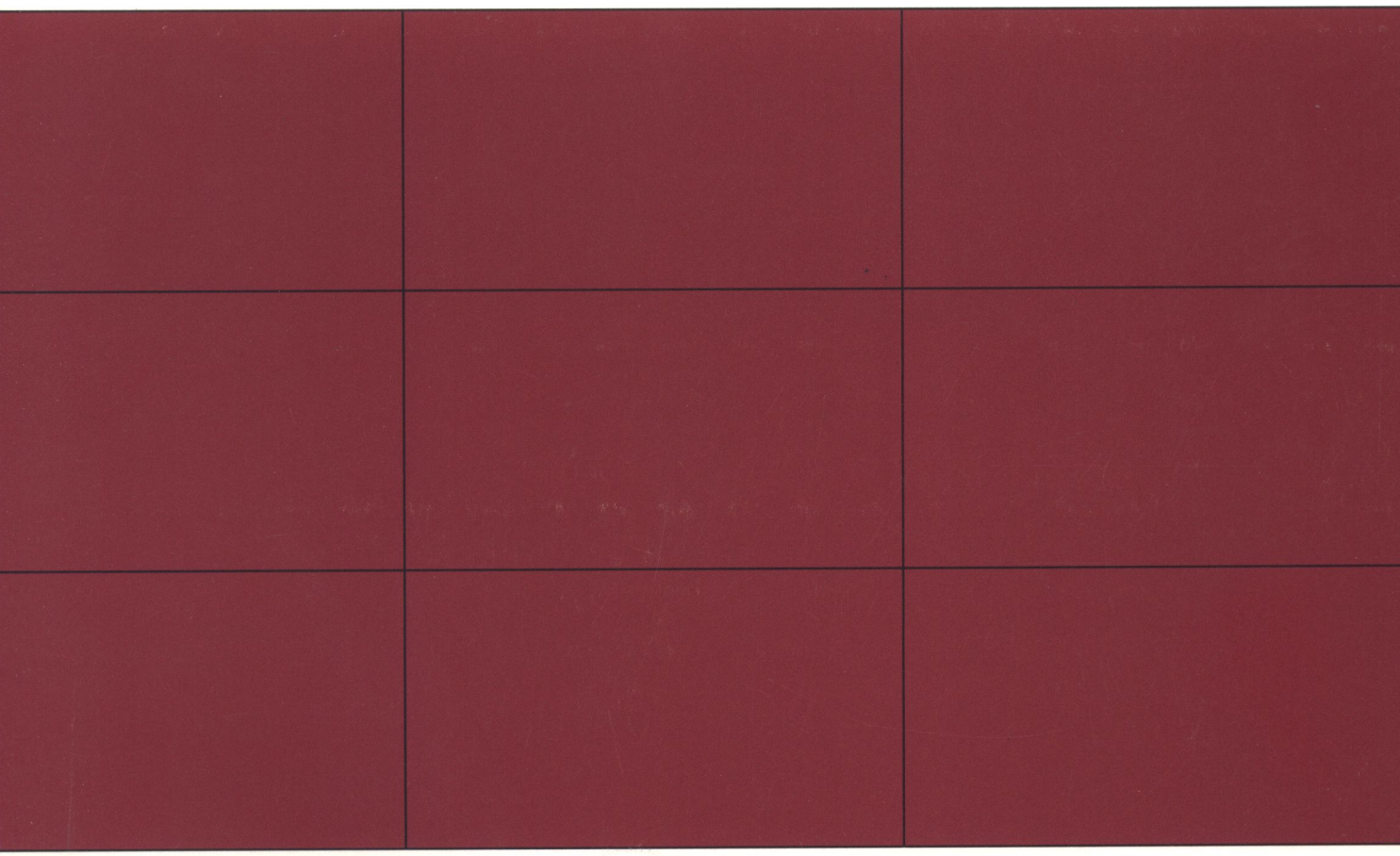
A Profile of Provincial Industries



A Profile of Provincial Industries

By

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A PROFILE OF PROVINCIAL INDUSTRIES

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EXECUTIVE SUMMARY

In Thailand, the level of industrial development among different regions and among different provinces in the same region varies greatly. Industrial activities have been concentrated in Bangkok and its adjacent provinces (Greater Bangkok). In 1987, 76.8 percent of the value added in the manufacturing sector was generated in Greater Bangkok. The manufacturing value added generated in the Central Region (including Greater Bangkok) was as high as 89.1 percent. This means that all other regions in the Kingdom could generate only around 10 percent of the manufacturing value added in 1987.

The geographical concentration of industrial activities has not decreased over time. On the contrary, the degree of geographical concentration has tended to increase as time passes. The concentration of industrial activities measured by manufacturing value added, employment, and the number of manufacturing factories all indicates increasing geographical concentration over time. Although the share of industrial activities in the Bangkok metropolis has decreased over the last decade or so, that of Bangkok's adjacent provinces and other provinces in the Central region has significantly increased over the years. During the period of 1981 to 1987, the region with the highest industrial growth was the Central Region, followed by Greater Bangkok. Other regions have a much lower growth in manufacturing value added, and the Southern Region showed the lowest growth rate in the Kingdom.

There is generally a lack of diversification of industrial activities in provincial areas. Industrial activities commonly found in the regions include food, wood products, non-metallic mineral products, metal products and machinery, and transport equipment.

The calculation of components of industrial growth by a shift and share model indicates that general economic expansion was the most important component of industrial growth during the period of 1981 to 1987. For the regional component, besides Greater Bangkok, all other

regions appeared to have a negative regional effect, indicating a general lack of competitiveness by regional industries compared with industries located in Bangkok.

Factors explaining the disparity in the degree of industrialization in different provinces include income level, population density, infrastructure level, level of financial development, and distance from the Bangkok metropolis.

The calculation of revealed comparative advantage (RCA), however, reveals that there are a few industries that exist in regions other than Greater Bangkok which tend to have some comparative advantage. In the food and beverages industries, all of these regions appear to have RCA indices greater than unity. Besides food and beverages, industries with an RCA greater than one include non-metallic mineral products and paper in the Central Region; wood products and paper in the North; leather products, wood products and non-metallic mineral products in the Northeast; and wood products, rubber products, paper, and non-metallic mineral products in the South. In general, the high RCAs of these industrial groups have resulted from manufacturing value added generated in only a few provinces in each region. In Greater Bangkok, there are more industrial groups with an RCA greater than unity. Most of these are market-oriented industries such as textiles, garments, printing, chemicals, electronic and electrical products, and transport equipment.

Analyses of survey results from around 1,000 respondents reveal that industrial activities in provincial areas generally have significant linkages with the local economy. Industrial enterprises in provincial areas, particularly small ones, rely greatly on the local market and on local labor and material inputs. Thus, the growth of the rural economy has a significant effect on the existence and growth of provincial industries.

Provincial industries are plagued with a number of operational problems, including limited demand for their products, lack of raw materials and skilled labor, and inadequate financing. Provincial industries mostly operate with a serious underutilization of capacity,

and there is a high degree of seasonal fluctuation in production. Important reasons for this irregularity in production and underutilizations are limited demand for the products manufactured and the lack of regular supplies of raw materials and labor. The limitation of demand is far more significant as a contributing factor to irregular production and underutilization of capacity than the problem caused by a shortage of labor and material inputs.

Entrepreneurs of industrial enterprises located in provincial areas usually receive little formal education. Most of them have had experience in business prior to the establishment of their present enterprises. The knowledge and experience gained from working in manufacturing enterprises--either as employees, or as family workers--have significantly contributed to the establishment of the present industrial enterprises.

Over half of the entrepreneurs covered in the survey are residents of the same provinces in which their firm is located. The two most important reasons given for the choice of location in a particular province are: 1) the entrepreneur is the resident there, and 2) the entrepreneur has conducted business in that province for a long time. These findings suggest that the promotion of entrepreneurs residing in a province could be an important means of promoting provincial industries. This is particularly true in provinces far away from Bangkok, where foreign entrepreneurs are not interested in investing.

Important economic factors determining the choice of location are proximity to the market, convenience in transportation and communication, proximity to raw material sources, adequacy of infrastructural facilities, and inexpensive land prices. Other factors, such as location close to ancillary industries and better access to governmental services, are far less important as factors considered for choice of location.

Considerations of industrial activities that exist in different regions and the various factors relevant to the choice of location reveal that regional industrialization can occur in different ways. We

may categorize the geographical dispersion of industrial activities into three major types: 1) the dispersion or expansion of industrial activities from Greater Bangkok to its nearby provinces in the Central Region; 2) the expansion of industrial activities in provinces that are regional centers or "growth poles"; and 3) the creation of industrial activities in other provinces.

The expansion or extension of industrial activities in provinces adjacent to Bangkok can occur by market forces and without any incentives from the government. There should also be concern about environmental pollution created by increasing industrial activities in this region. Provincial authorities should attempt to designate industrial zones in a way that will not jeopardize the environment due to the increasing congestion of industrial activities.

The second type of industrial expansion in regional centers will also occur by market forces. However, the government can accelerate the pace of this expansion by providing infrastructural facilities that are now unavailable. The provision of necessary information on investment opportunities and the promotion of investment by foreign as well as Thai entrepreneurs, both from Greater Bangkok and from other regions could also be useful.

The third type of industrial expansion, i.e., the creation of industrial activities in provincial areas, is worth the government's special attention. The generation of industrial activities in these provincial areas could serve as a generator of income and employment. The strategies used for the promotion should be that of encouraging industrial activities by local entrepreneurs and improving efficiency of existing industrial enterprises by various promotional measures, and not on providing of various fiscal incentives.

Four areas of promotional measures can be identified:

1. the creation of demand for industrial products in the provinces;

2. accelerated construction of infrastructural facilities and facilitation of investment;

3. encouragement toward establishing industrial activities by local entrepreneurs and improving the efficiency of existing enterprises.

4. provision of promotional services that would enhance the productivity of provincial enterprises.

In the long run, the most effective measure to promote the creation of industrial activities is the creation of the demand for industrial products through programs that are designed for rural development and the generation of the income and purchasing power of provincial residents. In addition, measures such as provision of information on investment opportunities, services, and training on various operational aspects could by very helpful.

There is a need for institutional restructuring so that the promotion of provincial industries can be effectively carried out on a continuous basis. In particular, the role of the provincial industrial office should be enhanced to enable the office to function as an information center, to provide advisory services, and to coordinator the need for promotional services of industrial enterprises in the provinces to various promotional agencies.

CHAPTER 1

REGIONAL DISTRIBUTION OF INDUSTRIAL ACTIVITIES

1.1 GEOGRAPHICAL CONCENTRATION OF INDUSTRIAL ACTIVITIES

1.1.1 Levels of Industrial Development

The level of industrial development in Thailand varies from region to region. Most industrial activities are concentrated in Greater Bangkok and the neighboring provinces (Greater Bangkok), while the level of industrial development in other provinces is very low. The contribution of industrial activities to aggregate economic activities in each region, as measured by the ratio of the manufacturing sector value-added to total value-added or gross regional product (GRP), is shown in Table 1.1. In 1987, the manufacturing sector was the most important economic sector in Greater Bangkok, accounting for as much as 36 percent of total economic activities. Agricultural activities still play the most significant role in other regions. In other Central provinces, the percentage of industrial activities is second to that of the agricultural sector -- except for the provinces in the west of the Central Region, where value-added in the service sector surpasses that of the industrial sector. In other regions, the agricultural sector is still very important, and the manufacturing sector's share in total value-added is below 10 percent. In terms of the importance of regional industrial activities to total industry activities, the South contributes the least, comprising only five percent of the economy-wide manufacturing sector value-added in 1987.

Over the past seven to eight years, the regions having an increasing share of industrial activities include Greater Bangkok, the provinces in the Central Region (except Greater Bangkok) and the North Region. The

share of industrial activities in the Northeast Region has slightly declined. The manufacturing sector's importance to the regional economy in the South has evidently declined. From 1981-87, the manufacturing sector's growth rates in the Central Region (Eastern, Western and other provinces of the Central Region) were the highest, followed by Greater Bangkok and the South, which experienced the lowest growth rate in manufacturing. (See Table 1.2).

One interesting point regarding industrial distribution is that the ratio of manufacturing activities to total economic activities varies greatly from province to province. There are provinces with both high and low industrial development levels in the same region. For example, Ang Thong, Chai Nat and Nakhon Nayok in the Central Region show a very low share of industrial activities, with manufacturing shares of only 2-3 percent; whereas, some other provinces in the same region such as Chon Buri, Ratchaburi, and others have a high share of manufacturing activities.

The growth of manufacturing value-added in some provinces was very high during 1981-87. These provinces included Pathum Thani, Samut Sakhon, Nakhon Pathom and Nonthaburi in Greater Bangkok; Chon Buri, Chachoengsao, Rayong, Trat, Prachin Buri, Ratchaburi, Kanchanaburi, Suphan Buri, Saraburi and Lop Buri in the Central Region; Tak, Chiang Mai, Uttaradit, Nakhon Sawan, Kamphaeng Phet in the North; Nong Khai, Khon Kaen, Sakon Nakhon, Udon Thani, Buri Ram in the Northeast; Prachuab Khiri Khan, Surat Thani and Yala in the South. Meanwhile, manufacturing value-added in some provinces declined during the same period.

Bangkok and the surrounding provinces have considerably higher incomes and more industrial activities than other regions. In 1987, the value-added of this region which consists of only six provinces, accounted for as much as 48.5 percent of the total gross domestic product. The higher industrial development level in Bangkok and its neighboring provinces indicates that most industrial activities are concentrated in this region. Moreover, the degree of concentration has been very high. In 1987, 76.8 percent (or over three-fourths) of the manufacturing sector's value-added was generated in Bangkok and its

neighboring provinces. If other Central provinces are included, the percentage amounts to 89.1 percent. The other regions contributed only 10 percent of the industrial sector's GDP. Bangkok itself generated approximately 50 percent of the manufacturing sector's GDP. This indicates that there is a considerable discrepancy between Bangkok's industrial development and that of other regions.

It is noticeable that the degree of industrial concentration has not been reduced through time. The percentage share of the Central region, including Greater Bangkok, has increased over time. Data on the distribution of the manufacturing sector's value-added in the regions, based on old series GDP data, indicates that the manufacturing value-added in Bangkok (excluding neighboring provinces) was as high as 39.4 percent in 1969. With other Central provinces included, the percentage increased to 77. In 1980, the share of manufacturing value-added in Bangkok rose to 51.7 percent of the national manufacturing value-added, and this percentage increases to 87.6 if other Central provinces are included (see Table 1.3). Based on the new series GDP data, it is found that industrial concentration during 1981-87 tended to increase. The share of Bangkok and its neighboring provinces rose from 75.3 percent in 1981 to 76.8 percent in 1987, whereas the share of other provinces slightly increased, from 12.1 percent in 1981 to 12.2 percent in 1987. The share of other regions tended to decline, particularly the South where the contribution of manufacturing value-added was only 3 percent and 2.1 percent of the national industrial value-added in 1981 and 1987, respectively.

1.1.2 Employment

Employment in the industrial sector is highly concentrated in Bangkok and the other provinces in the Central Region. In 1986, the manufacturing work force in Bangkok (excluding neighboring provinces) constituted as much as 32.4 percent of the manufacturing sector's total employment, while the manufacturing employment of other Central provinces was 35.6 percent (See Table 1.5). This indicates that 68 percent (or over two-thirds) of the total employment in the

manufacturing sector was generated from industries located in the Central Region, including Bangkok.

Nevertheless, the concentration of manufacturing employment in Bangkok and other Central provinces is lower than the concentration of industrial value-added, as shown in Table 1.4. This could be due to the fact that the industrial work force in Greater Bangkok has more working hours per year than do workers in other regions.[1] Moreover, the fact that the share of industrial value-added in Bangkok and the Central provinces is higher than the share of the industrial sector's employment indicates that industries located in Bangkok and the Central provinces are more capital-intensive than those in other regions; and that many factories situated in Greater Bangkok are large scale and well equipped with modern machinery, leading to higher value-added per worker. Considering the amount of investment required to create an additional job, regional industrial promotion will be more effective in promoting employment because the production process is more labor intensive. However, working hour differences must also be taken into consideration.

It is apparent that the shares of the manufacturing sector's employment (Table 1.6) and value-added exhibited in Table 1.4 present a contradictory picture to some extent. For instance, the Northern Region's manufacturing value-added share in 1987 was lower than that of the Northeast while the share of the manufacturing labor force was higher than that of the Northeast in 1986. The Southern Region, with a very low manufacturing value-added, showed a manufacturing work force share only slightly lower than those of other regions. This indicates that differences exist among regions in the intensiveness of labor utilization as well as labor productivity as measured by value-added per worker.

Table 1.5 shows that the concentration of the manufacturing labor force in Bangkok and other Central provinces has not declined through

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1. Data on the working hours of the labor force in different regions is derived from the labor force surveys of the National Statistics Bureau.

time. On the contrary, it has been increasing. From 1981-86, the share of manufacturing employment declined in Bangkok but drastically rose in other Central provinces. The ratios of the regional manufacturing labor force to the national manufacturing labor force in other regions fluctuated, but it generally tended to decline.

The comparison of the regional manufacturing labor force with the total regional labor force shown in Table 1.6 reflects another aspect of the increasing disparity between industrial development in Bangkok and other Central provinces. During 1981-87, the manufacturing sector's share of labor compared with that of all economic sectors tended to rise in Bangkok and the Central region, but it fluctuated and tended to fall in other regions, except in the North.

It should be noted that the data derived from the labor force surveys must be carefully interpreted. The number of employed persons estimated by the surveys drastically varied from year to year. Prior to 1984, two surveys were conducted each year -- in the summer (January to March) and in the rainy season (July to September). More industrial labor was available in the summer, when the first round survey was conducted, since the labor force in the agricultural sector was not fully utilized and thus joined the industrial sector. In general, the estimation of the manufacturing labor force is based on data collected during the second round survey prior to 1984, and on the third round survey since 1985. Although the comparison is based on employment data collected during the same period of the year, great variations exist among annual employment. An analysis of manufacturing employment based on labor force surveys must therefore be made carefully. However, labor force surveys are the only source of data with regional information on manufacturing employment. Therefore, the analysis of changes in manufacturing employment must still be based on these surveys. Despite the difficulties caused by the yearly data fluctuations, some of the findings regarding regional shares of industrial labor and changes in such shares can be of use.

1.1.3 Number of Industrial Factories

Another indicator of industrial concentration is the statistical information on industrial factories registered with the Factory Control Division at the Ministry of Industry or at the regional offices of the Ministry of Industry. The data from both sources differs to some degree because data compiled at the Factory Control Division in later years excludes factories promoted by the Office of the Board of Investment and those located in industrial estates or directly registered with the Provincial Industry Office. Thus, the data on the number of factories collected at the Central Provincial Industry Office is more complete. Nonetheless, collecting data from this source is rather difficult because data on only a few years and some provinces is available. In this study, data on the number of registered factories in 1987 was collected from both sources to give a more complete overview of registered factories. With regard to the comparison of the numbers of factories in each region in different years, we rely on the data from the Factory Control Division because the data is more systematically filed and longer time series data is available.

Another negative aspect of the analysis of regional industrial structure based on data from the Factory Control Division is that small-scale factories are excluded from the database because according to the Factory Act, only industrial activities with at least seven employed persons (including the entrepreneur and unpaid family workers) or those with over two-horsepower machinery are required to register. Consequently, very small factories are excluded from the registered factory directory. Furthermore, it is known that numerous factories do not comply with the Ministry of Industry's registration requirements. Thus, statistics on the number of factories are understated.

By the end of 1987, the total number of factories registered with the Factory Control Division amounted to 87,221. Rice mills (46,637) constituted 53.6 percent of the total. Factories in Bangkok numbered 17,056, representing 19.6 percent of all registered factories. Factories located in other Central provinces totaled 13,322, or 15.3 percent of the total registered factories. Over one-third of registered

factories were located in Bangkok and other Central provinces. However, if rice mills are excluded, the concentration of industrial factories is even higher. Factories located in Bangkok (excluding the nearby provinces) would amount to as much as 41.7 percent, and factories in other Central provinces would amount to 22.2 percent of all factories. In other words, 63.9 percent (or almost two-thirds) of all factories excluding rice mills were located in the Central Region, including Bangkok.

The findings mentioned above are based on statistics from the Factory Control Division. Statistics from the Central Provincial Industry Office are somewhat different: The number of factories excluding rice mills in 1987 totaled 44,897, exceeding those registered with the Factory Control Division by 4,313. Moreover, the percentage of factories located in Bangkok and other Central provinces was higher, representing 74.8 percent (or one-third) of total registered factories excluding rice mills. This indicates that factories promoted by the Office of the Board of Investment and those in industrial estates are heavily concentrated in provinces near Bangkok.

Industries with a large number of factories included food processing, metal products and machinery, wood products, transportation equipment, printing, textiles, and miscellaneous manufacturing. In some industries such as transportation equipment, and metal products and machinery, factories operating repair and other services were also included. These factories are also required by the Ministry of Industry's regulations to be registered. Industries with a large number of factories are usually activities with a high percentage of small factories.

Most industrial factories were small-scale. While 64.3 percent of registered factories employed less than 10 people, 28.5 percent employed 10-49 people. If factory size is classified as follows: less than 50 workers, small; 50-199 workers, medium; and over 200 workers, large. Small, medium and large factories represented 92.9, 5.4 and 1.7 percent of all registered factories, respectively.

Although the percentage of small factories in Bangkok and its neighboring provinces was high, medium and large factories were mostly located in this area. Of the factories with over 50 workers, 70 percent were located in Bangkok and the other Central provinces. Over 80 percent of the factories with 200-499 employees were in Bangkok and the Central region. Over 90 percent of factories with over 500 workers were situated in the Central Region, and most of these factories were in Bangkok and its neighboring provinces. In contrast, most factories in other regions were small (See Table 1.7).

The analysis on changes of regional industrial distribution must rely on the Factory Control Division's longer time series data. Over the past 10 years, the regional distribution of industrial factories (rice mills excluded) has not changed significantly. In general, the percentage of factories in Greater Bangkok and other Central provinces has declined, while the percentage of factories in other regions has increased. However, data acquired from the Provincial Industry Office, together with data from Factory Control Division in 1987 (which is presumably more complete) reveals a higher factory concentration in Greater Bangkok and other Central provinces. Although factories in other provinces in the Central Region represented a lower percentage, the total number of factories in Greater Bangkok and other Central provinces represented 74.8 percent. Compared to earlier data from the Factory Control Division, this data shows an increasing level of factory concentration in Greater Bangkok (Table 1.8).

The calculation of the growth rates of the number of registered factories in different regions reveals that the average growth rate of registered factories in other regions from 1978-84 was higher than that of Greater Bangkok and the other Central provinces. In 1986 and 1987, a similar growth pattern existed. However, although the growth rate of the number of factories in Bangkok was lower than the national average growth rate, provinces near Bangkok experienced a high growth of registered factories. The growth rates of registered factories in other provinces generally fluctuated (Table 1.9) due to the small number of existing factories.

Based on the data on the number of registered factories, conclusions cannot be drawn on whether the concentration of factories in Greater Bangkok has declined or increased. It is possible that the concentration of industrial facilities around Bangkok has increased due to the growth of factories promoted by the BOI and those in industrial estates in provinces near Bangkok.

1.1.4 Industries in Each Region

The examination of industry groups in each region confirms the statement that industrial activities in regional areas are only slightly diversified, particularly in provinces that are not regional centers and are distant from Bangkok. Industrial factories are not only scarce but are also concentrated in a few industries. Industries with a large number of factories in regions other than Greater Bangkok included food processing (311-312), wood products (331), furniture (332), pottery and non-metal products (361 and 369), metal products and machinery (381 and 382) and transportation equipment (384). Industries next in importance were rubber products (355), textiles (321) and printing (342). The percentage of other industrial factories in regional areas was very low, compared to Greater Bangkok.[2]

On a regional basis, industry groups in Bangkok with the highest numbers of factories were as follows: metal products and machinery (381 and 382), textiles and garments (321 and 322), plastics products (356), transportation equipment (384) and publishing (342) industries. In provinces near Bangkok, food processing, garments, machinery and wood product factories outnumbered those in other industry groups. In the rural Central and the Northeast, food products comprised the largest number of factories. But in the North and the South, factories in the metal products industry in 1987 outnumbered those in the food industry.

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2. For further comparison of registered factories classified by industry (TSIC two-digit level), see Somluckrat W. Grandstaff (1990), Tables 2.12, 2.13, and 2.14.

Moreover, tobacco and wood factories represented a rather high percentage of total registered factories in the North. In the South, apart from food and machinery factories, wood products, furniture and rubber products factories were numerous. In the Northeast, almost half of the registered factories were in the food industry, while machinery, non-metal products, transportation equipment, wood products and furniture factories had a higher share than other industries.

According to the World Bank (1983), industries commonly operating in rural areas are classified as follows:

1. Processing of primary commodities, including agricultural products and minerals, which require perishable raw materials and which have a substantial weight loss in the production process.
2. Construction materials, i.e., bricks.
3. Services, i.e., rice mills, activities related to locally-consumed food products, such as rice, noodles, soybean curd, etc.
4. Textile products and handicrafts for sale in other areas.
5. Metal product manufacturing and repair services, i.e., machine and automobile repairing.

The survey on the structure of factories in areas remote from Bangkok confirms the findings mentioned above, as factories in the regional areas are mostly concentrated in these five industrial categories. Apart from these five activities, other manufacturing industries are negligible, and production of some industrial goods, such as chemicals, plastic products, and electronics products, hardly exists in regional areas. In addition, most factories in regional areas are small. However, over the past two to three years, the congestion in Bangkok and its neighboring provinces, along with rising land prices in these provinces and additional government incentives granted to industries located outside Greater Bangkok, have resulted in more large-scale BOI-promoted factories located in provinces near Greater Bangkok, where infrastructure facilities are also quite well developed, i.e., Ayutthaya, Chachoengsao, Suphan Buri, and Nakhon Nayok. Thus, Greater

Bangkok's share of industrial activities has declined. However, the concentration of industrial activities in the Central Region as a whole has increased, although some large-scale industries dependent on raw materials, such as sugar mills, canned food processing, rubber glove manufacturing and mining, are located in somewhat remote provinces with abundant raw materials.[3]

1.2 FACTORS AFFECTING CHANGES IN REGIONAL INDUSTRIAL ACTIVITY

1.2.1 Components of Regional Industrial Growth

All the above findings indicate that levels of industrial development vary greatly from region to region. In some regions (provinces), industrial activities have been growing rapidly, while other regions (provinces) have experienced very low or negative industrial growth rates. The industrial growth rate of each region or province is the combined outcome of the country's general economic growth and regional or provincial industrial growth. The industrial growth of regions or provinces with a large number of high-growth industries will accordingly be higher than that of other regions or provinces. The industrial growth of a particular region (province) depends on factors conducive to investment in industries with high growth potential and the competitiveness of industries located in that region (province) compared to other regions.

The Shift-Share approach, which is similar to the Constant Market Share model in international trade, is widely used in decomposing elements of employment or economic growth. Despite its limitations and

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3. See Rachain Chintayarangsan (1990) for a discussion of regional industrial structure. Considerations on factory site selection will be discussed in the section 4 of this study.

questionable forecasting capability, this method is very popular among regional economists because of its simplicity and transparency. [4]

The Shift-Share analysis will use the following formula:

$$V_{ijt} = r.\ V_{ijo} + (r_i - r)V_{ijo} + (r_{ij} - r_i)V_{ijo}$$

given

$$r = \frac{V_t}{V_o}$$

$$r_i = \frac{V_{it}}{V_{io}}$$

$$r_{ij} = \frac{V_{ijt}}{V_{ijo}}$$

V = Total GDP
V_i = GDP of economic sector i (or industry i)
V_{ij} = GDP of economic sector i in region j

All symbols with t refer to the ending year and those with o refer to the starting year of the analysis.

From the equation, the growth of manufacturing value-added of an economic sector in a region can be separated into three components:

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4. There are many articles on the Shift-Share approach and formula sometimes differ. See Benjamin H. Stevens and Craig L. Moore, "A Critical Review of the Literature on Shift-Share as a Forecasting Technique. "Journal of Regional Science, Vol. 20, No. 45 1980, pp. 419-437.

1. Thailand's overall economic growth (r).
2. Sectoral growth or the difference between the country's overall economic growth rate and the growth rate of the economic sector under consideration (r_i-r). If the economic sector under consideration is growing at a higher rate than the overall economy, the value of (r_i-r) will be positive. The difference will be negative if the situation is the reverse.
3. The difference between the growth rate of an economic sector of a region and that of this particular economic sector across all regions: (r_{ij}-r_i). If a particular economic sector of a region has a higher growth rate than the same sector at the national level, the difference will be positive. The regional effect indicates the factors particular to a region that influence the growth of the industry under consideration. Thus, the effects of overall economic growth and the industrial or economic sector's growth are excluded.

The Shift-Share approach enables us to identify the sources of growth for an economic sector within a region: the overall economic growth, the industrial or economic sector-specific growth, and the region-specific growth of an economic sector. The degree of each effect can also be identified.

The Shift-Share analysis is done at the economic sector level. Each region's different industrial sectors are compared. Data utilized are gross regional product classified by economic sector during 1981-87.

The results of the shift-share calculation at the sectoral level are shown in Table 1.11. The effect of overall economic growth is the major determinant of sectoral growth. With regard to the agricultural sector of every region, the sectoral effect (I) is negative, indicating that the agricultural sector's average growth rate is lower than that of the overall economic system. The regional effect (R) is negative in all regions except in the South. The positive effect in the South indicates that the agricultural sector's growth rate in the South during 1981-87 were, on average, higher than those in other regions. In contrast, in

the mining sector, the South showed a negative regional effect of as much as 70 percent, while other regions showed a positive effect.

Of concern here is the shift-share of industrial sectors in different regions. The calculations show that the overall economic growth (G) remains the most significant determinant of the industrial sector's growth. The overall economic growth affected the South's industrial growth to the highest degree. The Northeast was affected to a lesser degree (106.2 percent). In terms of sectoral effect (I), every region showed a positive result. This indicates that the industrial sector's growth rates during 1981-87 were higher than those of the country's overall economy. We are interested in the regional effect (R), which turned out to be positive in Greater Bangkok and other Central provinces, and negative in other regions. The South showed the largest negative effect (-44.9 percent), followed by the Northeast (-11.2 percent) and the North (-3.5 percent). Although this effect was positive in Greater Bangkok, the percentage was very low compared to the other effects. Further examination of provinces other than Greater Bangkok reveals that Western Central provinces and other Central provinces were highly influenced by the regional effect (10 percent), while the regional effect of Eastern Central provinces was negative (-8.2 percent). However, when the Eastern Seaboard project starts to affect industry in the East in the future, it is believed that the industrial expansion of the East will definitely be higher than the average rate during 1981-87.

The result of the regional shift-share analysis indicates that the overall industrial competitiveness of the regions other than Greater Bangkok and the Central provinces is very weak. Regional effects create hindrances to regional industrial growth. Nonetheless, the inferior competitiveness of the overall industrial sector in other regions in no sense means that all industries in other regions are less competitive. Unfortunately, consistent time series data on manufacturing value added by industry are not available; the shift-share analysis at the industrial level is thus not made in this study.

The analysis of the elements of regional industrial growth therefore reveals that the overall industrial sector's growth (G) highly affects the growth of industries, whereas the effect of each industry's growth (I) and the regional effect are less influential.

Although this shift-share analysis allows us to identify the regional effect on the industrial sector's growth and other economic sectors of each region, it cannot reveal the factors leading to differences among regional economic sectors. In other words, the analysis does not explain why the regional effect of one region is negative while that of others is positive.

1.2.2 Causes of Differences of Industrial Development Levels among Regions

Industrial growth varies from region to region, leading to a disparity in industrial development levels among regions. In the case of Thailand, as is widely known, the industrial development of the Central Region is higher than that of other regions because industrial activities are concentrated there, especially in Bangkok and the neighboring provinces. Investors are more interested in the Central Region due to various factors. Bangkok and the surrounding provinces comprise the country's most important consumer product market, with high purchasing power. Locating factories in or near Bangkok not only allows access to customers and a growing market, but also leads to transportation cost savings. With regard to export-oriented businesses or those depending upon imported machinery, equipment, intermediate goods, and raw materials, being near Bangkok -- the location of the major port -- enables businesses to save on transportation costs and inventories. Moreover, the availability of public utilities, modern telecommunication system, supporting industries, and skilled labor, as well as living and entertainment facilities, further enhances Greater Bangkok's attractiveness as an industrial site and as a location for other economic activities.

Other regions lack these infrastructural facilities. According to the World Bank (1983), Bangkok's advantages resulted from "economies of scope" for industrial manufacturing, whereas factories located in remote areas were deprived of such necessary facilities. Thus, except for some industries that must be located near raw material sources in order to gain cost savings, most industries do not locate in remote areas because labor costs do not vary greatly from one region to another and labor can be easily mobilized. Cheaper labor costs in rural areas do not impose a strong disadvantage on factories located in the Bangkok area.

With improved communications systems, lower transportation costs, and rising land costs in Bangkok and neighboring provinces, more industrial activities may move to other provinces. However, improvements in the transportation system cannot compensate for the disadvantages relating to economies of scope. Industrial activities will then expand from Bangkok to its surrounding and other provinces nearby, such as Ayutthaya and Chachoengsao, also in the Central Region.

The improving transportation system can also lessen some of the natural advantages of rural industries, because goods from other localities can be transported at low costs. Raw materials available only in some areas can be sent to other areas with better infrastructure. Skilled labor may move to large cities or large factories in other areas where wages are higher. Without a wide range of improvements, some rural industries probably will not survive in the future.

Apart from the factors earlier mentioned, industrial policies regarding import substitution and export promotion through exemption of import duties imposed on machinery, equipment, and raw materials as well as the income distribution gap among regions, also contribute to the establishment and growth of import-substitution industries that serve consumers with high purchasing power in urban areas. Both import-substitution and export-oriented industries depend on international transportation. Moreover, with the government's centralized administration, large-scale industrial activities choose to be located

in Greater Bangkok in order to be able to conveniently contact public agencies. [5]

The number and growth of industrial activities in the regional areas depend on various factors, such as market size, infrastructure availability and other socioeconomic factors. In this study, we tested the correlation between industrial development levels as measured by the ratio of industrial value-added to gross domestic product, and some other quantifiable variables; namely, per capita income, population density, infrastructure availability, financial development levels, and distance from Bangkok. The test results revealed that per capita income, population density, infrastructure, and financial development levels showed a positive and significant correlation with the industrial development level. Provinces with high incomes, high population densities, better infrastructure, and high levels of financial development show a higher industrial development level. As expected, distance from Bangkok was negatively correlated with industrial development levels, with a high level of statistical significance. Provinces remote from Bangkok had more disadvantages regarding industrial development, and they showed a lower industrial development level on the average.[6]

This statistical test reconfirmed the significance of some factors, such as market size, consumer purchasing power, and infrastructure (i.e., electricity, public water, and roads) on the development of the industrial sector in each region. Nonetheless, the test has many limitations. The independent variables could only partly explain differences in industrial development levels across provinces. Each region possessed different advantages and disadvantages as an industrial site, and each industry had different considerations concerning industrial location selection. An analysis of factory location selection behavior and the factors affecting industrial site selection will be discussed in section 4 of this report.

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5. See the analysis on the importance of income distribution and centralized administration in Somluckrat W. Grandstaff (1990) and Chesada Loha-unchit (1990).

6. The results of the regression analyses are shown in Rachain Chintayarangsan (1990) and Chesada Loha-unchit (1990) in this research project.

1.3 COMPARATIVE ADVANTAGES OF EACH REGION IN DIFFERENT MANUFACTURING INDUSTRIES

Since each region (province) has different geographic characteristics, natural resources, and economic and social conditions, the advantages with regard to industrial goods manufacturing vary from region to region. Some regions (provinces) are endowed with natural resources suitable for the manufacture of some products, while other regions (provinces) lack those resources. Some regions (provinces) possess unique craftsmanship, leading to the more cost-effective production of some industrial goods. In order to identify comparative advantage, we calculate the revealed comparative advantage (RCA) for each region in each industry by classifying industries at the TSIC 3-digit level.

The calculation of RCA uses the following formula.

$$RCA_{ij} = \frac{V_{ij}/ V_j}{V_i/ V_t}$$

V_{ij} = Value-added of industry i in region j
V_i = Value-added of the country's industry i
V_j = Value-added of all industries in region j
V_t = Value-added of the country's all industries

The revealed comparative advantage or RCA is widely used in comparative studies of export performance.[7] Some argue that this index cannot evaluate the true comparative advantages underlying international trade because the percentage of each export depends on many factors, including export subsidies, distance, transportation costs, and trade restrictions in importing countries. These factors result in a

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7. The RCA formula was first used by Bela Balassa in the study on the comparative advantages of 10 developed countries' exports during 1953-55 and 1960-62 in the article titled "Trade Liberalization and Revealed Comparative Advantage" Manchester School of Economics and Social Studies, Volume 33(2), 1965, pp. 99-123.

distorted picture of comparative advantage. However, a study on true comparative advantages cannot be easily estimated in practice while the RCA formula can be easily calculated. This method is therefore very popular in studies on international trade.

In effect, the RCA index merely shows the percentage of certain products in a region compared to the percentage of the same product in the country as a whole. Assume that j refers to regions. The numerator is V_{ij}/V_i or the ratio of the value-added of industry i in region j to the value-added of the country's industry i, and the denominator is V_j/V_t or the ratio of the total manufacturing value-added of region j to the value-added of the whole country. According to this formula, if region j can create value-added in industry i at a rate higher than the ratio of the region's manufacturing value-added to the country's manufacturing value-added, region j will possess comparative advantages in industry i. In this case, the RCA will exceed 1. A higher RCA indicates increasing comparative advantage. On the other hand, if the RCA is less than 1, region j lacks comparative advantage in that industry. RCA is a relative value. Thus, a province that has very low manufacturing value-added in relation to the country's manufacturing value-added and happens to depend on only a few industries will show a high RCA for these industries despite that province's low value-added.

The RCA can be calculated on a regional or provincial basis relying on data on industrial value-added (at constant 1972 prices) from 1981-87.

Table 1.12 presents regional RCAs in 1988. Greater Bangkok possessed more industries with an RCA above one than other regions. The industries in which Greater Bangkok showed low comparative advantage include food processing, paper products, non-metal products, and wood products. However, all provinces in Greater Bangkok except Bangkok and Pathum Thani had food and beverage industries with RCAs over one. In the Bangkok Metropolis, only garments, wood products, chemical products, printing, and miscellaneous manufacturing showed an RCA slightly over one.

In all the other regions, the food and beverage industry showed an RCA above one. Apart from these two industries, only paper products, non-metal products, and miscellaneous manufacturing had an RCA exceeding one among other Central provinces (excluding Greater Bangkok). In the North, industries with an RCA above one included textiles, leather products, paper products, and non-metal products; whereas, wood products, paper products, rubber products, non-metal products, and miscellaneous manufacturing possessed an RCA higher than one in the South.

Another interesting point derived from Table 1.12 is that although many industries in Greater Bangkok exhibited an RCA above one, this RCA value was not very high -- that is, it was only slightly over one. Industries with the highest RCA included electrical & electronic products and transportation equipment industries, for which the RCA was 1.3. This is in accordance with the theoretical expectation that in countries or regions with high industrial development, industries tend to be more diversified and less concentrated. Moreover, Bangkok's industries with RCAs over one were usually market-oriented -- such as the textile, garment, printing, chemical, machinery, electrical and electronics equipment, and transportation equipment -- while industries with low RCAs usually depended on natural resources, such as the food, paper and non-metal products industries.

Some similarities existed among other regions' RCA indexes. There were only a few industries with an RCA above one, but the RCA of these industries was rather high. This indicates the higher concentration and lower industrial development of regional industries compared to that of Greater Bangkok. In the Central Region, the industry with the highest RCA was metal products (RCA = 4.1), followed by food processing (RCA = 3.5), paper products (RCA = 2.3), and beverages (RCA = 1.8). Further details on a provincial basis reveal high industrial concentration. For example, with regard to the non-metal products industry, only two provinces -- Saraburi and Phetchaburi -- showed an RCA over one. These two provinces' high value-added in this industry resulted in the Central Region's high RCA in this industry. Rayong's high RCA in the paper industry led to the Central Region's (except Greater Bangkok) high

RCA in this industry. The food and beverages industries were less concentrated in the Central provinces, but some provinces had a low RCA in these two industries.

This pattern was also prevalent in the North. The high RCA in most industries was created by only a handful of provinces. For example, in the case of the beverage industry, only Chiang Mai, Nakhon Sawan and Uttaradit had RCAs over one. Regarding the wood and paper products industries, many provinces had a high RCA. As many as eight provinces in the North had a high RCA in the wood products industry, while nine provinces out of a total of 17 provinces in this region had a high RCA in the paper products industry.

In the Northeast, all provinces except Buri Rum, Nakhon Ratchasima, Nong Khai, Surin and Ubon Ratchathani had the food industry an RCA above. Only four provinces possessed an RCA over one in the beverage industry: Buri Ram, Khon Kaen, Nong Khai, and Ubon Ratchathani. The high RCA of the leather products, and paper industries is also the result of high RCAs in only some provinces. In the leather products industry, only Khon Kaen and Surin showed an RCA above one, while in the paper industry, only Kalasin, Mukdahan, Roi Et, Si Sa Ket and Yasothon had an RCA exceeding one.

In the South, industries with a high RCA were also concentrated in only a few provinces. The rubber industry was concentrated in Krabi, Phatthalung, Phangnga, Satun, Songkhla, Trang and Yala. The paper industry's RCA was over one in Chumphon, Narathiwat, Pattani, Ranong, Satun and Yala.

The calculation of the RCAs of different industries in various provinces during 1981-87 indicates that the RCAs of most industries in Greater Bangkok slightly decreased. In other Central provinces, industries with a rising RCA were those with higher than average RCAs -- namely, the food, beverages, paper and rubber industries. In the North, major industries with an increasing RCA included beverage, wood, and paper. In the Northeast, industries with an increasing RCA were food, beverages, leather products and paper but the RCA of the non-metal

products industry fell slightly. In the South, the food, beverages, wood, paper, rubber and non-metal products industries had a rising RCA. In particular, the non-metal products sector showed a drastically rising RCA. In general, each region's RCA did not change considerably during these seven years. However, on a provincial basis, larger RCA changes existed in some cases.

The RCA analysis provides a cross-sectional perspective, although we can also compare the RCAs of a region's different industries in different years. It should be noted that industries in which a region possesses comparative advantages do not necessarily have a high growth potential. Nevertheless, if an industry in a particular region has been continuously growing at a very high rate, that industry will eventually yield a high RCA. Since the data on value-added by industry show some inconsistencies and the data dates back only seven years, the changes in RCA by each industry in each province cannot be accurately investigated. However, the RCAs presented in Table 1.12 tell us something about the comparative advantage of various industries. The high RCA of an industry in a particular region might be the effect of the compatibility of the industry's characteristics with the geographical and natural conditions in that region. If the data on industrial growth is reliable, we can further examine whether industries with a high RCA have a higher growth than other regions. If the two results are identical -- as in the case of the non-metal products industry in the Central Region and the rubber industry in the South -- we can then conclude with confidence that these industries possess a high growth potential in their respective regions. Since the results of the RCA and growth rates of different industries in different regions are frequently contradictory, concrete conclusions on the industrial growth potential of each region cannot be accurately drawn.

Table 1.1

Distribution of Gross Domestic Product (at Constant 1972 Prices) by Region, 1987

Percent

Economic Sector	Greater Bangkok	Rural Central	North	Northeast	South
Agriculture	3.07	24.77	33.96	33.17	33.58
Mining and quarrying	0.30	5.77	4.66	1.85	4.50
Manufacturing	35.99	16.74	7.34	8.37	5.02
Construction	3.55	3.02	4.92	5.21	4.25
Electricity and water supply	2.88	3.54	2.08	2.03	2.30
Transportation and communication	9.32	5.09	5.37	4.83	7.12
Wholesale and retail trade	19.11	16.01	12.25	12.67	16.88
Banking, insurance and real estate	4.65	2.23	2.61	2.03	2.23
Ownership of dwellings	2.82	4.52	5.84	7.27	4.80
Public administration and defence	3.27	5.59	7.03	8.41	6.28
Service	15.03	12.72	13.94	14.17	13.05
TOTAL	100.00	100.00	100.00	100.00	100.00

Source: NESDB

Table 1.2

Growth and Share of Manufacturing Value Added in Gross Regional Product by Region, 1981-1987 *

Percent

Region	Distribution							Annual Average Growth Rate
	1981	1982	1983	1984	1985	1986	1987	
Greater Bangkok	35.28	35.51	35.68	35.77	34.69	35.81	35.99	6.97
Rural Central	15.47	16.14	16.40	16.18	15.69	15.92	16.74	7.43
North	6.72	6.88	6.82	6.52	7.25	6.94	7.34	6.01
Northeast	8.53	8.27	7.86	8.24	7.22	8.23	8.37	4.74
South	6.76	6.03	5.79	5.86	5.70	5.08	5.02	0.22
Whole Kingdom	21.92	21.60	21.67	21.53	20.67	21.69	22.72	6.61

Note: * At Constant 1972 Prices
Source: NESDB

Table 1.3

Regional Distribution of Manufacturing Value Added, 1970, 1975 and 1980 *

Percent

Region	1970	1975	1980
Greater Bangkok	39.4	38.7	51.7
Central	37.6	41.4	36.0
North	7.9	6.7	4.0
Northeast	8.5	7.3	4.6
South	6.6	5.8	3.7
TOTAL	100.0	100.0	100.0

Note: * At Constant 1972 Prices
Source: World Bank, Thailand's Industrial Sector Background Report, Volume I: The Main Report, August 1982, Table 4.4.

Table 1.4

Distribution of Manufacturing Value Added by Region: 1981 - 1987 *

Percent

Region	1981	1982	1983	1984	1985	1986	1987
Greater Bangkok	75.25	73.57	74.86	74.58	73.79	75.22	76.80
Rural Central	12.24	13.86	13.04	13.15	13.62	13.02	12.32
North	3.92	4.09	3.95	3.92	4.54	3.98	3.79
Northeast	5.58	5.69	5.58	5.78	5.40	5.51	5.02
South	3.01	2.78	2.57	2.58	2.66	2.29	2.08
Whole Kingdom	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Note: * At 1972 Constant Prices
Source: NESDB

Table 1.5

Distribution of Manufacturing Labor Force by Region

Percent

Region	1971	1976	1981	1986
Greater Bangkok	32.04	30.97	35.55	32.41
Central	32.53	26.97	31.91	35.58
North	14.93	14.01	11.59	13.55
Northeast	13.62	18.88	10.40	10.32
South	6.86	9.17	10.52	8.11
TOTAL	100.00	100.00	100.00	100.00

Source: Labor Force Survey

Table 1.6

Proportion of Manufacturing Labor Force in Total Labor Force

Percent

Region	1971	1976	1981	1986
Greater Bangkok	17.16	24.48	25.59	25.36
Central	6.50	7.93	11.35	13.68
North	2.48	3.94	3.73	4.78
Northeast	1.45	3.13	2.03	2.22
South	2.33	5.01	6.75	5.32
Whole Kingdom	3.97	6.22	7.15	7.75

Source: Labor Force Survey

Table 1.7

Distribution of Registered Factories Classified by Employment Size, 1987*

Percent

Region	Size of Employment									Total
	0-5	6-9	10-19	20-49	50-99	100-199	200-499	500-999	>=1000	
Greater Bangkok	53.38	60.30	63.54	70.16	69.17	71.11	69.44	79.74	73.12	59.75
Rural Central	17.90	15.66	12.22	9.25	10.19	8.94	11.30	11.11	18.28	14.92
North	10.47	6.54	7.70	7.84	9.19	6.24	8.15	3.27	1.08	8.62
Northeast	10.81	11.83	10.49	6.25	5.82	6.24	4.07	4.58	6.45	10.11
South	7.44	5.67	6.06	6.50	5.63	7.47	7.04	1.31	1.08	6.60
Whole Kingdom	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Note: * Excluding rice mills

Source: Provincial Factory Directories, Ministry of Industry, 1987.

Table 1.8

Distribution of Registered Factories by Region*

Percent

Region	FCD				PFD
	1978	1981	1984	1987	1987
Greater Bangkok	54.15	52.03	52.62	51.30	59.75
Rural Central	20.03	19.50	18.20	17.99	14.92
North	7.44	7.99	8.92	9.73	8.62
Northeast	11.42	12.99	12.66	13.33	10.11
South	6.96	7.49	7.60	7.65	6.60
TOTAL	100.00	100.00	100.00	100.00	100.00

Note: *Excluding rice mills.

Source: Factory Control Division (FCD) and Provincial Factory Directories (PFD), Ministry of Industry.

Table 1.9

Annual Average Growth Rate of Number of Registered Factories, by Region and Province*

Percent

Region	1978-1984	1986	1987
GREATER BANGKOK	8.98	-0.39	3.88
Bangkok	8.47	-2.93	2.42
Nakhon Pathom	10.22	11.43	6.09
Nonthaburi	13.44	6.95	9.93
Pathum Thani	9.37	11.45	15.79
Samut Prakan	10.73	10.02	10.07
Samut Sakhon	13.71	10.73	4.64
RURAL CENTRAL	8.61	4.71	2.85
Ang Thong	-2.05	6.56	16.92
Ayutthaya	7.16	11.89	9.89
Chai Nat	9.16	-10.14	3.23
Lop Buri	17.76	13.06	1.99
Saraburi	11.01	0.63	2.52
Sing Buri	3.02	-13.33	-7.69
Samut Songkhram	3.02	-6.00	-1.06
Kanchanaburi	13.48	6.19	1.41
Phetchaburi	24.34	0.41	2.43
Prachuap Khiri Khan	15.57	10.05	19.71
Ratchaburi	2.54	1.42	-2.95
Suphan Buri	19.31	11.24	1.74
Chachoengsao	7.42	17.90	9.24
Chanburi	10.53	4.21	1.77
Chon Buri	3.65	4.05	-2.28
Nakhon Nayok	7.77	14.71	23.08
Prachin Buri	16.25	1.22	3.82
Rayong	8.00	1.82	1.79
Trat	8.23	1.04	20.62
NORTH	12.77	5.89	9.58
Chiang Mai	10.47	0.97	7.69
Chiang Rai	7.07	-7.61	2.94
Kamphaeng Phet	9.94	11.72	24.69
Lampang	8.16	1.60	6.04
Lamphun	18.11	33.70	10.57
Mae Hong Son	7.64	10.00	72.73
Nan	10.45	98.25	19.47
Nakhon Sawan	7.20	-4.51	3.60
Phetchabun	47.69	16.32	9.28
Phayao	34.80	5.13	17.07
Phrae	5.07	3.09	-8.00
Phichit	26.32	6.70	13.61
Phitsanulok	30.93	7.98	12.40
Sukhothai	23.33	-6.48	3.96
Tak	13.59	20.41	25.42

Table 1.9 (Continued)

Region	1978-1984	1986	1987
Uttaradit	11.71	6.45	31.82
Uthai Thani	20.91	0.00	27.78
NORTHEAST	11.32	8.07	8.55
Buri Ram	8.47	15.83	19.88
Chaiyaphum	10.04	7.92	27.52
Kalasin	47.36	46.88	11.70
Khon Kaen	8.35	9.79	10.22
Loei	2.76	14.29	12.50
Maha Sarakham	20.55	9.66	6.61
Mukdahan	-	-5.88	18.75
Nakhon Phanom	28.06	-3.56	5.33
Nakhon Ratchasima	3.45	8.43	7.31
Nong Khai	9.38	45.12	52.94
Roi Et	21.06	6.08	1.27
Sakhon Nakhon	13.88	-14.76	4.47
Si Sa Ket	18.44	13.27	3.60
Surin	17.19	10.43	12.22
Ubon Ratchathani	7.01	19.13	5.45
Udon Thani	18.44	0.13	1.96
Yasothon	10.11	11.54	6.90
SOUTH	11.05	1.43	8.84
Chumphon	16.94	2.38	9.30
Krabi	8.63	5.00	4.76
Narathiwat	20.45	10.14	7.89
Nakhon Si Thammarat	14.67	4.19	21.18
Phatthalung	21.65	9.72	6.33
Pattani	6.36	-2.97	6.63
Phangnga	37.67	4.70	8.33
Phuket	7.24	-9.79	1.42
Ranong	5.91	16.42	25.64
Satun	4.22	9.52	21.74
Songkhla	9.61	-10.40	3.09
Surat Thani	6.80	12.01	9.28
Trang	12.86	6.55	-0.56
Yala	5.54	9.26	16.10
Whole Kingdom	9.63	2.12	5.16

Notes: *Excluding rice mills.
*In 1985, the Factory Control Division has revised the data on number of factories by deleting those factories which did not renew their registration. The number of factories in 1985 is thus much less than that in 1984. The growth rate for 1985 is therefore excluded from our calculation.
Source: Factory Control Division, Ministry of Industry.

Table 1.10

Industrial Distribution of Registered Factories, 1987*

Percent

TSIC	Name of Industry	Greater Bangkok	Rural Central	North	Northeast	South	Whole Kingdom
311	Food	6.82	36.27	19.89	47.76	18.47	17.25
313	Beverages	0.32	0.46	0.85	0.31	0.54	0.40
314	Tobacco	0.03	0.01	6.51	0.00	0.00	0.58
321	Textiles	5.15	1.03	0.44	1.15	0.34	3.41
322	Wearing Apparel	5.84	0.03	0.67	0.07	0.00	3.56
323	Leather	1.23	0.01	0.00	0.02	0.00	0.74
324	Footwear	0.98	0.04	0.00	0.00	0.00	0.59
331	Wood Products	5.66	9.83	9.40	4.12	13.04	6.94
332	Furniture	2.94	1.43	2.71	2.93	3.82	2.75
341	Paper Products	1.49	0.19	0.28	0.04	0.14	0.96
342	Printing and Publishing	5.76	1.51	1.89	1.74	2.40	4.16
351	Industrial Chemicals	0.53	0.25	0.15	0.00	0.07	0.37
352	Other Chemical Products	2.81	0.42	1.24	0.31	0.41	1.90
353	Petroleum Refineries	0.00	0.03	0.03	0.00	0.00	0.01
354	Petroleum and Coal Products	0.08	0.04	0.03	0.00	0.03	0.06
355	Rubber Products	1.56	2.25	2.48	1.89	5.47	2.03
356	Plastic Products	5.95	0.13	0.15	0.26	0.51	3.65
361	Pottery	0.24	1.34	1.96	0.22	0.41	0.56
362	Glass Products	0.18	0.01	0.00	0.00	0.00	0.11
369	Other Non Metallic Mineral Products	1.33	6.70	6.87	6.90	8.44	3.64
371	Iron and Steel Basic Industries	0.63	0.06	0.05	0.11	0.27	0.42
372	Non Ferrous Metal Basic Industries	1.21	0.10	0.28	0.04	0.07	0.77
381	Fabricated Metal Products	20.91	3.18	4.65	4.12	4.29	14.07
382	Machinery	9.54	15.10	20.04	10.55	19.49	12.03
383	Electrical and Electronic Products	3.18	0.93	1.29	0.57	0.57	2.25
384	Transport Equipment	5.74	5.70	5.14	5.09	4.29	5.52
385	Professional, Scientific Equipment	0.43	0.04	0.03	0.00	0.00	0.27
390	Others	9.44	12.86	12.96	11.78	16.96	10.99
	TOTAL	100.00	100.00	100.00	100.00	100.00	100.00

Note: *Excluding rice mills

Source: Provincial Factory Directories, Ministry of Industry.

Table 1.11

Decomposition of Changes in Value Added by Economic Sector and Region

Percent

Economic Sector	Greater Bangkok			Rural Central			North			Northeast			South		
	G	I	R	G	I	R	G	I	R	G	I	R	G	I	R
Agriculture	126.8	-19.6	-7.1	118.8	-18.3	-0.4	128.3	-19.8	-8.5	118.4	-18.3	-0.1	100.8	-15.6	14.8
Mining and quarrying	91.3	-2.5	11.3	92.1	-2.6	10.5	56.1	-1.6	45.4	131.4	-3.7	-27.7	175.0	-4.9	-70.1
Manufacturing	93.6	4.4	2.0	94.8	4.5	0.7	98.9	4.7	-3.5	106.2	5.0	-11.2	138.4	6.5	-44.9
Construction	139.7	-18.0	-21.7	101.2	-13.0	11.8	93.7	-12.0	18.3	87.0	-11.2	24.2	104.0	-13.4	9.4
Electricity and water supply	84.3	26.6	-10.9	64.1	20.3	15.7	61.4	19.4	19.2	74.1	23.4	2.5	74.2	23.5	2.4
Transportation and communication	77.0	10.0	13.0	112.5	14.6	-27.2	124.2	16.2	-40.3	108.5	14.1	-22.5	82.5	10.7	6.8
Wholesale and retail trade	97.2	-3.1	5.9	103.1	-3.3	0.2	121.5	-3.9	-17.6	117.8	-3.8	-14.0	106.8	-3.4	-3.4
Banking, insurance and real estate	78.6	23.8	-2.3	76.6	23.2	0.3	72.9	22.0	5.1	68.1	20.6	11.3	75.2	22.8	2.0
Ownership of dwellings	113.2	-10.6	-2.6	111.0	-10.4	-0.6	112.8	-10.6	-2.2	107.5	-10.1	2.6	103.2	-9.7	6.5
Public administration and defence	115.4	-4.4	-11.0	100.7	-3.9	3.1	98.9	-3.8	4.8	96.9	-3.7	6.8	99.1	-3.8	4.7
Services	92.1	12.3	-4.4	95.0	12.7	-7.6	83.1	11.1	5.8	71.9	9.6	18.5	86.3	11.5	2.2

Notes: G = Economic Growth Effect
I = Industry Effect
R = Regional Effect

Source: NESDB

Table 1.12
Revealed Comparative Advantage Index, 1987

Industry	Greater Bangkok	Rural Central	North	Northeast	South
Food	0.281	3.468	3.913	3.126	2.509
Beverages	0.594	1.762	2.909	3.524	1.904
Textiles	1.196	0.238	0.033	1.013	0.009
Wearing Apparel	1.293	0.007	0.110	0.016	0.048
Leather	1.132	0.026	0.029	2.519	0.001
Wood Products	0.944	0.687	2.448	0.812	2.727
Paper Products	0.591	2.274	2.273	2.161	3.435
Printing and Publishing	1.256	0.068	0.190	0.181	0.517
Chemicals	1.273	0.100	0.140	0.056	0.079
Rubber Products	1.056	0.157	0.722	0.573	5.468
Non Metallic Mineral Products	0.415	4.126	0.906	1.725	2.507
Iron and Steel	1.248	0.337	0.007	0.001	0.001
Fabricated Metal Products	1.250	0.167	0.096	0.189	0.305
Machinery	1.198	0.471	0.319	0.180	0.040
Electrical and Electronic Products	1.302	0.000	0.009	0.000	0.000
Transport Equipment	1.301	0.000	0.010	0.003	0.000
Others	1.032	1.058	0.904	0.426	1.031
Total	1.000	1.000	1.000	1.000	1.000

Source: NESDB

CHAPTER 2

CHARACTERISTICS OF RURAL INDUSTRIES

2.1 GENERAL CHARACTERISTICS OF SURVEYED ACTIVITIES

2.1.1 Selection of Sample Firms

This section of the report describes the characteristics of regional industries, based on data derived from the survey. Since the labor, financial and marketing aspects of regional industries -- including linkages among industries -- are thoroughly studied in other studies of this project, this section will focus mainly on the differences between the characteristics of regional industries and those of industries in Bangkok. It will also include some problems of regional industries identified in other research reports under the Rural Industries and Employment Project.

In the survey, a sample of factories was selected from various regions all over the country, with different levels of industrial development as measured by the ratio of the provincial manufacturing value-added to the gross provincial product (GPP) and per capita income. A total of 30 provinces were selected from the five regions: namely, Greater Bangkok, the Central Region, the North, the Northeast, and the South. Each region was represented by six provinces: two provinces with a high degree of industrial development (compared to other provinces within the region), two provinces with moderate industrial development, and two provinces with low level of industrial development. The survey covered factories located in different areas within the same region.

The surveyed provinces in each region, ranked by industrial development are as follows:

Greater Bangkok:	Bangkok, Samut Prakan, Pathum Thani, Samut Sakhon, Nakhon Pathom and Nonthaburi
Central:	Chon Buri, Ratchaburi, Saraburi, Prachin Buri, Suphan Buri and Sing Buri
North:	Chiang Mai, Nakhon Sawan, Phetchabun, Sukhothai, Phrae and Nan
Northeast:	Nakhon Ratchasima, Khon Kaen, Ubon Ratchathani, Nong Khai, Sakhon Nakhon and Si Sa Ket
South:	Songkhla, Surat Thani, Chumphon, Phangnga, Yala and Pattani

The sample firms were randomly selected from the list of factories registered with the Factory Control Division and the Provincial Industry Office, without limitations on industry type except for rice mills, which are excluded from the survey. However, when any particular industry represented an extraordinarily high percentage of total firms, some factories categorized under this industry would be deleted from the sample group and replaced by factories in other industries in order to avoid overconcentration. Thus, surveyed factories do not accurately reflect the actual distribution of factories registered with the Ministry of Industry.

We planned to survey more than 1,000 factories. After the survey, questionnaires with highly contradictory information were sorted out. A total of 989 questionnaires were used. However, many of these were incomplete or gave some contradictory or unreliable answers. The data derived from such questionnaires will not be taken into consideration for the analysis of the respective issues. The number of the firms presented for different issues is thus somewhat different, based on the number of the firms who gave complete answers to a particular question.

2.1.2 Industry and Factory Size

Table 2.1 indicates the distribution of factories in different provinces by employment size. Small factories with fewer than 10 workers constituted the largest group, representing 46.5 percent. When

factories with 10-49 workers are included, the percentage rises to 65.4. However, the number of factories with more than 100 workers was not negligible, totaling 119, or 12 percent of all surveyed factories. Most surveyed factories are located outside Greater Bangkok, while large-scale factories are mostly in Greater Bangkok. A number of large factories in our sample group are located in other regions. The share of factories with fewer than 50 workers was smaller in the sample group than in the group of all registered factories.

In terms of industry diversification, the survey covers many industries (at TSIC three-digit level), although the sample size of some industries was quite small and some industries did not exist in some regions. The industries with a large number of factories in the sample group included food, machinery, metal products, transportation equipment, and textiles. Many factories outside Greater Bangkok were classified under these industries (See Table 2.2). Thus, the structure of industries covered under this survey is in accordance with the diversification pattern of existing factories registered with the Factory Control Division.

Among surveyed factories, the factories outside Greater Bangkok were, on average, smaller than those in Greater Bangkok. Seven of the sampled factories with more than 500 workers were located in Greater Bangkok, while the remaining 16 factories were in other regions. Half of the large-scale factories in regional areas were in the food industry; the rest were textile, non-metal product and paper product factories. Provinces with these large factories included Sing Buri, Chon Buri, Ratchaburi and Saraburi in the Central; Sukhothai in the North; Nakhon Ratchasima and Khon Kaen in the Northeast and Surat Thani and Songkhla in the South. Most large-scale factories in our sample group that were located outside Greater Bangkok were in resource-based industries. However, with regard to the textile industry, which is market-oriented, as many as three factories were located in the Northeast (Nakhon Ratchasima and Khon Kaen) and one factory was located in the Central region (Chon Buri).

2.1.3 Start-up Year

Most factories (91.6 percent) in the sample group began operations after 1960; 37.5 percent opened between 1970-79. The number starting up after 1980 is larger: 398 factories, or 41.0 percent of sampled factories reporting the start-up year. A total of 106 factories started up after 1986 (see Table 2.3). The number of new factories in the South exceeded that in other regions, despite its low industrial value-added and very low industrial growth during 1981-87 (See Table 1.2). Many factories in the South registered in the factory directories could not be found during the survey. Some factories had closed. New factories in the South were mostly in food, wood product, rubber product, machinery and equipment industries. In the Northeast, a large number of factories started operations after 1980. The number of factories in the North and Greater Bangkok starting up after 1986 was relatively small compared to other regions, although the North's industrial growth measured by registered factory growth (Table 1.9) and industrial value-added growth during 1981-87 (Table 1.2) was not lower than that of other regions during the later period.

2.1.4 Foreign Investment

There were 38 factories with foreign capital participation in this survey. These factories were mostly located in Greater Bangkok (13 factories). There were five in the Northeast, five in the South and two in the North. Foreign ownership ranged from 10 to 100 percent. Employment also ranged from fewer than 10 to thousands of workers. Major industries in which foreigners invested were the food industry (nine factories), the textile industry (seven factories) and the chemical industry (three factories). Although major investors were Japan, ASEAN countries and Newly Industrialized Countries (NICs), there were also some investors from the U.S., Europe and other countries. Most of enterprises with foreign participation were located in Greater Bangkok and the Central provinces. Those located in other regions were mainly in major cities or regional centers such as Chiang Mai, Songkhla and Khon Kaen. Central provinces with foreign investment projects included

Chon Buri (seven factories), Saraburi (four factories), Ratchaburi (one factory) and Prachin Buri (one factory). In the North, both foreign investment projects were located in Chiang Mai. In the Northeast, foreign investment projects were in Khon Kaen (two) , Nakhon Ratchasima (one), Nong Khai (one) and Si Sa Ket (one) whereas in the South four foreign investment projects were located in Songkhla and one in Surat Thani.

2.2 PRODUCTION

2.2.1 Production Characteristics and Linkages to the Local Economy

Industries in regional areas, particularly in provinces with low level of industrial development are usually concentrated around only a few industries. The food industry is the most important. Other major industries include the wood product, non-metal product and machinery industries which mainly engage in the manufacture of household utensils repairs and other services. These industrial activities are established in regional areas partly due to natural protection such as product perishability (i.e. noodle, soybean curd), high transportation costs (i.e. bricks, cheap furniture) and the importance of proximity to customers (i.e. services). Local manufacturers can satisfy local demand without competition from non-local manufacturers. Nonetheless, improved transportation systems and substitutes for some local products (e.g. dried noodles and packaged soybean curd) have eroded this natural protection.

Other important characteristics of rural industries are a high degree of dependence on the local market, particularly among small-scale activities, and seasonal production. Moreover, the production capacity of rural industries is relatively low when compared to that of industries in Greater Bangkok. Industrial characteristics vary by industry, factory size and location, as will be discussed later.

In general, regional industries are closely related to the local economy because they manufacture and sell products to the local market, and rely heavily on the local work force and raw materials.

In terms of marketing, small-scale industries in regional greatly depend on the local market. A high percentage of surveyed industrial activities supplied their output to markets in the province or region where those activities were located. According to the survey, more than 80 percent of regional industrial activities served markets in the same province, while more than half of activities in Greater Bangkok did not serve the local market. On average, more than 70 percent of regional industrial activities generated greater than 50 percent of their domestic sales in local markets (in the province where activities were located). A large number of activities solely depended on the local market. Nearly 80 percent of industrial activities outside the Central Region did not serve the Greater Bangkok market. Approximately 30 percent of the industries surveyed in the Central region sold to the market in Bangkok. Industrial activities in the North were dependent on the local market to the highest degree. Industries with a large number of businesses relying heavily on the local market were the food, wood product, furniture, printing, non-metal product, metal product, machinery and transportation equipment industries. The last three industries mainly involved repair services. With regard to employment, activities with fewer than 20 employees depended heavily on the local market. The degree of local market dependence decreased as employment became larger and sales to Bangkok and exports increased.[1]

The percentage of export sales for firms in Greater Bangkok was higher than that for regional firms. Thirty and 13 percent of firms in Greater Bangkok and the Central region respectively exported their products, whereas less than 10 percent of regional firms produced products for exports. The level was 10 percent in the South 8.6 percent in the North, and 6.9 percent in the Northeast. Major regional industries with export sales included the food manufacturing, textile,

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1. See Tables 3.10 and 3.11 in Somluckrat W. Grandstaff (1990) and Table 3.1 in Rachain Chintayarangsan (1990).

wood product, rubber product, and handicraft industries. Apart from the manufacturing of some handicrafts, activities distant from Bangkok with export sales were mostly resource-based.

Rural industries were more dependent on local raw materials than were industries located in the Central Region. Industries outside Greater Bangkok and other Central provinces depended on local production factors to a higher degree than in Greater Bangkok and relied on production factors from Bangkok and imports to a lesser extent. Approximately 60 and 15 percent of industrial activities outside and inside Greater Bangkok, respectively, acquired over 50 percent of their raw materials from within the province. Activities in the North, Northeast, and South were more dependent on indigenous raw materials than those in the Central. However, Bangkok is a rather important source of raw materials and intermediate goods for some rural industries. Although approximately 60 percent of rural industrial activities did not source any raw materials or intermediate goods from Bangkok, quite a few regional firms depended on raw materials from Bangkok. More than one-fourth of all regional industrial activities purchased greater than 50 percent of their raw materials from Bangkok, but the dependence on imported raw materials or intermediate goods of regional industrial activities was very low. More than nine percent of regional firms did not import any raw materials or intermediate goods, and only a few firms relied greatly on imports. Rural factories highly dependent on imports were found among the textile, garment, printing, chemical, rubber product, plastic product, metal product and transportation equipment industries. In general, small enterprises depended heavily on regional raw materials and intermediate goods, and relied on imports and essential materials from Bangkok to a lesser degree than large-scale enterprises. Nevertheless, small enterprises in such industries as textiles, machinery and transportation equipment depended on raw materials or intermediate goods from Bangkok or abroad. Apart from raw materials and intermediate goods, regional firms were less dependent on imported machinery than were enterprises in Greater Bangkok.[2]

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2. See Tables 2.1 - 2.4 in Rachain Chintayarangsan (1990).

Regarding employment, a high percentage of the rural industrial work force was recruited from within the province. More than three-fourths of unskilled workers were recruited from local areas and more than 70 percent of skilled workers were recruited within the province.[3] Regions with the high dependence on the local work force were the Northeast and the North. The Central and the Southern regions were more dependent on workers from other regions but less so than Bangkok, where the work force was mostly from other provinces.

In addition to their relationship to the locality in which local people buy production output and supply raw materials and labor, rural industrial activities are interrelated through subcontracting among different industries or between urban industrial activities and villagers. Nonetheless, this survey reveals only negligible formal subcontracting relationships among rural activities; but connections among different activities and between industrial activities and rural people were more significant.[4] The study under the Rural Off-Farm Employment Project (Donald M. Mead, 1981) indicates that urban manufacturers of some products subcontract processes to rural households by providing them with the required raw materials plus equipments or instruments. For instance, in Chiang Mai and other provinces in the North, urban manufacturers have cut fabric sewn by rural households; carved wood product manufacturers provide carvers in villages with wood and design; some silk manufacturers in the North and Northeast use only a few weaving machines and dyeing equipment, and subcontract other processes to neighboring villages.

The high degree of linkages between industrial activities and local economy indicate the mutual support of the survival and growth of rural industries and the rural economic sector. An increase in the agricultural sector's income due to improvement of production efficiency and higher agricultural product prices not only creates more savings for

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3. See Table 3.3 in Pradit Charsombut (1990).

4. See Tables 3.18, 3.19 and the analysis in section 3.2.2 in the report by Somluckrat W. Grandstaff (1990).

further investment in agricultural activities and other off-farm activities, but also raises farmers' purchasing power for industrial goods. This will stimulate more industrial growth in regional areas. Meanwhile, industrial expansion will create more employment opportunities and incomes derived from the sale of raw materials to the promotion of manufacturers. Thus, rural industry leads to positive effects on income and employment and stimulates other economic activities.

2.2.2 Irregular Production and Capacity Utilization

Rural industries' dependence on local economies to create a market and regarding markets, supply raw materials and labor causes irregular production. Capacity utilization usually fluctuates. Many rural industries cease production during some periods of the year due to raw material shortages. The shortages may be caused by seasonal availability of some products such as vegetables, fruits and perishables, or rising raw material prices (e.g., wood). Another factor leading to irregular production is seasonal product demand. In some cases, small enterprises serving the local market cannot manufacture and keep products until the peak season arrives due to the nature of products and the lack of financial resources to maintain raw materials and finished product inventories. Moreover, the manufacture of some products must rely on climatic conditions. For example, some products cannot be made in the rainy season because of the need for sunlight.

According to the survey, most enterprises (71.3 percent) had irregular production. Industries with the most irregular production were the food, metal product, machinery, wood product, non-metal product, printing, tobacco and rubber manufacturing industries. As expected, a higher percentage of rural industrial activities had more seasonal production than did industrial enterprises located in Greater Bangkok, and small-scale factories faced higher production irregularity than larger ones. The remaining Central provinces showed slightly higher seasonality than did other regions (See Table 2.4).

The most important cause of production irregularity is seasonal demand, which occurs in many industries such as the textile, garment, wood product, furniture, printing, rubber product, non-metal product, metal product, machinery and transportation equipment industries. The second most significant cause is the seasonal shortage of raw materials, particularly in the food, wood product and tobacco industries. Another important factor is the nature of some products which depend on the climatic conditions. The food and non-metal product industries are the major industries facing this constraint. The seasonal shortage of labor does not seem to be a main cause of irregular production compared to the three aforementioned factors, and the labor shortage problem mainly occurs in the wood product, metal product, machinery and transportation equipment industries. However, about one-third of the surveyed activities had seasonal employment. Even in Greater Bangkok, more than 20 (about 20 percent) of the surveyed enterprises had seasonal employment. Still, employment seasonality was more evident in regions other than Greater Bangkok, where approximately 40 percent of surveyed activities reported seasonal employment. In the South, only 25 percent of all surveyed activities had seasonal employment. Activities with high seasonal employment were concentrated in firms between 10 and 100 employees. Very small and very large activities had less seasonal employment.

The importance of factors causing production fluctuations differed from region to region. In Greater Bangkok and other Central provinces, seasonal demand was the most significant factor, and labor shortages were also important. In other regions, although most surveyed enterprises considered seasonal demand a cause of production fluctuations, raw material and labor shortages were relatively more important. The survey results on production regularity are in accordance with previous studies. The study by Tambunlertchai and Loha-Unchit (1985) indicates that seasonal demand, climate-sensitive production, and the seasonal availability of raw materials are more important factors than seasonal labor shortages.

The survey examined whether the production capacity of the surveyed activities was fully utilized in 1987. Full capacity refers to the

utilization of machinery and equipment up to the limit, with no constraints regarding demand, labor and raw materials. The survey also examined the number of production days per year and the average number of production hours per day. Over half (57.3 percent) of surveyed activities reported that production capacity was not fully utilized in 1987. In Greater Bangkok, activities utilizing full capacity outnumbered those operating at below full-scale capacity, but the opposite occurred in other regions. The percentage of activities with idle capacity in the Northeast and the South was the highest (Table 2.4).

Generally, large-scale activities utilize their production capacity more effectively than do small ones. Nonetheless, it also depends on the nature of the industry. A high percentage of enterprises operating at below full capacity was found in the food, wood product, chemical and non-metal product industries. More than three-fourths of the predominantly small food factories in the Northeast did not fully utilize their production capacity.

We attempted to derive capacity utilization rates by calculating the ratio of actual production hours to full capacity in each industry, but the result was not satisfactory. The capacity utilization of each activity greatly varied. With regard to working days and hours, 73.5 percent of surveyed factories operated more than 300 days per year, and 23.2 percent of these factories had more than 350 working days. Moreover, the percentage of small enterprises with a high number of working days was not lower than that for large firms. Most firms (74.6 percent) operated between 8 and 12 hours per day. Enterprises in the large sized group operated for more working hours per day on average.

The most frequently quoted cause of partial capacity utilization was inadequate demand. The second most important cause was shortages of raw materials and labor. Insufficient demand was a more important factor in Greater Bangkok, while raw material shortages were considered the most significant cause of underutilization of production capacity in regional areas, particularly in the North and the South (See Table 2.5).

2.2.3 Production Growth

The production figures of 1987 and 1982 (and of the start-up year in the case of the firms less than five years old) given by the surveyed firms appear imprecise. Some figures contradict responses to other related questions. However, taking into account the average production value achieved by 659 firms in those years, we found a remarkable annual rate of production growth of 50% in several industrial sectors. Thriving in the Greater Bangkok area were firms in the beverage, publishing, non-metal product, machinery and electronics industries. In the Central Region, the production of textiles, chemical products, non-metal products, and machinery out paced other products. The manufacture of beverages, garments, chemical products, non-metal products grew quickly in the North. In the South, the food-processing, publishing, rubber product, transportation and equipment industries fared well; whereas the production of beverages, garments, chemical products, non-metal products, and transportation equipment, gained ground in the Northeast.

Nonetheless, it should be noted that the above rates of growth are significantly influenced by the activities of a few large firms in each region, because the sample sizes of each industrial sector are very limited. Consequently, the growth rate must be interpreted carefully. In addition, other factors such as the data on employment and value-added of industries by regions should be taken into consideration. However, shortages of information on value-added of the regional firms at the TSIC three-digit code level, and of employment data in various industrial sectors impede the investigation of this issue.

Additional information about production trends can be gleaned from the production and employment plans of firms for the next five years. Almost 40% of the interviewed manufacturers plan no expansion in the next five years. About 30% are uncertain, while the 30% remaining have scheduled some expansion of their production lines. The South had the highest percentage of firms with production expansion projects (35.3%), followed by Greater Bangkok (34.5%), the Central region (27.9%), the

Northeast (24.0%) and the North (17.7%). Our survey shows the consistency between the projected figures of manufacturing and employment schemes. Clearly, a large number of firms in the South, Greater Bangkok and the Central regions projected an upsurge in employment, while those in the North and the Northeast indicated the lowest rate of projected increases in employment. In each industrial sector, the number of firms projecting labor increases was greater than the projecting declines.[5] The converse was true for expectations of industrial growth.

Interestingly, although with the lowest rates of and employment generation, the proportion of Southern firms projecting growth in the next five years in the survey was the highest in all regions. This is possibly due to the fact that firms responding to our survey were those with potential for survival and growth. Specifically, these firms manufacture food-processing products, textiles, rubber products, non-metal products, and transportation equipment.

2.3 PROBLEMS OF REGIONAL ENTERPRISES

2.3.1 Marketing and Management

Rural businesses, particularly those relying on local markets with low levels of economic development, typically encounter cyclical demand due to fluctuations in the purchasing power of local consumers. It is difficult for businesses in the regional areas to penetrate new markets because of differences in product features, production technology and management techniques. There is often a perception that firms located far from Bangkok and the urban centers will benefit from lower labor costs and better access to resources and raw materials. In fact, lower labor costs may be no longer the major incentive for locating factories in the rural areas.[6] First, the continuing migration of labor within

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5. See Table 5.1 in Pradit Charsombut (1990).
6. See Pradit Charsombut (1990) for an analysis on regional wage differences.

and between the regions leads to insignificant inter-regional wage differences. Furthermore, in some underdeveloped areas, shortages of skilled labor are more critical. Skilled workers are often enticed to move to other areas or regions with higher wages. In addition, the easier access to raw materials is realized mostly by manufacturers whose production process requires large quantities of bulky and heavy inputs. Generally, the movement of raw materials and labor is made easier and cheaper through improved infrastructure. Consequently, the attractiveness of regional locations is reduced. Furthermore, the free movement of the factors of production between the regions increases the threat of competition from lower-cost producers in other regions.

The perceived advantages of lower land costs for firms locating in the regional areas are essentially counterbalanced by shortfalls in infrastructure and the unavailability of necessary utilities, including electricity, water, and telecommunications. Thailand's industrial development can be characterized by the following patterns: decentralization of industries from Greater Bangkok to the nearby provinces in the Central region; and dispersion of the industries to more developed cities including Chiang Mai in the North, Chon Buri in the Central region, and Surat Thani in the South. In the latter case, the relocation of the plants or the establishment of new plants in provinces outside Greater Bangkok often came as a consequence of excessive increases in the cost of land and other costs resulting from the increasing concentration of industrial activities in Bangkok.

For problems confronted by manufacturing enterprises, several earlier studies (Saeng Sanguanreung et. al., 1978; and World Bank, 1983) found that marketing and finance are the most pressing problems for businesses located in regional areas. Another problem of lesser importance is the accessibility of raw materials. Shortages of skilled labor were not seen as serious. It was therefore concluded that regional industries do not rely heavily on skilled labor.

Our conclusions concur with the earlier studies. Most firms emphasize marketing problems followed by the problems of supplying raw materials and skilled labor. For enterprises in the South, marketing

constraints are not as acute as is the supply of raw materials. Firms in Greater Bangkok and the Central region rank regulation and taxation as second to marketing constraints, with shortages of raw materials in third place. The emphasis that most regional businesses place on raw material problems reflects their high degree of dependence on the supply of indigenous resources. However, for provincial business respondents, labor problems are not as are pressing as marketing, raw material, and taxation problems. The above-mentioned marketing problems are mostly due to the inability of the local markets to absorb the supply of manufactured goods. Rural businesses that depend on local markets often encounter this problem as a consequence of declines in the already weak purchasing power of the consumers.[7]

However, marketing dilemmas do not hamper the growth of all regional industries. A great number of regional businesses, such as food-processing and handicrafts, have successfully expanded their market domain into other regions and Bangkok. Currently, many firms in these industries manufacture for export to other countries. Small-scale factories producing to fulfill local needs are typically slow to develop the capabilities needed to move into other markets. The growth of small industries is thus susceptible to local demand.

In the area of competition, our survey found that products from Bangkok are increasingly taking market share from regional enterprises in the provinces markets. In the survey, imported products were seen as the most serious source of competition in Greater Bangkok (31.3%), the North (19.1%) and the Central Region (14.2%). The Northeast and the South reported less competition from imports but 20% of firms from these areas cited competition from Bangkok as a major problem. Nonetheless, more than one-third of the enterprises in the North and the Central Region felt greater effects (relative to the South) from the presence of products made in Greater Bangkok. On average, three-fourths of the surveyed businesses regard other local manufacturers as their key competitors; the level in the North and in the Central regions was 85%. Approximately 50% of the surveyed firms say rivals from other regions

7. See Table 3.1 in Watana Na Ranong (1990).

are second to local competitors, and this type of competition is greatest in the North and the Central Regions. It is striking that, compared to the figures five years ago, the number of firms affected by competition from imported goods and Bangkok products is increasing, while the number of firms facing competition from local producers is declining. On the one hand, this trend reflects the fact that regional businesses, particularly in the North and the Central region, have successfully upgraded themselves to compete with imports and goods from Greater Bangkok. On the other hand, it could indicate the increasing penetration of Greater Bangkok products into the regional markets. In summary, provincial businesses have been increasingly affected by competition, mainly from Greater Bangkok, foreign producers and local manufacturers.

In conformity with our findings on the reliance of regional businesses on the local markets, a higher proportion of large-scale manufacturers face stiff competition from imports and products made in Greater Bangkok. The regional producers of textiles and chemical products are most affected by imports. Firms in the textiles, chemical and metal product industries are under greatest pressure from Greater Bangkok competitors. In the food processing sector, an increasing number of firms are concerned with competition from imported and Bangkok products, although for most of the firms in this industry, competition among local producers is still for more significant.

Competition is one of the major factors discouraging the majority of the surveyed manufacturers in the regional areas from increasing production. In addition, other marketing constraints as well as supplies of raw materials are reasons for a zero-growth policy. The proportion of firms in the regions encountering these three problems is greater than in Greater Bangkok. The manufacturing sectors in which a higher proportion of firms are not planning to expand production include food-processing, wooden products, chemical products, metal products, and machinery. The manufacturers of food and wood product are hardest hit by shortages of raw materials. Generally, the regional small-scale companies experience marketing problems and encounter fiercer

competition than do large-scale enterprises or small firms in Greater Bangkok.

Furthermore, problems of finance which used to trouble most firms (see Saeng Sanguanreung et. al. 1978; Tambunlertchai and Loha-Unchit, 1985) have become less important in our survey. Firms in Greater Bangkok and the Central region, for example, place finance problems after regulations and taxation. But for provincial industries in general, financial constraints still ranked high among the problems they are facing.

The firms ranked their management problems in the following order: marketing, finance, production, personnel and then accounting.[8] The fact that firms view marketing as the most important management problem is possibly explained by the competition or the persistent marketing constraints previously discussed. Firms with fewer than 10 employees view marketing problems as particularly critical. They are not much concerned with accounting management, although many firms expressed problems with financial management. Firms between 10 and 50 employees faced some problems in accounting management. This could be explained by the fact that the financial structure of small businesses is not very complex and does not require the systematic accounting management that is necessary in larger firms. Accounting problems therefore would be expected to increase as the firms grow. At some point, a professional accountant is usually employed to manage the accounting tasks. The survey revealed that firms in Greater Bangkok experienced the least accounting management problems, whereas those in the Northeast suffered the most. Firms in every region identified marketing and financial problems as being extremely critical.

These problems arose partly from the organization of the firms themselves. It is often found that traditional business practices and old-fashioned styles of decision making do not respond to the changing environment. This not only aggravates the emerging problems but also weakens competitiveness and threatens the survival of the companies.

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8. See Table 3.2 in Watana Na Ranong (1990).

Public and private agencies should help alleviate some of the problems hindering the survival and growth of regional industries.[9]

2.3.2 Labor Issues

Seasonal migration of labor between regions is a typical feature of the labor market in Thailand. The employment of migrant workers continues at a high rate. Annual labor surveys indicate that the work force engaged in manufacturing activities during the rainy season is much smaller than during the summer, since workers return to work on the farm during this time. On the one hand, the seasonal employment benefits the rural economy, since underemployment is reduced through employment in the manufacturing sector. On the other hand, the shortages of labor during the crop season significantly affects the industrial sector. The high turnover rate also impedes attempts of enterprises to develop working skills in their employees.

Regional industries have greater problems with seasonal employment than do firms in Greater Bangkok. Interestingly, more firms report seasonal production problems than seasonal employment problems. The fluctuations in production may result from several factors. Compared to marketing constraints and shortages in supply of raw material, seasonal shortages of labor posed less constraint on expansion and growth of regional firms.

An earlier study (Saeng Sanguanreung et. al., 1977) discovered that labor turnover, both due to seasonal effects and other causes, was critical. Our survey, however, found that shortages of skilled labor are perceived as being more critical. Complaints are mostly made about shortages of engineers and skilled labor. In addition, quite a few firms are affected by the unavailability of unskilled and semi-skilled labor.[10] The turnover rate of employees is not as critical as is the

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9. See Watana Na Ranong (1990) for the provision of services to regional industries.
10. See Table 4.17 in Pradit Charsombut (1990).

shortage of skilled labor in regional areas, especially in the South. The Central region, the Northeast and the North suffer more from seasonal shortages of labor. Not many firms are affected by wage increases. Shortages of skilled labor are acute in firms with fewer than 10 employees and in industries such as metal products and machinery and transportation equipment. This reflects the current tight labor market. Skilled workers in many medium-sized provincial businesses are incited by higher pay to jump between firms.

2.3.3 Financial Issues

Several surveys revealed problems of financial management in medium-scale regional enterprises. In general, small-scale firms use their own funds to establish and operate their businesses. Commercial banks are the major external source of funds, while other financial institutions designed to render financial assistance to regional enterprises, such as the Industrial Finance Corporation of Thailand and the Small Industry Finance Office, have not been able to achieve their objectives. Other financial institutions are rarely mentioned as financial sources for small-scale enterprises. The medium and small-scale firms often face difficulties in obtaining loans due to insufficient credit lines, or inability to meet collateral requirements. Overdraft facilities are generally the major short-term source of funds used by firms to finance the purchase of fixed assets. Difficulties in obtaining overdraft facilities from commercial banks lead to the emergence of the informal money market instruments, which are relatively less demanding in the borrowing procedure. Furthermore, trade credit and other types of loans based only on personal connections and known business achievements are widely used. This kind of financing from informal sources, although at high interest rates, is normally resorted to by small firms. This puts small firms at a disadvantage compared to their larger counterparts who tend to have less difficulty in obtaining low-cost loans from established financial institutions.

Problems of financing are discussed in detail in Saroj Angsumalin (1990). In studying the financial problems of rural enterprises, one often finds a contradiction. On the one hand, rural firms commonly complaint about the deficiency of funding sources and the high interest costs they must bear; this implies that there is a general lack of credit facilities in provincial areas. On the other hand, however, the low loan/deposit ratio in most provincial areas indicates the transfer of financial resources from the outer regions to the Central region by commercial banks. The low loan/deposit ratio in the provinces could lead one to conclude that financial resources are more than sufficient and that investment opportunities are rare in the regions. The banks therefore cannot find appropriate projects to which to extend credits and have to transfer resources from the regional to the central offices. Are financial resources really insufficient for industrial development in the provincial areas?

Saroj's analysis showed that problems of accessibility of financial resources in regional industrial activities can be characterized by the behavior of both lenders and borrowers. The financial institutions are reluctant to provide financial assistance to the enterprises established in the remote areas due to high default risks, and insufficient financial information provided by the borrowers. As profit-seeking institutions, the commercial banks would unavoidably consider the costs as well as the benefits of giving loans. The provincial enterprises with insufficient collateral will normally have difficulty obtaining financial facilities. In particular, the high cost of project appraisals, and the lack of information and qualified project analysts discourage regional bank offices from granting credit lines commonly applied for by firms in remote areas. Therefore, the banks prefer to grant credits to larger industries with well prepared projects and applications. They also tend to give loans to firms located in the cities rather than in the outer areas.

Our findings regarding financial problems of the regional enterprises are mostly consistent with past studies. Significant differences in financing ability are found between large and small firms. A major discrepancy is also found for enterprises situated in the

urban areas with high level of economic development and those in the underdeveloped areas of the same region. In general, there are no major differences between the financing problems faced by firms in different regions. But firms located in different regions tend to different aspects of the problems they have encountered. Northeastern firms, for instance, emphasize the high rate of interest, while firms in the other regions see insufficient credit lines as more critical.

Our study agreed with past studies, especially on the issue of the seasonal requirement of funds and the firms' dependence on informal credits. Similar to other studies, the findings on finance tend to imply that the lack of financial resources hinders the growth of regional industries located outside urban areas.

2.3.4 Accessibility of Government Assistance Facilities

The activities of several government bodies set up to promote regional industries, such as the offices under the Industrial Promotion, Department of the Ministry of Industry and public service agencies that provide information and other assistance, are limited by budgetary and personnel constraints. Their services covered limited geographical areas and were concentrated mainly in Bangkok or in regional economic centers.

Our survey revealed that most regional enterprises, and even some in Greater Bangkok, are unaware of the existence of the public service agencies such as the Industrial Promotion Center, the Thailand Industrial Productivity Center, the Thailand Institute of Scientific and Technological Research, the Technology Transfer Center, the Department of Science Services, and the Small Industry Finance Office. The largest number of firms that are unacquainted with these institutions was found in the Northeast and in provinces in the Central region outside of the Greater Bangkok.[11]

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11. See Watana Na Ranong (1990), Tables 3.38 to 3.43.

Regional enterprises are familiar with the public authorities which they have to contact, such as the Provincial Industry Office and the Provincial Commerce Office. Not many firms are cognizant of the industrial promotion agencies, however. But the limited number of firms who have gained access to the services of provided by these offices mostly satisfied with the services rendered.[12] With a wider geographical coverage, these agencies will be able to contribute to the promotion of the firms' efficiency; this will help the firms become more self-sufficient in their future operations. It is thus worth considering how to broaden the geographical coverage of these assistance programs.

12. See Watana Na Ranong (1990), Tables 3.44 to 3.49.

Table 2.1

Distribution of Sample Firms by Province and Number of Employees

Region/Province	Number of Employees						Total
	1-9	10-19	20-49	50-99	>=100	Not Known	
GREATER BANGKOK	**26**	**23**	**25**	**12**	**33**	**0**	**119**
Bangkok	7	5	3	2	3	0	20
Nakhon Pathom	0	8	4	2	4	0	18
Nonthaburi	8	1	3	3	7	0	22
Pathum Thani	2	5	6	1	6	0	20
Samut Prakan	3	4	4	2	6	0	19
Samut Sakhon	6	0	5	2	7	0	20
RURAL CENTRAL	**114**	**34**	**27**	**14**	**25**	**4**	**218**
Saraburi	14	6	8	4	6	2	40
Sing Buri	19	7	3	0	1	1	31
Chon Buri	15	7	3	6	10	0	41
Prachin Buri	22	4	5	2	2	0	35
Ratchaburi	21	4	6	2	4	1	37
Suphan Buri	23	6	2	0	2	0	33
NORTH	**121**	**36**	**30**	**11**	**15**	**2**	**215**
Nakhon Sawan	34	5	5	3	3	0	50
Phetchabun	17	4	3	0	1	0	25
Sukhothai	23	6	4	0	1	0	34
Chiang Mai	12	16	10	5	4	1	48
Nan	17	2	2	1	2	1	25
Phrae	18	3	6	2	4	0	33
NORTHEAST	**99**	**50**	**36**	**13**	**20**	**0**	**218**
Khon Kaen	16	11	9	6	8	0	50
Sakon Nakhon	15	4	5	1	0	0	25
Nong Khai	21	4	6	1	2	0	34
Nakhon Ratchasima	16	18	10	1	5	0	50
Si Sa Ket	11	4	1	4	4	0	24
Ubon Ratchathani	20	9	5	0	1	0	35
SOUTH	**100**	**44**	**31**	**17**	**26**	**1**	**219**
Chumphon	11	9	8	4	4	0	36
Phangnga	17	4	2	1	0	1	25
Surat Thani	21	11	7	6	5	0	50
Pattani	20	5	4	2	4	0	35
Yala	9	4	5	2	4	0	24
Songkhla	22	11	5	2	9	0	49
TOTAL	**460**	**187**	**149**	**67**	**119**	**7**	**989**

Source: Rural Industries and Employment Project Survey, TDRI, 1989.

Table 2.2

Number of Sample Firms by Industry and Region

TSIC	Industry	Region					Total
		Greater Bangkok	Rural Central	North	Northeast	South	
311	Food	13	61	48	76	56	254
313	Beverages	1	3	4	4	3	15
314	Tobacco	-	-	5	-	-	5
321	Textiles	16	11	2	7	3	39
322	Wearing Apparel	4	-	3	2	-	9
323	Leather	2	1	-	-	-	3
331	Wood Products	8	21	25	19	24	97
332	Furniture	3	4	5	10	11	33
341	Paper Products	1	1	4	1	1	8
342	Printing and Publishing	4	2	3	2	6	17
351	Industrial Chemicals	2	2	1	-	2	7
352	Other Chemical Products	6	3	3	3	3	18
355	Rubber Products	3	4	5	3	13	28
356	Plastic Products	3	1	4	4	3	15
361	Pottery	-	4	3	2	4	13
362	Glass Products	1	-	-	1	-	2
369	Other Non Metallic Mineral Products	5	28	13	17	18	81
371	Iron and Steel Basic Industries	2	-	1	1	2	6
372	Non Ferrous Metal Basic Industries	1	1	-	1	-	3
381	Fabricated Metal Products	15	9	12	13	13	62
382	Machinery	12	32	46	21	37	148
383	Electrical and Electronic Products	5	3	3	1	2	14
384	Transport Equipment	6	18	21	22	12	79
390	Others	6	9	4	8	6	33
	TOTAL	119	218	215	218	219	989

Source: Rural Industries and Employment Project Survey, TDRI, 1989.

Table 2.3

Year of Establishment, Legal Status,
Foreign Investment Participation of Sample Firms by Region

number of sample firms

Attribute	Region					Total
	Greater Bangkok	Central	North	Northeast	South	
Year of Establishment						
Before 1960	15	23	18	12	14	82
1960 - 1969	14	31	26	30	26	127
1970 - 1979	40	78	89	83	74	364
1980 - 1985	39	58	65	62	68	292
1986 and after	11	22	13	27	33	106
TOTAL	119	212	211	214	215	971
Legal Status						
Limited Company	51	31	18	26	46	172
Limited Partnership	21	28	26	41	34	150
Ordinary Partnership	1	3	10	8	6	28
Single Proprictorship	44	151	159	141	132	627
Others	2	2	1	1	1	7
TOTAL	119	215	214	216	219	984
Foreign Investment						
Yes	13	13	2	5	5	38
No	106	205	213	213	214	951
TOTAL	119	218	215	218	219	989

Source: Rural Industries and Employment Project Survey, TDRI, 1989.

Table 2.4
Regularity of Production and Most Important Reason for Irregularity

number of sample firms

Region	Regular	Irregular	Reasons for Irregular Production					
			1	2	3	4	5	Total
Greater Bangkok	52 (43.7)	67 (52.3)	6	42	0	10	7	65
Rural Central	51 (23.8)	163 (76.2)	24	117	7	21	8	177
North	66 (31.9)	141 (68.1)	35	73	7	25	16	156
Northeast	54 (25.0)	162 (75.0)	34	92	12	19	9	166
South	56 (25.8)	161 (74.2)	59	67	2	18	15	161
Total	279 (28.7)	694 (72.3)	158	391	28	93	55	725

Notes: 1 = Seasonal Availability of Raw Materials
2 = Seasonal Demand for Product
3 = Seasonal Labor Supply
4 = Production Process depends on Season
5 = Other

Source: Rural Industries and Employment Project Survey, TDRI, 1989.

Table 2.5
Capacity Utilization

number of sample firms

Region	At Full Capacity	Less than Full Capacity	Reasons for Underutilization of Capacity				
			1	2	3	4	Total
Greater Bangkok	69 (58.0)	50 (42.01)	8	9	36	1	54
Rural Central	93 (43.5)	121 (56.5)	25	15	78	19	137
North	98 (46.9)	111 (53.1)	30	10	76	16	132
Northeast	75 (34.9)	140 (65.1)	30	21	88	19	158
South	81 (37.5)	135 (62.5)	52	21	87	17	177
Total	416 (42.8)	557 (57.2)	145	76	365	72	658

Notes: 1 = Shortage of Raw Material
2 = Shortage of Labor
3 = Shortage of Demand
4 = Other

Source: Rural Industries and Employment Project Survey, TDRI, 1989.

CHAPTER 3

THE ENTREPRENEUR AND HIS CHOICE OF LOCATION

3.1 THE ENTREPRENEUR

3.1.1 Education, Age and Business Experience

An entrepreneur is the one who undertakes the production of goods and services. He gathers factors of production, such as labor, capital, and raw materials to process and turn them into commodities to fulfill the demands of the society. To initiate his business, he has to make decision on the type of product, the amount of investment and employment and the location of his factory. In particular, he must bear all the associated risks. An industrial entrepreneur needs to be well equipped with several characteristics in order to be able to survive and generate growth in his business. In addition to these qualifies possessed by the entrepreneur, favorable government regulations, strong financial support, and cooperation of the staff will contribute to a firm's prosperity. A study on the backgrounds of regional industrial entrepreneurs in terms of family background, education, age and work experience as well as his business motivation will be helpful for the promotion of provincial industries.

The survey discovered that many manufacturers have only a primary school education. As evidenced in Table 3.1, some never received a formal education. The entrepreneurs who have only primary level education account for 37.1% of all surveyed entrepreneurs. Forty-two of the total (4.3%) never went to school. 28.9% of the manufacturers received high school education, and 16.7% received higher education. These university-educated manufacturers are mostly found in Greater Bangkok, with very few in the Northeast.

It was also found that uneducated and primary-school educated proprietors typically run small-scale business with fewer than 10 employees. The manufacturers with vocational school education are also mostly found in small-scale enterprises and in industries such as food products, metal products, machinery and wood products.

Compared to a previous study by Saeng Sanguanreung in 1976 (Saeng Sanguanreung et. al., 1977), our findings reflect an improvement in the educational level of the small and medium-scale regional manufacturers, their educational level is although still relatively low on average. This implies that regional entrepreneurs are better educated nowadays and that an increasing number of university graduates take a career path in the manufacturing sector.

The ages of the entrepreneurs mostly fall in the range between 30 and 60. Relative to the other regions, more Southern and Northeastern businessmen are in the younger group (Table 3.2).

Generally, knowledge and experience from past occupations greatly contributed to the establishment of the present businesses. As described in Table 3.3, most surveyed manufacturers (80%) were previously owners of commercial enterprises, owners of a manufacturing enterprise, employees of a manufacturing enterprise, or family apprentices in manufacturing enterprises.[1] About 82.8% of these entrepreneurs continued in the same industrial fields as their previous ones. This was typical of the managers of small and medium- scale firms. Our conclusions about the contribution of former business experience to a new enterprise are comparable to previous studies (Saeng Sanguanreung et. al., 1977). Expertise generated from previous business involvement and connections created within a particular business society greatly support the establishment of a new business.

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1. The questionnaire aims at the previous occupation of the enterprise "founder" rather than the present administrator. This would give an insight into the background and experience of the enterprise founders.

Most entrepreneurs acknowledged that the production and management techniques employed in the current operation were mostly developed from past experience. This is especially true for production technology. A greater number of rural managers compared to those in Greater Bangkok, are usually self-educated in production technology.[2] It is interesting to see from Table 3.3 that 54 regional business founders had previous occupations in the agricultural sector. They are found both in medium and large-scale enterprises in the food, non-metal product, machinery, and vehicle sectors.[3] This indicates the possibility of promoting farmers or peasants to enter into manufacturing activities.

3.1.2 Factors Important for the Establishment of Manufacturing Activities

Manufacturing activities require many supporting factors which generally include knowledge regarding production, potential customers, ability to compete with existing firms, and financial backing. The factors important for the establishment of industrial enterprises could vary according to the type of activity and location. As illustrated in Table 3.4, the skills and know-how derived from past involvements in production are among the major reasons given by most manufacturers for their current choice of industrial activity.

The entrepreneur's perception of a demand for the product is an important prerequisite for the entrepreneur to enter into the present business; present business activities are also taken up through the inheritance of family-owned business, and collaboration with persons with knowledge of product sales or production techniques. Firms in Greater Bangkok and the Central region stress the importance of marketing over production techniques, while manufacturers in the North and in the South highlighted the relevance of the latter. Specifically, firms with fewer than 10 employees in the South stress the importance of technical know-how, while larger firms tend to give more importance to

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2. See Section 3.5 and 3.6 together with Tables 3.36 and 3.37 in Watana Na Ranong (1990).

3. In many instances, the current firm size may be larger than at the start-up time.

the existence of demand. However, the findings regarding product demand reveal a higher degree of reliance on local markets by small and medium-scale firms compared to large firms.[4] Clearly, production know-how and marketing potential are the major factors influencing manufacturing activities in rural areas. But these two factors are both critical; neither one can be ignored. Manufacturer cannot ignore marketing prospects, although a greater weight may be assigned to production technique. The reason that larger firms give more importance to the existence of market demand as a factor for their decision to invest could be due to the fact that many of them not only serve the local market, but also expand their markets to other areas, and the existence of adequate demand is essential for their survival and growth.

A review by sector found that market potential is often the principal motivation for the establishment of private firms in the food, textiles and garment, plastic product, and non-metal product sectors, whereas possession of technological know-how is a more important impetus for manufacturers of wood products and furniture, metal products, machinery, and transport equipment.

3.1.3 Role of Local Entrepreneurs

Rural manufacturing activities could be established in different ways:

1. establishment of new businesses by entrepreneurs in the locality;
2. expansion of business by existing entrepreneurs to other of manufacturing activities; and
3. establishment of manufacturing activities by entrepreneurs outside of the region (i.e. from Greater Bangkok or from foreign countries).

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4. See Table 3.10 in Somluckrat W. Grandstaff (1990).

In addition, expansion of manufacturing activities could also come from the growth or expansion of firms already in existence. Entrepreneurs residing in the province can play an important role in the establishment of provincial industries. Establishing an industrial enterprise in a specific locality would require a number of supportive factors. Entrepreneurs who reside in the area who have some familiarity with the vicinity could be in a better position to establish businesses there. For example, personal connections can help them better identify potential customers and potential sources of raw materials. Familiarization with local bankers can make financing a new business much easier. In addition, resident entrepreneurs are in a better position to know about business opportunities and market potential in the area.

Local entrepreneurs with strong supportive elements such as production know-how, management skills and financial backing may consider implementing a manufacturing project in the area where they live. By so doing, they are able to save the time and cost of looking for an appropriate site, and bear lower risks. On the other hand, the popular choices of location for outside manufacturers are often limited to a number of known provinces (Hamer, 1985).

However, in establishing a large-scale enterprise, an investor may consider it worthwhile, and be willing to pay for the exploration costs for a more suitable location. The local small and medium-scale businesses are undoubtedly the major driving force behind the industrial development processes in their home province. However, outside manufacturers, including those from Bangkok and foreign countries could also be important for the establishment of industrial enterprises in certain well-known areas.

Generally, these outside investors will usually appraise the costs and benefits of the plant location. The outlay including production and transportation expenses will be assessed against the benefits of market size, growth potential, level of competition, and availability of public utilities.

Cases of plant relocation are rare. An enterprise will relocate its plant only if such a move is a necessity, such as in the case of persistent decline in demand, and increasing scarcity of raw materials and labor supplies. In some, the relocation was implemented on the grounds of business integration. However, in these cases an expansion plant is normally placed adjacent to the main facility, due to convenience in management and reductions in the costs of transportation and communications. A Brazilian case study of plant relocation in Sao Paulo is one example of this feature (Townrose 1983 and Homer 1985).

Table 3.5 illustrates the domicile of the entrepreneurs. About 58.4% of the surveyed manufacturers came from the provinces where current production facilities are situated. Some 11.5% came from other provinces of the same region. Unlike rural entrepreneurs who tend to stay near home, a large number of Bangkok investors tend to locate facilities in provinces outside Bangkok, especially in the neighboring provinces.

Foreign investors tend to set up plants in Greater Bangkok and neighboring cities in the Central region such as Chon Buri and Saraburi. Some prefer the cities which are the economic center of a region such as Chiang Mai in the North, Songkhla in the South and Khon Kaen in the Northeast. For investors from Bangkok, the favorite locations are Chon Buri in the Central Region, Chiang Mai in the North, Nakhon Ratchasima and Khon Kaen in the Northeast, and Surat Thani and Songkhla in the South. Considering the correlation of size and ownership patterns, we found that most small and medium-sized firms are owned by local entrepreneurs. While entrepreneurs from Bangkok and from foreign countries are found more often in large enterprises. Large-scale enterprises operated by native proprietors are found mostly in the wood product, rubber product and non-metal product industries.

When asked why they locate their plant in this specific area, the most common reason for current choice of location are related to "familiarity". Many attributed it to their hometown, long place of residence, former business connections, and the recommendation of an acquaintance (Table 3.6).

The "familiarity" factor, often referred to as business connections, is a major factor leading to the establishment of manufacturing activities in a specific area by small and even large firms. A high degree of the reliance on local entrepreneurs is common in the poor and underdeveloped provinces. Bangkok and foreign investors more often opt for the cities around Bangkok or the developed cities in the regions. Specifically, the popular provinces for foreign investment in the Central region are Chon Buri (four cases) Ratchaburi (two cases), Saraburi (three cases), Nong Khai in the Northeast (two cases), Chiang Mai in the North (five cases) and Surat Thani in the South (two cases). Bangkok investors prefer Greater Bangkok (43 cases) Chon Buri in the Central Region (12 cases), Nakhon Ratchasima (15 cases) and Khon Kaen (12 cases) in the Northeast, Chiang Mai (14 cases) in the North, Surat Thani (12 cases), Chumphon (seven cases) and Songkhla (eight cases) in the South. The data clearly demonstrate that the well-known regional cities attract more foreign and Bangkok investors than the more rural areas.

Although Bangkok manufacturers and foreign investors contribute significantly to rural economic growth, indigenous entrepreneurs still play the major role in the local industrial development process. Therefore, actions should be taken to promote entrepreneurship and manufacturing activities particularly in the underdeveloped areas.

3.2 CHOICE OF LOCATION

3.2.1 General Consideration of Location Choice

Because location decision has a long-term strategic impact for business operations, selecting a location certainly requires a series of steps. Strategic decisions regarding location vary in different industries. A study by Hoover (1948), explained the facility location decision patterns by classifying the manufacturing activities into

market-oriented, resource or material-oriented,and footloose industries. Our findings agree with many preceding studies that the principal concern of firms is with transportation costs. For example, market-oriented industries with less concern about the accessibility to raw materials and other production factors may try to locate near the markets. For manufacturing activities that rely on large quantities of heavy and bulky raw materials, the entrepreneurs may choose to operate near the sources of raw materials. However, some industries,for which neither proximity to the market nor to the supplies of raw materials are deemed more significant, may simply opt for a well-developed location to save costs of general plant operation.

Since long-term profit maximization is generally supposed to be a corporation's ultimate goal, an evaluation of costs and revenues is indispensable in the process of location decision. On the revenue side, long-term sales and profitability are taken into account. Detecting a growth potential of a specific area, a manufacturer may decide to pioneer the market by setting up a manufacturing facility. On the costs side, land prices, construction and operation expenses,and raw material transportation costs are to be considered. In addition, other relevant factors such as convenience of contact with the customers and raw material suppliers; availability of labor, wage rates; proximity to related industries; availability of public utilities including roads, water, telephone, etc. are taken up to be considered.

Nonetheless, as previously discussed, the major factor influencing location decision is an entrepreneur's "familiarity" with the site alternatives. This is in line with the profit maximization motive. A manufacturer may feel more confident to operate in an acquainted place where he can be assured of an adequate number of customers, and retained competitiveness, In addition, he will be able to save costs of collecting relevant information, for instance, costs on obtaining marketing information, construction costs, and procurement of production factors and so on. In conclusion, relevant determinants for facility location can be categorized as follows:

1. marketing implications;
2. costs of business establishment and plant construction;
3. costs of procurement of production factors, including various services necessary for smooth business operation; and
4. transportation costs and convenience in selling the product, procuring raw materials and conducting business.

The relative importance of each factor varies according to the individual business. In some cases, proximity to the market might lose its degree of importance, if land prices and transportation costs of raw material outweigh benefit of locating close to the market. In such a case, a manufacturer may consider an area outside the targeted market. A recent example for this is the move away from the Greater Bangkok area as a popular recipient area of local and foreign investments, to the provinces in the Central Region including Ayutthaya, Saraburi, Ratchaburi and Chachoengsao. These areas, though not exactly in the major market of Bangkok, are still not far away.

3.2.2 Factors Influencing the Choice of Location

Our survey did not explicitly ask the entrepreneurs to rank the degree of importance of the various factors perceived by the respondents in their choice of location. Rather, the significance of a particular factor is determined by the frequency of answers by the surveyed entrepreneurs. Table 3.7 demonstrates the number of entrepreneurs who picked up specific determinants for the location choice. Based on the frequency of these selected items, the following six clusters of factors were found to influence location decision for a new manufacturing plant:

1. proximity to markets,
2. convenience in transportation,
3. proximity to raw materials,
4. adequate availability of water and electricity supplies,
5. land cost, and
6. availability of labor.

Many other factors including proximity to related industries; accessibility to Government services, to other businesses, and to machinery maintenance services are of relatively low importance to our surveyed respondents.

In fact, the proximity to markets (1) and to raw materials (3) are closely related to a developed transportation network (2) as regards transportation costs, a major factor for most firms. However, the proximity to markets also implies access to customers.

A large number of the respondents considered land costs a dominant factor. The land prices in Greater Bangkok and the nearby cities shot up during the past four to five years, reflecting a high degree of speculation about the appreciation of land value. Typically, plans for road construction significantly elevate the price of land. Apart from the Greater Bangkok area, anticipated development of facilities for emerging industries, and tourism in the major cities in the Regions such as Chiang Mai, Rayong and Chon Buri commonly result in excessive increases in prices. The speculation in land prices in urban areas, on the other hand, contributes to decentralization of some industrial activities to the provincial areas, such as the neighboring cities of Bangkok which are not far from markets.

We may expect a further dispersion of industries to the outer provincial rings as land prices keep climbing in Greater Bangkok. As a result, the Central region will become a large industrial zone. Although the concentrations of industries in the Greater Bangkok will decrease, the development gaps between the Central Region and the other regional areas will continued to widen.

Most surveyed firms in the Central Region, relative to the other regions, regard proximities to markets as a prerequisite for a site selection. It is noticeable that the respondent firms in the Greater Bangkok pay less attention to marketing dimensions, possibly because these firms are already situated "in the markets". Nevertheless, that firms in the Greater Bangkok are expressing concern about transportation

facilities evidently reflects the interrelationship with the marketing aspects.

Unlike firms in the Greater Bangkok, rural enterprises give the first priority in their choice of location to proximity to raw materials. Distinctively, the Northeast, where a large cluster of food businesses is located, claim that the accessibility to raw materials the dominant factor in their location decision, in relation to the other regional areas.

With a large pool of skilled labor at hand, firms in Greater Bangkok, relative to the other regions, do not give a particular weight to availability of labor in considering the site alternatives. This could be explained similarly by the case of proximities to markets as previously discussed.

In terms of correlating the sizes of firms with location, small and medium-scale enterprises stress proximity to markets, convenience in transportation, availability of infrastructure (such as water, electricity). As for large scale enterprises located in the rural areas, transportation elements and accessibility to raw materials dominate the location choice.

In terms of industrial sectors up to TSIC three-digit level, most firms in five groups of business, namely, food products (311-312), tobacco (314), paper (341), other chemical products (352) and pottery (361) pay more attention to proximity to raw materials rather than proximity to the market. However, the industries likely to rely highly on raw materials such as wood products (331), rubber products (355) and other non-mental products (369), do not see market proximity as being less important than obtainability of raw materials. Clearly, for market-oriented industries such as metal products and machinery (382), electronics (383), transportation equipment (384), marketing factors are the most critical. The manufacturers of wood products, non-metal products, and machinery look first at the condition of the transportation network. On the other hand, the producers of machinery and transportation equipment give significant weight to the

availability of maintenance services, at a higher rate than other activities. The manufacturers of food, chemical products, and machinery emphasize the significance of waste disposal facilities. Finally, availability of labor is important in the sectors of metal machinery, and transportation equipment, as well as in the textile product, and wood product sectors.

The conclusions of our study parallel those of other preceding studies in Thailand, such as in the study of Rural Off-Farm Employment (Mead, 1982). The general factors significantly contributing to rural industrialization and industrial growth are categorized as follows:

1. local demands;
2. availability of resources/raw materials;
3. availability of skilled labor; and
4. development level of infrastructure.

In addition, a study by Tingsabadh (1982) on location decisions manifested causes, patterns, and motivation of plant location in the Central region and in the Greater Bangkok. His survey of more than 50 firms in each region revealed that Greater Bangkok greatly benefits the firms because of reduced transportation costs, the presence of a developed infrastructure, public services,and presence of related industries. In our study, we found that the presence of related industries was not as significant a factor as the other determinants of marketing, raw material, transportation costs, and infrastructure.

We also agree mostly with some foreign findings about factory location decisions. A study by Lee and Cho (1985) in the city of Seoul in South Korea found that types of manufacturing activity, requirements of skilled labor, sizes of plant, availability of skilled labor influence plant decision process. Proximity to markets, raw materials, and convenience in transportation are the dominant factors. Lee and Cho suggested that major motivations for a firm divesting from a site include land prices, access to markets and raw materials, and to public services; and that difficulties in labor sourcing, wage rates, the quality and price of public utilities are of relatively low importance.

Our study did not touch upon the issues of plant relocation. As opposed to the Korean findings, we found public utilities to be significant and access to public services to be insignificant.

This study should have incorporated the influence of the government's location policies towards firms' plant location. At present the public policy toward industrial zoning is not obvious and systematic, although there are establishment of industrial estates, and the designation of the Board of Investment promotional zones which have been revised several times. Other foreign studies such as Brazil's Townrose (1983) and the Philippines' Herrin and Pernia (1987) demonstrated that the dominant factors for manufacturers in locating a facility are proximity to markets, availability of infrastructure (electricity, telephone) transportation, and communications, and availability of land appropriate for present and future activities. In the Philippines and Brazil, public incentives such as tax exemptions do not significantly influence location decisions. This should not be much different from the case of Thailand.

Table 3.1
Educational Level of Entrepreneurs

number of sample firms

Level of Education	Greater Bangkok	Rural Central	North	North east	South	Total
No Formal Education	1 (0.86)	13 (6.10)	13 (6.07)	6 (2.84)	9 (4.17)	42 (4.33)
Primary School	29 (25.00)	80 (37.56)	79 (36.92)	97 (45.97)	82 (37.96)	367 (37.84)
High School	30 (25.86)	63 (29.58)	67 (31.31)	47 (22.27)	79 (36.57)	286 (29.48)
Vocational School	17 (14.66)	13 (6.10)	24 (11.21)	19 (9.00)	18 (8.33)	91 (9.38)
University (Bachelor Degree or higher)	37 (31.90)	38 (17.84)	30 (14.02)	40 (18.96)	20 (9.26)	165 (17.01)
Others	2 (1.72)	6 (2.82)	1 (0.47)	2 (0.95)	8 (3.70)	19 (1.96)
Total	116 (100.00)	213 (100.00)	214 (100.00)	211 (100.00)	216 (100.00)	970 (100.00)

Note: Figures in parentheses are percentages
Source: Rural Industries and Employment Project Survey, TDRI, 1989.

Table 3.2
Age of Entrepreneurs

number of sample firms

Region	Age					Total
	20 - 29	30 - 39	40 - 49	50 - 59	60 and Above	
Greater Bangkok	6	33	53	20	5	117
	(5.13)	(28.21)	(45.30)	(17.09)	(4.27)	(100.00)
Rural Central	8	64	55	62	27	216
	(3.70)	(29.63)	(25.46)	(28.70)	(12.50)	(100.00)
North	15	57	63	57	23	215
	(6.98)	(26.51)	(29.30)	(26.51)	(10.70)	(100.00)
Northeast	12	68	66	52	19	217
	(5.53)	(31.34)	(30.41)	(23.96)	(8.76)	(100.00)
South	19	76	70	36	17	218
	(8.72)	(34.86)	(32.11)	(16.51)	(7.80)	(100.00)
Total	60	298	307	227	91	983
	(6.10)	(30.20)	(31.23)	(23.09)	(9.26)	(100.00)

Note: Figures in parentheses are percentages
Source: Rural Industries and Employment Project Survey, TDRI, 1989.

Table 3.3
Occupation of Entrepreneurs before Establishing their Present Business

number of sample firms

Previous Occupation	Greater Bangkok	Rural Central	North	Northeast	South	Total
Owner of Commercial Enterprise	34	53	50	76	38	251
	(29.57)	(24.54)	(24.27)	(36.36)	(17.51)	(26.06)
Owner of Manufacturing Enterprise	24	31	22	29	25	131
	(20.87)	(14.35)	(10.68)	(13.88)	(11.52)	(13.60)
Family Worker of Manufacturing Enterprise	15	34	24	14	13	100
	(13.04)	(15.74)	(11.65)	(6.70)	(5.99)	(10.38)
Employee of Manufacturing Enterprise	11	42	44	35	55	187
	(9.57)	(19.44)	(21.36)	(16.75)	(25.35)	(19.42)
Employee of Business Enterprise (other than Manufacturing)	7	11	18	13	22	71
	(6.09)	(5.09)	(8.74)	(6.22)	(10.14)	(7.37)
Family Worker of Commercial Enterprise	5	7	14	10	6	42
	(4.35)	(3.24)	(6.80)	(4.78)	(2.76)	(4.36)
Government Official or State Enterprise Employee	6	4	10	1	10	31
	(5.22)	(1.85)	(4.85)	(0.48)	(4.61)	(3.22)
Own Account Worker	3	8	2	5	9	27
	(2.61)	(3.70)	(0.97)	(2.39)	(4.15)	(2.80)
Peasant	1	8	14	12	19	54
	(0.87)	(3.70)	(6.80)	(5.74)	(8.76)	(5.61)
Not Specific Occupation/Student	3	6	5	1	3	18
	(2.61)	(2.78)	(2.43)	(0.48)	(1.38)	(1.87)
Others	2	5	1	4	5	17
	(1.74)	(2.31)	(0.49)	(1.91)	(2.30)	(1.77)
Not Known	4	7	2	9	12	34
	(3.48)	(3.24)	(0.97)	(4.31)	(5.53)	(3.53)
Total	115	216	206	209	217	963
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Note: Figures in parentheses are percentages
Source: Rural Industries and Employment Project Survey, TDRI, 1989.

Table 3.4
Reasons for Entering the Present Industry
by Region and Size Employment

number of sample firms

Reason for Entering Present Business	Greater Bangkok	Rural Central	North	North east	South	Total
Existence of Market/Demand	64 (37.65)	85 (29.93)	87 (28.25)	107 (36.39)	98 (30.72)	441 (32.07)
Possession of Knowledge in this Industry	43 (25.29)	79 (27.82)	109 (35.39)	76 (25.85)	97 (30.41)	404 (29.38)
Possession of Knowledge of Partner/Employee	9 (5.29)	11 (3.87)	8 (2.60)	7 (2.38)	16 (5.02)	51 (3.71)
Familiarity of Market/ Customers of Partner/Employee	5 (2.94)	6 (2.11)	3 (0.97)	4 (1.36)	13 (4.08)	31 (2.25)
Suggestion to Enter Business by Relative/Friend	16 (9.41)	27 (9.51)	35 (11.36)	39 (13.27)	38 (11.91)	155 (11.27)
Succession of Family Business	24 (14.12)	53 (18.66)	45 (14.61)	32 (10.88)	31 (9.72)	185 (13.45)
Others	9 (5.29)	23 (8.10)	21 (6.82)	29 (9.86)	26 (8.15)	108 (7.85)
Total	170 (100.00)	284 (100.00)	308 (100.00)	294 (100.00)	319 (100.00)	1375 (100.00)

Note: Figures in parentheses are percentages
Source: Rural Industries and Employment Project Survey, TDRI, 1989.

Table 3.5
Domicile of Entrepreneurs

number of sample firms

Domicile of Entrepreneur	Greater Bangkok	Rural Central	North	North east	South	Total
This Province	50 (42.02)	148 (68.52)	133 (62.15)	127 (58.26)	118 (54.88)	576 (58.66)
Other Province in this region	8 (6.72)	20 (9.26)	27 (12.62)	17 (7.80)	41 (19.07)	113 (11.51)
Other Province in other region (besides Greater Bangkok)	6 (5.04)	14 (6.48)	21 (9.81)	29 (13.30)	17 (7.91)	87 (8.86)
Greater Bangkok	48 (40.34)	25 (11.57)	27 (12.62)	38 (17.43)	35 (16.28)	173 (17.62)
Foreign Countries	7 (5.88)	9 (4.17)	6 (2.80)	4 (1.83)	7 (3.26)	33 (3.36)
Total	119 (100.00)	216 (100.00)	214 (100.00)	218 (100.00)	215 (100.00)	982 (100.00)

Note: Figures in parentheses are percentages
Source: Rural Industries and Employment Project Survey, TDRI, 1989.

Table 3.6
Reasons for Locating at Present Location

number of sample firms

Region	Reasons for Choice of Location					Total
	1	2	3	4	5	
Greater Bangkok	45	7	4	18	9	83
	(54.22)	(8.43)	(4.82)	(21.69)	(10.84)	(100.00)
Rural Central	116	21	3	33	14	187
	(62.03)	(11.23)	(1.60)	(17.65)	(7.49)	(100.00)
North	128	31	10	24	6	199
	(64.32)	(15.58)	(5.03)	(12.06)	(3.02)	(100.00)
Northeast	114	21	11	26	16	188
	(60.64)	(11.17)	(5.85)	(13.83)	(8.51)	(100.00)
South	120	24	3	36	11	194
	(61.86)	(12.37)	(1.55)	(18.56)	(5.67)	(100.00)
Total	523	104	31	137	56	851
	(61.64)	(12.22)	(3.64)	(16.10)	(6.59)	(100.00)

Notes: 1 = Entrepreneur was born here or has lived here for a long time
2 = Present Location Suggested by Relative Friend Living in this Province
3 = Present Location Suggested by Relative/Friend Living in Other Province
4 = Entrepreneur Used to have Business Connection in this Area
5 = Others
Figures in parentheses are percentages

Source: Rural Industries and Employment Project Survey, TDRI, 1989.

Table 3.7
Factors Important for Choice of Location
by Region

number of sample firms

Factor for Choice of Location	Greater Bangkok	Rural Central	North	North east	South	Total
Proximity to Market/Customers	47	110	92	67	90	406
	(15.77)	(23.40)	(19.05)	(16.03)	(18.67)	(18.87)
Proximity to Raw Material/Supplies	19	64	66	73	74	296
	(6.38)	(13.62)	(13.66)	(17.46)	(15.35)	(13.76)
Convenience for Recruiting Workers	37	42	64	38	32	213
	(12.42)	(8.94)	(13.25)	(9.09)	(6.64)	(9.90)
Existence of Electricity and Water Supply	48	58	69	31	48	254
	(16.11)	(12.34)	(14.29)	(7.42)	(9.96)	(11.81)
Proximity to Relation Industries	12	16	7	10	22	67
	(4.03)	(3.40)	(1.45)	(2.39)	(4.56)	(3.11)
Low Land Prices/Rental Cost	34	27	64	47	67	239
	(11.41)	(5.74)	(13.25)	(11.24)	(13.90)	(11.11)
Convenience in Transportation	64	85	62	75	74	360
	(21.48)	(18.09)	(12.84)	(17.94)	(15.35)	(16.74)
Convenience for Access to Government Agencies	11	12	10	8	18	59
	(3.69)	(2.55)	(2.07)	(1.91)	(3.73)	(2.74)
Convenience for Repair of Machinery	7	12	23	8	9	59
	(2.35)	(2.55)	(4.76)	(1.91)	(1.87)	(2.74)
Convenience for Disposal of Industrial Wastes	4	10	8	10	12	44
	(1.34)	(2.13)	(1.66)	(2.39)	(2.49)	(2.05)
Others	15	34	18	51	36	154
	(5.03)	(7.23)	(3.73)	(12.20)	(7.47)	(7.16)
Total	298	470	483	418	482	2151
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Note: Figures in parentheses are percentages
Source: Rural Industries and Employment Project Survey, TDRI, 1989.

CHAPTER 4

CONCLUSIONS AND POLICY RECOMMENDATIONS

4.1 CONCLUSIONS

The level of industrialization, as measured by the ratio of manufacturing value added to the gross regional product varies much among the regional areas, and among provinces within the each region.

The concentration of manufacturing activities in Bangkok and the nearby provinces is critical and represented 76.8% of the country's manufacturing value added in 1987. The value-added figures could reach 89.1% if other provinces in the Central region are included. The industrial activities in the other region share only around 10% of the total manufacturing GDP.

Our studies on the shares of value-added, industrial employment, and dispersion patterns of manufacturing factories suggest an increasing trend toward geographical concentration of industrial activities. While the growth rate of the industries located in the Bangkok Metropolitan area has slowed down somewhat during the past 10 years, the manufacturing activities in the Greater Bangkok and other provinces in the Central region registered a very high growth rate. The share of manufacturing activities in the Central region (including Bangkok) increased over time. During 1981-1987, the growth rate of industrial production in the Central region ranked among the highest, followed by the Greater Bangkok. Production in the South grew at the lowest rate.

The diversity of regional industries is not very high, especially in the remote provinces, which are not the economic centers of the region. In these remote areas, there exist not only a small number of

manufacturing plants, but also very few types manufacturing activities. The enterprises commonly found, other than rice milling, are in the production of food, wood and furniture, pottery, and other non-metal products, metal products and machinery, transportation equipment, construction materials, maintenance services and local handicrafts.

The shift-share analysis in our study reveals that the aggregate economic expansion significantly contributed to growth in the manufacturing sector. The competitiveness of the regional industries was very low, as demonstrated by the fact that between 1981-1987, some regional areas experienced negative regional effects in the shift-share analysis.

The factors significant to industrial development in regional areas are income levels, size and density of the population, availability of public utilities, economic and financial development level, and proximity to Bangkok. The provinces in the neighborhood of Bangkok with a high per capita income, a large population, economic and financial institutions and developed infrastructure and utilities therefore experience a better level of industrial development. Proximity to Bangkok is a powerful indicator of the speed of industrial development.

Typically, firms in the regional areas have close linkages with the local economy. Manufacturers in provincial areas serve as producers of goods to satisfy the local needs, and as employers of labor and resources from the locality. In general, small-scale firms are highly subject to the local market conditions such as in the food, furniture, non-metal products, machinery and transportation equipment industries. Among the regions, manufacturers in the North and the Northeast demonstrate high reliance on the local markets.

A common problem encountered by firms in the regional areas is seasonal production and employment. These firms also often operate at a low capacity due to slack demand and scarcity of raw materials. Small and medium-scale firms are most affected by these constraints. In

general, relative to the Greater Bangkok, regional production often fluctuates and runs at a lower capacity.

Other problems faced by firms in the regional areas are in the areas of marketing, raw materials, finance,and labor sourcing. Small and medium-size firm complain about the shortages of skilled labor, especially in the engineering industries. A few manufacturers are able to resort to the public promotion services, while a large number of regional enterprises are not even aware of the existence of these services, although the services are have proved satisfying to those already in reach.

On the average, the educational level of rural entrepreneurs is still low. The business background of the current owners demonstrates that past knowledge and former business experience contribute significantly to the establishment of manufacturing activities. Foreseeable market potentials, and knowledge and experience gained from former occupations are the major drives for entrepreneurs to enter into the present industrial sector.

More than half of the surveyed manufacturers live in the same location as the factories. Location decisions are normally influenced by the factors of domiciles, former business relations and recommendations by the local relatives or acquaintances, respectively. In particular, indigenous manufacturers are typically found in small and medium-scale firms in the rural areas.

Bangkok and foreign investors commonly locate their firms in the provinces near Bangkok or in the cities of economic centers of a regions, such as Chon Buri in the Central region, Nakhon Ratchasima in the Northeast, Chiang Mai in the North. None of the outside investors are interested in investing in remote and underdeveloped areas. Therefore, the emergence of manufacturing activities in the rural areas is normally initiated by the local entrepreneurs.

The dominant factors for location decisions are proximity to markets, a developed transportation network, proximity to raw materials,

availability of public utilities, land prices, and labor and employment considerations. The accessibility to public agencies, and the presence of related industries are relatively less significant.

4.2 POLICY IMPLICATIONS

Greater Bangkok has continued to be a preferred location for industrial factories, with advantages which cannot be compensated by any incentives offered by the government to disperse manufacturing activities to in regional areas. For the past 4-5 years, some new manufacturing activities have been moving out to the other provinces in the Central region, which surround Greater Bangkok. The areas around Bangkok will eventually become a gigantic industrial zone. The spread of industrialization to provinces nearby Bangkok is helpful for the deconcentration of industrial activities from Bangkok. On the other hand, the industrialization is not proportionally distributed in the other regions, resulting in an ever larger discrepancy of economic development levels among regions.

Interestingly, the Bangkok and foreign investors, besides investing in Bangkok and its nearby provinces, tend to move into the cities of economic centers in the regions and generate a spectacular growth rate of manufacturing sector in those specific provinces. In the underdeveloped areas, the local entrepreneurs, who normally run small and medium-scale enterprises continue to play a major role in the industrial development process. As a consequence, we can characterize three patterns of regional industrialization in Thailand as follows :

1. dispersion of some industries from the Greater Bangkok to the other provinces in the Central region;
2. dispersion of manufacturing activities to the cities which are the "capital cities" or "major cities" in the regional areas; and
3. industrialization in the regional areas of low economic development level.

The first pattern of decentralization helps to reduce the rate of increase of congestion in the Greater Bangkok. This has been a result of market mechanisms. Specifically, as the capital city becomes too crowded and the cost of establishing a factory shoots up, the manufacturers will give the priority of plant location to the provinces nearby Bangkok, because of the proximity to the market and to the seaport, and better developed infrastructure.

As the provinces surrounding Greater Bangkok in the Central region turn into a large and highly populated industrial area, the agricultural and forested land is likely to be destroyed. In absence of appropriate plans for future industrial growth, the emerging environmental problems resulting from the discharges and waste disposal by the factories will become more serious, and existing natural resources, such as the forests and fisheries will increasingly be destroyed. In the short run, the dispersion of industries to the cities in the Central region helps to reduce the congestion in the Bangkok Metropolitan area, but in the long run will also carry with it to the other cities the similar environmental dilemmas currently persistent in Bangkok. Therefore, we recommend that industrial areas for polluting industries be identified and officially designated so that the government be able to enforce the regulation of pollution controls.

The establishment of industrial estates does not directly solve the problem, since each industrial estate would only be able to accommodate some industrial enterprises, and it requires substantial resources for the development of industrial estates. In principle, owners of the enterprises, not the Government nor the taxpayers, should bear the social cost of pollution and waste management. Industrial zoning with regulations on pollution control will be more effective than Government measures aimed at reducing cost for private firms. Moreover, Government measures to promote decentralization of the industries including development of facilities such as industrial estates, tax incentives, and other privileges are unnecessary for firms located in the cities around Bangkok, since these industries already emerged naturally. Although industrialization in provinces around Bangkok benefits the

country in terms of economic growth, it also imposes social costs in terms of congestion and environmental pollution. Industries located in this area should thus not be subsidized by the government.

The second pattern of industrial dispersion into major regional cities may also not require great efforts from the public sector. Normally, the absence of regional industries are due to the disadvantages compared to industries operating in the Greater Bangkok. Manufacturing activities require several supporting facilities, which are usually available in developed cities of economic centers. Therefore, the promotion of regional industries could be relatively effective and inexpensive in the these developed cities. To attract investment in the regional developed areas, some Government support is required to narrow the gap between the greater Bangkok and these areas such as facilitation of necessary utilities, services and information. Tax incentives will not be effective, especially to solicit the firms highly relying on Bangkok markets and on international transportation of raw materials and finished products. The industries emerging in the major cities in the regional areas far from Bangkok are likely to be those that rely heavily on the local resources or regional markets. However, most manufacturing activities located in the major cities near the seaports such as Chon Buri, Songkhla, or on the borders of Thailand and the neighboring countries could also be geared to export. In any event, the same problems of industrial concentration currently prevailing in Bangkok could be anticipated in those cities as well. Consequently, the government should bear in mind an appropriate industrial zoning policy especially for the regional major cities with high economic growth rates.

If the major objectives of public policy towards industrialization is to generate income and employment for the rural people and promote the economic development in the low-income areas, the Government should pay most attention to the third pattern of industrialization. One promotion method for the Government agencies to foster industrialization in the regional areas is to encourage local entrepreneurship. In addition to encouraging the establishment of manufacturing activities by potential local entrepreneurs in their regional areas, industries that

already exist in the areas will also have to be promoted to strengthen and upgrade their productivity, marketing and management capabilities, which will lead to further growth and development. Studies on the potential comparative advantages of the industrial sectors, and constraints arising in each region could be helpful for the formulation of effective promotional measures. In the long term, the key factor leading to expansion of the manufacturing sector in the regional areas would be the development of markets to absorb the industrial output. Policy measures regarding rural development, commodity pricing, tourism promotion, etc., would contribute much to rural industrialization.

Our studies on the location decision and the behaviors of entrepreneurs indicate that despite the designation of "industrial promotion zones" with special incentives provided such as those being implemented by the BOI, outside manufacturers will opt for major cities of the region, due to availability of necessary facilities. They will not be interested in investing in a remote and underdeveloped area. Therefore, the definition of "industrial decentralization" should be clearly interpreted and the major objective of this measures verified. If the main objective of the measure is to create employment and income in remote provinces, the broad designation of the "investment promotion zones" implemented by the BOI will not achieve its goal.

The results of this study indicate that the terms "regional industries" or "provincial industries" cover various sectors and sizes of activities by the manufacturers with different approaches in location selections. An investment promotion policy that does not consider these differences will result in the promotion of activities already planing to locate in the regional areas due to raw material supplies, or market potentials. This may not be in line with the objective of industrial promotion and decentralization to the underdeveloped areas.

In addition, the term "promotion" requires a clearer definition, because it may cover subsidization for the manufacturers in various forms such as establishment of industrial estates, construction of infrastructure and public utilities without charging any appropriate service fees from the firms, tax privileges, as well as the provision of

useful information and services such as training courses to strengthen the efficiency of the firms. The questions that must be answered by the policy planners are what are the proper types of industrial promotion in the regional areas and target sectors, given constraints in the government's ability to support the industries in all sectors and areas.

The concentration of manufacturing industries in Greater Bangkok undoubtedly results from the industrialization policy as well as the income distribution policy in the past, which contributed to discrepancies in income between the city and rural population. The industrial promotion policy encouraged the activities which satisfy the needs of urban demand. For firms located near the seaport, tax incentives granted for machinery, components, and imported raw material result in cost reductions. This led to the clustering of factories in the Greater Bangkok area. The export promotion measures currently employed also lead to the same pattern of industrial location. This does not mean that export promotion measures and import substitution policy are undesirable. But the "side effects" of the policies, which result in excessive concentration of factories, should be realized.

We should not try to solve this problem by any more subsidization or tax incentives only to induce a relocation of 100 kilometers from Bangkok, and increase the congestions within the Central region. To tackle the environmental problems in Bangkok, the Government could definitely prohibit establishment and expansion of factories in Bangkok. However, such measures must be carefully considered, since areas are still available in Bangkok to accommodate some non-polluting industries, and dispersion of small and medium-scale industries from the excessively congested areas in the city center. The designation of zones prohibiting the setup and expansion of the factories requires a comprehensive study, and should be implemented only in congested industrial or residential areas. In the mean time, areas should be specified in the suburban areas of Greater Bangkok to accommodate the factories transferred from the city center.

The studies in this project and the preceding studies reveal various problems encountered by small and medium-scale firms in the

regional areas. The promotion scheme should be geared towards eliminating these problems in order to promote efficiency of these firms in the longer term. In finance, for example, regional financial institutions for small and medium-scale business should be established not only to provide financial support, but also to facilitate other consultancy services such as project analysis and accounting management, which will help solve the problem of lack of access to financial resources of the regional industries. Various promotional services provided by the agencies under the Department of Industrial Promotion are useful, but are far from adequate. The Department should evaluate the results of these promotion measures and continue the projects which are effective for promotion of regional industries. The projects which are not useful and cost-effective should be discontinued.

The study by Watana Na Ranong in this project discussed the problems of accessibility to the Government assistance services, such as deficiency of information regarding the firms in the target groups, duplication of the same type of service among different agencies, as well as constraints in geographical coverage of the services. Better coordination and cooperation between the private and public sectors is therefore needed and the creation of a specific public body to be responsible for the collaborative functions should be considered. The provision of improved public services should be more effective for the promotion of rural industrialization than the granting of tax incentives or the provision of infrastructure to only a small number of firms in terms of industrial estates.

4.3 POLICY FRAMEWORK AND MEASURES FOR PROMOTION OF REGIONAL INDUSTRIES

4.3.1 Policy Framework

The diversity of the dispersion patterns of regional industries should prompts the authorities to clearly define strategies of industrial promotion. As earlier discussed there are different patterns of industrial dispersion to the regional areas:

1. Deconcentration of industries from the Greater Bangkok to the other neighboring provinces to reduce the concentration of activities in the Greater Bangkok.

2. Establishment of industries in major cities or cities at the economic center of the regions, to distribute wealth to the regional areas, and also help releasing the congestion in Bangkok.

3. Promotion of industrialization in regional areas with low level of economic development in order to create employment and increase income, and to reduce the disparities in levels of economic and industrial development among different regions and provinces.

The promotion strategies for each type of regional industrialization could be very different. The first industrialization pattern (from the Greater Bangkok to the other provinces in the Central region) may result from market mechanisms without any government efforts. The Government may only watch out for environmental effects brought about by the excessive concentration of industries in the Central region. A policy framework in response to this is to grant to the provinces authority to specify industrial zones, agricultural and residential areas. In addition, measures towards environmental control should be clearly defined. The development of industrial estates in this region would accelerate industrial growth. The private sector, including owners of the industrial estate and manufacturers should however bear the costs of pollution control, and any other additional facilities constructed.

The second type of industrial dispersion to the major cities in the region also takes place by market mechanisms. Such a distribution has happened recently. To speed up the development, the government may adopt promotion measures such as improvement of the basic infrastructure and public utilities, and dissemination of information about investment opportunities in the region. Promotion of foreign investment will also be helpful for industrialization of this type. In addition, local entrepreneurs should be encouraged to invest in their own region. Other

promotional measures to strengthen the competitiveness and efficient operation of existing firms in the regional areas should also be simultaneously implemented.

Promotion of industrialization in the economically retarded provinces is the third type of industrial dispersion, which will help generate income and employment and should be given due attention by the government. Without the Government's interference, market mechanisms alone would result in a limited number of new industries. To promote this type of development, the Government will face several constraints, such as budgetary, personnel and effective promotional measures. This is because there are many provinces to be promoted. The measures to be adopted should be carefully designed so that they are complementary and do not hamper the market mechanisms.

A question that often comes up in rural industrialization is whether the Government should promote industrialization in every province. Is it not possibly more appropriate to direct promotional measures only to the areas with high potential for industrialization, because of the Government's limited resources? Furthermore, any interference by the Government as opposed to market mechanisms would ultimately fail. This argument is interesting. But the fact is that manufacturing activities exist in every provinces, although they are not evenly distributed. Since economic activities are interrelated, and unemployment and poverty are normally found in the areas where manufacturing shares are minimal, and other related activities such as trading and services are also poorly developed. Accordingly, encouragement for a suitable industrialization policy would improve the employment rate and income distribution and economic growth in these areas. The promotion of manufacturing activities in remote provinces, if properly designed, will improve income distribution, eliminate and reduce income discrepancies between the regions, and will not contradict the efficiency principle. In general, the measures adopted should be steered to strengthen the efficiency of the existing manufacturing activities and should not oppose to market mechanisms.

The policy framework or strategy for this type of development should emphasize the encouragement of establishment of new industrial enterprises by local entrepreneurs and upgrading the efficiency of existing local manufacturing enterprises by the provision of assistance, services and facilities in various forms. Since the development of the manufacturing sector has an overall interrelationship with the aggregate economy of a region, the industrial development should be implemented together with measures on agricultural and rural development. Effective promotional measures also must distinguish between town-based and rural based household enterprises.

4.3.2 Promotional Measures

Regional industrial promotional measures designed to increase employment and income according to the third type of industrial decentralization specified above could be elaborated by four types of promotion program as follows:

1. creation of markets for industrial products,
2. provision of infrastructural facilities,
3. promotion of establishment of industrial enterprises by local entrepreneurs, and
4. provision of promotional services aimed at enhancing the efficiency of regional industries.

Recommendations for measures for each promotional programs will be made only in addition to what has already been mentioned in other reports of this study project. Recommendations made in other reports -- such as correction of policy biases and distortions, and creation of demand by government procurement -- will not be repeated here.

Long-term measures for creation of demand for provincial industries are associated with commodity pricing policy and rural development. Short-term measures would include provision of marketing information to provincial enterprises, organization of trade fairs for rural manufactured products in Bangkok and in the regional major cities,

assistance for improvement of quality and design of products, and tourism promotion for remote provinces. These measures could help to stimulate demand for products manufactured by provincial industries such as handicrafts.

The authorities responsible for industrial promotion in each province such as the provincial industry office should, in cooperation with the private sector, conduct studies on the potential for marketing products manufactured by enterprises located in the province. The study on the possibilities of expanding the markets to include Bangkok and other regions, and even for exports as well as the marketing constraints of the products manufactured could be helpful in the design of appropriate policies general toward market expansion.

Permanent exhibition centers should be established for manufactured goods from the regional areas in Bangkok, in major cities of the regions, and in the tourist center cities. The exhibition centers should also be in a position to provide information regarding the products being exhibited together with the directory of producers of these products. Exhibition centers with personnel to disseminate marketing information, though they may generate limited effects for market expansion, will be cost effective, and could trigger off initiatives for new investment projects and the development of subcontracting activities in some areas.

For promotion of new manufacturing enterprises, the establishment of industrial estates may not be economically feasible in remote provinces. On infrastructure, each provincial office should identify the infrastructural facilities which are critically in need and report to the Ministry of Industry and NESDB. the NESDB will then evaluate the economic feasibility and priority for the building of infrastructure in various provinces so that the public facilities could be provided.

The provincial industry office should be in a position to facilitate service for entrepreneurs who want to establish or expand their manufacturing activities. These services include factory registrations, advice on application for BOI's investment privileges,

and on application for utilization of electricity and water,etc. The decentralization of authority in issuing Government and state-enterprise permits from the head offices in Bangkok to the regional areas should also be considered as another measure to assist regional investors.

Local entrepreneurs could be promoted by providing information about investment opportunities, production factors (raw materials and labor), and sources of finance. Other services could reinforce the efforts such as preparation of a guide for investors with instructions on the procedures and steps necessary for the establishment of an industrial enterprise. Training courses on business establishment and financial application techniques could also be designed. Some information on regional industries is now available, such as that prepared by the Information Center for Rural Industries of the Ministry of Industry. Training courses are occasionally organized by various agencies under the Industrial Promotion Department and by some non-government organizations. It would, however, be more effective if a co-ordination mechanism could be established. The provincial industry office should survey the need for promotional services of enterprises located in the province and give suggestions to the agencies involved. Agencies such as the provincial chamber of commerce and the provincial branch of the Federation of Thai Industry should also collaborate to disseminate information, not only to the local entrepreneurs, but also to outside investors who are interested in investing in the province.

Besides promoting potential manufacturing entrepreneurs, the measures designed to upgrade the efficiency of regional industries already in existence will improve the firms' the long-term efficiency and strengthen their competitiveness. The service programs could cover the consultancy services on marketing, technology and management, designs and quality of the products, and packaging. As for the training courses, various types of training could be arranged, including the courses for manufacturers, managers, skilled labor, and general workers.

Other training courses for specific industries and locally appropriate for each region are also recommended. In the meantime, the educational institutions including regional universities, vocational

schools, should be able to respond to the needs of regional industrial development. Clearly, coordination among the educational institutions, the industrial promotion authorities, and the private sector are essential. The educational institutions should manage to produce enough skilled labor to fulfill the demand of industries in the region. They should also be able to design and tailor the training programs to the needs of local industries to improve their efficiency. In addition, students should regularly have on-the-job training in industrial factories. Sufficient exposure to manufacturing activities should serve to motivate students with business potential to enter into the manufacturing sector as an entrepreneur in the future.

The above industrial promotion measures have been implemented by several Government agencies including the Industrial Productivity Division, the Industrial Service Division, and the Regional Industrial Promotion Centers under the Ministry of Industry. The geographical coverage of services, and the number of firms having access to the services of these agencies are still very limited, although the services provided are much appreciated by those who have gained access to them. The responsible agencies should try to improve their services by:

1) expanding the geographical coverage of the services;
2) improving the approach to be more pro-active vis-a-vis the private enterprises;
3) adopting performance appraisal and regularly improving promotional techniques; and
4) coordinating with other related promotional agencies in both the public and private sectors.

4.3.3 Institutional Restructuring[1]

The principle frameworks for regional industrial development are recommended as follows:

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1. For detailed recommendations of restructuring of the Ministry of Industry, see Kriyuth Teeratayakinun, "Ministry of Industry", Economic and Social Development, Draft Report, TDRI, 1989.

1. There should be agencies to formulate policy, collect information, and coordinate various promotional activities on a permanent basis.

2. There should be initiatives from public and private agencies of each province, and close collaboration between the Government and private bodies at the provincial and regional levels.

A common problem in the industrial development in Thailand is the lack of a central unit responsible for policy formulation and co-ordination of policy measures on programs relating to industrial development, and the insufficiency of efforts to coordinate and implement the programs on a continuous basis. At present, there is a Committee on Provincial Industry Development chaired by the Prime Minister with the Planning Division of the Department of Industrial Promotion as the secretariat. This secretariat has a limited number of officers who have heavy load of day-to-day responsibilities. The committee members who are cabinet members and high-ranking government officials also have several other duties. The Committee is thus constrained with the lack of manpower. The meetings have so far not been arranged regularly. The problems of the lack of manpower are also found in the National Economic and Social Development Board, which is responsible for overall economic planning for industry development.

The Thai economy has experienced remarkable growth over the past three decades, and the manufacturing sector has become a major component of the gross domestic product, and of the external trade. The problems of industrial development have become increasingly complicated, as the structure of the industry has been changed significantly over the years. The economy is also affected by foreign economic policies and the global economic situation. In response to this dynamic situation, information should be collected and analyzed to identify potential impacts, and to propose policy measures to tackle the emerging problems. This assignment must be performed on full-time, and not an ad-hoc basis. This leads to the question of whether the time is ripe for a specific government body to study, formulate strategies, policies, and lay out implementation programs for industrial

development. It is good that the establishment of an Office of Industrial Economics operated as a Department under Ministry of Industry has recently been approved by the Cabinet. The main function of this Office of Industrial Economics is to conduct research and analysis to achieve conclusions and recommendations regarding industrial development, particularly in the areas under the jurisdiction of the Ministry of Industry. However, since the agencies responsible for the problems of industrial development are not confined to those under the MOI, the Office of Industrial Economics should co-ordinate closely with other agencies such as the NESDB and the BOI. Ideally, it will serve as a "think-tank" for the economic policy makers to formulate appropriate policies, strategies, and measures related to industrial development, which includes the development in the regional areas. If possible, this Office of Industrial Economics should be made to report to the Committee on National Industrial Development which will be chaired by the Prime Minister. The Committee should comprise the related economic ministers, the Secretary General of the Office of the Board of Investment, the Secretary General of the NESDB, the Governor of the Bank of Thailand, and representatives from the private sector, with the Secretary General of this Office as the secretary.

An agency to coordinate and implement the policy of regional industrial development is also needed. The unit, which could be called "Regional Industrial Development Division" operate under the Department of Industrial Promotion, and would coordinate with other agencies under the Department of Industrial Promotion and with other offices of different ministries, as well as with the public and private offices in the regional areas, in order to implement the policy formulated by the Committee of National Industrial Development especially for the development in the rural industries. Recently, a plan was proposed to establish an Industrial Promotion Division by combining the work of the Rural Industry Information Service Center and the Industrial Development Center. This proposal should be implemented as soon as possible.

The Regional Industrial Development Division should take care of the promotion of both urban and rural industries, and the promotional

functions should be tailored appropriately to the different features of town and cottage industries.

In addition, the Ministry of Industry should plan to upgrade the ability of the Offices of the Provincial Industry to be the efficient service centers for the rural industry information and coordination. Ultimately, their functions should cover the following:

1. registering and issuing a factory permit;
2. collecting information of the province regarding problems, and investment opportunities;
3. serving as an information center for industries developing in the regional areas; and
4. facilitating various consultancy services.

This Provincial Industry Offices will closely collaborate with the Regional Industrial Development Division as well as with other related organizations of the public and private sectors for services and information.

As for the private sector, provincial Chambers of Commerce and the provincial branches of the Federation of Thai Industries should play a more active role in upgrading the industries in their own provinces. They should be able to reflect the need for promotion of the local industries. They should also be able to help provide information regarding investment opportunities in the province for outside investors. The Provincial Joint Public-Private Consultative Committee needs to be restructured to allow representatives from local small-scale industries to more actively participate in the activities.

Exhibition centers for locally manufactured products should be established in the major cities of the region and in the cities that serve as tourist centers. Each center will be equipped with officers qualified to provide assistance to interested persons with information on how to order the products. This type of exhibition center is also recommended in Bangkok.

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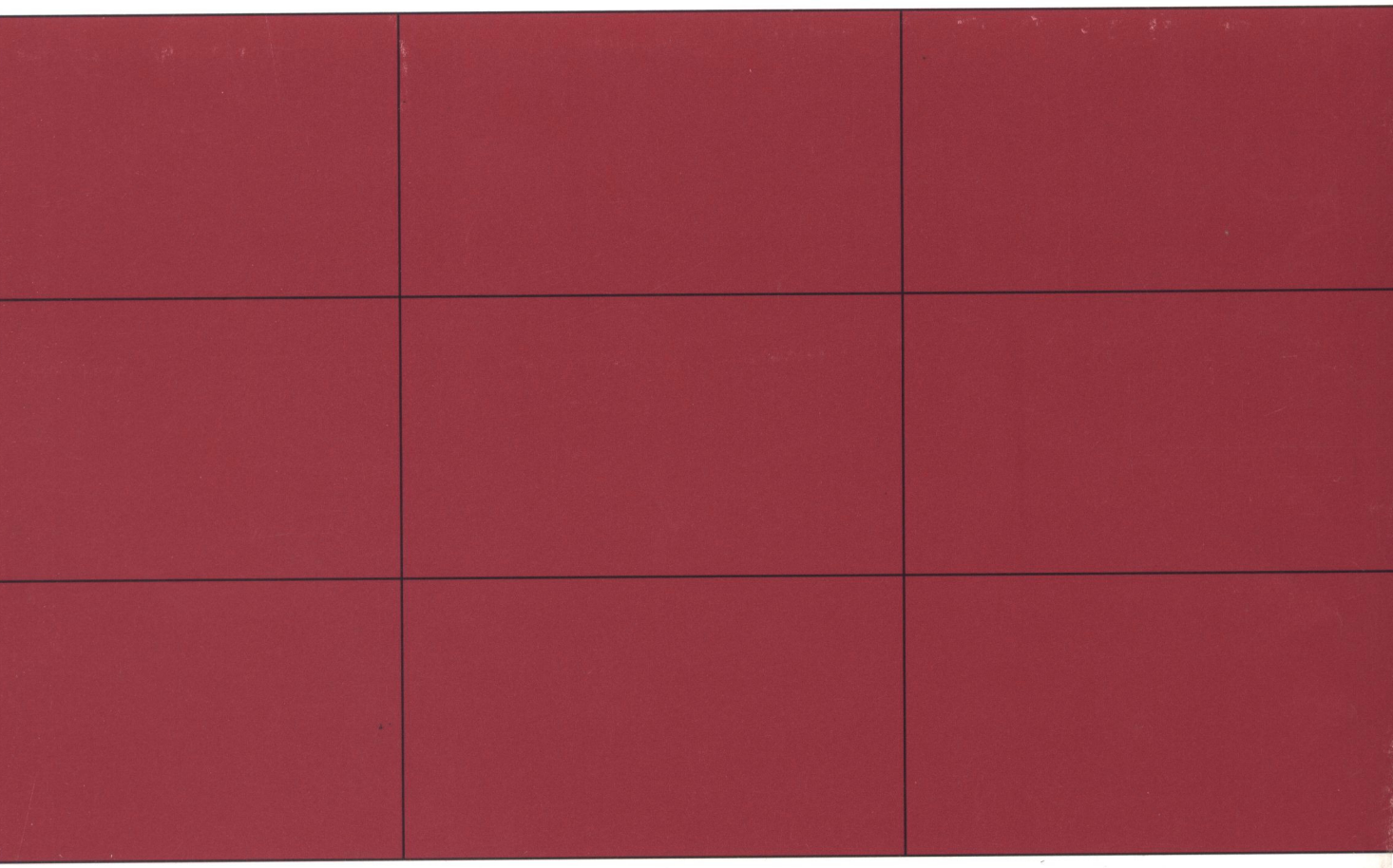

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