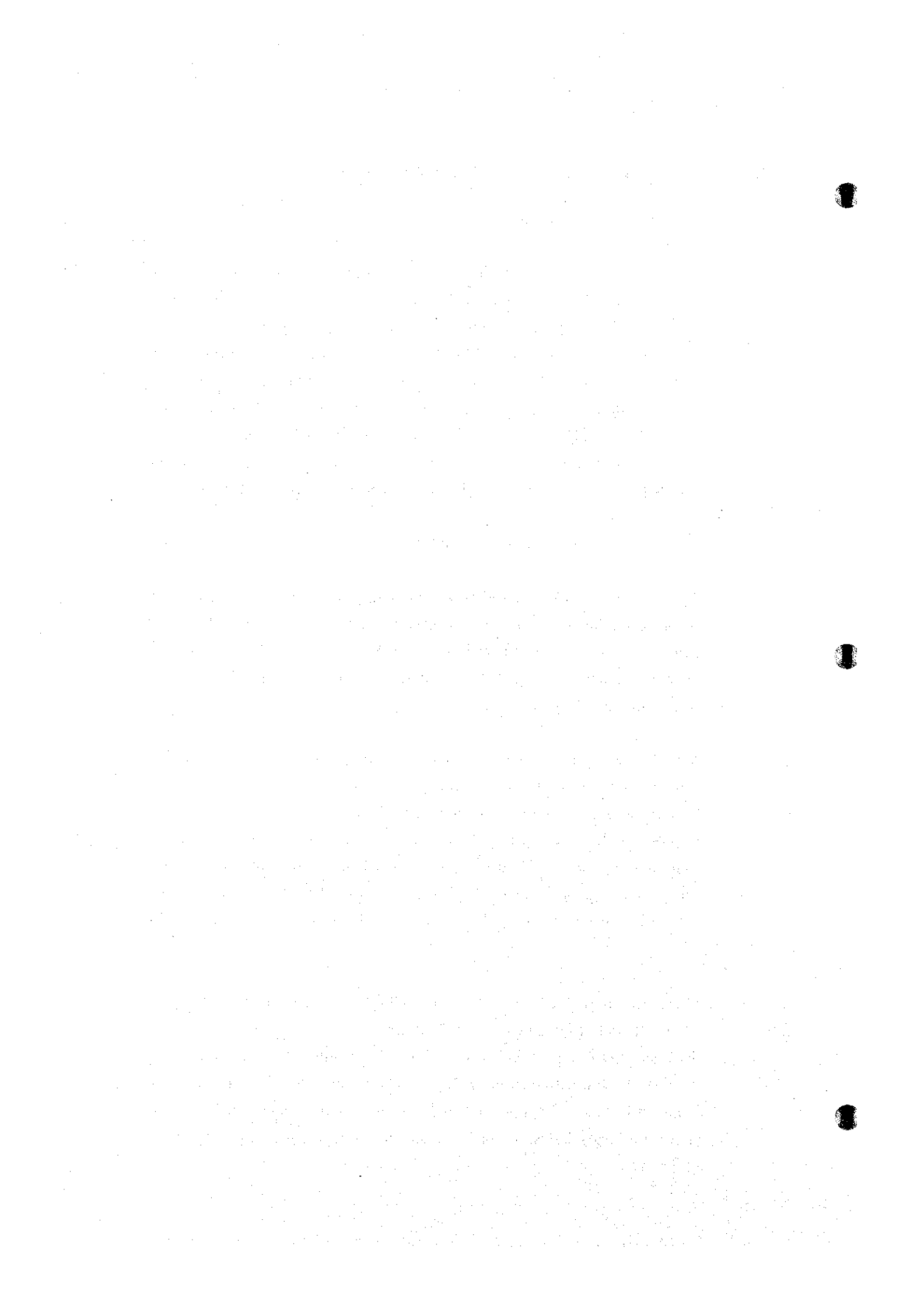
Nationwide organizations of the private sector include the Federation of Thai Industries (FTI), local Chambers of Commerce and the industrial associations of the individual industries. Among such private sector organizations the FTI is the most energetic in its lobbying activities towards the government. In many cases groups which are already members of a Chamber of Commerce or an industrial association also join the FTI. Internally the FTI is subdivided into clubs organized by industrial sector and clubs by region so that this organization can be justly described as a fully representative body of the private sector in Thailand. The following is a general outline of the FTI.

(2) The Thai Federation of Industries (FTI)

The Thai Federation of Industries is the largest private sector organization accorded public approval and was officially founded by the Thai Industrial Federation Act proclaimed on Dec. 19, 1987. In the present year of 1993 members of the FTI exceeded 3,200 companies organized into 25 industrial sector clubs and 13 regional clubs.

More than 300 private sector representatives represent the interests of the FTI constituent members on joint working committees between government and the private sector. A representative example of such participation are the activities undertaken in the JPPCC (Joint Public and Private Consultative Committee), and the FTI sends members to act as representatives on both the central and regional JPPCC. The organization of the FTI and its relations with governmental bodies and in particular with the JPPCC are shown in Fig. 3.1-3.

Specific aims of the FTI include conducting surveys to identify problems arising in industrial sectors as well as making proposals and engaging in discussions with the government on how to strengthen the industrial sector. As part of these activities the FTI presented a report to the Government of Thailand in June, 1993 on problem points and improvement policies for the automobile parts industries in Thailand. In this report the following points



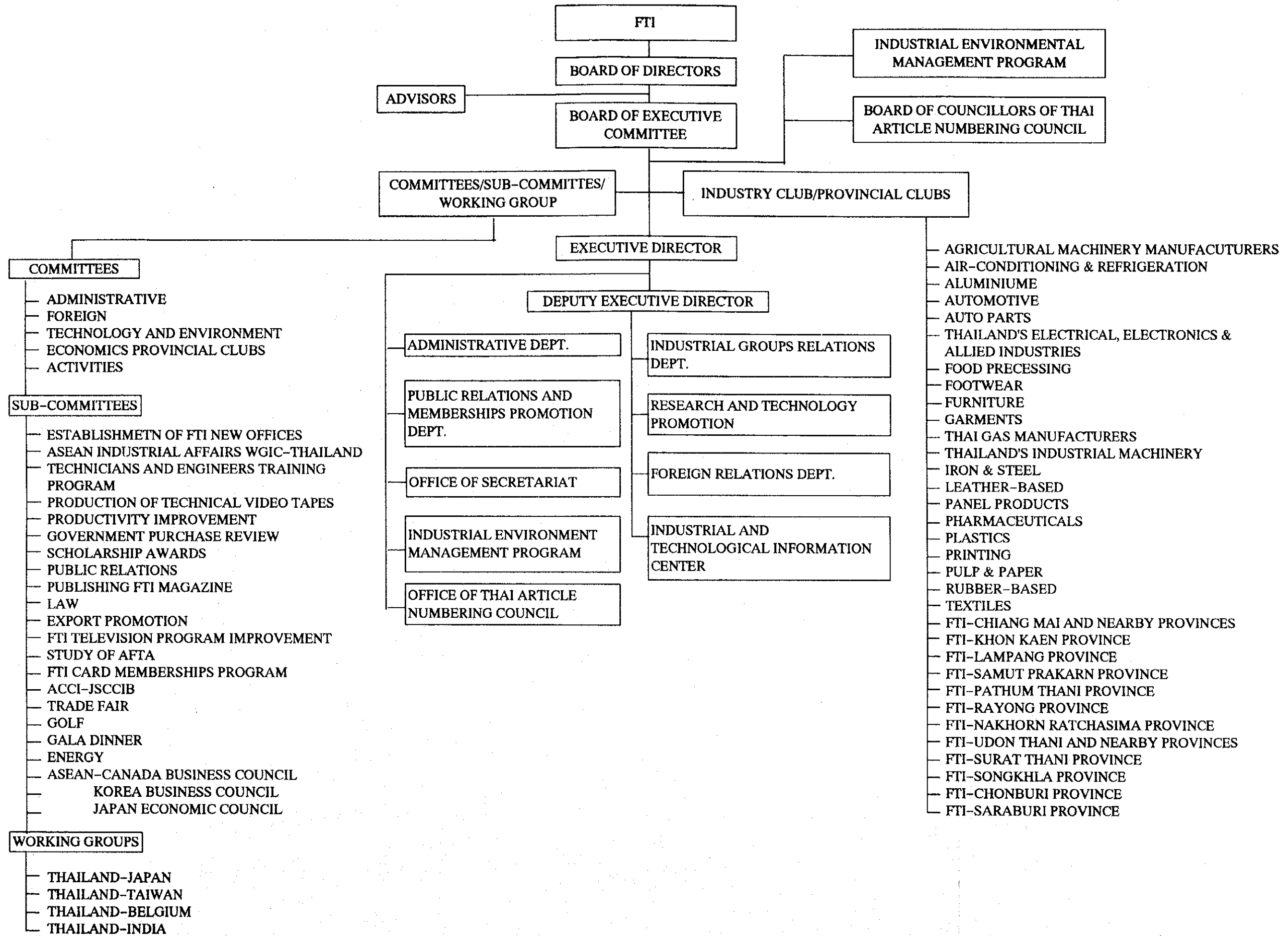


Figure 3.1-3 THE FEDERATION OF THAI INDUSTRIES ORGANIZATION CHART

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were made;

- 1) Need for consistency and greater clarification of customs policies regarding completed motor cars and automobile parts.
- 2) Introduction of measures of financial support such as low interest financing, etc.
- 3) Providing of personnel training programs in line with technological changes and innovations
- 4) Assistance to strengthen Research and Development.

(3) JPPCC (KORLOROR)

KORLOROR is the abbreviated form in Thai for the organization known in English as the JPPCC (Joint Public/Private Consultative Committee). Established in 1981 the committee was to provide a venue for the exchange of views between the private and public sectors, and a joint working committee for drawing up and establishing of policies and systems.

KORLOROR consists of a Central Committee whose Chairman is the Prime Minister and Provincial Committees chaired by the Provincial Governors. Administrative offices are placed under the Government and Private Cooperation Division of the NESDB. The constituent members of KORLOROR are shown on Fig. 3.1-4. At present, committee meetings of the Central Committee take place once every 3 to 4 months, and most recently to date was the meeting held on Dec. 17, 1993 at Haadyai in Southern Thailand. At the Haadyai meeting the central issue under discussion was industrial cooperation with Malaysia in areas bordering frontiers with these countries. For example, discussions were held concerning the plan to establish an industrial estate along the southern frontier line with Malaysia to act as a base for receiving and relocating electronics industries coming in from Malaysia.

KORLOROR handles a wide range of topics and issues and the government has delegated it the role of evolving and developing the guidelines and groundwork for drafting governmental plans. However it is sometimes pointed out that few of proposals at KORLOROR are backed by sufficient data, and even in cases of proposals arising from the sites concerned,

supporting data and information is inadequate or poor in the majority of cases and the government is consequently unable to make any concrete use of the proposals. The government has expressed its desire to see improvements on the part of the private sector in this regard. Finally, KORLOROR also holds sub committee meetings on individual topics and issues such as investment promotion or personnel development in order to encourage dialogue between the public and private sectors.

(4) Other Industrial Associations

The following organizations form a brief summary of those industrial associations which are concerned by the present survey. All of these carry out negotiations with the government as industrial bodies and the majority of these associations are members of the FTI clubs mentioned above.

1) The Thai Autoparts Manufacturers Association (TAMA)

Founded in 1978, at present there are about 100 member companies. The members include not only manufacturers of automobile parts but also traders, machine tool manufacturers, etc.

2) The Automotive Industry Association (AIA)

Founded in 1981, at present there are about 50 member companies. This association is the Thai representative at the Asia Automotive Federation (AAF).

3) Automotive Industry Club of the FTI and the Autoparts Industry Club of the FTI.

Both of these are FTI clubs. The latter acts as representative of the FTI in discussions concerning customs issues and takes part in meetings with the government.

4) Thai Electrical, Electronics and Allied Industries Club of the FTI.

This association is a club of the FTI but is also the largest and only industrial association in Thailand for the electrical and electronic industries. The Club members also include specialist parts manufacturers.

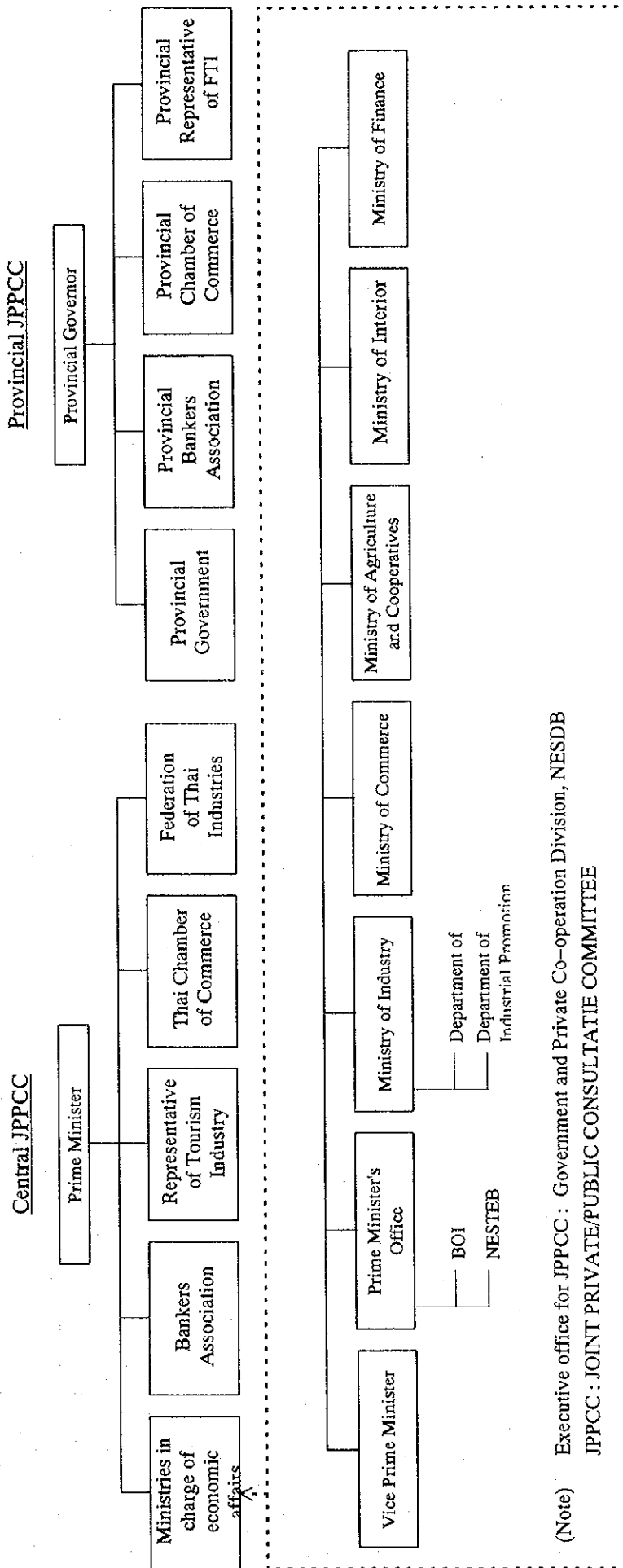
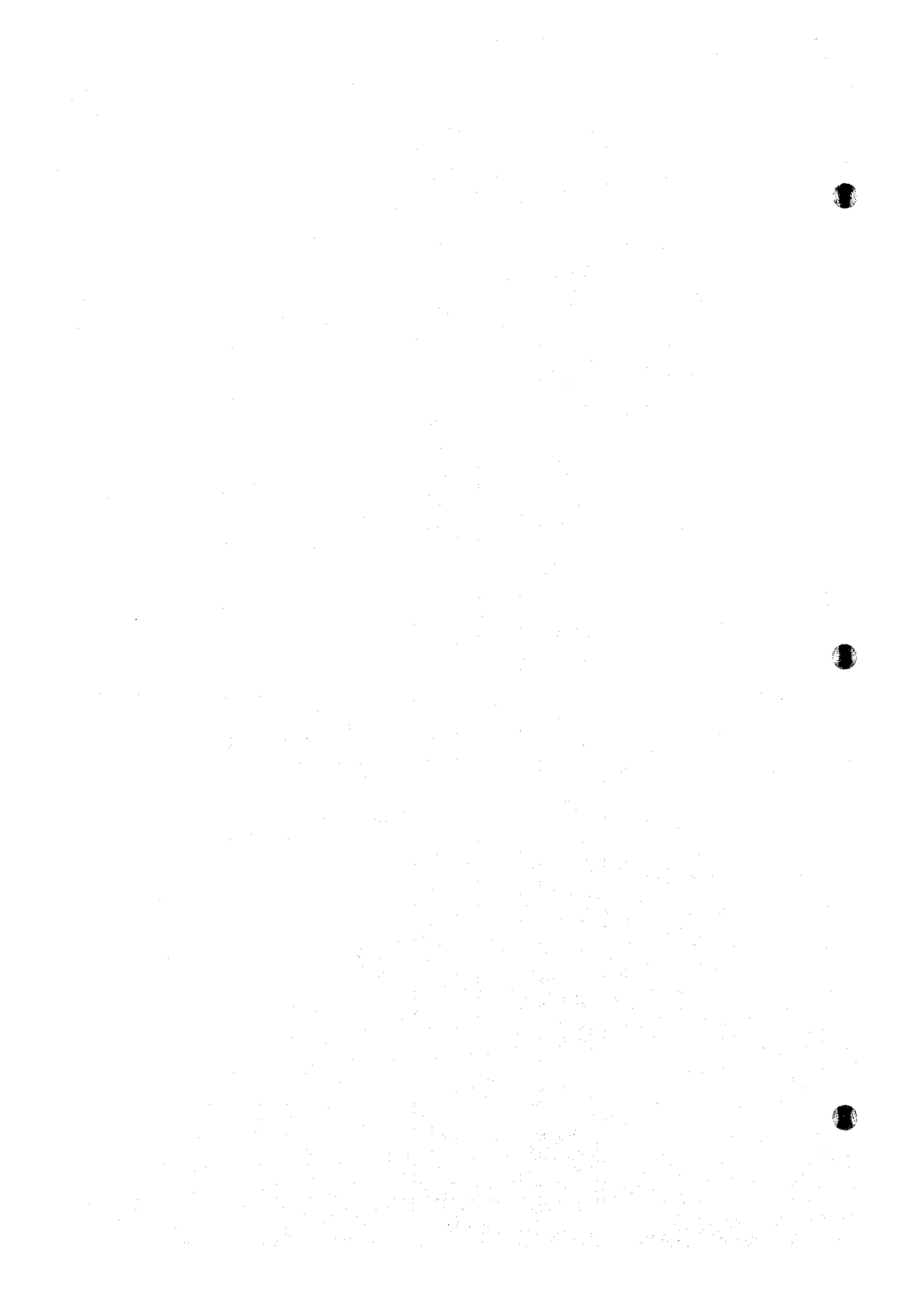


Figure 3.1-4 ORGANIZATION CHART OF JPPCC AND CONSTITUENT MEMBERS



3.2 Institutional Setup for Promoting the Supporting Industries

3.2.1 Human resource development and problems

The Seventh Plan and Ministerial programs all emphasize the urgency and importance of developing personnel resources. In particular, NESDB pointed out the following problem can be noted in relation to development of personnel resources and assistance to research and development in the manufacturing sector.

Problems relating to personnel development

- 1) insufficient supply of engineers and mid level administrative staff
- 2) need for reeducation of graduates coming from vocational training institutes
- 3) lack of research and development personnel in special fields
- 4) lack of training facilities and teaching staff
- 5) need for training schemes for unskilled labor from agricultural sectors

Problems relating to Research and Development Assistance

- 1) lack of personnel with experience and expertise in carrying out original and independent research and development
- 2) inadequate stock of wide ranging basic technical expertise
- 3) shortage of inspection and testing facilities
- 4) the lack of enthusiasm among private sector companies for research and development activities
- 5) the inadequate diffusion of technical information to the small and medium scale industries

Policy Theme

The Seventh National Economic and Social Development Plan lays down the basic policies regarding personnel development and training nationwide. While aiming at an overall upgrading of educational levels, special emphasis is given to the need to speed up and reinforce personnel training in the natural sciences. This is seen to reflect the recognition of the need to address the problems mentioned above. Further, for the time being it has been decided to adopt a policy of reinforcing supervisory training in existing educational institutes through technical assistance from overseas. The Seventh Plan lays down the following concrete numerical targets and assistance guidelines for research and developments policies.

1) Numerical targets

- Up to 1996, 0.75% of the GDP will be earmarked for investment into Research and Development. Of this, the public sector will be responsible for funding 0.50% while the private sector will provide 0.25% of the above investment.
- The targets set for the number of engineers, researchers and technicians to be trained in the field of natural science up to 1996 are as follows;

	<u>1991</u>	<u>1996</u>
Engineers	9.8 per 10,000 of population	14.9 per 10,000 of population
Technicians	141.5 per 10,000 of population	221.5 per 10,000 of population
Researchers	1.4 per 10,000 of population	2.5 per 10,000 of population

1991 is the first year of the Seventh Plan which will terminate in 1996.

2) Sector wise targets for research and development

- In the metal working and machinery sectors
To focus principally on design technology needed for precision molds and machine tools.
- In the electronics sector
To focus on trial product technology to develop new products with high market potential in high tech fields such as multi layer printed circuit board (MLPCB) or private automatic branch exchange (PABX) which involve relatively easy technology.

The basic policy set out in the Seventh Plan regarding promotion of research and development is to give priority to private sector initiatives and promote technology introduction from overseas. The government will provide support for systems to diffuse such technological expertise among the small and medium scale industries in Thailand. The BOI has drawn up incentive policies to encourage a flow of foreign capital into certain specific sectors. Implementation of these policies is accorded to the Ministry of Science, Technology and

Environment (MSTE) and the various institutions administered under the Ministry of Industry.

In particular, the lack of basic education as well as vocational education was strongly emphasized during the field survey, and this problem made clear the needs of training supervisory personnel (teaching staff, technical supervisors, etc.). The following Chapter 3.2.2 describes the present vocational training system in Thailand for understanding the actual situation and problems of the technical support system.

3.2.2 Vocational education and training system and its problems in Thailand

(1) Vocational training system in Thailand

In Thailand, vocational training have been carried on both in the formal and non-formal education systems. Various education and training institutions, public and private, have participated in vocational training activities, where public institutions as listed below played a leading role.

Formal education system:

- 1) Department of Vocational Education (DOVE), Ministry of Education;
- 2) Rajamangala Institute of Technology (RIT), Ministry of Education; and
- 3) King Mongkut Institute of Technology (KMIT), Ministry of University Affairs.

Non-formal education system:

- 1) National Institute for Skill Development (NISD), Department of Skill Development, Ministry of Labour and Social Welfare; and
- 2) Department of Non-Formal Education, Ministry of Education.

Figure 3.2-1 shows an organizational view of the vocational education and training system, in which the above-mentioned public institutions take the lead. In principle, Thai people complete an obligatory education comprising 6-year primary and 3-year lower secondary educations, and receive a higher education or find employment. (The obligatory 3-year lower secondary education system was decided by the Cabinet council in 1990 and took effect

in 1993.) If they go on to schools of higher grade, they may receive vocational training as one of their options. According to the 1992 statistics, about 341,000 and 250,000 students were registered in formal and non-formal vocational training courses respectively organized by the above-mentioned public institutions. In addition, about 263,000 students were registered by private vocational education and training schools under the control of Office of the Private Education Commission in the Ministry of Education. (Refer to Table 3.2-1.) From these data, it is estimated that about 60% of all the students were studying in vocational education and training courses for the industrial sector in 1992.

Table 3.2-1 NUMBER OF INSTITUTIONS AND STUDENTS IN 1992

	No. of Vocational Institutions	Total Number of Students	No. of Students in Trade & Industry
DOVE	228	258,896	145,574
RIT	50	65,505	27,445
KMIT	13 ^{*1}	17,298 ^{*2}	17,298
NISD	23	28,401	28,401
DONFE	n.a.	221,132	n.a.
Private ^{*3}	312	263,485	n.a.

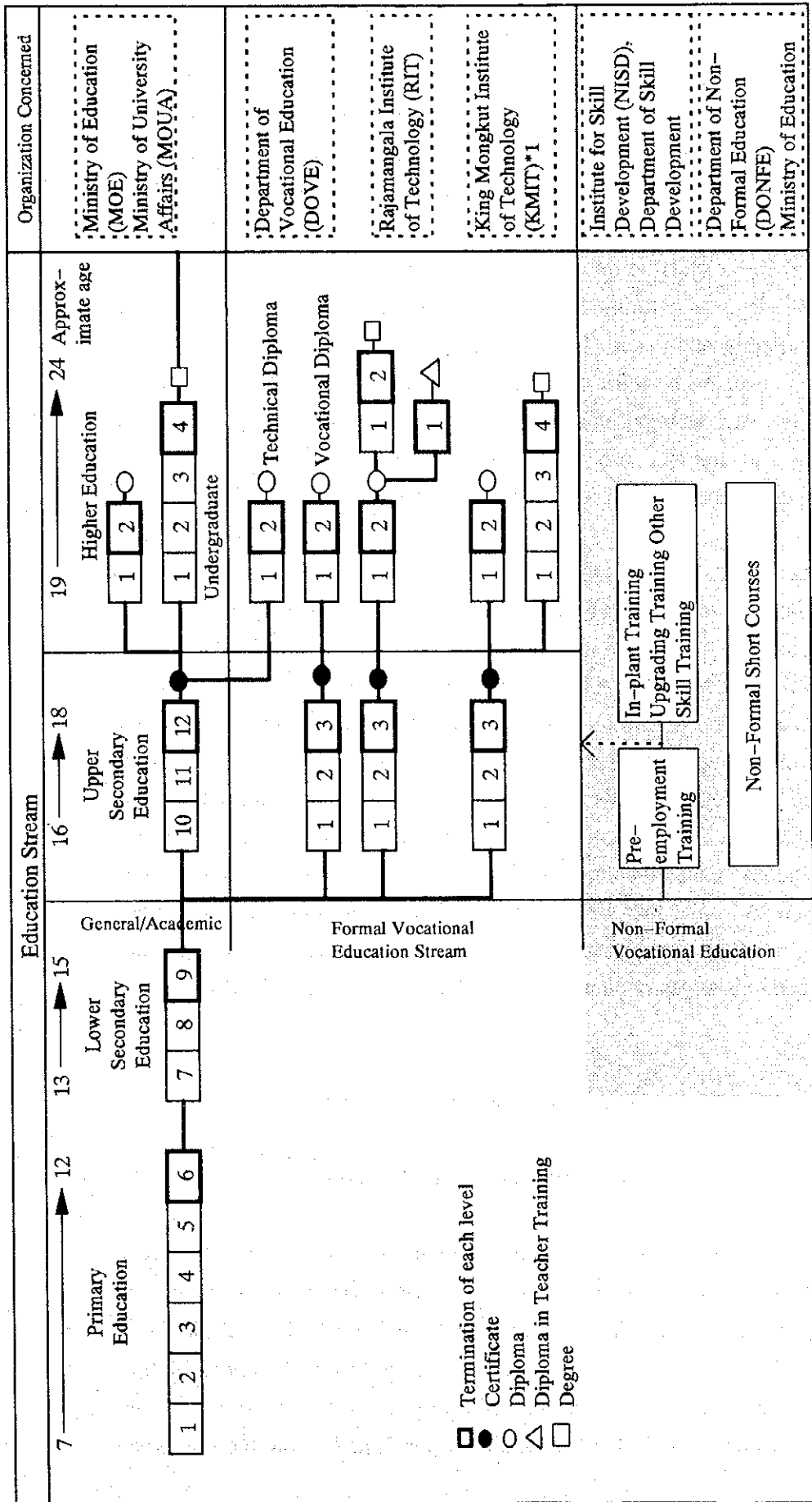
Notes: *1 Number of faculties.

*2 Total number of students including master's and doctoral degree in 1991.

*3 Private vocational education institutions under the supervision of Office of the Private Education Commission
n.a. not available

Sources: - Thai Economic Outlook 1992-1993, Japanese Chamber of Commerce, Bangkok.

- Dove 91.



Remarks: *1 The certificate level courses will be abolished soon.

Sources: Department of Vocational Education Institute for Skill Development

Figure 3.2-1 CONTINUING PROCESS OF VOCATIONAL EDUCATION

There are several differences between formal and non-formal education and training curricula. Particularly, the formal curricula are all-round, including a wide range of academic and other subjects for all types of students, while the non-formal curricula focus on re-education and vocational training courses for the adults who have had no opportunity to receive an education or training, or on a short-term skill training for those who are working. The formal education and training curricula formulated by the Departments of Vocational Education and Non-Formal Education in the Ministry of Education cover many types of job not only in the industry, but also in the other sectors such as services and agriculture. A majority of the non-formal education and training programs which the National Institute of Skill Development prepared is applied mainly to jobs in the industrial sector.

Rajamangala and King Mongkut Institutes of Technology have organized formal courses for vocational education and training. In the administrative organization, RIT belongs to the Ministry of Education, while KMIT is under the control of the Ministry of University Affairs. In addition to Diploma and Degree courses (for 4 and 2 years respectively) for regular students, the two institutes of technology have vocational education and training courses for those who completed the lower secondary education (junior-high school) and higher education. They are now groping their way toward the establishment of a vocational education and training system in active cooperation with industries. They have already operated several branches that were established with industries' supports and highly appreciated in educational achievements. Some typical examples of these branch schools will be described in Section 3.4.

(2) Problems in the vocational education and training system

1) Improvement in quality of people with lower education

In Thailand, the vocational education and training system is devoted in principle to people of 15 years and over, or those who completed the primary and lower secondary (junior-high school) education. Table 3.2-2 indicates that the percentage of school attendance has been kept as high as 93% for 5 recent years in the primary education. It was 46.8% for the lower secondary (junior-high school) education in 1992, just before the year when

this education became obligatory. In the same year, the percentage of graduation was about 5 points lower than that of school enrollment rate. The percentage of school attendance was about 25%, the lowest among ASEAN countries, for the upper secondary (senior-high school) education.

Table 3.2-2 ENROLLMENT RATE BY EDUCATIONAL LEVEL BY YEAR

Educational Level	1988	1989	1990	1991	1992
Elementary	93.56	93.63	93.82	93.72	92.58
Lower Secondary	32.81	34.40	37.19	41.43	46.82
Upper Secondary	23.39	22.73	22.54	23.64	25.29
Higher	7.33	7.97	8.58	9.98	20.52

Note: The sudden increase in 1992 of the enrollment rate at higher education level is due to the opening of open universities.

Source: Strengthening Vocational and Technical Manpower Production Program, Overseas Economic Cooperation Fund, Japan

Those who have primary and lower education backgrounds account for about 82% of the labor market in Thailand, as indicated in Table 3.2-3. This figure rises up to about 90%, including those who completed the lower secondary (junior-high school) education. In 1993, the Thai Government started to make the primary and lower secondary (junior-high school) education obligatory in order to push up the educational level of the people. However, it is generally supposed that it will take considerable years to improve the educational level in the labor market which is mainly constituted by those who have lower education backgrounds, because it takes many years to upgrade the educational level of the people. Under these circumstances, a great challenge to Thailand at present or in the near future is probably how to improve the quality of those who have lower education backgrounds and account for about 90% of the labor market. Therefore, it will be more and more necessary for the Thai Government to strengthen the basic education and the practical vocational education and training for those who are working and want to learn.

Table 3.2-3 EMPLOYED PERSON BY LEVEL OF EDUCATION ATTAINMENT

	1980		1985		1990		1991	
Total	22,523	100%	25,852	100%	30,842	100%	31,133	100%
None	2,015	8.9%	1,913	7.4%	1,666	5.4%	1,494	4.8%
Less than 4 year	1,106	4.9%	1,138	4.4%	987	3.2%	872	2.8%
Elementary	17,464	77.5%	19,570	75.7%	23,132	75.0%	23,444	75.3%
Lower Secondary	855	3.8%	1,267	4.9%	1,881	6.1%	1,961	6.3%
Upper Secondary	169	0.8%	362	1.4%	740	2.4%	778	2.5%
Vocational	287	1.3%	491	1.9%	771	2.5%	809	2.6%
University	246	1.1%	491	1.9%	1,110	3.6%	1,152	3.7%
Teacher Training	346	1.5%	491	1.9%	555	1.8%	592	1.9%
Short Course Vocational	4	0.0%	26	0.1%	0	0.0%	31	0.1%
Other	31	0.1%	103	0.4%	0	0.0%	0	0.0%

Sources: Labor Force Survey 1980, 1985, 1990, 1999 (NSO)
 Strengthening Vocational and Technical Manpower Production Program, Overseas
 Economic Cooperation Fund

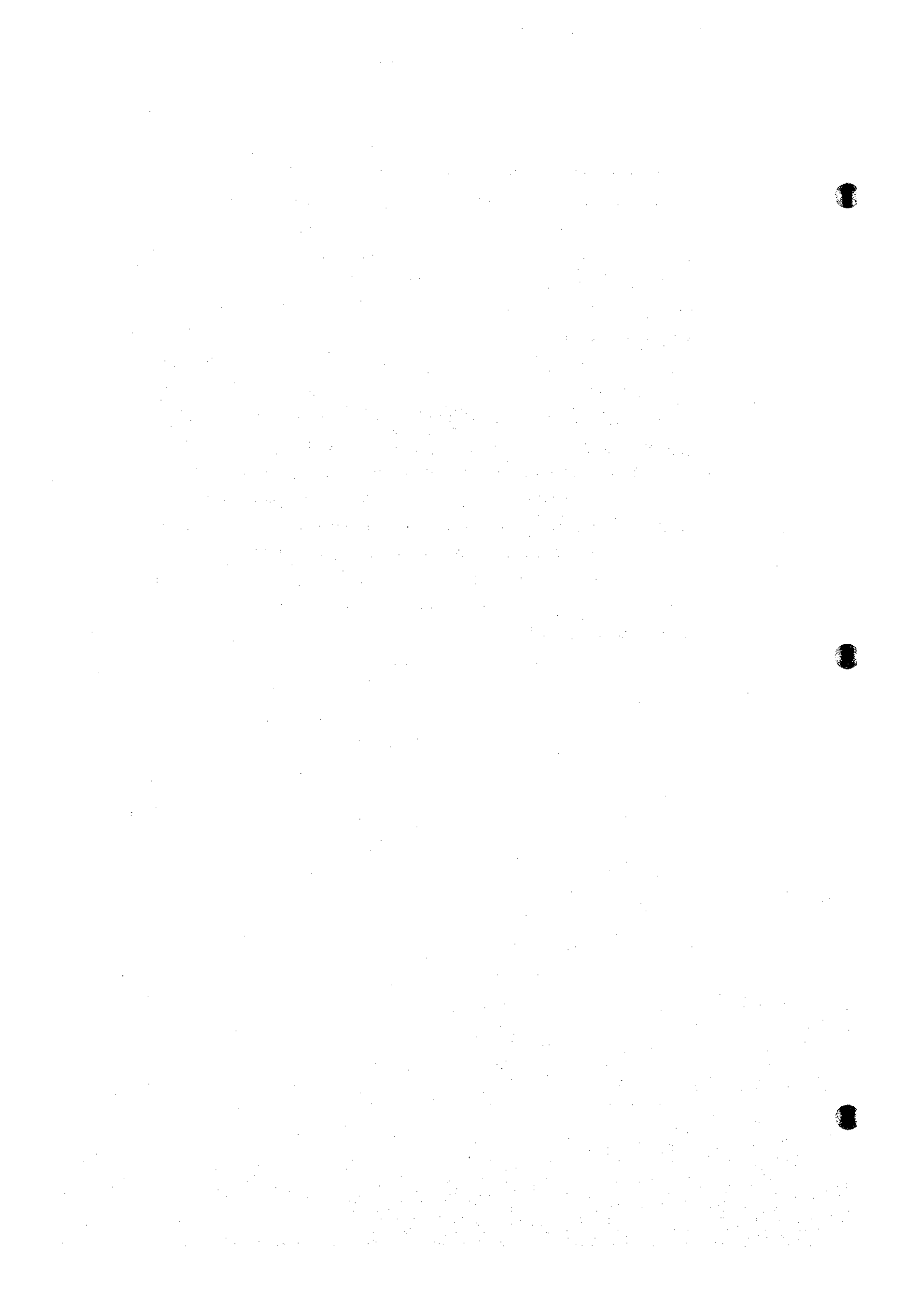
2) Training and recruitment of teachers

A shortage of teachers in educational facilities is the second problem by which the Thai vocational education system is confronted. This problem is now serious both in the formal and non-formal education fields. As described above, the Thai Government has increased its educational budget, including vocational education and training, year by year to upgrade the educational level of the people. This budget also includes the construction and extension of facilities and the training for teachers. Of course, it will take a certain period of time to train talents as teachers, as it does to improve the percentage of school attendance. Besides, these talents are now the targets of scouting as potential engineers and technicians in industries. It is also pointed out that there is a necessity of improving the treatment of the existing teachers. Under these circumstances, the second challenges to Thailand are how to construct and extend facilities necessary for the future vocational education and training system as well as how to train and recruit talents as teachers meeting the needs of the times for a short period.

3) Effective use of the open vocational training system

The third challenge to Thailand is how to establish a vocational education

and training system meeting the needs which industries have. In this age of rapid technological innovations, it is imperative to meet the needs of industries immediately by upgrading vocational education and training curricula, improving the quality of teachers, and constructing modern facilities. However, it is reported that industries require talents who have a higher education level than those who are now supplied by vocational training institutions. Industries require educational institutions to assure the strengthened basic education as well as the vocational education and training by which what was learned can be immediately useful on the job. Under these circumstances, the third challenge to Thailand is to establish a supporting system for in-house and on-the-job training projects in order to give employees more chances to receive vocational education and training directly on the job. In Thailand, Regional Institutes for Skill Development (RISDs) have partly adopted a field training program wherein instructors visit companies to train employees on the job concerning the selected themes. In the future, it is necessary to establish a supporting system that is required to develop the open vocational education and training system and make effective use of it.



3.3 Actual Situation and Problems of Technical Support Institutions for Supporting Industries

This section describes the actual situation and problems of technical institutions, especially public institutions, which Thai supporting industries can utilize. These technical institutions do not serve only to foster supporting industries, but any private company can utilize them at any time.

Of these technical institutions, this section covers only the "technical support institutions for fostering human resources" which are engaged in fostering employees who are now working in companies, that is, main institutions which give daily supports to private companies now under operation.

3.3.1 Actual situation of technical support institutions

Technical support activities for fostering Thai supporting industries can be roughly divided into the following 3 fields:

- (1) Supports for fostering human resources (Education/Training);
- (2) Supports for producing activities (inspections, production technology, and R & D); and
- (3) Information and management consulting services.

Table 3.3-1 lists the main technical support institutions by field. The institutions marked with serial numbers 1 to 11 have facilities to provide services for private companies. Those marked with numbers 12 to 15 are institutions which provide technical supports indirectly to private companies in terms of administration, except two national universities KMITNB and KMITL of which the main objective is to carry on an education for students and which use any of their facilities and personnel to provide technical services for private companies on a temporary basis. Thus, the universities themselves may not play a leading role in giving technical supports to Thai supporting industries, but a role as coordinators or organizers in drawing up new programs for fostering human resources.

- (1) Supports for fostering human resources

A majority of the technical support institutions as listed in Table 3.3-1 has taken more or less active part in support activities for fostering human resources.

Table 3.3-1 TECHNICAL ASSISTANCE FOR SUPPORTING INDUSTRIES PROVIDED BY MAJOR ORGANIZATION

Ser. No.	Name of Organization	Authorities Concerned or Status of Organization	Location	Sub-sectors Served or Major Functions	Education/ Training		Technical Assistance						Others		
					1 Seminar/Workshop (Technology, QC, etc.)	2 Vocational Training	3 Extension Services	4 Technical Consultation	5 Research & Development	6 Inspection, Testing	7 Calibration	8 Industrial Standardization	9 Consultation for Invest/Management	10 Technical Information	11 Credit
Technical Institution															
1	MIDI	MOI/DIP	Bangkok	Technical institution for metal work and machinery industries											
2	TMDPC	MOI/DIP	Bangkok	Improving of productivity and management development in manufacturing industry											
3	(R)IPC	MOI/DIP	Chonburi and other 4 cities	Promotion and advisory center for small scale and regional industries											
4	ISTTC	MOI/TISI	Bangkok, Bang Yi Kan	Industrial standardization, testing and training center											
5	MTC	MOSTE/TISTR	Bangkok	Testing center for industrial products, metrology and measurement system											
6	NISD (R)JSD	MLSW/DSD	Bangkok and 23 institutes	Coordinating vocational training											
7	TPA	NGO	Bangkok	Industrial technological supporting association											
8	KMITNB	MOUA	Bangkok	Providing formal and non-formal vocational education											
9	ATTC	MOUA/KMITNB	Ayuthaya	Providing formal and non-formal vocational education											
10	CTTC	MOE/RIT	Nakhon-ratchasima	Providing formal and non-formal vocational education											
11	KMITL	MOUA	Bangkok	Providing formal and non-formal vocational education											
Administrative & Information															
12	DOVE	MOE	Bangkok and other 240 institute	Formal vocational training program											
13	IDD	MOI/DIP	Bangkok	Industrial promotion for small and medium industries in the target provinces											
14	MTEC	MOSTE/NSTDA	Bangkok	Promoting research development in the field of industrial materials											
15	TTC	MOSTE/OPS	Bangkok	Core organization in coordinating the international technology transfer											

(Note) ○ : Services available for SIs. (Source) JICA team's interview survey, see ANNEX II

These support activities range from the organization of short-term seminars to that of formal vocational education and training courses. Many of these institutions are located in Bangkok. The Ministry of Industry has also organized regional seminars through its prefectural offices. The vocational education and training institutions controlled by the Ministry of Education and the Ministry of Labour and Social Welfare have now about 300 units of education and training facilities all over the country, and plan to add 50 units by the end of 1996.

Among the technical support institutions (Table 3.3-1), the most active is TPA (Thai-Japan Association), which is a non-profit-making organization supported by the Japan-Thailand Economic Cooperation Society (JTECS).

This association, established in 1973, has already achieved great success in the vocational education and training field, based upon its long history and experiences and because of its good location. In 1993, it organized about 500 training courses and seminars with about 15,500 participants in total. These training courses and seminars covered mainly production control and management technologies such as quality improvement, productive maintenance, computer, energy & environment, industrial instrumentation and management. They used well-prepared teaching materials and aids such as textbooks in Thai and videotapes.

On the other hand, the MIDI has organized many seminars mainly on production technology. In 1993, it held 71 seminars for 1,799 participants in total. During these surveys, MIDI organized a seminar on foundry technology with a foundry exhibition on the 4th and 5th of August in 1994. The seminar attained complete success with much more participants than MIDI had expected.

In recent years, new type support institutions for fostering human resources have been created in academic-industrial cooperation or as a part of NGOs' (Non-Governmental Organizations') activities to meet the needs of industries. Several examples of these institutions will be described in Section 3.4.

(2) Supports for producing activities

Institutions such as MIDI, ISTTC, MTC and TPA (Thai-Japan) have provided support services for producing activities. These support services cover technical instructions including those by visiting companies, testing and inspection of products and test pieces, calibration of measuring instruments, testing and inspection for industrial standardization, and environment and pollution instrumentation and R & D. Only MIDI has provided support services on production technology among the institutions as listed above.

MIDI, which was established with JICA's cooperation in 1985, are completely furnished with producing equipment comprising casting, heat treatment, machining and plating as well as testing and inspecting equipment including non-destructive testing machines. MIDI uses these machinery and equipment to provides training services for employecs in private companies. It made tests on 1,338 types of test pieces for 126 companies in 1993.

ISTTC (attached to MOI/TISI) and MTC Bangpoo branch center (attached to MOSTE/TISTR) were also established with JICA's cooperation in the Bangpoo Industrial Estate during 1988 and 1990 respectively. The ISTTC was set up with assistance received from the government of Japan, and a number of Japanese experts have been posted at the Center since it commenced operations. At present ISTTC facilities are based at two locations, the main one at Bangpoo has facilities Standardization and QC training and for carrying out product inspections relating to the four fields of electrical-electronic products, machinery, industrial materials and chemical goods (including agricultural chemicals etc.). The centre facility located at Bangyikhan carries out inspections and testing of construction materials and foodstuffs.

Commissions for product inspection are received at Bangkok and a standard charge of 55 Bahts per hour is normally charged for inspection work. Over the one year period from October, 1992 to Sept.,1993 the following number of commissions were carried out by the ISTTC;

- No. of product quality inspections	796
- No. of continuing inspections	679
- No. of sample inspections	436
- No. of standardization inspections	137

The main electrical items for which testing was commissioned were lights, electric irons and air conditioners. Since audio equipment manufacturers tend to carry out in house inspections the number of commissions for such items was small. At present standards and facilities for automobile standard testing are being prepared under the technical supervision of the Japanese Automobile Research Institute (JARI) which is the Japanese institute responsible for automobile safety and anti pollution research.

Prior to the creation of the ISTTC the TISI was unable to obtain its own independent data even in the case of items which came under the compulsory standards category and the TISI activities were limited to desk work. At present however the TISI has the ISTTC carry out approval inspections on all items which come under the compulsory standards and stores the data resulting in the TISI information centers.

MTC Bangpoo branch center (attached to MOSTE/TISTR) was created at Bangpoo to provide testing and analyzing services for industrial products and calibrating and other services for industrial measuring instruments. The Bangpoo center is equipped with up-to-date testing and inspecting machines and instruments, which are calibrated by the National Research Laboratory of Metrology in Tsukuba, Electrotechnical Laboratory of Japan, and by CISRO and NATA in Australia. This means that the Bangpoo center has a high traceability for these machines and instruments. In the ASEAN area, only SISIR in Singapore is now comparable to MTC Bangpoo branch center in terms of traceability and the range of calibration services.

TPA (Thai-Japan), private support institution, also provides calibrating services for measuring instruments. TPA has many customers owing to its good location and a short period of services, though its prices for calibration services are higher than those in MTC. The annual number of units calibrated by TPA increased year by year to 3,229 in 1993, and reaches 4,300 (estimate) in 1994. TPA's calibrating equipment is much smaller in sizes and

range of calibration and used for a narrower range of applications than MTC's.

Calibrating machines and instruments installed in TPA are sent to Japanese and German machinery and equipment makers, or otherwise Thai Airline and MTC to be calibrated by them.

(3) Information services

Almost all the technical support institutions as listed in Table 3.3-1 provide information services mainly through publications such as magazines. TMDPC and IPC provide individual consulting services. Especially, IPC gives loans of 200,000 bahts and less as a part of its financial assistance for a cottage industry.

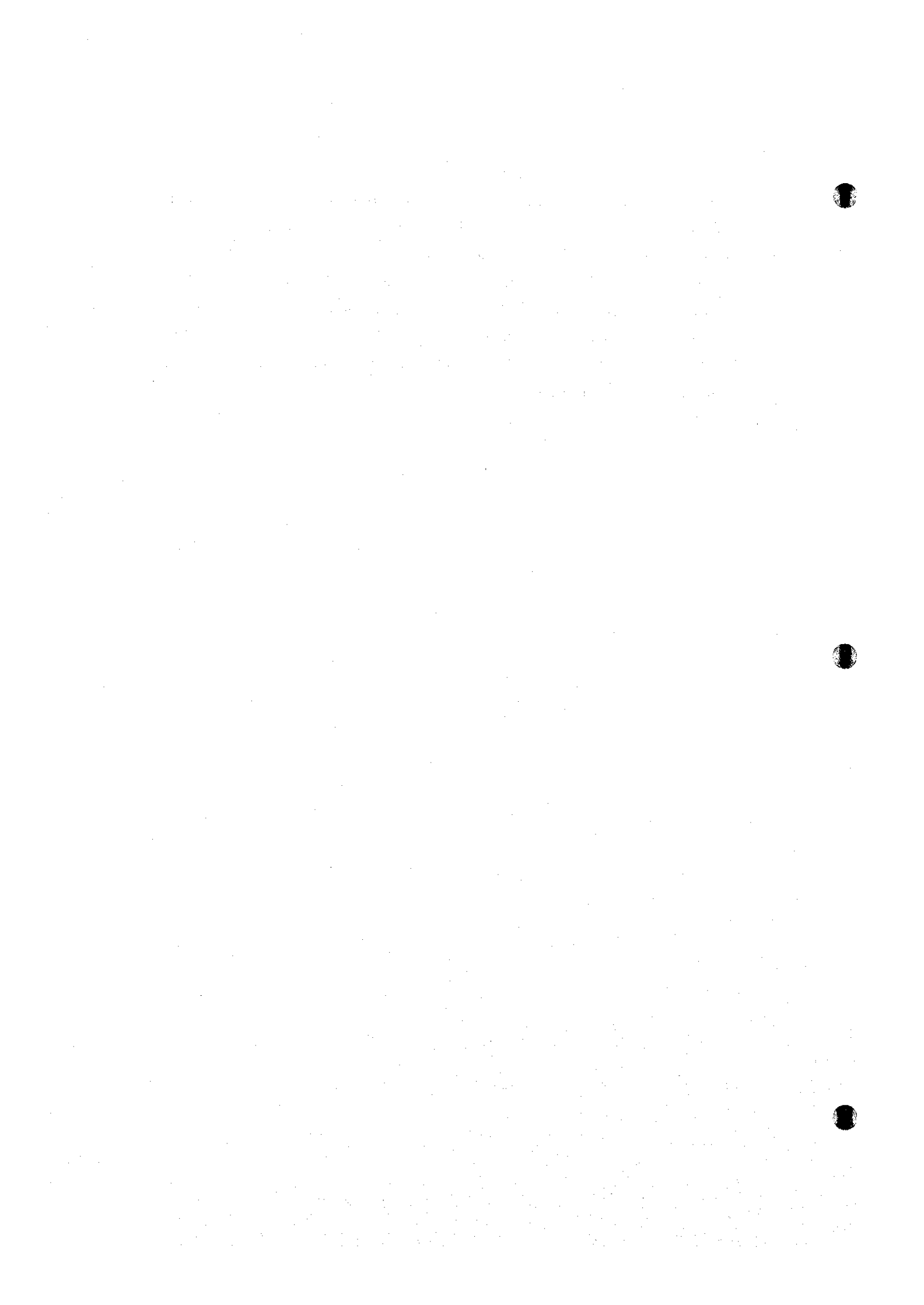
3.3.2 Problems in public technical support institutions

MIDI, ISTTC and the MTC Bangpoo branch center are now facing the common problems that personnel is inadequate in quality and quantity and that these institutions are located far from the center of Bangkok.

For example, MIDI's personnel is now 98 (as of August, 1994), of which 22 are related to general affairs services. Initially, MIDI planned to have 150 personnel. The shortage of personnel has been always caused by gaining less recruits than employees moving out into other organizations or private companies. There is a great difference in treatment between MIDI and private companies. MIDI is less attractive as workplace for its employees than private companies. For these reasons, it is easier and more favorable for the higher-classed technical staff to move from MIDI to private companies in favorable conditions. MIDI is now obliged to invite lecturers for seminars from the outside. Its equipment is not fully utilized. Users complain to MIDI that it took a too long time to have MIDI make tests for them. Of course, such a complaint reflects the shortage of technical staff in MIDI.

Similarly, ISTTC had an initial plan of employing 110 to 120 personnel. Its personnel is now 40 or about 1/3 of the planned level. MTC Bangpoo branch center also is suffered from a shortage of instructors teaching technical staff. This center considers this shortage of talents as a serious problem.

Location is also a very serious problem, considering the worst traffic conditions of Bangkok in the world. For example, it always takes anyone a day to take a set of test pieces to a testing center and come back to the plant where he or she is working. In Thailand, the working hours include the required time for an employee to go to and come home from his or her workplace. For this reason, the service time becomes so short that most technical support institutions cannot fully meet the private sector's needs. The problem of location means an inadequate number of required institutions.



3.4 Examples of Human Resources Fostering Activities in Academic-Industrial Cooperation or by NGOs

3.4.1 Institutes for skill development in academic-industrial cooperation

To meet the needs of industries, two of all the Institutes for Skill Development that are now operated in Thailand carry on vocational education and training with the financial assistance and human cooperation of industries. The two cases may suggest the future picture of vocational education and training, or solutions for the problems with which all the vocational education and training institutions in Thailand are now confronted. The two institutes will be described below, especially in terms of history and characteristics.

(1) AYUTTHAYA TECHNICAL TRAINING CENTER (ATTC)
KING MONGKUT'S INSTITUTE OF TECHNOLOGY, NORTH
BANGKOK (KMITNB)

ATTC was established as a vocational education and training center of KMITNB at the Hi-tech Industrial Estate in the prefecture of Ayutthaya in September 1992. This center has since conducted vocational education and training, especially in the field of electrical & electronic engineering, for the technical workers who are working mainly in the Industrial Estate and companies in the suburbs of Ayutthaya. ATTC was established with the cooperation of 2 private companies as follows:

Company	Cooperation
Thai Industrial Estate Corporation Ltd. (developer of Hi-tech Industrial Estate)	Provided the land and buildings without charge.
CANON INC., JAPAN (Japanese electronics maker and a subsidiary company is located in Hi-tech I.E.)	Provided machinery and equipment in facilities without charge. Dispatched lecturers from Japan.

The total investment was 120 million bahts, most of which the two companies invested in kind. KMITNB is responsible for the operation of the center, the preparation of curricula and the recruitment of employees. CANON INC. has dispatched 3 technical lecturers to the center through the

Overseas Vocational Training Association (OVTA in Japan).

The regular staff includes 3 Japanese technical lecturers, 18 technical instructors, and the administrative staff of 5 members. In addition, KMITNB dispatches instructors as required. The volunteer teachers who are officials in the Japanese Embassy in Thailand also teach the Japanese language in the center. The Japanese technical lecturers are also responsible for carrying on education and training not only for trainees, but for Thai instructors.

The 1993 budget of operation (3.2 million bahts) was covered by the payment of education and training fees and an appropriation from the KMITNB's budget. The annual lesson fee is now 30,000 bahts per person for the Permanent Course or 5-year formal course in which 72 students are now registered. (For the other information such as education courses and curricula, refer to the Annex-II.) About 20 trainees per course have been annually registered in short-term (5-day to 6-month) training courses. In case of 5-day training course, the fee is 3,000 bahts, and the revenue now almost balances the budget of operation. In the future, however, it is a serious problem for the center how to find out ways and means for purchasing new equipment and materials and organizing new courses. Companies bear education and training fees and other expenses for most of the students in formal courses and trainees in informal short-term courses, who belong to the companies.

All the machines, inspecting instruments and tools, and other mechanical equipment that CANON INC. provided to the center have been imported free of customs duties from Japan into Thailand. Lectures from Japan could easily get visas because they applied through OVTA.

ATTC present the following features:

- 1) It was created with the overall financial assistance of private companies.
- 2) It has organized short-term program courses (non-formal) to meet the request of companies which send trainees to the Center, in addition to formal education courses as basic ones.
- 3) The curriculum for the Permanent course (formal) includes a practical in-

plant training for 1 year.

(2) CHOONHAVAN TECHNOLOGY TRAINING CENTER (CTTC)
RAJAMANGALA INSTITUTE OF TECHNOLOGY (RIT)
NORTHEASTERN CAMPUS

CTTC was created as a RIT's campus within the Suranaree Industrial zone in the prefecture of Nakhonratchasima in 1991. The following companies gave their cooperation to create CTTC:

Company	Cooperation Field
Suranaree Industrial Zone Co., Ltd. (Developer of Suranaree Industrial Zone)	• Provided the land without charge
MITSUBISHI MOTORS CORP. (Japan) M.M.C. SITTIPOL CO., LTD. (Thai-Japan)	• Provided buildings, facilities and equipment without charge. • Dispatched lecturers from Japan.

To create CTTC, Mitsubishi Motors group made the total investment of 10 million bahts in RIT except the land. Initially, Mitsubishi Motors group planned to create an in-house education center, and encountered problems concerning the obtainment of visas for Japanese lecturers to be sent to the planned center as well as the managing entity of the center. Finally, the group made an agreement with RIT for the creation of CTTC as a campus of Rajamangala Institute of Technology (RIT) controlled by the Ministry of Education.

Only employees in local companies affiliated to Mitsubishi group are now admitted into CTTC. In the future, however, CTTC may probably be opened for the public in Thailand. The regular staff includes 12 lecturers (of whom 5 are Japanese sent on loan from Mitsubishi Motors) and 13 clerks, 25 in total. The number of trainees per grade is 65 in a 2-year training course on boarding basis (in which trainees receive a practical 1-year training in Japan). Thus, CTTC has accepted 130 trainees annually.

The 1993 budget of operation was 9 million bahts. The annual training fee is now 50,000 bahts per person (with boarding expenses included). The annual

budget of operation has not been able to be covered only by the training fee revenue, and the balance due has been made up by Mitsubishi Motors group. Although the legal character of CTTC is a campus of RIT, Mitsubishi Motors is the virtual operator of the center.

The CTTC's curriculum includes a general course (common to all trainees) and 4 special courses (of machinery, welding, motor vehicle servicing and engine servicing), and the training hours are 44 hours per week in all the courses. The trainees who completed special courses are not licensed, but they are so adequately trained that they may attain a skill level equivalent to the Grade 2 craftman worker or Grade 3 mechanic in Japan.

Moreover, several members of the teaching staff spends 2 months to visit the companies where trainees are sent for practical training, and explain to them how to carry out OJT (On-the-Job Training) and TQC (Total Quality Control).

All the machinery, inspecting instruments and tools, and other equipment that Mitsubishi Motors provided to CTTC were imported free of customs duties from Japan into Thailand. Mitsubishi Motors may dispatch up to 5 Japanese lecturers to CTTC beyond the limit of persons imposed on any foreign company, and all the lecturers are treated as the invited by the Ministry of Education.

CTTC present the following features:

- 1) It was created with the overall financial assistance of private companies.
- 2) The annual budget of operation is financially supported by private companies.
- 3) It is specialized in the vocational education and training related to the automotive industry.
- 4) All the trainees learn the Japanese language so that they may use an abundance of teaching materials in Japanese, because there is a shortage of teaching materials in Thai.

The two training centers as described above are characterized by the points

that the shortage of funds and teachers is made up by private companies' supports and that they conduct the practical vocational education and training which can meet various needs in production fields. The private companies which support the training centers may secure an improvement in the quality of labor force by giving special training courses to their employees, apart from the in-house training. They may also enjoy a secondary effect that they are liberated from problems such as limit of foreign employment and customs duties on machinery and equipment.

3.4.2 Examples of education and training projects by foreign governments or NGOs

(1) TECHNOPRENEUR DEVELOPMENT PROJECT PHASE 1

This is an entrepreneur development program for technicians and engineers that KMITNB is now implementing in cooperation with the German Government (GTZ) and Technonet Asia. This program is carried out according to an educational system package (or manual) that was developed in Germany. This package has been used in 25 countries. It is scheduled that the Project starts to be carried out in January 1994, and that the Thai version of the manual is prepared by March of the year and that the training for the potential teaching staff is completed by March of the year. Then, 4 cycles of one-month Technopreneur Development course are organized during 1994. The project term is now limited to 1 year, but it is expected that the term will be further prolonged, if the Project is successful.

In the Project, KMITNB is responsible for securing the coordination of activities in Thailand, the recruitment of teaching staff and the execution of education and training. Since KMITNB itself was established as a vocational education and training center with German supports 35 years ago, the Project adopted a basic policy of education and training that was formulated on the German model of academic-industrial cooperation.

(2) HVAC & R TECHNOLOGY TRANSFER CENTER (HVAC & R TTC)

HVAC & R TTC (referred to as "TTC" hereinafter) is a program in which an

installation work technology for refrigerating and air conditioning equipment is transferred from Japan to Thailand. Therefore, it is not directly related to the parts industry which these surveys cover. However, this project will be described below as a reference to consider the future technology transfers and the education and training methodology.

In January 1993, TTC started its activities under an agreement (October 1992) made between a Japanese industrial association (NGO) and the DIP in the Thai Ministry of Industry. The TTC's education and training base is located in MIDI, which provides offices and other facilities and gives other supports to TTC. The formal name of the Japanese association is "Japan Association of Refrigeration and Air-conditioning Contractors" (JARAC). JARAC provides education and training equipment and dispatches experts as lecturers to TTC, and bears operating expenses for TTC. 3 Japanese lecturers have been sent to TTC. The name of HVAC & R means as follows:

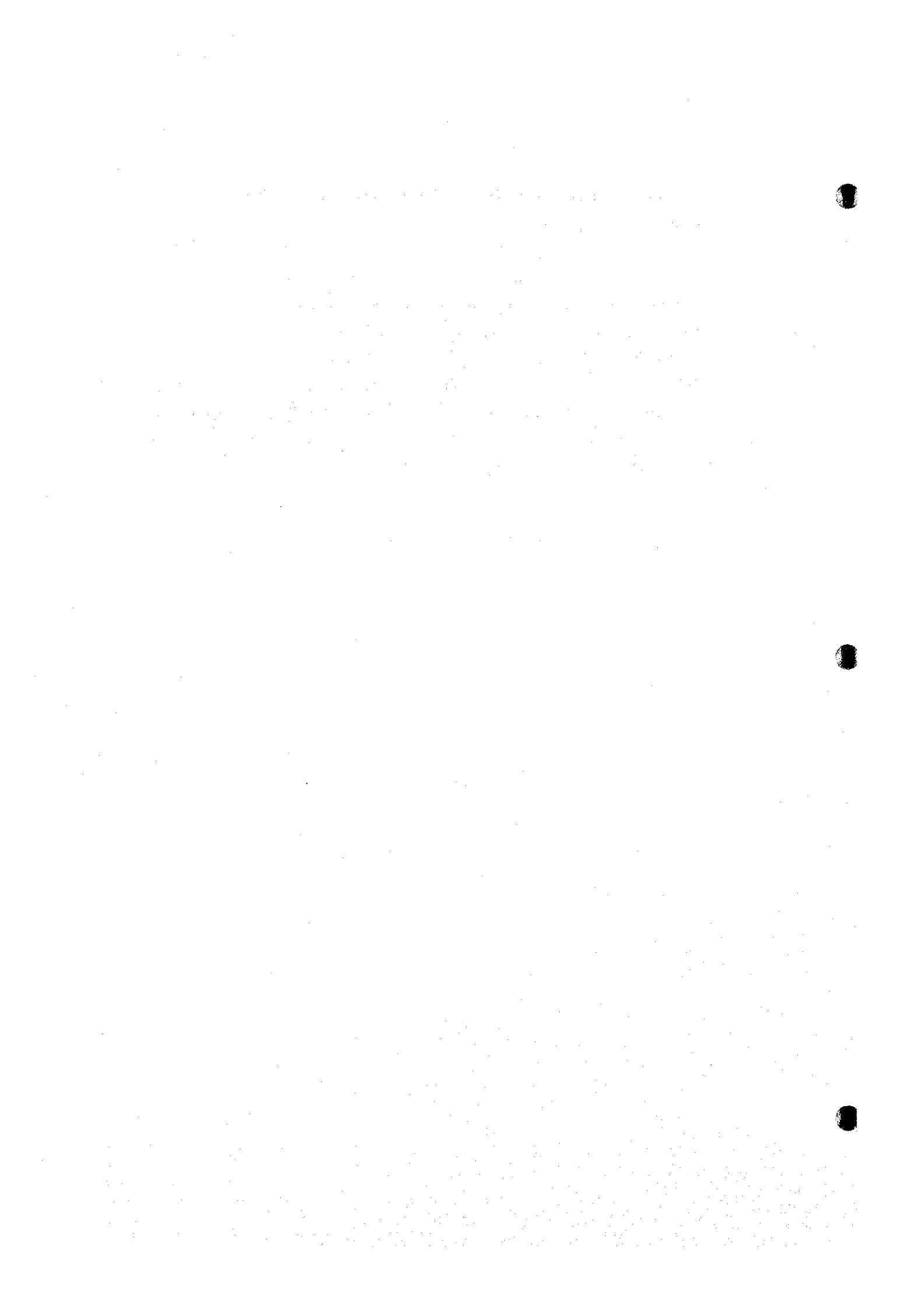
- H: Heating,
- V: Ventilating,
- A: Air-Conditioning,
- R: Refrigerating.

Trainees gather from all areas in Thailand. Most of them are graduates from lower secondary education (junior-high schools) and have completed 2-year to 3-year vocational education & training courses. In the TTC program, it is planned to train 400 trainees for 5 years, or 80 trainees for each year. These trainees receive education and training at MIDI for 1 year, and those who made excellent achievements are sent to Japan where they receive an on-the-job training (OJT) in JARAC's member plants for 1 year.

All the trainees receives a general education for working persons and specialized technical training courses (on theories and practical skills). The training curriculum includes also a field trip to Thai factories and a practical training there as well as a learning of Japanese language. The number of trainees was 30 (finally 26 trainees remained) in the first term beginning in January 1993, and 40 in the second term beginning in July of the year. Thus, TTC plans to accept about 40 trainees semiannually. All the 1st-term

trainees have received an OJT in Japan since January 1994, except one trainee who dropped out.

All the trainees are supported by a scholarship and live in a MIDI's boarding house so that they can be trained free of charge. The total of scholarship and boarding expenses, 60 million yens (15 million bahts), is shared by JARAC (25%) and another Japanese NGO (75%). It is reported that TTC is now facing serious problems such as languages (most of trainees cannot speak or write English, while all the Japanese lecturers cannot do Thai, and there is no literature in Thai) and the low and irregular levels of basic scholastic ability among trainees.



3.5 Financial Institutes concerned in Promotion of the Supporting Industries

3.5.1 The financial market and government policies

The financial market in Thailand under the general influence of financial policies issued from the Ministry of Finance is composed of the Bank of Thailand (an independent public body), 15 commercial banks and 14 foreign banks, five special government banks and more than 100 finance companies under the general tutelage of the Bank of Thailand.

Recent policies in this sector can be summarized as deregulation and liberalization. In line with the activation of economic activity domestically the Foreign Exchange Control laws were relaxed in 1990 and inflow of foreign capital was made free. On the other hand the stability of financial institutes was emphasized and strict control of easy overdraft access increasingly adopted.

The role of finance in promoting industrial development and supporting the small and medium scale industries has been given more emphasis than ever before. To secure such support the government has taken new measures to strengthen and reinforce systematized finance. For example, the Small Industrial Finance Office which was financial supporting system to the small industries (defined as those having fixed capital assets is less than 10,000 Bahts) operating under the MOI was transferred to newly established Small Industry Finance Corporation (SIFC). Also the government extended the traditional activities of the Government Savings Banks, to permit these to add financing schemes to promote provincial industry to their activities.

The following outlines the details and programs of the public financial institutions which carry out activities concerned with industrial development including promotion of small and middle scale industries and regional development.

3.5.2 Institutional finance and its special characteristics

(1) Institutional finance organizations

At present, the financial institutions and government bodies listed below are all involved in institutional financing of industrial development. Further, the

Bank of Thailand acts as final controller of the various financial organizations and carries out rediscounting of drafts with regard to all of the financial bodies listed below.

Special Banks

The Industrial Finance Corporation of Thailand (IFCT)

The Small Industry Finance Corporation (SIFC)

The Government Saving Bank (GSB)

The Small Industry Credit Guarantee Corporation (SICGC)

The Export - Import Bank of Thailand (EIBT)

Government Institutions dealing with Low interest Financing

The Industrial Promotion Centre (IPC)

The Technology Transfer Centre (TTC)

For an outline of each of the above institutions please refer to Annex-III. The following outlines the details and problems of the financing programs carried out by each of the financial institutions. (Regarding EIBT describes in Section 2.2)

1) The Industrial Finance Corporation of Thailand (IFCT)

Table 3.5-1 gives a summary of the Financing services carried out by the IFCT. In principle the terms of IFCT project financing differ according to the type of industry, business structure, location, and total investment sum but there is no ruling with regard to the size of the industry. Therefore even if the firm has a fixed capital inferior to 20 million Bahts which is the eligibility condition for SIFC financing, it will still also be eligible for an IFCT loan. In fact, there are a number of types of loans to small scale projects currently on offer beginning with the OECF loans. The IFCT intends to continue its operations in this sector even after the SIFC starts operating. However, in view of the problems of profitability in the case of small scale loans and also the problem of demarcating the activities of the SIFC and the IFCT, loans to small size firms hereafter are expected to be concerned with firms with capital assets amounting to between 10 million and 20 million Bahts in the case of the IFCT.

Table 3.5-1 SUMMARY OF IFCT'S FINANCING SERVICES

(As of September, 1993)

TYPE	INTEREST RATE	MAJORITY	SIZE OF SERVICES
1. IFCT Long-term Loan (Baht)	11.25 - 14.0 % (Fixed) MLR + 1 to MLR + 2 % (Floated)	Average 5-8 yrs. maturity with max. 2 yrs. grace period	Small scale project: Bt. 200,000 to Bt. 10 million for expansion project Bt. 500,000 to Bt. 10 million for new project Medium and large project: max. loan size of Bt. 1,800 million.
IFCT Long-Term Loan (US\$)	LIBOR/SIBOR + 2.0 to 3.50 % (Floated)	Average 5-7 yrs. Grace period 2-3 yrs.	For medium and large scale project.
2. OECF Loans for - Export Oriented Project	11.40 - 12.04 % (Fixed)	Average 5-8 yrs. maturity with max. 2 yrs. grace period.	Exported Oriented Project: max. loan size of Bt. 30 million Small scale Project: Bt. 200,000 to Bt. 10 million for expansion project Bt. 500,000 to Bt. 10 million for new project
- Small Scale Project	12.95 % (Fixed)		
3. Loans for Investment in Regional Areas form BOT (I)	10.0 - 12.5 %	Average 3-5 yrs. maturity with max. 3 yrs. grace period.	Project located in zone 2, 3 -Environmental Protection projects or energy saving projects -Small scale projects with max. loan not exceeding Bt. 10 million -Medium scale projects with max. loan not exceeding Bt. 50 million
4. Loan for Investment in Regional Areas from BOT (II)	11.25 %	Max. 5 yrs. maturity	Projects granted BOT's promotional privileges and located in Zone 3 with an investment cost not exceeding Bt. 200 million (excluding land and working capital) Max. loan Size of Bt. 20 million
5. -Loan for Environmental Protection Project	10.5 % (Fixed) MLR - 1.5 % (Floated)	Max. 7 yrs. maturity with max. 2 yrs. grace period.	Max. loan Size of Bt. 20 million
-OECF IV Program	10 % (Fixed)		Max. loan Size of Bt. 160 million
6. Loans for Energy Saving Project	11.5 % (Fixed) MLR - 0.5 %	Max. 7 yrs. maturity with max. 2 yrs. grace period.	Max. loan Size of Bt. 20 million
7. Medium-term Loan (Baht)	11.25 to 11.75 % (Fixed) MLR - 0.50 % to MLR - 0.50 % (Floated)	3-5 yrs. maturity	Max. loan Size of Bt. 1,500 million
Medium-term Loan (US\$)	LIBOR/SIBOR + 2.5 - 3.5 % (Floated)		
8. IFCT working Capital Loan (Baht)	MOR to MOR + 2.0%	1 yr. maturity and annually reviewed	Depending on requirement of projects.
IFCT working Capital Loan (US\$)	LIBOR/SIBOR + 2.25 % - 3.0 %		
9. Bank of Thailand Working Capital Loan	10%	Depending on BOT's consideration	Small scale project: max. loan size of Bt. 10 million Medium and large project: depending on BOT's consideration Min. Bt. 1 million
10. Call Loan	Market rate (Effective rate)		
11. Leasing and Hire Purchasing	Market rate (Effective rate)	Max. 5 yrs. maturity	Min. amount of Bt. 200,000
12. Equity Participation for Joint Venture Project (Thailand and EC Countries)			Max. participation of 500,000 ECU (Approx. Bt. 15 million) and not more than 20% of project's register capital. Usually not exceeding 10% of project's registered capital
13. Equity Participation			

* IFCT reserves the right to adjust its interest rate if the client makes his disbursement after the period stated in the loan agreement.

The OECF loans which the IFCT offers can be said to be among the most attractive loans available for manufacturing firms on the financial market in Thailand. There are two types of OECF loan, one available to small and medium scale export orientated firms (EIMP) and secondly the SIPP loan available to finance the modernization of small scale firms. The EIMP variety was started in Dec., 1985 and the third scheme of loans is now underway. To present more than 500 such loans have been arranged.

Table 3.5-2 indicates the latest achievement (at the present date of Dec., 1993) regarding the OECF loans (that is for the third round of EIMP loans and for the second round of SIPP loans). There have been 56 EIMP loans accorded (with an average investment sum of 19.2 million Bahts per case) and 65 SIPP loans accorded (with an average investment sum of 4.5 million Bahts per case).

Looking at the sectors concerned we note that loans to agricultural and seafood processing projects are numerous, and this trend has been observed since the commencing of such loans nine years earlier. Further, a recent trend noted with the EIMP loans is the increase in loans accorded to the electrical and machinery sectors. On the other hand looking at the distribution of financing by region we note that while the Bangkok metropolitan area accounts for 43% of the total EIMP in the case of the SIPP loans Bangkok only accounts for 14% of the loans negotiated.

Also while the second largest number of loans after those to Bangkok went to projects in the Eastern provinces in the case of the EIMP whereas in the case of the SIPP loans there were also a large number of loans accorded to the north-east, northern, and southern regions. The distribution of these loans can be said to reflect the current contours of industrial distribution in Thailand.

Otherwise in the case of loans to promote development of regional small and medium scale industries there are cases in which such loans are eligible for the maximum discount offered by the Bank of Thailand (please refer to the section concerning export promotion). Also other cases are concerned with the development of supporting industries such as the RIDP loan for development of the northern region which received assistance from the Canadian government.

Table 3.5-2 APPROVED OF OECF LOAN (as of Dec. 1, 1993)

BY INDUSTRIES		(Bt.million)	
Type of Industry	EIMP-III	SIPP-II	
1. Agriculture, Fishing, Mining and Quarrying	4 67.0	14	54.1
2. Food Products and Beverages	16 259.0	12	47.0
3. Textile, Wearing Apparel and Leather	4 59.5	7	48.0
4. Wood and Paper	2 62.0	7	34.5
5. Publishing and Printing	0 0.0	1	8.6
6. Coke and Petroleum	0 0.0	0	0.0
7. Chemicals and Chemical Products	1 10.0	0	0.0
8. Rubber and Plastic Products	2 27.0	4	13.5
9. Cement, Lime, Plastic and Concrete Products	0 0.0	7	33.4
10. Ceramic Ware and Ceramic Products	1 35.0	0	0.0
11. Glass and Glass Products	0 0.0	0	0.0
12. Other Non-metallic Mineral Products	0 0.0	0	0.0
13. Basic Metals	0 0.0	0	0.0
14. Fabricated Metal Products	1 35.0	1	2.6
15. Machinery and Equipment	3 105.0	4	15.7
16. Electrical Machinery	9 229.2	1	10.0
17. Motor Vehicles and Other Transport Equipment	2 67.0	4	19.5
18. Furniture and Other Manufacturing	11 119.0	3	5.7
19. Construction, Wholesale and Retail Trades	0 0.0	0	0.0
20. Hotels and Restaurants	0 0.0	0	0.0
21. Transport, Storage and Communication	0 0.0	0	0.0
22. Other Services	0 0.0	0	0.0
Total	56 1074.7	65	292.6

BY REGION		(Bt.million)	
Region	EIMP-III	SIPP-II	
Bangkok 1)	24 463.7	9	67.6
Regions Outside Bangkok	32 611.0	56	225.0
Divided into : Central Region	5 70.5	4	26.5
Eastern Region	12 275.0	5	17.7
Northeastern Region	5 87.0	17	47.8
Northern Region	3 38.0	16	69.3
Southern Region	7 140.5	14	63.7
Total	56 1074.7	65	292.6

Note: 1) Including Nonthaburi, Samut Prakan, Pathum Thani, Samut Sakhon and Nakhon Pathom

One particularity of the loans carried out by the IFCT is that collateral security tends to be appraised more highly than would be the case with the commercial banks. The commercial banks still continue to give emphasis as heretofore to personal credibility and relations with customers, while rigorous numerical evaluations are relatively neglected. Further, the provision of long term financing at low fixed interest is another particularity. Such particularities are advantages for small and medium scale industries or entrepreneurs endeavoring to start up new enterprises. On the other hand, since at least two months are required from the time of submitting a request to receive financing to the reaching of a decision this is seen as a problem since the commercial banks are able to respond within a month in quick cases.

2) Small Industry Finance Corporation (SIFC)

The SIFC was set up in 1992 when the Ministry of Finance undertook the integration of SIFO, and operations were begun in 1993. In comparison with the SIFO, the SIFC has a much larger capital source and larger capital funding channels, so that the maximum loan ceiling could be raised to 10 million Bahts. This has resulted in an expansion of the maximum finance limit accorded to small and medium scale industries

The companies eligible for SIFC financing are manufacturing firms with fixed capital assets below 20 million Bahts. In Thailand about 90% of the manufacturing firms meet with these eligibility conditions. Since the eligibility condition for SIFO was fixed capital assets below 100,000 Bahts it is obvious that the scope of eligibility has been considerably widened.

However, in order to strengthen its position as financial institution the screening of applications has been rendered more rigorous. In the case of small and medium scale industries with poor collateral security or self financing ability the limit for the debt repayment ratio is set at 50%, and by reducing the amount of financing easily available it is hoped to stimulate tougher managerial awareness. However, in contrast with the commercial banks the potentiality of enterprises is taken into account in screening assessments, and in this sense it is easier to borrow here than from the commercial banks.

Table 3.5-3 SUMMARY OF SIFC'S FINANCING SERVICES

< Regulations and Rules >

1. Credit Line of 200,000 Baht~10 mill. Baht
2. Interest Rate = MLR (Krung Thai Bank) + 1.5 ~ 2.5
Adjust every 6 month.
MLR + 1.5 For Factory situated in the suburb area, Industry Estate
Authority of Thailand and Cooperatives
MLR + 2.5 For Factory Located in Bangkok and Boundary area
For Finance for Working Capital and/or Debt
Repayment more than 50%
3. Period up to 10 Year term loan with 2 Years Grace Period
4. Criteria
 - A. Single Proprietorship
 1. For New Establish Business - Joint ownership of 30%
 2. For Improvement of Business - Joint ownership of 50%
 - B. Company Limited Corporation
 1. Registered Principal to the loan Ratio of 1:3
5. Debt Service Coverage Ratio
 - A. New Establishment Business/2 Times
 - B. Improvement of Business/1.5 Time
6. Security = Land, Building, Machinery and Equipment and Bank
Guarantee
7. Evaluation Fee of 0.5% of Credit Line

Table 3.5-3 provides a general outline of the SIFC's financing services. The maximum repayment period for loans is 10 years, but actually the average repayment period in 1993 was 4.3 years on average. Further, the loan interest differs by 1% depending on whether the loan is for Bangkok and surrounding zone (BOI Zone I) or for other areas (BOI Zones II and III), with a preferential rate being provided for the provincial areas.

3) Government Saving Bank (GSB)

To date this Bank has functioned as a saving bank, with savings deposited by the private sector being used as a Treasury Fund. At the present time of the end of 1993 the GSB has 530 domestic branches and a total capital of about 150 billion Bahts.

The new financing services which were approved and started operating in October, 1993 aim to permit financing to develop regional industrial development and commercial enterprises and tourism are eligible as well as small and medium scale industries. However, the regions eligible for such financial support are restricted to firms located in the 9 Northern Provinces, 13 North eastern Provinces, or the six Southern Provinces. In view of this restriction it is expected that the firms which will be accorded loans will be in the category of small and medium scale industries.

Since the GSB has little experience in Project assessment it secures the cooperation of the IFCT for its financing services. For the time being, applications are received in the local GSB branches but actual application assessment is carried out at the IFCT branches by a special unit team to include personnel sent from the GSB. Although this financing service has only just started the move represents another possible financing route for regional enterprises and declared policy is to actively follow up applications for cases which have met with difficulties when presented to the commercial banks.

4) Small Industry Credit Guarantee Corporation (SICGC)

The SICGC was set up in 1992 to carry out guaranteeing procedures for financing to the small and medium scale industries. Previously the same

activities had been carried out by the SICGF (Fund) but as a result of the government's intention to expand financial assistance to the small and medium scale industries the capital funding available was doubled and the SICGC started anew.

Credit guarantee from the SICGC is effective support for loan financing applications to almost all financial institutions including commercial banks. The guarantee is provided to make up for any shortages in the collateral of small and medium scale industries. The credit guarantee is restricted to 50% of the loan sum applied for, and the credit user must pay 1.5% per annum as guarantee fee.

Table 3.5-4 shows recent records of guarantee services (since SICGF days). This shows that although the records for 1993 are only for the first ten months of that year that the achievement in terms of cases and amount reached a record high. In a general context of falling interest rates such an expansion of achievement is proof of the strong need for such services. Further, although the table referred to does not indicate which industrial sector users belong to, we find that the most frequent group is the agricultural and seafood processing industries as with the IFCT loans already examined, and that this sector is followed by the metal working industries whose applications have shown a rapid expansion. The above would seem to indicate that the traditional industries are being increasingly replaced by new industries as the main applicants for financial loans among the small and medium scale industries in Thailand.

5) Industrial Promotion Center (IPC)

The IPC acts on behalf of the MOI to promote regional industrial development, and there are five centers located across the country. One channel for realizing this aim is the system of Small Credit for Cottage Industries, and each center handles on average 50 such loans yearly. The terms and conditions of this system are as follows;

Table 3.5-4 RECENT RECORDS IN SICGCS GUARANTEE SERVICE

Unit: Thousand Baht

Fiscal year		1988	1989	1990	1991	1992	1993 (JAN-OCT)
Item							
Acceptance of guarantee/ insurance	Case	126	120	141	141	139	153
	Amount	107,108	107,632	118,327	167,466	151,313	194,126
Outstanding guarantee/ insurance liabilities	Case	131	234	360	447	517	621
	Amount	163,442	227,763	297,221	407,731	494,637	653,879
Payment under guarantee/ insurance	Case	-	3	2	2	4	7
	Amount	-	2,650	1,783	2,521	6,986	10,765
Recovery of payment	Case	-	-	2	-	-	-
	Amount	-	-	3,255	-	-	-
Income from guarantee fee/ premium		1,775	2,922	4,039	5,055	6,160	6,782
Number of guaranteed/ insured enterprises		131	234	360	447	517	621
Default Rate		-	1.16	0.60	0.62	1.41	1.65

- maximum loan 200,000 Bahts
- interest rate 10% p.a.
- repayment period max. of 24 months (with 4 months deferment)
- collateral no physical collateral, only a promissory note from the borrower

Normally one month is required for assessment and processing procedures and in the case of loans in excess of 50,000 Bahts the signed approval of the Director General of DIP is also required.

6) Technology Transfer Center (TTC)

The financing offered by the TTC is available for two distinct categories of project; firstly Research and Development projects and secondly for projects which either aim to raise productivity and or which will produce concrete returns as a result of Research and Development. The Center started operations in 1986 and is accorded an annual budget of 30 million Bahts in Government Budgeting, and is run as a revolving fund. At present the total capital amounts to 200 million Bahts.

Financing details are as follows;

For Research and Development projects

- maximum credit 5 million Bahts
- interest rate 4% p.a. (fixed)
- repayment period max. 8 years (grace period 2 years)

For Productivity Upgrading and Return related R and D Projects

- maximum credit 10 million Bahts
- interest rate 6% p.a. (fixed)
- repayment period max. 7 years (grace period 2 years)

There are not terms or conditions set relating to the size of the firms making applications but looking at actual records 80% of the firms accorded credit had fixed capital assets inferior to 20 million Bahts. Since the capital source is limited and the about of credit for each loan large the total number of loans accorded at any one time is kept to 20 cases but every year the

center receives some 30 applications.

(2) Problems relating to financing of small and medium scale industries

The following summarizes the problems in relation to financing of small and medium scale industries which were mentioned at hearings held with the financial institutions handling the credit services outlined above.

1) Insufficient awareness of market realities

The small and medium scale industries which are eligible for credit financing are not able to give concrete explanation of the potentiality and specific nature of the product markets of undertakings.

2) Overly optimistic forecasts of capital raising ability

Explanations to financial institutions regarding how companies will raise their equity of capital funding for the undertaking envisaged are vague and overly optimistic. A large number of cases have a very high uncertainty.

3) Poor Collateral

The value of collateral (buildings, land, machinery, etc.) offered when applying for credit is low.

4) Half-heartedness about disclosing business activities

This is especially the case in family run firms, and in such cases it is very difficult for financial institutions to get a clear picture of undertakings.

In addition to the above problems, financial institutions also point to the lack of appropriate personnel to support management activities.

Chapter 4 The Automotive Industries and Related Parts Industries

4.1 Automotive Assembly Industry

4.1.1 The history of automotive assembly industry development

The development of Thai automotive industry started as an import substitution policy with the Promotion of Industrial Investment Act, of October, 1960, which was largely revised in February, 1962. The purpose of the Act's revision was to accelerate the import substitution through attraction of foreign direct investment. As special measures for prior industries including the automotive industry, restrictions on foreign ownership of land were eliminated, remittance of capital and dividends was allowed, and tax incentives for foreign investors were provided.

As of the end of 1993, there were 12 automotive assemblers of which seven are Japanese joint ventures. These companies sold 456,461 vehicles in 1993, making Thailand the first country in the ASEAN region to sell more than 400,000 vehicles in a year.

The following describes the historical development of the automotive industry in Thailand, the trend of production, and salient features of the industry.

(1) 1960s

Subsequent to the 1962 revision of the Industrial Investment Act, four European and American assemblers started operations in Thailand, and were followed by five Japanese assemblers, all of which started operations through joint ventures. They were mainly engaged in assembly of Semi Knocked Down (SKD) kits where total production at this early stage was about 30,000 to 40,000 vehicles a year.

Investment privileges for the automotive industry were terminated in 1969, when all of the nine assemblers started operation for this small domestic demand. All the automotive assemblers continued operations, however, in anticipation of future import ban on Completely Built Up (CBU) vehicles.

In 1969, the Automotive Industry Development Committee (AIDC) was

established under the Ministry of Industry, in order to work on policy for development of the automotive industry.

(2) 1970s

During 1971, the AIDC announced the following two core items of "New Policy for the Automotive Industry" for development of the industry.

- 1) Strengthening of the industry through limitations on the number of vehicle types, number of models, and number of manufacturers.
- 2) Mandatory local content of 25% effective January, 1974.

Adoption of the local content regulation resulted in expansion of the local autoparts production, notably castings, and increase in foreign investment for the autoparts industry, in particular from Japan. It was from this point that the autoparts industry in Thailand was begun. The restricting the numbers of types, models and assemblers aimed at strengthening the industry (concretely, through achievement of mass production effects), instead what came to pass was a surge in the entry of foreign companies, each aiming at the market share in Thailand in the future. By 1976, two European companies and one Japanese assemblers became new investors in automotive production in Thailand.

In 1978, another new policy, replacing the New Policy for the Auto Industry in 1971, was adopted, to further strengthen the industry, or to improve the industrial base of the nation. It had the following three major components.

- 1) In principle, prohibition of importation of CBU vehicles.
- 2) Ending of issuance of approvals for new assembly plants.
- 3) Adoption of a new local content program.
 - For passenger cars, an increase from 30% in 1979 to 50% by 1983.
 - For commercial vehicles, from 25% in 1980 to 45% by 1984.

These new regulations continued as the basic policy framework for the development of the Thailand automotive industry through 1991.

(3) 1980s

As a result of the localization policy in force from 1974 onward, during the first half of the 1980s, the share of domestically-assembled vehicles to total sales rose, but nevertheless remained at the level of 100,000 vehicles, and both assemblers and parts makers continued to be unable to attain merits of scale.

Further, problems gradually emerged in the procurement of tools and dies needed to manufacture parts, and in the quality of materials available. It was at about this time that reports written by financial institutions began to indicate the need for development of supporting industries. Institutional development was seen when, in 1978 the Thai Autoparts Manufacturers Association (TAMA) and in 1981 the Automotive Industry Association (AIA), were established.

The local content ratio enforced from 1978 was temporarily frozen at 45% in 1982 because of low quality of domestically-made autoparts as well as slump of car sales in these years. After that, the ratio was twice revised to the current ratio applicable since 1987 at 54% for passenger cars and 65-80% for pick-up trucks (the ratio varying by type of vehicles).

It was this period that diesel engines for one-ton pickup trucks were designated as being on the localization list. The so-called engine project, under leadership of the government, approved four companies for engine assembly. All car assemblers of one-ton pickup trucks were obliged to buy engines from these companies.

During the latter part of the decade (1986-1990) the Thai economy achieved high growth, largely due to a high level of investment by foreign and domestic companies. The automotive market expanded at a high rate and sales grew at an annual average of 40%. The number of autoparts makers increased, and substantial development in the structure of the automotive industry was evident.

(4) 1990-1993

Annual sales exceeded 300,000 in 1990 and recorded 456,000 in 1993. Today, car assemblers and autoparts makers are either studying or implementing an expansion of their production capacity. In 1991, the government ended the restriction on importation of CBU vehicles and lowered the tariff on Complete Knocked Down (CKD) imports (to 20% for passenger and commercial vehicles, and 10% for large trucks), in order to proceed with liberalization of the automotive industry. This can be said to be the major deregulatory move on various regulations continued since 1978.

While Thai-owned parts makers have made progress in development, the assemblers are coping with the high ratio of the local contents relying partly on in-house production of components and largely on procurement from J/V companies in Thailand from the viewpoints of quality and cost of parts. There are some assemblers who have achieved local content ratios of 75-80% for one-ton pickup trucks including engines.

In 1993, the decision was made to abandon restrictions on foreign equity shares in automotive assemblers. Prior to this, the Thai share had to be 51% or more, but now establishment of fully-foreign-owned assemblers will be approved.

4.1.2 Import, export and production of automotives

(1) Imports and exports of automotives

The first commercial-base exportation of automotives by Thailand was in 1988, by the MMC Sittipol Co., Ltd. This company primarily exported to Canada but since then has expanded its market to Laos and European countries. Other assemblers have exported pickup trucks to neighboring nations since 1991, and as of the end of 1993 there are six companies that have acquired records as exporters. Nevertheless, the number of CBU export was just 1,900 for 1992. All exporters except MMC Sittipol are doing so only on a spot basis. Export value has been as shown in Table 4.1-1. The statistics show that the value of export declined since 1988 to 1991. Some assemblers have a plan to expand their production capacity taking into

account not only growth of the domestic market but also the prospects for export to nearby countries.

Table 4.1-1 CAR EXPORT

Unit: Million Baht

	1985	1986	1987	1988	1989	1990	1991
Buses < 30 seats	0.20	0.66	0.00	2.16	0.24	0.05	0.31
Vehicles	1.88	8.51	72.39	2,024.73	1,338.97	802.33	967.64
Total	2.08	9.17	72.39	2,026.89	1,339.21	802.38	967.95

(Source) Investment Opportunities Study, BOI
Customs Department of Thailand

During the period of 1978 to 1991, imports of CBU vehicles were substantially prohibited. Even in the period, however, the importation of big trucks, buses and special-use vehicles were allowed. Imports prior to 1978 was 40,000 to 50,000 a year but since then have been on the order of from 4,000 to the 6,000 level, while in keeping with growth of the national economy the import has grown since 1987. In particular, in 1991 imports rose sharply after abolition of the restriction on importation of CBU vehicles and the provisional report for 1993 is that imports totaled more than 40,000. Early in 1994, Thai government raised again the import tax of luxury cars for restricting importation. Table 4.1-2 shows the import record up to 1991 in terms of customs value.

Table 4.1-2 CAR IMPORT

Unit: Million Baht

	1985	1986	1987	1988	1989	1990	1991
Buses < 30 seats	615.97	69.67	958.65	1.74	0.20	0.00	3.20
Vehicles	1,750.70	1,659.33	3,145.73	7,468.44	7,914.10	11,265.90	13,623.07
Total	2,366.67	1,729.00	4,104.38	7,470.18	7,914.30	11,265.90	13,626.27

(Source) Investment Opportunities Study, BOI
Customs Department of Thailand

(2) Domestic production and demand for automobiles

There are 12 major automotive assemblers operating in Thailand, of which 7 are Japanese and the rest 5 are European, US and so on as shown in Table 4.1-3. Other than the above, smaller-scale fitting-out factories exist. The Table shows the brands and type of vehicles being assembled by each

assembler as well as their distributors. Some assemblers assemble two or more brands on consignment contract.

Although annual production volumes are published by AIA, they slightly differ from the aggregate of announcements by the individual assembler. Instead, the figures of car sales are available for long time of period and more reliable as statistics. Production volumes are here estimated on the basis of the statistics of car sales by the following formula:

$$\text{Production} = \text{Consumption (Sales)} + \text{Export} - \text{Import}$$

Table 4.1-4 gives the car sales in number of cars for 1984 to 1993. Taking 1992 as an example, the number of car sales was 363,000, and 1,900 for exports and 28,000 for imports were reported by a news paper.

$$\text{Production} = 363,000 + 1,900 - 28,000 = 336,900$$

Thus, Production volumes are computed as 336,900 for 1992 using the above formula, that is 93% of the car sales. Statistics for exports and imports in number are not available for each year, but as per spot data the car production in Thailand is supposed to fall in the range of 90% to 95% of the car sales.

The number of vehicles sold in Thailand during the past decade are as shown in Figure 4.1-1. It is a characteristic of the Thailand market that the share of commercial vehicles has been high. Detailed statistics are provided in Tables 4.1-4 and 4.1-5; which note that up to 1991 commercial vehicles have had a share exceeding 70%. In 1992 and 1993, however, the share declined. In view of the ongoing improvement of the standard of living and change in the Thailand lifestyle, despite the expected peaking out in 1994 of "special" demand for taxis caused by the introduction of "taxi-meter" system in 1992 and 1993, all the car assemblers predict that the commercial vehicles' share is likely to decline.

Table 4.1-3 MAJOR AUTOMOTIVE ASSEMBLERS, THEIR PRODUCTION AND DISTRIBUTORS

Assemblers	Type of Vehicle Assembled			Brands Assembled	Distributors
	Passenger car	Pick-up	Truck/Bus		
1. TOYOTA MOTOR (THAILAND) CO., LTD.	○	○		TOYOTA	TOYOTA MOTOR (THAILAND) CO., LTD.
2. ISUZU MOTORS CO., (THAILAND) LTD.		○	○	ISUZU	TRI PETCH ISUZU SALES CO., LTD.
3. MMC SITTIPOL CO., LTD.	○	○	○	MITSUBISHI	MMC SITTIPOL CO., LTD.
4. SIAM NISSAN AUTOMOBILE CO., LTD.		○	○	NISSAN	SIAM MOTORS CO., LTD.
5. SIAM MOTORS AND NISSAN CO., LTD.	○			NISSAN DIESEL	NISSAN DIESEL CO., LTD.
6. SUKOSOL AND MAZDA MOTOR INDUSTRY CO., LTD.	○	○		NISSAN	SIAM MOTORS CO., LTD.
7. HONDA CARS MANUFACTURING (THAILAND) CO., LTD.	○			SUZUKI	SIAM INTERNATIONAL CORPORATION CO., LTD.
8. THAI HINO INDUSTRY CO., LTD.			○	MAZDA	KUKAMOL SUKOSOL CO.,LTD/SUKOSOL MAZDA CO.,LTD.
9. THONBURI AUTOMOTIVE ASSEMBLY PLANT CO., LTD.	○		○	FORD	MEW ERA CO., LTD.
10. Y.M.C. ASSEMBLY CO., LTD.	○			HONDA	HONDA CARS (THAILAND) CO., LTD.
11. BANGCHAN GENERAL ASSEMBLY CO., LTD.	○	○		HINO	THAI HINO MOTOR SALES CO., LTD.
12. THAI SWEDISH ASSEMBLY CO., LTD.	○			TOYOTA	TOYOTA MOTOR (THAILAND) CO., LTD.
				MERCEDES	THONBURI PHANICH CO., LTD.
				BENZ	
				BMW	THAI YARNYON CO., LTD.
				CITROEN	THAI-EUROPE CORP AUTOSALES CO., LTD.
				PEUGEOT	EUROPEAN AUTOMOBILE CO., LTD.
				OPEL, HOLDEN	PHRA NAKORN AUTOMOBILE LTD.
				DAIHATSU	DAIHATSU-PHRA NAKORN MOTOR CO., LTD.
				HONDA	HONDA CARS (THAILAND) CO., LTD.
				RENAULT	SIAM RENAULT CO., LTD.
				VOLVO	SWEDISH MOTORS CORPORATION LTD.

Table 4.1-4 TOTAL CAR SALES BY TYPE OF CARS

Unit: Cars

CLASS	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
BIG	2,966	2,173	2,256	3,544	3,860	5,377	6,652	7,610	9,041	14,447
MEDIUM	13,924	11,329	10,521	10,940	14,997	16,665	26,952	24,015	40,281	41,334
SMALL	14,610	8,595	9,974	12,580	19,911	25,663	32,260	35,154	72,423	118,388
PASSENGER	31,500	22,097	22,751	27,064	38,768	47,705	65,864	66,779	121,745	174,169
VAN & M. BUS	4,982	2,715	1,863	2,794	4,533	4,964	6,980	7,670	9,620	11,727
LESS <1 TON	2,778	2,080	2,083	2,986	4,372	7,488	11,960	10,200	14,490	14,207
1 TON	60,327	49,913	46,061	59,411	81,514	115,964	167,613	155,366	182,958	224,388
2-4 TON	6,625	3,870	3,380	4,721	7,025	10,629	15,920	10,312	12,465	12,722
BIG TRUCK	7,127	4,310	3,284	4,158	9,349	19,610	32,126	15,895	17,549	15,568
4 x 4	210	237	179	363	919	1,883	3,599	2,388	4,160	3,687
COMERECIAL	82,049	63,125	56,850	74,433	107,712	160,538	238,198	201,831	241,242	282,299
GRAND TOTAL	113,549	85,222	79,601	101,497	146,480	208,243	304,062	268,610	362,987	456,468

Source: For 1984-1991: Outlook of Thai Economy; Japanese Chamber of Commerce, Bangkok

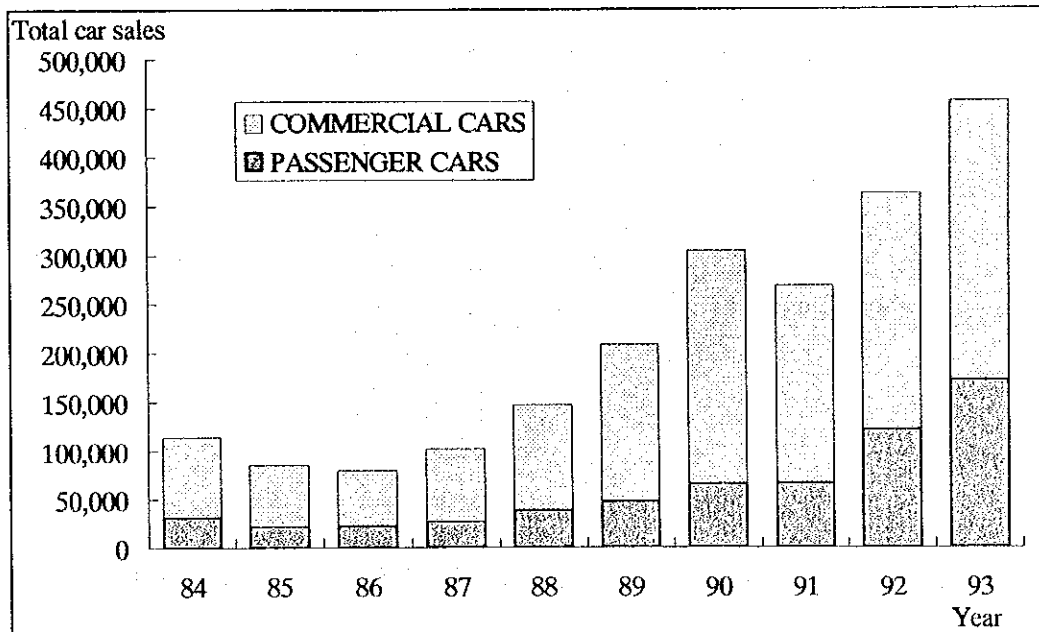


Figure 4.1-1 TOTAL CAR SALES BY TYPE OF CARS

As for the types of vehicles (see Table 4.1-5 and Figure 4.1-1) the high share of one-ton pickup trucks stands out. It has been 57.6% in average of the past decade, and is clearly the highest in number not only among commercial vehicles but in the overall total as well. Therefore, one-ton pickup trucks are regarded as a representative model of Thai automotive industry taking into account the share of production as well as the highest localization including diesel engines.

The sales volumes are shown in Table 4.1-6 by make. Shares by make are shown in Table 4.1-7 and Figure 4.1-2. Statistics for 1993 show a 90% share for Japanese-affiliated companies. In view of production it may be stated that 95% of the Thailand automotive market is dominated by Japanese companies. Other than the Japanese companies, in 1993 Benz increased a share of about 4% of total sales. The increase was largely owed to CBU imports reflecting the reduction in tariff rate for them.

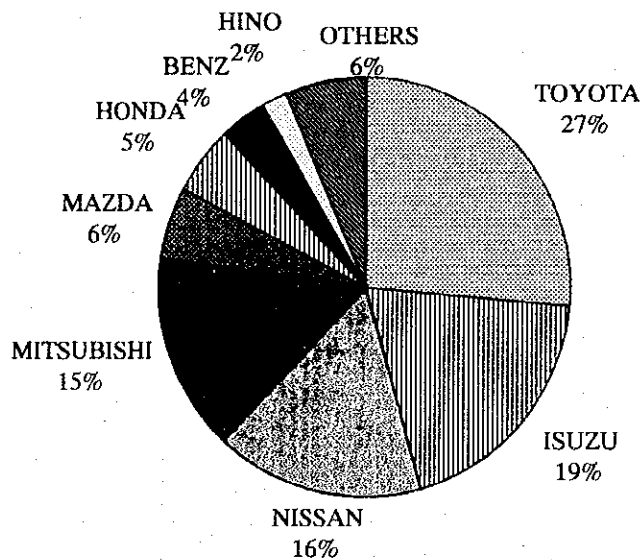


Figure 4.1-2 SHARE OF CAR SALES BY MANUFACTURERS IN 1993

4.1.3 Interview survey to automotive assemblers

All automotive assemblers engaged in production in Thailand were requested, through the Ministry of Industry, to cooperate in a survey; the following seven agreed to be interviewed. These companies combined produce about 90% of sales or 95% of production in Thailand.

Toyota:	Toyota Motor (Thailand), Co., Ltd.
Nissan:	Siam Nissan Automotive Co., Ltd.
Isuzu:	Isuzu Motors Co., (Thailand) Ltd.
Honda:	Honda Cars Manufacturing (Thailand) Co., Ltd.
Mitsubishi:	MMC Sittipol Co., Ltd.
Mazda:	Sukosol and Mazda Motor Industry Co., Ltd.
Hino:	Thai Hino Industry Co., Ltd.

Objectives of the interview survey to the automotive makers are divided into two parts: One is to hear each company's view on the supporting industry, and the other is to collect statistical data of her parts/components procurement. The result of the latter part will be analyzed in the following section of 4.2. In this section, the results of former part is explained referring to ATTACHMENT 4-3.

Table 4.1-5 CAR SALES SHARE BY TYPE OF CARS

Unit: %

CLASS	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
BIG	2.61	2.55	2.83	3.49	2.64	2.58	2.19	2.83	2.49	3.16
MEDIUM	12.26	13.29	13.22	10.78	10.24	8.00	8.86	8.94	11.10	9.06
SMALL	12.87	10.09	12.53	12.39	13.59	12.32	10.61	13.09	19.95	25.94
PASSENGER	27.74	25.93	28.58	26.66	26.47	22.91	21.66	24.86	33.54	38.16
VAN & M. BUS	4.39	3.19	2.34	2.75	3.09	2.38	2.30	2.86	2.65	2.57
LESS <1 TON	2.45	2.44	2.62	2.94	2.98	3.60	3.93	3.80	3.99	3.11
1 TON	53.13	58.57	57.86	58.53	55.65	55.69	55.12	57.84	50.40	49.16
2-4 TON	5.83	4.54	4.25	4.65	4.80	5.10	5.24	3.84	3.43	2.79
BIG TRUCK	6.28	5.06	4.13	4.10	6.38	9.42	10.57	5.92	4.83	3.41
4 x 4	0.18	0.28	0.22	0.36	0.63	0.90	1.18	0.89	1.15	0.81
COMERCIAL	72.26	74.07	71.42	73.34	73.53	77.09	78.34	75.14	66.46	61.84
GRAND TOTAL	100	100	100	100	100	100	100	100	100	100

Source : Same as Table 4.1-4

Table 4.1-6 TOTAL CAR SALES BY MAKE

Unit: Cars

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
TOYOTA	32,366	22,977	22,052	28,326	39,339	52,544	77,331	75,095	95,910	120,384
ISUZU	22,985	19,376	16,283	23,579	31,403	48,551	69,654	58,275	74,130	86,128
NISSAN	25,445	16,891	13,841	17,135	28,335	35,891	51,038	51,401	63,462	71,875
MITSUBISHI	10,035	5,926	6,608	10,101	14,344	23,856	38,112	34,455	46,324	70,109
MAZDA	7,038	5,999	7,499	6,614	8,368	12,497	19,365	12,881	20,555	25,536
HONDA	841	949	870	3,405	6,735	10,470	11,909	10,855	19,513	24,033
HINO	3,666	2,041	1,721	2,841	4,920	8,484	14,200	6,569	7,863	8,270
PEUGEOT	1,514	2,570	2,809	1,546	2,872	2,465	3,744	1,541	2,010	1,010
VOLVO	717	591	814	1,559	1,902	2,313	3,167	3,735	3,725	5,524
B.M.W.	1,690	2,170	2,767	2,129	2,124	2,341	3,189	2,110	4,252	6,340
BENZ	1,354	1,145	988	1,381	1,767	2,447	2,328	2,984	6,546	11,291
RENAULT	0	0	0	310	572	778	1,471	1,007	1,283	865
FORD	1,015	883	1,186	970	757	585	807	770	1,185	2,972
CITREON	520	760	580	498	332	228	200	89	85	227
OPEL	0	0	11	246	31	144	194	131	358	1,502
HOLDEN	177	171	113	47	418	615	481	462	202	131
OTHERS	4,186	2,773	1,459	810	2,261	4,034	6,872	6,200	15,584	20,271
GRAND TOTAL	113,549	85,222	79,601	101,497	146,480	208,243	304,062	268,560	362,987	456,468

Sources : Same as Table 4.1-4

Table 4.1-7 SHARE OF CAR SALES BY MAKE

Unit: %

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
TOYOTA	28.50	26.96	27.70	27.91	26.86	25.23	25.43	27.96	26.42	26.37
ISUZU	20.24	22.74	20.46	23.23	21.44	23.31	22.91	21.70	20.42	18.87
NISSAN	22.41	19.82	17.39	16.88	19.34	17.24	16.79	19.14	17.48	15.75
MITSUBISHI	8.84	6.95	8.30	9.95	9.79	11.46	12.53	12.83	12.76	15.36
MAZDA	6.20	7.04	9.42	6.52	5.71	6.00	6.37	4.80	5.66	5.59
HONDA	0.74	1.11	1.09	3.35	4.60	5.03	3.92	4.04	5.38	5.26
HINO	3.23	2.39	2.16	2.80	3.36	4.07	4.67	2.45	2.17	1.81
PEUGEOT	1.33	3.02	3.53	1.52	1.96	1.18	1.23	0.57	0.55	0.22
VOLVO	0.63	0.69	1.02	1.54	1.30	1.11	1.04	1.39	1.03	1.21
B.M.W.	1.49	2.55	3.48	2.10	1.45	1.12	1.05	0.79	1.17	1.39
BENZ	1.19	1.34	1.24	1.36	1.21	1.18	0.77	1.11	1.80	2.47
RENAULT	0.00	0.00	0.00	0.31	0.39	0.37	0.48	0.37	0.35	0.19
FORD	0.89	1.04	1.49	0.96	0.52	0.28	0.27	0.29	0.33	0.65
CITREON	0.46	0.89	0.73	0.49	0.23	0.11	0.07	0.03	0.02	0.05
OPEL	0.00	0.00	0.01	0.24	0.02	0.07	0.06	0.05	0.10	0.33
HOLDEN	0.16	0.20	0.14	0.05	0.29	0.30	0.16	0.17	0.06	0.03
OTHERS	3.69	3.25	1.83	0.80	1.54	1.94	2.26	2.31	4.29	4.44
GRAND TOTAL	100	100	100	100	100	100	100	100	100	100

Source : Same as Table 4.1-4

(1) Market view and expansion plans

Each automotive manufacturer expects demand in Thailand to grow at a high rate. Most anticipate that in the six years to 2000 demand will grow from 460,000 vehicles in 1993 to about 800,000 to 1,000,000. Most of the growth will be in passenger cars, and there is the expectation that the present ratio of commercial to passenger vehicles, 62:38, will be reversed and approach the 40:60 ratio common in industrialized nations.

As may be expected by such forecasts, five of the seven companies are planning to expand production capacity, and have determined plant sites for expansion. Intention to increase capacity is strong particularly among the assemblers of passenger cars as well as one-ton pick up trucks. They also have in mind the possibility of exporting CBU vehicles but are not planning yet on making Thailand into a major base for exports for international markets. Other than those companies that have unused space in their existing plant sites, the companies are thinking of expanding by acquiring land in Zone II of the BOI Zoning.

(2) Domestic procurement of autoparts

Fundamentally the assemblers intentions are to do the engine assembly work, transmissions, press skin panels and large-size plastic injection in their own plants or have the work done at subsidiaries, and for other autoparts they wish to contract with domestic suppliers. As the seven companies are affiliated with Japanese companies, they are subject to the influence of decreased cost competitiveness of parts exported from Japan, as long as the yen remains strong. It is thought, despite the interest in buying locally, that there are not enough reliable companies making high-grade castings and processing large plastic parts. There is a problem in transporting large plastic parts over long distances for import that are large with light weight, and have much air space in stocking that make them costly to ship in addition to damages during transportation. Therefore, the car assemblers expect local production of large-size plastic parts. Large stamping parts also have this characteristic, but as domestic production of these has made considerable progress, there is little demand to for efforts to further develop this industry except outer body panels which require high international standards.

Problems of cost and quality nevertheless remain when local procurement (outsourcing) is used. They complain that in particular, the rapid growth of demand has created a seller's market, in which prices have risen. Uneven quality due to lack of understanding on specification required for autoparts was also pointed out.

They expected that in order to increase local sourcing, it is necessary for more foreign investment in autoparts industries of Thailand, and that such investment might have to be encouraged by initiatives of the assemblers themselves in the near future.

(3) Linkage between car assemblers and parts suppliers

Five of the seven companies have formed their co-operation clubs or families of parts suppliers, and the suppliers typically belong to two or more clubs of different assemblers. The so-called "exclusive subcontracting system with long-term contract" is not being formed. At the assemblers, the generally held opinion is that it would be difficult or meaningless to form the exclusive subcontracting system in Thailand. One reason for this is the large number of assemblers and the small scale of the market; another is that it is not desirable in terms of corporate culture in Thailand for a company to let itself be bound to a single customer.

Almost all assemblers provide technical assistance to their suppliers, and conduct training both in Thailand and in overseas. About half of those assemblers provide suppliers with the materials and moulds & dies.

(4) Cooperation among assemblers in Development of supporting industry

Inquiries were made, taking into account the mode of linkage as described above, whether there would be necessity in collaboration between assemblers or competitors for doing business in this small market. Up to this time, there have been few instances of competing assemblers jointly attracting a common parts supplier to Thailand from overseas, but they think that necessity in this type of arrangement will increase in the future.

Negative responses were given by most companies interviewed, regarding the

idea that it was necessary to make greater use of common design and specifications for critical autoparts, as a way of attaining higher production quantities and lower production costs of parts and components. Joint use of common parts such as radiators and electrical parts has become fairly well established but this has taken place by initiatives on the suppliers' side, not action by the assemblers. They think that this situation will continue in the future. The opinion was also voiced that for those parts closely related to their own design of cars there could be no joint components.

Next, with regard to cooperation among assemblers, inquiry was made as to the possibility of creating a general program for transfer of technology to suppliers, with the cost shared by the national government, suppliers and assemblers. More than half of the companies (four) responded that it depends on the details of the program, and whether their companies would directly benefit from such a program. The other (three) companies responses included, one from each company, that the company would do it by itself, that it would be difficult to cooperate, and that the company had a different idea.

(5) Global strategy and division of labor within ASEAN

At present the participants in the BBC Scheme are four assemblers of seven, and one other company is importing parts from Indonesia which is not participating to BBC so far. Two assemblers have no intention to use the BBC scheme. There is few concrete measures regarding AFTA, as it is expected that free trade for the automotive industry lies somewhat further in the future. One company stated that GATT was of greater importance than AFTA, and another company stated that it welcomed AFTA much.

(6) What is desired to the government

The foremost question that the automotive industry now faces is the tariff rate for CBU vehicles importation; in the case that the rate is set low, Thai vehicles cannot compete with imported CBU in terms of cost. Therefore, they also have keen interest in move of cost-push factors including the tariff rate of materials, intermediates and CKD as well as the local content regulation.

Owing to this background situation, almost all assemblers interviewed strongly desired for Thai government to clarify the basic policy regarding the automotive industry (especially tariff policy), and the present imbalance among tariff rates. Contradictions involved in the present tariff system are caused by the fact that the rates for materials, intermediates and parts are set higher than those for CKD. Therefore, mandatory CKD under the local content regulation using imported materials, intermediates and parts, cannot compete with imported CKD in cost.

Requests related to local content regulations were strongly expressed too; that is high local content rates and compulsion by nominating the name of parts and components. In other words, they say that the regulations should place just a total percentages of local contents within the reasonable range for doing business in free-market economy. To set high local content ratios guarantees that the vehicle produced will be expensive. Nevertheless if the tariff on imported CBU vehicles would be set lower, the domestic vehicles will be unable to survive.

There were also requests for elimination of price controls on sales prices, improvement of infrastructure and improvement of technical education and training for labors.

4.1.4 Forecast of the direction of the automotive industry

(1) Domestic demand

Domestic demand for automotives will be likely to rise from 460,000 units in 1993 nearly to 800 thousands to a million units in six years up to 2000. This is a remarkable increase of about 2.0-to 2.5-fold. The high growth is expected for passenger cars. Their share will increase from 38% in 1993 to nearly 60% in 2000.

(2) Production

More than 70% of the companies now producing vehicles in Thailand are planning to expand their capacity to meet this increasing demand. Basically,

they have now regarded Thailand as a base for their production activities in the ASEAN and Asian region.

(3) Exports

Exports of CBU vehicles are also expected to increase. They will be mainly directed to the Asian countries where are no production capacity or relatively small number of production, and to the EC and North American markets. But for the time being emphasis will be laid on the domestic market so that about 10% of total production in Thailand will be an aim for exports.

(4) Imports

Imports of higher-price or luxury vehicles which are not being procured in the country may increase in line with reduction of import duties.

(5) Tariffs and local content regulations

With the policy of the liberalization of economy in Thailand and the agreements of GATT and AFTA, the tariffs on CBU vehicles, CKD, parts and materials will be gradually reduced. It will force the regulations of local content to be gradually eased for cost competition in the world market. The ASEAN region, and Indochina countries are entering on a borderless age and it will be increasingly difficult for any country to remain a protectionist.

(6) Regional dispersion

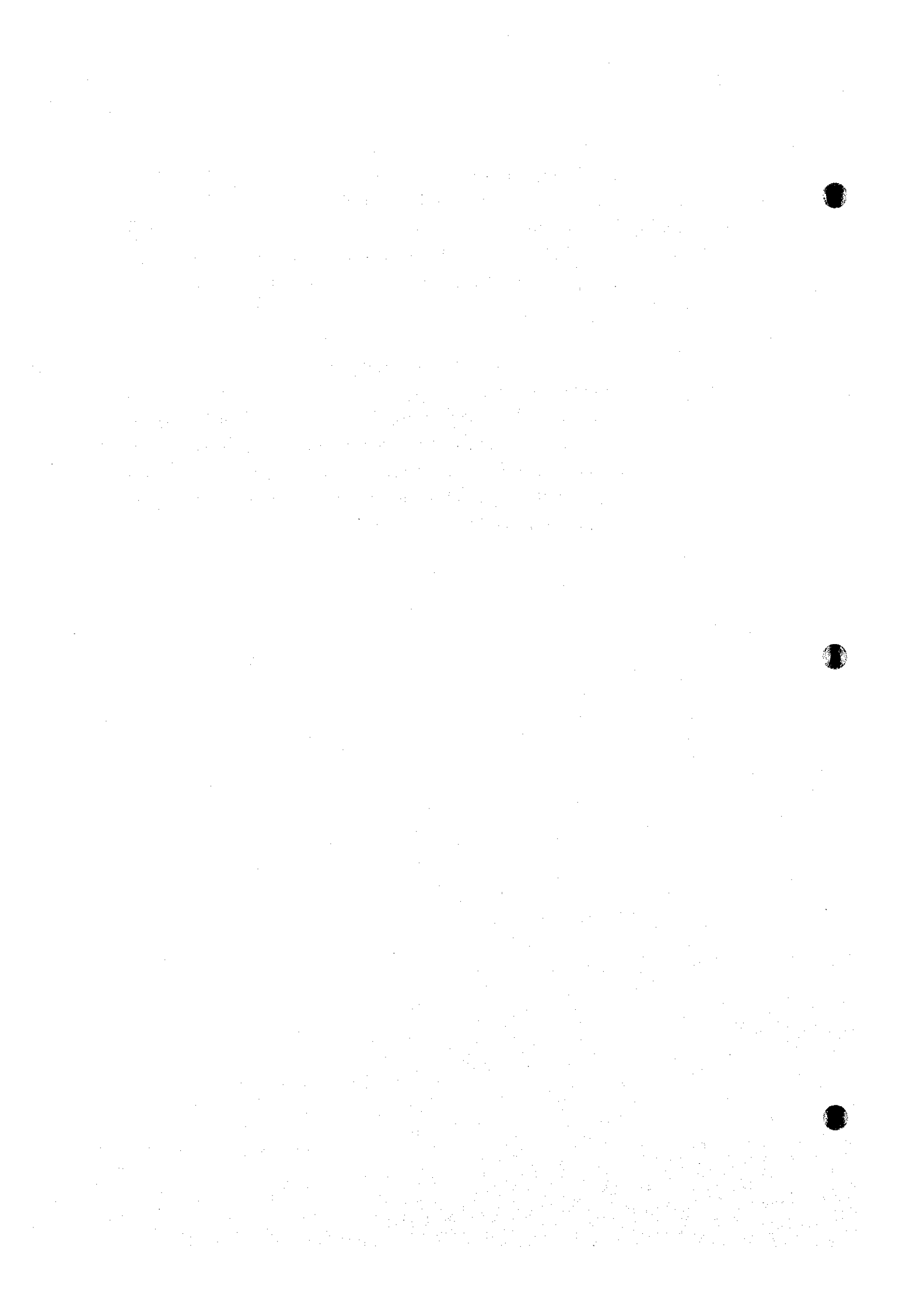
Almost all assemblers will choose the BOI's Zone II as new plant sites for expansion. Accordingly parts makers tend to move to the Zone II too. Dispersion of industry from Zone I to Zone II is proceeding gradually.

(7) Complementation in CBU vehicles

On the assumption that protectionism within the ASEAN region will give way to a borderless age, and that competition with imported automobiles is unavoidable, the automotive manufacturers are likely to concentrate their production on specific types or brands in a developing country. Though the

growth rate of demand is high, total demand remains still much less than in industrialized countries. Under such conditions, it seems to be possible for country A to specialize in pickup trucks, country B in passenger cars, and so on. This will enable the assemblers to attain high-volume production of both vehicles and parts, contributing to reduction of cost and stabilization of quality.

(Note) Some assemblers said, "The parts complementation through the BBC scheme does not necessarily lead to cost reduction, due to more packing and transportation cost, damages during transportation and increasing stock of parts to cope with delay of custom clearances. This scheme is not effective especially in the case of light and bulky parts including outer panels and large plastic moulding."



4.2 Autoparts Industry

4.2.1 Historical development of the autoparts industry

The components & parts industry in Thailand began development during the first half of the 1960s in parallel to that of the automotive assembly industry. Investment incentive policies were made applicable to the automotive industry in 1962, and to the components & parts industry in 1965.

The initial thrust in development was to substitute imports in the aftermarket or through what is called replacement equipment manufacturing (REM), but with the start of assembly of vehicles in 1964, original equipment manufacturing (OEM) started in the components industry of tires, batteries, springs and other components.

- (Note) i) REM means manufacturing of parts and components used for repairing.
ii) OEM means manufacturing of parts and components used for new brands at an assembly line.

The ministry of Industry identified two policies which have accelerated the development of the autoparts industry in the country. One is a guarantee on market for autoparts suppliers by adopting the local content regulation compulsory to the automotive assemblers since 1974. The other is a protection of the interior cost competition against the imported ones through high tariff rates since 1971.

The Auto Parts Industry Club of the Federation of Thai industry (FTI) have stated that whereas the club's members numbered 95 (as of September, 1993), the total number of domestic companies engaged in autoparts production is estimated as 400 to 500. The club stated that 25% of the total number of companies are engaged in OEM production, and the remaining 75% are targeting the REM sector (as an exception, there is some companies supplying their products to both these markets).

The tariff reduction policy for CKD sets announced in 1991 has intensified competition between domestic parts and imported parts. Further, the concrete steps toward implementation of the BBC scheme within the ASEAN region, since early 1992, as well as the reductions of local content requirements that are now

under study, signify the start of a period when the Thai automotive parts industry will be put to the test of international competitiveness, regarding price, quality, and delivery reliability, for both OEM and REM parts.

4.2.2 Production and trade of autoparts

Domestic demand for autoparts necessarily changes in proportion to the change in domestic demand for automobiles. In particular, there is a close correlation in the case of the OEM market segment. Though official statistics on production of autoparts item by item are not available, the Industrial Finance Corporation of Thailand (IFCT) compiled a report "TRIMs and Their Impacts on the Automotive Parts Industry in Thailand," in October 1993. Table 4.2-1 gives automotive parts production statistics for 1985-1991 based on this report.

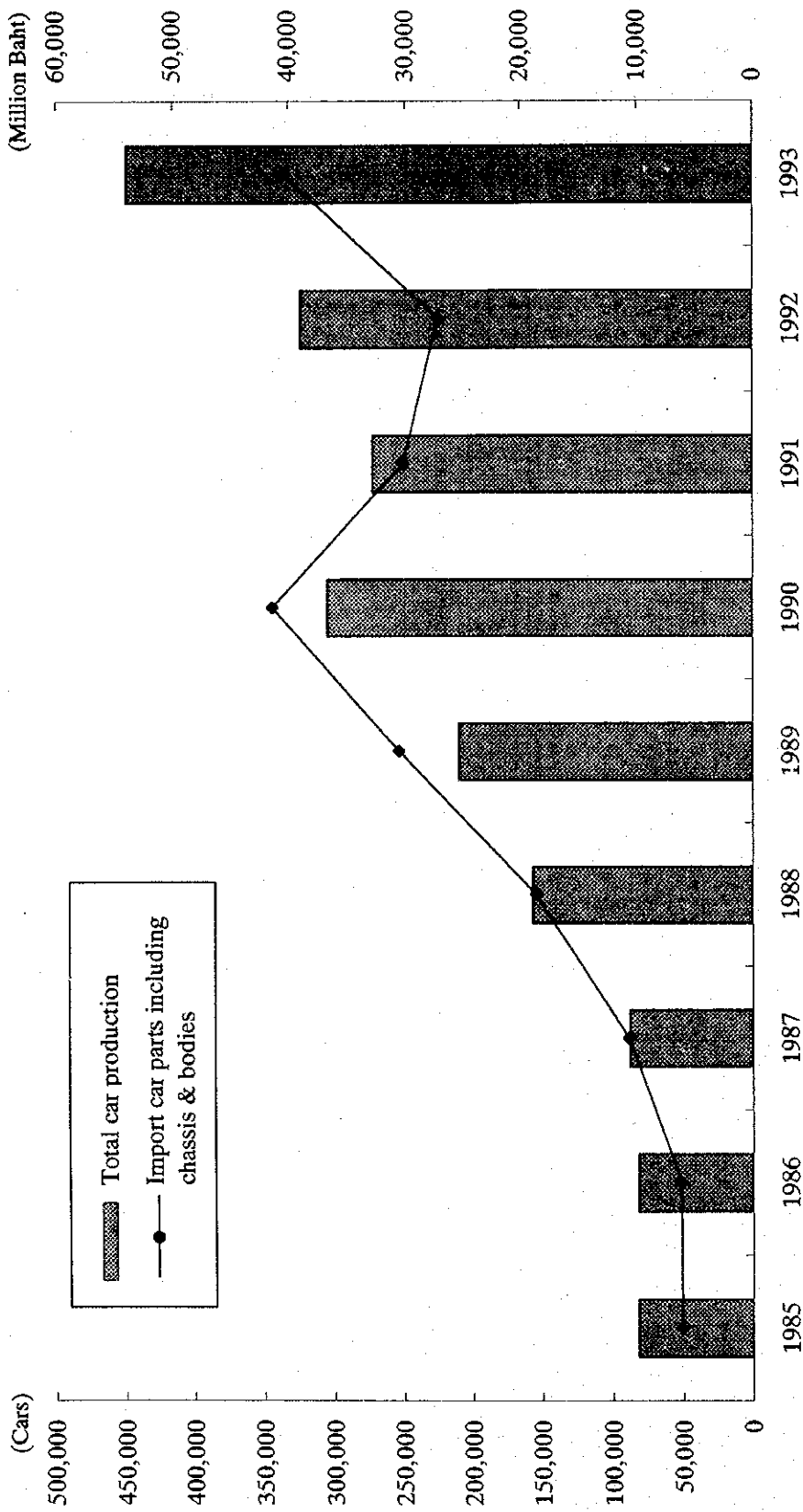
(Note) It is supposed from Table 4.2-1 that the number of autoparts production is computed by a multiplier of number of autoparts used for a car and the same multiplier is used over 1985 to 1991 or 7 years long. In other words, no change in the ratio of local contents is assumed over the period so that accuracy of the production volume of parts/components shown in the report has a limitation.

The values of imports and exports of autoparts are given in Tables 4.2-2 and 4.2-3, respectively. Exports are gradually growing, but they were only 5.8 billion Bahts in 1991, a tenth of the value of imports.

Figure 4.2-1 gives the correlation between the number of car production and the import value of autoparts for years from 1985 to 1993. The production was obtained by adjustment of car sales with imports and exports, while the import value was computed from Table 4.2-3 by deducting, from the total import value, that for items of tires, and chassis with engine which should be counted as a CBU. The figure also shows the import value of autoparts for producing a CBU vehicle, in thousands bahts per car dividing the import value of autoparts by the number of the car production.

The autoparts import value per car production, a unit value, gradually increased from 1985 to 1989 including cost push factors of inflations and Yen appreciation because Japan has been a major exporter of autoparts to Thailand. Since 1990,

however, the unit value begun to decrease in spite that the cost push factors continued. Taking 1989 when the unit value recorded a peak as an index of 100, the unit value index was 95 in 1990, 77 in 1991, 59 in 1992 and 63 in 1993. During the period of time, foreign investment rapidly grew in the field of autoparts industry.



Import (Million Bahts)	6,095	10,656	18,587	30,418	41,238	30,060	27,128	40,401
Production (Cars)	81,790	88,247	157,005	213,548	304,843	272,600	324,608	450,000
Import/car ('000 Bahts)	74.5	75.7	118.4	142.4	135.3	110.3	83.6	89.8
Index (1989=100)	52	53	83	100	95	77	59	63

Figure 4.2-1 CORRELATION BETWEEN TOTAL CAR PRODUCTION AND IMPORTED CAR-PARTS

Table 4.2-1 PRODUCTION OF AUTOMOTIVE PARTS (1/3)

Units: pieces

Item	Quantities						
	1985	1986	1987	1988	1989	1990	1991
1. Engine Parts							
- Intake & exhaust valve	25,712	23,224	30,735	48,283	66,873	95,462	88,658
- Spring valve	5,695	5,144	6,808	10,694	14,144	21,812	19,637
- Timing chain cover	7,728	6,980	9,238	14,511	20,099	28,691	26,646
- Engine gasket	16,955	15,315	20,268	31,840	44,099	62,952	58,465
- Exhaust manifold	24,555	22,179	29,352	46,110	63,864	91,167	84,669
- Connecting and bearing	33,674	30,416	40,253	63,235	87,582	125,025	116,114
- Main bearing	42,093	38,020	50,317	79,044	109,478	156,281	145,142
- Flywheel	6,794	6,137	8,122	12,759	17,671	25,226	23,428
- Crankshaft pulley	15,205	13,734	18,176	28,553	39,547	56,454	52,430
2. Accessional Equipment of Engine							
- Radiator	81,548	73,658	97,481	153,135	212,097	302,771	281,191
- Oil filter	23,300	21,046	27,853	43,755	60,602	86,510	80,344
- Accelerator cable	10,667	9,635	12,751	20,031	27,744	39,605	36,782
- Oil level gauge	23,300	21,046	27,853	43,755	60,602	86,510	80,344
- Spark plug	81,147	73,296	97,002	152,383	211,054	301,283	279,809
- Distributor	6,458	5,833	7,720	12,127	16,796	23,977	22,268
- Ignition coils	11,719	10,585	14,008	22,006	30,479	43,510	40,408
3. Electrical Equipment							
- Alternator	81,548	73,658	97,481	153,135	212,097	302,771	281,191
- Starter motor	81,548	73,658	97,481	153,135	212,097	302,771	281,191
- Battery	87,883	79,380	105,054	165,031	228,573	326,292	303,035
- Regulator	60,761	54,882	72,632	114,100	158,032	225,593	209,513
- Wiper motor	74,083	66,915	88,557	139,116	192,680	275,054	225,449
4. Wiring							
- Low voltage wire	67,175	60,676	80,300	126,146	174,715	249,409	231,632
- Spark plug cable	16,285	14,709	19,466	30,580	42,354	60,461	56,152
- Battery cable	169,431	153,038	202,535	318,166	440,670	629,063	584,226
5. Exhaust Pipe System							
- Exhaust pipe	81,548	73,658	97,481	153,135	212,097	302,771	281,191

Table 4.2-1 PRODUCTION OF AUTOMOTIVE PARTS (2/3)

Units: pieces

Item	Quantities						
	1985	1986	1987	1988	1989	1990	1991
6. Fuel System							
- Fuel tank gauge	74,532	67,321	89,094	139,961	193,849	276,723	256,999
- Fuel pipe & tube	68,197	61,599	81,522	128,064	177,373	253,203	235,155
- Fuel filter	35,621	32,175	42,581	66,892	92,647	132,255	122,829
7. Wheel & Tire set							
- Hubcap and nuts	400,508	361,758	478,760	752,096	1,041,675	1,487,007	1,381,019
- Tire & tube	429,971	388,370	513,979	807,422	1,118,304	1,596,395	1,482,611
8. Interior Decorating Components							
- Sound proofing	12,798	11,560	15,299	24,033	33,287	47,517	44,131
-	74,506	67,297	89,063	139,911	193,780	276,624	256,908
- Roof side inner & garment	37,969	34,295	45,387	71,299	98,752	140,970	130,922
- Door trim	197,027	177,964	235,522	369,988	512,444	731,521	679,381
- Center console	1,084	979	1,296	2,035	2,819	4,024	3,737
- Handle door window regulator	193,161	174,474	230,901	36,728	502,389	717,167	666,051
- Door weatherstrip	54,723	49,428	65,414	102,761	142,327	203,174	188,692
9. Seats							
- Seat adjustment, headrest	75,213	67,936	89,908	141,239	195,620	279,251	259,347
10. Glass Sets							
- Glass weatherstrip windshield	104,396	94,295	124,793	196,040	271,521	387,600	359,973
- Window glass panel	75,213	67,936	89,908	141,239	195,620	279,251	259,347
- Glass weatherstrip	68,748	62,096	82,180	129,098	178,804	225,246	237,053
11. Lamp Sets							
- Turn single lamp	104,995	948,361	125,509	197,164	273,078	389,824	362,038
- Tail lamp	94,408	85,274	112,854	177,285	245,545	350,519	325,535
- Room lamp	8,307	7,503	9,930	15,599	21,605	30,841	28,643
- Combination lamp	4,781	4,318	5,715	8,977	12,434	17,947	16,484
12. Shock Absorbing System							
- Front leaf and coil spring	267,865	241,948	320,201	503,011	696,684	994,528	923,642
- Front stabilizer bar	79,423	71,739	94,941	149,146	206,571	294,883	273,865

Table 4.2-1 PRODUCTION OF AUTOMOTIVE PARTS (3/3)

Units: pieces

Item	Quantities						
	1985	1986	1987	1988	1989	1990	1991
13. Brake System							
- Drum brake & disk brake	250,687	226,432	299,666	470,753	652,006	930,749	864,409
- Brake tube	76,739	69,314	91,732	144,104	199,588	284,915	264,608
- Cable parking brake	49,168	444,111	58,775	92,331	127,881	182,551	169,540
14. Clutch System							
- Clutch disc	32,689	29,526	39,076	61,385	85,020	121,367	112,716
- Clutch cable, lining	41,401	37,395	49,490	77,744	107,678	153,712	142,756
15. Body Components							
- Floor, roof, door, FD side frame, bonnet, tray	78,705	71,090	94,082	147,796	204,702	292,216	271,388
16. Bumper Set							
- Bumper	33,185	29,974	39,668	62,316	86,310	123,208	114,426
17. Instrument Panel Set							
- Mileage gauge	2,843	2,568	3,399	5,339	7,395	10,556	9,803
- Technometer	2,843	2,568	3,399	5,339	7,395	10,556	9,803
18. Facilitating Equipment and Other Equipment							
- Horn	82,106	74,162	98,148	154,183	213,548	304,843	283,113
- Safety belt	31,145	28,132	37,231	58,487	81,006	115,637	107,395
- Mud guard rubber sheets	121,681	109,908	145,455	228,499	316,478	451,777	419,576
- Radio	23,300	21,046	27,853	43,755	60,602	86,510	80,344
- Air condition	7,982	7,210	9,542	14,990	20,761	29,637	27,524

(Source) "TRIMS and Their impacts on the Automotive Parts Industry in Thailand" Oct., 1993, IFCT

Table 4.2-2 AUTOPARTS EXPORT

Commodity	Unit: Million Baht									
	1970	1975	1980	1985	1986	1987	1988	1989	1990	1991
Rubber hoses, tubes	0.14	0.65	46.92	58.20	66.81	100.86	170.90	206.53	222.20	210.81
Transmission belts	0.00	2.24	0.44	1.21	2.03	14.06	31.30	56.08	103.73	176.25
Tyres	0.00	0.00	47.04	75.24	116.95	109.75	156.53	152.34	122.50	346.39
Inner tubes	0.05	0.07	12.06	10.85	8.64	12.91	20.78	24.96	16.28	19.72
Filter blocks	0.00	10.49	3.02	0.00	0.00	0.00	67.65	25.22	0.65	0.43
Brake and clutch materials	0.46	0.45	22.63	2.65	8.61	24.17	35.13	48.84	69.28	59.85
Safety glasses	0.00	1.39	5.73	42.12	92.92	203.31	235.74	197.77	163.63	146.89
Mirrors	0.00	2.09	3.30	3.26	7.61	27.72	33.82	143.15	139.88	121.42
Springs and leaves	0.00	0.09	1.21	0.25	5.66	53.34	0.64	89.71	84.11	154.51
Gasoline engines	0.00	0.01	0.00	0.03	0.08	13.97	28.32	18.05	14.65	11.20
Diesel engines	0.09	0.07	1.26	2.70	3.44	4.89	37.82	99.84	214.72	352.95
Spark ignition parts	0.09	3.80	16.84	59.58	62.30	126.53	214.95	215.93	199.94	234.59
Liquid filters	0.00	0.41	4.51	8.26	4.79	9.98	114.95	65.63	71.18	63.62
Gas filters	0.00	0.00	0.02	0.01	0.64	0.26	2.99	8.09	20.19	32.21
Transmission systems	0.00	0.46	1.07	3.29	12.17	23.49	44.78	59.29	53.98	74.98
Gaskets	0.02	0.39	6.94	8.16	8.72	16.95	23.55	26.91	40.26	41.25
Machinery parts	0.00	0.01	1.50	0.25	1.46	1.50	1.67	11.00	47.78	93.13
Electric Accumulators	0.04	1.08	100.01	15.75	27.60	78.87	107.04	174.58	206.15	253.45
Starting equipment	0.00	0.07	0.02	0.49	1.13	0.22	65.95	198.98	336.10	377.87
Electric lighting	0.00	0.01	1.74	1.86	8.08	11.89	49.64	116.12	143.85	157.40
Ignition and wiring sets	0.17	12.37	69.48	101.17	124.10	198.03	1,227.80	2,299.12	2,673.39	1,807.94
Chassis with engines	0.00	0.00	0.00	0.00	0.00	0.00	2.51	0.21	0.07	0.00
Bodies	0.00	1.22	0.00	0.00	9.89	4.79	1.65	2.06	0.64	4.84
Accessories	0.01	0.99	161.42	257.99	310.18	476.13	678.17	762.83	706.88	1,019.37
Total	1.07	38.36	507.16	653.32	883.81	1,513.62	3,354.28	5,003.24	5,652.04	5,761.07

Source: Investment Opportunity Study, BOI.
Customs Department of Thailand

Table 4.2-3 AUTOPARTS IMPORT

Unit: Million Baht

Commodity	1970	1975	1980	1985	1986	1987	1988	1989	1990	1991
Rubber hoses, tubes	18.32	36.25	63.23	75.59	73.32	86.10	111.34	147.15	221.40	266.05
Transmission belts	29.86	63.67	108.07	134.75	144.65	179.48	252.87	213.66	279.69	332.72
Tyres	0.00	0.00	81.47	92.31	79.97	96.16	258.51	289.47	391.59	390.08
Inner tubes	0.37	0.25	63.00	11.18	6.14	10.40	36.20	40.36	75.44	41.06
Filter blocks	0.42	1.94	5.78	6.41	6.82	4.11	20.40	3.38	10.31	6.54
Brake and clutch materials	6.46	37.94	49.16	64.45	60.21	73.56	96.02	84.96	101.60	85.90
Safety glasses	9.72	18.66	10.92	34.85	14.58	10.49	12.45	26.96	63.34	45.25
Mirrors	5.40	10.89	32.64	48.67	26.88	25.92	25.77	52.86	76.62	74.11
Springs and leaves	10.49	31.30	49.52	65.22	72.97	104.61	22.15	29.09	31.91	38.83
Gasoline engines	46.57	259.63	361.47	570.62	588.44	767.91	964.12	1,019.30	1,149.30	1,073.60
Diesel engines	170.64	830.40	781.08	1,245.02	753.19	1,219.56	1,695.95	4,055.73	6,783.70	6,056.83
Spark ignition parts	241.43	623.24	1,641.50	1,668.34	1,965.66	2,896.18	3,293.42	3,943.92	4,944.65	4,346.34
Liquid filters	28.95	37.83	33.52	126.31	94.41	97.38	43.45	74.01	115.98	143.02
Gas filters	2.18	3.60	10.19	27.95	25.35	31.37	23.32	22.93	24.29	53.60
Ball bearing	97.65	326.27	509.70	2,523.31	1,604.61	1,597.80	1,071.79	1,329.17	1,635.71	1,900.59
Transmission systems	108.02	353.10	586.07	792.59	774.42	1,199.93	1,630.21	2,289.85	2,787.71	2,949.87
Gaskets	128.87	74.02	95.86	120.49	113.99	150.32	233.77	228.85	302.64	331.68
Machinery parts	17.23	57.20	81.63	111.19	140.04	180.17	238.64	293.81	348.29	415.95
Electric Accumulators	31.99	6.05	13.56	26.82	36.61	63.38	3.64	5.30	7.32	44.81
Starting equipment	1.97	7.16	24.73	170.03	107.61	54.39	1,244.32	1,588.55	1,904.70	1,756.81
Electric lighting	23.37	50.57	131.02	235.55	285.74	358.70	336.80	419.03	521.64	473.02
Ignition and wiring sets	104.19	118.03	121.21	37.03	107.48	295.65	58.33	77.36	69.82	52.28
Chassis with engines	0.00	1,064.97	92.94	1,957.42	2,196.96	3,812.97	14,721.88	19,079.70	24,383.49	13,835.82
Bodies	1.55	10.57	1.45	3.20	2.99	2.99	5.59	16.74	62.14	60.70
Accessories	56.45	142.95	914.39	1,402.68	1,539.25	1,968.50	3,505.06	10,189.66	15,614.19	14,435.45
Total	1,085.65	4,166.49	5,864.11	11,551.98	10,822.29	15,288.03	29,906.00	45,521.80	61,907.47	49,210.91

Source: Investment Opportunity Study, BOI.
Customs Department of Thailand

4.2.3 Structure of the autoparts industry

(1) Analysis of the autoparts suppliers by type of enterprises

Reliable statistics related to the production and producers of automotive parts in Thailand are not available. The most comprehensive information source is thought to be Directory of Supporting Industries in Thailand 1993, published by the SEAMICO Business Information & Research Co., Ltd., with support by industrial associations and BOI.

Therein, 395 companies are listed as comprising the supporting industry related to vehicles. The structure of parts suppliers derived from this Directory is shown in Table 4.2-4. In this table the following points merit attention.

- 1) Motorcycle parts suppliers are mixed in with autoparts suppliers.
- 2) In addition to OEM suppliers that sell parts for assembly of new vehicles, REM suppliers that sell only replacement parts for repairing are included.

In Table 4.2-4, Code No. 11 includes castings, forgings and basic metal, and Code No. 33 covers other metal working, includes parts production and their fabrication that is the core of the autoparts industry. Code No. 60 is electrical parts, Code No. 61 is electronic parts, Code No. 70 is plastic parts, and Code No. 71 is rubber parts. These are major areas in the autoparts industry. It is noteworthy that in Code No. 33, there is a high percentage of foreign participation.

Ownership of the parts suppliers in terms of the capital composition is shown in Table 4.2-4. It is summarized in the table below where suppliers with no data are excluded.

Table 4.2-4 COMPOSITION OF AUTOMOTIVE SUPPORTING INDUSTRY SOURCED BY DIRECTORY

Code	Subsector	Total No. of Companies	By Ownership			By No. of Employees				
			Thai 1/	For. 2/	n.a.	~100	101~200	201~500	501~	n.a.
11	Iron & Steel Basic Industries	29	14	14	1	5	7	8	5	4
12	Non-Ferrous Metal Basic Industries	21	10	11	0	8	4	5	3	1
20	Gear Cutting	10	4	4	2	3	4	1	0	2
21	Mould Making	8	5	3	0	6	0	0	2	0
22	Other Metal Machining	8	2	1	5	1	2	4	0	1
30	Spring & Wire Products	11	7	2	2	5	1	1	3	1
31	Precision Parts & Components	12	6	6	0	9	1	1	0	1
32	Metal Packaging & Containers	1	1	0	0	0	0	0	1	0
33	Other Metal Fabrication	118	34	60	24	43	18	20	9	28
50	Engines	11	5	6	0	0	3	4	3	1
51	Other Machinery & Equipment	5	4	1	0	5	0	0	0	0
60	Electrical Parts & Components	37	16	14	7	10	6	8	6	7
61	Electronic Parts & Components	6	2	3	1	1	2	1	2	0
70	Plastic & Synthetic Fibres	30	12	12	6	9	7	5	5	4
71	Rubber Products	49	22	13	14	10	6	9	5	19
72	Glass Products	8	2	3	3	2	1	2	0	3
74	Pulp & Paper Products	2	1	1	0	1	1	0	0	0
75	Chemicals	17	6	10	1	13	3	0	0	1
76	Petrochemicals	1	1	0	0	1	0	0	0	0
79	Other Non-Metal Parts & Process	11	5	3	3	4	2	1	0	4
	Total	395	159	167	69	136	68	70	44	77

Notes: 1/ Thai 100% ownership

2/ Jointventure with a foreign investor(s) or foreign 100% ownership

Source: Directory of Supporting Industries in Thailand 1993, SEMICO Business Information & Research Co. Ltd.

Table 4.2-5 OWNERSHIP

	Number of companies	Share
100% Thai owned	159	48.2%
100% foreign owned	12	3.6%
Joint venture	159	48.2%
	330	100.0%

There are approximately the same number of companies that are fully owned by Thai capital and joint venture companies. More than 90% of the latter are invested by Japanese companies.

Table 4.2-6 COMPANY SCALE
(BY NUMBER OF EMPLOYEES)

	Number of companies	Share
100 or less	136	42.8%
101-200	68	21.4%
201-500	70	22.2%
501 or more	44	13.8%
	318	100.0%

The number of companies having 100 or less employees is about the same as the number of companies having 101-500. This shows that, even taking into account the absence of microscopic companies from this sort of directory, the scale of companies in the industry is somewhat large compared to that of Thai industry in total.

(2) Structural analysis of the autoparts industry

The structure of the autoparts industry in Thailand is viewed from two indicators, "the total number of enterprises" and "stratification of primary suppliers and secondary or more down-stream suppliers," based on which the size of the industry is estimated. Note that the figures given below are the Study Team's own estimate derived from data obtained from various sources, since there are no official statistics providing relevant data.

In the first step, directories covering supporting industries were collected as far as possible. The following is a list of directories used for the present study, including those mentioned in (1) above:

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

These directories were then reviewed for "noise filtering" to remove enterprises in the fields not relevant to the target group of the Study, such as motorcycles and heavy electrical equipment. Then, enterprises not listed in the directories but identified by the Study Team were added to obtain a total number of 744 enterprises.

(a) Parts suppliers serving the automotive and electrical/electronics industries: 744

Subtracting the number of electrical/electronic parts suppliers from the above figure, the number of automotive parts suppliers can be obtained.

(b) Autoparts suppliers: 374 (32)

(Note) The number in the parentheses is those who produce electrical/electronic parts as well.

Among them, 148 enterprises have been identified as primary suppliers.

(c) Primary suppliers of autoparts: 148 (11)

Subtracting (b) from (a), the net number of autoparts suppliers excluding

primary suppliers, including "secondary suppliers or below (OEMs)," "repair parts suppliers (REMs)," and "export parts suppliers" was obtained.

(d) Autoparts suppliers other than primary suppliers (b) – (c): 226 (21)

Then the 226 suppliers were classified into "secondary suppliers or below (OEMs)," "repair parts suppliers (REMs)," and "export parts suppliers." First of all, export-oriented suppliers, not considered to be part of the supporting industry in Thailand, were subtracted to from the total figure. In other words, enterprises that are 51% or more owned by foreign capital were excluded from the list, because they are required to export their products.

(e) Export-oriented parts suppliers: 26 (4)

(including those 51% or more owned by foreign capital)

(f) Autoparts suppliers serving the domestic market (d) – (e): 200 (13)

(not-including primary suppliers)

There are estimated 200 parts manufacturers serving the automotive industry in Thailand (not including primary suppliers). They are further divided into "OEM parts suppliers" and "REM parts suppliers." The former is regarded as secondary on more down-stream suppliers for assembly operation. The latter represents a group of companies who supply repair parts to after markets.

Classification of the 200 enterprises into OEM and REM parts suppliers has required some efforts because no relative information is available in any of the directories. As a surrogate, the results of the interview survey for the supporting industry in the country, as conducted by the Study Team, were used as the basis of estimation. The interview survey obtained responses from 239 enterprises, of which 63 were automotive parts suppliers and were classified as (f) (13 also produce electrical/electronics parts). They were classified according to the type of market they served, as follows:

Enterprises exclusively producing OEM products:	12 (19%)
Enterprises producing OEM/REM products:	27 (43%)
Enterprises exclusively producing REM products:	24 (38%)
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Total	63 (100%)

If the above percentage distribution by type of market, is applicable to 200 enterprises, those were classified as follows:

Enterprises exclusively producing OEM products (19%):	38 (7)
Enterprises producing OEM/REM products (43%):	86 (5)
Enterprises exclusively producing REM products (38%):	76 (1)
<hr/>	
Total	200 (13)

Note that enterprises producing and supplying OEM parts (including those also producing REM products), which are not primary suppliers, are considered to be secondary or more down-stream suppliers. As a result, 38 enterprises produce only OEM products, and 86 manufacture both OEM and REM products, making a total of 124 secondary or more down-stream suppliers.

From the above analysis, the general structure of the automotive parts industry in Thailand is estimated as follows: