

Chapter 2. Investment Promotion Policies

2-1. Promotion of Investment for Products Covered by Third Year Survey

2-1-1. Investment Promotion in Ceramic Tableware Industry

At the moment, only glazed pottery is covered by the promotion measures of the BOI. Promotion is limited to firms which can export over 80 percent of their sales. That is, new entries into the domestic market are being restricted and a policy of giving priority to protection of domestic companies is being continued.

From the standpoint of promotion of export industries, the policy may be said to be extremely goal-oriented, but judging from the obligation of exporting over 80 percent of sales, only projects which are able to secure export markets from the very beginning (which means, de facto, joint ventures with foreign capital) have the qualifications for promotion. With this, it would be difficult to effectively promote investment. Further, the condition of a value of investment of over 50 million bahts (over 20 million bahts in the case of expansion) is somewhat too high in the case of novelty items.

*** Ceramic Projects eligible for BOI Promotion**

(1) 2.5 "Glazed Pottery"

- Stoneware, porcelain, bonechina, where
- The investment, except in land and operating funds,
 - [1] is 50 million bahts or more in the case of stoneware and porcelain (however, 20 million bahts or more in the case of expansion)
 - [2] is 20 million bahts or more, in the case of bonechina, and
- Where 80 percent or more of the annual sales is from exports,

(2) 5.49 "Production Primarily for Export"

- Investment of over 1 million bahts, with 50 percent of production exported in two years of operation and 80 percent or more exported in the third year on.
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(Source) BOI

While coverage is also extended to small-scale investment of 1 million bahts without regard to the type of industry, a condition of over 80 percent exports is also imposed, so the projects meeting the qualifications for investment are again limited.

It would be desirable if the conditions for BOI promotion of investment were improved so as to help promote small and medium enterprises by, for example, alleviating new-entry restriction, reducing the minimum investment amounts, and easing the conditions of obligatory export.

2-1-2. Investment Promotion in Plastic Molding Industry

Currently, all plastic processing industries are covered by the BOI promotion scheme. However, again, there is a heavy export obligation and it is not probable that many projects are able to qualify for promotion.

*** Plastic Molding Projects eligible for BOI Promotion**

- [1] 5.6 "Plastic or Plastic Coated Products"
 - Investment of 3 million bahts or more and the majority or totality of the production exported
- [2] 5.25. "Manufacture of Artificial Flowers and Trees for Export"
 - Investment of 2 million bahts or more and 100 percent of production exported
- [3] 5.31. "Manufacture of Packaging Materials"
 - "Plastic Film": Investment of 40 million bahts or more, with at least 60 percent of the registered capital being Thai capital and with 40 percent or more of production exported
 - "Polystyrene Film": Investment of 20 million bahts or more, use of domestic raw materials, and exports of at least 30 percent of production
 - "Packaging or Packaging Materials for Export": Investment of 30 million bahts or more and 100 percent exports
 - "Laminated Tube and Web": Investment of 50 million bahts or

more

[4] 5.49 "Production Primarily for Export"

- Investment of over 1 million bahts, with 50 percent of production exported in two years of operation and 80 percent or more exported in the third year on.

(Source) BOI

While coverage is also extended to small-scale investment of 1 million bahts without regard to the type of industry, a condition of over 80 percent exports is also imposed, so the projects meeting the qualifications for investment are again limited.

It would be desirable, for the plastic molding industry as well, to improve the conditions for promotion by reevaluating competition-restricting policies, reducing the minimum investment amounts, and easing the conditions of obligatory export.

2-2. Review of Investment Promotion Policies

2-2-1. Questions Regarding BOI Promotion Measures

The emphasis in Thailand's industrial policies to date has been on the promotion of exports, primarily of large corporations. Therefore, as a result, mainly companies with large scale investment through specialization in exports were covered by the promotion policies and inevitably there was a strong tendency to incorporate modern and labor saving production systems. Accordingly, problems have been created such as [1] the slow growth in the supporting industries and the partial gaps in the linkage among the industries, [2] a reliance on imports for parts, intermediate goods, and production goods and thus no assistance in the positive improvement in the trade balance, and [3] a relatively low employment efficiency per unit investment, even though priority was given to large-scale projects with high employment effects. Also, the current incentives and restrictive policy measures for promotion of investment and export may come under increasing criticism from the West in the future as infringing upon the provisions of the GATT (General Agreement on Trade and Tariffs)⁽¹¹⁾ and, therefore, they will have to be reevaluated.

2-2-2. Examination of Problems

The BOI's investment promotion policies have reached certain limits in their effectiveness in promotion of small and medium sized enterprises, industrial linkage, and employment efficiency. This will be discussed in some detail here.

(1) Delayed Promotion of Small and Medium Size Enterprises

The investment promotion policies of the BOI are considered as difficult to be used by small and medium sized enterprises due to the criteria for promotion. This assessment apparently has widely been accepted in Thailand. The following data, though incomplete, demonstrates a certain degree of objectivity in favor of this assessment.

For example, of the 130 product items being promoted as of 1985, 127 require as a condition for promotion a minimum investment (excluding the land costs and operating funds) of 2 million bahts. Of these, 92 (72%) require minimum investments of 5 million bahts or more and 63 (50%) 10 million bahts or more. Small enterprises (enterprises with less than 50 employees), however, are defined as those with fixed assets (including land) of 1 to 10 million bahts. This being the case, small sized enterprises are excluded from coverage in a considerable number of product items.

A look at the 936 manufacturing companies which were promoted by the BOI in the 23 years from 1960 to 1982 by the number of employees (Table II-1) shows there were only 156 (16.7%) small enterprises (those with less than 50 employees), there were 400 (42.7%) medium sized enterprises (those with from 50 to less than 200 employees), and there were 380 (40.6%) large enterprises (those with 200 employees or more). In other words, 780 (83.3%) of the enterprises were medium or large in size - an overwhelmingly large proportion. Most of the projects promoted by the BOI, however, have brought in modern, labor-saving production systems, so the rate of capital intensity is high even in companies with small numbers of employees (Table II-4). Therefore, even companies classified as medium sized enterprises in terms of the number of employees would be classified as large sized projects in terms of the size of investment.

Further, the data of the number of BOI promoted companies classified according to the size of investment (Table II-2) would be of use.

Table II-1. Number of BOI Promoted Enterprises Classified by Size of Employment (Manufacturing Industries, 1960 to 1982)

No. of employees	No. of companies (%)	
1 - 19	27	(2.9)
20-29	30	(3.2)
30-49	99	(10.6)
50-99	200	(21.4)
100-149	121	(12.9)
150-199	79	(8.4)
200-299	112	(12.0)
300-399	87	(9.3)
400-499	48	(5.1)
500-999)	77	(8.2)
1000-	56	(6.0)
Total	936	(100)

Note: Numbers of companies are actual numbers.
Source: BOI

Since no breakdown of the number of projects of an investment size of under 100 million bahts before 1985 was obtained, the number of projects of a size of under 20 million bahts is unknown. Although we should not make a hasty judgement from only the data of 1986 onwards when such a breakdown exists, we can say so far as 1986 to 1988 (Q1) goes, that about two-thirds of the investment projects of under 100 million bahts value (number of applications for promotion) were of more than 20 million bahts. Thus there were not that many projects of a relatively small size of under 20 million bahts. When seen by the number of projects approved, it may be considered that there were even fewer small sized projects. Further, it is conjectured that there were even fewer small sized projects of less than 10 million bahts value included among the number of applications or the number of applications approved. By way of note, the value of investments in the case of new investment projects of small and medium sized enterprises is said to be generally under 10 million bahts in Thailand.

Table II-2. Number of BOI Promoted Companies by Size of Investment

Size of investment (million bahts)	1982	1983	1984	1985	1986	1987	1988
Number of applications for promotion							
<20					126	251	89
20-100					211	505	184
<100	164	263	289	255	337	756	273
100-500	30	64	65	51	69	227	56
500-1000	2	9	15	12	17	33	14
>1000	4	5	7	7	8	41	33
Total	200	341	376	325	431	1057	376
Number of applications approved							
						1987(1-6)	
<100	93	118	205	174	230	182	
100-500	16	20	50	26	47	45	
500-1000	0	1	5	4	12	11	
>1000	1	1	6	6	6	8	
Total	110	140	266	210	295	246	

Source: BOI

(2) Industrial Linkage Effect

To quantitatively verify the effect on domestic industrial linkage, it would be necessary to divide the ratio of the input of imported goods in the total input in the manufacturing industries for BOI promoted companies and for general companies and make a comparison for at least two time periods. However, it is impossible to make an analysis comparing BOI promoted companies and general companies due to the reasons that [1] it is impossible to isolate and extract data relating to BOI promoted companies from the IO tables, [2] there are no other statistics which can take the place of the IO tables.

Looking at the manufacturing industries in general, however, the share of imported input may be said to be relatively big in the case of export-oriented industries

Table II-3. Dependence on Imports of Input (1975 to 1982)

(Unit: %)

Industrial sector	Share of imports in total intermediate input			Share of imports in total input			Export/output		
	1975	1980	1982	1975	1980	1982	1975	1980	1982
Agriculture	8.7	9.9	10.2	1.8	2.5	3.0	6.0	5.2	5.4
Mining	14.6	23.7	15.7	2.5	3.7	3.5	11.6	11.0	6.2
Food	3.8	5.4	4.5	2.6	3.8	3.1	17.0	25.7	30.3
Textile	22.1	19.0	17.4	14.7	12.9	11.8	7.2	12.4	14.0
Wood	4.5	10.1	12.7	2.7	5.4	7.0	14.6	7.5	12.6
Paper	38.7	37.8	55.0	24.0	22.9	34.1	1.2	1.5	1.9
Rubber, Chemical & Petroleum	60.3	66.6	68.0	40.9	46.6	48.6	8.5	11.7	8.7
Non-metallic	10.8	15.7	9.1	6.5	9.9	6.0	8.4	2.9	2.8
Engineering	37.7	33.7	29.7	26.4	23.9	20.9	7.3	20.1	11.1
Other Manufacturing	19.1	22.9	24.2	9.6	12.9	13.3	12.9	37.6	33.1

Source: 1975, 1980 and 1982 Input-Output Tables, Input-Output Section, National Accounts Div., NESDB

(Quoted from Background Paper No.7 for the 1989 TDRI Year-end Conference, P.59)

with over a more than 10% reliance on exports, such as "food processing", "textiles", "wooden products", machinery and metals (engineering)", and "other manufacturing industries", with the exception of "food processing" (Table II-3).

Regarding export-oriented industries or industries with an absolute high dependence on imports, such as "paper" and "rubber, chemical, and petroleum products", it would be possible to verify the hypothesis that the BOI promoted companies have a much higher dependence on imported input, if it were possible to extract just data on BOI promoted companies.

In the case of export-oriented companies, the biggest problem is with the quality of the products and therefore technology is introduced from abroad and the companies are

often dependent to a large degree on imports of raw materials, intermediate goods, and capital goods as well. This slows the development of supporting industries and therefore is a major factor behind the slow deepening of domestic industrial linkage. This problem, however, will be gradually alleviated in the future.

As a matter of fact, the dependence on imported input is continuing to increase for "wooden products", "paper", "rubber, chemical, and petrochemical products", and "other manufacturing industries", but is clearly falling for "textiles" and "machinery and metals". The dependence on imports in "food processing" and "nonmetallic products" was moving toward a decline in 1982 as well. IO data for the years after 1982 is not available, but the general trend is believed to have been for a decline of the dependence on imported input and a deepening of the domestic industrial linkage. However, it is not clear if a similar trend is underway in the BOI promoted companies.

(3) Employment Efficiency

We compared the capital intensity ratio of companies being promoted by the BOI and that of manufacturing industries as a whole and examined the rate of creation of employment per unit investment from the same so as to view the degree of contribution of the BOI promoted companies to employment (Table II-4).

Compared to the manufacturing industries as a whole the BOI promoted companies clearly have a higher capital intensity. That is, the rate of creation of employment per unit investment is lower than the average in the case of the BOI promoted companies. This means that less jobs have been created per value of capital investment.

In general, small and medium scale industries have lower capital intensity and conversely higher rates of employment creation. In the case of the BOI promoted companies, however, even the companies with small numbers of employees do not have low capital intensity. That is, not only are the BOI promoted companies mostly large sized enterprises, but also even the small and medium sized enterprises have extremely high capital intensity and thus low employment efficiencies compared with nonpromoted companies.

Table II-4. Capital Intensity Ratio of Thai Manufacturing Companies by Size of Employment

Size of employment	No. of employees (actual no.)		Total investment (mil. B)		Capital intensity ratio (1000 B/person)			Employment creation rate (Persons/mil. B)	
	BOI	Overall	BOI	Overall	BOI	Overall	BOI/Overall	BOI	Overall
-19	311	260514	380	22927	1221.8	88.0	13.9	0.82	11.36
19-29	752	77116	379	7867	503.9	102.0	4.9	1.98	9.80
30-49	3891	103826	3306	12974	849.6	124.9	6.8	1.18	8.00
50-99	14667	127919	7605	16359	518.5	127.8	4.0	1.93	7.82
100-149	14556	72375	5494	14980	377.4	206.9	1.8	2.65	4.83
150-199	13780	48382	5879	8927	426.6	184.5	2.3	2.34	5.42
200-299	27152	75498	42186	15471	1553.6	204.9	7.5	0.64	4.88
300	210327	378472	94731	84623	450.3	223.5	2.0	2.22	4.47
Total	285436	501411	159960	96270	560.4	191.9	2.9	1.78	5.21

Note: 1) BOI data is for 1960 to 1982 and overall data is of 1984.

2) Capital intensity = Total investment/No. of employees, Employment creation rate = No. of employees/Total investment

Source: Prepared from data of DIW-MOI and BOI.

2-2-3. Hypotheses

In the latter half of the 1980's, the Government adopted the policy of developing export-type industries by inviting foreign firms, scrapping the regulations for localization of foreign firms. It was due to the fact that both the policies of import-substitution industrialization in the 60's and developing export industries through foreign capitals in the 70's were not quite successful to boost exports and improve the trade balance, and it was urgently required to prompt foreign exchange earnings through boosting exports of industrial goods because, after the second oil crisis in 1979, the trade deficit extremely deteriorated and debt repayments were about to swell.

However, the domestic industries were not well developed for export except for Food-processing and Textile industries. Due to this situation, the Government decided to adopt a more drastic policy of inviting foreign export-type industries for quicker increase of exports. After all, the above-mentioned policy has proved to be the most efficient and the shortest way for quick expansion of exports, and it has been successful. However, the industrialization which is relied on foreign capital and technology and separated from the domestic market in terms of the inter-industry linkages and marketing will be very vulnerable. Also, it has proved that such a policy is not so effective to develop domestic industries or supporting industries.

Now, the domestic demand-market has largely been expanded compared with 60's or 70's. The domestic capital and technical know-how accumulated. The world markets have been cultivated. It will not be too difficult for the industries, whether foreign or Thai, to advance into the world market after substituting imports. The economic conditions for transitional development from import substitution to export-oriented industrialization can be said to be more mature now when compared with 30 years before. And, protective measures which is theoretically required at the initial stage of industrialization could be much less.

Apart from this issue, we should bear in mind the progress of the international movement toward "freer trade" or "international unification of the economic systems" which is likely to impose more restrictions on protective and promotional policy measures. In consequence of such changes in the international environment, the current policies of protection, regulation and privileges seem to be facing inevitable modification.

In conclusion, we will have to get away from the policy concept of protection and redirect ourselves toward the concept of competition, away from the export promotion through privileges and toward the industrial development⁽¹²⁾ through equal opportunities, away from development of export-industries skipping the import substitution process and toward export-oriented industrialization after accomplishing import substitution.

The investment promotion policy is expected to raise the internal linkage effect in industry, lessen the dependence on imports of parts, intermediate goods, and capital goods, and thereby push the industries in the direction of strengthening international competitiveness. This would lead to an improvement of the trade balance. Therefore, it will become necessary to shift to policies stressing the promotion of supporting industries and small and medium sized sub-contracting enterprises. This would lead to the more effective use of human resources, thereby enhancing employment and rural development and making the distribution of income more fair.

While the promotion of the SMEs and the supporting or subcontracting industries on a selective basis may come under the jurisdiction of the BOI, the MOI will have to be responsible for the overall development of the same through generally applicable policy measures.

Chapter 3. Protection of Domestic Industries

3-1. Policies of Protection of Domestic Ceramic Industry

In January 1978, the government banned the import of construction tile, refractory brick, wall tiles, sanitary ware, and ceramic tableware/kitchenware. In August 1982, it further banned imports of stoneware, thus placing a complete ban on imports of ceramic tableware/kitchenware.

In the past, almost all of the imports of ceramic products were of tableware and imported tableware accounted for 20 percent of the domestic demand. The above-mentioned import bans have brought the imports way down after 1983. At present, there is an almost complete ban on imports of ceramic tableware, except for tableware for the use of hotels promoted by the BOI. Even tableware and kitchenware imported by hotels with the proper approval are levied with a high tariff of 80%.

No ban has been placed on imports of ceramic novelties, but the domestic industry is protected by an 80% import tariff.

These protective measures have enabled ceramic product manufacturers promoted by the BOI to monopolize the domestic market for high class goods and to steadily increase their exports to the markets of the advanced nations. The small and medium sized manufacturers too have expanded their domestic sales along with the growth of the domestic consumption market.

The tableware produced by the large manufacturers in the Bangkok area and the novelty items in Lampang have reached a stage of maturity sufficient for import substitution and have grown to a certain level of international competitiveness even as an export industry. In particular, the large manufacturers may be said to have enough competitiveness to face international competition.

Although certain restrictions are permissible on the volume of imports, at the very least some review should be made of the current ban on imports from the viewpoint of strengthening competitiveness through competition with imports and the market mechanism, thereby leading the industry to higher level of technology.

The aim of future policies should be to strengthen competitiveness of the products

of the small and medium sized enterprises through the modernization of the facilities of the small and medium sized enterprises, to raise their technical level, and to rationalize their management practices.

3-2. Policies of Protection of Domestic Plastic Products

There are no quantitative restrictions on imports, but the domestic industry is continuing to be protected by high tariffs.

The Thai plastic processing industry, particularly the industrial parts sector, has not sufficiently matured even as an import substitution industry and remains weak in international competitiveness as an export industry. A certain level of mass production is essential for auto parts to meet high depreciation costs for molds and dies. Currently, however, production of finished cars in Thailand and the rest of the ASEAN nations has not reached at the stage where the economy of scale works for parts production.

Due to these factors, regarding auto parts, plans for the mutual supply of parts in the ASEAN nations and mutual concessions on tariffs are being implemented. In this way, external factors are emerging that will gradually push Thailand to convert to an outward-looking policy toward its plastic industry, even if the industry is not sufficiently competitive. The finished car and parts industries of Korea and Taiwan are striving for future growth through positive participation in an international division of labor. Policy implications may be found here.

Further, looking at the resin materials for plastic processing, the types of resin materials that can be supplied domestically will increase in number along with the growth of the petrochemical industry. In view of the monopolistic nature of the industry at the moment and the current scale of production, however, it will be difficult to expect the prices of domestically produced materials to be set at international market levels so long as the industry is protected by the current import tariffs. Consideration based on economic welfare will be sought regarding the tariff rates for materials.

In particular, auto parts require sophisticated resin materials of special quality. These are not, however, included in the current petrochemical complex plan of Thailand. Consequently, imports have to be relied on for the supply of such materials. The decisive factors enabling participation in an ASEAN horizontal division of labor will be price competitiveness and quality. Reconsideration will be necessary of the import tariffs on the

types and grades of resin materials not available under domestic production plans from the viewpoints of the international competitiveness of the products.

3-3. Review of Protection Policies

Thailand's industrial policies may be considered as having fundamentally changed in emphasis to an export orientation in the late 1970s. Considerable changes were seen in the industrial and trade policies throughout the export-oriented industrialization period, that is, the 1980s, but restrictive means and competition-restricting measures introduced during the period of import substitution type industrialization continue to be used as policy tools even today. This undeniably works to hinder freer competition and to block the strengthening of international competitiveness.

Import restrictions were strengthened in the 1970s, but were gradually reduced throughout the 1980s. As of 1985, there were 75 import-restricted product items, imports being banned for 43 items among them. As of January 1988, however, there were only 53 items for which imports were restricted and imports were banned for only 20 of these.⁽¹³⁾

Most of the import-restricted products are agricultural products or processed agricultural products, but Thailand should review the current import restrictions on industrial products, in particular, garments, ceramic tableware, and other products for which Thailand has achieved a certain degree of competitiveness, and endeavour to strengthen its competitiveness with imports and to upgrade its technical level.

Regarding the tariff structure, it maintains the basic structure as the fiscal revenue sources established in the 1960s and fundamentally has inherited intact the protective structure built in the 1970s. In the fifth five-year plan (1982 to 1986), tariff reforms were supposed to be one of the policy goals, but due to considerations relating to fiscal revenue, no drastic reforms were made in the end. On the contrary, in 1985, the government increased the nominal tariff rates by 5% on raw materials and intermediate goods and 10% on consumer goods, resulting in a rise, though slight, in the effective rate of protection (ERP). The upward revisions made during this period were also a result of revenue considerations.⁽¹⁴⁾

The high tariffs on raw materials and intermediate goods have an impact on external competitiveness of the manufactured product for export, but they are balanced off

by the tariff exemptions of the BOI and the tariff refund and rebate systems of the Ministry of Finance. On the other hand, the domestic intermediate goods and capital goods industries find that the refund and rebate systems, along with the BOI tariff exemptions, cancel out their tariff protection.

In general, import substitution type industrialization follow the process of strengthening competitiveness by improving productivity and technology after the elapse of a certain term of protection. To stimulate corporate effort, the extent of the protection and the period of the same should be kept to the minimum possible levels. Once competitiveness is secured, tariff protection becomes unnecessary and the contradictions arising from the tariff exemption system and the refund system can be eliminated.

The high tariffs on machinery are not offset by the refund and rebate systems. With the exception of the BOI promoted companies which have obtained privileges of tariff exemption on machineries, the high tariffs are negative factors when it comes to the competitiveness of the export industries and export supporting industries (for example, the mold and die industry). The government should reconsider the fiscal-oriented tariffs on machinery not being produced domestically or for which production is not planned. The tariff protection policies for apparel, ceramics, and other consumer goods should also gradually be shifted to competition policies when these have changed to export orientations.

3-4. Protection Policies and Shift to Competition Policies as Seen in Taiwan and Korea

Taiwan began full-scale industrialization in 1949 in primarily the textile industry using the influx of capital from the mainland. At the start, import substitution type protection policies (import restrictions, protective tariffs, exchange controls, restrictions on factory establishment, restrictions on foreign investment, etc.) were taken. Along with the progress in substitution of imports, however, the government established at an early period, from 1954 to 1957, export incentives such as preferential export financing, tax drawback system, and a system for promotion of foreign investment. Further, in 1958, it began to rationalize its foreign exchange system, such as with reforms of its double-tiered exchange rates. Since 1959, it has slashed products for which imports are banned, eased import restrictions, lowered import tariffs, lifted restrictions on new entries, and taken other measures to liberalize industry and in the late 1950s began to shift to export oriented type policies stressing the market mechanism.

Taiwan began to encourage foreign investment in 1954 with the "Foreign Investment Order". In 1962, it established a bonded processing system and in 1965 came out with the establishment of export processing zones. Due to these institutional measures, export-oriented investment from Japan, the U.S., etc. rapidly rose throughout the 1960s and 1970s.

That is, in the late 1950s when the domestic import substitution had been substantially completed, Taiwan had already shifted to market oriented policies and was trying to attract foreign investment under a policy of free competition. In the process, it brought about the development of the labor-intensive export industries and electronics industry. With an amendment to the "Investment Promotion Order" of 1970, it reduced the incentives for the labor-intensive industries and shifted its emphasis to the heavy and chemical industries. In another amendment in 1977, it gave more preference to capital-intensive and technology-intensive industries.

Korea also began a full-fledged policy of promoting exports around 1960, aimed primarily at textiles, sundry goods, and other light industries. In its first five-year plan for economic development (1962 to 1966), in the textile industry for example, Korea ended import substitution industrialization for cotton goods and began to promote exports and further began to shift to domestic production of synthetic fibers. The period from the first plan to the third five-year plan (1972 to 1976), in particular in the 1960s, was one of massive exports overall. Positive support was given to export industries as a whole in financing and tax measures by the government authorities.

In the first plan, the government stressed the development of industries such as textiles, power, fertilizers, and cement as target industries. The industries it stressed for development in the second plan were synthetic fibers, petro-chemicals, and electrical equipment. Natural fibers were removed from the list of target industries.

The development strategy in the second plan (1967 to 1971) was to maintain the protection policies for industries in the import substitution stage but to further open up things for other industries compared with the first plan. It explains the common view that the Korean government began to fundamentally shift toward an export orientation in its industrial policies in the second plan period. The automobile industry, however, which began to grow only after 1962, remained under protection and promotion during this period. It has only been very recently that restrictions on the types of vehicles produced

were scrapped (January 1987), imports of finished cars were liberalized (substantially in April 1988), restrictions on new entries into the industry were completely lifted (July 1989), and other measures taken for liberalization.

Chapter 4. Tax and Tariff System

4-1. Relation with Plastic Processing and Ceramic Industries

There are no special tax incentives aimed at the promotion of the plastic processing industry and the ceramic industry. However, the refund system and the rebate system for tariffs, business taxes, and municipal taxes on imported materials used for export products (all by the Ministry of Finance) apply to both industries.

Business tax worked to promote in-house vertical integration and to block the development of a horizontal division of labor in industry and a subcontracting structure, as has been pointed out before. Such a structure exists in the plastic processing industry and the ceramic industry in the same way as in other industries. For example, large plastic processors generally have internal mold and die fabrication divisions and have high rates of in-house printing and plating as well. In the case of ceramics, almost all factories handle all the processes in-house, from the preparation of the clay to the fabrication of the plastic molds, the molding, painting, and firing.

Business tax is set up to be applied at all stages of processing and sales starting from the import of the raw materials, so domestically produced parts and intermediate goods inevitably end up with higher cost compared with imports, which are taxed only once at the time of import. Therefore, users of parts and intermediate goods (assemblers and downstream businesses) inevitably rely more on imports. This trend was clearly seen in all the surveys conducted so far.

4-2. Review of Tax and Tariff Policies

As stated repeatedly up until now, in the case of raw materials where reliance on imports would be higher in economic effect, priority should be given to reduction of the import tariff rates instead of the refund and rebate systems, which are forms of export subsidies, since the fiscal dependence on tariff revenue has already fallen. This is because it would be more effective in the strengthening of competitiveness of the industries. Further, reduction of tariffs could also have a beneficial effect on indirect exports, for which it is difficult to use the BOI incentives and the refund and rebate systems.

The tariff exemptions offered for machinery and equipment by the BOI should also be replaced with lower import tariffs because the small and medium sized enterprises

find it difficult to take advantage of the BOI incentives. The Ministry of Finance is currently studying the reduction of import tariffs for machinery. Further, replacement of the "refund" and "rebate" systems by lower tariffs may be urgent to avoid international criticism against export subsidy policy and CVDs and other retaliatory measures.

Taiwan and Korea stressed import substitution in their industrialization strategies from the 1950s to the mid 1960s and pressed forward with tough protection of domestic industry, primarily through import restrictions but also making use of discriminatory tariffs and exchange rate policies. Through this period, however, the import tariffs on raw materials, intermediate goods, and capital goods, for which domestic industry relied on imports to a large extent, were held relatively low. This pattern was also seen in Japan in the past and may be considered a common pattern of policy in the process of industrialization of developing countries.

In Thailand, tariff revenue has been an important part of the national revenues, but the problem is that the fundamentally old tariff structure is still maintained today.

Regarding the business tax, a quick shift toward a value added tax (VAT) system would be desirable so as to accelerate the construction of a vertical division of labor or a sub-contracting structure, so as to promote and stimulate the supporting industries, thereby strengthening the international competitiveness of export products.

The in-house vertical integration which has been encouraged by the business tax is considered effective as a mass production system, but a flexible subcontracting system would be more suitable in industries⁽¹⁵⁾ where a system of short run production of diverse products is sought in order to cope with the diversification of demand. One of the factors in the strength of the competitiveness of Japanese industries is, as is well known, the widespread subcontracting structure.

Incentives such as special deductions for the corporate income tax will be one extremely effective means of guidance for the effective promotion of sectorial development plans.

Chapter 5. Financing System

The "EIMP scheme" of the IFCT for financing small and medium sized export companies uses OECF loans as its main funding source and covers 10 industries: food processing, apparel (excluding knits), rubber processing, electrical and electronic products, wooden products and furniture, metal working, footwear (excluding leather), toys, plastic processing, and industries supporting exports of these industries. 100% of the funds have been used up to now and have assisted the modernization of facilities of export companies. In EIMP-3, the ceramics industry has been added to the industries to be promoted. The main export industries are well covered by the scheme and a wide range of supporting industries can also be covered.

The effective promotion of sectorial industrial promotion requires policy means of a profit inducing type. Official financing programs have been a powerful policy tool in Japan, Korea, and elsewhere.

In Thailand, there is a traditional tendency for companies to procure fund through use of noninstitutional financing (informal market). This tendency is notable for the smaller size of the company (Table II-5). The use of institutional financing is increasing as a general trend, but the rate of utilization of official financing schemes of the IFCT and SIFO remains only a low 2 to 3% of the total credit outstanding. Therefore, official financing schemes do not function effectively as policy tools.

The refinancing scheme of the Central Bank, launched in 1956 for the export of rice, has been expanded in coverage to the export sector (1958), the industrial sector (1963), and the agricultural sector (1968) and thus funds have been distributed to priority economic sectors. The amount of refinancing by the Central Bank has been restricted to a certain ceiling based on the viewpoint of management of the money supply and maintenance of economic stability, but the demand for refinancing has always been higher than the supply. Therefore, the funds have been primarily supplied to certain better customers in the export sector, primarily large corporations.

To resolve this problem, the Central Bank has tried to equalize the supply of funds by specially establishing a refinancing scheme for small sized enterprises and allowing a 3% spread for commercial banks for financing small sized companies (usually only 2% spread). However, this system is only being used to a very low extent due to some problems in operating procedures.

Table II-5. Procurement of Funds for Capital Investment

(Unit: %)

Size of employment	1-9	10-19	20-49	50-99	100-199	200-	Total
Own capital	83	84	82	60	37	46	66
Family ties and mutual assistance group	4	3	6	2	-	12	4
Noninstitutional Financier	10	1	0	-	-	-	1
(Noninstitutional financing)	(14)	(4)	(6)	(2)	(-)	(12)	(5)
Institutional financing	4	12	13	38	63	42	29
Total	100	100	100	100	100	100	100

Source: IDC, "Basic Survey of Industrial Development in the Kingdom of Thailand", 1980.

The biggest problem preventing the dissemination of public financing is the securing of low-interest long-term funds. The long-term capital market, however, is insufficiently developed. A state-run capital procurement mechanism which could be compared to Japan's postal savings system or public annuity system exists, but it is also immature. There are limits to the use of foreign loans because of fiscal management and exchange risks. Under the circumstances, there is no effective source for procuring low-interest, long-term funds.

It may be pointed out that a characteristic of the private companies in Thailand is their inherently high ratios of own capital and therefore their low reliance on external sources of funds (making investments after accumulating funds internally). Further, there is considerable investment anticipating short term returns, so there is a strong tendency that the demand for medium and long-term funds is not keenly felt.

On the other hand, it is also a fact that the supply of the medium and long term funds required for industrialization has been scarce. About 60% of the financial market is in short term time deposits. The stock market has been growing as a general trend in recent years, but still has not reached a sufficient level (one-third of size of time deposits) and is not a major source of long term funds. (Table II-6)

The flow of funds in companies primarily derives from the savings in the

Table II-6. Trends in Financial Market

(Unit: 100 mill.bahts, %)

	1976		1980		1985	
Currency	257	(12.3)	457	(10.5)	637	(7.0)
Demand deposits	143	(6.9)	215	(5.0)	198	(2.2)
Time deposits	969	(46.5)	2,050	(47.3)	5,706	(62.8)
Promissory notes	153	(7.3)	413	(9.5)	766	(8.4)
Government savings	106	(5.1)	152	(3.5)	273	(3.0)
Capital account	392	(18.8)	1,052	(24.3)	1,660	(18.3)
Total	2,082	(100)	4,338	(100)	9,084	(100)

Source: Bank of Thailand

household sector (Table II-7), but the rate of savings in the household sector has been around 10 percent of the GDP and is still not that high. Further, savings in the household sector traditionally have been of short term mostly. In the past, 60 to 80 percent of the household savings were in short term funds. In 1988, however, the rate of short term funds fell somewhat to 53.9 percent and conversely long term savings showed signs of increasing to 46.1 percent (1988, BOT estimates).⁽¹⁶⁾ Further, most of the funds from the household sector has flowed into the noninstitutional financing sector (informal sector), but gradually a trend is being seen to shift to the institutional financing sector (formal sector) (Table II-8).

Savings in the private sector account for 64% of the total savings (1988, BOT estimates). If divided into the household sector and business sector, the share of savings of the business sector in total savings has remained at the 35 to 44 percent level in the past 14 years. As opposed to this, the ratio of savings in the household sector in total savings had been 55 to 66 percent before 1983, but fell to 32.8 percent in 1988, a remarkable decline.⁽¹⁷⁾ Domestic resources in the household sector should be mobilized.

The commercial banks primarily provide short term credit to the trade and commercial sectors and offer little medium or long term financing for investment in the manufacturing industries. A full 75 percent of the funds is sourced from the private

Table II-7. Flow of Funds Among Sectors

(Unit: Million bahts)

	1970	1975	1980
Household	1,999	17,425	16,091
Corporate	- 1,198	- 17,221	- 15,221
Government	- 1,228	- 22	- 9,721
Foreign	13	- 115	2,023
Financial institutions	414	- 67	6,829
Total	0	0	0

Source: "Flow of Funds Accounts of Thailand", 1977-86, NESDB and Bank of Thailand.

Table II-8. Pattern of Savings in Household Sector

(Unit: %)

	61-66	67-71	72-76	77-80
Commercial bank deposits	22.0	30.2	37.5	42.2
Finance companies	--	5.6	12.2	6.7
Government savings bank	4.2	4.7	3.9	4.5
(Bank deposit subtotal)	26.2	40.5	53.6	53.4
Government securities	2.1	1.3	0.1	0.5
Holding of equities	13.7	20.0	12.5	9.4
Other financial institutions	0.9	1.9	2.2	3.4
(Subtotal)	42.9	63.7	68.4	66.6
Unorganized sectors	57.1	36.3	31.6	33.4
Total	100	100	100	100

Source: "Pattern of Household Financial Savings in Thailand Since 1960", Bank of Thailand Quarterly Bulletin, June 1981.

sector, but over 50 percent of that is of short-term time deposits of less than one year. There are little long term funds. 67 percent of assets are lent out to the private sector, but due to the shortage in long-term funds, the loans are mostly short term loans of about one-year or so. (18)

The government savings bank is by nature similar to Japan's postal savings and postal insurance system. They also handle small value life insurance and have the largest network of branches in Thailand. They do not, however, do that much business. Over 60 percent of the funds are from short-term time deposits and 90 percent of the funds is invested in government securities.

As the financial institutions able to supply medium and long term funds, there are the BAAC, the IFCT, and the SIFO, but the IFCT and the SIFO, as seen up to now, cannot be said to be fully utilized in view of their share in the total credit outstanding.

The fact that the Thai long-term capital market is relatively weak could be one of the major obstacles in the way of further industrial development. Investment both in the public and private sectors is increasing. Furthermore, the scale of investment will be larger in most cases than in the past. They need increased longer term financing. This trend will require a stronger capital market which can efficiently supply equity capital and long-term credit.

To expand mid- and long-term capital flow, some reforms, as follows, for examples, will be needed.

Firstly, [1] independent status for SIFO as a financial institution exclusively for Small-Scale Industries, [2] a certain share of deposits of the commercial banks as in the case in BAAC, [3] strengthening of the project evaluation function, [4] expansion of branch network, [5] liberalization of self-procurement of funds (e.g., intake of funds from household sources through issueing debentures and others), [6] amplification of credit guarantee system (e.g., SICGF) for public financing institutions.

For the commercial banking sector, [1] the introduction of competition policy (e.g., liberalization of new entries, relaxation of interest ceiling restrictions), [2] introduction of policy to make it possible to procure long term capital (e.g., preferential interest rates for long-term fixed deposits, tax deduction for interest gained from long-term fixed deposits), [3] raising of efficiency of project evaluation or general services

for lending to small-scale industries, and [4] relaxation of obligation to accept Government securities, could be considered.

In order to expand the capital market, [1] liberalization of bond issuing by private firms, [2] some measures to increase the number of listed companies (e.g., softening of conditions for listing), and, for small and medium-sized enterprises, advantageous measures for medium- and long-term borrowing (e.g. tax incentives, preferential treatment on collateral) will be worthy of consideration.

However, the Thai government declared that it would move to an IMF Article 8 country on May 21, 1990 and is moving forward at a fast pace to ease foreign exchange controls and restrictions on capital transactions.⁽¹⁹⁾ Further, so far as could be determined at the stage of the supplementary survey of June 1990, the financial authorities are studying a draft three year plan for deregulation of the financial system.

A look at the outline of the three year plan for financial deregulation clearly shows that Thailand will be moving to mobilize domestic resources and promote a long-term capital market by deregulation of interest rates on loans, easing of restrictions on branch openings by financial institutions, easing of conditions for approval for opening of branches by foreign banks, easing of restrictions on portfolios of commercial banks, finance companies, and the like (easing of obligation of loans to small and medium enterprises, obligations of acceptance of government debentures, etc.), and improvement of the infrastructure of the financial markets (development of long-term financial instruments, promotion of secondary markets, etc.)

Note that the government, before this, already came out with measures for deregulation of financing such as the scrapping of the ceilings on interest rates for time deposits of more than one year (June 1989), suspension of taxation on interests on small time deposits (of up to 200,000 bahts) (October 1989), and abolition of the ceilings on interest rates for time deposits of less than one year (March 1990).

Chapter 6. Human Resource Development

In Thailand, there is a shortage of not only skilled labor, but also middle management. In particular, the shortage of technicians with engineering backgrounds is being viewed as a major factor inhibiting future growth.

Looking at the number of university graduates in the engineering sector, there were only 2,231 graduates (1986) from the six national universities. The six universities further had only 10,681 students registered in their engineering departments . (Table II-9)

Seen from this situation, the average number of new graduates in the engineering sector from 1987 to 1990 is estimated to be less than 2,700 annually.

Table II-9. Number of New Graduates in Engineering Departments (1986) and Number of Students Registered (1987)

(Unit: Persons)

Name of university with engineering department	Number of new graduates in engineering sector (1986)	Number of students in engineering department (1987)
Chulalongkorn University	343	1,897
Kasetsart University	221	1,324
Khon Kaen University	175	1,142
Chiang Mai University	195	1,075
Songkhla University	140	841
King Mongkut's Institute of Technology (KMUT)	1,157	4,402
Total	2,231	10,681

Source: Ministry of University Affairs

According to projections of the TDRI on the demand for newly graduating technicians (Table II-10), there will be 3,069 engineers newly graduated in 1991,

compared with the 2,684 new graduates in 1988, as opposed to a demand for 8,574 newly graduated engineers in 1991, compared with 7,301 in 1988. This means there will be a shortage of 5,500 engineers in 1991, compared with a shortage of 4,600 already in 1988.

Table II-10. Projections on Demand for Newly Graduated Engineers (1988 to 1991)

(Unit: Persons)

Field	1988		1991	
	Demand	New graduates	Demand	New graduates
Computer Engineering	252	131	316	160
Electric	955	720	1,130	820
Mechanical	2,813	527	3,484	585
Civil	2,087	965	2,565	1,128
Chemical	297	109	357	125
Industrial	559	114	675	111
Mining	338	118	47	140
Total	7,301	2,684	8,574	3,069

Source: TDRI

The sixth national plan envisions a total population in 1991 of 57 million and yet calls for the supply of only 5,586 university graduated engineers in 1991. Compared with the TDRI demand projections, this would mean a shortage of about 3000 higher level engineers.

Another projection⁽²⁰⁾ sees the total population in 2000 reaching 65 million, the 15 to 65 year old labor population reaching 39 million, and the number of employees in the manufacturing industry 6.5 million, with a demand for engineers reaching 130,000, corresponding to 2 percent of the latter figure. According to this, in view of the about 30,000 engineers "in stock" in 1989, Thailand would have to train 100,000 engineers over the next 10 years before the year 2000, or about 10,000 a year. At the present time, however, as seen above, only about 3,000 engineers are being newly supplied a year.

From 1989, the government has been taking steps such as the establishment of a system for transfer of students of the science departments of the national universities to the engineering departments and the establishment of night time courses. Further, the BOI has been reportedly studying the promotion of the establishment of in-house training facilities for training engineers, promotion of the establishment of private sector training facilities, and the like.

In this way, various measures are being studied at the Ministry of University Affairs, the BOI, the Ministry of Science and Technology, etc., but fundamental long term plans must be considered for closing the gap between supply and demand.

Chapter 7. Foreign Investment by and Technical Tieups with Japanese Firms

7-1. Probability of Investments and Technical Tieups in Ceramics Industry

There are many technical areas which have to be improved in promoting the small and medium sized ceramic manufacturers of Thailand. These extend over a wide range from the raw materials to the manufacturing facilities, production control, design, market development, and training of human resources (engineers).

While there are areas in which technical transfers could be made from Japan in a relatively short time, such as [1] the technology for selection and blending of materials, [2] the introduction and use of basic machinery and equipment for improvement of quality, and [3] modern scientific production control techniques, there are also areas in which considerable time would be required, such as [1] the technology for development of high quality materials, [2] the introduction and use of automated facilities, [3] market development and design development technology, and [4] the training of engineers able to handle production control and technical guidance.

There is a large difference between the production technology of the small and medium sized enterprises of Thailand, which is based on manual labor, and the manufacturing technologies of Japanese companies, which are mainly based on high efficiency production. To introduce Japanese technology as it is would create numerous problems in terms of technology, funding, and personnel on the receiving side. The Japanese companies, on the other hand, would not find it easy to find suitable partners for joint ventures or technical tieups.

According to the results of a questionnaire survey made on the Japanese ceramic industry⁽²¹⁾, of the 80 companies which responded to the question on plans for overseas investment, five indicated that they were "planning or specifically studying" investment (three manufacturers and two trading companies) and 11 indicated that they "had no plans at the present, but might study the same in the future". Despite the existence of the above problems, therefore, there are quite a number of Japanese companies considering investment overseas, which, of course, includes Thailand.

Nevertheless, the decisive factors in deciding to invest in Thailand are its

"political stability" and "cheap labor". Japanese firms, it was learned, are interested in the comparative advantage of Thailand as an investment market, in particular in its current labor costs.

As seen from the above, Japanese companies considering investment in Thailand are looking at the current comparative advantage of Thailand in labor costs, but there is considerable apprehension over the future projections of soaring labor costs and the decline in the comparative advantage in factor cost. One company stated that even if it were to invest in Thailand, it could successfully stay there for only five years at the most. In other words, the level of technology which would be able to make up for the loss of comparative advantage in labor costs will become of increasing importance as a determinative factor for Japanese investors. Japanese industrial experts are of the opinion that the core of the private-based technical cooperation in the ceramic industry will probably be in the form of provision of know-how and technical guidance accompanying the sale of machinery by plant manufacturers.

7-2. Probability in Plastic Processing Industry

The technology for molding plastics has developed through an interdependence between molding technology and mold-and-die manufacturing technology. The balance between the two is important. Despite this, there is no such balance in Thailand. If the issue in Thailand were only meeting domestic demand or demand in countries around Thailand, there would be no critical problem, but when trying to develop export markets, in particular to penetrate the markets of the advanced nations, a higher level of quality becomes necessary, and the current technology is regarded with regret as insufficient for this.

In the Thai plastic processing industry, the biggest problem is said to be the molds and dies. The quality of molded articles depends to a large extent on the precision of the molds and dies. However, the machining technology in Thailand has not yet reached a stage enabling the precision machining required for manufacturing molds and dies.

Therefore, in the field of plastic molding, it is hoped there will be technical transfers not only in forming technology, but also mold and die-making technology. The costs of manufacturing molds and dies are considerably lower in Thailand than in Japan and while there may be problems in quality at present, the field is of considerable interest to Japanese firms. However, it must be recognized that it takes a long time to train people

in mold and die technology and that most of the mold and die makers of Japan are small and medium sized enterprises who are not able to dispatch of engineers overseas.

In the results of a questionnaire survey on the plastic processing industry (122 companies responding), there were four companies in the field of parts and one company in the field of household goods, a total of five firms, which indicated that they were "planning or specifically studying" investment in Thailand. Also, there were seven companies in the field of parts and 12 in the field of household goods, for a total of 19, which indicated that they "might study investment in the future". The potential possibility for joint ventures and technical tieups with Japanese companies may therefore be said to be still high, but the determinative factors for investment given the highest priorities were "political stability" and "cheap labor", with the greatest emphasis being placed on the "cheap labor costs" in the case of companies dealing in household goods.

In the field of plastic parts for home electrical appliances and automobiles, the activity among Japanese subcontractors has been strongly governed by the procurement strategies of parent companies which have invested in Thailand, as it has always been in the past. In particular, activity in auto parts will be affected by the international procurement strategies of the auto manufacturers, in particular the procurement strategies in the ASEAN region.

Japanese companies studying investment in Thailand are looking at the current comparative advantage of Thailand in labor costs in the same way as in the case of ceramics. The comparative advantage in the factor cost will sooner or later disappear, however, and therefore it will be necessary to quickly establish the advantage in technology to substitute for this in the plastic processing industry. This is much more necessary in the field of industrial parts.

7-3. Joint Ventures and Technical Tieups in Small and Medium Sized Enterprises (A Review)

The mold and die, toy, garment, wooden furniture, ceramic, and plastic product industries are primarily comprised of small and medium sized enterprises in Japan as well. That is, almost all the manufacturers are medium, small, or cottage sized and in general not enough competent in terms of technology, funds, or manpower for overseas production. Further, they are being hard pressed by competition from Korea, Taiwan, and other areas to which technology had been transferred in the past and, for that reason,

are not necessarily eager to transfer further technology overseas.

Also, in Japan, the automation of production processes has been accompanied with a shift toward capital-intensive production systems in the small and medium sized enterprises as well, and the low cost labor in the developing countries would not be as powerful an incentive as in the past.

Thailand is rapidly increasing its exports of light industrial products to the markets of the advanced countries of the West, taking over the market shares of Taiwan, Korea, and Hong Kong. Due to the very fact of the good business performance, there are actually very few Thai companies which desire for joint ventures or technical tieups with Japanese companies, judging from the results of field interviews. Even if Thai companies desired joint ventures or technical tieups with Japanese firms, due to the above-mentioned situation, it is not easy for them to find Japanese partners.

Further, as mentioned earlier, there is a large gap between the production technology of the small and medium sized enterprises of Thailand and the manufacturing technology of Japanese companies, which is based on a combination of accumulated knowhow and experience. Therefore, the introduction of current day Japanese technology as it is would present quite a few problems to the receiving side in terms of technology, funds, and manpower. Due to this situation, Japanese companies would find it difficult in practice to find a suitable Thai partner for a joint venture investment or technical tieup.

Relating to the problem of human resource development discussed in the previous chapter, there have been noteworthy moves taken by Japanese affiliated companies in Thailand to cooperate with local companies and technical education organizations in the areas of training and technical education, in view of the shortage of manpower. Some Japanese affiliated companies dispatch experts to local companies with which they have business relations, technical colleges, vocational training organizations, etc. and cooperate in the guidance and practical training of technicians. Further, there are Japanese affiliated firms which provide cooperation to educational organizations in the form of scholarships, contribution of training equipment and materials, etc. One Swiss company is reportedly considering stopping training in Switzerland and bringing over its facilities to a technical college in Thailand for training personnel in Thailand. This form of technical cooperation and technical tieups is expected to be seen increasingly in the future.

To promote future technical transfers between Japan and Thailand or investments

by Japanese companies, it will first be necessary to strengthen the education for engineers, promote private sector R&D investment, by providing support so as to raise the technical level of small and medium sized Thai manufacturers and thus to improve the environment for reception of foreign technology. To support private sector R&D investment, consideration should be given to the establishment of special incentives in taxation and financing for R&D expenditures and also to the establishment of a new organization similar to the Agency of Industrial Science and Technology of Japan or the Institute of Industrial Technical Research of Taiwan. By way of note, the ratio of R&D investment to the GDP is 1.6% in Korea, 1.1% in Taiwan, and 3% in the U.S., Japan, and West Germany, but only 0.3% in Thailand.⁽²²⁾

Most Japanese companies considering investment in Thailand have their eyes on the comparative advantage of Thailand today in the area of factor cost, but at the same time are worried that this comparative advantage will be lost in the near future. Competitiveness based on comparative advantage in factor costs is something which is always lost sooner or later. This being the case, it is necessary to quickly establish comparative advantage in the technical area so as to make up for this. From this viewpoint too, upgrading of the technical level in Thai industry may be said to be extremely urgent.

Chapter 8. Subcontracting System of Production and Rural Development

The dependence on subcontractors is an essential part of the industrial production system of Japan. This may be considered to be a feature of the industrial structure unique to the East Asian region. For example, the competitiveness of Japanese industries such as automobiles, electronics, and machinery, which assemble large numbers of parts and components, is largely supported by the excellence of the subcontractors.

In these industries, the different levels of manufacturers form a pyramidal structure, at the top of which stand such large corporations like Toyota, Matsushita, and Hitachi. The 11 automobile manufacturers of Japan have rates of outside manufacture of as high as around 70 percent and reportedly have organized under them 500 primary subcontractors and 200,000 secondary or lower subcontractors (Fig. III-4A-1).

In contrast with this production structure of Japanese companies, U.S. companies generally operate on the basis of in-house vertical production. This difference between the U.S. and Japan is considered to be a result of the emphasis on "flexible production systems" in Japan and the emphasis on "mass production systems" in the U.S.

In mass production systems, companies try to compete by producing standardized products at the minimum possible cost. Here, the mass production is a requirement and improvement of production efficiency at each stage of the process is achieved by having workers specialized in specific work processes. Therefore, in a mass production system, in-house vertical integration is more rational economically. However, there is unavoidable inefficiency in that managerial resources are tied down by in-house production and therefore it is difficult to deal with changes in demand or changes in technology.

On the other hand, in the Japanese style flexible production system, companies continuously work to make their products different from others and set their sights on capturing a part of the market, which tends to be considered to be a single uniform one, but in reality is quite diversified. In this marketing strategy, the differentiation of a product determines its competitiveness. The final assemblers must be organized to be able to quickly supply differentiated products in accordance with market needs, that is, must be able to flexibly change their production lines. It is more efficient in this regard to use different subcontractors rather than to establish several vertical production lines in one's own factories.

There is no clear answer to the question of which of the production systems is more efficient, but from the viewpoint of swiftly dealing with changes in market needs or technical innovations, the Japanese system enables a more flexible response and therefore may be said to be more competitive. This is probably the international concensus at the present time.

Other reasons why Thai industries might find a subcontracting system of production more suitable are as follows:

- [1] The domestic market is relatively small in size, so the economy of scale derived from mass production might not work.
- [2] Companies investing in Thailand from Japan, Taiwan, etc. are experienced in the subcontracting production systems in their own countries and therefore have the knowhow necessary for using similar systems in their production activities in Thailand.
- [3] The use of Thai subcontractors by these investing companies and the transfer of technology to the same as a result could be expected to raise the overall level of technology in Thai industry.
- [4] The regional location of the subcontracting industries would strengthen the linkage between the urban industries and the local regions and would contribute to a fairer distribution of income.
- [5] In-house vertical integration promotes concentration of industries in the cities, while the subcontracting system promotes regional dispersion of industries. A good example of this is the auto parts industry of Nakhon Ratchasima.

A basic factor in regional development is the strengthening of the backward linkage with the urban manufacturing sector and the development of industries which would link the regional labor force with the urban industries and export markets. Further, the promotion of supporting industries or small and medium sized subcontractors is an effective policy for the industrialization of the regional areas.

A good example of the promotion of regional industry is that of gem cutting. Gem cutting has grown rapidly as an industry these past few years in the northern region of the country in particular and now employs about 400,000 rural workers. Gem processors and exporters supply the raw stones to the farmers through intermediaries and have the farmers cut the stones using simple machines. This is promoting the formation of

numerous subcontractors and giving rise to a single supporting industry.

It is this type of tie-in between the urban export industries and supporting industries in the hinterlands which the Thai government would like to press forward for development of the regional areas. In the case of gem cutting, it was possible for the system to easily take root in the rural areas, even with their insufficient infrastructure, because of the high level of value added production per unit weight and the labor-intensivity of the work. Therefore, study should be made in the future as to what kind of other industries could be effectively promoted in the regional areas through a tieup with the central regions. For example, the garment industry has recently been moving in the direction of use of regional labor in the same way as with gem cutting. The government should device some sort of support or encouragement, for example, tax and financial incentives, for both apparel makers and subcontractors.

Another important consideration in promoting subcontracting in the regional areas is of course the infrastructure. It is necessary to establish the proper foundations for industries and social development, such as transportation, communications, energy, government representative offices, vocational training schools, information, etc. Judging from Japan's experience, the most decisive factor in regional development is the means of transportation. Advancement into the regional areas by private companies could probably be accelerated all at once if the central regions could be linked with the regional ones by highways in particular.

Chapter 9. Preparation and Disclosure of Statistics

In the three years of the surveys, the surveyors strongly felt the lack of industrial statistics (in particular sectorial statistics), the lack of processed statistics, and the difficulty in acquiring such statistics. For example, production statistics, even insufficient, could only be obtained for textile materials, spinning, woven fabrics, and plastic materials and even these were prepared by industrial organizations.

Further, regarding other statistics, the surveyors were asked in the related sections of the government to present letter of introduction from high officials of the Ministry of Industry and even when data existed, sometimes they could not be obtained due to their "confidentiality". They experienced, in that way, various difficulties in obtaining statistics from the government ministries. Statistical data should be made more public in nature.

Recently, the IEPD has begun the preparation of sectorial industrial statistics. However, the data are being collected by questionnaires sent through the mail and this leads to low rate of return of the questionnaires resulting in the insufficient coverage and the reduced reliability of the statistics prepared. Consideration should be given to more effective means such as commissioning of collection of data to DIW, industrial organizations etc. Toward this end, it is necessary to promote establishment of industrial organizations and establish legal regulations obligating them to perform such work. Further, consideration should be given to avoiding duplication with statistics prepared by the National Statistics Office (NSO) and other government organizations.

A considerable variety of processed statistics are being prepared by some ministries and agencies, but there is a problem, it has been pointed out, that most of the processed statistics stop at a certain time period and are not subsequently updated. Continuous updating of processed statistics is desirable.

Industrial statistics should be prepared by the Ministry of Industry, but it is considered that it would be effective to learn from the experience of countries more advanced in statistics through the dispatch of trainees to, e.g. the Statistical Institute for Asia and the Pacific (SIAP) in Tokyo, etc. so as to help determine what kind of statistics should be prepared (primary statistics, processed statistics) and what means should be used for the same.

By way of note, Japan has established a "Statistics Law" with the aim of ensuring

the reliability of statistics, eliminating the overlap of statistical surveys, systemizing statistics, and improvement and promoting the overall statistics system. The "Statistics Law" includes the following provisions:

- [1] The types of statistics to be prepared by the government or the local autonomous bodies and the statistics to be prepared commissioned to other parties shall be designated by the Director-General of the Management and Coordination Agency (MCA).
- [2] Persons conducting surveys of government administrative organizations, local autonomous bodies, and the like are allowed to order private individuals, corporations, and organizations to make reports for their survey of designated statistics. Persons ordered to submit reports shall be obligated to submit the said reports. In the case where reports are ordered, persons failing to submit reports or making false reports and persons obstructing reports may be sentenced to up to six months in jail or fined.
- [3] Personnel engaged in the work of surveys of designated statistics may, presenting their identification, enter premises necessary for their surveys, inspect matters preapproved by the D.G. of the MCA, demand the provision of materials, or question. In such a case, persons refusing inspection, failing to present the survey materials, presenting false materials, or making false statements in response to questions may be sentenced to up to six months in jail or fined.
- [4] The confidentiality of confidential matters learned from the survey of designated statistics shall be maintained. Persons engaged in the surveys of designated statistics and persons in such posts may be sentenced to up to one year in jail or fined if leaking or abusing the confidential information of individuals, corporations, or organizations learned in the execution of their jobs.
- [5] No one may use the original individual forms compiled for preparation of the designated statistics for any purpose other than statistics.
- [6] The results of surveys of designated statistics shall be quickly disclosed to the public.

[Notes]

- (1) The second role corresponds to the functions of "Genkyoku" and "Genka" of Japan's MITI.
- (2) This function is also close to the role of the "Genkyoku" and "Genka" of Japan's MITI.
- (3) Corresponding to the Research and Statistics Department in the Minister's Secretariat of MITI.
- (4) At the present time, three ministries are involved in the so-called technical education or pre-employment vocational training: the Ministry of University Affairs (MUA), the Ministry of Education (MOE), and the Ministry of the Interior (MOI).

The Ministry of University Affairs has jurisdiction over the King Mongkut's Institute of Technology (KMIT) and five universities with engineering departments. The Ministry of Education has jurisdiction over 78 technical colleges under the Department of Vocational Education (DOVE) and also 10 campuses of the Institute of Technology and Vocational Education (ITVE) and 122 private educational institutions under the Office of Private Education.

The Ministry of the Interior has jurisdiction over the "vocational training centers" run in eight locations nationwide by the National Institute for Skill Development (NISD), which belongs to the Department of Labor.

Post-employment training is offered mainly at the Regional Non-formal Education Centers (RNEC) of the Ministry of Education (located in five locations in the North, Northeast, Northwest, Central Region, and South and with provincial centers in all the provinces) and the National Institute for Skill Development (NISD) of the Ministry of the Interior. Further, the ITVE is considering establishment of a retraining course (for example, at the Rajamangala Institute of Technology). In addition to these, there are the technical training services of the MOI.

R&D is being tackled by not only the MOI, but also the Ministry of Science and Technology (MOSTE), the universities, the technical colleges, the Institute of Technology and Vocational Education (ITVE), and the Regional Non-formal Education Centers (RNEC).

- (5) Since the fourth five-year plan (1977 to 1981), the government has taken up the promotion of labor intensive small and medium scale industries as a policy goal, but in reality the investment promotion strategy has given priority to relatively large sized projects and less priority to small and medium sized projects. But, improvement has been made in this area in the past two to three years. That is, the

BOI has been working to augment its investment incentives focusing on the promotion of small and medium sized export companies by, for example, lowering the minimum necessary investment to 1 million bahts.

Recently, while the MOI has been establishing certain restrictions on establishment of dyeing factories from the viewpoint of pollution, there have been cases seen where the BOI has approved applications for promotion by such companies. This is an example of the lack of coordination between policies of the MOI and the policies of the BOI. The reason for this conflict in policies is likely to be that the MOI bases its policies on "restrictions", while the BOI bases its policies on "promotion". If effort is made to coordinate policies in advance between the MOI and the BOI, this sort of situation could be prevented.

The MOI and the BOI coincide with each other to take a policy of protection in promotion of the import substitution industries of materials and intermediate goods (yarn, fabrics, plastic materials, etc.), but as a result it has allowed domestic manufacturers to establish high prices for their products. On the other hand, there exist the exemptions on tariffs for imported input goods (BOI incentive) and the tariff refund system of the Ministry of Finance. This means that the export industries keep down their inputs of domestic goods to the lowest level possible. This is not in line with the policy of promoting domestic linkage of the MOI and is an area where some sort of policy coordination should be required.

It should be possible to distribute resources more effectively if there were some sort of coordination between the "Ceramic Resource Center" plan of Chiang Mai University and the "Ceramic Center" concept of the MOI.

- (6) Regarding this, see Komiya, Okano, Suzumura ed. "Japan's Industrial Policies" (Tokyo Daigaku Shuppankai 1984). Further, much of this was thanks to information from Mr. Hayao Takenaka of the International Trade Policy Bureau of MITI.
- (7) Regarding the sectorial industrial policies, see the "Overall Review of First to Third Year Surveys" of this report.
- (8) Regarding the composition of the issues-wise sections, refer to the compositions of the Industrial Policy Bureau and Industrial Location and Environmental Protection Bureau of MITI.
- (9) It would be worthwhile to study the Research and Statistics Department of MITI.
- (10) Refer to the organization and operating methods of the various councils of Japan.
- (11) Thailand has already experienced anti-dumping and subsidisation attacks from the US and Europe on steel pipe fittings and ball bearings. Recently the EC took action against Thailand's exports of athletic shoes and monosodium glutamate.

- ("JETRO Daily" 12 Apr 1988, 2 Sep 1989, "Nikkei" 9 Apr 1989, "Far Eastern Economic Review" 3 May 1990, et al.)
- (12) The U.S. imposed a high CVD of 21.54 percent on Thai ball bearings, but only a 2.34 percent CVD on ball bearing from Singapore, which also has preferential measures similar to Thailand implemented (Nikkei, 4 Sep. 1989). This is reportedly because Singapore does not call for "export promotion" in its investment incentive policy and lays as conditions for incentives the contribution to economic development, the size of the investment itself, and the scale of employment.
 - (13) World Bank, "Thailand: Country Economic Memorandum" (1989), Atchaka Sibunruang "Industrial Development Policies in Thailand (1986), Dun's "Exporters' Encyclopaedia" (1990), Bangkok Japanese Chamber of Commerce and Industry "Thai Economic Summary: 1988-89" et al.
 - (14) A. Kruegar et al. (ed.) "Trade and Employment in Developing Countries" (University of Chicago Press, 1981), World Bank "Growth with Stability" (1986), World Bank, op. cit. (1989), et al.
 - (15) Good examples are molds and dies, toys, apparel, plastic industrial parts, ceramic products, etc.
 - (16) Chittima, D., Suchart S. "Domestic Resource Mobilization: The Case of Thailand" (Bank of Thailand Quarterly Bulletin, June 1989, Table 6)
 - (17) Chittama, Suchart, op. cit. (1989)
 - (18) Bank of Thailand
 - (19) On May 21, 1990, along with its declaration of movement to an IMF Article 8 country, Thailand announced partial easings of its restrictions on foreign exchange and capital transactions. It implemented these starting on May 22. The central bank is supposed to proceed with deregulation step by step while watching the effects of these measures on the economy and is scheduled to announce a second series of deregulatory measures in September.
 - (20) Trial calculation by Professor Kosal Ptchsuwan of King Mongkut's Institute of Technology
 - (21) See Appendix IV
 - (22) World Bank, op. cit. (1989)

PART-III.
PLASTIC PROCESSING INDUSTRY

PART-III. PLASTIC PROCESSING INDUSTRY

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PART-III PLASTIC PROCESSING INDUSTRY

Introduction

Much use is made in general of the term "plastic products" but the term itself does not signify any particular products.

Plastics have much more diverse properties than other materials, so there are also many types of products using these properties. The term "plastic products" refers to all of the same. It is impossible to limit the term to individual products.

In promoting the plastic processing industry, it is necessary to first of all understand this point and then to understand the following characteristics of plastics before attempting to promote the industry:

(1) Plastics cover a large number of products.

Plastics differ in chemical, physical, and mechanical properties depending on their composition and are extremely numerous in type. The selection of the plastic has a great effect on the quality of the final product. At the same time, the appearance of new plastics sometimes makes the creation of new products possible. Due to their diversity, there is no country in the world able to secure all its plastics domestically. While a matter of degree, something or another is always imported. Due to the diverse properties of the material, massive investment is being made in research of new plastics.

(2) Plastics are excellent substitute materials.

Plastics are often used as substitutes for wood, metal, paper, glass, leather, and other materials. With some products, in fact, materials other than plastics will soon be inconceivable.

Due to this substituting nature, demand for plastics extends over a wide range of fields from industrial goods to household goods.

Naturally, the quality demanded of plastic products differs depending on the nature of the demand and it is necessary to select plastics meeting that demand.

(3) Plastics are easy to process.

There are several methods of processing plastics, but the technologies for the same are all firmly established, so production is relatively easy, leaving aside the question of the quality.

This ease of processing makes it possible to many small and medium sized companies to enter the field. The same ease creates the danger of a tendency to think that all products can be supplied and to ignore the limitations arising from demand characteristics. In producing products, along with the selection of the plastic, it is necessary to ensure the processing technology suited for the demand characteristics.

In promoting the plastic industry, it is necessary to devise comprehensive promotional measures considering the above three characteristics of the industry.

In the current survey, the emphasis was placed on household goods and industrial parts, but specific sectors in the plastic processing industry do not stand independently and therefore it is necessary to study the industry from a comprehensive viewpoint.

Chapter 1. Summary of Industry

1-1. Summary of Development

The plastic industry was introduced into Thailand in the 1950s and developed relatively slowly up until the 1970s. Even at the end of the 1950s, there were only about a hundred processing manufacturers.

Thailand relied completely on imports for its raw materials up until the beginning of the 1970s. In 1972, it began the production of raw materials. The plastic processing industry developed rapidly in the 1970s under these conditions. By 1974, there were 639 processing manufacturers registered with the Ministry of Industry. Today, including unregistered manufacturers, these are said to be over 3,000.

Like in other industries, the plastic processing industry began to develop as an import substitution industry and up until the end of the 1970s developed centered on the domestic market. In 1980, exports of processed products rose over imports and this trend has continued to the present.

The plastic processed products of Thailand developed initially centered around plastic bags and other packaging materials. Today, the product lines have spread to include containers, vessels, diningware, and diverse other daily sundry goods.

Along with the rapid developments in the manufacturing industry in the 1970s, production has grown of not only the above final products but also processed plastic products used as parts for electrical equipment, parts for motorcycles, automobiles, etc., and other intermediate goods. At the present time, the plastic industry is growing in importance as such supporting industries. Improvement are also being made in technical capabilities in industrial parts, for which demand is growing. Further, since the appreciation of the Japanese yen, there has been an increase in joint ventures of this type with foreign capital.

The increase in processed products has also led to an increase in the types of plastics used. Initially, the plastic used the most was low density polyethylene (LDPE), but depending on the type of the processed product, use was also made of polyvinyl chloride (PVC), high density polyethylene (HDPE), polystyrene (PS), polypropylene (PP), etc. At the present time, almost all plastics are being used. Among these plastics, the industry depends on imports for PP and special types. The domestically produced plastics are derived from imported raw material ethylene, VCM, styrene monomers, etc. This is one feature of the Thai plastic industry.

In 1984, construction started on a national petrochemical complex (NPC) for utilization of the natural gas in the Gulf of Siam. This construction will enable production of plastics utilizing domestic materials. The plans for the plant are divided into two stages: NPC-1 and NPC-2. NPC-1 was scheduled for completion at the end of 1989. NPC-2 is scheduled to enable domestic demand after 1992 to be met and to enable exports.

The construction of the NPC will mean a new stage for the Thai plastic processing industry, which has previously depended much on imports of raw materials, in that it will ensure the availability of a considerable amount of raw materials domestically.

1-2. Structure of Industry

It is said that there are over 3000 plastic manufacturers in Thailand. According to the available statistics of the Ministry of Industry for 1984, there were 1454 at that time. Based on this, the industrial structure may be viewed as follows. In the structure there are some companies which manufacture not only general household items, but also industrial parts, but it is impossible to classify the industrial structure by types of manufactured goods. According to the present survey, almost all the plastic manufacturers delivering parts to assembly manufacturers were large in size.

A look at the employees shows that there were 930 small companies with nine or less employees, 311 companies with 10 to 19 employees, 75 with 20 to 29, and 76 with 30 to 49, so companies with fewer than 50 employees accounted for 96 percent of the total. There were only 27 companies with over 100 workers, making this industry very much characterized by small and medium sized businesses.

There are 31,047 employees engaged in the processing industry, of which 15 percent worked in companies with nine or less workers, 25 percent in companies with 10 to 19 employees, 10 percent in companies with 20 to 29 employees, and 15 percent in companies with 30 to 49 employees, with thus 20,174 employees, or 65 percent of the total, working in companies of less than 50 employees.

A look by the invested capital shows that 1,038 companies, or 71.4 percent of the total, had capital of less than 1 million bahts and only 24 companies, or 1.6 percent, had capital of over 20 million bahts (about 100 million yen), so looking at capital, this industry is mostly comprised of small and medium size enterprises.

Regarding location, 88 percent of the companies are located in Bangkok, 97 percent if one includes companies in nearby areas. This concentration in Bangkok and its environs is a major characteristic of the industry. (See Table III-1-1)

The Thai plastic processing industry is comprised of an extremely highly proportion of small and medium sized companies, but this is not a feature unique to Thailand. A comparison of the structure of employment shows that the industry is high small business like in nature in the advanced countries and NIES as well. Taking as examples the U.S. and Japan, in the former case, 65 percent of the companies have less than 50 employees and in the latter case, 92.5 percent of the companies have less than 50.

In particular, this small business like nature of the plastic processing manufacturers of Japan is similar to that of Thailand.(See Table III-1-2)

From this viewpoint, the plastic processing industry is the one featuring intensive international competition among small and medium sized enterprises.

Table III-1-1. Summary of Plastic Manufacturers (1984)

(1) Number of Registered Factories by Number of Workers

	- 9	10 - 19	20 - 29	30 - 39	50 - 59	100 - 149	150 - 199	200 - 299	300 -	Total
National (a+b+c)	930 (64%)	311 (21.4)	75 (5.2)	76 (5.2)	35 (2.4)	14 (1.0)	4 (0.3)	6 (0.4)	3 (0.2)	1,454 (100%)
(Cities)	909	297	71	76	35	13	4	6	3	1,414 (97.2%)
a. Bangkok	870	267	60	56	18	6	2	3	1	1,283 (88.2%)
b. Neighboring Provinces	39	30	11	20	17	7	2	3	2	131 (9.0%)
c. Regional areas	21	14	4	0	0	1	0	0	0	40

(2) Number of Employees by Size of Company

(Unit: Persons)

	- 9	10 - 19	20 - 29	30 - 39	50 - 59	100 - 149	150 - 199	200 - 299	300 -	Total
National	4,906	7,502	3,099	4,667	3,422	2,431	1,085	1,965	1,970	31,047
Cities	4,799	7,318	2,999	4,667	3,422	2,331	1,085	1,965	1,970	30,556
Regional areas	107	184	100	0	0	100	0	0	0	491

(3) Number of Factories by Investment Capital

(Unit: million bahts)

	<1.0	1.0 <3.0	3.0 <5.0	5.0 <10.0	10< 15	15< 20	20< 30	30< 50	50<	Total
National	1,038 71.4	242 16.6	62 4.3	59 4.1	16 1.1	13 0.9	10 0.7	9 0.6	5 0.3	1,454 100
Cities	1,008	237	60	58	14	13	10	9	5	1,414
Bangkok	964	206	51	33	8	7	6	3	5	1,283
Neighboring Provinces	44	31	9	25	6	6	4	6	0	131
Regional areas	30	5	2	1	2	0	0	0	0	40

Source: Ministry of Industry

Table III-1-2. Ratio of Size of Plastic Processing Industries of Other Countries (1988)

Ratio of Business Establishments by Number of Employees (%)

	1 - 6	10 - 49	50 - 99	100 - 499	500 - 999	1,000 or more workers
U.S.A.	35	30	10	10	10	5
Japan	55.2	37.3	4.4	3		0.1
W. Germany	-	45	26	26	2	1
France	65	24	6	4		1
Holland	51	35	9		5	
Italy	75.6	20.7	2.2	1.3	0.1	0.1
Canada	36.2	39.1	14.1	10.4	0.2	
U.K.		67	14.8	17.1	0.9	0.2
Korea	29.9	57.1	7.9	4.7		0.4
Taiwan	43.6	39.8	7.8	8.2	0.5	0.1

Source: Japan Plastics Industry Federation

Note: Figures for Korea are calculated from materials of the Korean Economic Planning Agency obtained by survey of the Japan External Trade Organization

1-3. Industrial Organizations and Their Activities

(1) Thai Plastic Industrial Association (TPIA)

The plastic processing industry developed in the 1970s, so the industry has been slower to organize than the textile industry etc. The Thai Plastic Industrial Association (TPIA) received approval for organization in 1982. At the present time, the organization has 280 members. In comparison with other industries, the organization features brisk activities, despite its short history.

One of the activities is the publication of a plastic processing journal (subscription). This is widely sold not only to members, but to general parties as well. In 1984, the organization organized on its own university researchers and established the Plastic Development Center for providing small and medium sized companies with consultations, commissioned tests, analysis, and other services. Further, it recognizes the importance of training of foremen and assistant engineers and is trying to set up an independent training system.

(2) Thai Plastic Club

Another organization dealing with the plastic industry in addition to the TPIA is the Thai Plastic Club. This club is a member of the Federation of Thai Industries (FTI). In order for one to become a member of the plastic club, one must become a member of the FTI.

The members of the club include raw material manufacturers, importers, machine manufacturers, and processing manufacturers, making the club a comprehensive private organization of plastic fields. There are over 50 members. A feature of the club is the membership of companies with relatively large capitals.

One of the aims of the club is to strengthen relations with government related agencies so as to increase cooperation with the government. When the government contacts the plastic industry, it contacts the club and when the club wishes to convey the opinions of the industry to the government, it does so through the FTI. As a practical activity, the club itself offers a technical training program.

(3) Thai Petrochemical Industry and Trade Association

Another related organization is the Thai Petrochemical Industry and Trade Association. This association is a member of the Bangkok Chamber of Industry and Commerce and has 30 members, primarily raw material manufacturers and traders. One of the main activities of the association is training of students and employees of processing manufacturers.

As opposed to the existence of these private organizations and their energetic activities, the government does not have any clear authority in charge of the industry in the Ministry of Industry. The plastic processing industry itself is one of the industries under promotion, but there is a problem in that there is no system for coordinating policies for the industry as a whole.

1-4. Problems and Countermeasures

(1) The plastic processing industry is in a period of transition from an import substitution industry to an export industry. Due in part to the fact that the domestic market is also strong, the manufacturers interviewed in the survey mostly gave optimistic projections on future growth. The types of products made range from household goods to industrial parts. Thailand is now at the stage where it requires more advanced technology enabling attainment of the quality required for industrial parts in addition to the technology for producing household goods.

(2) Thanks to the operation of the NPC, the Thai plastic industry is entering a new stage where it can supply large quantities of plastic materials on its own. However, almost none of the processors interviewed stated that they believed that this would mean domestic raw materials would be supplied at more advantageous price conditions than imported raw materials. On the other hand, manufacturers of raw materials affiliated with the NPC indicated that they would set their supply prices at the price of imported raw materials (price of raw materials + 40 percent import tariff), thus verifying the opinions of the processors. This is an example showing the mismatch in interests of the upstream sector and downstream sector (processing) of the plastic industry and is a problem requiring government resolution.

At the present time, however, there is no section in the Ministry of Industry which deals with this type of problem.

(3) The plastic processing industry is built up of small and medium sized enterprises, as stated in section 1-2. The industry is influenced by many industries, such as raw material manufacturers, the mold making industry, and the molding machine making industry, and the level of technology has an effect on the quality of the products, but it is almost impossible for small and medium sized enterprises to cope with such diverse areas of technology. They either have to engage in joint development or receive guidance from some public organization.

(4) Since the plastic processing industry has such diverse problems, joint action is required. In the rest of the world, the industry is being promoted with the assistance of private organizations and problems are being resolved jointly with public organizations. Private organizations starting this type of activity in Thailand as well, but there are no public organizations providing assistance to such activities.

(5) To resolve the above problems, it is necessary to quickly establish a section in the Ministry of Industry to take charge of the plastic industry.

Chapter 2. Supply and Demand

2-1. Supply

According to the national income statistics of the NESDB, the plastic processing industry accounted for 1.1 percent of the added value of manufacture in 1988, or 4036.5 million bahts in 1988 prices. This percentage has not changed much at all in the past five years. The percentage has not changed but it is true that the processing industry itself is continuing to expand as a general trend, due to the overall growth and expansion of the Thai manufacturing industries.

A look at the rate of growth in 1972 prices shows that the average annual growth rate from 1980 to 1988 was 8.50 percent, higher than the 7.16 percent of the manufacturing industries as a whole. The average annual growth rate for the early 1980s, however, i.e., 1980 to 1985, was 3.26 percent (compared with 4.74 percent for the manufacturing industries), lower than the growth rate of the manufacturing industries. The growth rate for 1985 to 1988 was 17.24 percent (11.20 percent for manufacturing industries). There was thus striking growth in the latter 1980s. (See Table III-2-1)

Table III-2-1. Indicators Related to Plastic Processors

(1) Ratio of plastic processed products in added value of manufacturing industries)

	1980	1981	1982	1983	1984	1985	1986	1987	1988
Ratio (%)	1.0	0.6	0.6	0.9	0.8	1.0	1.0	1.1	1.1

(2) Growth rate over previous fiscal year (according to 1972 prices)

(%)

	1981	1982	1983	1984	1985	1986	1987	1988
Plastics	17.6	7.8	19.6	7.3	19.6	13.4	23.9	19.4
Growth rate of manufacturing industries	6.6	2.5	2.6	7.0	0.3	9.1	13.9	12.5

(3) Average growth rate by 1972 prices

	1980-85	1985-88	1980-88
Plastic Products	3.26	17.24	8.50
Manufacturing industries	4.74	11.20	7.16

(4) Added value (unit: million baht)

	1980	1981	1982	1983	1984	1985	1986	1987	1988
Plastic	1,495.7	1,172.4	1,551.9	1,857.6	1,874.9	2,328.7	2,656.1	3,360.6	4,036.5

Source: National income statistics of NESDB

Plastic processed products may be divided into final goods (products) and indirect goods (parts etc.). It is not possible to use production statistics for these, so a look will be taken at the relationship of the more general plastic products using statistics prepared by the Ministry of Industry. This is shown in Table III-2-2. In 1988, 8 billion bahts worth of plastic products were sold.

Table III-2-2. Sales and Production of Plastic Products (1988)

	Production (tons)	Sales (1000 baht)	
Foam	1,534	141,184	1.8
Bags	37,076	1,455,191	18.7
Sacks	31,590	885,715	11.4
PVC pipe fittings	30,637	936,433	12.0
PVC and sponge leather fabric	12,270	949,037	12.2
Sheets	61,309	540,800	6.9
Plastic toys	14,572	1,221,612	15.7
Plastic products	13,497	1,670,837	21.4
Total	202,485	7,800,837	100.0

Source: Thai Ministry of Industry

The value of sales of plastic products in Thailand accounts for about one-fifth of that of general products and is followed by that of bags and sacks. These together account for half of the all plastic products.

Products made by injection molding account for 70 percent of all processed products, it is said (according to Thai Plastic Industry).

The export value of the items given in Table III-2-2 is 2230 million bahts, 28.6 percent of the production value, i.e., about 30 percent of the production is exported.

At the same time, a similar amount is imported, with the import dependence (value of imports/value of production - value of exports + value of imports) being 31.7 percent.

There are no clear statistics on industrial parts, but Thailand produces some accessories and parts for televisions, radios, refrigerators, fans, air-conditioners, washing machines, vacuum cleaners, and other electrical appliances, motorcycles, and automobiles. The volume of production of these parts has risen along with the increase in production of the end products.

2-2. Demand

Demand for plastic processed products is characterized by two aspects of use: one as an end product (final demand) and one as intermediate goods (intermediate demand). Only naturally, the quality of the plastic products used for the end products and intermediate goods differs tremendously. Intermediate demand is extremely important for the plastic processed product industry and some grasp of the volume of the same is necessary. A look at the demand using the currently available 1982 I-O tables shows the following:

In 1982, final demand accounted for 42.5 percent and intermediate demand for 57.5 percent, so in that year too intermediate demand was already higher. Intermediate demand is comprised of demand from the primary industries (agriculture and fisheries), secondary industries (spinning, cosmetics, pharmaceuticals, electrical appliances, and motorcycles), and tertiary industries (construction, civil engineering, commerce, restaurants). Of these types of intermediate demand, that of the secondary industries accounted for 67.9 percent.

In the secondary industries, demand from electrical appliances and automobiles accounted for 24.4 percent of demand in the industry.

In the end demand, private consumption accounted for 66.6 percent and export demand for 26 percent.

The state of demand in 1982 does not exactly reflect the current conditions, but judging from the subsequent state of growth of the manufacturing industries, it may be deduced that the intermediate demand for processed products of plastic increased. In particular, the average annual growth rate for the value added production of electrical appliances from 1985 to 1988 was a high 14.9 percent and that of transportation equipment was 20.8 percent, so the demand for plastic processed products in these fields can be guessed to have increased. This is further backed up by the increase in the volume of production of electrical equipment and transportation equipment. (See Table III-2-3 and Table III-2-4)

Table III-2-3. Breakdown of Demand of Plastics

	Real figures (.000B)			Ratio (%)		
	Total	Imports	Domestic	Total procurement	Domestic procurement	Import procurement
Final demand						
Exports	639,590		639,590	11.05	100.0	
Personal consumption	1,639,200	144,329	1,494,871	28.33	91.20	8.80
Others	179,231	49,080	130,151	3.10	72.62	27.38
Total	2,458,021	193,409	2,264,612	42.49	92.13	7.87
Intermediate demand						
Primary industries	279,920	48,996	230,924	4.84	82.50	17.50
Mining	2,725	22	2,703	0.05	99.19	0.81
Secondary industries						
Light industries	972,186	387,723	584,463	16.80	60.12	39.88
Other industries	1,287,136	303,831	983,305	22.24	76.39	23.61
Tertiary industry	785,602	153,479	632,123	13.58	80.46	19.54
Total	3,327,569	894,051	2,433,518	57.51	73.13	16.87
Total supply	5,785,590	1,087,460	4,698,130	100.00	81.20	18.80

Source: 1982, Thai I/O Tables

Note: Intermediate demand/total supply x 100

Table III-2-4. Thai Production of Industrial Products

(Unit: units)

	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988
Motor-cycle	83,999	283,971	305,349	286,027	313,260	320,563	228,673	241,148	310,083	488,699
Passenger car	16,543	24,164	26,732	24,673	34,087	36,120	24,861	21,046	29,333	54,457
Commercial vehicle	15,467	50,361	60,203	55,680	70,440	81,850	58,214	53,116	68,815	99,724
TV sets	82,693	268,897	331,390	339,670	499,873	530,985	466,127	500,481	544,327	-
Telephone sets	75,596	37,384	29,278	56,661	177,516	32,074	16,327	78,202	87,812	-

Source: Statistics of Ministry of Industry

2-3. Imports

As stated in section 2-1, the import dependence of Thailand on general processed products stands at about 30 percent. Looking at the state of imports based on trade statistics, we can see the following. The plastic trade of Thailand is in its favor when looking just at processed products (CCCN 3907), but Thailand suffers from a large deficit in the plastic trade in the wider sense including raw materials. (See Table III-2-5 and Table III-2-6)

Table III-2-5. Plastic Trade of Thailand

(Unit: million bahts)

		Exports		
		1985	1986	1987
Phenol resins	(3901)	53	94	119
Polyethylene	(3902)	690	1,132	1,267
Polypropylene				
Polyvinyl				
Cellulose	(3903)	-	1	2
Natural and synthetic resins	(3905)	2	1	-
Other materials	(3906)	19	6	11
Products	(3907)	1,262	1,414	2,215
Total	(39)	2,025	2,648	3,616
		Imports		
		1985	1986	1987
Phenol resins	(3901)	928	1,277	1,815
Polyethylene	(3902)	4,664	5,342	7,441
Polypropylene				
Polyvinyl				
Cellulose	(3903)	283	327	447
Natural and synthetic resins	(3905)	33	43	29
Other materials	(3906)	46	70	82
Products	(3907)	1,019	1,401	2,373
Total	(39)	6,942	8,460	12,194

Source: Thai trade statistics

Table III-2-6. State of Trade of Plastic Related Products (1988)

	A.Exports (million)	B.Imports (million)	A - B(Million)
3901	155.1	2,707.3	-2,552.2
3902	164.7	3,198.1	-3,033.4
3903	379.8	1,259.1	-879.3
3904	46.7	936.7	-890.0
3905	1.5	423.1	-42.16
3906	2.2	338.3	-336.1
3907	118.4	1,145.9	-1,036.5
3908	0.2	224.2	-224.0
3909	20.8	589.5	-568.7
3910	0.2	145.8	-145.6
3911	1.0	288.9	-287.9
3912	4.1	221.5	-217.4
3915	9.7	29.4	-19.7
3916	0.8	189.1	-188.3
3917	96.7	240.5	-143.8
3918	38.6	15.4	23.2
3919	151.1	318.3	-167.2
3920	447.3	783.4	-206.1
3921	324.5	960.1	-635.6
3922	15.3	8.6	6.7
3923	2,100.1	378.0	1,722.1
3924	799.1	70.7	728.4
3925	11.1	23.9	-12.8
3926	553.9	2,876.7	-2,322.8
Total	5,472.7	17,381.7	-11,909.0

Source: Prepared from Thai trade statistics

- Note: 3901: Polymers of ethylene
 3902: Polymers of propylene or of other olefins, in primary forms
 3903: Polymers of styrene, in primary forms.- polystyrene
 3904: Polymers of vinyl chloride or of other halogenated olefins, in primary forms
 3905: Polymers of vinyl acetate or of other vinyl esters, in primary forms; other vinyl polymers in primary forms - Polymers of vinyl acetate
 3906: Acrylic polymers in primary forms
 3907: Polyacetals, other polyethers and epoxide resins, in primary forms; polycarbonates, alkyd resins, polyallyl esters and other polyesters, in primary forms
 3908: Polyamides in primary forms
 3909: Amino-resins, phenolic resins and polyurethanes, in primary forms
 3910: Silicones in primary forms
 3911: Petroleum resins, coumarone-indene resins, polyterpenes, polysulphides, polysulphones and other products, not elsewhere specified or included, in primary forms.
 3912: Cellulose and its chemical derivatives, not elsewhere specified or included in primary forms - Cellulose acetates
 3915: Waste, parings and scrap, of plastics
 3916: Monofilament of which any cross-sectional dimension exceeds 1 mm, rods, sticks and profile shapes, whether or not surface-worked but not otherwise worked, of plastics
 3917: Tubes, pipes and hoses, and fittings therefor (for example, joints, elbows, flanges), of plastics
 3918: Floor coverings of plastics, whether or not self-adhesive, in rolls or in the form of tiles; wall or ceiling coverings of plastics
 3919: Self-adhesive plates, sheets, film, foil, tape, strip and other flat shapes, of plastics, whether or not in rolls.
 3920: Other plates, sheets, film, foil and strip, of plastics, non-cellular and not reinforced, laminated, supported or similarly combined with other materials
 3921: Other plates, sheets, film, foil and strip, of plastics
 3922: Baths, shower-baths, wash-basins, bidets, lavatory pans, seats and cover, flushing cisterns and similar sanitary ware, of plastics
 3923: Articles for the conveyance or packing of goods, of plastics; stoppers, lids, caps and other closures, of plastics.
 3924: Tableware, kitchenware, other household articles and toilet articles, of plastics
 3925: Builders' ware of plastics, not elsewhere specified or included
 3926: Other articles of plastics and articles of other materials of headings No. 3901 to 3914

Looking just at processed products (household goods etc.), imports have increased for three years, i.e., from 1 billion bahts in 1985 to 1.4 billion bahts in 1986, 2.4 billion bahts in 1987, and 3.4 billion bahts in 1988. A characteristic feature of the imported goods is that plastic processed products classified as "others" in the trade statistics account for from 70 to 80 percent of all imports of processed goods. (See Table III-2-7)

Table III-2-7. Imports of Plastics by Thailand

(Unit: Ton, 1000Baht)

	1983		1984		1985		1986		1987		1988	
	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value	Volume	Value
390721.....Tubes and pipes	1,313	109,599	1,102	106,482	858	103,421	1,193	157,350	1,266	181,571	891	162,205
390723.....Tablewares and Kitchenware	96	8,891	63	6,328	90	10,340	522	47,248	474	41,700	640	59,281
390724.....Sanitary and Plumbing Fixtures Fittings	27	3,724	31	5,511	51	9,936	48	9,061	64	12,335	-	-
390725.....Electric Lamps including Shades Globes	52	8,160	27	4,041	57	7,688	73	13,061	81	19,775	-	-
390731.....Bags Jars Other Containers	295	30,609	381	44,158	371	54,524	409	60,718	646	95,595	518	75,563
390732.....Caps covers stoppers etc.	120	24,854	133	27,043	298	28,089	125	46,060	126	46,159	91	26,917
390735.....Floats used in Fishery	170	11,902	89	5,681	74	5,602	150	11,484	206	16,116	270	20,709
390736.....Adhesive cellophane Tapes	208	22,640	184	21,305	196	23,138	156	14,986	198	18,020	2,076	245,346
390741.....Article for Conveyance or Packing	5	2,704	9	2,754	11	4,253	22	11,183	32	15,303	-	-
Other Articles		566,778		670,244		(772,210)		1,029,958		1,927,367		2,788,589
Total		789,861		913,547		1,019,201		1,029,958		1,927,367		3,357,901

Source: Thai trade statistics

Note: The method of classification of goods changed in 1988. Therefore, more items were classified under "other articles".

The main countries of origin are Japan, Singapore, and the U.S. Other notable commodities are tubes, pipes, etc., of which about 200 million bahts were imported as of 1987. The main areas of origin of these were Hong Kong, Japan, and the U.S. Following these were imports of bags, jars, and other containers, of which about 100 million bahts were imported as of 1987 from mainly Japan and the U.S. Bags, jars, and other containers constitute a key export item of Thailand as well, but a comparison of the unit price of imports and the unit price of exports gives a ratio of 3.09 in 1983, 3.64 in 1984, 4.19 in 1985, 4.38 in 1986, and 4.05 in 1987, i.e., imports are much higher in price compared with Thai products. Thailand, it may be said, relies on imports for special products among those produced domestically. (See Table III-2-8)

Table III-2-8. Terms of Trade of Plastic Processed Products of Thailand (Unit Price of Imports/Unit Price of Exports)

	1983	1984	1985	1986	1987
Tubes and Pipe 390721	1.616	2.781	2.486	3.052	2.958
Table ware and Kitchen ware 390723	1.240	1.324	1.599	1.222	1.318
Bags Jars other containers 390732	3.094	3.639	4.192	4.384	4.059
Caps 390732	1.955	2.523	1.773	2.477	4.468

Source: Prepared from Thai trade statistics

It was impossible to obtain clear figures for the imports of plastic processed parts products, but in general large growth has been shown in imports of electrical parts and auto parts, so it is possible to estimate the increase in plastic parts accompanying the same.

A look at imports of television parts shows that imports of parts in 1987 increased 12 fold in value and 11 fold in volume over 1980. Imports of fans similarly rose about seven-fold in value and three-fold in weight. (See Table III-2-9)

Table III-2-9. Trends in Imports of Electrical Equipment Parts by Thailand

(Unit: 1000 Baht, Kg)

	1975		1980		1984		1985	
	volume	value	volume	value	volume	value	volume	value
851524								
Parts and accessories for TVs	771,407 (100)	96437 (45.7)	767,359 (100)	210,884 (100)	3,793,234 (494)	1,233,829 (580.3)	5,895,233 (768)	1,670,016 (791.9)
Parts for fans	211,135 (131)	11,351 (76)	160,207 (100)	14,894 (100)	264,461 (141)	28,340 (190)	308,404 (193)	42,044 (282)
Parts and accessories for automobiles	14,407,267 (87)	525,036 57.4	16,659,087 (100)	914,387 (100)	24,022,508 144	1,471,584 (160.9)	15,567,627 93	1,402,619 (153.4)
	1986		1987		1988			
	volume	value	volume	value	volume	value		
851524								
Parts and accessories for TVs	6,630,777 (864)	1,742,320 (826.2)	8,605,563 (1,121)	2,518,654 (1,943.3)				
Parts for fans	227,215 (173)	53,353 (358)	481,251 (300)	99,692- (669)				
Parts and accessories for automobiles	13,304,739 (80)	1,728,335 (189.0)	18,361,796 (110)	1,969,497 (215.3)	21,823,558 (131)	2,359,972- (258.1)		

Note: Figures in parentheses are comparative figures based on 1980 as 100.

Source: Thai trade statistics

2-4. Problems and Countermeasures

Demand for plastic products, as stated in section 2-2, is comprised of final demand and intermediate demand. In the promotion of the plastic processing industry, therefore, measures have to be taken tailored to this characteristic of demand.

In particular, to deal with intermediate demand, which is expected to grow in the future, a broad range of measures dealing with the quality of the raw materials, the machine technology, sales methods, etc. is considered necessary. Here, further, the level of quality demanded by electrical appliance parts, auto parts, office equipment parts, and other industries differs.

When targeting at meeting domestic demand for intermediate goods and going on to exports, in particular, the means taken would differ for each industry. Taking as an