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Productivitity Changes and International Competitiveness of Thai Industries

PRODUCTIVITY CHANGES
AND
INTERNATIONAL COMPETITIVENESS
OF
THAI INDUSTRIES

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TABLE OF CONTENTS

TABLE OF CONTENTS (continued)

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CHAPTER 1

INTRODUCTION AND SUMMARY

Within less than three decades the manufacturing sector has become a major sector in the Thai economy. Its share was nearly equal to that of the agricultural sector in 1986 (21.7% compared to 22.6%). This may be attributed to its rapid growth of real production of 16% and 11% a year during the 1960s and the 1970s respectively. Even under the unfavorable trade conditions, a prolonged recession, and the rapid depletion of natural resources, the manufacturing sector still grew at around 6-7% during the first half of the 1980s. The sector has also been increasingly linked with the world market through export channels, especially since the mid-1970s. In 1986, the share of manufactured exports in total exports was about 44% compared with only 5% in 1970. The challenge ahead is whether production growth can be sustained when the sector is becoming increasingly open in a world environment in which demand continues to grow slowly and there is a persistent threat of protectionism. One among many policy options is to improve productivity to remain competitive with existing exports and, at the same time, innovate by changing comparative advantage. Given that the issue of international competitiveness is important for sustaining export growth, it is not easy to assess competitiveness because its domestic and international determinants are multi-faceted.

The collection of papers in this volume attempt to address this issue by starting with an overview the industrial sector in Chapter 2. The chapter discusses Thai industrial development in terms of production, trade, and firm size. Then the discussion is linked to the macro, trade, industrial policy environment, and industrialization strategy of the Sixth Plan. The paper concludes by providing likely scenario for future development and investment requirements.

The third chapter focuses on the issue of international competitiveness of Thai exports. It uses the revealed comparative advantage index as a measure to assess the areas on which the country's competitiveness lies. The analyses of changing comparative advantage were performed by comparing Thailand's indexes with the changing comparative advantage of major competitors and trading partners. The conclusion is that Thailand has an overwhelming competitiveness in natural resource-based products with revealed comparative advantage for labor-intensive products increasing sharply. It is clear that manufactured exports have expanded and are no longer only concentrating on resource-based products. When the country's labor force becomes more skillful and Thailand's technological know-how has accumulated, it will be possible to shift the comparative advantage to higher value-added items such as the ones the NICs are producing.

The sources of changing competitiveness as measured by revealed comparative advantage can be from the following (1) changes in total factor productivity, (2) changes in international price competitiveness; and (3) changes in the world trading environment. The

fourth chapter provides estimates of rates of total factor productivity growth (TFPG) for three digit ISIC manufacturing industries from 1963 to 1979. The major finding is that the Thai TFPG rate was still small compared to that of developed countries and the Asian NICs. However, it did increase from 1963-1970 to 1970-1979 and, on the average, TFPG rates for exporting industries were higher than those of import-substituting industries. The increased TFPG could well be a source of change in the international competitiveness of Thai industries.

The fifth chapter uses purchasing-power-parity (P-P-P) as an approximate measure of the country's is international price competitiveness across all traded goods. The P-P-P, under the 1972 base year, is computed bilaterally between the domestic currency (baht), each of the major trading partners and the Asian NICs. The primary conclusions are that before 1985 the baht tended to be generally too strongly attached in the of the U.S. dollar, deutschemark (1974-1975 and 1980-1984), and even against the pound (during 1973-1979 and 1982-1984 using the WPI price index). The overvaluation by the purchasing-power-parity rate of the baht vis-a-vis the yen, prior to 1977, was followed by the large baht undervaluation at the end of 1977 and 1978, due to the rapid rise in strength of the yen. However, this exchange-rate competitiveness against Japan tended to erode over time and then was completely gone by 1983. Nevertheless, the devaluation and the discretionary floating baht regime (that occurred close to the end of 1984) put Thailand quite a competitive position against all four of the industrialized countries under study. This was because the

market foreign exchange rate, in terms of baht in 1985, was higher by about 15-39% compared to the purchasing-power-parity rate.

The purchasing-power-parity calculation for Korea and Hong Kong, based on the consumer price index, indicated the excessive strength of the baht against the Korea won and Hong Kong dollar up to the end of 1985, i.e. even after the devaluation of the baht in November 1984. The real exchange rate competitive edge of Hong Kong was substantial, ranging between 5-40% during 1980-1985, for the use of the 1975 WPI-based calculation of the P-P-P rate. The calculated result (in the case of Taiwan and Singapore), is opposite that obtained for Hong Kong and Korea. Though the lower strength of the baht vis-a-vis the N.T. dollar was generally found to be small (except about 12% for the year end of 1981 and 1985), the undervaluation of the baht against the Singapore dollar by the 1975 WPI-based comparison was larger. Singapore's case, it is presumed, may be due to the excessive strength of the Singapore dollar after the full liberalization of foreign exchange control in 1978. Singapore has become, along with Hong Kong, a regional financial center. But in the Singapore case, its currency probably tended to be too strong for the purpose on trade-equilibrating Though the baht was found to be relatively and slightly undervalued to the N.T. dollar before 1983, Taiwan's relatively excellent export performance may be due to other factors, notably the change of import-substitution policy to the export-substitution or export-promotion policy after 1960. Nevertheless, there was a larger exchange-rate advantage for Thailand over Taiwan in 1984 and 1985. The

last case is Malaysia. It was found that the baht again tended to be generally too strong against the Malaysian dollar up to 1984. The value of the baht became somewhat lower than it should have been under the P-P-P, enabling Thai exports to become relatively more competitive against Malaysia, only after 1984.

Despite increasing TFPG and favorable changes in price competitiveness, the restrictive world trading system can adversely affect the performance of Thai exports. The final chapter (6) examines issues related to export opportunities in the present and future world trading environment. The major conclusions are that as tariffs in DCs have come down, new types of nontariff barriers (NTBs) have gone up. In general, the burden added by NTBs has more than offset the gains from low tariffs. The manufactured exports for which LDCs face high NTBs are labor-intensive products such as textiles, clothing, and footwear. However, in the short run, despite the protectionist pressures, Thai exports still show favorable performance for three possible reasons: (1) the share of some Thai exports is still small in total world imports and has not reached the threshold of the limits of NTBs; (2) the share of other Thai exports is large and they benefit from the favorable terms of trade; and (3) other major exporting countries are faced with more severe protectionism and thus Thai exports could benefit from the opening opportunities.

The conclusion of the volume is that the results broadly indicate that comparative advantage lies mainly in exporting of resource-based goods with growing competitive strength in labor-intensive products. Skilled labor and capital-intensive products could be the exports to which the country's comparative advantage is shifting. The major sources of changing comparative advantage are changes in productivity and price competitiveness. However, excessive protection among Thailand's trading partners could adversely affect the country's long-term export performance. Thus, limited market access and intense international competition is likely to prevail.

CHAPTER 2

THAILAND: INDUSTRIAL SECTOR OVERVIEW

Narongchai Akrasanee

2.1 DEVELOPMENT OF THE MANUFACTURING SECTOR

Thailand emerged from World War II with a small manufacturing sector consisting mainly of processing of primary products - rice, sugar, rubber, timber - for export as well as the domestic market and production of some basic consumer goods, largely by small - and medium-sized firms. The collapse of the Korean War commodity boom in the early 1950s suggested a need to strengthen the manufacturing sector. After rather unsuccessful attempts to promote manufacturing through public enterprise, policy shifted in the 1960s towards encouragement of private investment through improvement of transportation network and other infrastructure and moderate tariff protection.

The economy of Thailand has undergone some structural changes over the past two decades and a half. The first decade of Thai industrial development relied upon import substitution industrialization. The production of consumer goods began to spring up during this period and the production of resource-based manufactures, i.e., processed foods continued to grow until the 1970s. At the dawn of the 1970s many manufacturing activities, which have been nourished by the protective system, began to export the residual output.

As the limitations of import substitution in a relatively small domestic market became apparent, Thailand embarked in the mid 1970s on an outward-looking policy of promoting exports of labour-intensive

manufactures. With the advantage of the late-comer in exemption from quota restrictions on the major textile and clothing exporters, such as Hong Kong and Taiwan, Thailand experienced a decade of very rapid growth of exports, production and employment in these industries, as well as in more traditional processing industries, such as timber and rubber, in precious stones and jewelry, and electronics assembly. The mid-1970s, however, also brought pressures on Government to use its policy instruments of tariffs and investment incentives in favour of relatively capital-intensive industrial projects producing for the domestic market, from oil refining and vehicle assembly to chemicals, metal products and machinery.

By 1980, these developments had greatly changed the structure of the manufacturing sector. The relative importance of processing industries (food, in 1960 accounted for 31 per cent of value added) had diminished in favour of resource and labour-intensive industries which had risen to 36 per cent and intermediate and capital goods which by 1980 accounted for about one-third. The share of consumer goods production for the home market had remained virtually unchanged at around 20 per cent. Much of this new capacity, however, was relatively capital-intensive, high-cost and highly concentrated.

During the early 1980s, growth of manufacturing production, along with that of the economy as a whole, slowed down. This was ostensibly because of the unfavourable changes in both external environment and internal factors. On the one hand, world economic downturn and a tidal wave of protectionism in developed market economics have retarded the growth of manufactured exports. On the other hand, unduly macroeconomic

policy management has resulted in the deterioration of the competitiveness of Thai manufactured exports. Fortunately, the situation has been improved somewhat and by 1986 the Thai economy seems to be on a growing trend again.

Various efforts from the public and private sectors have been undertaken to improve domestic resource mobilization and to enhance the competitive edge of Thai exports. There are close links between business and the Government elites who share common view on the active role of the private corporate sector, and recent trends (especially in the Eastern Seaboard Development Programme) indicate increased government participation in industrial development.

The impact of such efforts on the Thai economy generally and the manufacturing sector in particular lies in the remaining of the 1980s. The crucial question is whether this growth can be sustained, and whether the benefit of growth is widely shared throughout the economy.

2.2 PRESENT STRUCTURAL PROFILE

In the past twenty-seven years, Thailand has been transformed from a predominantly agarian into a next tier NIC economy, with the contribution of manufacturing to GDP on the verge of overtaking that of agriculture. The annual growth of GDP at constant prices from 1960 to 1980 was over 7%, with particular high growth in manufacturing, public utility, banking and other services. As a result, the share of agriculture in GDP decreased from 40.5% in 1960 to 24.9% in 1980, despite its respectable annual growth of 4.9% (Tables 1 and 2).

With rates of growth of about 11% a year in real terms during the 1960s and about 10% a year during the 1970s, the manufacturing sector expanded faster than any productive sectors. Its share in GDP increased from 11.7% in 1960 to 21.7% in 1980. The agricultural sector contributed to the expansion of manufacturing sector through sustained growth in the production of raw materials for industrial use and the generation of demand for manufactured goods. The Government has provided tariff protection and investment incentives to stimulate import substitution industries. The nature of import-substitution industries, by and large, employed capital-intensive technique and generated rapid increase in import bill on intermediate and capital goods. This caused a persistent trade deficit. Apparently, the import substitution industrialization was partly made possible at the expense of the agricultural sector through cash crop diversification and huge export volume of such new crops as maize and tapioca.

During the early 1980s, the growth of manufacturing sector slowed down due partly to world economic recession and rising protectionist abroad and partly to macroeconomic policy environment particularly high interest rates and overvalued exchange rates which imparted a substantial anti-export bias.

A recent World Bank report (1982) came to the conclusion that domestic demand was the primary source of growth to the manufacturing output. Table 3 shows that import substitution was significant in the 1966-72 period and even before this period. There was no net import substitution during the period of 1972-75 and even some "negative substitution" in sectors where demand outpaced the growth of domestic

capacity and the import share grew accordingly. Nonetheless, exports made an increasing contribution to the growth of output. The shift towards greater export orientation became evident in some sectors such as textiles, rubber products and wood products. During the period of 1975-80, export demand has become the dominant contributor to the growth of manufacturing.

On the supply side, the sources of growth of the manufacturing sector will be classified into the increase in physical inputs and the total factor productivity growth (IFPG). The study by Wiboonchutikula (1984) showed that the period of increases in the total factor productivity growth (TFPG) coincided with that of changes in industrialization and trade policies from import substitution to export promotion. During this phase average TFPG increased from 1963-70 to 1970-79 despite the decline in the contribution of the primary inputs growth to real output growth Interestingly, TFPG was more likely to be from the increases in the quality of inputs, efficiency, capital utilization and technology knowhow. Meanwhile the source of labour productivity growth which became more important was the residual term of TFPG.

2.2.1 The Structure of the Manufacturing Sector

The manufacturing sector is still broadly divided into those industries processing primary products for either export or domestic consumption and those transforming imported raw materials and intermediate goods into final goods for domestic consumption or, more recently, for export. Until 1973, most of the growth of manufacturing was based on production for the domestic market, including significant

amount of import substitution in consumer goods. The domestic market was sufficiently profitable to sustain adequate levels of output and was less demanding than the world market in terms of marketing and quality standards so there was little incentive to export.

The capital and intermediate goods industries in Thailand are still little developed and inter-industry linkages are weak. This is mainly because of the cascading structure of protection which favours the production of consumer goods for the domestic economy and provides widespread exemptions from duties on imported machinery and intermediate products.

Manufactured exports have become important only since a decade ago. They have grown quite rapidly in response to favourable external market conditions, a good domestic business situation, relatively low wages and a favourable disposition towards exports by the Government. The statistical data show that tariff rates applicable to Thai products are low, in particular because GSP duty rates are considerably lower than the average tariff rates. As pointed out by Ajanant (1987) what to be concerned are the increase in non-tariff barriers. Textiles and wearing apparel (MFA quota), frozen squid (quota, Japan) and frozen shrimps (stringent quality regulations, Japan) are the cases in point.

Analysis of the compsition of the manufacturing sector itself shows that the bulk of production is still closely related to the primary producing sectors. (Tables 4 and 5) In 1986, 25% of value added is attributed to processed food, beverages and tobacco. Textiles and wearing apparel are the next most important group, accounting for 21.4% of value added. They have grown very rapidly over the past 10 years and

are the leading supplier of manufactured exports. Although local production capacity had already saturated the domestic market, the primary impetus for export was the migration of new production capacity to Thailand from nearby countries which were subject to textile quotas in OECD countries. Thailand at that time had no quotas; it has since been subjected to quotas. The entry into exports was not simply an outgrowth of domestic activity, but resulted more from grafting external production capacity on the Thai industrial sector.

Of particular notice is the emergence of petroleum and chemical products as a result of the expansion of oil refineries and the establishment of gas separation plant. The share of engineering industries accounted for 12.9% of manufacturing value added. This sector deserves special attention for its future growth as one of the skilled labour-intensive and technology based industries. The sector is dominated by the transport equipment primarily automobile assembly plants. There is a small and growing domestic parts industry which is being encouraged by rising local content requirements in vehicle assembly. Until recently, the industry has rarely participated in exports.

To recapitulate, industrial growth has been mostly horizontal. The production base is rather shallow, with only some capacity in producing intermediate and capital goods.

As an open economy, the industrial development of the country has closely been related to the development of foreign trade. Over time, the share of consumer goods in total merchandise imports was reduced, while that of intermediate and capital goods increased significantly.

(Table 6) By the early 1970s as the easy stage of import substitution was reached, its contribution to industrial growth began to decline. And by the end of 1970s it became evident that import substitution ceased to contribute further. During 1980-86, the share of consumer goods in total imports was relatively stable at around 9%. Conversely, the import statistics reveal the fact that the development of manufacturing industries in Thailand has been highly import dependent and that the capital goods sector has not properly developed as the amount of intermediate and capital goods imports increased significantly with the passage of time.

As for export structure, it is only after 1970 that manufactured products have made some ground in the export market. According to SITC classification, exports of primary products which traditionally form a major bulk of total export value declined significantly from 95.7% in 1960 to 54.4% in 1986. On the other hand, exports of manufactured goods rose from 1.4% in 1960 to 5.1% in 1970 and 43.6% in 1986. (Tables 7 and 8)

An analysis of the manufactured exports based on the Input-Output Tables for 1975 and 1980 indicates that during 1975-80 their value increased by about 28% a year, compared with 19% and 18% a year for manufacturing and value added, respectively (all measured in current prices). Thus, the manufacturing sector has become more export-oriented, with the value of export sales to manufactured output increasing from about 14% in 1975 to 20% in 1980 (Table 9). Clearly, resource-based and labour-intensive products occupied a significant share of Thailand's manufactured exports. The relatively more export-

oriented industries were rubber and rubber products, electrical machinery (basically integrated circuits), food, leather products, ceramics and fabricated metals. The industries that contributed the most to export earnings during the 1970s were textiles, garments, processed foods, jewelry and an array of small but rapidly growing manufactured goods.

2.2.2 Employment and Trade Regime

The expansion of Thai manufacturing is important also for its contribution to employment creation. The rate of labour absorption in the manufacturing sector accelerated in the 1970s, coinciding with the rapid expansion of manufacturing. About 7.9% of employment in 1980 was attributable to manufacturing, but its rate of labour absorption is increasing and the manufacturing sector now absorbs about 12.7% of the increment to the labour force (Table 10). The projected rate of employment generation in agriculture, even with the introduction of new techniques, will not be adequate to absorb the projected increase in the labour force over the next decade; the industrial sector will have to provide a growing share of job creation in the future.

The relatively rapid growth of employment is explained in part by the rapid growth of the manufacturing sector itself and in part to a structural change within manufacturing resulting from the growth of export-oriented industries, which appear to be more labour intensive than those producing for the domestic market. Akrasanee (1981) estimated that the direct plus indirect labour inputs into nonresource based export production was 36 worker years per million baht annual value added compared to 21 for import competing industries.

Moreover, there was a positive, though not strong, relationship between the degree of capital intensity of production and effective rates of protection. Protection tended to protect importables with higher capital intensity, whereas labour intensive exportables received lower or negative protection. Since the strategy of export promotion has been found to be more employment creating, the continued practice of import substitution has meant that employment is being created at higher cost. However, the bias in the incentive system has not been strong enough to reverse the pattern of factor intensity of production and trade from that predicted on the basis of factor endowments.

2.2.3 SMIs and Rural Industrialization

Small and medium-scale enterprises have played an important role in industrial development. They were major sources of manufacturing employment and income, and also accounted for more than 40% of total value of fixed assets and value added.[1/] There is a clear phenomenon of duality in technological standard among firms; imported modern technology applied by large firms and traditional technology by small firms. Small firms are more likely to employ traditional method of production and use local raw materials.[2/] Tambunlertchai's study

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1/ Akrasanee (1982).

2/ Akrasanee (1982), Saguanruang, et.al. (1977), Onchan (1985), and Tambunlertchai and Loohaoonchit (1982).

(1980) indicated that small-scale firms were more labour-and less capital-intensive than large-scale firms. Furthermore, the efficiency of SMIs was not always relatively low compared to larger firms.

Statistics on the number of registered factories classified by size are not available for recent years. According to the data of registered factories in 1979 classified by industry and size of employment, which are shown in Table 11, it becomes apparent that factories with less than 20 employees accounted for 84.3 percent of the total, and if those with 21-40 employees were added, their percentage in registered factories would increase to 92 percent. Industries where small scale firms were concentrated including food, wood products, paper products, plastic products, non-metallic mineral products, fabricated metal, machinery, electrical products, and transport equipment. The last three industries involved mainly repair services.

Data in Table 12 which shows the distribution of registered factories by region and size of employment in 1978 again confirm the predominance of small scale firms in the country's industrial sector. Thailand's industrial activities are much concentrated in Bangkok and other provinces in the Central Region, i.e., over 70 percent of the registered factories in 1978 were located in the Central region, including Bangkok. Again, industries outside Bangkok are predominantly food and agro-based and also include the production and repair of agricultural implements. The rapid increase which has been found in the 1970s for rural non-farm employment can largely be attributed to these

industries, but their growth in turn has been found to depend virtually on the growth in agricultural activities.[3/]

2.2.4 Relationship between Large and Small Firms

It has long been argued that subcontracting system should be promoted as an effective means to boost the growth of SMIs. Its benefit will encompass the scale economies, improvement in technical capability, time savings, and improvement in productivity and efficiency. So far not much is known about the nature of contractual arrangement and its extent in the Thai manufacturing sector.

Subcontracting arrangements among industrial enterprises are relatively recent in Thailand, and most enterprises start having subcontracting after 1973. A firm level survey in 1984 by Tambunlertchai (1986) reveals valuable information on subcontracting arrangements. Out of 200 sample firms, 95 firms or 47.5% engaged in subcontracting arrangements either as contractors, subcontractors or both. In terms of percentage, 44.3% of large firms and 48.9% of SMIs surveyed dealt with subcontracting. As expected, contractors or offerers of subcontracting were mostly large scale firms and a significant proportion of these firms were having foreign investment participation. Subcontractors or receivers of subcontracting, on the other hand, were mostly SMIs.

The subcontracting arrangements were frequently found in engineering industry, textiles, and wood products. The local content

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3/ Akrasanee (1983).

requirement imposed particularly on transport equipment sector has influenced the emergence of subcontracting arrangements.

As for the extent of subcontracting, 10 out of 28 contractors have 40-49% of their business through subcontracting, while about half of 67 subcontractors have subcontracting value ranging from 20-49% of their total production.[4/]

2.3 MACRO, TRADE AND INDUSTRIAL POLICIES

In Thailand, industrial development has taken place largely on the initiative of the private sector responding to market forces. In the late 1950s the Government experimented with becoming directly involved in production by a number of public enterprises. This experiment proved unsuccessful and was discontinued. The Government still owns some enterprises, few of which are profitable; but reliance on private sector activity remains the key element in the sustained growth of industry. Thailand has had numerous governments and several military coups, yet this policy stand has remained intact.

Apart from the ability of the private sector in responding to market forces, the dynamism of industrial growth has been due mainly

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4/ The study by Tambunlertchai (1986) is based on 200 sample firms in ten industries. Since the sampling procedure was biased towards subcontracting firms, the result therefore should be interpreted with great care. Chintayarangsan and Taniguchi (1987) also conducted study on subcontracting in three selected industries, i.e., agricultural machinery, air-conditioners, and motorcycle.

to policy direction of the Government. The policies which have important bearing on industrial growth are macro policy and trade and industrial policies, This section will discuss these policies in turn.

2.3.1 Macro Policy

The pattern of expenditure of the Thai economy is conducive to economic growth; investment expenditure has always been higher than 20% of GDP. But the economy has not saved enough for this rate of investment. This is particularly true for the public sector during 1977-83 period, resulting in growing foreign debts and competition with the private sector for limited financial resources.

The government role has been active in investment in infrastructural facilities such as roads, ports, and electricity, particularly in the early phase of industrial development. Later on various industrial estates and export processing zones were pushed to cope with rapid expansion of manufacturing activities.

In addition, the Government has practiced conservative monetary policy; money supply and credit creation are closely watched, and there has been no effort to undervalue the currency.

This partly explains why the rates of inflation were low in most years. During the 1960s inflation was less than 4 percent per annum. The oil shocks of 1973 and 1979, and the increase in food prices in 1972-74 caused the rates of inflation to be over 10%. But they were brought quickly under control.

During the 1970s real interest rates were low, because of the control on interest rates. In certain years such as 1980 and 1981, real interest rates were in fact negative. As a consequence private savings fell drastically. Part of the savings went into the informal financial sector. But in 1982 when interest rates were increased, real interest rates became positive. During 1983-85 real interest loan rate remained higher than 10%, the rate considered to be rather high for investment.

As for exchange rate, during the 1960s and early 1970s there was a slight upward trend in the exchange rate. But price level remained stable, so there was no major divergence between the nominal and real exchange rates. Torigoe (1987) argued that at least until 1973 the exchange rate was not used as a measure for promoting import substitution. Over the period from 1974 the exchange rate was fixed at about 20 baht to the US dollar. However, rising price levels caused an overvaluation in the exchange rate by about 15%.

At the macro level government policies have an effect on the incentive structure through the effects of macroeconomic imbalances on the "real exchange rate" or the relative price of tradables to nontradables. In addition to providing a "subsidy" to the use of capital, thereby increasing the capital intensity of profitable projects, an overvalued exchange rate also reduces the competitiveness of sectors producing tradables--both for export and for the domestic market. In this regard the macroeconomic policy stance of the Government may well have significant effects on a sector such as agro-industry which heavily relies on export markets. From the point of view of this sector, the steady appreciation of the baht vis-a-vis the yen

and other European currencies as the US$ strengthened in the early 1980s posed severe difficulties with regard to competitiveness in world markets. The problem was alleviated considerably in November 1984 when the baht was devalued by some 15% against the US$ and the exchange rate system changed from being pegged to the US dollar to being determined on the basis of a basket of currencies. After this major policy change, it became apparent that export growth has regained its momentum in the last few years.

2.3.2 Trade and Industrial Policies

Thailand's industrialization process essentially began in the early 1960s. The first few development plans focussed the Government's attention primarily on the provision of the required economic infrastructure and the promotion of private sector investment. Towards the end of the 1960s, the Government began to pursue import-substitution policies more actively primarily via the use of trade taxes to protect domestic industry. The protectionist trends continued into the 1970s, albeit with some shift of emphasis away from consumer goods towards intermediate goods and raw materials. Increasing trade deficits in the early 1970s prompted the Government to devote more attention to export promotion policy since the Third Plan (1972-76).

The BOI can, in principle, provide incentives to export oriented firms, and for some types of activities all or part of output must in fact be exported if a firm is to receive promotional privileges. However, despite these stipulations, promoted firms were on balance not more export oriented than the manufacturing sector as a whole. The

reason is that promoted enterprises in the past could make higher profits in domestic markets, given that incentives were largely in the form of protection of domestic sales.

More important for exporting industries were the exemption of duties and taxes paid on imported inputs and the refund of taxes on domestic inputs granted by the Customs Department. Recent reforms of these tax refund schemes, which previously were found to be cumbersome and resulted in only partial and delayed refunds, have streamlined the procedures and ensured sufficient financial resources to assure speedy and full compensation for exporters. These measures approximately eliminate any distortions in export prices. Of course, the protection accorded to import substituting activities implies a continuing bias in favour of production for import substitution rather than for export.

Other export promotion activities include the rediscounting facilities administered by the Bank of Thailand, whose use, however, has been concentrated in traditional (agricultural) export commodities, while nontraditional manufactured exports have in the past only comprised a relatively small share. An Export Development Fund was set up in February 1982 as part of the Government's restructuring program to provide marketing support to Thai exporters through export service centers in Thailand and overseas.

The industrial sector in Thailand experienced a marked slowdown as the economy entered the 1980s. This was partly due to the import-substitution policies that had been pursued in the 1960s and 1970s. The domestic markets for the many consumer goods industries that had grown

quickly in the 1970s became satiated and were no longer able to provide an engine for continued rapid growth. The so-called easy period of import-substituting industrialization reached its end and the efficiency costs of the aggressive protectionistic and anti-export policies of the late 1960s and 1970s became increasingly evident. 5/

Recognition of this led to a major shift in trade and industrial policies at the outset of the 1980s. This shift was embodied in the Fifth Plan which clearly set out the objectives for industrial structural adjustment reforms in the 1980s. The major components of the industrial policy included: (a) a comprehensive examination and rationalization of the tariff structure; (b) an overhauling of the existing structure of industrial incentives; and (c) the improvement and further development of measures to promote the growth of manufactured exports.

This came with a definite shift in government policy in relation to industrial restructuring, moving away from an industry by industry approach to a broader strategy based on three groups of enterprises: export-based manufactures, rural-based industries and agro-industries.

Over the last few years, Thailand had been attempting to push several of its import substituting industries established in the early stages of industrialization in the 1960s to become more efficient and therefore more competitive in export markets by reducing levels of

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5/ For review of the protection structure in the 1960s and 1970s, see Akrasanee and Ajanant (1983) and Ajanant (1987).

tariff protection and seeking a rationalization of industrial structures. This operation had begun with the textile sector and had moved on since to deal with the automobile and electrical industries.

A significant bias in favor of import substitutes (and therefore against exports) remains. A major attempt at tariff reform in October 1982 was largely offset by subsequent measures. The protection of the agro-business sector increased to some extent. However, the incentive bias in favour of other manufacturing in general and finished consumer products in particular, was substantially reduced, and the dispersion of ERPs across sectors declined somewhat. While progress towards reducing protection rates was achieved in some subsectors, progress within the industrial sector as a whole was modest, and even these gains were reduced by the April 1985 tariff measures. Bhattacharya and Brimble (1986) suggest that it was revenue concerns (rather than worries about the balance of payments) that were the most important impediment to tariff reform. Indeed import tariff revenues have been raised without worsening the distortionary effect of the system, which may be regarded as somewhat of a success, although this was not the original goal.

The system of investment incentives which is primarily administered by the BOI, has remained largely unchanged in recent years. The main instruments used are tax holidays, duty and business tax rebates on machinery and a drawback scheme for exports. The BOI also plays an important facilitating and coordinating role for foreign investment. Only about 6% of private sector industrial investments

receive BOI incentives. So far, incentives have been primarily directed towards large firms for capital-intensive import-substituting investments.[6/] In January 1983, new guidelines were issued to shift emphasis to export-oriented and labour-intensive projects. But uonly now the impact has been substantial. At the same time there has been a trend away from the promotion of consumer goods towards intermediate goods industries such as chemicals and metal products. And approval procedures have also been streamlined through the establishment of a "mini" BOI with authority to approve smaller proposals, so that processing time has been considerably shortened.

A common criticism levied against the present system is the discretionary nature of the promotional policies. The criteria for promotion remain ambiguous, and in the absence of adequate technical and staff support, promotion privileges continue to be granted without a comprehensive analysis of the economic merits of the proposals and with only weak follow-up on the investment projects that are promoted.[7/]

6/ A study of tax incentives in the ASEAN countries, found, however, that Thailand had the lowest rate of capital subsidy, whether for regular or "pioneer" firms. See Agell (1983).

7/ For a comprehensive review of the BOI, see Sibunruang (1986) Moreover, IMG and IMC study (1984) on fiscal implication of investment incentives estimated the net cost of giving investment promotion at 2,617 million baht in 1980 or about 3% of the tax revenue. The largest source of the net cost was import duties on machinery and raw materials (68%), followed by business taxes (25%) and corporate income tax (7%).

The growing emphasis on export-oriented industrial promotion in Thailand which has been the theme of policy over the past years, emerged even more clearly in the early 1980s. Good -progress has been made in some areas. For example, export promotion measures have been introduced or strengthened. These include improvements in the duty drawback system, improved financing facilities for both direct and indirect exporters, and the encouragement of trading companies. In addition, the devaluation and "depegging" of the exchange rate in November 1984 has restored much of the competitiveness lost during 1981-84.

2.4 MAIN STRUCTURAL POLICY ISSUES

2.4.1 Industrial Base

Despite the rapid industrial change, import substitution strategy has remained a moot point. Continued import substitution focusing on finished consumer products has caused the balance of trade problem. Over the years, the balance of trade shifts from deficits in finished products to deficits in intermediate products. This is considered to be usual when the initial industrial base is small and the linkages between economic units are not broad.

While the limit to the first phase of import substitution industrialization has been reached, Thailand has entered the second phase of import substitution regime, but the problem lies in the type

of heavy industries[8/] to be developed. Light and heavy industries can receive privileges and tax incentives granted under the Investment Promotion Act. One of the privileges Thailand can grant is limited entry and protection against imports. However, heavy industries require a large size of market to accommodate their output, not withstanding large investment requirement and technology factor. Given the limited market size, then, we see only a few heavy industries in Thailand. The cases of synthetic fiber and paper pulp help exemplify the issue. Import ban and subsequently import surcharges have been imposed to ensure the survival of these new industries.

The situation has been drastically changed in recent years due primarily to the discovery of natural gas in the Gulf of Siam and, shortly after 1985, the currency realignment particularly the appreciation of Yen. At the first instance, the gas separation plant and the petrochemical complex have been ambitiously developed and promoted in the Eastern Seaboard area. Secondly, the new wave of Japanese and Asian NICs investment is likely to make Thailand as a base for third country export and, at the same time, to enhance the

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8/ The first phase of import substitution aims to produce ordinary consumer products to substitute similar imported products. In the second phase, there is a vertical movement towards intermediate and capital goods: light goods and heavy goods. The former includes downstream chemical products, metal fabrication, and component manufacturing. The latter includes upstream chemical and metal products, manufacturing of machinery and equipment. For a comparative study on second phase import substitution in ASEAN, see Lo and Akrasanee, eds. (1987).

viability of many second phase import substitution projects[9/]. The manufacturing of engines and electrical machinery like transformers are the cases in point. In this respect, there is a strong implication that to foster the second phase import substitution industry, supporting industries, mostly small and medium scale industries, must be strengthened. This also requires ways and means to establish formal relation ship between small producers and large producers, such as subcontracting.

As noted earlier, the prevailing structure of protection tends to favour the production of consumer goods at the expense of the production of intermediate inputs and capital goods. This results in the high prices of the latter which, in turn, affects the competitiveness of Thai manufacturing sector and export-oriented industries particularly. This dilemma has confused the direction in which second phase import substitution industries ought to be promoted[10/]

In addition to the development of second phase import substitution, the increasingly important issue is how to expand export production base of the country. With regard to its large agricultural

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9/ For the exploration of the likely effects of the Yen appreciation on both Thailand and Japan, see Industrial Management Co., Ltd. (1987) and Phongphenichit (1987).

10/ Factors which determine sources of intermediate inputs are comprehensively explored in Industrial Management Co., Ltd. (1986). Apart from price factors, non-price factors also play a role. They include such factors as quality of inputs, specifications by customers or importers, shortage of local supplies and speed and punctuality of local delivery.

sector, recent trend is oriented towards the development of agro-industrial project. A wide variety of opportunities has been identified. Certainly, ways and means are to be designed to establish the link between farmers and modern manufacturing enterprises, and in this respect contract farming should be accorded high priority.

2.4.2 Anti-Export Bias

Since the early 1970s the Government has adopted various measures to promote manufactured exports. Two major incentives given to exporters are the refunds and rebates of taxes and duties paid on intermediate inputs, and the interest cost subsidy by which exporters can obtain short-term loans at preferential interest rates. Estimation of effective exchange rates and effective promotion rates by Tambunlertchai, et.al. (1981) revealed that the incentive measures, enabling exporters to reduce a small portion of their operating costs, were far from adequate to compensate for the bias against export industries resulting from the country's protective tariff structure 11/. Indeed, industries which produce primarily exports or import substitutes receiving limited protection generally showed superior total factor productivity change and increase in international

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11/ There are, of course, many factors other than the fiscal incentives that influenced the growth of manufactured exports. These include the nature of the exported products which are mostly in line with the country's perceived comparative advantage, and individual attempts of manufacturers to promote their export.

competitiveness to those which produce heavily protected import substitutes.[12/] The results are therefore consistent with other evidence suggesting a negative relationship between import protection and dynamic comparative advantage.

Thus, it is convincingly argued that the Government should reform trade and industrial policies to create a more consistent economic environment. A crucial first step is to implement a carefully phased reform of the tariff system in the direction of lower and more uniform rates which could provide an important stimulus for exports[13/]

2.4.3 Technological Deepening

In Thailand, the upgrading of science and technology (S&T) has involved the promotion of foreign direct investment and the encouragement of applied research activities by universities and Thailand Institute of Scientific and Technological Research. Foreign direct investment is seen by policy markers as the means by which technology can be brought into the country. Clearly, entrepreneurs

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12/ Nishimizu and Page (1986) have proposed a simple decomposition of change in DRC measure of international competitiveness into three distinct elements: changes due to relative price movement, changes in technique, and total factor productivity change. It was found out that for the period 1963-76 changes in price competitiveness and in total factor productivity were the major sources of changes in international competitiveness; changes in production technique accounted for relatively little DRC change. Furthermore, there was an association between exposure to external competition, productivity change, and improvement in international competitiveness.

13/ For extensive recommendations to boost manufactured exports, see Industrial Management Co., Ltd. (1985) and World Bank (1985).

have not sufficiently realized the importance of S&T in reducing production cost and enhancing product quality. A survey on 105 manufacturing firms revealed that R&D constituted only 0.11% of total annual sales.[14/] Most of the technology used in the modern sector was imported without any screening process. It is evident that costs associated with technology contract were excessive not only in monetary terms but also various restrictive clauses.[15/]

The situation was aggravated by the fact that foreign or joint venture firms attached little importance in indigenization. This was attributed to the negative attitude of the expatriate managements towards the capabilities of local staff. Doubts were also expressed regarding the rationale for, and effectiveness of head-office training programme for local staff. Previous studies on Japanese joint venture in Thailand had reported that some of these training programmes were actually meant to serve as rewards for hard work rather than to contribute to the transfer of valuable skills to local staff.[16/]

It is expected that universities and research institutes provide the skilled manpower base. The general perceptions, however, are that the strategy of build capacities in the public sector has not met

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14/ Thailand National Commission for UNESCO (1983).

15/ For a detailed study, see Joint UNCTC/ESCAP Unit on Transnation Corporations (1984) and also Industrial Management Co., Ltd. (1985c)

16/ See, for example, Surakanvit (1984). It is also noted that Japanese joint ventures were relatively more concerned on training of middle managerial class employees.

with much success, in part because of the absence of effective linkages between the public and private sectors, as well as the lack of explicit measures and schemes to promote technological base.

Just recently, the Thai Government in cooperation with the USAID has undertaken a major programme to build up S&T base in three major areas; mechanical and material science, electronics and computer technology, and bio-engineering. However, its impact cannot be assessed at this time.

2.4.4 Industrial Location and Regionalization

The regionalization of industrial growth is still far from being successful. Bangkok and neighbouring provinces continue to be the most attractive location for factories. In the light of the insufficient infrastructure and a far-reaching distance to the market, incentive measures have not provided sufficient compensation for the disadvantage of regional locations. Indeed, study by Santikarn (1980) pointed out that decisions to locate outside the Greater Bangkok was hardly influenced by government tax incentives. Nor was cheap labour a significant factor in the process of decision making. Industries move to the rural areas either because of the need for agricultural raw materials or because the owners are rural residents.

In addition to investment incentives provided, the Government has attempted to develop industrial estates in regional areas. In this regard there is only one industrial estate in operation, the Northern Region Industrial Estate in Lamphun. Unfortunately, even this one is

not very successful. Numerous problems and obstacles have been encountered by the Industrial Estate Authority of Thailand. To mention a few, they are the lack of coordination among government agencies concerned, conflict of interest in the acquisition of land, and locational disadvantages such as the long distance from Bangkok Port.

Despite these deficiencies, there are five regional industrial estates in the pipeline:

(1) Mab Ta Phut industrial estate in the Eastern Seaboard Program (ESBP)

(2) Lam Chabang industrial for light and medium industries also in ESBP

(3) Samut Sakorn industrial estate near Bangkok

(4) Nakorn Ratchsima industrial estate for services and small industries in the Northeast

(5) Southern Region industrial estate in Songkhla

The Government has recently attempted to develop infrastructure under the Eastern Seaboard Development Programme, but the implementation has been delayed due to budget constraints and controversies over the economic viability of certain components. After a careful review, the decision was reached to proceed with a moderately sized petrochemical complex, relying to a large extent on private sector initiatives. Other large-scale projects have been delayed pending further investigation and improved opportunities. The major portion of public investment is on massive infrastructural facilities to develop the ESBP to its full potential including ports and industrial estates.

Recent assessment by the World Bank (1984) has pointed out that the Thai Government has moved cautiously in developing the programme, adopting a flexible approach with frequent reappraisals of investment options. But it also issued a warning that each major project should be assessed on its own economic merits, in terms of its feasibility and appropriate timing, given overall public and private financial constraints. Since the ESB area is considered as a new industrial core particularly for heavy industries, such large scale project must be justified on the basis of direct economic benefit generated, rather than by reference to general regional development criteria. For light and medium industry development in the Lamchabang area, though the projected economic impacts are more significant, major costly public investments should also be justified on their own merits. This is ostensibly so because the likely impact of the ESBP on the relocation of industries from Bangkok and nearby provinces and thus the growth of these centres will be low.

Rather than encouraging decentralization of manufacturing activities, perhaps that the Government should correct its policy bias against rural and small and medium scale industries in general. The regionalization efforts could be effective only when the good infrastructures are provided and the entrepreneurship is properly developed. This requires a concerted government policies and measures.

2.4.5 Employment Generation

Thailand will continue to be a labour surplus economy for many years, and finding employment for the growing labour force poses serious question to the Sixth Plan (1987-91). In addition to more intensive use of domestic resources and strong backward linkage, export oriented industries as well as natural resource-based industries on average use significantly more labour than import substitution industries. Therefore the expansion of manufactured export can help improve the employment absorptive capacity of the manufacturing sector.

Investment incentives can also influence the pattern of employment. There has been many revisions of the Investment Promotion Act. One of the main impetus was the generation of productive employment. However, existing incentives still favour capital intensive enterprises due mainly to the exemption or reduction of import duties on imported machinery which result in lower cost of capital relative to labour. Unfortunately, this beneficial effect has been weakened by the exemption and reduction of import duties on inputs. The resulting low import price inevitably encouraged industrial activities where production process involve the use of high import content and penalised activities using domestically produced raw materials which have been made relatively more costly compared to imported inputs.

One evidence of low labour absorption of industries in Thailand can be seen in the capital - labour ratio. Taking the average fixed assets per number of workers employed as a measure of capital - labour ratio, it was found that the figure for firms which were granted promotional privileges by the Board of Investment, were more than twice as high as that for non-promoted firms (Tables 11 and 12). Furthermore, this ratio has also risen over time and at a much faster rate for the promoted firms.

Since many of these firms have foreign capital participation, it may be argued that the influence of foreign technology partly account for the high capital-labour ratio, but more important reason still lies in the investment incentives which allow the firms to acquire capital equipment at artificially low prices.

Perhaps a more effective policy would be to strengthen efforts to support small-scale enterprises in rural areas which tend to be much more employment intensive than their large scale urban counterparts. The Rural Off Farm Employment Project 17/ concluded that scope for rural industrialization was considerable but that assistance, in the of form credit, marketing information and skill development, was required.

17/ Akrasanee (1984), Onchan , et.al.(1985) Industrial Management Co., Ltd. (1984b).

2.5 INDUSTRIALIZATION STRATEGY OF THE SIXTH PLAN

2.5.1 The Rationale

It has been said that the Thai economy has emerged rapidly as a near NIC and will probably be categorized as a NIC by the early 1990s. Some evidences support this assertion. The share of the manufacturing sector in the economy is nearly equal to that of agriculture. The manufactured export has grown at satisfactory rates and accounted for about one-half of the total exports. And per capita income is US$ 823 in 1986 and is projected to be US$ 1068 in 1991. Still, there is a question of whether Thailand is, in fact, in the process of becoming a NIC. Eventhough it seems to be clear which countries are NICs, it is not as clear what it means to be a NIC.

The NIC phenomenon is essentially one of a surge of manufactured exports. It has been found that the export pattern of Thailand is broadly consistent with a factor proportions explannation of structural change and trade with declining natural resource shares and increasing labour shares, but not having reached the point where human and/or physical capital intensive exports have been forthcoming.[18/] One may wonder whether Thailand is simply taking further step with higher human and physical capital formation or whether she is stuck in a high labour intensive stage having defficulty in diversifying upscale to human and physical capital-intensive exports.

18/ Bradford (1987), Torigoe (1987).

The Sixth Plan (1987-91) has stipulated that one of the principal opportunities for the Thai economy exports. Taking into account increasing protectionism in the international markets, a large agricultural base, an ample supply of labour, and export opportunities due to currency realignment, it becomes apparent that the export growth strategy of Thailand will rely on composite elements of developing diversifying export base and, simultaneously, implementing and managing properly macro and trade policies. Attempts have been made underway to promote agro-industrial projects. Labour-intensive industries as well as those off-shore assemply plants are also vigorously encouraged. Moreover, special attention has been given to the engineering industries sector as not only a skilled labour-intensive but also a technology-based potentials.

2.5.2 Targets and Guidelines of the Sixth Plan

The main targets of the Sixth Plan are to maintain 5% overall economic growth in order to absorb new entrants into the labour market probably not less than 3.9 million persons and to achieve 10.7% export growth. The manufacturing growth has been set at 6.6% a year. The manufacturing sector will create new jobs for 800,000 persons during the Sixth Plan period or 160,000 persons a year. (See Table 13)

Therefore, it is necessary that dedication and cooperation be focused on the following development guidelines:

1. increase the efficiency in development in human resources, science and technology, and natural resources.

2. improve production and marketing systems and raise the quality level of basic economic inputs.
3. distribute income and prosperity to regional and rural areas.

2.5.3 Industrial Development Policy

Under the above targets and guidelines, the Sixth Plan has set 10 programmes as the framework of operations of the government and private sectors. The NESDB has employed a different approach in the preparation of the Sixth Plan. Then, there is no industrial development plan as such as a separate part of the Plan. Out of 10 major programmes designed, the Production, Marketing, and Employment Development Programme, and, to a lesser extent, the Urban and Specific Zones Development Programme are of direct relevance to industrial development.

The essence of the Production, Marketing, and Employment Development Programme is based on two fundamental thinking: the integration of the marketing oriented concept in the planning process and the shift in government role from regulatory and control to promotion and support functions. A brief outline of policies on production diversification, marketing development, and improvements in incentive system and institutional arrangements is presented below.

As regards diversifying industrial production, the emphases have been placed on developing agro-industry, regional and medium-sized industry, and engineering industry. Government services and necessary facilities will be improved to reduce investment costs and build capabilities for exporters. Support will be given for the expense for

marketing and for data and information system for small and medium-sized exporters.

On marketing development, the Government will conduct market studies, and provide information in the macro perspective, while the private sector play the major role in the selection, production and marketing of specific commodities. The Government will launch trade promotion and campaign in the export markets, simplify laws and regulations which adversely affecting export procedures, and improve export standard and grading system.

With regard to improvement in incentive system, the policy measures include the introduction of Domestic Letter of Credit, the revision of tax rebate rates based on Physical Input Coefficients, the establishment of Export Financing Guarantee Fund, the tariff and tax reform, and the expansion of bonded warehouses.

For the Urban and Specific Zones Development Programme, the Eastern Seaboard and other new economic zones have been set to become alternatives to Bangkok in the future. The Government will determine incentive measures and encourage private investment in new economic zones especially in large industries so as to enable efficient organization of basic services and environmental controls.

2.6 LIKELY SCENARIO OF INDUSTRIAL SECTOR DEVELOPMENT

A likely scenario of industrial sector development during the period of the Sixth Plan may be discussed in terms of the pattern of production and location, and in technological development.

Responding to market forces and government policies as laid out in the Sixth Plan, it is likely that the fastest growing sectors will be consumer products for export, agro-industries, intermediate goods and light capital goods.

Thailand has embarked on the production of manufactured goods for export, which has become a major factor contributing to economic recovery in 1987. There is already a manufactured export momentum created in the Thai economy, and this is likely to continue despite the anti-export bias in the trade and incentive regime. Goods may be sold in the domestic market under protected prices, but in most cases competition is very high in the relatively small market. Thus export seems to open up a much bigger opportunity for consumer products. Exports also enjoy various incentives offered by the government which, in effect eliminate the tax cost of production. Trade promotional efforts including trade negotiations carried out by the government have had positive effect on the manufactured export momentum.

In view of the prolonged slump in agricultural prices, the move towards agro-industries and agri-business is likely to be accelerated. High growth is expected in the livestock industry, aquaculture

(especially tiger prawn farming), and new varieties of processed or prepared fruits and vegetables. In most of the new projects of this type the farms and the factories are usually linked through a contractual arrangement whereby raw materials are procured.

Among the intermediate goods likely to expand the most important one will be the petro-chemical industry, part of the construction of which has already begun. And the major intermediate -cum- capital goods are the television picture tubes, engines for motor vehicles, and parts-components for electrical goods.

In the next five to ten years industries will continue to grow in and around Bangkok. The new major industrial center will be the Eastern Seaboard. Other regions will see some growth in industrial production, but the situation concerning infrastructure will continue to be biased against regional location. The stronger effort by the government to support industries in the areas away from Bangkok is expected to produce some result, but it will not be enough to reverse the existing trend.

As far as technological development in the industrial sector is concerned no major change is expected in the next few years. If the present technological development schemes are successful, Thailand may lead in the industrial areas utilizing bio-technology.

2.7 INVESTMENT REQUIREMENT FOR INDUSTRIAL DEVELOPMENT

2.7.1 The Pattern of Public Investment

The public sector as a whole has on average spent about US$ 2.88 billion per year during the 1982-85 period. In real terms this represents an increase of about 52% over public expenditure in the Fourth Plan (1977-81). But the growth has been much more rapid in current (up 60%) than in capital expenditure (up 26%).

The pattern of public investment has concentrated on public utilities and infrastructure. Transport and telecommunications sector has always recorded the highest share in public capital expenditure, averaging 31.7% during 1982-85. Recently, the energy sector has been accorded increasing importance from 26% of public investment during 1977-81 to 31.7% during 1982-85. As for agriculture, the share in public investment was 15.4% during 1982-85 or averaging US$ 444 million a year during the same period. Clearly, public capital expenditure in the industrial sector was rather trivial, less than 1% of total public investment during 1982-85. (Table 14).

In light of the large public resource gap, policy makers have become more concerned about the growth of foreign public borrowing and they have tended to borrow a higher proportion from domestic markets instead. And in 1986, the Government has set the limit to foreign borrowing of not exceeding US$ one billion a year during the next few years. Moreover, the Sixth Plan (1987-91) has stated that only 16.7%

of public capital expenditure will be financed by foreign capital, compared to the actual figure of 21.7% during the Fifth Plan period. At the same time, the Sixth Plan has set the target of public expenditure growth (constant prices) at 5.3% for consumption and only 1% for investment.

Under resource constraint and adverse world trade environment, a World Bank Report (1986) has comprehensively reviewed the public capital expenditure during the Sixth Plan period as outlined below.

(a) Energy. The Government has recently undertaken, with the assistance of the World Bank and UNDP, a comprehensive assessment of its energy needs in the coming years. The Government's goals in the sector are not only to be able to satisfy demand but also to further reduce Thailand's reliance on imported energy. Already, the development of natural gas and further use of lignite have lowered this dependence on foreign energy from over 70% in 1980 to less than 50% in 1986. This has required 100 billion baht (US$4.1 billion) in investment in 1982-85. Present plans are to reduce imported energy dependence to 33% by 1991 and to satisfy a growing energy demand of 5-6% per year. This will require an investment programme of about US$ 5.6 billion (in current prices). There is already some discussion about reducing this level due to resource constraints and lower oil prices. Care must be taken in cutting back the programme however; a cutback of more than about 10% in the power programme may lead to serious risks of inadequate supply by the early 1990s.

(b) Telecommunications. The official investment programme for TOT for the Sixth Plan period amounts to 69 billion baht (US$ 2.6 billion), of which about 50% would be foreign exchange cost. This represents a substantial reduction from earlier plans. But even this reduced programme may have to be trimmed back. This is partly due to financial constraints, but equally to continued delays in implementation. There is already a delay foreseen for the Fifth Project which is likely to result in a completion date of FY92 (instead of FY88 as originally planned) and a future project is then also likely to slip a year. In view of this, a more realistic program is suggested, amounting to 52 billion baht (US$ 1.9 billion). There is not much scope for reducing the size of the program further in the short term, when such cutbacks are most required from a macroeconomic standpoint. Any further cutbacks in FY86 or FY87 would mainly delay telephone installations, in turn delaying cost recovery, as well as the benefits of telephone service.

(c) Agriculture. For the past 15 years, public investment in agriculture has been mostly for irrigation (64% of total capital expenditure on agriculture in the Fifth Plan period). The proportion of central government investment allocated to the sector has risen from about 20% in the mid-1970s to over a quarter in 1982-85 (equivalent to 15% of total public sector investment). The most recent budget allocations reflect both global fiscal constraints and the sense that a period of consolidation is now required for the government's agricultural agencies to fully assimilate the large number of new activities initiated over the last decade. The Sixth Plan investment

program is expected to reflect these factors. As a result, the share of agriculture is likely to decline in the coming years.

(d) The Eastern Seaboard Development Programme (ESDP). The deterioration of Thailand's resource position, coupled with new doubts about the viability of some of the components, has prompted the government to adopt a cautious approach to the implementation of the ESDP. Between FY82 and FY85, only US$ 233 million was invested, mostly for infrastructure-related works (industrial estate, railways and water supply). For the period FY86-91, about 52 billion baht (US$ 1.92 billion) is expected to be invested. Total investments during the 1980s therefore would amount to only about half of the originally projected capital requirements. Total planned capital expenditures on the ESDP are equivalent to about 0.8% of GDP and 3.5% of total investment during the 1986-90 period. The public sector's share of investment--about 40% of the total--is estimated at 3.2% of total public sector capital formation during the Sixth Plan period Investment Requirement by Public Sector.

Given such a broad scenario of public investment, we have reviewed the current status of various components of the ESDP as presented in Table 15. Of particular notice is the development of industrial projects. The construction of the Gas Separation Plant No.1 has been completed with investment cost of 7,360 million baht. It started operation on January 1985. The second project is under consideration. The construction of the olefin plant has just started in May 1987 and will be finished in August 1989. The total investment requirement of the project is estimated at 8,505 million baht.

The diversified petrochemicals industries include the Thai Polyethylene Co.,Ltd. (LDPE, HDPE), the Thai Petrochemicals Industry Co.,Ltd. (LDPE, HDPE), the Sri Krung Wattana Co.,Ltd. (PP), and the Thai Plastics and Chemicals Co.,Ltd. (VCM). The total investment required is about 8,050 million baht excluding working capital. Only the Thai Petrochemical Co.,Ltd. has already started its operation. The other projects are planned to start the construction by the end of 1987. The fertilizer project, however, cannot proceed at present.

As for the development of industrial estates, there are six projects in the implementation scheme: five of them are scattered in regional areas and the remaining is the expansion phase of Latkrabang Industrial Estate at the outskirt of Bangkok. Four industrial estates which are considered as high potential for development and would be of interest to financial development institutions (Table 16) are:

(1) The expansion phase of Latkrabang Industrial Estate. It covers the area of 112 hectars with investment requirement of 240 million baht. Foreign investors, especially the Japanese, are very interested in this land because of its proximity to Bangkok Port and Bangkok International Airport. The land development is expected to be completed and then open to the investors application by 1988.

(2) Samut Songkram Industrial Estate. This is a pilot project which intends to capture all polluted industries under well developed pollution abatement system. The area is about 332 hectars and the investment requirement is about 596 million baht. The project is planned to start in 1987.

(3) Southern Region Industrial Estate. This project is related to the development of Songkhla Deepsea Port. The Port itself was going to be completed by April 1987, but this has been delayed. The estate will be located somewhere between Haadyai City and Songkhla City. The area required is 128 hectars and the investment cost is approximately 250 million baht.

(4) Nakorn Ratchasima Industrial Estate. The clients are targetted at services and small and medium firms in the Northeast. The area is 32 hectars and the investment cost is 39 million baht.

It should be noted that in the macro perspective, the budget allocation to the Eastern Seaboard Development Programme as well as the undertaking of industrial estates is quite a flexible component when the resource position is tightest. This explains why, although not large in aggregate terms, the ESDP has achieved such a high profile in public debate.

In this regard, the government policy has clearly stimulated that the private sector will be encouraged to play an increasing role in investment in basic infrastructure. It will be necessary to improve both laws and the implementation of various government responsibilities to facilitate this private role. The recent developments are the allowance of the private sector to manage the Songkhla Deepsea Port and to fully undertake the construction and operation of the Nakorn Ratchasima Industrial Estate.

2.7.2 Private Capital Formation in the Manufacturing Sector

According to the Basic Input-Output Tables of Thailand, the gross capital formation of the manufacturing sector was 40 and 93 billion baht (current prices) in 1975 and 1980, respectively, accounting for 51.24% and 53.63% of the manufacturing value added (MVA) in the corresponding years.

The industries with relatively high share of capital formation in MVA were the engineering industries (basic metal, non-electrical and electrical machinery, transport equipment, and metal products).

During 1975-80 period, the industries which experienced high growth in capital formation were petroleum and petroleum products, electrical machinery, basic metal, wood products and furniture, and paper and paper products. (Table 17)

Under the Sixth Plan, the growth of MVA is estimated at 6.6% per annum. Based upon capital formation/MVA ratio in 1980, we estimated that total investment requirement for the manufacturing sector is about 121.5 and 167.2 billion baht in 1986 and 1991, respectively. Unfortunately, the projected growth rates at the disaggregate level are not available. However, it is very likely that the investment requirement will be quite significant in the engineering industries sector particularly the machinery and transport equipment industries.

Table1: Share of GDP by Economic Sector (1972 prices)

(per cent)

Sector	1960	1965	1970	1975	1980	1982	1984	1985	1986*
Agriculture	40.5	36.3	32.2	30.4	24.9	24.1	23.6	23.2	22.6
Mining	1.2	1.7	1.7	1.2	1.6	1.4	1.5	1.6	1.6
Manufacturing	11.7	14.0	15.5	18.2	20.7	20.8	21.2	20.7	21.7
Construction	4.8	5.8	5.8	4.2	5.7	4.7	4.9	4.8	4.7
Electricity	0.3	0.6	1.1	1.6	1.9	2.1	2.2	2.4	2.5
Transportation	6.7	6.3	6.1	6.1	6.4	6.7	6.8	6.9	7.1
Trading	15.8	16.3	17.7	17.7	16.5	16.3	15.8	15.8	16.1
Banking	1.9	2.6	3.9	4.9	5.9	6.6	7.4	7.4	7.4
Ownership of dwellings	2.9	2.4	2.0	1.7	1.5	1.5	1.5	1.0	1.5
Public administration and defences	4.6	4.3	4.3	4.1	4.2	4.3	3.9	4.0	4.0
Services	9.5	9.7	9.7	9.9	10.6	11.5	11.4	11.7	12.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Note: * estimated
Source: National Accounts Division, NESDB

Table2: Growth Rate of GDP in Agricultural and Manufacturing Sectors (1972 prices)

(per cent)

Year	Total GDP	Agriculture	Manufacturing
1960-1965	7.0	4.6	10.2
1965-1970	7.6	5.0	12.4
1970-1975	6.5	4.3	10.5
1975-1980	12.2	10.2	12.9
1980-1982	3.9	3.9	5.4
1982-1984	3.5	3.5	6.8
1984-1985	5.0	3.2	5.0
1985-1986	3.5	-0.7	6.7

Source: NESDB

Table 3: Sources of Growth of Manufacturing Output, 1966-80
(%contribution to increase)

Sector	1966-72			1972-75		
	DE/a	IS	EX	DE/a	IS	EX
Processed foods	107.3	0.5	-7.8	89.3	0.6	10.0
Beverages&tobacco	73.6	26.4	-0.1	87.9	0.1	11.9
Construction materials	69.5	19.6	10.9	89.5	0.3	10.2
Intermediate products I	65.8	23.7	10.5	96.3	-2.1	5.8
Intermediate productsII	33.6	50.6	15.9	89.7	-9.5	23.6
Consumer nondurables	51.8	35.6	12.6	80.8	14.9	4.3
Consumer durables	31.7	66.7	1.6			
Machinery	48.3	49.0	2.7	107.3	-7.7	0.4
Transport equipment	24.7	75.2	0.1			
Total	64.1	29.4	6.5	91.0	0.5	8.5

	1975-78			1977-80		
	DE/a	IS	EX	DE/a	IS	EX
Processed foods	46.9	-4.6	57.7	72.3	-7.5	35.2
Beverages&tobacco	101.6	-219.9	0.6	110.6	-11.2	0.5
Construction materials	103.6	-1.0	-2.6	130.1	-28.6	-1.5
Textiles&clothing	65.8	3.4	30.8	74.5	10.4	15.0
Leather&leather products	-420.2	-18.5	538.6	51.6	-3.0	51.4
Wood&wood products	107.2	-16.0	8.8	96.8	-1.2	4.4
Paper&paper products	102.6	-4.0	1.5	70.6	2.7	26.7
Chemicals&petroleum	130.2	-29.5	-0.6	72.1	-10.7	3.9
Rubber&rubber products	31.8	16.4	51.7	-11.8	-9.2	121.0
Metals&metal products	64.1	-1.0	36.9	70.3	-3.6	33.3
Machinery	60.8	4.4	34.8	81.8	-60.5	78.8
Transport equipment	81.1	18.2	0.5	81.9	16.1	1.9
Other	89.0	-33.5	44.5	64.7	13.9	21.4
Total	79.5	-7.7	28.2	144.2	-14.9	70.3

Note: DE = Domestic demand effect
IS = Import substitution
EX = Export demand
/a = Domestic demand effects greater than 100 indicate that domestic demand grew faster than production and either the import share increased (negative import substitution) or surpluses available for import were reduced (negative export expansion) or both to meet the higher domestic demand in excess of domestic supply capacity.

Source: World bank

Table 4: Share of Manufacturing Value Added by Industrial Subsectors at Current Market Price

(Millions of Baht)
(per cent)

Industrial subsectors	1960	1965	1970	1975	1980	1984	1985	1986
Food processing	1,881	3,044	4,967	11,216	18,216	26,673	27,513	26,690
	(31.45)	(31 76)	(23.18)	(22.29)	(13.85)	(13.81)	(13.38)	(11.93)
Beverage	643	1,104	2,224	4,034	10,919	16,965	20,016	17,876
	(10.75)	(11.52)	(10.38)	(8.02)	(8.30)	(8.79)	(9.74)	(7.99)
Tobacco	879	1,194	1,984	3,929	7,985	11,879	12,086	12,869
	(14.70)	(12.46)	(9.26)	(7.81)	(6.07)	(6.15)	(5.88)	(5.75)
Textiles	160	359	1,705	4,622	11,808	12,007	13,194	13,753
	(2.68)	(3.75)	(7 96)	(9 19)	(8.98)	(6.22)	(6.42)	(6.15)
Wearing apparel	266	321	1,148	3,577	14,178	27,566	31,036	34,235
	(4.45)	(3 35)	(5.36)	(7.11)	(10 78)	(14.28)	(15.10)	(15 30)
Leather products	119	131	137	214	486	910	1,244	1,813
	(1 99)	(1.37)	(0.64)	(0.43)	(0.37)	(0.47)	(0.61)	(0.81)
Wood and wood products	289	565	597	1,752	3,206	3,242	3,241	3,081
	(4.83)	(5.90)	(2.79)	(3 48)	(2.44)	(1.68)	(1.58)	(1 38)
Furniture	88	113	316	577	1,233	1,965	2,024	2,130
	(1.47)	(1 18)	(1 47)	(1.15)	(0.94)	(1.02)	(0.98)	(0.95)
Paper and paper products	24	28	161	238	1,653	2,118	2,244	2,470
	(0 40)	(0.29)	(0.75)	(0.47)	(1.26)	(1.10)	(1.09)	(1.10)
Printing and Publishing	132	214	552	1,982	2,993	3,873	4,012	4,101
	(2.21)	(2 23)	(2 58)	(3 94)	(2.28)	(2.01)	(1.95)	(1.83)
Chemicals and chemical products	421	613	1,509	2,743	9,170	14,386	16,279	17,265
	(7 04)	(6.40)	(7.04)	(5.45)	(6.97)	(7 45)	(7.92)	(7 72)
Refinery and	264	626	1,622	4,930	14,534	16,784	18,674	30,950
	(4.41)	(6.53)	(7.57)	(9.80)	(11.05)	(8.69)	(9.08)	(13.84)
Rubber and rubber products	224	246	359	875	3,062	3,447	3,232	3,013
	(3 75)	(2.57)	(1.68)	(1.74)	(2.33)	(1 79)	(1.57)	(1.35)
Non metallic	-	-	1,418	2,639	8,561	13,443	14,345	15,022
			(6.62)	(5.25)	(6 51)	(6.96)	(6.98)	(6.72)
Basic metal	17	9	227	745	2,943	2,228	2,876	2,424
	(0.28)	(0.09)	(1.06)	(1 48)	(2.24)	(1 15)	(1.40)	(1.08)
Metal products and Machinery	206	778	508	1,196	2,684	3,416	3,934	4,214
	(3.44)	(8.12)	(2 37)	(2.38)	(2.04)	(1.77)	(1.91)	(1.88)
Elec machinery and appliances	27	32	314	663	3,148	4,460	4,364	4,826
	(0 45)	(0.33)	(1.47)	(1 32)	(2.39)	(2.31)	(2.12)	(2.16)
Transport and equipments	242	308	1,078	3,585	11,416	20,651	17,436	17,355
	(4.05)	(3.21)	(5.03)	(7.13)	(8.68)	(10.70)	(8.48)	(7.76)
Miscellaneous products	-	-	507	893	3,431	7,171	7,898	9,697
			(2.37)	(1.78)	(2.61)	(3.71)	(3.84)	(4.34)
Total	5,980.36	9,583.95	21,432.54	50,309.80	131,525.92	193,087.66	205,551.80	223,688.29

Source: National Accounts Division, NESDB

Table 5: Growth of Manufacturing Value Added by Industrial Subsector (at 1972 prices)

(per cent)

Industrial subsector	1960-1965	1965-1970	1970-1975	1975-1980	1980-1984	1984-1985	1985-1986
Food processing	10.1	10.2	117.7	10.2	10.0	3.1	(3.0)
Beverage	11.4	15.0	12.7	22.0	11.7	18.0	(10.7)
Tobacco	6.3	10.7	14.6	15.2	10.4	1.7	6.4
Textiles	17.5	36.6	22.1	20.6	0.4	9.9	4.2
Wearing apparels	3.8	29.0	25.5	31.7	18.1	12.6	10.3
Leather products	1.9	0.9	9.3	17.8	17.0	36.7	45.7
Wood and wood products	14.4	1.1	24.0	12.9	0.3	-0.1	(4.9)
Furniture	5.1	22.8	12.8	16.4	12.4	3.0	5.2
Paper and paper products	3.1	41.9	8.1	47.4	6.4	6.0	2.2
Printing and Publishing	10.2	20.9	29.1	8.6	6.7	3.6	2.2
Chemicals and chemical products	7.8	19.7	12.7	27.3	11.9	13.2	6.1
Refinery and petroleum products	18.9	7.6	24.9	11.0	3.7	11.3	65.7
Rubber and rubber products	1.9	7.9	19.5	28.5	3.0	(6.2)	(6.7)
Non-metallic				26.5	11.9	6.7	4.7
Basic metal	(11.9)	90.7	26.8	31.6	(6.7)	29.1	(15.7)
Metal products and machinery	30.4	(8.2)	18.7	17.6	6.2	15.2	7.1
Electrical machinery and appliances	3.5	57.9	16.1	36.6	9.1	(2.2)	10.6
Transport equipments	4.9	28.5	27.2	26.1	16.0	(15.6)	(0.5)
Miscellaneous products		2.4	12.0	30.9	20.2	10.1	22.8
Total	9,784	21,432	50,510	131,726	193,280	205,744	223,878

Source: National Accounts Division, NESDB

Table 6 : Imports by Economic Classification

(Millions of Baht)

Type of Imports	1960	1965	1970	1975	1980	1981	1982	1983	1984	1985	1986
Consumer Goods	3,365	4,163	5,378	8,455	19,286	18,263	17,095	22,308	22,692	23,966	24,466
	(34.97)	(26.97)	(19.91)	(12.65)	(10.22)	(8.43)	(8.73)	(9.43)	(9.26)	(9.54)	(10.14)
Non-durable	2,558	2,919	3,486	5,148	12,257	10,459	10,299	12,251	12,184	12,805	12,982
	(26.58)	(18.91)	(12.91)	(7.70)	(6.50)	(4.83)	(5.26)	(5.18)	(4.97)	(5.10)	(5.38)
Durable	807	1,244	1,892	3,307	7,029	7,804	7,606	10,057	10,508	11,161	11,484
	(8.39)	(8.06)	(7.01)	(4.95)	(3.73)	(3.60)	(3.88)	(4.25)	(4.29)	(4.44)	(4.76)
Intermediate product and raw materials	1,746	3,210	6,725	16,105	45,312	58,084	53,060	66,474	69,613	75,772	84,333
	(18.15)	(20.80)	(24.90)	(24.10)	(24.01)	(26.80)	(27.10)	(28.09)	(28.40)	(30.17)	(34.94)
Chiefly for consumer goods	1,031	2,128	4,139	10,318	28,182	38,225	34,891	44,122	47,089	51,107	61,191
	(10.72)	(13.79)	(15.32)	(15.44)	(14.94)	(17.64)	(17.82)	(18.65)	(19.21)	(20.35)	(25.35)
Chiefly for capital goods	716	1,082	2,586	5,787	17,130	19,859	18,169	22,352	22,524	24,605	23,142
	(7.44)	(7.01)	(9.57)	(8.66)	(9.08)	(9.16)	(9.28)	(9.45)	(9.19)	(9.80)	(9.59)
Capital goods	2,367	4,775	9,371	22,239	46,075	56,985	48,192	69,814	73,607	75,404	78,316
	(24.60)	(30.94)	(34.70)	(33.27)	(24.42)	(26.29)	(24.61)	(29.51)	(30.02)	(30.02)	(32.45)
Other imports	2,144	3,285	5,535	20,036	78,013	83,414	77,459	78,013	79,243	76,027	54,243
	(22.28)	(21.29)	(20.49)	(29.98)	(41.35)	(38.48)	(39.56)	(32.97)	(32.32)	(30.27)	(22.47)
Vehicles and parts	755	1,454	2,204	4,542	6,912	9,568	7,687	11,416	11,834	9,292	8,939
	(7.85)	(9.42)	(8.16)	(6.80)	(3.66)	(4.41)	(3.93)	(4.82)	(4.83)	(3.70)	(3.70)
Fuel and lubricants	1,025	1,353	2,329	14,233	58,733	65,100	60,765	57,065	57,353	56,719	32,354
	(10.65)	(8.77)	(8.62)	(21.30)	(31.13)	(30.04)	(31.03)	(24.12)	(23.39)	(22.58)	(13.40)
Other	303	342	894	1,261	12,368	8,746	8,987	9,497	10,024	9,975	12,790
	(3.15)	(2.22)	(3.31)	(1.89)	(6.55)	(4.04)	(4.59)	(4.01)	(4.09)	(3.97)	(5.30)
Total imports	9,622	15,433	27,009	66,835	188,686	216,746	195,806	236,609	245,155	251,169	241,358
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Source: Bank of Thailand

Table 7: Exports by Commodities Groups

(Millions of Baht)

Industrial subsector	1960	1965	1970	1975	1980	1981	1982	1983	1984	1985	1986
Food	3,912	6,777	6,957	26,599	59,338	80,038	86,371	73,755	86,482	86,582	101,629
	(45.41)	(52.37)	(47.10)	(59.10)	(44.55)	(52.31)	(54.07)	(50.35)	(49.35)	(44.78)	(43.95)
Beverages	25	90	206	579	1,393	1,758	2,599	1,860	1,698	1,648	1,565
	(0.03)	(0.08)	(0.15)	(0.14)	(0.12)	(0.13)	(0.18)	(0.14)	(0.11)	(0.09)	(0.07)
Crude materials	4,303	4,942	4,262	6,804	19,095	16,722	15,134	162,886	18,875	19,611	20,529
	(49.95)	(38.19)	(28.85)	(15.12)	(14.34)	(10.93)	(9.47)	(111.21)	(10.77)	(10.14)	(8.88)
Minerals fuels &	–	40	45	249	86	37	40	30	411	2,448	1,832
lubricant		(0.31)	(0.30)	(0.55)	(0.06)	(0.02)	(0.03)	(0.02)	(0.23)	(1.27)	(0.79)
Animal vegetable oils	2	7	14	43	222	232	298	270	432	583	225
and fats	(0.02)	(0.05)	(0.09)	(0.10)	(0.17)	(0.15)	(0.19)	(0.18)	(0.25)	(0.30)	(0.10)
Chemicals and chemical	8	15	33	243	936	1,191	1,253	1,673	2,187	2,440	3,381
products	(0.09)	(0.12)	(0.22)	(0.54)	(0.70)	(0.78)	(0.78)	(1.14)	(1.25)	(1.26)	(1.46)
Manufactured goods	96	599	2,188	6,419	29,474	26,941	26,587	26,002	29,187	35,860	43,392
	(1.11)	(4.63)	(14.81)	(14.26)	(22.13)	(17.61)	(16.65)	(17.75)	(16.66)	(18.55)	(18.77)
Machinery	1	9	15	573	7,618	7,662	8,293	8,356	11,959	16,977	22,693
	(0.01)	(0.07)	(0.10)	(1.27)	(5.72)	(5.01)	(5.19)	(5.70)	(6.82)	(8.78)	(9.81)
Miscellaneous	14	28	59	1,582	8,467	11,731	13,404	14,756	19,558	24,030	33,166
manufactured goods	(0.16)	(0.22)	(0.40)	(3.52)	(6.36)	(7.67)	(8.39)	(10.07)	(11.16)	(12.43)	(14.34)
Miscellaneous	61	134	471	983	3,777	2,650	2,060	1,332	1,286	1,433	1,525
transactions	(0.71)	(1.04)	(3.19)	(2.18)	(2.84)	(1.73)	(1.29)	(0.91)	(0.73)	(0.74)	(0.66)
commodities											
Re-exports	192	300	522	933	2,791	4,039	3,689	2,150	3,162	1,754	1,288
	(2.23)	(2.32)	(3.53)	(2.07)	(2.10)	(2.64)	(2.31)	(1.47)	(1.80)	(0.91)	(0.56)
Total	8,614	12,941	14,772	45,007	133,197	153,001	159,728	146,472	175,237	193,366	231,225
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Source: Bank of Thailand

Table 8: Export Growth by Commodities Groups

(per cent)

Industry	1960-1965	1965-1970	1970-1975	1975-1980	1980-1985	1985-1986
Food	11.6	0.5	30.8	17.4	7.8	17.4
Beverage&tobacco	29.2	18.0	23.0	19.3	3.3	-5.0
Crude materials	2.8	-2.9	9.8	22.9	0.5	4.7
Mineral fuel	-	2.4	40.8	-19.2	96.4	-25.2
Animal vegetable	28.5	14.9	25.2	38.9	21.3	-61.4
Chemicals	13.4	17.1	49.1	21.0	21.3	38.6
Manufactured goods	44.2	29.6	24.0	35.6	4.0	21.0
Machinery	58.2	10.8	107.2	67.8	17.4	33.7
Mis.manufactured goods	14.9	16.1	93.0	39.9	23.2	38.0
Mis.transaction commodities	17.0	28.6	15.9	30.9	-17.6	6.4
Re-export	9.2	11.7	12.3	24.5	-8.9	-26.6
Total	8.5	2.7	25.0	24.2	7.7	19.6

Source: Bank of Thailand

Table 9: Export Production Ratio by Industry 1975 and 1980

(Millions of Baht)

Industry	Export		Value of Output		Export/Output Ratio (%)	
	1975	1980	1975	1980	1975	1980
Food	19,076.3	49,725.2	87,309.3	153,397.9	21.8491	32.4158
Beverage	0.001	0.098	8,335.7	16,191.2	.0000	0.0006
Tobacco	0.572	1,125.3	8,022.7	14,217.8	0.0071	7.9147
Textiles	2,722.0	12,122.7	33,769.2	88,492.7	8.0606	13.6991
Leather	0.129	1,123.1	2,208.4	4,978.1	0.0058	22.5608
Wood&wood products	1.473	2,017.6	8,611.0	23,025.0	0.0171	8.7626
Paper&paper products	0.082	0.404	6,323.8	23,213.1	0.0013	0.0017
Basic industrial chemicals	0.041	0.434	3,316.1	5,014.5	0.0012	0.0087
Chemical products	0.167	0.546	6,620.5	18,242.2	0.0025	0.0030
Refineries&petroleum products	0.252	0.09	16,839.2	50,467.7	0.0015	0.0002
Rubber&rubber products	3.546	13,238.8	601,609.0	16,471.9	0.0006	80.3720
Plastic products	0.138	0.616	2,455.6	5,332.2	0.0056	0.0116
Ceramics&earthern ware	0.018	0.312	0.4	1,905.9	4.2857	0.0164
Glass&glass products	0.031	0.138	1,424.5	2,153.3	0.0022	0.0064
Other non-metallic products	0.593	0.142	3,840.7	12,547.8	0.0154	0.0011
Iron&steel	0.105	1,035.7	6,497.7	11,103.9	0.0016	9.3274
Non-ferrous metal	2.396	15,923.1	4,153.3	19,204.0	0.0577	82.9155
Fabricated metal	0.216	1,201.6	4,213.0	8,276.2	0.0051	14.5187
Machinery	0.081	0.682	4,842.9	13,365.4	0.0017	0.0051
Electrical industrial machinery and appliance	0.464	6,776.9	4,275.9	20,432.1	0.0109	33.1679
Transport equipment	0.025	0.0145	15,783.2	44,908.7	0.0002	.0000
Other manufactured products	1.048	4,820.6	5,508.7	9,823.7	0.0190	49.0711
Total	33,185.4	112,718.0	240,788.6	562,765.6	13.7820	20.0293

Source: Thailand Input-Output Tables 1975 and 1980

Table 10: Share of Employment by Major Economic Sector

(Thousand person)
(per cent)

Sector	1977	1978	1979	1980	1981	1982	1983	1984	1985
Agriculture	14,922	16,018	15,019	15,943	17,528	16,844	17,401	18,130	15,092
	(73.85)	(74.06)	(71.10)	(71.14)	(72.30)	(78.08)	(69.54)	(67.61)	(62.65)
Mining	50	30	39	37	61	62	51	117	97
	(0.25)	(0.14)	(0.18)	(0.16)	(0.25)	(0.29)	(0.20)	(0.44)	(0.40)
Manufacturing	1,329	1,478	1,725	1,789	1,742	1,347	1,842	1,986	2,312
	(6.58)	(6.83)	(8.17)	(7.98)	(7.18)	(6.24)	(7.36)	(7.41)	(9.60)
Construction	332	313	410	436	468	380	512	533	737
	(1.64)	(1.45)	(1.94)	(1.95)	(1.93)	(1.76)	(2.04)	(1.99)	(3.06)
Public utilities	49	49	49	49	49	49	49	49	49
	(0.24)	(0.22)	(0.23)	(0.22)	(0.20)	(0.22)	(0.19)	(0.18)	(0.20)
Trading	1,675	1,640	1,742	1,916	2,046	1,361	2,194	2,214	2,739
	(8.29)	(7.58)	(8.25)	(8.55)	(8.44)	(6.31)	(8.77)	(8.25)	(11.37)
Transportation	383	388	425	456	394	289	535	517	600
	(1.89)	(1.79)	(2.01)	(2.03)	(1.62)	(1.34)	(2.14)	(1.93)	(2.49)
Services	1,567	1,813	1,815	1,887	2,056	1,344	2,537	3,365	2,558
	(7.76)	(8.38)	(8.59)	(8.42)	(8.48)	(6.23)	(10.14)	(12.55)	(10.62)
Other	0.7	-	-	0.5	0.3	-	4.8	5.0	7.9
	(.00)	-	-	(.00)	(.00)	-	(0.02)	(0.02)	(0.03)
Total	20,206.81	21,627.34	21,122.92	22,410.95	24,242.69	21,574.13	25,024.12	26,814.94	24,090.72
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Source: National Statistical Office

Table 11: Distribution of Registered Factories by Industry and Size of Employment 1979*

Industry	Size of Employment						Total
	20 and less	21-40	41-60	61-80	81-100	100 and more	
Food	6,373	428	149	66	61	165	7,242
Beverages/tobacco	305	85	44	22	18	60	534
Textiles	601	200	93	43	29	134	1,100
Wearing apparels	258	182	65	25	10	55	595
Leather products	164	17	3	6	3	4	197
Footwear	112	14	2	2	1	3	134
Wood products	2,345	268	110	63	28	58	2,872
Furniture and fixture	696	65	20	7	3	9	800
Paper products and printing	1,731	86	33	15	17	36	1,918
Industrial chemicals	99	28	8	7	2	17	161
Other chemical products	528	118	41	19	12	34	752
Rubber products	255	38	16	14	2	18	343
Plastic products	1,018	76	24	9	6	17	1,150
Pottery	89	43	24	9	5	9	179
Glass products	15	5	3	2	3	3	31
Other non-metallic mineral products	1,279	112	53	26	15	30	1,515
Basic iron and steel	31	35	11	11	5	23	116
Non-ferrous metal	125	13	20	18	15	10	201
Fabricated metal products	3,226	157	68	49	19	31	3,550
Machinery	3,637	150	41	24	13	17	3,882
Electronic/electrical products	1,795	129	36	35	14	34	2,043
Transport equipment	1,375	114	27	15	9	34	1,574
Scientific equipment	25	8	1	1	1	1	37
Others	449	48	14	7	1	13	532
Total	26,531 (84.34)	2,419 (7.69)	906 (2.88)	495 (1.57)	292 (0.93)	815 (2.59)	31,458 (100.00)

Note: excluding rice mills
Source: Factory Control Division, Ministry of Industry.

Table 12: Distribution of Registered Factories by Region and Size of Employment in 1978*

Size of Employment	Central				North	Northeast	South	Total
	Bangkok	5 nearby provinces	Others	Total				
Less than 10	a 46.8	a 8.1	a 17.7	a 72.6	a 7.3	a 12.3	a 7.9	a 100.0
	b 68.4	b 45.2	b 71.0	b 65.3	b 56.8	b 58.5	b 63.7	b 63.5
10-49	a 40.3	a 14.3	a 13.1	a 67.7	a 9.1	a 14.8	a 8.3	a 100
	b 27.6	b 37.6	b 24.5	b 28.5	b 33.3	b 33.0	b 31.4	b 29.7
50-99	a 26.0	a 26.2	a 10.1	a 62.4	a 14.5	a 17.1	a 6.1	a 100.0
	b 2.3	b 8.8	b 2.4	b 3.4	b 6.8	b 4.9	b 2.9	b 3.8
100-199	a 23.8	a 33.3	a 9.5	a 66.7	a 6.7	a 22.1	a 4.5	a 100.0
	b 0.1	b 5.1	b 1.0	b 1.6	b 1.4	b 2.9	b 1.0	b 1.7
200-499	a 25.0	a 36.5	a 10.1	a 71.6	a 13.5	a 7.2	a 7.7	a 100.0
	b 0.5	b 2.5	b 0.5	b 0.8	b 1.3	b 0.4	b 0.8	b 0.8
500-999	a 30.9	a 26.5	a 20.6	a 77.9	a 8.8	a 8.8	a 4.4	a 100.0
	b 0.2	b 0.6	b 0.3	b 0.3	b 0.3	b 0.2	b .14	b .3
>1,000	a 36.4	a 18.2	a 21.2	a 75.8	a 6.1	a 15.2	a 3.0	a 100.0
	b 0.1	b 0.2	b 0.2	b 0.13	b 0.1	b 0.1	b .04	b .12
Total	a 43.4	a 11.3	a 15.9	a 70.6	a 8.1	a 13.3	a 7.9	a 100.0
	b100.0	b100.0	b100.0	b100.0	b100.0	b100.0	b100.0	b100.0

Note: * excluding rice mills
a percentage distribution of factories for each region
b percentage distribution of factories for each size in each region

Source: Factory Control Division, Ministry of Industry

Table 13

Macro Economic Targets of the Sixth Plan (1987-1991) Compared with the Fifth Plan (1982-1986)

Items	Fifth Plan (1982-1986)	Sixth Plan target (1987-1991)
1. Trade deficit (current prices)		
1.1 Average value per year (million baht)	55,600	35,900
1.2 Trade deficit/GDP (%)	5.8	2.7
2. Current account deficit (current prices)		
2.1 Average value per year (million baht)	36,000	11,800
2.2 Current account deficit/GDP (%)	3.8	0.9
3. Exports of goods and services		
3.1 Value growth rate (% p.a.)	9.8	9.9
3.2 Volume growth rate (% p.a.)	8.4	7.4
4. Export of goods		
4.1 Value growth rate (% p.a.)	8.4	10.7
4.2 Volume growth rate (% p.a.)	8.3	8.1
4.3 Average value per year (million baht)	177,500	290,700
5. Income from tourism (current prices)		
5.1 Value growth rate (% p.a.)	12.2	7.4
6. Imports of goods and services		
6.1 Value growth rate (% p.a.)	3.7	9.3
6.2 Volume growth rate (% p.a.)	2.0	4 5
7. Import of goods		
7.1 Value growth rate (% p.a.)	2.9	9.5
7.2 Volume growth rate (% p.a.)	2.9	4.6
7.3 Average value per year (million baht)	233,100	326,700

Table 13 (Cont.)

Items	Fifth Plan (1982-1986)	Sixth Plan target (1987-1991)
8. Economic expansion (% p.a. at constant prices)		
8.1 Agriculture	2.1	2.9
8.2 Manufacturing	5.1	6.6
8.3 Mining (including natural gas)	6.1	6.4
8.4 Natural gas (million cubic feet per day)	320[1]	720[2]
8.5 Gross domestic product	4.4	5.0
9. Expenditure growth (% p.a. at constant prices)		
9.1 Private sector		
- Consumption	4.3	3.7
- Investment	-0.8	8.1
9.2 Public sector		
- Consumption	3.3	5.3
- Investment	1.8	1.0
10. Government revenue/GDP (%)	14.8	15.8
11. Population growth rate (% p.a.)	1.7[1]	1.3[2]
12. Per Capita Income (baht)	21,395[1]	27,783[2]
13. Inflation (% per year)	2.9	2.3

[1] in 1986
[2] in 1991
Note: Exchange rate 1 dollar/25.88 baht as of 12/2/87

Table 14

CONSOLIDATED PUBLIC CAPITAL EXPENDITURE, 1977-85

(US$ m., current prices)

	1977	1980	1982	1983	1984	1985	As % of total 1977-81	As % of total 1982-85
Agriculture	200	361.3	439.1	447.8	427.2	463.1	15.3	15.4
Energy	185	752.0	908.7	904.3	998.3	856.3	26.1	31.7
Transport and Communications	420	927.7	778.3	800.0	922.2	1,135.6	33.8	31.7
- Telecommunications/a	(35)	(83.0)	(95.7)	(186.9)	(308.8)	(249.9)	(4.0)	(7.3)
- Road	(255)	(463.9)	(408.7)	(391.3)	(372.3)	(418.9)	(17.6)	(13.8)
Education/b	125	175.8	330.4	308.7	300.3	260.9	9.0	10.4
Health	25	48.8	82.6	60.9	59.2	62.5	2.1	2.3
Industry	30	29.3	21.7	13.0	33.8	36.8	1.3	0.9
Others	195	293.0	221.7	178.3	224.2	253.6	12.2	7.6
Total	1,180	2,587.9	2,782.6	2,713.0	2,965.2	3,068.8	100.0	100.0

/a Includes TOT and CAT capital expenditures only.
/b Responsibility for primary education was switched from local to Central Government in 1981.

Note: Includes Central Government and state enterprise capital expenditure

Source: Bank of Thailand

Table15: Eastern Seaboard Development Projects

Project/Total investment/ Source of Fund	Status	Responsible agency
1. Laem Chabang target area		
a. Laem Chabang Commercial Sea Port (See Table 2)		
b. Laem Chabang Industrial Estate (See Table 2)		
c. Nongko-Laem Chabang water pipe line Total investment 308 m.baht Source of fund Foreign 118.2 m.baht Local 119.8 m.baht Approved loan JICA grant 12.0 m.baht OECF Yen11,12 1,507.0 m.Yen Local budget119.8 m.baht	- completed construction design on September 1986 - construction will begin in November 1987 and finish on December 1988	-Construction Department
d. Sriracha- Laem Chabang Railway Total investment 261 m.baht	- completed engineering design on December 1985 - construction will start on March 1989 and finish on April 1990	Railways Authority of Thailand (RAT)
e. Laem Chabang Telecommunication system	- expanded 600 telephone number from Sriracha telephone junction - prepare to expand another 2,850 telephone line in accordance with the telephone development plan during 1982-1987 - service in radio-telecom for business and industry	Telephone Authority of Thailand (TAT)
f. Laem Chabang Electricity Project	- install electricity power station around Laem Chabang Area and the Provincial Electricity Authority of Thailand (PEAT) has increased electricity generating system to cope with the demand of industry	Electricity Generating Authority of Thailand (EGAT)

2. Map-Ta-Phut target area

Basic infrastructures

a. Map-Ta-Phut Industrial Estate
(see Table 2)

b. Map-Ta-Phut Industrial Sea Port
(see Table 2)

c. Dok Krai - Map-Ta-Phut Water pipe line

Total investment	548 m.baht	- the construction is already finished and now supplying water to industries in Map-Ta-Phut area	Water Irrigation Department
Source of fund			
Foreign	373 m.baht		
Local	175 m.baht		
Approved loan			
OECF			
Yen 10	373 m.baht		
Govt. budget	175 m.baht		

d. Sattahep-Map-Ta-Phut Railway line

Total investment	473 m.baht	- completed engineering design on September 1986	Railways Authority of Thailand (RAT)
Foreign	331 m.baht		
Local	142 m.baht		
Approved loan			
OECF		- prepare construction plan to be consistant with the Map-Ta-Phut Industrial Sea Port	
Yen 10	7.2 m.baht		
Government budget	142 m.baht		

e. Industrial Projects

- Gas Seperation Plant No.1			
Total investment	7,360 m.baht	- the construction has been finished and plant has started operation on January 1985	
Source of fund			
Foreign	5,810 m.baht		
Local	1,541 m.baht	- gas seperation plant no. 2 is under consideration procedure	
Approved loan			
IBRD	1,035 m.baht		
CDC	575 m.baht		
OECF	1,495 m.baht		
EXIM Bank	1,840 m.baht		
Yen Syndicate	874 m.baht		
Local loan and revenue from PAT	1,541 m.baht		

- Petrochemical industries Total investment 8,505 m.baht Registered capital 70 m.baht Ratio of shareholders PTT 49% The King Property Bureau 2% IFC 9% Thai Polyethylene Co., Ltd. 13.9% Thai Petro Chemicals Industry Co., Ltd. 12.6% Sri Krung Watana Co., Ltd 8.8% Thai Plastic and Chemicals Co.,Lt 4.7%	- develop land for construction - agreed on Olefin plant construction on January 1987 - construction started on May 1987 and will be finished on August 1989	National Petrochemicals Co., Ltd.(NPC)
- Diversified Petrochemicals Industries Total investment 8,050 m.baht (exclude working capital) Companies under this project are oThai Polyethelene Co.,Ltd. (product: HDPE/LDPE) 2,000 m.baht oThai Petrochemicals Industry Co., Ltd. (product: LDPE,HDPE) 2,450 m.baht oSri Krung Watana Co.,Ltd. (product: PP) 1,100 m.baht oThai Plastic and Chemicals Co.,Ltd. (product: VCM) 2,500 m.baht	- every project is planned to start construction in the late of 1987 except for the Thai Petrochemical Industry Co.,Ltd. which is already started operation	
- Fertilizer Industry Total investment 12,213 m.baht The National Fertilizer Corporation is the main shareholder Ratio of shareholders Ministry of Finance 10% PTT 21% Farmer Marketing Organization 8% BAAC 2% The King Property Bureau 5%	- completed land development for plant construction	National Fertilizer Corporation

Thai Central Chemicals Co., Ltd. 17% 16 Thai Commercial Banks 15% Other fertilizer companies 12% Other finance companies 5% Approved loan Registered capital 200 m.baht OECF 2,400 m.baht			
- Tantalum Industry Co.,Ltd. Total investment 1,000 m.baht	- develop land for plant construction scheduled to start at October 1987	Thailand Tantalum Industry Co.,Ltd.	

Source : Industrial Estate Authority of Thailand , August 1987

Table16: Industrial Estate Development Projects

Project/Total Investment/ Source of fund	Progress	Responsible agencies
1. Laem Chabang target area		
a. Laem Chabang Commercial Sea Port Total investment 3,447 m.baht Source of fund: Foreign 2,052.4 m.baht Local 1,394.6 m.baht Approved loan OECF Yen 10 53.4 m.baht Yen 11,12 16,455.0 m.Yen Local 1,394.6 m.baht	- completed construction design in April 1986 - construction will be undertaken on October 1987 and complete on October 1991 - starting operation on October 1990	Industrial Estate Authority of Thailand (IEAT)
b. Laem Chabang Industrial Estate Total investment 1,606.6 m.baht Source of fund: Foreign 746.5 m.baht Local 860.1 m.baht Approved loan OECF Yen12 4,997.0 m.baht IEAT 860.1 m.baht JICA grant 12 m.baht SAL1 loan 56.2 m.baht	- prepare for the agreement on joint-private investment in developing and managing the industrial estate - construction design will be completed on November 1987 - begin construction on August 1988 and complete on July 1990	IEAT
2. Map-Ta-Phut target area		
a. Map-Ta-Phut Industrial Sea Port Total investment 3,812.5 m.baht Source of fund: Foreign 2,516.5 m.baht Local 1,296.0 m.baht Approved loan OECF Yen 10 62.8 m.baht Yen 11,12 21,656.0 m.Yen Budget loan 1,296.0 m.baht	- completed engineering design on December 1985 - completed construction bidding	IEAT
b. Map-Ta-Phut Industrial Estate Total investment 728.8 m.baht Source of fund: Foreign 391.5 m.baht Local 337.3 m.baht Approved loan SAL1 200 m.baht OECF Yen 10 10.7 m.baht Yen 11,12 3,207.0 m.Yen IEAT 337.3 m.baht	- completed engineering design on October 1985 - completed construction bidding - construction will begin on October 1987 and finish on October 1989 - the NPC has already located in the estate	IEAT

3. Samut Sakhon Industrial Estate Total investment 596.0 m.baht Main source of fund came from foreign source	- feasibility study in 1980 by JICA - construction will start on the beginning of 1988	IEAT
4. Lat-Krabang Industrial Estate Total investment 240.0 m.baht Main source of fund came from land sales revenue and others from IEAT budget and Japanese loan	- developing land area - sale land in 1988	
5. Southern Industrial Estate Total investment 250.0 m.baht Main source of fund came from government budget, IEAT, land sales revenue and foreign source	- Select location of land	IEAT
6. Nakhon Ratchasima Industrial Estate Total investment 39 m.baht Main source of fund came from government budget IEAT revenue from land sales	- feasibility study during 1980-1981 by JICA	

Source: Industrial Estate Authority of Thailand, August 1987

Table 17 Gross Domestic Fixed Capital Formation, Increase in Stock and Total Demand 1975,1980

Thousands of Baht

I-O Code		(1) GDFCF		(2) Increase in stock		(3) (1)+ (2)		(4) Growth (%)	(5) Total Value Added		(6) (3)/ (5) (%)	
		1975	1980	1975	1980	1975	1980	1975-1980	1975	1980	1975	1980
042-062	Food			3,083,596	1,941,194	3,083,596	1,941,194	-8.84	27,244,371	41,430,515	(11.32)	(4.69)
063-064	Beverages			58,133	68,660	58,133	68,660	3.38	1,421,916	4,626,935	(4.09)	(1.48)
065-066	Tobacco			75	73	75	73	-0.54	3,786,040	6,787,194	(.00)	(.00)
067-071, 073,074	Textiles	10,314	54,276	642,225	767,800	652,539	822,076	4.73	8,359,945	18,729,861	(7.81)	(4.39)
072	Wearing apparels			415,576	539,365	415,576	539,365	5.35	2,961,932	7,053,160	(14.03)	(7.65)
075-077	Leather products & footwear	9,693	13,236	80,211	48,489	89,904	61,725	-7.25	832,073	1,814,434	(10.80)	(3.40)
078-079	Wood and cork products	5,740	6,268	215,826	624,151	221,566	630,419	23.26	2,447,886	7,466,412	(9.05)	(8.44)
080	Wooden furniture & fixtures	931,208	3,766,769	199,040	82,282	1,130,248	3,849,051	27.77	1,059,853	3,224,936	(106.64)	(119.35)
081-082	Paper & paper products			37,227	93,484	37,227	93,484	20.22	1,578,350	4,739,270	(2.36)	(1.97)
083	Printing & publishing			7,697	18,423	7,697	18,423	19.07	826,474	4,407,926	(0.93)	(0.42)
084-092	Chemicals & chemical products			878,885	1,112,375	878,885	1,112,375	4.82	3,636,733	9,279,192	(24.17)	(11.99)
093-094	Petroleum refineries & petroleum products			381,475	1,719,569	381,475	1,719,569	35.14	4,149,291	12,007,019	(9.19)	(14.32)
095-097	Rubber & rubber products	121,893	214,851	186,256	527,869	308,149	742,720	19.24	2,289,867	5,158,349	(13.46)	(14.40)
098	Plastics & plastic products			67,163	134,596	67,163	134,596	14.92	1,281,598	2,214,444	(5.24)	(6.08)
099-104	Non-metallic products	58,192	203,357	261,407	372,024	319,599	575,381	12.48	2,271,364	6,160,148	(14.07)	(9.34)
105-107	Basic metal industries			548,920	1,653,652	548,920	1,653,652	24.68	3,031,680	6,031,273	(18.11)	(27.42)
108-111	Metal products	2,348,377	4,754,654	204,521	206,857	2,552,898	4,961,511	14.21	1,489,158	3,008,520	(171.43)	(164.92)
112-116	Machinery	12,472,109	30,512,774	1,664,362	1,325,641	14,136,471	31,838,415	17.63	1,631,339	4,357,000	(866.56)	(730.74)
117-122	Electrical machinery	3,061,452	13,194,797	638,596	617,124	3,700,048	13,811,921	30.14	1,407,859	6,531,573	(262.81)	(211.46)
123-128	Transport equipments	9,568,440	25,259,139	822,236	693,236	10,390,676	25,952,375	20.09	4,388,887	14,206,773	(236.75)	(182.68)
129-134	Miscellaneous	638,384	1,707,220	912,130	1,001,459	1,550,514	2,708,679	11.80	3,001,647	4,625,847	(51.66)	(58.56)
	Total	29,225,802	79,687,341	11,305,557	13,548,323	40,531,359	93,235,664	18.13	79,098,263	173,860,773	(51.24)	(53.63)

Source: Basic Input-Output Table of Thailand 1975,1980

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CHAPTER 3

CHANGING COMPARATIVE ADVANTAGE OF THAILAND

Paitoon Wiboonchutikula

Thailand's manufactured exports have become increasingly important. They increased from 10% in total exports in the 1960s to 38% in the early 1980s. Further the growth rate in exports has been remarkable. Thailand's average annual growth rate of 25% in 1970-85 was well in excess of that for developing countries or the world as a whole. The composition of our export sector has also become more diversified. Several exports are increasingly penetrating into major markets in the U.S.A., Japan, EEC, NICs, and ASEAN. The exports registering particularly sharp increases in import penetration are resource-based products (agriculture and mining-based) and labor-intensive manufactured products (textiles, clothing, footwear, and electronic components).

According to the constant-market-share analysis, the source of growth for exports may be attributed to four factors; (1) the general growth of world exports to the focus-destination (standard growth effect); (2) the commodity-mix of exports and differential growth in import demand (commodity composition effect); (3) the extent to which particular markets represent growing centers of demand (market distribution effect); (4) and a residual item which captures the net gain or loss in the market shares, owing, it is assumed, to changes in the relative price of the focus-exporter's product (competitiveness effect). The results of the analysis of Thailand's manufacturing

exports during the 1970s show that the commodity-composition factor exerted very little influence. The standard growth factor was generally not a major one. It is the "competitiveness" term which emerges as the essential explanatory factor.[1/]

3.1 CHANGING INTERNATIONAL COMPETITIVENESS

Products of a country which are internationally competitive are those for which the country has a comparative production cost advantage relative to other countries. For these products the pre-trade prices are lower than those of other countries. In the absence of trade distortions, the country will thus export these products and their market share would be higher than for countries where the pre-trade production price is higher.

Following Heckscher-Ohlin-Samuelson's (HOS) theorem on the explanation of the characteristics of trade patterns of different countries, we see that these products generally utilize factor inputs which the country possesses in the greatest relative abundance. If the resource endowments were to consist of two elements -- namely capital and labor -- the more labor abundant country would have a comparative advantage in exporting labor intensive products. Meanwhile it would

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1/ The study assessing Thailand's export performance to Japan (using the constant market share analysis) can be found in Thailand Development Research Institute (1986), and the study for the performance of the exports to all other countries in Ariff and Hill (1985).

import capital-intensive products from the country which was endowed with more capital resources. Over time, however, the international competitiveness or the comparative advantage of a country can change according to changes in its resource endowments. If the HOS model is extended to include another kind of endowment factor (besides labor and capital), namely, natural resources, it can be shown that in the early stages of development, when capital endowment is still small, the country which is relatively abundant in natural resources will have a comparative advantage in natural resource-based products. It will then export these products and import capital-intensive manufactured products [2/]. As the country's per capita income grows and greater capital endowment accumulates more labor input will be mobilized to engage in the production of manufactured products that need more capital input. The country will then gradually shift its comparative advantage from natural resource-based products to the products which require an increasingly higher degree of capital intensity. In other words, under these conditions, comparative advantage changes according to changing resource endowment as the country develops. This process can be summarized in three phases. Phase 1, resource-based processing; Phase 2, the diversification of exports to labor-intensive manufactured goods; and Phase 3, the emergence of capital- and technology-intensive production.

2/ See the detailed models in Jones (1971) and Krueger (1971). By applying Jones' three factor and two-commodity model, Krueger introduces natural resources as the third factor endowment besides capital and labor. The two goods traded among many countries are natural resource based and other manufactured goods. Natural resources are an input specific to the production of resource-based goods; capital is specific to other manufactured goods; and labor is required for both.

The speed with which comparative advantage shifts is determined by the initial per capita endowment of natural resources. That is, the greater the endowment, the greater the capital accumulation and the higher the wage necessary to speed up the change in comparative advantage (from natural resource-based products to products with higher capital intensity). This is because at an early stage of development, the country with little capital will have wage rates determined predominantly by its per-worker natural resource endowment, and will export resource-based products in exchange of other manufactured goods. As incomes grow and capital is accumulated, labor will be attracted to the manufacturing sector and the speed of the reallocation of labor toward more capital-intensive manufacturing will be greater the lower the initial wage rate is -- that is, the smaller the natural-resource endowment is per worker. This is because, initially, the lack of natural resources and the existence of low wages will give a resource-poor country an international comparative advantage in labor-intensive, standard-technology manufactured goods. Hence, it will switch from being predominantly a producer of labor-intensive goods at a low level of capital per worker. Over time, as the per-worker endowment of capital increases, the comparative advantage within the manufacturing sector will shift toward more capital-intensive activities. By contrast, a resource-rich country with a relatively high initial wage rate will switch much more slowly toward specialization in manufacturing outside natural resource-based products.

In the above model a major assumption is that the world trading system operates under free trade. With government policy interventions, the predictive power of the model is, unfortunately, weakened. Two examples of interventions which have the effect of distorting the pattern of trade and comparative advantage are, first, the inter-industry variations in the structure of protection. While import-substitution policy may discriminate against potential exportable products in which the products appear to have a comparative advantage, export-subsidization policy may enable some products to have more comparative advantage than in a situation without any subsidy. The second kind of intervention is a result of the protective schemes of trading partners. For example, tariff and nontariff barriers in developed countries may distort the comparative advantage of exports from LDCs by making them less competitive at their domestic price.

3.2 REVEALED COMPARATIVE ADVANTAGE INDEX

The competitiveness of an export of a country can be compared to other countries at a given point in time, or with itself over a period of time. A measurement which is widely used for such an assessment is the "revealed comparative advantage (RCA) index," developed by Balassa.[3/] It assumes that relative costs as well as non-price factors are reflected in the pattern of commodity trade. The index is defined as the ratio of the share of a commodity in total exports of a country, to the commodity's share in total world exports.

3/ See Balassa (1965).

In symbols,

$$RCA_{ij} = \frac{X_{ij} \Big/ \Sigma_j X_{ij}}{X_{wj} \Big/ \Sigma_j X_{wj}} = \frac{X_{ij} \Big/ X_i}{X_{wj} \Big/ X_w}$$

where RCA_{ij} = reveals comparative advantage of the j-th export of the i-th country

X_{ij} = value of the j-th export of the i-th country

$\Sigma_j X_{ij}$ = total value of exports of the i-th country

X_{wj} = value of the j-th export in the world

$\Sigma_j X_{wj}$ = total value of all exports in the world

The ratio, in fact, indicates the extent of commodity specialization in a country's exports relative to that of other exporting countries. A ratio of unity reveals an export specialization equivalent to the global average. A figure of 2 indicates that the share of commodity j in country i's exports is twice the world average. The ratio can range from to infinity, but, for obvious reasons, large numbers (say in excess of 10) are uncommon.

The ratio can also be shown to possess the following properties:

1. Hillman shows that if a country's exports of a particular good are, simultaneously, neither overly prominent in its total exports nor overly prominent in total world trade for that good, then the following condition holds. 4/

$$RCA_{ij} \gtreqless RCA_{ij} \quad \text{as} \quad P_{ij} \lesseqgtr P_{ij}$$

where P_{ij} is the autarkic relative price of the j-th export in the i-th country.

Further, the relative export share measure of revealed comparative advantage is consistent with comparative advantage as indicated by pre-trade relative prices. The qualification is that the reference countries have identical homothetic preferences and the trade data are not too aggregated.

2. According to Balassa 5/ the degree of specialization and diversification of manufactured exports can be indicated by the

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4/ There is a difficulty that, in theory, comparative advantage is specified with respect to pre-trade relative prices, whereas in empirical research one has to confront with post trade data. Thus, Hillman (1980) and Bowen (1983) examine whether cross-country rankings of revealed comparative advantage for a particular commodity reflect comparative advantage as given by pre-trade prices. Both conclude that cross-country comparisons revealed comparative index may reflect pre-trade prices under certain conditions.

5/ Balassa (1977) draws his conclusions from the empirical facts found in the study of revealed comparative advantage in most OECD countries.

standard deviation of revealed comparative advantage indicies and may be explained by: reference to the size of domestic markets; the level of technological development; and natural resource endowments. First, large countries tend to have a more diversified export structure, mainly because their large domestic markets permit the exploitation of economies of scale in a wide range of industries. Thus, they tend to show a smaller standard deviation. Second, lack of natural resources may explain the relatively high degree of diversification (a smaller standard deviation), while, conversely, the availability of natural resources may explain the relatively high degree of specialization (larger standard deviation). Third, countries with higher levels of technological development tend to be more diversified (less specialized) in exports and thus show a smaller standard deviation. But reversals take place at higher levels of technological development.

The index can reflect both the comparison of relative prices of a product among countries and over time. However, one must be cautious. The index can be vulnerable to influences of government policy interventions in both importing and exporting countries. Thus an index exceeding unity, or one which is increasing, can be interpreted as evidence of some revealed comparative advantage or a particular policy intervention to facilitate exports, or both. Although the measure can thus be deceptive and distorted by policy interventions, the danger of such distortions should be less in countries where government interventions distort the import mix more than its export mix. In addition, comparison within a country over time should be less damaging when the interventions are done systematically.

The revealed comparative advantage indexes of Thailand, ASEAN, Asian NICs, four South Asian countries, and some developed countries (namely, Japan, the U.S.A., Canada, and Australia) were computed for the period 1970-1983, the latest year in which the data are available. These countries were selected for comparison of competitive positions among each other. The data reported are the revealed comparative advantage indexes and their rankings for the SITC commodity groups. Table 1.1-1.4 show the indexes of ASEAN, Asian NICs, selected developed countries, and some South Asian countries respectively, whereas Table 2.1-2.4 show the rankings of the indexes of these groups of countries.

3.3 THE CHANGING REVEALED COMPARATIVE ADVANTAGE OF THAI EXPORTS

Table 2.1 shows that the top ten exports with the highest revealed comparative advantage indexes in the 1970s were rice, maize, sugar, tapioca products, frozen and canned foods and fruits, tobacco, crude rubber, nonferrous metal products, wood and wood products, and textile fibers. They are all products intensive in using agricultural, forestry, and mining products as intermediate inputs. The exports with the highest revealed comparative advantage over the period were thus the ones that benefited from the low prices of relatively abundant natural resources in Thailand. Further, these exports were produced with a combination of unskilled labor, and little capital, and used simple technology to process the raw materials.

The exports ranked among the first ten in the early 1980s were similar to those of the 1970s; however, the number of exports with revealed comparative indexes greater than one or steadily rising has been increased. The new export items with revealed comparative advantage indexes greater than one in the early 1980s were textile yarn, footwear, integrated circuits, leather products, and travel goods (Table 1.1). Those exports whose indexes rose rapidly were frozen chicken, woven textiles, clothing, and jewelry. However, in the period several industries also experienced declines in revealed comparative advantage; they were animal feeds, textile wastes and fibers, nonferrous metals, and wood and wood products. This pattern of change of comparative advantage shows that, while natural resource-based manufactured goods were still among the exports with top rankings in the indexes, exports expanded into labor-intensive, light manufactured goods. These new exports used higher skilled labor, more capital, and a higher level of technology in the production process. They also contributed higher value-added items than the exports that simply processed natural resources.

Apparently Thailand's comparative advantage did change gradually over time in accordance with its changing resource endowment. As skills, capital, and technical know-how were gradually accumulated, entrepreneurs were able to expand exports to include some labor-intensive manufactured goods. The expansion of these exports was made possible by benefits from both the comparative labor-cost advantage and the opening up of marketing opportunities in some importing countries.

Notice that most of light, labor-intentive products used to be extensively exported by the NICs. As they became more industrialized and labor became increasing expensive, exports had to shift to higher valued-added items to sustain growth. As a result, marketing opportunities for these labor-intensive products became more available for Thai exports (or those of other LDCs); this follows closely with their shifting from phase to phase of comparative advantage.

The following sections examine the changing revealed comparative advantage of selected individual countries and the implications of the changes on Thailand's exports. We first examine the changes in revealed comparative advantage of our neighboring ASEAN countries whose endowments are similar to ours. How will the direction of their changed comparative advantage affect our competitive position or provide areas for cooperation? Second, we discuss the revealed comparative advantage of the Asian NICs. They are not only compete with our labor-intensive exports, they also are the countries whose traditional exports might be taken over by ours. Third, we examine the revealed comparative advantage of a few major developed countries such as the U.S.A., Japan, Australia, and Canada. How does their comparative advantage contrast with ours and how will their changes affect ours through their effect on the changing competitiveness of NIC exports? Last, we study the revealed comparative advantage of some labor-abundant South Asian countries which have been or will become our potential world market competitors in the export of unskilled labor-intensive products.

3.4 IMPLICATION OF THE CHANGING REVEALED COMPARATIVE ADVANTAGE OF OTHER COUNTRIES ON THAILAND

3.4.1 The Revealed Comparative Advantage of ASEAN Countries

(a) Indonesia

Indonesia is generously endowed with agricultural and mineral resources, but the high population density in some regions makes the per capita income the lowest among the ASEAN countries. The top ten exports with the highest revealed comparative advantage indexes were natural resource based products. The indexes changed slowly over the period from 1970 to 1983. The exports whose revealed comparative advantage indexes remained high throughout the period were vegetable oil, wood and wood products, nonferrous metal products, and metal ores. These are processed resource-based products whose world prices also declined recently. Those whose revealed comparative advantage was still less than one but had increased in recent years were textiles, clothing, and electrical machinery. These latter exports were labor intensive goods. However, the competitiveness of these products in Indonesia is probably weakened by its rather inward-looking policy and the slow accumulation of both physical and human capital.

(b) Malaysia

Malaysia is another country rich in natural resources which experienced a rapid growth of per capita income and real wages in the last decade. All of its traditional resource-based products (such as vegetable oil, wood and wood products, nonferrous metal products,

rubber and rubber products, seafood, petroleum products, and metal ores) were among the exports ranked in the top ten of revealed comparative advantage indexes. However, some of these exports were recently replaced by skilled labor-intensive manufactured goods, such as electrical machinery, woven manmade fabric, woven cotton fabric, and petroleum products. Due to its more rapid growth of per capita income and real wages, the revealed comparative advantage indexes of these manufactured goods increased at a more rapid rate than the average rate of increase of other ASEAN countries in the early 1980s.

(c) The Philippines

Natural resource per capita in the Philippines is lower than that in Indonesia and Malaysia, but the country did begin industrializing earlier. In fact, it also started diversifying its exports to concentrate on agro-based and light manufacturing goods earlier than any other resource rich ASEAN countries. However, due to the difficulty it has in sustaining high per capita income growth, diversification slowed down in the 1970s. The principal exports (whose revealed comparative advantage indexes were high throughout the 1970s and the early 1980s) remained mostly resource-based products such as vegetable oil, wood and cork, metal ores, animal feeds, vegetables and fruit, and furniture. Similar to other ASEAN countries, the exports whose revealed comparative advantage indexes declined in more recent years were sugar, nonferrous metal products, wood and wood products, rice, and tobacco. The products with increasing indexes were clothing, footwear, and electrical machinery. Thus, after 1970, exports were

diversified gradually from some natural resource-based goods to labor-intensive manufactured goods. The competitiveness of the last group of exports stems from the Philippines' slow increase in real wages.

(d) Conclusion of ASEAN Revealed Comparative Advantage

Most exports with high revealed comparative advantage indexes in ASEAN were natural resource-based goods. The diversification to labor-intensive manufactured goods was gradual because of ASEAN countries' relatively high per capita natural resource endowment. Improvement of productivity in the natural resource sector increased the comparative advantage more firmly for resource-based manufactured goods and postponed the emergence of comparative advantage in labor-intensive goods. Meanwhile, the decreases in world prices in some resource-based goods and the rapid increases in real wages and structure changes in the NICs helped increase the ASEAN countries' competitiveness in exporting labor intensive goods.

The speed of changing comparative advantage thus depends on the balancing of these two contrasting forces. The resource-based exports whose revealed comparative advantage indexes declined due to declines in commodity prices were wood and wood products, vegetable oil and fat, and nonferrous metal products. At the same time, those with increasing indexes were clothing, textiles, woven manmade fabric, footwear, and electrical machinery. These last industries are labor-intensive and obtained their advantage from lower wages and availability of more quotas in the DC markets than in the Asian NICs.

Table 3 shows that the standard deviations of the revealed comparative advantage indexes of ASEAN countries were smaller than the Asian NICs because ASEAN countries are relatively large and endowed with abundant natural resources. However, the coefficients increased over time, a fact that shows increased specialization in a small number of manufactured exports in ASEAN. This happened, surprisingly, despite increases in the revealed comparative advantage indexes of most exports. The explanation could be that the revealed comparative advantage indexes of natural resource-based products increased at a higher rate than the rest. These countries thus continued specializing in a small number of exports, traditional agro-based or light manufactured goods.

3.4.2 The Revealed Comparative Advantage of the NICs

(a) South Korea

The revealed comparative advantage indexes of South Korean exports changed at a much more rapid rate than those of any ASEAN country. (See Table 1.2) We can hardly find products with a constant ranking of indexes. (See Table 2.2) The index for each product increased or declined rapidly over time. This indicates the dynamic nature of the exports of this natural-resource-scarce country. Except for travel goods, most traditional exports experienced rapid declines in revealed comparative advantage indexes over time. Those which had started to decline early in the 1970s were clothing, wood and wood products, cotton fabric, and seafood. Those whose comparative advantage declined

in more recent years were textile yarn, and footwear. They were mostly, however, labor-intensive exports suffering from rising wages at home and import barriers in the DCs. Under its rapid structural adjustment, the new exports with increasing revealed comparative advantage were manmade woven fabric, transport equipment, telecommunications, metal products, fertilizers, iron and steel, and electrical machinery. They were capital intensive products developed in response to an increasing abundance of capital and a scarcity of labor.

(b) Hong Kong

Similar to Korea, Hong Kong's revealed comparative advantage also changed rapidly. It shows a dynamic and diversified export structure. The exports whose revealed comparative advantage ranking remained high were clothing, travel goods, and miscellaneous products. The ones whose revealed comparative advantage declined were cotton fabric, jewelry, footwear, yarn, nonmetallic mineral products, pharmaceuticals, crude animals, dyes and tanning, metal products, and fish and fish preparation. These are labor-intensive or low value-added products. The products with increasing revealed comparative advantage were woven manmade fabrics, photo equipment, watches and clocks, telecommunications, and electrical machinery. They are products that more intensively use capital and technology in their production process.

(c) Singapore

Singapore's traditional major exports were vegetable oil, petroleum products, rubber and rubber products, wood and wood products, animal feeds, coffee and spices, and clothing. These items are mostly natural-resource based manufactured exports whose raw materials were imported from neighboring countries for packaging and processing and then exported. The products were either labor-intensive or required simple technology for production. Some of those that had declining revealed comparative advantages in recent years were clothing, wood and wood products, and animal feeds. This shows their declining reliance on natural resource-based or labor-intensive exports. The ones with increasing revealed comparative advantage, on the other hand, were woven manmade fabric, telecommunications, electrical machinery, fertilizers, other transport equipment, and jewelry. They are more capital-intensive; require higher technology; and thus contribute higher value-added to the industries.

(d) Taiwan

In Taiwan the traditional exports with high rankings of revealed comparative advantage were wood and wood products, textile yarn and fabric, clothing, footwear, sugar, vegetables and fruits, rubber products, organic chemicals, and metal products. Among these exports, agro-based products (such as sugar, vegetables and fruits, and fish and fish preparation) were less able to maintain their competitive position than the rest. Meanwhile there were new exports with a rising comparative advantage. These were more capital-intensive products such

as electronic products, fertilizers, and machinery for special industries.

Taiwan's pattern of exports and changing comparative advantage show that similarly to ASEAN countries it used to specialize in exporting both agro-based and labor-intensive products. However, since Taiwan has a much lower natural resource per capita but a much more rapid increase in per capita income, it was able to diversify its exports to products with higher degrees of capital intensity earlier and more rapidly than the ASEAN countries. Meanwhile, due to its policy that emphasizes the development of smaller-scale industries, the pace of export specialization in highly capital intensive goods was less rapid than Korea's.

(e) Conclusion of NICs Revealed Comparative Advantage

The NICs are natural resource-poor countries whose comparative advantage changes most rapidly. The standard deviations of revealed comparative advantage of these countries were higher than ASEAN countries in 1970, but decreased over time. (See Table 3) This shows the rapid export diversification of these natural resource-poor countries. The direction of the change in exports composition with top ranking revealed comparative advantage indexes went from labor-intensive to capital-intensive -- or to higher-technology, higher value-added products. The countries with faster increases in real wages and per capita stocks of physical and human capital were the ones with the most rapid changes in revealed comparative advantage. The exports whose revealed comparative advantage declined in all NICs were

cotton fabric, clothing, yarn, and footwear. The declines were due to rising real wages, restricted markets in the DCs, or both. Those whose revealed comparative advantage indexes increased were capital-intensive goods such as manmade woven fabric, telecommunications, fertilizers, and electrical machinery.

The changes in the export competitive position of the NICs allowed low-wage countries (such as ASEAN countries) to benefit from the opening up of markets for labor-intensive exports such as textile products, clothing, and footwear. Meanwhile, if in the low-wage countries , per capita income and technology were able to be accumulated rapidly enough, products such as manmade woven fabric, telecommunications, fertilizers, and electrical machinery should emerge as the next products that would gain comparative advantage -- once the NICs do move to products with an even higher level of capital and technology intensity.

3.4.3 The Revealed Comparative Advantage of Elected DCs

(a) Japan

Japan is the leading natural-resource-scarce country with large, well-diversified, and has a dynamic economy. The structure of competitive exports changed rapidly within the top ten product that revealed comparative advantage. (See Table 2.3) The ones whose indexes were high and stable were woven manmade fabric, steel, telecommunications, photo equipment, transport equipment, general industrial machinery, electrical machinery, and rubber products. (See

Table 1.3) The ones with a declining comparative advantage were yarn, machinery-specific industries, fish preparation, metal products, cotton fabric, organic chemicals, and miscellaneous products. Among them, those whose comparative advantage was taken over by the Asian NICs were transport equipment, metal manufacturing, iron and steel, photo equipment, machinery for specific industries, and organic chemicals. Their diversified exports whose comparative advantage increased in recent years were capital and technology-intensive goods.

(b) The U.S.A.

Compared to Japan, the U.S.A. is rich in natural resources but shows less rapid change in its export structure. The top ten ranked exports that revealed comparative advantage remained natural-resource-based products, namely, maize, tobacco, rice, animal feeds, and vegetable oil, and included capital-intensive industries such as transport equipment and fertilizers. Those with declining revealed comparative advantage were inorganic and organic chemicals, machinery for specific industries, and miscellaneous products. Organic chemicals and machinery were partly taken over by NICs. Those rising were products with high technology intensity: pharmaceutical products, electrical machinery, plastic materials, and precision instruments.

(c) Canada and Australia

Both countries are large and generously endowed with natural resources. In Canada the major exports with top revealed comparative advantage were natural resources-based products such as paper and paper

products, wood and wood products, cereal, crude fertilizers, and seafood. Those with declining revealed comparative advantage were natural ores and nonferrous metals. Those with increasing revealed comparative advantage were road vehicles, organic and inorganic chemical, and rubber products. The country did diversify slowly to export vehicles and chemical products.

In Australia the comparative advantage lay in such natural resource-based products as metal ores, cereal, sugar, nonferrous metal products, rice, seafood, and textile fiber and waste. Similar to Canada, the country's rise in per capita income and real wages induced exports to diversify from resource-based to capital-intensive products; however, due to its high level of resources per capita, the shifting of comparative advantage was slow.

(d) Conclusion of Selected DCs Revealed Comparative Advantage

It is interesting to compare the changes in comparative advantage of Japan, which is a natural-resource-scarce DC, with the resource-abundant countries such as the U.S.A., Canada, and Australia. Evidence shows that, while the latter countries relied firmly on the exports of resource-based goods, the principal exports of Japan (mainly physical capital-intensive goods) were more diversified and the composition changed much more rapidly than that of the other countries. The natural-resource-rich DCs tend to retain a comparative advantage in resource-based production despite high levels of capital accumulation and competition from the resource-rich LDCs. This is due to their high

per capita endowment or their trade barriers. If the productivity of their production of natural resources were not accelerated too rapidly or the resource-based sector were not under protection, the structure of their principal exports would have changed more rapidly and the opportunities for resource-rich LDCs to specialize in exporting of resource-based products would also be extended. At the same time, if both Japan and other DCs were to continue diversifying their exports to become specialized in the areas of high-technology products, the NICs would be able to supplant their human- and physical-capital-intensive exports more rapidly. In fact, the more rapid the structural changes in production and trade in the DCs are, the more rapid the effects of the changes are on the changes in the comparative advantage in the rest of the world.

3.4.4 The Revealed Comparative Advantage of South Asian Countries

(a) India

India is a large country endowed with natural resources and an unlimited supply of unskilled labor. Domestic policy is rather inward-looking and the size of the trade sector was only about 15% from 1970-83. Due to its large size and rich resources the economy was quite diversified in its exports. However, the structure of the top ten ranking exports only moderately changed over the period 1970 to 1980. (See Table 2.4) The exports with a stable revealed comparative advantage were tea, spices, textiles and textile products, animal and vegetable materials, tobacco, and seafood.

Those with a declining revealed comparative advantage were animal feeds, metallic ores, sugar, vegetables and fruit, and nonferrous metal products. Those with rising revealed comparative advantage were clothing, footwear, dyeing, tanning materials, pharmaceutical products, textile fiber and waste, and nonmetallic mineral products. (See Table 1.4)

The products with top ranking revealed comparative advantage were either natural resource-based or labor intensive. The exports with a rising revealed comparative advantage were, however, both labor- and capital-intensive products.

(b) Pakistan

The domestic policy of Pakistan is more export-oriented than India; however, it is similarly to ASEAN countries, the structure of major exports was quite stable and diversified at a rather slow pace. The products with a high revealed comparative advantage were textile fibers and wastes, yarn, seafood, cereal, tobacco, animal and vegetable materials, and animal feeds. The ones with an increasing revealed comparative advantage were footwear, sugar, clothing, nonmetallic mineral products, and miscellaneous products. The export structure and its changes over time was quite similar to that of India, except that there were less capital-intensive exports in Pakistan.

(c) Sri Lanka

Sri Lanka's exports with top and stable rankings of revealed comparative advantage indexes were tea, vegetable oil and fats, and vegetables and fruits. These are all natural-resource-based. Other exports with top but declining revealed comparative advantage were textile fibers and waste and crude fertilizer. The ones with an increasing revealed comparative advantage were crude rubber, seafood, oil seeds, yarn, and animal and vegetable materials. The exports were a smaller set of those of India and Pakistan. In fact, it seems that Sri Lanka is catching up with the former two countries. Among the exports with rising revealed comparative advantage, except for crude rubber and oil seeds, the rest -- namely yarn, seafood, and animal and vegetable materials, were all major exports of both India and Pakistan. However, compared to the above two countries, Sri Lanka's exports still greatly rely on natural resources. Textiles were the only item to which the country's exports will be diversified.

(d) Bangladesh

Bangladesh is an LDC which is poor in natural resources but abundant in cheap labor. Exports were concentrated on a few items and the least diversified over time. The major exports were textiles and textile products, textile fiber and waste, tea, and seafood. Clothing and animal and vegetable materials were the new exports with rising revealed comparative advantage.

(e) Conclusion of South Asian Countries' Revealed Comparative Advantage

Table 3 shows that except for a large country like India, the standard deviations of revealed comparative advantage indexes of the rest of the selected South Asian countries were much larger than that of the ASEAN countries. While Bangladesh showed a rapid decrease in the standard deviation, Sri Lanka showed the opposite trend. Increases in revealed comparative advantage of Bangladesh were distributed to a large number of exports, while those of Sri Lanka were concentrated on fewer items.

The major exports with stable revealed comparative advantage of all of these countries were: processed food, tobacco, and textiles. In India, there was diversification of its exports to some capital intensive products such as dyeing and tanning materials, and pharmaceutical products. The products with rising revealed comparative advantage in common to all countries were clothing and footwear. These latter products are labor intensive and the competitiveness could be from their lower wages than labor in ASEAN.

3.5 CONCLUDING REMARKS

Similar to other resource rich ASEAN countries Thailand has an overwhelming comparative advantage in natural resource-based products. Labor-intensive products were the category with revealed comparative advantage increasing sharply to exceed unity. The revealed comparative advantage for human capital and technology-intensive products were still less than unity and increasing slowly. It is thus clear that there has been an expansion of manufactured exports from concentration on resource-based products to labor intensive items.

Nevertheless, compared to NICs, the speed of change of revealed comparative advantage indexes of Thailand or other ASEAN countries was still less rapid. In the NICs, where natural resources are limited, real wages were steadily rising, while human and physical capital was rapidly accumulating. There has been a shift from the initial specialization of labor intensive products to higher skilled labor and more capital-intensive products. They seemed to move in stages, following the similar path of changing comparative advantage of natural resource poor developed country, namely Japan. This should provide opportunities for the expansion of labor intensive exports of countries at a lower level of development where unskilled labor is still abundantly available.

Comparing the real wages among LDCs, there are countries at a lower level of development than ASEAN whose wages were also lower. Thus, there is the possibility of the competition of ASEAN labor-

intensive exports from countries such as China and some South Asian countries. As their per capita income and productivity rise, this group of LDCs, with even cheaper labor, will have the comparative advantage that the ASEAN countries presently possess.

From the above discussion, the implied outlook seems to be the following. Thailand can still benefit from the advantage of having abundant natural resource as long as we can improve the productivity in the natural resource sector, as the physical availability of the resources become less over time. At the same time, we should diversify to new agro-based industries and to light higher valued-added manufacturing goods. The prospect for the development of agro-based exports is promising, as long as there is no high-technology-intensive products to replace them. As for the possibility of having rising real wages and the labor-intensive exports being taken over by new low wage countries, the concern is valid. However, wages are not expected to increase quickly, due to the large reserve of labor force in the agricultural sector. If wages were to increase more rapidly, we could still remain competitive in the export of labor-intensive products, as long as our labor productivity rises at a rate commensurate with the rate of wage increases. Our competitive position (of these products) would be lost, once our real wages rise at a rate higher than that of increase of labor productivity. In any case, when our labor becomes more skillful; more capital investment is available, and our technology know-how is more accumulated, we should take the advantage of this changing resource endowments to produce higher value-added items, such as the ones which the NICs are producing.

What are the prospects of the speed of change of comparative advantage? Factors which could accelerate changes are the more rapid recovery of the DC markets, the rapid structural changes in DC manufacturing and the corresponding rapid growth and structural adjustment in the NICs. Meanwhile, the factors which may slow down the changes are protectionism in the DCs, the emergence of alternative exporters of labor intensive goods, and the rapid technological changes in labor intensive goods in the DCs. For the latter factor, applications of high technology in DCs could turn the present labor-intensive, to become technology-intensive industries, and then their competitiveness of these exports could be revived. However, they may face the problem of replacement of high technology for the jobs they intend to protect for their workers in the first place. Besides, there are studies showing that, as long as the differences in wages between DCs and LDCs remain substantial, the competitiveness of relatively labor intensive goods will remain with a low-wage country such as Thailand.

Table 1.1

Revealed Comparative Advantage by Commodity : Asean Countries
1970-1983

SITC	Commodity	Thailand				Indonesia				Malaysia				Philippines			
		1970	1975	1980	1983	1970	1975	1980	1983	1970	1975	1980	1983	1970	1975	1980	1983
0114	Poultry Fresh Chold, Frzn	n.a.	0.00	5.63	7.78	n.a.	0.00	0.00	0.00	n.a.	0.00	0.00	n.a.	n.a.	0.00	0.00	0.00
03	Fish & Preparations	3.00	6.71	6.69	9.57	0.68	1.79	1.39	1.39	2.49	2.97	1.39	n.a.	0.25	1.09	3.44	3.31
04	Cereals & Preparations	14.18	10.31	12.84	13.41	0.13	0.05	0.00	0.00	0.00	0.00	0.07	n.a.	0.02	0.00	0.04	0.19
05	Vegetables & Fruit	5.36	8.10	10.11	10.31	0.40	0.24	0.00	0.00	0.73	0.77	0.39	n.a.	2.45	4.25	4.63	4.75
06	Sugar & Preps, Honey	1.24	10.73	3.87	12.91	0.30	0.00	0.00	0.00	0.00	0.41	0.00	n.a.	24.33	20.87	17.46	17.38
07	Coffee, Tea, Cocoa, Spices	0.00	0.00	0.14	0.49	5.54	2.52	3.48	3.44	0.84	1.61	1.03	n.a.	0.00	0.20	0.98	1.55
081	Feeding Stuff for Animal	1.33	1.25	2.41	2.26	0.94	1.36	0.96	0.71	0.00	0.90	0.54	n.a.	2.58	3.32	2.96	17.90
09	Misc Edible Products	0.00	0.00	0.81	2.22	0.00	0.00	0.00	0.00	0.00	1.69	1.05	n.a.	0.00	0.00	0.00	0.00
12	Tobacco and Manufactures	2.80	3.15	3.15	3.35	0.98	1.24	0.00	0.00	1.91	0.00	0.00	n.a.	2.73	3.72	1.60	1.87
22	Oil Seeds, Oleaginous Frt	0.00	0.00	0.57	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	1.98	0.42
23	Rubber, Crude	0.00	0.00	24.29	24.68	0.00	0.00	14.01	12.28	0.00	0.00	42.88	n.a.	0.00	0.00	0.00	0.00
24	Cork and Wood	0.94	1.58	0.00	0.00	6.09	6.70	6.61	1.80	9.63	11.47	11.28	n.a.	14.52	8.15	3.98	5.04
26	Textile Fibres and Waste	3.78	1.97	1.05	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.51	n.a.	1.02	0.71	0.89	0.63
27	Crude Fertilizer, Minrls Nes	2.42	1.40	1.01	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	0.00
28	Metalliferous Ores, Scrap	0.46	0.65	1.46	0.48	4.03	1.34	1.15	1.03	1.08	0.35	0.67	n.a.	7.86	6.49	10.51	6.84
29	Crude Animal, Veg Mat Nes	1.66	1.91	2.60	3.66	1.23	0.00	1.10	1.61	0.00	0.00	0.00	n.a.	0.00	0.71	0.76	1.12
33	Petroleum and Products	0.10	0.04	0.03	0.03	4.58	4.69	3.01	4.06	1.02	0.68	1.26	n.a.	0.22	0.10	0.04	0.14
42	Fixed Vegetable Oil, Fat	0.00	0.00	0.00	0.00	7.61	4.35	6.64	3.05	12.64	30.91	55.82	n.a.	20.32	19.51	50.94	57.94
51	Organic Chemicals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.11	0.53	0.64
52	Inorganic Chemicals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.05	0.00
53	Dyes, Tanning, Colour Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	0.00
541	Medicinal,Pharm Product	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00	n.a.	0.00	0.00	0.00	0.00
562	Fertilizers, Manufacture	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	0.00
58	Plastic Materials Etc	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.16	0.17
62	Rubber Manufactures Nes	0.00	0.00	0.87	0.74	0.00	0.00	0.00	0.00	0.77	0.76	0.49	n.a.	0.00	0.00	0.00	0.00
63	Wood, Cork Manufactures Nes	0.52	2.37	2.35	2.30	0.00	0.00	0.77	0.91	3.44	5.09	3.00	n.a.	0.23	5.97	7.39	8.18
64	Paper, Paperboard and Mfr	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.02	0.00	0.00
65	Textile Yarn, Fabrics, etc	0.35	1.86	2.04	2.09	0.00	0.00	0.00	0.24	0.12	0.44	0.56	n.a.	0.15	0.49	0.52	0.38
66	Nonmetal Mineral MFS NES	0.89	1.81	1.59	3.10	0.00	0.00	0.00	0.00	0.38	0.00	0.00	n.a.	0.17	0.84	0.57	0.33
67	Iron and Steel	0.06	0.06	0.24	0.13	0.00	0.00	0.00	0.00	0.10	0.00	0.00	n.a.	0.25	0.02	0.26	0.22
68	Non-ferrous Metals	3.13	2.79	4.31	2.42	0.22	0.63	0.82	1.16	5.32	7.02	3.79	n.a.	0.04	2.64	1.04	1.04
69	Metal Manufactures Nes	0.11	0.29	0.44	0.42	0.03	0.03	0.00	0.00	0.17	0.22	0.18	n.a.	0.00	0.00	0.17	0.12
72	Machs for Spcl Industrys	0.00	0.23	0.00	0.09	0.00	0.04	0.00	0.00	0.09	0.69	0.10	n.a.	0.00	0.00	0.08	0.06
74	Genrl Industrl Machy Nes	n.a.	n.a.	0.07	0.13	n.a.	n.a.	0.00	0.00	n.a.	n.a.	0.15	n.a.	n.a.	n.a.	0.00	0.00
76	Telecomm, Sound Equipment	n.a.	n.a.	0.00	0.00	n.a.	n.a.	0.00	0.08	n.a.	n.a.	0.48	n.a.	n.a.	n.a.	0.20	0.29
77	Electric Machinery NES etc	n.a.	n.a.	1.58	1.32	n.a.	n.a.	0.14	0.15	n.a.	n.a.	2.38	n.a.	n.a.	n.a.	0.30	1.07
78	Road Vehicles	n.a.	n.a.	0.00	0.00	n.a.	n.a.	0.00	0.00	n.a.	n.a.	0.00	n.a.	n.a.	n.a.	0.09	0.07
79	Other Transport Equipment	n.a.	n.a.	0.08	0.03	n.a.	n.a.	0.00	0.00	n.a.	n.a.	0.44	n.a.	n.a.	n.a.	0.00	0.00
821	Furniture, Parts Thereof	0.00	0.00	0.84	1.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	1.05	2.46	2.62
831	Travel Goods, Handbags	0.00	0.00	1.48	2.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	0.00
84	Clothing & Accessories	0.08	1.41	2.14	3.19	0.00	0.00	0.23	0.37	0.31	0.63	0.60	n.a.	0.00	0.83	2.52	3.16
851	Footwear	0.00	0.00	0.48	1.94	0.00	0.00	0.00	0.00	0.40	0.81	0.57	n.a.	0.00	0.00	2.09	1.83
87	Precision Instruments Nes	n.a.	n.a	0.01	0.34	n.a.	n.a	0.00	0.00	n.a.	n.a.	0.00	n.a.	n.a.	n.a.	0.00	0.00
88	Photo Equ, Optic Gds Etc	n.a.	n.a.	0.33	0.38	n.a.	n.a.	0.00	0.00	n.a.	n.a.	0.34	n.a.	n.a.	n.a.	0.46	0.30
89	Miscellaneous Manufactured Goods NES	0.13	0.39	0.63	0.88	0.00	0.00	0.00	0.00	0.18	0.22	0.23	n.a.	0.16	1.05	1.13	1.12

Source United Nations. International Trade Statistics Yearbook various issues.

Table 1.2

Revealed Comparative Advantage by Commodity : Asian Newly Industrialized Countries
1970-1983

SITC	Commodity	Korea				Hong Kong				Singapore				Taiwan			
		1970	1975	1980	1983	1970	1975	1980	1983	1970	1975	1980	1983	1970	1975	1980	1983
0114	Poultry Fresh Chold, Prsn	n.a.	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	n.a.	n.a.	n.a.	n.a.
03	Fish & Preparations	6.51	10.84	5.58	3.77	0.97	1.69	1.20	1.18	0.72	0.93	0.99	0.84	1.93	5.36	2.21	1.43
04	Cereals & Preparations	0.00	0.00	0.00	0.00	0.15	0.07	0.00	0.00	0.52	0.37	0.53	0.39	n.a.	n.a.	n.a.	n.a.
05	Vegetables & Fruit	1.13	0.65	0.69	0.54	0.39	0.48	0.44	0.65	1.08	0.75	0.44	0.54	2.78	1.84	1.02	0.48
06	Sugar & Preps, Honey	0.06	1.82	1.98	1.08	0.00	0.00	0.00	0.00	0.00	0.54	0.00	0.00	4.05	3.88	1.77	0.45
07	Coffee, Tea, Cocoa, Spices	0.00	0.00	0.00	0.00	0.50	0.25	0.00	0.00	2.93	1.96	1.32	1.65	0.53	0.34	0.13	0.08
081	Feeding Stuff for Animal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.12	1.55	1.00	0.43	n.a.	n.a.	n.a.	n.a.
09	Misc Edible Products	0.00	2.90	0.00	0.00	0.00	2.32	1.46	1.70	0.00	2.49	1.81	0.99	n.a.	n.a.	n.a.	n.a.
12	Tobacco and Manufactures	3.30	3.22	1.53	1.28	0.79	0.00	0.94	1.37	1.92	0.00	0.00	0.00	n.a.	n.a.	n.a.	n.a.
22	Oil Seeds, Oleaginous Frt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	n.a.	n.a.	n.a.
23	Rubber, Crude	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.78	13.99	n.a.	n.a.	n.a.	n.a.
24	Cork and Wood	0.03	0.30	0.38	0.00	0.00	0.00	0.00	0.00	1.42	1.15	1.12	0.95	n.a.	n.a.	n.a.	n.a.
26	Textile Fibres and Waste	3.26	0.87	0.61	0.27	0.00	0.40	0.83	0.77	0.11	0.26	0.00	0.00	n.a.	n.a.	n.a.	n.a.
27	Crude Fertiliser, Minrls Nes	1.39	0.64	0.52	0.00	0.00	0.00	0.00	0.00	0.00	0.46	0.00	0.00	n.a.	n.a.	n.a.	n.a.
28	Metalliferous Ores, Scrap	1.44	0.40	0.00	0.00	0.39	0.25	0.66	0.77	0.47	0.22	0.37	0.62	n.a.	n.a.	n.a.	n.a.
29	Crude Animal, Veg Mat Nes	3.77	1.69	1.37	1.09	2.00	3.43	3.63	3.45	1.94	1.47	1.76	1.44	n.a.	n.a.	n.a.	n.a.
33	Petroleum and Products	0.08	0.12	0.01	0.14	0.04	0.02	0.02	0.02	3.22	2.98	1.48	1.75	0.06	0.06	0.07	0.11
42	Fixed Vegetable Oil, Fat	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.43	3.54	10.54	5.46	n.a.	n.a.	n.a.	n.a.
51	Organic Chemicals	0.08	0.34	0.57	0.44	0.27	0.21	0.21	0.26	0.27	0.24	0.31	0.67	1.07	0.83	1.40	1.56
52	Inorganic Chemicals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	n.a.	n.a.	n.a.
53	Dyes, Tanning, Colour Products	0.00	0.00	0.00	0.00	1.32	2.62	1.51	1.76	0.00	0.00	0.00	0.00	n.a.	n.a.	n.a.	n.a.
541	Medicinal,Pharm Product	0.00	0.00	0.00	0.00	2.15	1.39	1.03	1.04	0.53	1.81	1.12	1.07	n.a.	n.a.	n.a.	n.a.
562	Fertilisers, Manufacture	0.00	0.00	4.17	3.09	0.00	0.00	0.00	0.00	0.00	0.00	1.01	1.41	0.00	0.00	1.16	1.48
58	Plastic Materials Etc	0.00	0.00	0.57	0.51	0.00	0.00	0.42	0.45	0.00	0.00	0.40	0.43	0.00	5.82	5.57	5.36
62	Rubber Manufactures Nes	0.76	2.89	4.70	2.89	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.00	1.69	1.45	2.59	2.13
63	Wood, Cork Manufactures Nes	22.62	10.24	5.31	1.65	0.00	0.00	0.00	0.00	2.38	3.59	3.84	2.94	17.46	14.36	13.71	12.15
64	Paper, Paperboard and Mfr	0.03	0.54	0.62	0.39	0.18	0.26	0.33	0.33	0.29	0.26	0.24	0.29	n.a.	n.a.	n.a.	n.a.
65	Textile Yarn, Fabrics, etc	2.94	5.44	5.09	4.24	3.16	4.96	3.62	3.96	1.00	1.22	0.77	0.76	9.17	14.02	9.06	8.51
66	Nonmetal Mineral MFS NES	0.41	1.24	1.36	1.09	2.00	2.59	1.69	1.26	0.49	0.42	0.38	0.46	n.a.	n.a.	n.a.	n.a.
67	Iron and Steel	0.38	1.08	2.96	2.99	0.16	0.03	0.09	0.19	0.19	0.38	0.34	0.35	0.99	0.55	0.63	1.10
68	Non-ferrous Metals	0.20	0.08	0.22	0.33	0.09	0.25	0.36	0.32	0.07	0.17	0.58	0.94	n.a.	n.a.	n.a.	n.a.
69	Metal Manufactures Nes	0.79	1.39	2.35	3.24	1.30	1.35	1.42	1.35	0.72	0.71	0.58	0.62	1.03	1.41	2.31	3.04
72	Machs for Spcl Industrys	1.09	1.81	0.19	0.40	1.91	2.27	0.45	0.44	0.83	2.41	0.98	0.88	0.68	0.76	1.80	1.75
74	Genrl Industrl Machy Nes	n.a.	n.a.	2.17	0.18	n.a.	n.a.	0.20	0.34	n.a.	n.a.	0.75	1.10	n.a.	n.a.	n.a.	n.a.
76	Telecomm, Sound Equipment	n.a.	n.a.	1.26	3.46	n.a.	n.a.	3.90	3.63	n.a.	n.a.	4.30	3.24	n.a.	n.a.	n.a.	n.a.
77	Electric Machinery NES etc	n.a.	n.a.	1.67	1.75	n.a.	n.a.	2.07	2.29	n.a.	n.a.	2.83	3.09	n.a.	n.a.	5.73	5.41
78	Road Vehicles	n.a.	n.a.	0.74	0.21	n.a.	n.a.	0.21	0.18	n.a.	n.a.	0.20	0.13	n.a.	n.a.	n.a.	n.a.
79	Other Transport Equipment	n.a.	n.a.	0.00	8.47	n.a.	n.a.	0.23	0.23	n.a.	n.a.	1.96	2.24	n.a.	n.a.	n.a.	n.a.
821	Furniture, Parts Thereof	0.00	0.50	0.00	0.00	1.63	1.35	0.97	0.85	0.00	0.00	0.62	0.76	n.a.	n.a.	n.a.	n.a.
831	Travel Goods, Handbags	3.04	14.62	10.42	14.53	11.87	14.61	12.07	11.19	0.00	0.00	0.00	0.00	n.a.	n.a.	n.a.	n.a.
84	Clothing & Accessories	16.48	13.04	8.81	7.53	16.02	19.50	13.19	12.00	1.21	1.26	1.15	1.00	n.a.	n.a.	n.a.	n.a.
851	Footwear	4.17	7.98	9.02	8.40	4.07	2.95	1.54	1.43	0.57	0.00	0.00	0.00	n.a.	n.a.	n.a.	n.a.
87	Precision Instruments Nes	n.a.	n.a.	0.57	0.39	n.a.	n.a.	0.34	0.40	n.a.	n.a.	0.51	0.74	n.a.	n.a.	n.a.	n.a.
88	Photo Equ, Optic Gds Etc	n.a.	n.a.	1.41	1.07	n.a.	n.a.	9.99	8.91	n.a.	n.a.	1.04	0.89	n.a.	n.a.	n.a.	n.a.
89	Miscellaneous Manufactured Goods NES	5.51	3.61	1.86	1.66	8.97	6.28	5.66	5.23	0.78	0.87	0.83	0.96	n.a.	n.a.	n.a.	n.a.

Sources : 1. United Nations, International Trade Statistics Yearbook, various issues.
2. Council of Economic Planning and Development, Taiwan Statistical Data, 1986.

Table 1.3

Revealed Comparative Advantage by Commodity : Developed Countries
1970-1983

SITC	Commodity	Japan				United States				Canada				Australia			
		1970	1975	1980	1983	1970	1975	1980	1983	1970	1975	1980	1983	1970	1975	1980	1983
0114	Poultry Fresh Chold, Frzn	n.a.	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	n.a.	0.00	0.00	0.00
03	Fish & Preparations	2.18	1.23	0.90	0.57	0.36	0.43	0.64	0.61	2.00	2.09	2.39	2.17	1.39	1.24	1.68	2.30
04	Cereals & Preparations	0.40	0.00	0.00	0.00	2.72	4.09	5.01	4.89	2.52	3.10	3.86	4.27	5.20	6.41	8.50	4.84
05	Vegetables & Fruit	0.17	0.00	0.00	0.00	0.70	0.79	0.98	0.92	0.23	0.23	0.29	0.32	1.22	0.75	0.88	0.76
06	Sugar & Preps, Honey	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.79	4.60	8.17	8.00
07	Coffee, Tea, Cocoa, Spices	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
081	Feeding Stuff for Animal	0.00	0.00	0.00	0.00	1.74	2.05	2.63	2.31	0.69	0.59	0.66	0.64	0.43	0.58	0.32	0.56
09	Misc Edible Products	0.00	0.00	0.00	0.00	2.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	Tobacco and Manufactures	0.00	0.00	0.00	0.00	3.24	2.92	3.38	3.54	0.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	Oil Seeds, Oleaginous Frt	0.00	0.00	0.00	0.00	0.00	0.00	5.14	5.78	0.00	0.00	1.76	1.63	0.00	0.00	0.00	0.00
23	Rubber, Crude	0.00	0.00	0.00	0.00	0.00	0.00	0.88	0.88	0.00	0.00	1.01	1.22	0.00	0.00	0.00	0.00
24	Cork and Wood	0.00	0.00	0.00	0.00	0.79	1.04	1.11	1.25	2.71	3.04	3.77	5.28	0.00	0.00	0.89	1.00
26	Textile Fibres and Waste	0.66	0.86	0.85	0.54	0.81	1.29	2.82	1.61	0.00	0.00	0.00	0.00	10.21	9.89	13.96	11.39
27	Crude Fertiliser, Minrls Nes	0.00	0.00	0.00	0.00	1.00	1.20	1.17	1.35	2.48	2.12	3.15	2.96	0.43	0.50	0.83	1.18
28	Metalliferous Ores, Scrap	0.00	0.00	0.00	0.00	0.83	0.74	1.19	0.89	3.37	3.96	3.26	2.49	5.45	9.78	9.64	14.22
29	Crude Animal, Veg Mat Nes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.76	0.00	0.87	0.00
33	Petroleum and Products	0.00	0.02	0.00	0.00	0.16	0.05	0.07	0.15	0.57	0.65	0.31	0.37	0.12	0.12	0.11	0.34
42	Fixed Vegetable Oil, Fat	0.00	0.00	0.00	0.00	1.36	1.04	2.62	2.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
51	Organic Chemicals	1.24	1.28	1.09	0.99	1.70	1.44	1.40	1.54	0.62	0.52	0.76	0.90	1.22	1.01	0.19	0.00
52	Inorganic Chemicals	0.00	0.00	0.59	0.54	7.43	0.00	1.55	1.90	0.00	0.00	1.87	1.50	0.00	0.00	0.46	0.00
53	Dyes, Tanning, Colour Products	0.66	0.84	0.89	0.92	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
541	Medicinal,Pharm Product	0.39	0.00	0.00	0.00	1.12	1.08	1.32	1.57	0.00	0.00	0.00	0.00	0.58	0.49	0.56	0.59
562	Fertilizers, Manufacture	0.00	0.00	0.00	0.00	0.00	0.00	2.18	1.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58	Plastic Materials Etc	0.00	0.00	1.08	1.04	0.00	0.00	1.32	1.40	0.00	0.00	0.31	0.32	0.00	0.00	0.24	0.41
62	Rubber Manufactures Nes	1.89	2.04	2.13	2.23	0.74	0.82	0.58	0.84	0.00	0.48	0.71	1.24	0.52	0.00	0.00	0.00
63	Wood, Cork Manufactures Nes	1.34	0.00	0.00	0.00	0.63	1.04	0.00	0.00	1.53	1.34	1.89	1.99	0.14	1.21	0.00	0.00
64	Paper, Paperboard and Mfr	0.58	0.57	0.51	0.46	0.89	1.01	0.99	0.99	4.67	4.63	4.75	4.36	0.21	0.15	0.26	0.00
65	Textile Yarn, Fabrics, etc	2.61	2.64	1.58	1.56	0.41	0.77	0.67	0.52	0.16	0.20	0.19	0.15	0.16	0.14	0.25	0.27
66	Nonmetal Mineral MFS NES	1.03	0.77	0.78	0.91	0.68	0.61	0.67	0.67	0.17	0.22	0.27	0.30	0.35	0.31	0.37	0.36
67	Iron and Steel	3.32	4.34	3.73	3.48	0.66	0.55	0.45	0.31	0.57	0.55	0.86	0.73	0.63	1.02	0.96	0.88
68	Non-ferrous Metals	0.37	0.52	0.58	0.57	0.64	0.70	0.96	0.60	2.69	2.84	2.53	2.42	2.05	2.76	2.40	3.64
69	Metal Manufactures Nes	1.99	1.84	1.67	1.55	0.94	1.01	0.98	0.96	0.54	0.66	0.70	0.64	0.65	0.65	0.45	0.48
72	Machs for Spcl Industrys	2.57	2.30	1.87	1.83	1.46	1.51	2.74	2.14	0.68	0.50	1.25	0.91	0.22	0.25	0.44	0.28
74	Genrl Industrl Machy Nes	n.a.	n.a.	1.74	1.95	n.a.	n.a.	1.71	1.53	n.a.	n.a.	0.48	0.50	n.a.	n.a.	0.27	0.23
76	Telecomm, Sound Equipment	n.a.	n.a.	5.71	6.09	n.a.	n.a.	1.01	1.10	n.a.	n.a.	0.70	0.85	n.a.	n.a.	0.00	0.00
77	Electric Machinery NES etc	n.a.	n.a.	2.18	2.26	n.a.	n.a.	1.52	1.74	n.a.	n.a.	0.30	0.28	n.a.	n.a.	0.15	0.13
78	Road Vehicles	n.a.	n.a.	3.70	3.36	n.a.	n.a.	1.10	1.10	n.a.	n.a.	2.31	3.36	n.a.	n.a.	0.15	0.14
79	Other Transport Equipment	n.a.	n.a.	2.43	2.32	n.a.	n.a.	4.04	3.70	n.a.	n.a.	1.39	0.88	n.a.	n.a.	0.94	0.16
821	Furniture, Parts Thereof	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.49	0.00	0.00	0.54	0.88	0.00	0.00	0.00	0.00
831	Travel Goods, Handbags	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	Clothing & Accessories	1.34	0.34	0.20	0.22	0.32	0.23	0.29	0.22	0.28	0.20	0.17	0.13	0.00	0.00	0.00	0.00
851	Footwear	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
87	Precision Instruments Nes	n.a.	n.a.	1.25	1.33	n.a.	n.a.	2.62	2.87	n.a.	n.a.	0.58	0.68	n.a.	n.a.	0.48	0.45
88	Photo Equ, Optic Gds Etc	n.a.	n.a.	3.78	3.59	n.a.	n.a.	1.18	1.22	n.a.	n.a.	0.36	0.42	n.a.	n.a.	0.47	0.59
89	Miscellaneous Manufactured Goods NES	2.51	1.56	1.20	1.29	1.07	1.12	1.37	1.13	0.25	0.28	0.38	0.37	0.24	0.27	0.28	0.28

Source : United Nations, International Trade Statistics Yearbook, various issues.

Table 4.4

Revealed Comparative Advantage by Commodity : South Asian Countries
1970-1983

SITC	Commodity	India				Pakistan				Sri Lanka				Bangladesh			
		1970	1975	1980	1983	1970	1975	1980	1983	1970	1975	1980	1983	1970	1975	1980	1983
0114	Poultry Fresh Child, Prsn	n.a.	0.00	0.00	n.a.	n.a.	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	n.a.	0.00	0.00	0.00
03	Fish & Preparations	2.70	4.64	4.63	n.a.	3.92	3.26	2.77	2.81	0.00	0.86	2.05	2.10	n.a.	2.30	7.54	11.84
04	Cereals & Preparations	0.20	0.14	1.53	n.a.	1.78	5.89	10.45	9.78	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.00
05	Vegetables & Fruit	2.37	2.33	2.45	n.a.	0.18	0.45	1.31	1.21	2.50	3.41	3.55	3.77	n.a.	0.00	0.12	0.32
06	Sugar & Prepn, Honey	1.66	9.86	0.95	n.a.	1.51	0.42	1.13	2.25	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.00
07	Coffee, Tea, Cocoa, Spices	8.50	9.70	10.17	n.a.	0.20	0.50	0.43	0.44	35.70	49.68	33.81	38.65	n.a.	5.04	5.23	7.92
081	Feeding Stuff for Animal	5.64	5.62	4.37	n.a.	0.91	0.69	1.12	0.48	0.19	0.62	0.05	0.39	n.a.	0.00	0.64	0.64
09	Misc Edible Products	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	0.00	0.00	1.32	0.00	0.00	n.a.	0.00	0.00	0.00
12	Tobacco and Manufactures	4.38	7.00	6.92	n.a.	0.62	3.43	0.82	0.79	0.23	0.00	0.84	0.42	n.a.	0.00	0.00	0.00
22	Oil Seeds, Oleaginous Frt	0.00	0.00	0.82	n.a.	0.00	0.00	0.00	0.00	0.00	0.00	1.93	1.49	n.a.	0.00	0.00	0.00
23	Rubber, Crude	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	0.00	0.00	0.00	38.99	34.72	n.a.	0.00	0.00	0.00
24	Cork and Wood	0.25	0.34	0.13	n.a.	0.00	0.00	0.00	0.00	0.21	0.42	0.49	0.38	n.a.	0.00	0.00	0.00
26	Textile Fibres and Waste	1.26	1.15	3.79	n.a.	17.11	16.22	29.10	14.25	1.55	2.11	3.49	1.93	n.a.	24.98	28.94	17.96
27	Crude Fertilizer, Minrls Nes	1.91	1.19	1.91	n.a.	0.63	0.49	0.65	0.71	0.57	6.87	0.86	0.94	n.a.	0.00	0.00	0.00
28	Metalliferous Ores, Scrap	3.61	4.00	3.63	n.a.	0.00	0.00	0.00	0.00	0.00	0.21	0.19	0.29	n.a.	0.00	0.00	0.00
29	Crude Animal, Veg Mat Nes	5.51	6.46	6.66	n.a.	3.44	5.90	4.48	2.71	0.00	0.52	0.54	1.01	n.a.	0.00	0.82	2.21
33	Petroleum and Products	0.08	0.03	0.02	n.a.	0.17	0.07	0.36	0.12	0.00	0.00	0.92	0.69	n.a.	0.01	0.00	0.24
42	Fixed Vegetable Oil, Fat	0.89	1.64	1.73	n.a.	0.00	0.00	0.00	0.00	13.81	9.28	1.49	10.24	n.a.	0.00	0.00	0.00
51	Organic Chemicals	0.20	0.30	0.00	n.a.	0.00	0.16	0.22	0.14	0.00	0.00	0.00	0.00	n.a.	0.22	0.00	0.00
52	Inorganic Chemicals	0.00	0.00	0.35	n.a.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.00
53	Dyes, Tanning, Colour Products	0.89	1.48	2.35	n.a.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.00
541	Medicinal,Pharm Product	0.64	0.87	2.08	n.a.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.00
562	Fertilizers, Manufacture	n.a	0.00	0.00	n.a.	n.a	n.a	0.00	0.00	n.a	n.a	0.00	0.00	n.a.	n.a.	0.00	0.00
58	Plastic Materials Etc	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.00
62	Rubber Manufactures Nes	0.75	0.48	0.00	n.a.	0.00	0.00	0.00	0.00	0.00	0.00	0.32	0.34	n.a.	0.00	0.00	0.00
63	Wood, Cork Manufactures Nes	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.00
64	Paper, Paperboard and Mfr	0.22	0.00	0.00	n.a.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.70	0.73	0.13
65	Textile Yarn, Fabrics, etc	6.58	6.92	6.11	n.a.	12.81	18.14	13.44	18.23	0.00	0.00	1.38	1.90	n.a.	29.98	22.47	19.19
66	Nonmetal Mineral MFR NES	1.61	2.25	4.60	n.a.	0.24	1.26	0.13	0.17	0.00	0.27	0.00	0.00	n.a.	0.00	0.00	0.00
67	Iron and Steel	1.47	0.63	0.36	n.a.	0.00	0.00	0.01	0.43	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.00
68	Non-ferrous Metals	0.22	2.45	0.10	n.a.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.00
69	Metal Manufactures Nes	0.88	1.21	1.56	n.a.	0.00	0.36	0.28	0.29	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.00
72	Machs for Spcl Industrys	0.23	0.37	0.41	n.a.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.20	0.42
74	Genrl Industrl Machy Nes	n.a	0.17	0.31	n.a.	n.a	n.a	0.00	0.00	n.a	n.a	0.02	0.00	n.a.	n.a.	0.17	0.07
76	Telecomm, Sound Equipment	n.a	0.00	0.00	n.a.	n.a	n.a	0.00	0.00	n.a	n.a	0.00	0.00	n.a.	n.a.	0.00	0.00
77	Electric Machinery NES etc	n.a	0.00	0.00	n.a.	n.a	n.a	0.00	0.00	n.a	n.a	0.00	0.00	n.a.	n.a.	0.00	0.00
78	Road Vehicles	n.a	0.00	0.00	n.a.	n.a	n.a	0.00	0.00	n.a	n.a	0.00	0.00	n.a.	n.a.	0.00	0.00
79	Other Transport Equipment	n.a	0.01	0.29	n.a.	n.a	n.a	0.00	0.00	n.a	n.a	0.00	0.20	n.a.	n.a.	0.01	0.35
821	Furniture, Parts Thereof	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.00
831	Travel Goods, Handbags	0.00	0.00	0.00	n.a.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.00
84	Clothing & Accessories	1.09	2.58	4.09	n.a.	0.44	1.78	2.06	3.66	0.24	0.35	5.43	9.38	n.a.	0.00	0.12	1.30
851	Footwear	1.52	1.16	1.08	n.a.	1.56	2.04	0.75	0.82	0.00	0.00	0.00	0.00	n.a.	0.00	0.00	0.00
87	Precision Instruments Nes	n.a	0.00	0.00	n.a.	n.a	n.a	0.00	0.00	n.a	n.a	0.00	0.00	n.a.	n.a.	0.00	0.00
88	Photo Equ, Optial Gds Etc	n.a	0.00	0.44	n.a.	n.a	n.a	0.00	0.00	n.a	n.a	0.00	0.00	n.a.	n.a.	0.00	0.00
89	Miscellaneous Manufactured Goods NES	0.70	0.81	1.32	n.a.	0.80	1.52	0.87	1.16	0.00	0.00	0.00	0.00	n.a.	0.10	0.07	0.11

Source United Nations, International Trade Statistics Yearbook, various issues.

Table 2.1

Ranking of Revealed Comparative Advantage Indices Breeding Unity by Commodity : Asean Countries

1970-1983

SITC	Commodity	Thailand				Indonesia				Malaysia				Philippines			
		1970	1975	1980	1983	1970	1975	1980	1983	1970	1975	1980	1983	1970	1975	1980	1983
0114	Poultry Fresh Child, Prsn			5	6												
03	Fish & Preparations	6	4	4	5		5	6	8	5	5	8			10	7	8
04	Cereals & Preparations	1	2	2	2												
05	Vegetables & Fruit	2	3	3	4									8	6	5	7
06	Sugar & Preps, Honey	10	1	1	3									1	1	2	3
07	Coffee, Tea, Cocoa, Spices					3	4	4	4	9	7	10					13
081	Feeding Stuff for Animal	9	15	10	13		6				8			7		8	2
09	Misc Edible Products				14						6	7					
12	Tobacco and Manufactures	6	5	8	8		8			6	7			6		13	11
22	Oil Seeds, Oleaginous Frt											2				12	
23	Rubber, Crude			1	1			1	1			3					
24	Cork and Wood		12			2	1		6	2	2			3	3	6	6
26	Textile Fibres and Waste	3	8	18										9			
27	Crude Fertilizer, Minrls Nes	7	14	19	20												
28	Metalliferous Ores, Scrap			17		5	7	7	10	7		11		5	4	3	5
29	Crude Animal, Veg Mat Nes	8	9	9	7	6		8	7								14
33	Petroleum and Products					4	2	5	3	8		9					
42	Fixed Vegetable Oil, Fat					1	3	2	5	1	1	1		2	2		1
51	Organic Chemicals																
52	Inorganic Chemicals																
53	Dyes, Tanning, Colour Products																
541	Medicinal,Pharm Product																
562	Fertilisers, Manufacture																
58	Plastic Materials Etc																
62	Rubber Manufactures Nes									10							
63	Wood, Cork Manufactures Nes		7	11	12				2	4	4	4		4	5	4	4
64	Paper, Paperboard and Mfr																
65	Textile Yarn, Fabrics, etc		10	13	15												
66	Nonmetal Mineral MFR NES		11	14	10												
67	Iron and Steel																
68	Non-ferrous Metals	4	6	6	11				9	3	3	6			9	15	17
69	Metal Manufactures Nes																
72	Machs for Spcl Industrys																
74	Genrl Industrl Machy Nes																
76	Telecoms, Sound Equipment																
77	Electric Machinery NES etc			15	18							6					16
78	Road Vehicles																
79	Other Transport Equipment																
821	Furniture, Parts Thereof				19										11	18	19
831	Travel Goods, Handbags			16	16												
84	Clothing & Accessories		13	12	9											9	9
851	Footwear				17											11	12
87	Precision Instruments Nes																
88	Photo Equ, Optic Gds Etc																
89	Miscellaneous Manufactured Goods NES														12	14	15

Source : United Nations, International Trade Statistics Yearbook, various issues.

Table 2.2

Ranking of Revealed Comparative Advantage Indices Exceeding Unity by Commodity : Asian Newly Industrialized Countries

1970-1983

SITC	Commodity	Korea				Hong Kong				Singapore				Taiwan			
		1970	1975	1980	1983	1970	1975	1980	1983	1970	1975	1980	1983	1970	1975	1980	1983
0114	Poultry Fresh Child, Prsn																
03	Fish & Preparations	3	3	4	6		11	14	15			3		5	8	7	10
04	Cereals & Preparations																
05	Vegetables & Fruit	13								10				4	6	12	
06	Sugar & Preps, Honey		11	12	18									3	5	9	
07	Coffee, Tea, Cocoa, Spices									3	6	11	8				
081	Feeding Stuff for Animal									5	8						
09	Misc Edible Products		9				9	13	9		3	8					
12	Tobacco and Manufactures	7	8	15	15				12	7							
22	Oil Seeds, Oleaginous Frt																
23	Rubber, Crude											1	1				
24	Cork and Wood									8	12	13					
26	Textile Fibres and Waste	8															
27	Crude Fertiliser, Minrls Nes	12															
28	Metalliferous Ores, Scrap	11															
29	Crude Animal, Veg Mat Nes	6	13	17	17	8	5	6	7	6	9	9	9				
33	Petroleum and Products									2	5	10	7				
42	Fixed Vegetable Oil, Fat									1	2	2	2				
51	Organic Chemicals													7		10	8
52	Inorganic Chemicals																
53	Dyes, Tanning, Colour Products					11	6	11	10								
541	Medicinal,Pharm Product					17	12		16		7	14	13				
562	Fertilisers, Manufacture			8	9							16	10			11	9
58	Plastic Materials Etc														3	4	4
62	Rubber Manufactures Nes		10	7	11									6	7	5	6
63	Wood, Cork Manufactures Nes	1	4	5	13					4	1	5	5	1	1	1	1
64	Paper, Paperboard and Mfr																
65	Textile Yarn, Fabrics, etc	10	6	6	5	5	4	7	5		11			2	2	2	2
66	Nonmetal Mineral MFR NES		15	10	16	6	7	9	14								
67	Iron and Steel		16	9	10												11
68	Non-ferrous Metals																
69	Metal Manufactures Nes		14	10	8	12	14	13	13					8	8	6	6
72	Machs for Spcl Industrys	14	12			9	8				4					8	7
74	Genrl Industrl Machy Nes			11									11				
76	Telecomn, Sound Equipment			19	7			5	6			6	3				
77	Electric Machinery NES etc			14	12			8	8			6	4			3	3
78	Road Vehicles																
79	Other Transport Equipment				2							7	6				
821	Furniture, Parts Thereof					10	13										
831	Travel Goods, Handbags	9	1	1	1	2	2	2	2								
84	Clothing & Accessories	2	2	3	4	1	1	1	1	9	10	12	12				
851	Footwear	5	5	2	3	4	10	10	11								
87	Precision Instruments Nes																
88	Photo Eqp, Optic Gds Etc			16	19			3	3			15					
89	Miscellaneous Manufactured Goods NES	4	7	13	14	3	3	4	4								

Sources : 1. United Nations, International Trade Statistics Yearbook, various issues.
2. Council of Economic Planning and Development, Taiwan Statistical Data, 1986.

Table 3.3

Ranking of Revealed Comparative Advantage Indices Exceeding Unity by Commodity : Developed Countries

1970-1983

SITC	Commodity	Japan				United States				Canada				Australia			
		1970	1975	1980	1983	1970	1975	1980	1983	1970	1975	1980	1983	1970	1975	1980	1983
011	Poultry Fresh Child, Frzn																
03	Fish & Preparations	5	8							7	7	7	8	6	6	6	6
04	Cereals & Preparations					3	1	2	2	5	3	2	3	3	3	3	4
05	Vegetables & Fruit													1			
06	Sugar & Preps, Honey													4	4	4	3
07	Coffee, Tea, Cocoa, Spices																
081	Feeding Stuff for Animal					5	3	7	6								
09	Misc Edible Products					4											
12	Tobacco and Manufactures					2	2	4	4								
22	Oil Seeds, Oleaginous Frt							1	1			11	10				
23	Rubber, Crude											14	13				
24	Cork and Wood						10	21	18	3	4	3	1				8
26	Textile Fibres and Waste						6	5	11					1	1	1	2
27	Crude Fertilizer, Minrls Nes					11	7	20	17	6	6	5	5				7
28	Metalliferous Ores, Scrap							18		2	2	4	6	2	2	2	1
29	Crude Animal, Veg Mat Nes																
33	Petroleum and Products																
42	Fixed Vegetable Oil, Fat					8	11	9	7								
51	Organic Chemicals	11	7	14		6	5	14	14					8	9		
52	Inorganic Chemicals					1		12	9			10	11				
53	Dyes, Tanning, Colour Products																
541	Medicinal,Pharm Product					9	9	16	13								
562	Fertilisers, Manufacture							10	12								
58	Plastic Materials Etc			16	14			17	16								
62	Rubber Manufactures Nes	7	4	7	7								12				
63	Wood, Cork Manufactures Nes	9								8	8	9	9		7		
64	Paper, Paperboard and Mfr									1	1	1	2				
65	Textile Yarn, Fabrics, etc	3	2	11	10												
66	Nonmetal Mineral MFR NES	12															
67	Iron and Steel	1	1	3	3										8		
68	Non-ferrous Metals									4	5	6	7	5	5	5	5
69	Metal Manufactures Nes	6	5	10	11												
72	Machs for Spcl Industrys	3	3	8	9	7	4	6	8			13					
74	Genrl Industrl Machy Nes			9	8			11	15								
76	Telecoms, Sound Equipment			1	1			23	21								
77	Electric Machinery NES etc			6	6			13	10								
78	Road Vehicles			4	4			22	22			8	4				
79	Other Transport Equipment			5	5			3	3			12					
821	Furniture, Parts Thereof																
831	Travel Goods, Handbags																
84	Clothing & Accessories	18															
851	Footwear	8															
87	Precision Instruments Nes			12	13			8	5								
88	Photo Equ, Optics Gds Etc			2	2			19	19								
89	Miscellaneous Manufactured Goods NES	4	8	13	13	10	8	15	20								

Source : United Nations, International Trade Statistics Yearbook, various issues.

Table 2.1

Ranking of Revealed Comparative Advantage Indices Exceeding Unity by Commodity : South Asian Countries.

1970-1983

SITC	Commodity	India				Pakistan				Sri Lanka				Bangladesh			
		1970	1975	1980	1983*	1970	1975	1980	1983	1970	1975	1980	1983	1970*	1975	1980	1983
0114	Poultry Fresh Chold, Frsn																
03	Fish & Preparations	7	7	6		3	6	5	6			6	6		4	3	3
04	Cereals & Preparations	8		16		5	3	3	3								
05	Vegetables & Fruit		11	11				7	8	3	4	4	5				
06	Sugar & Preps, Honey	10	1			7		8	7								
07	Coffee, Tea, Cocoa, Spices	1	2	1						1	1	2	1		3	4	4
081	Feeding Stuff for Animal	3	6	7				9									
09	Misc Edible Products										6						
12	Tobacco and Manufactures	5	3	2			5										
22	Oil Seeds, Oleaginous Frt											7	9				
23	Rubber, Crude											1	2				
24	Cork and Wood																
26	Textile Fibres and Waste	14	18	9		1	2	1	2	4	5	5	7		2	1	2
27	Crude Fertilizer, Minrls Nes	9	16	14							3						
28	Metalliferous Ores, Scrap	6	8	10									10				
29	Crude Animal, Veg Mat Nes	4	5	3		4	4	4	6							5	5
33	Petroleum and Products																
42	Fixed Vegetable Oil, Fat		13	15						2	2	8	3				
51	Organic Chemicals																
52	Inorganic Chemicals																
53	Dyes, Tanning, Colour Products		14	12													
541	Medicinal,Pharm Product			13													
562	Fertilizers, Manufacture																
58	Plastic Materials Etc																
62	Rubber Manufactures Nes																
63	Wood, Cork Manufactures Nes																
64	Paper, Paperboard and Mfr																
65	Textile Yarn, Fabrics, etc	2	4	4		3	1	2	1			9	8		1	2	1
66	Nonmetal Mineral MFS NES	11	12	6			10										
67	Iron and Steel	13															
68	Non-ferrous Metals		10														
69	Metal Manufactures Nes		15	17													
72	Machs for Spcl Industrys																
74	Genrl Industrl Machy Nes																
76	Telecomn, Sound Equipment																
77	Electric Machinery NES etc																
78	Road Vehicles																
79	Other Transport Equipment																
821	Furniture, Parts Thereof																
831	Travel Goods, Handbags																
84	Clothing & Accessories	15	9	8			8	6	4			3	4				6
851	Footwear	12	17	19		6	7										
87	Precision Instrumnts Nes																
88	Photo Equ, Optic Gds Etc																
89	Miscellaneous Manufactured Goods NES			18			9		9								

Source : United Nations, International Trade Statistics Yearbook, various issues.

Note: * : not available data

Table 3

Standard Deviations of Revealed Comparative Advantage Indices

1970-1983

	1970	1975	1980	1983
Asean Countries				
Thailand	2.36	2.58	4.35	4.87
Indonesia	1.85	1.72	2.48	2.34
Malaysia	2.45	4.93	10.40	n.a
Philippines	5.18	4.41	8.08	9.34
Asian Newly Industrialised Countries				
South Korea	4.13	3.65	2.61	2.91
Hong Kong	3.25	3.66	3.02	2.75
Singapore	1.23	1.07	3.48	2.20
Taiwan	2.96	3.11	2.62	2.50
Developed Countries				
Japan	1.03	0.98	1.31	1.34
United States	1.26	0.84	1.38	1.37
Canada	1.14	1.17	1.22	1.30
Australia	1.96	2.27	2.91	2.92
South Asian Countries				
India	1.98	2.62	2.40	n.a
Pakistan	3.19	3.71	4.88	3.62
Sri Lanka	5.69	7.46	7.53	7.70
Bangladesh	n.a	5.71	5.45	4.25

Source : United Nations, International Trade Statistics Yearbook, various issues.

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CHAPTER 4

TOTAL FACTOR PRODUCTIVITY GROWTH OF MANUFACTURING INDUSTRIES IN THAILAND

Paitoon Wiboonchutikula

4.1 INTRODUCTION

According to Nishimizu and Page (year 1986) who studies changes in the international competitiveness of Thai manufacturing industries, the sources for the changes can be decomposed into three elements: (1) changes in international prices; (2) changes in production techniques; and (3) changes in total factor productivity. The results indicate that the major sources of the changes are changes in price competitiveness and total factor productivity. This paper will discuss the rates of total factor productivity growth (TFPG) for three digit ISIC manufacturing industries from 1963 to 1979. Rate estimates are also analyzed in relation to changing trade and industrialization policies and the movement energy prices during the period. In addition, the paper compares the TFPG rates of import-substitution and exporting industries.

Section 2 presents the methods chosen and data sources for measuring of TFPG. A detailed discussion of the measurement of real output, real inputs, and factor shares is given in the Appendix. Section 3 presents the results of the estimation of TFPG of the three digit ISIC industries. It also discusses the estimates in relation to the changing trade and industrialization policies during the decades

under study. Section 4 analyzes productivity movements during the periods of severe energy prices increases. Section 5 compares the TFPG of the import-substituting and exporting industries. It also provides some implications on the validity of infant industry protection in Thailand. The final section concludes with the findings and implications.

4.2 MEASUREMENT OF TFPG AND DATA SOURCES

TFPG can be measured by the production function approach, or its duality, the cost function approach. The measurement of TFPG that uses the cost function approach requires yearly prices data for inputs and output; there were not available for our study. Production function approach, TFPG can be measured based on a general form of production function or on an explicit form such as the leontief, the Cobb-Douglas, or the traslog types. In our study the underlying production function for measuring TFPG is that of a general form. That is it can be any production function that has linear, homogeneous, twice differentiable, properties and where it is possible for all inputs to be substitutable in the production of an output.

Let the i-th industry's production at time t be in the form:

(1)

$$Q_i(t) = f_i\{L_i(t), K_i(t), M_i(t), t\}$$

where

$Q_i(t)$ = real output of the i-th industry at time t

$L_i(t)$ = labor employed by the i-th industry at time t

$K_i(t)$ = physical capital used by the i-th industry at time t

$M_i(t)$ = real intermediate inputs used by the i-th industry at time t

t = a "shift" variable subject to time

By totally differentiating equation (1) with respect to time, we obtain

(2)
$$\frac{\hat{Q}_i(t)}{Q_i(t)} = f_i, l_i(t), \frac{L_i(t)}{Q_i(t)}, \frac{\hat{L}_i(t)}{L_i(t)} + f_i, k_i(t), \frac{K_i(t)}{Q_i(t)}, \frac{\hat{K}_i(t)}{K_i(t)}$$

$$+ f_i, m_i(t), \frac{M_i(t)}{Q_i(t)}, \frac{\hat{M}_i(t)}{M_i(t)} + \frac{f_i, t(t)}{Q_i(t)}$$

where "$\wedge$" denotes the rate of change of the variables over time.

Equation (2) shows that the rate of growth of real output can be decomposed into the weighted average of the rates of growth of labor input, capital input, and real intermediate inputs, where the weights are the output elasticities of corresponding factors of production, and the rate of growth of the shift variable.

Under profit maximization and the implied marginal product condition, equation (2) can be written as

$$(3)\quad \frac{\hat{Q}_i(t)}{Q_i(t)} = \frac{W_i(t)L_i(t)}{P_i(t)Q_i(t)} \cdot \frac{\hat{L}_i(t)}{L_i(t)} + \frac{r_i(t)K_i(t)}{P_i(t)Q_i(t)} \cdot \frac{\hat{K}_i(t)}{K_i(t)} + \frac{P_i^m(t)\,M_i(t)}{P_i(t)\,Q_i(t)} \cdot \frac{\hat{M}_i(t)}{M_i(t)} + \frac{f_{i,t}(t)}{Q_i(t)}$$

where

$w_i(t)$ = nominal wage rate of the i-th industry at time t

$r_i(t)$ = nominal rental rate of capital of the i-th industry at time

$p_i^m(t)$ = prices of intermediates inputs the i-th industry at time t

$p_i(t)$ = prices of products of the i-th industry at time t

By assuming linear homogeneity and letting α and β represent labor and intermediate input shares of the value of the i-th industry's total production, respectively, the Euler's theorem implies that the capital share is equal to $(1 - \alpha - \beta)$. Now

$$(4)\quad \frac{\hat{Q}_i(t)}{Q_i(t)} = \alpha(t)\frac{\hat{L}_i(t)}{L_i(t)} + \left\{1 - \alpha(t) - \beta(t)\right\}\frac{\hat{K}_i(t)}{K_i(t)} + \beta(t)\frac{\hat{M}_i(t)}{M_i(t)} + \frac{f_{i,t}(t)}{Q_i(t)} \cdot$$

Notice that, without having to estimate the production function or the output elasticities directly, the TFPG of the i-th industry can be measured from the following differential equation as if it were an "accounting identity."

$$(5) \qquad \frac{f_{i,t}(t)}{Q_i(t)} = \frac{\hat{Q}_i(t)}{Q_i(t)} - \left[\alpha(t) \frac{\hat{L}_i(t)}{L_i(t)} + \beta(t) \frac{\hat{M}_i(t)}{M_i(t)} + \left\{ 1 - \alpha(t) - \beta(t) \right\} \frac{K_i(t)}{K_i(t)} \right]$$

Equation (5) is essentially the Divisia index of TFP in a continuous form. Our measurement of TFPG of each industry will be done in a discrete form which is the discrete approximation to the measurement in equation (5) [1/], namely,

$$(6) \qquad \frac{f_{i,t}(t)}{Q_i(t)} = \left\{ \ln Qi(t) - \ln Qi(t-1) \right\} - \left[\left\{ \frac{\alpha(t) + \alpha(t-1)}{2} \right\} \cdot \left\{ \ln Li(t) - \ln Li(t-1) \right\} + \left\{ \frac{\beta(t) + \beta(t-1)}{2} \right\} \cdot \left\{ \ln M_i(t) - \ln M_i(t-1) \right\} + \left\{ 1 - \frac{\alpha(t) + \beta(t) + \alpha(t-1) + \beta(t-1)}{2} \right\} \cdot \left\{ \ln Ki(t) - \ln K_i(t-1) \right\} \right] .$$

1/ See Hulten (1973) and star and Hall (1976) for a discussion on the discrete approximation of the continuous Divisia index.

For the TFPG of total industries, denoted by $f_t(t)/Q(t)$, the Divisia index approximation is defined as follows:

(7)
$$\frac{f_t(t)}{Q(t)} = \sum_{i=1}^{n} \frac{P_i(t)Q_i(t)}{\sum_{i=1}^{n} P_i(t)Q_i(t)} \left\{ \ln Q_i(t) - \ln Q_i(t-1) \right\}$$

$$- \left[\frac{\sum_{i=1}^{n} W_i(t)\, L_i(t)}{\sum_{i=1}^{n} P_i(t)\, Q_i(t)} \sum_{i=1}^{n} \frac{W_i(t)\, L_i(t)}{\sum_{i=1}^{n} W_i(t)\, L_{i(t)}} \right.$$

$$\left. \cdot \left\{ \ln L_i(t) - \ln L_i(t-1) \right\} \right.$$

$$+ \frac{\sum_{i=1}^{n} P_i^m(t)\, M_i(t)}{\sum_{i=1}^{n} P_i\,(t)\, Q_i(t)} \sum_{i=1}^{n} \frac{P_i^m(t)\, M_{i(t)}}{\sum_{i=1}^{n} P_i^m(t)\, M_i(t)}$$

$$\cdot \left\{ \ln M_i(t) - \ln M_i(t-1) \right\}$$

$$+ \left\{ 1 - \frac{\sum_{i=1}^{n} W_i(t)\, L_i(t) + \sum_{i=1}^{n} P_i^m(t)\, M_i(t)}{\sum_{i=1}^{n} P_i(t)\, Q_i(t)} \right\}$$

$$\cdot \sum_{i=1}^{n} \frac{P_i(t)\, Q_i(t) - W_i(t)\, L_i(t) - P_i^m(t)\, M_i(t)}{\sum_{i=1}^{n} \left\{ P_i(t)\, Q_i(t) - W_i(t)\, L_i(t) - P_i^m(t)\, M_i(t) \right\}}$$

$$\left. \cdot \left\{ \ln K_i(t) - \ln K_i(t-1) \right\} \right] .$$

Estimation of the TFPG of each industry from equation (6) requires measures of real inputs, real output, and the shares of all factors of production for successive years. The methods of measuring these real variables are presented in the Appendix. The major source of data is the industrial census conducted by the National Statistical Office of Thailand (NSOT)[2/]. NSOT provides data on production, intermediate inputs, number of workers, the stock of fixed assets, depreciation, and the wage bill. However, there is good reason to believe that these data dramatically understate the growth of output for many industries. As a result, the NSOT data were supplemented with data from the Ministry of Industry (MOI), the Ministry of Commerce (MOC), the Bank of Thailand (BOT), and the National Economic and Social Development Board (NESDB).[3/]

The NSOT census data are available for the years 1963, 1968, 1970, 1975, 1976, 1977 and 1979. The data for all variables, except for fixed assets and depreciations, are available at both three- and five-digit ISIC aggregation levels. The lack of data on fixed assets and

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2/ The data are from the publications of the National Statistical Office of Thailand (NSOT), Report on Industrial Census: Whole Kingdom, Bangkok, 1964, 1969, 1971, 1976, 1977, and 1980.

3/ The data are from the Ministry of Industry, Industrial Statistics, Bangkok, 1978 and 1980; Ministry of Commerce, Report on Industrial Research, various reports; National Economic and Social Development Board, Industrial Development Planning of Thailand, 1977-1981, Bangkok, various publications. Also see discussion on computations of real inputs, real output, and factor shares in the Appendix.

depreciation at the five-digit ISIC level made it impossible to estimate the TFPG of industries at the more disaggregated five-digit ISIC level. The NSOT data are, in actuality, a sample that is drawn from all firms with 10 or more workers. The response rate of the NSOT census sample is about 75%, although it varies from year to year and industry to industry.

The Ministry of Industry has data on output from which the growth rates of total output for three-digit ISIC industries can be computed. However, there are discrepancies between the growth rates of real output of the three-digit ISIC industries reported by the NSOT and rates implied by the aggregation of the Ministry of Industry commodity data on commodity output. Our estimates of TFPG are based on the Ministry of Industry data because they cover more firms. However, the Ministry of Industry data cover only total output and contain no information about factor inputs, so we need to compute data on factor inputs. For each year with NSOT census data, we estimate data on factor inputs for three-digit ISIC industries by adjusting NSOT data on all factor inputs by the ratio of our estimate of total output based on our aggregation of data from the Ministry of Industry to the output reported by the NSOT.

4.3 ESTIMATION OF TFPG OF THAI INDUSTRIES

Table 1 provides the characteristics of three-digit ISIC industries in Thailand during the period 1963-1979. The last three columns show the shares of factor inputs (namely, intermediate input and capital input) in total production of each industry in 1970. It can be seen that the shares varied across industries. Natural resource-based and intermediate product processing industries such as processed food, wood and wood products, paper products, iron and steel, and transport equipment industries had high shares of intermediate input in total production. Meanwhile, it did not appear that labor intensive industries always had higher labor shares than those of capital intensive industries.

Table 1 also shows the 1970 share in total industrial production and the average annual growth rates of each industry during the two subperiods of 1963-1970 and 1970-1979. In the past two decades the principal industries were processed food, beverages, textiles and textile products, rubber and rubber products, and metal products. On the average, for all industries, the annual growth rate was higher in the 1960s than in the 1970s. It was 18.79% a year during 1963-1970 and 11.48% during 1970-1979.

During the 1960s, policy supported the promotion of import-substituting industries. In the 1970s, policy shifted to emphasize the promotion of industries producing products to be

exported.[4/] In fact, it can be seen from the table that the growth rates of industries were influenced by the changing industrial policies of the two subperiods. In the 1960s, the larger sectors -- in term of shares in total output and above average growth rates -- were mostly import-substituting industries and industries with high import content such as paper and paper products, chemical and chemical products, and machinery and equipment. The incentives given to these industries included tax exemptions for domestic production, high tariffs on imports competing with domestic production, and other promotional privileges. Firms, under this promotion policy would obtain additional incentives, such as credit assistance, and tax and import duty exemption for imported raw exemptions for imported raw materials and capital goods. It is noted that, with these preferential taxes and tariffs supporting the import of capital goods, the growth of import-substituting industries (which are normally capital intensive in nature) entailed policy for reducing certain imports. What happened was that the total imports grew faster than exports which were discriminated against in the 1960s.

Since the early 1970s the industrial development strategy has shifted to promote export-producing industries. These industries were either labor intensive or natural resource-based; they could therefore use more domestic resources and import relatively smaller amounts of

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4/ Import competing industries are defined as industries which import more than 10% of total domestic utilization. Those which export more than 10% of their production are categorized as exportables. The rest are called non-competing industries.

raw materials and capital goods. The exporting industries to which incentives for rapid growth were provided included processed food (such as sugar, tapioca products, canned fruits and food), textiles and textile products, clothing, shoes, and some miscellaneous products. The high growth and the rapid increase in shares in total output for these industries are clearly shown in Table 1. Some of their incentives were: rebates on import duties and taxes on imported inputs used in their production for export; loans at subsidized rates provided by the Bank of Thailand; and additional promotional privileges given to firms producing exports being promoted. However, it is notable that industries that produced such outputs as chemicals and chemical products, electrical machinery, and transport equipment also had higher than average growth rates. These were the industries which, in the last decade, had high protective rates.

Table 2 shows the rates of growth of total factor productivity and real inputs and their contribution to output growth by industry from 1963 to 1979. During the period of 1963 to 1979 real output of all industries grew at the rate of 14.06% per year (shown in Table 3). When separated into two main sources of growth, namely, the accumulation of real inputs and their TFPG, the table shows that the latter source was still minor despite the high real output growth. In fact, TFPG contributed only 1.07 percentage rate. In other words, a substantial part of real output growth (92.38%) was due to the increases in total real inputs, whereas less than 8% was due to the TFPG (which measures increases in the savings of inputs used in the production of a unit of output). Furthermore, the contribution of TFP

was also less than that of total primary inputs (namely, labor and capital combined) to the growth of real output.[5/]

This estimate of the TFPG is rather low compared to the estimates of many DCs such as the U.S. and Japan. In the U.S. the estimated rates of TFPG of the aggregated manufacturing sector are about 1.82% (Kendrick 1980) in the past two decades. In Japan it was on the average of 2.04% (Hulten and Nishimizu 1978) for all the disaggregated industries. They all accounted for about 17% of real output growth. The TFPG comparison with other LDCs is more difficult because, so far, not many studies have been done. It is due partly to the paucity of data. Although there are some TFPG economy-wide estimates, those for the manufacturing sector are very scarce. Moreover, those that are available are usually estimated by different methodologies, varying periods of time, and different scopes of the manufacturing sector. Above all, they are mostly at the highly aggregated level of industrial classification. For example, Chen (1977) estimated the TFPG rates of the aggregated manufacturing sector of the four fastest growing countries in Asia, namely, Hong Kong, South Korea, Taiwan and Singapore, to be 2.29, 3.47, 3.59 and 3.75% respectively, during the 1960s. They all, however, accounted for only 12 to 18% of the rate of growth of real output of the sector, which is also low compared to the DCs' standard. At a more disaggregated level, Krueger and Tuncer's estimate of the average TFPG in Turkish manufacturing industries was

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5/ Nishimizu and Robinson (1984) also reported this fact for, Turkey and Yugoslavia during the same period.

about 2.10% during 1963-1976 accounting for about 17% of real output growth.[6/] Tsao's estimate of TFPG in the Singapore industries during 1970-1979 was about 0.69% and accounted for about 4% of real output growth.[7/]

Table 2 also shows that at the disaggregated three digit ISIC level industries with rates of TFP greater than 2% and a high contribution of TFPG to rates of output growth were the result of a mixture of exporting, import competing, and nonimport competing industries. The exporting industries were textiles and textile products, other nonmetallic mineral products and nonferrous metal products. The import-competing industries were paper and paper products and electrical machinery products. The nonimport- competing industries were beverages, tobacco, and printing and publishing. However, it will be shown later, in Section 5, that, on the average, among the three trade categories of industries exporting and nonimport-competing industries had similar rates of TFPG -- and they were higher than rates of import-competing industries.

The breakdown of rates of growth of real output, real input, and TFP into the 1963-1979 and 1970-1979 subperiods is shown in Table 3. Although (compared to that of DCs and a few available estimates of LDCs) the TFPG rate for Thailand was low for the entire 1963-1979 period, it had increased over the two decades. During the period 1963-

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6/ See Krueger and Tuncer (1980)

7/ See Tsao (1983).

1970, it was about 0.39% or accounting for two to 3% of the 18.79% real output growth rate. During the 1970-1979 period, it increased to 1.76% or about 15% of the 11.48 percentage rate of real output growth. In other words, the increase in real inputs as a source of real growth had declined over time, and was compensated by the acceleration in TFPG rates. This finding is, in fact, similar to the Hayami-Ruttan Study on the agricultural development during the period of 1950-1969.[8/] They found that, during the early period, despite a low TFPG, real farm output could grow rapidly by exploiting the elastic supply of uncultivated land applying more labor and other inputs in response to the increase in market demand. However, in the mid-1960s, when uncultivated land became more limited as a result or more land being opened for cultivation, the TFPG rate, as a source of the growth of real farm output, increased to compensate for the decline in the rate of growth of real input relative to output. Results of our study of the TFPG of manufacturing industries in Thailand indicate that one reason that real output was able to grow more quickly during the initial period of industrialization (1963 to 1970) than during the latter period (despite the low TFPG) could be because abundant raw material resources were combined with labor and capital inputs for production. However, in the latter period, as raw material inputs became more expensive relative to other inputs, the TFPG rate had to accelerate to offset the decline the in real material growth rate, to enable real output to expand at a high rate.

8/ See Hayami and Ruttan (1979), pp. 3-26.

4.4 THE TFPG AND INCREASES IN RAW MATERIAL PRICES

Michael Bruno (1984) shows that if output is produced by the combination of three factors of production -- labor, capital and intermediate input -- and intermediate input is employed optimally to the level at which its marginal product is equal to its relative price, then the production function can be expressed in terms of the two remaining labor and capital factors and the relative intermediate input prices. In this model, in the short run, when capital is fixed, if labor employment is also somehow constant, then an increase in the relative intermediate input prices will affect real factor incomes like the Hicks-neutral technical regress. That is, there will be an inward homothetical shift in the factor-price frontier in the factor-cost space or, equivalently, an outward homothetical shift in the isoquant in the primary input space.

In the case of Thailand, the TFPG of almost all industries was retarded by the increases in energy prices and other raw material prices in both the early and the late 1970s. During the period 1972-1974, although the prices of petroleum products for industrial use were controlled, the prices increased more than twofold, or about 71% a year (see Table 4). The average prices of other major intermediate products of the industrial sector (such as textile materials, pulp paper, chemical materials, and basic metals -- especially the imported ones) increased at the rate of over a quarter percent per year.[9/] These

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9/ See the price data and discussion in the Ministry of Commerce, The Wholesale Price Index of Thailand, 1978, and the Bank of Thailand, Annual Report, Bangkok 1973.

price increases slowed down the TFPG of some industries sooner, but some with a lag. However, energy price increases alone were unlikely to have had that much impact on the slowdown of the TFPG because the cost of energy in the value of production of all industries was only a few percent before 1973 and jumped to the maximum of no more than 5 to 6% later.[10/] What affected them more were the following: First, the accompanying price increases of other raw materials whose share of total production was over one-half; this was especially true among the heavier import-substituting industries (see Table 4); and, second, the decreases in demand for all products in the early and late 1970s. Both shocks made it difficult for industries to expand as evidenced by the decreases in industrial output growth to an average annual rate of 8.51% during 1972-1974 and 8.63% during 1977-1979. Meanwhile, capital and labor inputs were not able to adjust fast enough in the short run. During the latter part of the first half of the 1970s, some capital stock which was accumulated at a fast rate in the late 1960s and early 1970s was left under-utilized.[11/] On the other hand, due to the rise of labor union pressures during this period, some industries (such as textiles and clothing) had difficulties in lowering employment in response to the decline in production. All of these factors made real output decline faster than real input, and the result was a substantial

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10/ The figures are computed from National Statistical office of Thailand, Report of Industrial Census: Whole Kingdom, Bangkok, various years.

11/ See Bank of Thailand, Annual Report, Bangkok, 1973 to 1975 issues.

decline in the TFPG in many industries. However, during 1974-1977, when aggregate demand increased and all inputs were better adjusted to the shocks, the TFPG rose again. During the period, output grew at 14.26% a year, labor input declined at 2.02%, capital input increased slowly at 0.52%, and TFPG accelerated to 5.07% a year.

In the late 1970s when there was another steep increase in energy prices combined with another demand period of slower growth TFPG declined again for the same reason as it had during the period of the early 1970s. From 1977 to 1979, energy prices increased at over 20% a year. Output decelerated to less than 9% a year, but total real inputs grew at a higher rate, 9.25%. As a result, the TFPG rate declined to negative 0.62%.

4.5 COMPARISON OF TFPG OF IMPORT-SUBSTITUTING AND EXPORTING INDUSTRIES

Import-substitution policies to encourage domestic industrial production were introduced in Thailand in the late 1950s and were in effect throughout the 1960s. The government protected new industries from foreign competition by imposing higher tariffs on imports competing with them and, at the same time, imposed lower tariffs on raw materials and capital inputs used in production. The rationale for the policies was mainly to help these newly established industries survive during their initial period of production when their costs were higher than the imported price of the same product. Advocates of the policies believe that, over time when some factors (such as learning-by-doing,

externalities, indivisibilities, etc.) are realized or corrected so that total, average costs decline, these industries would be viable without protection. This, suggests that, after some initial period of production, inputs per unit of output of these protected industries should decline. Moreover, the decline should be at a faster rate than that of other, unprotected industries.[12/] In other words, for the advocates of the policies to be correct,one would expect the TFPG of the protected import-substituting industries to be higher than the others.

Our results (shown in Table 5) compare the average of all protected import-substituting industries during the whole 1963-1979 period. They show that TFPG was lower than the average of all industries, and it was much lower than that of non-import-competing and exporting industries. The annual rate of TFPG of import-competing industries was almost nil. However, for non-import-competing industries, it was about 1.22% a year which accounted for about 8% of the growth of its real output. For exporting industries, it was about 1.26% and accounted for about 9% of the real output growth.

12/ It is discussed in Krueger and Tuncer (1982) that this is a necessary, but not sufficient, condition for the infant industry argument to be valid. It is not sufficient to justify infant industry protection because TFP may grow faster over time for other reasons (such as technical change and economies of scale) than learning-by-doing and externalities. Furthermore, there could be other forms of incentives other than the provision of high protective rates which would more efficiently promote high TFPG rates.

When comparing the TFPG of import-competing industries in the two subperiods (the 1960s and 1970s) we found that TFPG declined in the 1970s in contrast to other industries that experienced an increase in TFPG over the two decades. In other words, when comparing the percentages of the growth of these inputs relative to that of real output between the two subperiods, we found that for import-competing industries, over time, the dominant sources of growth of real output either came from the accumulation of raw materials or capital input. This is true despite the fact that some import-substituting industries (such as chemicals and chemical product and transport equipment) continued (from the first subperiod) to have high effective rates of protection. These industries also showed a higher import content of raw material inputs and a faster growth of capital intensity over time. Whenever they wanted to increase production to meet the strong domestic demand resulting from higher tariffs on imported products, they simply increased raw material and capital inputs. With additional protection in the form of obtaining preferential treatment in importing of raw materials and capital inputs, they did not have to make an effort to modify, adapt or manage the inputs to reduce total costs in order to be competitive in the market.[13/] Thus, the protection was not only ineffective in promoting TFPG, but it also provided a shelter for these industries to exist even when their TFPG was declining over time.

13/ An example for the argument is found in the survey of agricultural machinery firms in Thailand for 1980. See Wiboonchutikula (1983).

For exporting industries, when comparing the two subperiods, we found that the TFPG was higher in the second period of the 1970s than in the first. It increased from 0.65% (which accounted for about 4% of real output growth) in the first period to about 1.72% (which accounted for about 15% of real output growth) in the second period. In fact, the second period is also noted for the expansion of exports in response to the policies favoring export promotion that began in the early 1970s. In the 1960s, the export sector grew at 5.89% a year. In the 1970s the rate of export growth increased to 24.60% a year. This suggests a positive relation between TFPG and the growth of exports in the two decades. The growth of the TFPG (which reflected the increase in savings of all real inputs per unit of output over time) enabled the industries to compete in the world market. On the other hand, the increases in exports allowed domestic production to grow fast enough to exploit some abundant raw materials, to better utilize capital stock, and to employ better skilled workers. All of these factors, combined with the advantage gained by extending production to the most efficient scale fostered increases in the TFPG. This positive effect of export growth on the TFPG of industries was in contrast with the low TFPG observed in the import-competing industries discussed earlier. The growth of import-competing industries entailed a faster growth of raw materials and capital goods (mostly imported) than their real output growth over time. Meanwhile, their labor productivity growth was also more likely to be hindered by the suboptimal production technology in response to distorted input prices. All these factors, combined with

the possible inefficient use of plant size due to the small domestic market, explain the low TFPG of the import-substituting industries.[14/]

4.6 CONCLUSION

During the period under study, the TFPG of manufacturing industries in Thailand was still small compared to that of developed countries and some newly industrialised countries. However, in Thailand, similar to the results of some studies of other countries, during the late first half of 1970s and the late 1970s when energy and raw material prices increased and there was a simultaneous, mild recession, the TFPG of most industries declined. After the industries started to recover quickly during the period 1975-1977, the TFPG rose again and in the midst of continuing high energy prices.

The comparison of the average TFPG of the past two decades shows that it increased from 1963-1970 to 1970-1979. In the 1960s, besides the growth of intermediate input which was always the largest source of growth of real output due to its having the largest share in total production, the next most important source of growth the increases in capital and labor inputs. In the 1970s when the industrial sector became more developed, TFP as a source of growth, increased despite the decline in the contribution of primary input growth to real output

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14/ For further discussion of other possible reasons for the superior performance of export promotion policy over import substitution policy, see Krueger (1981).

growth. Our study also shows that the period of TFPG increases coincided with that of changes in industrialization and trade policies from import substitution to export promotion. The import-substitution policies protect industries which are less likely to have market demand potential outside the domestic market and fewer cost-saving prospects for productivity increasing over time. On the other hand, export-promotion policies encourage industries in which the country has a comparative advantage and, hence, the potential for demand expansion in the world market. The growth in demand and competition in the world market can enhance the TFPG, helps industries be more competitive in the world market, and increases the amount of exports even further. Thus, any industrialization or trade policy should also be considered in terms of the impact of the policy on the TFPG. A policy which emphasizes increases in the TFPG will contribute toward more rapid industrial growth in the long run.

Table 1 : Characteristics of Three-Digit ISIC Industries in Thailand

ISIC Code	Industry	Trade Category	1970 Share of Output %	Growth Rate of Output 1963-70	1970-79	1970 Share in Output of Intermediate Input	Labor Input	Capital Input
311	Food Processing	EP	16.32	10.91	12.65	.700	.050	.250
312	Other Food Processing	NIC	7.83	39.24	6.52	.818	.096	.086
313	Beverages	NIC	12.17	20.84	12.16	.362	.066	.572
314	Tobacco	NIC	6.08	5.86	6.45	.544	.047	.409
321	Textiles & Textile Products	EP	7.46	16.32	13.83	.582	.087	.331
322	Wearing Apparel & Shoes	EP	1.25	15.98	16.05	.546	.167	.287
331	Wood & Wood Products	EP	3.71	10.16	7.19	.726	.115	.159
332	Furnitures & Fixtures	IC	0.29	14.08	3.13	.618	.097	.285
341	Paper & Paper Products	IC	1.51	25.07	9.15	.726	.101	.173
342	Printing & Publishing	NIC	1.32	12.02	9.84	.572	.137	.291
351	Basic Chemicals	IC	0.54	18.86	14.00	.600	.130	.290
352	Chemicals Products	IC	2.13	10.93	12.27	.573	.087	.340
355	Rubber & Rubber Products	EP	17.97	36.50	11.31	.698	.050	.252
361	Nonmetallic Mineral Products	IC	1.47	48.32	8.34	.530	.252	.218
362	Glass & Glass Products	IC	1.49	20.35	10.32	.438	.144	.418
369	Other Nonmetallic Mineral	EP	3.89	13.84	8.13	.623	.097	.280
371	Iron & Steel	IC	2.06	19.15	7.53	.747	.073	.180
381	Metal Products	IC	5.64	16.99	4.72	.667	.076	.257
382	Nonelectrical Machinery	IC	2.09	23.82	9.03	.685	.076	.239
383	Electrical Machinery	IC	1.55	24.36	21.76	.667	.078	.255
384	Transport Equipment	IC	2.68	15.73	22.30	.748	.091	.161
390	Miscellaneous	NIC	0.55	13.09	8.23	.642	.075	.283
	Total		100.00	18.79	11.48	.620	.077	.303

Source: National Statistical Office of Thailand, Report of Industrial Census; Whole Kingdom, various years.

Table 2 : Annual Rates of Growth of Total Factor Productivity and Factor Inputs and Their Contribution to Output Growth, 1963 - 79

ISIC Code	Industry	Trade Category	Annual Growth Rate of TFP	Annual Growth Rate of Intermediate Input	Annual Growth Rate of Labor Input	Annual Growth Rate of Capital Input	Annual Contribution to Output of TFP	Annual Contribution to Output of Labor Input	Annual Contribution to Output of Capital Input	Annual Contribution to Output of Primary Input	Annual Contribution to Output of Total Inputs
311	Food Processing	EP	0.89	12.40	6.86	6.47	7.49	2.52	10.60	13.12	92.15
312	Other Food Processing	NIC	1.12	21.22	13.46	13.38	5.38	6.14	6.39	12.53	94.62
313	Beverages	NIC	2.14	15.90	12.80	12.57	13.41	5.45	44.24	49.69	86.59
314	Tobacco	NIC	2.48	4.64	4.38	2.75	40.06	4.85	21.32	26.17	59.94
321	Textiles & Textile Products	EP	3.72	14.84	6.58	10.61	22.77	4.04	13.10	17.14	77.23
322	Wearing Apparel & Shoes	EP	-0.32	15.90	6.47	15.57	-2.29	7.36	27.73	35.10	102.29
331	Wood & Wood Products	EP	-1.51	11.09	4.91	8.71	-17.79	6.24	18.37	24.62	117.79
332	Furnitures & Fixtures	IC	-1.69	9.09	7.66	11.08	-21.34	11.87	20.45	32.32	121.34
341	Paper & Paper Products	IC	2.78	15.62	10.31	9.89	17.04	6.50	16.20	22.75	82.96
342	Printing & Publishing	NIC	2.25	9.83	3.84	8.73	20.83	5.74	22.22	27.96	79.17
351	Basic Chemicals	IC	1.55	15.60	11.02	13.72	9.61	6.26	27.40	33.66	90.39
352	Chemicals Products	IC	1.61	12.01	4.29	6.89	13.78	3.60	13.78	17.38	86.22
355	Rubber & Rubber Products	EP	1.40	19.77	13.26	23.78	6.27	2.46	38.07	40.53	93.73
361	Nonmetallic Mineral Products	IC	-0.13	28.70	20.55	26.79	-0.50	23.23	19.43	42.66	100.50
362	Glass & Glass Products	IC	-0.77	16.14	11.64	15.64	-5.23	8.29	42.76	51.05	105.23
369	Other Nonmetallic Mineral	EP	1.45	10.98	2.03	8.45	13.64	1.79	30.67	32.46	86.36
371	Iron & Steel	IC	1.32	12.24	6.61	8.40	10.46	3.41	9.90	13.31	89.54
381	Metal Products	IC	0.11	10.00	8.73	10.48	1.09	6.24	16.25	22.50	98.91
382	Nonelectrical Machinery	IC	-0.63	16.41	8.83	17.36	-4.06	4.77	41.42	46.19	104.06
383	Electrical Machinery	IC	2.02	21.18	20.66	20.18	8.82	11.97	19.91	31.88	91.18
384	Transport Equipment	IC	-2.31	23.25	15.28	18.63	-11.89	6.59	17.87	24.46	111.89
390	Miscellaneous	NIC	-0.56	12.33	6.05	9.82	-5.41	8.12	20.39	28.50	105.41
	Total		1.07	14.35	8.76	11.02	7.62	4.69	22.19	26.88	92.38

Source : National Statistical Office of Thailand, Report of Industrial Census; Whole Kingdom, various years.

Table 3 : Growth Rates of Real Output, Inputs, and Total Factor Productivity of Total Manufacturing Industries, 1963 - 1979

Year	Input Shares in Production		
	Intermediate	Labor	Capital
1963 - 70	.6064	.0806	.3130
1970 - 79	.6538	.0680	.2782
1963 - 79	.6422	.0748	.2830

Continuous Annual Growth Rates in Percent of

Year	Output	Input			Weighted Input				
		Inter-mediate	Labor	Capital	Inter-mediate	Labor	Capital	Total Inputs	TFP
1963 - 70	18.79 (100.00)	19.81	14.36	16.71	12.01 (63.92)	1.16 (6.17)	5.23 (27.83)	18.40 (97.92)	0.39 (2.08)
1970 - 79	11.48 (100.00)	11.25	6.64	6.88	7.36 (64.11)	0.45 (3.92)	1.91 (16.64)	9.72 (84.67)	1.76 (15.33)
1963 - 79	14.06 (100.00)	14.35	8.76	11.02	9.21 (65.50)	0.66 (4.69)	3.12 (22.19)	12.99 (92.38)	1.07 (7.62)

Source: National Statistical Office of Thailand, Report of Industrial Census; Whole Kingdom, various years.

Notes: Figures in parentheses are ratios of growth rates of inputs and TFPG to growth rate of real output in percentages.

Table 4 : Growth Rates of Real Output, Inputs, and Total Factor Productivity of Total Manufacturing Industries in Four Subperiods

Period	Factor Share			Annual Percentage Growth Rates of:					Annual Percentage Increase of Imported Oil Prices
	Intermediate	Labor	Capital	Output	Intermediate	Labor	Capital	TFP	
1963 - 72	0.6169	0.0811	0.3020	17.19	18.57	14.54	16.11	0.41	n.a
1972 - 74	0.6381	0.0823	0.2796	8.51	6.41	12.48	12.35	-0.06	70.77
1974 - 77	0.6423	0.0721	0.2856	14.26	14.30	-2.02	0.52	5.07	8.41
1977 - 79	0.6583	0.0631	0.2786	8.63	11.68	5.43	4.39	-0.62	20.93

Source : National Statistical Office (same as Table 1), and Bank of Thailand, Annual Report, various years.

Table 5 : Growth Rates of Total Factor Productivity Relative to Real Output of Industries by Trade Categories, 1963 - 1979

Year	Import-Competing Industries			Non-Import-Competing Industries			Exporting Industries			
	Growth Rates of Output (%)	TFP (%)	Ratio of TFPG to Output Growth (%)	Growth Rates of Output (%)	TFP (%)	Ratio of TFPG to Output Growth (%)	Growth Rates of Output (%)	TFP (%)	Ratio of TFPG to Output Growth (%)	Export Growth (%)
1963 - 70	19.44	0.37	3.76	19.31	0.25	1.29	18.35	0.65	3.5	5.89
1970 - 79	13.09	-0.40	-3.31	11.25	1.98	17.60	11.77	1.72	14.	24.60
1963 - 79	15.88	0.01	0.06	14.78	1.22	8.25	14.00	1.26	9.00	15.30

Source : Same as table 4 and National Economic and Social Development Board.

APPENDIX

This appendix discusses methods of estimating real inputs, real output, and factor shares and the construction of the database. All real inputs and output are in constant 1968 prices.

Real intermediate inputs. The growth rate of real intermediate inputs for each three-digit ISIC industry can be obtained by aggregating the continuous growth rates of all purchased inputs measured in real terms using their value shares in total intermediate inputs as weights, Thus, if the values of different types of purchased inputs used in industries were available, we would deflate each of them by its own price deflator and aggregate growth rates with their value shares weights to obtain the growth rate of real intermediate inputs. Unfortunately, the values of purchased inputs reported in the NSOT's industrial census were all in an aggregated form and not broken into type. We therefore deflated these aggregated figures by appropriate deflators to obtain real intermediate inputs to then find continuous growth rates. The deflator of intermediate inputs used in each industry was found by weighted-averaging the deflators of purchased inputs used in the industry, where weights were their corresponding value shares in total intermediate inputs. That is, by letting

$DM_i(t)$ be the deflator of intermediate inputs of the i-th three-digit ISIC industry at time t

$DM_{ij}(t)$ be the deflator of the j-th intermediate input used in the i-th three-digit ISIC industry at the time t

and $M_{ij}(t)$ be the j-th intermediate input used in the i-th three-digit ISIC industry at time t

where

$i = 1, 2, \ldots, n$

$j = 1, 2, \ldots, m$

we obtain

$$(A.1) \quad DM_i(t) = \sum_{j=1}^{m} \frac{M_{ij}(t)}{\sum_{j=1}^{m} M_{ij}(t)} DM_{ij}(t)$$

The source of data for deflators was the Ministry of Commerce's wholesale price indexes of industries. The value shares were computed from the input-output table for 1975.

Real capital stock. Capital stock was classified into two types: (1) buildings and structures; and (2) machinery, equipment and vehicles. For each type at any period, real capital stock was obtained by adding current gross investment at constant prices to the real capital stock of the previous period, excluding real depreciations in the period.

That is, if we let

$K_{ij}(t)$ be the real capital stock of the j-th type of the i-the industry at time t

GI_{ij} be the gross investment flow on the j-th type of capital of the i-th industry at time t

$PI_j(t)$ be the investment deflator of the j-th type of capital at time t

and δ_{ij} be the rate of depreciation of the j-th type of the capital stock of the i-th industry

where $i = 1, 2, \ldots, n$

$j = 1, 2,$

and $t = 0, 1, 2, \ldots, T$

then we obtain

$$(A.2) \quad K_{ij}(t) = \frac{GI_{ij}(t)}{PI_{ij}(t)} + (1-\delta_{ij}) K_{ij}(t-1)$$

By a process of iterative substitution of $K_{ij}(t-1)$ in equation (A.2) we can write

$$(A.3) \quad K_{ij}(t) = (I-\delta_{ij})^{t} K_{ij}(O) + \sum_{s=0}^{t} (1-\delta_{ij})^{y-s} \frac{GI_{ij}(t-s)}{PI_{ij}(t-s)}$$

where $K_{ij}(O)$ is the initial real capital stock of the j-th type of the i-th industry.

The estimation of real capital stock, therefore, requires an estimate of flows of gross investment, investment deflators. initial real capital stock,, and rates of depreciation of the two types of assets. The rates of depreciation were

assets. The rates of depreciation were defined as the reciprocal of the economic life of different types of capital. The methods and data sources for the measurement of all the above variables are described below.

Investment data. The gross nominal investment for again period was defined to be the change in net book value of fixed assets from the previous period, plus the depreciations in that period. The data were from the NSOT's revised industrial census. Note that the investment flows were not modified in the case of transfers of secondhand assets among industries because such transactions were infrequent and the data are not available.

Investment deflators. The deflators for buildings and structures were from wholesale price indexes of construction materials; those for machinery, equipment and vehicles were from the weighted average of the indexes of machinery and equipment, and transport equipment whose weights were their value share of total investment in them. The price indexes of all assets were from the Ministry of Commerce.

Initial capital stock. According to our method of estimating real capital stock with gross investment increasing along its time trend, it is noticeable from equation (A.3) that the further back in the initial year of capital stock we have, the better estimates of the present capital stock we obtain. This is because, with the passage of time, the investment of previous periods constitutes a smaller and smaller portion of the current capital stock. Should there be errors in the investment data of initial years, these will minimally affect our estimates of the current stock.

For Thailand, 1949 is the earliest year that relevant data are available for estimating initial capital stock by type and by manufacturing industry. The fixed capital formation in 1949 was therefore employed to estimate capital stock for the initial year. In 1949, fixed capital formation was less than 10 percent of the capital formation in 1963 and three percent of that in 1979. Thus, with the depreciation rates described below, any possible error in the estimates of initial capital stock would be embodied in a small portion of the estimates of capital stock of 1963 to 1979. In fact, the errors, if any, of the estimates for initial investments in machinery, equipment and vehicles almost vanished by 1963. Meanwhile, estimates for buildings and structures were embodied in no more than five percent of the estimates of capital stock in 1963 and one to two percent in 1979.

Economic life of assets. Between two types of assets building and structures are much more durable than machinery and equipment. Based on Krueger and Tuncer's estimates (see Krueger and Tuncer, 1980), the average life of structures is about 33 years. On the other hand, machinery and equipment have an average life of about 15 years. Since the life of a structure does not vary much across industries compared to machinery and equipment, we assumed all industries had the same life of 33 years for structures, but the life of machinery and equipment varied by industry. Estimates for the life of machinery and equipment for each industry was based on Park's estimates for U.S. industries (see Park, 1973). The average life of U.S. machinery and equipment is longer than Thailand's; so, Parks' estimate of the life of machinery and equipment of each industry was scaled down proportionately. Thus,

we obtained a the weighted average for the whole manufacturing sector of 15 years. The weights were the shares in output of corresponding industries.

Labor Input. A better measurement of labor input of an industry is man-hours classified by different qualities of laborers, such as age, sex and education. The growth rate of labor input can be obtained by aggregating the weighted continuous growth rates of laborers of different quality groups using the wage bill for each group as a weight. However, due to the lack of the above data, we decided simply to use the number of workers employed in each industry during the year as the measurement of labor input. The data source was the NSCT's industrial census.

Real Output. Real output was obtained by deflating the value of production by output deflators. The data of production are based on the NSCT's industrial census. However, there are discrepancies between the growth rates of real output of the three-digit ISIC industries reported by NSCT and those implied by the aggregation of the Ministry of Industry data on commodity output. We therefore adjusted the NSCT production data to make it consistent with the growth rates computed from the Ministry of Industry data. Data on inputs were also adjusted to correspond with revised NSCT production data. As for output deflators, the data source was the Ministry of Commerce's wholesale price indexes of industries.

Factor shares. The share of intermediate inputs was computed by dividing the value of intermediate inputs by the value of total production. The value of intermediate inputs included the cost of raw materials and fuel energy used. The labor share was expenditures on labor divided by the value of total production. The labor expenditure consisted of wages and salaries, bonuses, piecework payment, overtime payment, and all other fringe benefits. The share of capital was defined as the remainder of intermediate input and labor shares in total production. All the data on value of production and expenditures on intermediate inputs and labor were from the NSOT's industrial census.

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CHAPTER 5

THAILAND'S INTERNATIONAL COMPETITIVENESS IN THE FORM OF BILATERAL REAL EXCHANGE RATE MOVEMENTS

Supote Chunanuntathum

5.1 INTERNATIONAL TRADE COMPETITION

A country's competitiveness in real trade flow refers to its ability, relative to other trading countries, to make best maximum and use of its own resources for the production and the international exchange of its goods and services. The more it is competitive relative to other countries, the more it tends to capture, in the long run, an increasing share of total world trade.[1/] Competitiveness can be measured in terms of the relative export price comparison vis-a-vis the competitors, as well as the comparison of other non-price factors which are, however, difficult to quantify. Given various export price comparison, the actual situation will also be affected by various government policies operating to enhance, or obstruct, the country's ability to export.

Competitiveness depends, therefore, on a number of factors. These include the domestic factors and the international environment in which that country operates vis-a-vis its competitors. In the international market, a country's major export item may, for example, face relatively more restrictive practices by many of its major exporters competitors.

1/ The market share is widely used as a proxy for the international trade competitive position. Nevertheless, some limitations in its interpretation are found in an analysis by Leamer and Stern (1970), Chapter 3.

Thus, despite its competitive strength, it is constrained to export as much as it possibly can. This is currently the international economic environment for a number of export items which are subject to different quantitative restrictions in many major industrialized countries. The country may also be able to capture an increasing portion of world trade (or a particular market) because it is able to export items which are increasingly demanded by importers. Its exports may also be geographically concentrated (due to location, historical reasons, or marketing ability) in markets or countries which are growing relatively rapidly, compared to other markets or countries.

On the domestic front, relative factor endowments i.e. in labor, physical and human capital, land and other as natural resource available, have always played a crucial role. Due to differences in comparative advantage, certain goods are produced more inexpensively by some countries and than others. Therefore, given the relative demand, these countries can competitively export their goods to the benefit of their respective trading partners. Over a period of time, a country's factor endowment (as well as its factor productivities) can slowly change bringing with it changing international comparative advantage in different lines of production. International price competitiveness and export and import patterns are correspondingly and dynamically altered.

In addition to this natural price competitiveness, government policy can also have an important impact on a country's ability to export. Governmental action may give rise to pro-export or anti-export conditions, and change normal economic course described above. In other words, the government can adopt various policies and their

associated measures may directly or implicitly affect the net, or effective, prices received by its exporters and paid by importers. Domestic production, together with total export and import, are then affected. Commercial and domestic industrialization policies, in the form of various production and international trade taxes, restrictions and subsidy schemes (with their resultant protection rates for different kinds of production in Thailand) are already presented elsewhere.

Two other important policies, which may also have an important bearing on Thailand's international trade situation, are macro economic and the foreign exchange-rate policies. Although an exchange rate is considered a policy instrument, its own determination depends on other real and monetary variables in international comparisons as well as other policy variables notably the international trade intervention by the countries concerned.

Nevertheless, the purpose of this section is limited to show how the price of foreign exchange, in terms of the Baht, has changed over a period of time and how, together with the relative price level movement, it can affect the country's international competitiveness in general. This is done bilaterally and specifically vis-a-vis some of Thailand's major industrialized country trading partners, as well as the so-called four newly-industrialized-countries (NICs) i.e. Korea, Taiwan, Hong Kong and Singapore. Malaysia is also included in our calculations because it is a trading competitor of Thailand in many export lines and is, potentially, a second-generation NIC like Thailand.

5.2 THE ROLE OF THE EXCHANGE RATE COMPETITION FOR THAI EXPORTS

As mentioned above, a relative price structure for production and consumption is , determined simultaneously by demand, together with the relative factor endowment and the factor productivities, which can, themselves, change over a period of time. In this respect, the foreign exchange rate (defined as the price of foreign currency in terms of domestic currency) can play an important role. Given domestic prices, the foreign exchange rate serves as a monetary translator of domestic prices to foreign prices. A foreign exchange rate helps link the prices and cost structures of various countries. International price competitiveness can be greatly influenced by both the level and the changing foreign exchange rate. An overvaluation of a domestic currency in relation to foreign currencies, will give rise to a disadvantage in export prices and hence lower its relative export price competitiveness. Moreover, it will tend to encourage relatively more imports into the domestic economy. On the other hand, undervaluation of a domestic currency will yield the opposite result, with an increasing tendency toward relative export-price competitiveness and discouraging imports. A change in the exchange rate also affects exports and imports. A depreciation or devaluation of a domestic currency value against foreign exchange will be equivalent to an export subsidy and import tax by the some percentage of the change in the relative value of the currencies. With reallocation of both tradable and non-tradable domestic resources among sectors, exports become more profitable and more competitive in the international market. Export

can then possibly be expanded. Import tend to be substituted, due to a higher domestic price, after depreciation or devaluation of the domestic money.

When we take, as analyzed above, an exchange rate as a monetary converter of the international terms of trade, we implicitly assume that the money prices of goods in a country are given. However, the absolute level of money prices in a domestic currency may also change as a result of domestic monetary inflation. Differential rates of monetary inflation affect the prices of exported goods among competitors, particularly when they export the same or closely-substituted products. To the extent that a country's relatively high inflation is not offset by an opposite movement of its external currency value, the country's international price competitiveness will be imparied. This is especially true when the exchange policy of a country is a "pegged" exchange rate regime. Even under this managed floating regime the country's exchange rate may be managed so that it becomes too far out of line from the level it should be, under optimal and fundamental conditions.

In order to assess Thailand's price competitiveness based on the exchange rate movement, a purchasing-power-parity (P-P-P) theory was adopted for our calculation of the exchange rate. The well-known P-P-P, in its pure theoretical form, is the so-called "absolute" version. It states that, at any point in time, the equilibrium price of foreign exchange is the rate that equilibrates the local and foreign costs of purchase of a representative bundle of internationally tradable goods. The absolute version of P-P-P is difficult, however,

to obtain empirically. The comparative version of P-P-P then is usually employed instead. This calculation of P-P-P exchange rate assumes a beginning base period of equilibrium value. In the ensuing period, the exchange rate, if allowed to adjust freely, should change in proportion to the differences in price levels in both domestic and foreign countries. Thus, if the absolute version holds in the base period, the relative version should also hold in the current period and under the condition that there are no large changes in real relative prices. Thus, the formula used in our calculation of the bilateral P-P-P exchange rate between the Baht and various selected countries is stated below. 2/

$$E_p = \frac{P_c^t / P_b^t}{P_c^f / P_b^f} \cdot R_{ob}$$

where E_p = the purchashing-power-parity foreign exchange rate in terms of Baht

R_{ob} = the market (official) foreign exchange rate in terms of Baht

P_c^t = the price level in the current period in the domestic economy (Thailand)

2/ For a detailed and lucid theoretical analysis of the exchange rate and the price level, together with certain limitations and a discussion of the difficulty of the data (price index) used in calculating the P-P-P rate, please refer to Chapter 11 of Yeager (1976).

P_c^f = the price level in the current period in the foreign country

P_b^t = the price level in the base period in the domestic economy (Thailand)

P_b^f = the price level in the base period in the foreign country

5.3 EMPIRICAL INVESTIGATION

Based on the P-P-P formula above, bilateral calculations were made of the Thai Baht against the currency of the United States, Japan, West Germany, the United Kingdom, Korea, Hong Kong, Taiwan, Singapore and Malaysia. In our estimates, different kinds of price indexes are used so that we can come up with a relatively more uncomfortable analysis and more probable conclusions. The consumer price index, the wholesale price index, and the export price index were employed in our investigations.

Before presenting the exchange rate movements and the P-P-P results, we present some self-explanatory statistics on the market share in the world trade as well as in the U.S. import market among the countries concerned. These appear as in Tables A and B and their corresponding Figures A, B, C and D.

5.3.1 The Baht, U.S. Dollar, Yen, Deutsche Mark and Pound Sterling

(a) The Trend and Thai Policy on the Baht and the U.S. Dollar

Historically, the Thai currency has been tied to the U.S. dollar, especially before November 1984. Since the multiple-exchange-rate was abolished in 1955, a single-pegged exchange rate system was adopted until November 1978. Though the parity of the baht against gold and hence the American dollar, was not officially declared until October 1963, the Baht was allowed to fluctuate very slightly against the dollar. The official parity was baht 20.80 per dollar. When the dollar was adjusted downward against gold by 7.89% in December 1971 in the Smithsonian Agreement and by 10% against Special Drawing Rights (SDRs) in February 1973, the Thai government followed these devaluations to keep its original parity against the U.S. dollar. However, there was, strangely, a minor official baht revaluation of 3.8% on July 15, 1973. At that time, the U.S. dollar became nominally much stronger against the currencies of most other industrialized countries except the deutsche mark. But it was a short-term strengthing of the U.S. dollar which lasted only for the remaining half of that particular year (1973) and early 1974.

When most of the industrialized countries went on the managed floating regime, the official Thai policy was to continue pegging the baht to the American dollar. Despite adopting the so-called "discretionary daily fixing exchange rate regime," from November 1978 on the baht was officially and daily pegged with almost no variations around Baht 20.40 per U.S. dollar. The local currency officially

showed sign of weakness when it was adjusted downward and by the end of 1980 stood at Baht 20.63 to the dollar. The baht was pegged at Baht 21.00 on May 12, 1981. The Government then decided to announce a devaluation of the baht against the dollar by 8.7% and at the same time reverted back to the original adjustable-peg system, in mid July of the same year. The official value of the baht settled at Baht 23.00 per U.S. dollar. This rate was maintained until the 14.81% devaluation of November 1984. Along with this last baht devaluation, the exchange rate scheme was also changed to the managed floating regime with a discretionary peg to a so-called basket of currencies. The U.S. dollar probably carries the most weight in this undisclosed basket and, presumably, remains, technically, the intervention currency. The central (or official) rates are calculated daily, first for the U.S. dollar, and then are multiplied with other prevailing market rates in the world market to obtain the cross rates of Baht vis-a-vis other currencies. Based on the supposedly efficient arbitrage operations among currencies, these cross rates are then taken as the spot market exchange rates for the day.

The official, market rate of the baht against the dollar and other data are taken mostly from International Financial Statistics of the International Monetary Fund. The official, market exchange rate is that at the end of a set period. We chose 1972 as our base year for almost all of our calculations. The choice of a base year, which is normally taken as the year in which the exchange rate is in, or is very close to equilibrium, always begs question. Another problem for this practice is, when a long-time series, in the relative purchasing power parity is calculated, due to structural shifts in the interval period.

Braving all questions, our P-P-P exchange rate of the baht to the U.S. dollar is first presented in Table 1 and Figure 1. Based on the consumer price index the P-P-P rate after 1972 was almost always above the official market rate. The baht tended to be overvalued up to 1984. The overvaluation as measured by the percentage deviation of the market or official rate, as per the P-P-P rate was between 10.47-20.14% during 1973-1984. Had it not been for the last two baht devaluations in 1981 and 1984, the baht would have been too far out of line against the U.S. dollar. Though the local currency appreciated against the dollar by the end of 1985, its value was relatively lower than the rate it would have been under the purchasing power parity.

The use of the consumer price index (as a proxy of a general price index comprising both tradable and non-tradable goods) usually puts a downward bias against the price of foreign currency especially if the foreign country in question is a much richer one. The above-mentioned bias is relative to the purchasing-power-parity as would be for the balance of payments equilibrating rate. The wholesale price index is usually considered to be better in this respect due to its closer relationship to international trade prices. The P-P-P rate of the U.S. dollar against the baht, based on the wholesale price index, is shown in Table 10 and Figure 10. The pattern of the P-P-P, in relation to the official rate, is found to be rather similar. There was first an undervaluation of the baht in the earlier period before 1972. Nevertheless, this undervaluation tended downward and the baht was overvalued in the latter period after 1972 and up to 1984. But the magnitude of the baht overvaluation was much less than that based on

the CPI index. It ranged between only 0.82-17.37% between 1973-1984 compared to the wider range above. The undervaluation of the baht was also higher in 1985 for the WPI-based P-P-P, i.e. 14.51% compared to 7.07% in the CPI-based calculation.

These different magnitudes of movement may be explained by a faster rise in overall domestic inflation rates as measured by the consumer price index. The overall macroeconomic policies in the 1970s (especially after 1972-73) may not have been as well carried out. The central bank's monetary policy was rather accommodating for the period up to the early 1980s, giving rise to a higher inflationary situation which was not offset by a movement in the exchange rate. There also has been a shift in the Thai economy toward more manufactured production and exports. This shift might possibly help bring about a slight gain in productivity, not with standing continued protection in many domestic sectors. As a result, there appears to have been a slower rise in wholesale price, especially since the early 1980s. The use of the export price index both in the domestic currency and the dollar, in calculating the P-P-P rate, (despite the terms-of-trade deterioration after 1973 up to 1985), has caused greater price competitiveness for Thai exports only in recent years. Prior to 1982, the baht tended to be greatly overvalued against the dollar, as shown in Table 18, Table 26 and in Figure 18 and 26. Thailand did not gain its exchange rate competitiveness until after the devaluation of November 1984 and its newly adopted discretionary managed floating regime.

(b) The Trend in Yen and Baht

Even before the Smithsonian Agreement when the U.S. dollar (and hence baht) was devalued against gold by 7.89 percent, the yen had already temporarily appreciated against the dollar as a result of its currency floating, from August 28 to December 1971. In the Smithsonian realignment of December 1971, the yen was then revalued by 7.66% in terms of gold or Special Drawing Rights. The new central rate of 308 yen per dollar was announced This meant a total effective rise in the value of the yen by 16.88%. As central rate margins widened to 2.25%, the value of the yen closed at around 314.0 yen per dollar by the end of 1972, the year we took as our base for the calculation of purchasing-power-parity. The price of the yen in terms of baht was 0.0693 baht per yen, an appreciation of the Japanese currency by 13.68%, as compared to the price in the earlier year end period.

When the U.S. dollar was further devalued by 10.00% in February 1973, Japan allowed the yen to float along with the currencies of some other Western industrialized countries. The baht, which was pegged relative to the dollar, (as analysed above) then fluctuated against the yen along with the U.S. dollar. As shown in Table 2 the official value of the yen in terms of baht tended to rise, (after a dip in 1974, 1975 and 1976) when compared to the apparent and temporary strength of the dollar and baht. This occurred near the end of 1973. After 1976, the yen especially, became strong, reaching its peak vis-a-vis the U.S. dollar in 1978. Thus, the baht depreciated substantially against the yen. Comparing the year-end exchange rate of 1978 with that of 1976,

the yen was found to have appreciate by as much as 50.34%. Afterward, the price of the yen fluctuated between a narrower range of 0.0852 to 0.1081 baht per yen for 1979-1984. This was basically due to Reaganomic economic policies, resulting in a stronger dollar and the tied baht. There was a rise in the value of yen in terms of baht, by only 9.08% for the end-to-end comparison of 1984 and 1983, while the U.S. dollar rose by 18.04% after an official baht devaluation in November 1984.

However, after November 1984 there was a change in the foreign exchange rate policy. The baht depreciated slightly further against the U.S. dollar until the third quarter of 1985, while the yen continued its unfaltering appreciation against the baht. When the G-5 countries decided, in September 1985, to stage a concerted intervention to correct the strong U.S. dollar, the yen jumped in value. By the end of 1985, the yen again appreciated vis-a-vis the baht by as much as 22.94% as compared to the exchange rate for the period at the end of 1984.

Given the official exchange rate and price levels, the purchasing-power-parity rate, in Table 11, was found to be higher than the official rate, especially before 1977 for use of the wholesale price index in our calculation. It indicated the past undervaluation of the yen. The P-P-P rate, calculated by means of the wholesale price index, generally was consistent with what can be expected, as compared to the consumer-price-index parity rate. The WPI-based purchasing-power-parity exchange rate gave a higher value to the yen than the latter, with

exception for the years prior to 1971. Although the use of the wholesale price index for our calculation is relatively better when compared to the consumer price index, the P-P-P rate based on the export price index, (as shown in Table 19 and 27) makes it even more evident competitive Japan's export was vis-a-vis Thailand before 1985. It was only after the G-5 countries' agreement in September 1985, that the yen became much stronger. The P-P-P rate based on the wholesale price index, again gave an overvaluation of the yen, by as much as 35.83% in 1985. But a rise of Japanese productivity in the export sector helped to cut down this exchange rate disadvantage. Although we do not have the unit value in U.S. dollar for 1985, (as shown in Table 18) the P-P-P rate, using domestic export price in Table 27, merely gave rise to a small exchange rate disadvantage of 5.15% against Japan. The Japanese export price in yen did not rise as much as the Thai export price index. Despite this reasonably expected rise of Japanese export price in dollar terms due to yen appreciation, (in terms of U.S. dollars), there is a higher growth in Japanese productivity especially in tradable manufactured goods. There is also a relative rapidity in its structural readjustment in domestic production, after a substantial exchange rate correction. This will probably soon be completed. After that the Japanese price competitiveness probably will be revitalized with a smaller advantage, or even a disadvantage for Thai export, especially if the structural adjustment on the Thai economy (or any Japanese competitor) making it more internationally efficient, is still not substantially carried out.

(c) The Trend in Deutschemark and Baht

The deutschemark, like the yen, tended to rise in value against most currencies over the period of our study. In the case of the German mark, there was, in fact an even earlier sign of gaining strength in the 1950s. As a result of higher productivity and real income growth, together with a monetary policy orientation, relating more toward domestic price stability, there tended to be, under a pegged exchange rate system, a surplus balance of payments. The almost yearly gain in international reserves in the 1960s, forced the deutschemark to be revalued in March 1961 by 4.76% against the U.S. dollar. The D. Mark price in terms of baht was then 5.25 baht at the end of 1961 as compared to 5.07 baht per deutschemark at the end of 1960.

The same relative situation occurred again for the external sector of Germany especially during the second half of the 1960s. Germany then decided to let its currency float partially and temporarily in September 1969. Later, in October, a revaluation of the mark by 9.29%, was announced. The D. Mark price of the U.S. dollar was 3.66 marks per dollar. By the end of 1969, 5.68 baht could then be exchanged for one D. Mark.

Before the Smithsonian realignment, the D. Mark was released to float again, as from May 1971. The D. Mark was then effectively revalued vis-a-vis the U.S. dollar by 13.58%. As a result, the D. Mark rose (as shown in Table 12) by 11.50% in terms of baht, for the year-to-year comparison of 1970 and 1971. With the generalized floating

regime among major industrialized countries after the devaluation of the U.S. dollar in early 1973, the D. Mark tended to rise in value against the baht. This new long-term pattern of the D. Mark rise in market strength, is somewhat similar to that of the Japanese yen, especially prior to 1985. The D. Mark did not appreciate against the baht as much as the yen did in 1984. But by the end of 1985, the apposite was true. There was an appreciation of the D. Mark in terms of baht, by as much as 44.08% as compared to the still relatively large revaluation of 22.94% for the yen in this particular year.

Given this background of the deutschemark, the P-P-P rate as calculated with the wholesale price index, was shown in Table 12. It indicated an overvaluation of baht against D.Mark in most years prior to 1972. There seemed to be an undervaluation of the baht for 1976-1979, due, probably, to the weakening U.S. dollar and its tied baht. After 1979, until the end of 1984 the baht was again found to be greatly overvalued. Due to a change in the exchange policy on the Thai side, and the G-5 countries' concerted action in correcting the strong dollar, the purchasing-power-parity rate of the D. Mark, was found (as shown in Table 12 to be much lower than the market rate of the mark in terms of baht. In other words, there was a substantial weakening of the baht by 23.37% as compared to the base rate of 1972. The exchange rate competitiveness was, thus, restored in 1985 for Thailand, relative to Germany was thus restored in 1985.

The purchasing-power-parity calculation was also ascertained by the relative export price comparison. The use of the export price index in our domestic currency, as the basis of our calculation, (just

like the case of Japan) showed an increasing competitive edge of the German export sector. Due to the generally rising productivity of the export (tradable) sector, above the level of export productivity increase of the Thai counterpart, the baht was shown (in Table 28 and Figure 28) to be consistently overpriced in relation to the D. Mark for most of the period up to 1984. A slower rise in the German export price helped to offset its own currency strength against the baht. In the most recent year of 1985 where the deutschemark appreciated by 44.08%, the export price comparison put the German exports at a disadvantage of only 15.48%.

(d) The Trend in Pound Sterling and Baht

The path of pound sterling, which was also an important key international reserve currency during the adjustable-peg system before February 1973, was equally eventful. Nevertheless, it could simply be stated for our purpose at hand that, there was a long-run tendency for the pound to go down in value vis-a-vis other strong currencies, e.g. deutschemark and yen. It also tended to depreciate against the U.S. dollar until the North Sea oil production significantly helped to slow its long-run fall in value in the 1980s. Actually. it depreciated against the yen, mark and even the U.S. dollar overtime a period of because of a slower real economic growth and higher inflation rate.

The pound sterling was devalued in November 1967 against the U.S. dollar by 4.29%. One pound could be exchanged for 2.40 dollars instead of 2.80 dollars. The British government, like the Japanese and Germans, released its currency to float for a temporary period after the U.S. closed its official gold window in August 1971. The pound

sterling retained its gold parity in the Smithsonian realignment, so that its central rate against the U.S. dollar, rose from $2.40 to $2.6057, or by 8.57%. As a result, the price of pound sterling increased (as shown in Table 13) from 50.10 baht in 1970 to 53.42 baht by the end of 1971. When the pound was unilaterally allowed to float in June 1972 in response to a speculative attack after a large wage increase and its resultant inflationary expectation, it depreciated relative to other currencies. Against the baht, the pound depreciated 8.01% for the 1971-1972 year-end comparison.

In the generalized floating of the exchange rate regime, the pound sterling floated downward. The market rate of the sterling against the Thai baht was 47.34 at the end of 1973. By the end of 1976, the pound was down to 34.73 baht. It began to rise in value again until it reached a recent peak of 49.20 baht per pound by the end of 1980. The pound then depreciated again, and more rapidly, during 1981-1984. And this, occurred despite the devaluation of the baht against the U.S. dollar in 1981 and 1984. At 31.40 baht, the pound was at its lowest level at the end of 1984. The pound appreciated again relatively to the baht, and was at 38.50 baht per pound at the end of 1985.

The purchasing power parity of the sterling vis-a-vis the baht, was of a mixed result. Based on the wholesale price index, the P-P-P equilibrium rate was generally lower than the official rate in the 1960s. The baht was too weak, including the year of 1971. But after the pound floating in June 1972 and the generalized managed floating regime, the P-P-P rate was above the officially sanctioned rate for the years of 1973-1977. Then the baht began to be undervalued relative to

the pound, with the exception of the 1982-1984 period. In the last year of our calculation, the baht was considered undervalued with respect to the pound by 17.66%. By the purchasing-power-parity with 1972 as a base, the exchange rate competition was in Thai favor in the most recent year of 1985. Figure 13 provides the picture of the P-P-P calculation between the baht and pound sterling.

5.3.2 The Exchange Rates Between the Baht and Currencies of the Asian NICs and Malaysia

Governments of developing countries have, generally, intervened in the foreign exchange market, and in many cases, have done so even more than the industrialized countries. In many developing countries, due to balance of payments difficulties, there are even a bewildering variety of ways to intervene in the trade and foreign exchange market. In the multiple exchange rate system, with international trade taxes and control, exports are usually taxed, due to the low effective rate of foreign exchange received by exporters. In the case of Korea, there was a complicated system of exchange control in the form of a multi-exchange-rate system before May 1964. After two drastic devaluations of the Korea won, i.e. technically from 60 won to 100 won per U.S. dollar in February 1961, and from 120 won to 255 won per dollar in May 1964, the won multiple rates were finally unified. This was the beginning of a successful liberalization together with a change of policy, toward more effective incentives for export-oriented production. The won was then floated at 270 to the U.S. dollar by August 1964. After that, the Korean government tended to keep its currency at a relatively stable rate vis-a-vis the U.S. dollar until 1969.

After the Smithsonian realignment in December 1971, the U.S. dollar rose in value by 18% in relation to the won. It was further reduced by 21%, i.e. from 399 won to 484 won per dollar in December 1974. This rate was pegged until official devaluations of the won in the 1980s. By 1985, the year-end foreign exchange rate of the U.S. dollar against won was 890 as compared to 659 in 1980. The won again lost nominally by 35.05%.

As against this background of continuing devaluations of the won, the price of won, relative to the baht, is shown in Table 5 or 14. The won had a lower value compared to the baht by 84.85% during 1960-1972 and by 42.94% during 1972-1985. There was, thus, a substantial reduction in the market or official, value of the Korean won to the baht.

Taiwan's early exchange policy was rather similar to that of Korean. In response to the balance of payments difficulty in the 1950s,there was a multiple-exchange rate system, coupled with foreign trade taxes and direct control. The overall incentive system was, thus, biased against export production. There were, however, successful reforms both in the form of international trade liberalization, (i.e. removal of many quantitative restrictions and lowering of taxes) after 1958, as well as the gradual collapse of the multiple exchange rate into a single-exchange rate by 1960. The exchange rate reform, coupled with the equally important tax-rebating scheme for exporters of import duty, commodity and other indirect taxes (since 1955), resulted in an effective export-oriented industrialization.

Substantial foreign exchange liberalization was, therefore, taken even before Korean did it in 1964. To keep to the sphere of our direct concern in this paper, i.e. the specific rate for foreign exchange, there was a massive devaluation by 1960. The exchange rate was 40.00 N.T. (New Taiwan) dollar per U.S. dollar in 1960, as compared to an average rate of about 23 N.T. dollar in 1955. When the U.S. dollar was devalued in December 1971, the Taiwanese dollar, like the baht, also went down proportionally. The exchange rate of the N.T. dollar to the baht was, thus, 0.52 baht per N.T. dollar during 1965-1972, as shown in Table 6 or 15. When the U.S. dollar was further devalued in February 1973, the Taiwanese dollar was slightly up valued against the U.S. dollar to a rate of 38.00 N.T. dollar per U.S. dollar. The price of the N.T. dollar vis-a-vis baht, at the end of 1973 was 0.53 baht per U.S. dollar and remained at 0.54 baht to one dollar until 1978 due to the Taiwanese and Thai peg to the U.S. dollar. The Taiwanese dollar was further liberalized in 1979 and appreciated slightly against the U.S. dollar, and hence the baht. The devaluation of the baht and the appreciation of the N.T. dollar against the U.S. dollar, resulted in 0.61 baht per N.T. dollar by the end of 1981. From 1981 to 1984, the baht appreciated against the N.T. dollar because of the N.T. dollar's depreciation against the U.S. dollar. It was the baht devaluation and its managed floating after November 1984, that caused the local currency to weaken against the N.T. dollar.

The change in the official exchange rate between the baht and won, as well as the N.T. dollar vis-a-vis the U.S. dollar are not, as described above, synchronized. These are also the observations for

Hong Kong, Singapore and Malaysia. As a result, the baht, against each of these countries' currencies fluctuated differently. Hong Kong decided to switch its peg from sterling to the U.S. dollar, after the currency realignments among industrial countries in 1971. The currency was fixed at 5.65 H.K. dollar per U.S. dollar, instead of 6.06 H.K. dollar to the U.S. dollar. But following the U.S. dollar devaluation in February 1973, the rate was adjusted to 5.085 H.K. dollar per U.S. dollar. It was then in November 1974, that the H.K. dollar was allowed to float independently. The H.K. dollar tended to fluctuate within a relatively small range with the height of the H.K. dollar's strength at 4.62 H.K. dollar to U.S. the dollar by the year-end of 1977. The H.K. dollar was traded for 4.42 baht in the market by 1977 (See Table 7 or 16). Afterward, it became weak and fell precipitously in 1982 due to the first round of unsuccessful negotiations on the future of Hong Kong between the Chinese and British governments. The lowest level reached was 9.55 H.K. dollars to the U.S. dollar, in September 1983. With the new pegging at 7.80 H.K. dollars per U.S. dollar, and the return to a strict prior-to-1972 foreign exchange reserve standard of note issuing, helped to stabilize the H.K. dollar. By 1984, the market rate of baht weakened against the H.K. dollar by 17.63% as compared to 1983. The H.K. dollar then depreciated vary marginally at 0.55% against the baht in 1985.

The other two countries in our study are Malaysia and Singapore. Both countries shifted to the dollar peg from pound sterling, by the end of 1972. Both the Malaysian ringgit and the Singapore dollar were allowed a discretionary float in March 1973. Moreover, there was a

tendency for both currencies to float together until 1980. This was so, despite the official Malay policy of pegging the ringgit to an undisclosed basket of currencies since 1975. It was not until the early 1980s that the market value of the ringgit began to diverge, somewhat in terms of the U.S. dollar, from that of the Singapore dollar. In the last few months of 1984, the ringgit began to depreciate against the U.S. dollar, after a long period of strength beginning in 1973. As a result, the baht vis-a-vis these currencies (as shown in Table 8 and 9) tended to fluctuate somewhat differently in 1980s. During 1980-1985, the Malaysia ringgit gained by 18.32% against the baht, as compared to 28.53% for the Singapore currency. The Malaysian money depreciated after the third quarter of 1984.

Given these non-synchronized movements of the nominal market exchange rates among each of these Asian currencies and their divergent price levels, the P-P-P are then calculated for each of these exchange rate against the baht.

The use of the wholesale price index to calculate the P-P-P rate against the Korea won, after 1972, indicated a swing from baht overvaluation, during 1973-1975 to a generally undervaluation afterward. The use of the consumer-price index, which may, in this case, not be inappropriate among developing countries's inflationary comparison, showed a general trend of baht overvaluation to the won, (See Tables 5 and 14, and Figures 5 and 14). However, the baht overvaluation tended to be smaller when compared to 1973-1975. The baht purchasing-power-parity rate was close to the official rate after

the baht devaluations in 1981 and 1984. By the end of 1985, the baht was excessively stronger against the won, in purchasing-power-parity by 6.92%. This overvaluation was also clearly seen when we reverted to the use of the export price index comparison. Both in the domestic-currency, and U.S. dollar exports price calculation, the P-P-P rate in Table 22 and Table 30 revealed an overvaluation of the baht to the won. Due to the frequent exchange devaluation or depreciation of the won, the exchange rate competition resulted in a substantial dollar price advantage for export, in favor of Korea over Thailand. Even the baht devaluation in November 1984 helped only to lessen an excessive strength of the baht (or undervaluation of the won) from 50.18% in 1983, to 40.05% in 1984, and to 41.83% in 1985.

Due to a lack of the completed wholesale price series, we applied the 1972-base to the consumer price index purchasing-power-parity to only the Hong Kong dollar and the baht. The P-P-P rate (in Table 7) was found to be above the market rate, despite a relatively more inflationary situation in Hong Kong during 1975-1982. This was the result of a relatively more flexible exchange rate regime adopted by Hong Kong. The Hong Kong dollar depreciation helped to keep Hong Kong competitive against Thai exports. Only in 1984-1985, was this exchange rate advantage for Hong Kong much reduced, to approximately a few percent. The wholesale price index P-P-P rate was estimated in (Table 16) for a shorter period with 1975 as the base. The result was similar in direction, i.e. the baht was too strong in purchasing-power-parity from 1978 to 1985. To ascertain the export price competitiveness of

Hong Kong over Thailand, the export price index in U.S. dollars was used as our additional evidence in our P-P-P calculation. The calculated result only up to 1982 (as shown in Table 24) indicated a consistently substantial export price competitive edge for Hong Kong over Thailand.

The case of Taiwan was an unexpected outcome. The P-P-P rate, using both the consumer price index and the wholesale price index (in Table 6 and 15) was generally below the official or market rate. This rated the baht as an undervalued currency, relative to the N.T. dollar for most years. Though the baht undervaluation was generally not very large, there was an undervaluation rate for the baht at 21.34% in 1984, and at 12.74 % in 1985, according to the consumer price index comparison. The extent of this undervaluation was about the same for a purchashing-power-parity under wholesale price index. Despite such an inflationary disadvantage for Taiwan against Thailand, Taiwan performed relatively much better, from the external account point of view, especially in the 10 years before 1986. In addition to the government export promotion schemes resulting in export subsidies, this might explained by the increasing productivity, especially of the export sector. Based upon the export price comparison, Taiwan's competitiveness is seen from Table 31 and Figure 31. There was almost a consistent export price advantage for Taiwan over Thailand. Even though the export mix of the two countries differ, the increase in export productivity, (as reflected in a slower rise in the trend of export price index) is presumably higher for Taiwan. Nevertheless, such an advantage seemed to be lower in the last few years ending in

1985. Due to the appreciation of the N.T. dollar against baht, the calculation of export price competitiveness in 1984 (as shown in Table 31) put Thailand at an advantage of approximately 6% which was later reversed again to a price disadvantage by approximately 4.5% in 1985.

The P-P-P rate calculated for Singapore and Malaysia, are shown respectively in Tables 8 and 9, for the consumer price index and in Table 17, in the case of wholesale price and for Singapore only. Due to a shorter data period, we made the wholesale price comparison for the P-P-P rate calculation for the Singapore-Thai case of 1974-1985.

The Singapore case, in terms of the P-P-P rate, based on both types of index after 1972, indicated a continuous overvaluation of the Singapore dollar vis-a-vis the Thai baht. This overvaluation was, in fact, rather larger in the use of the wholesale price index for our calculation, even though it was in a different and more recent base year of 1975. By 1984 and 1985, the overvaluation of the Singapore dollar (undervaluation of the baht) by the use of the wholesale price index, was approximately 18.00% by the consumer price index, and by 27.00-28.00% by the wholesale price index.

Though we do not have the export unit value index to reckon with, this apparent excessive strength of the Singapore dollar over the baht, from the point of view of the trade-eqilibrating exchange rate can perhaps be reconciled from the fact that Singapore has also developed to become a regional financial market. This is especially true after the full exchange liberalization in June, 1978. With continuous government support, and the comparative advantage of location and

certain infrastructure required for efficient financial dealings over most of its regional neighbors, as well as a basically strong economic performance of an export-oriented type of industrialization, Singapore began the development of becoming a regional financial center at the end of the 1960s. Singapore has been set to compete with Hong Kong as a regional financial market. Thus, there was a more than usual capital inflow resulting in balance of payment surplus, even in the face of a trade account deficit. The Singapore dollar was kept relatively stronger than would normally be justified for trade-equilibrating purposes, under the narrowly calculated purchasing-power-parity used in this study.

The case of Malaysia, which tended to float its currency rather closely with Singapore's, especially prior to the early 1980s, was different. The P-P-P rate basing on the consumer price index before 1984 for the Malaysian ringgit, was found (in Table 9) to be mostly above the official or market rate. The undervaluation of the ringgit (or overvaluation of the baht) was generally less than 10% except in 1980. This was true until the situation was reversed after 1983. Due to the devaluation of the baht against the ringgit in 1984, the baht was then undervalued to the purchasing-power-parity rate. The percentage undervaluation was 6.75% in 1984, and 2.58% in 1985. This helped to put Thailand in a relatively better position, in terms of exchange rate competition against Malaysia. It was, however, only a small advantage which could easily be reversed by either side in terms of its exchange rate policy.

5.4 SUMMARY AND SUGGESTION FOR FURTHER STUDY

A country's international trade competitiveness, on a certain level, can be reasonably reflected in the market share of exports captured by that country. The market share may be either in the world export as a whole, in a specific market, or in commodity, depending on the objective of the study. A rising and sustained level of the share in the long-run may, subject to some qualification of the use of the market share concept, be taken as a good and early approximation of a increasing competitiveness in international trade.

There are different factors which affect the international trade competitiveness of a country vis-a-vis its competitors. Mainly, this may be summed up in the form of a change over a period of time, of the price and non-price factor. Government policies pursued by different countries, which can also have a direct bearing on the country's relative export performance, includes not only the present and widely discussed the commercial policy (so-called unfair trade practices in the form of international trade taxes, subsidies as well as other quantitative and hidden restrictions), but also the macro-economic and foreign exchange rate policy.

In our limited study, we have singled out the specific role of the foreign exchange rates as a form of price competition. Different countries under our study pursued different exchange rate policies. The industrialized countries, of course, after the complete collapse of the adjustable-peg system, have pursued their own managed floating

regimes with an occasional co-ordination of their exchange rate intervention. Korea pursued a relatively stable nominal rate against the U.S. dollar until more frequent changes of the 1980s. However, Korea was found to be more willing to alter its exchange rate much more frequently by large devaluation (or depreciation) even in the world of the adjustable-peg period. Taiwan kept its pegged rate against the U.S. dollar until the 1973 revaluation, and the 1979 and 1981 appreciation. When the U.S. dollar was strong, Taiwan chose to depreciate its currency against the U.S. dollar during 1981-1984. Thailand, an even more stable pegger to the U.S. dollar especially until November 1984, had by policy choice, a slight revaluation in 1973, and devaluations in 1981 and 1984 against the U.S. dollar. Unlike these three Asian peggers largely to the U.S. dollar, the other three Asian countries, i.e. Hong Kong, Singapore and Malaysia allowed their currencies to float. Singapore and Hong Kong did it respectively in June 1973 and November 1974 after breaking away from their tie to the U.S. dollar after the Smithsonian agreement. Hong Kong reverted to a close peg to the U.S. dollar in 1983. Though Malaysia began to tie its currency to a basket of currencies in 1975, Malaysia and the Singapore dollar, in practice tended to float jointly. Not until the early 1980s, did the Malaysia dollar began to depreciate against the U.S. dollar more than the Singapore dollar.

Given the non-synchronized movements of the exchange rate, due to policy choices, as well as the divergence of different price level movements, the purchasing-power-parity with mostly 1972 a base year, was calculated bilaterally between the baht and the currencies of each

of these countries. It may be preliminarily concluded that the baht, before 1985, tended to be generally too strong against the U.S. dollar, the deutschemark (1974-1975 and 1980-1984), and even against the pound (during 1973-1979 and 1982-1984, using the WPI price index). The overvaluation by the purchasing-power-parity rate of the baht vis-a-vis the yen, prior to 1977, was followed by the large baht undervaluation by the end of 1977 and 1978, due to the rapid rise in strength of the yen. However, this exchange rate competitiveness against Japan tended to erode over time and then completely by 1983. Nevertheless, the devaluation and the discretionary floating baht regime close to the end of 1984 put Thailand quite a competitive position against all the four industrialized countries in our study, because the market foreign exchange rate, in terms of baht in 1985, was higher by about 15-39% as compared to the purchasing-power-parity rate.

The purchasing-power-parity calculation for Korea and Hong Kong, based particularly on the consumer price index, indicated an excessive strength of the baht against the Korea won and Hong Kong dollar up to the end of 1985, i.e. even after the devaluation of the baht in November 1984. The real exchange rate competitive edge of Hong Kong was substantial, ranging between 5-40% during 1980-1985, for the use of the 1975 WPI-based calculation of the P-P-P rate. The calculated result in the case of Taiwan and Singapore, is opposite to that obtained for Hong Kong and Korea. Though the lower strength of the baht vis-a-vis the N.T. dollar was generally found to be small (except about 12% for the year end of 1981 and 1985), the undervaluation of the baht against the Singapore dollar by the 1975 WPI-based comparison was

larger. Singapore's case, it is presumed, may be due to the excessive strength of the Singapore dollar after the full liberalization of foreign exchange control in 1978. Singapore has become, along with Hong Kong, a regional financial center. But in the Singapore case, its currency probably tended to be too strong for the trade-equilibrating purpose. Though the baht was found to be relatively and slightly undervalued to the N.T. dollar before 1983, Taiwan's relatively excellent export performance may be due to other factors, notably the change of import-substitution policy to the export-substitution or export-promotion policy after 1960. Nevertheless, there was a larger exchange-rate advantage for Thailand over Taiwan in 1984 and 1985. The last case is Malaysia. It was found that the baht again tended to be generally too strong against the Malaysian dollar up to 1984. The value of the baht became somewhat lower than it should have been under the P-P-P, enabling Thai export to become relatively more competitive against Malaysia, only after 1984.

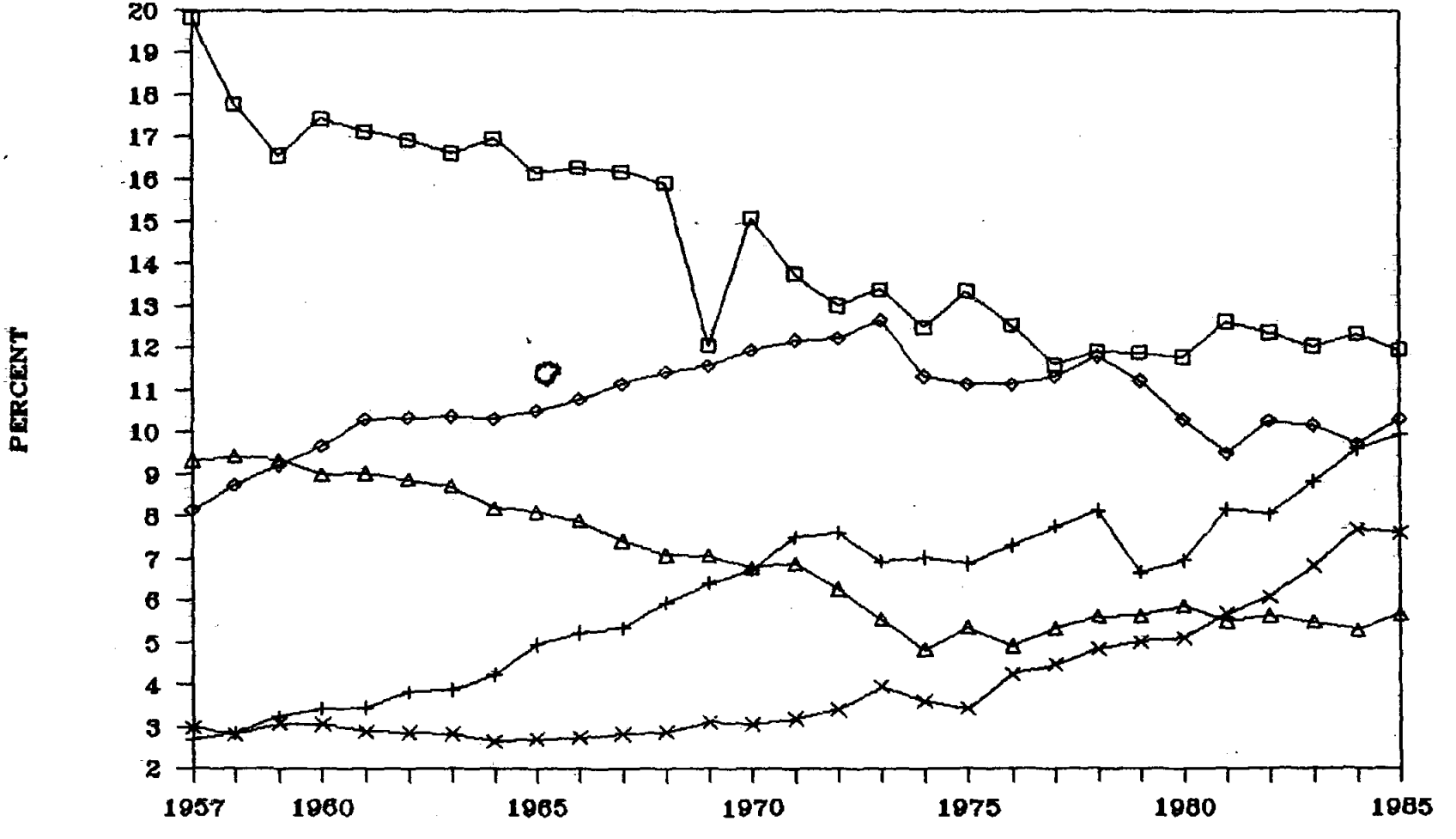
Though the 1985 purchasing-power-parity exercise indicated a major turn-around in the foreign exchange policy of the Thai government, giving rise to an exchange rate competitive power in real terms for Thai export, this conclusion should be regarded as preliminary. Further and more detailed investigation may be required, in order to arrive at a more definite conclusion on this specific exchange rate issue. Particularly for the P-P-P purpose, the monetary-and-fiscal policy mix among countries should be further analysed. Moreover, for a structural change bias of P-P-P rate over a period of time, which

admittedly , is more difficult to tackle, we may need to resort to calculating the P-P-P under a shorter time interval, by choosing a new and appropriate base, say a five to six year period. Since the determinant of an exchange rate also depends on other real variables, it is suggested that these should be looked into. In particular, for relative export competitiveness purposes, it is necessary to bring the countries' commercial policies into comparative perspective.

All of these suggested additions, when combined together, will go far beyond our limited purpose here of showing how important an exchange rate policy can be to drive a differential international competitiveness among trading nations. This is especially true in the present world of increasing international competition.

Figure A

Share of United States, Japan, Germany, United Kingdom and ASIAN NICs
In the World Export Market, 1957-1985



□ USA + JAPAN ◇ GERMANY △ UK × ASIAN NICs
(including Thailand and Malaysia)

Figure B

ASIAN NICs's Share in World Export Market, 1957-1985

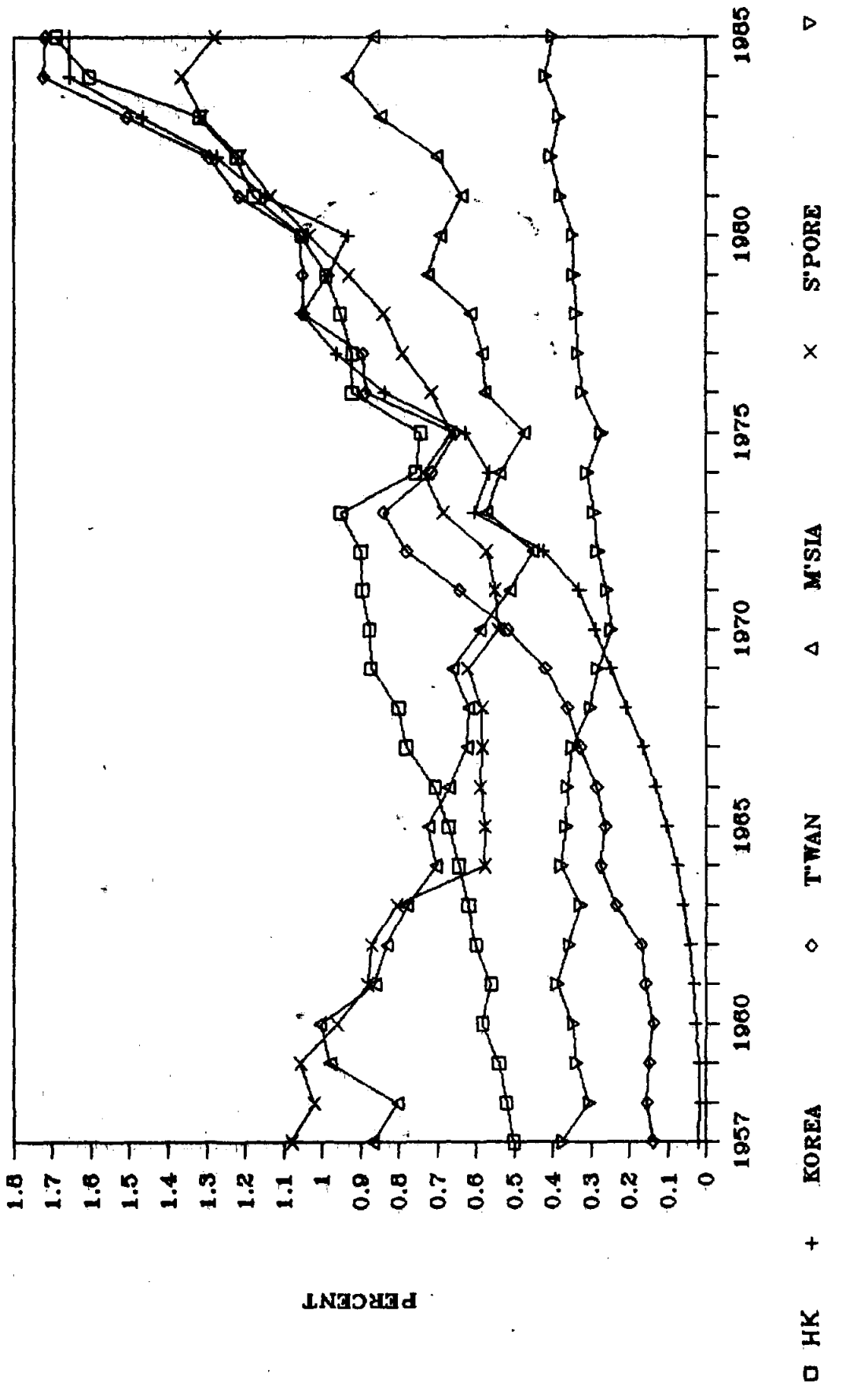


Figure C

Share of Japan, Germany, United Kingdom and ASIAN NICs

In the U.S. Market, 1967-1984

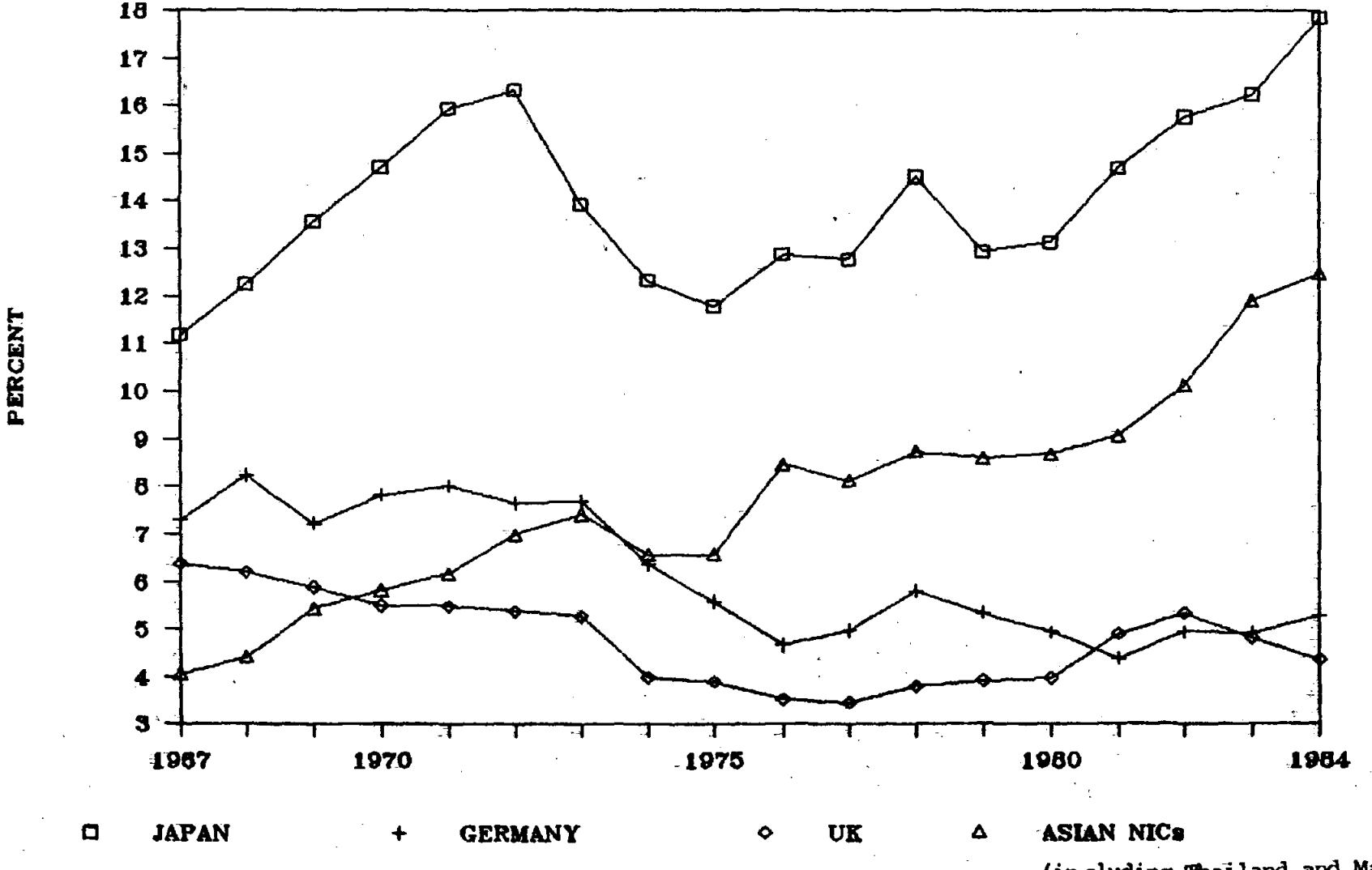


Figure D

ASIAN NICs's Share in the U.S. Market, 1967-1984

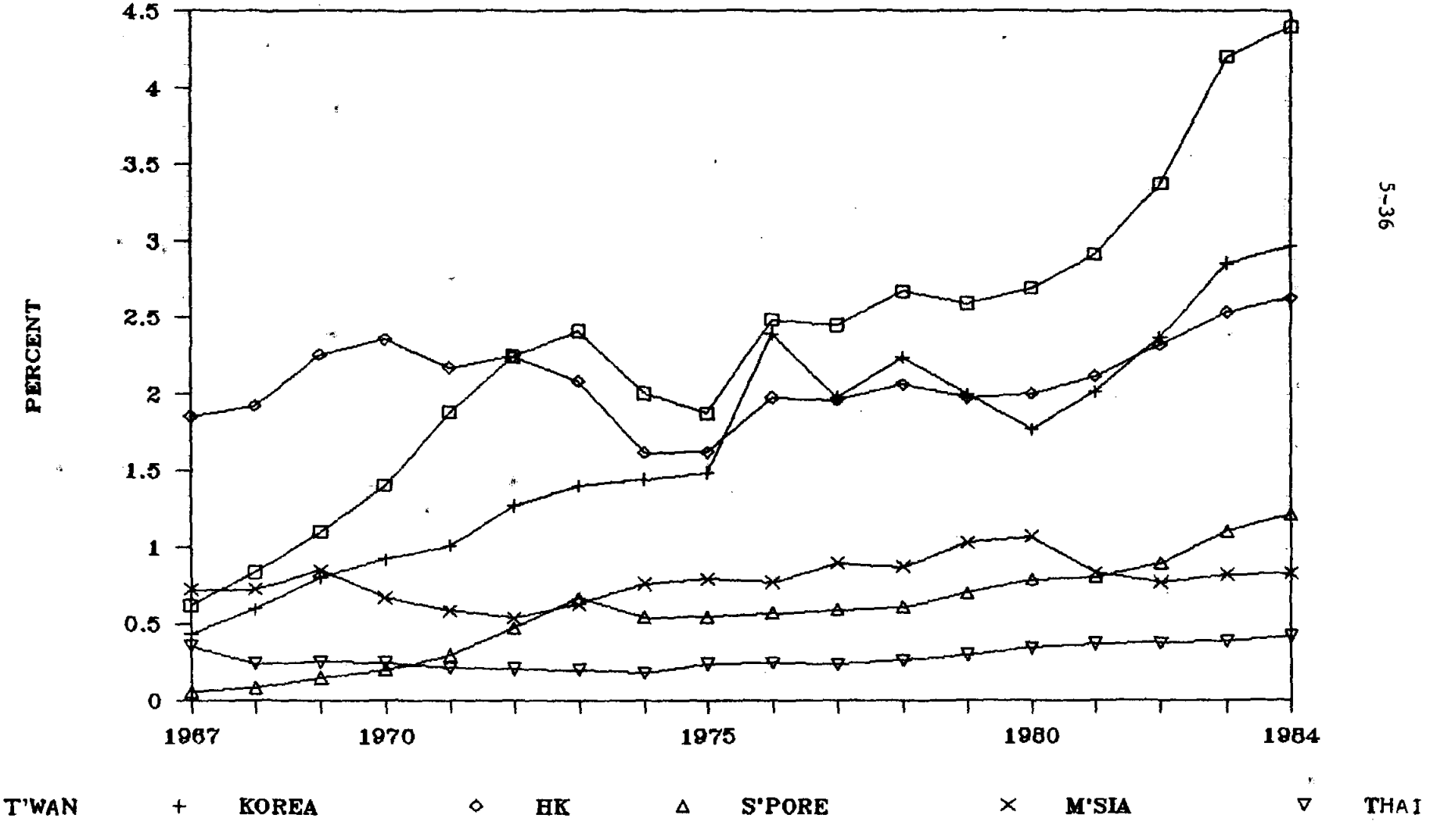
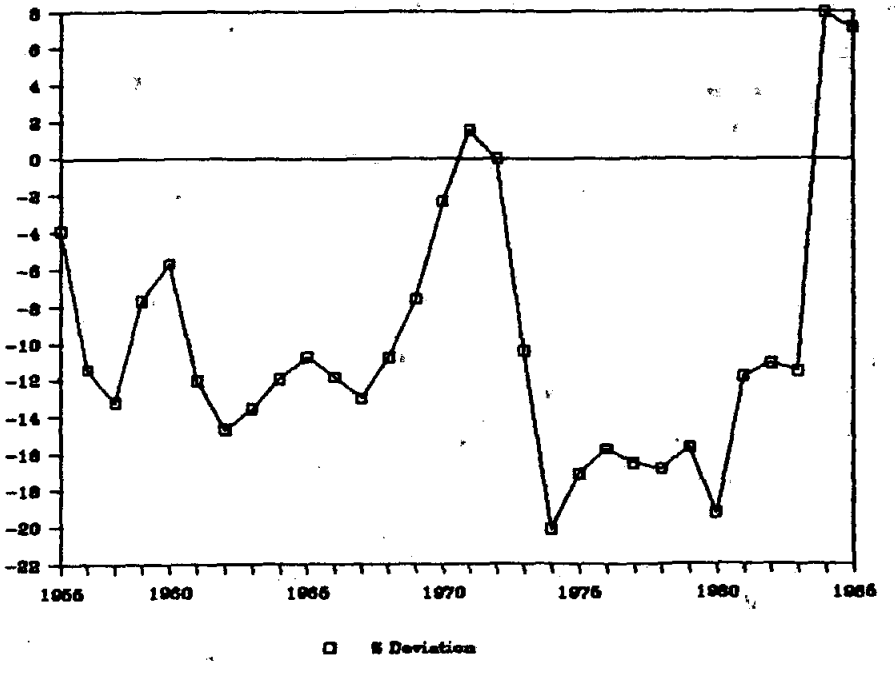


Figure 1

Percentage Deviation

Between Baht and U.S.dollar

(Based on Consumer Price Index, 1972=100)



Minus sign indicates overvaluation of baht.

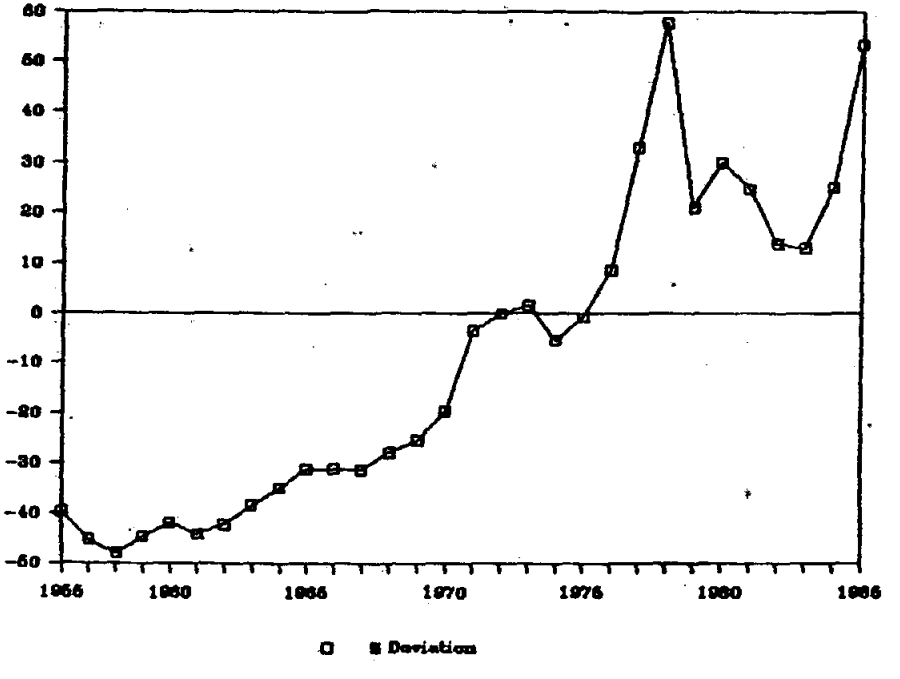
Plus sign refers to baht undervaluation against the foreign currency.

Figure 2

Percentage Deviation

Between Baht and Japanese Yen

(Based on Comsumer Price Index, 1972=100)



Minus sign indicates overvaluation of baht.

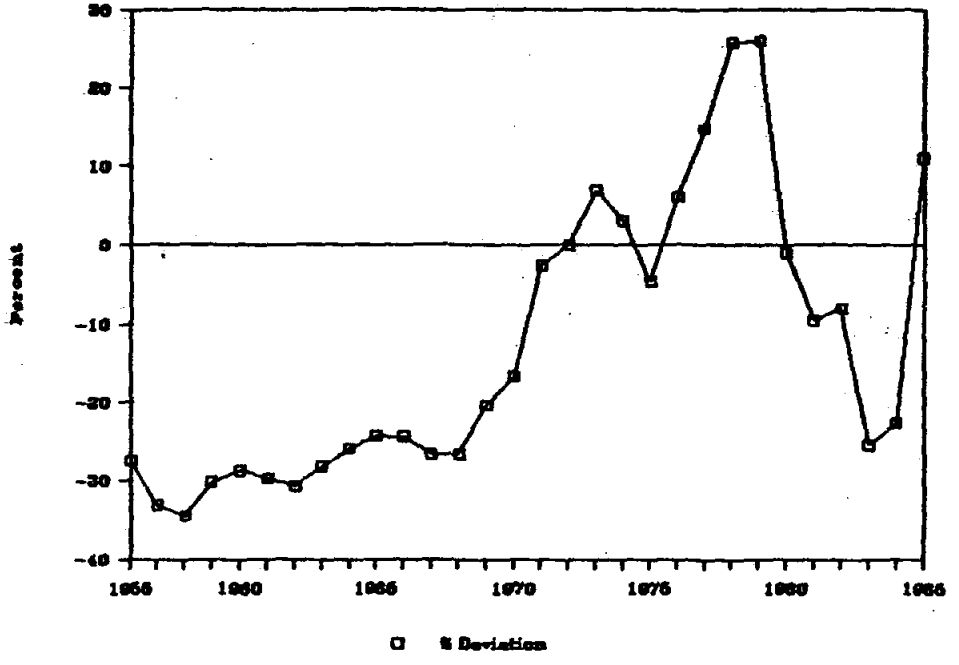
Plus sign refers to baht undervaluation against the foreign currency.

Figure 3

Percentage Deviation

Between Baht and Deutsche Mark

(Based on Consumer Price Index, 1972=100)



Minus sign indicates overvaluation of baht.

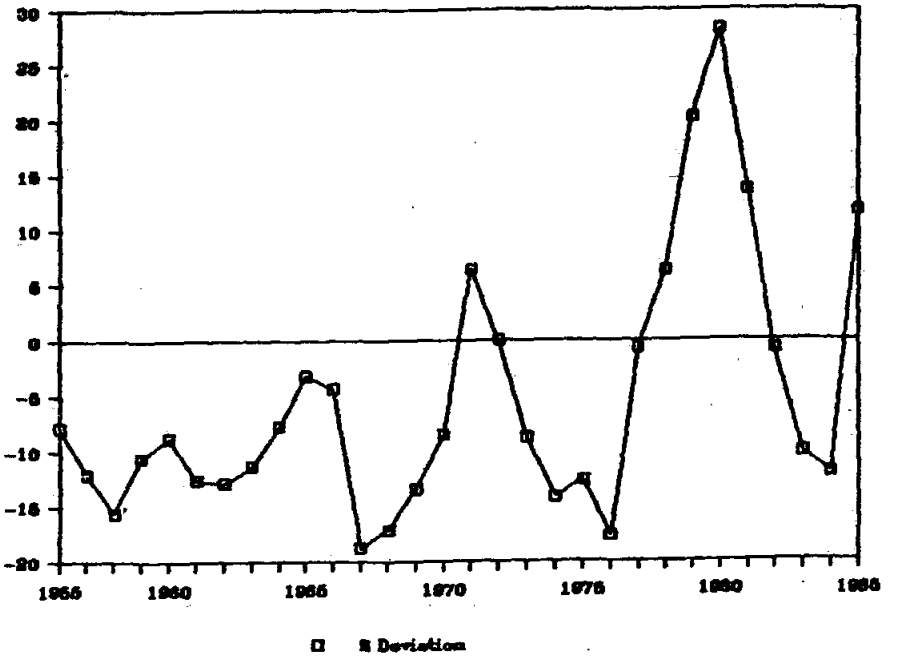
Plus sign refers to baht undervaluation against the foreign currency.

Figure 4

Percentage Deviation

Between Baht and Pound sterling

(Based on Consumer Price Index, 1972=100)



Minus sign indicates overvaluation of baht.

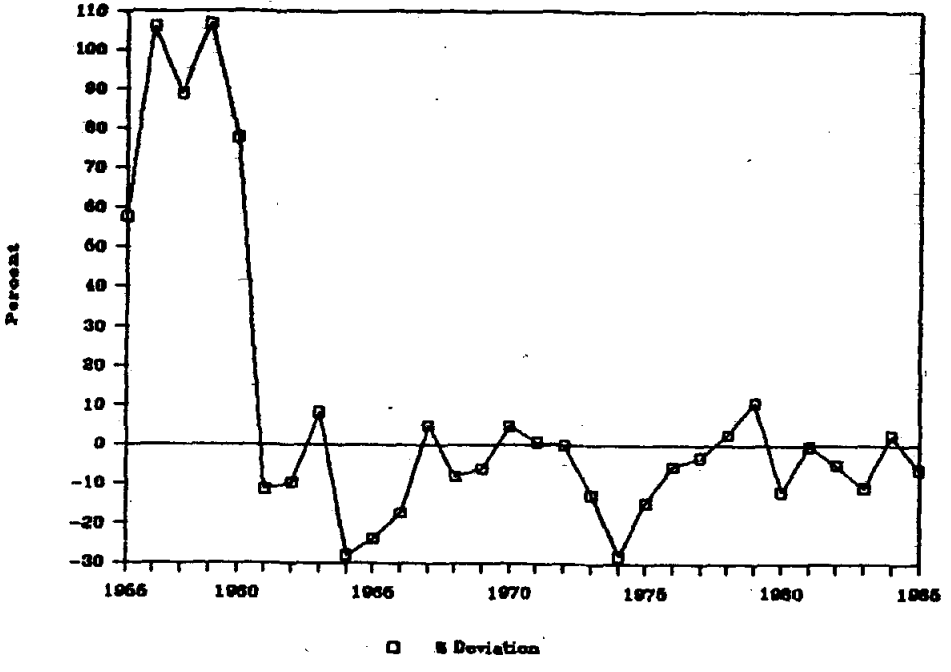
Plus sign refers to baht undervaluation against the foreign currency.

Figure 5

Percentage Deviation

Between Baht and Korea Won

(Based on Consumer Price Index, 1972=100)



Minus sign indicates overvaluation of baht.

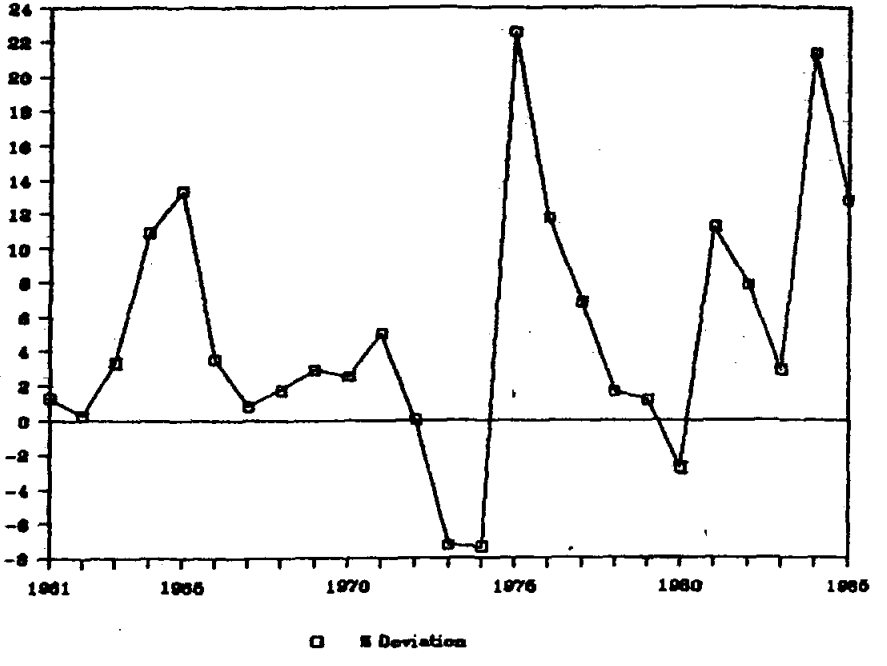
Plus sign refers to baht undervaluation against the foreign currency.

Figure 6

Percentage Deviation

Between Baht and Taiwan dollar

(Based on Consumer Price Index, 1972=100)



Minus sign indicates overvaluation of baht.

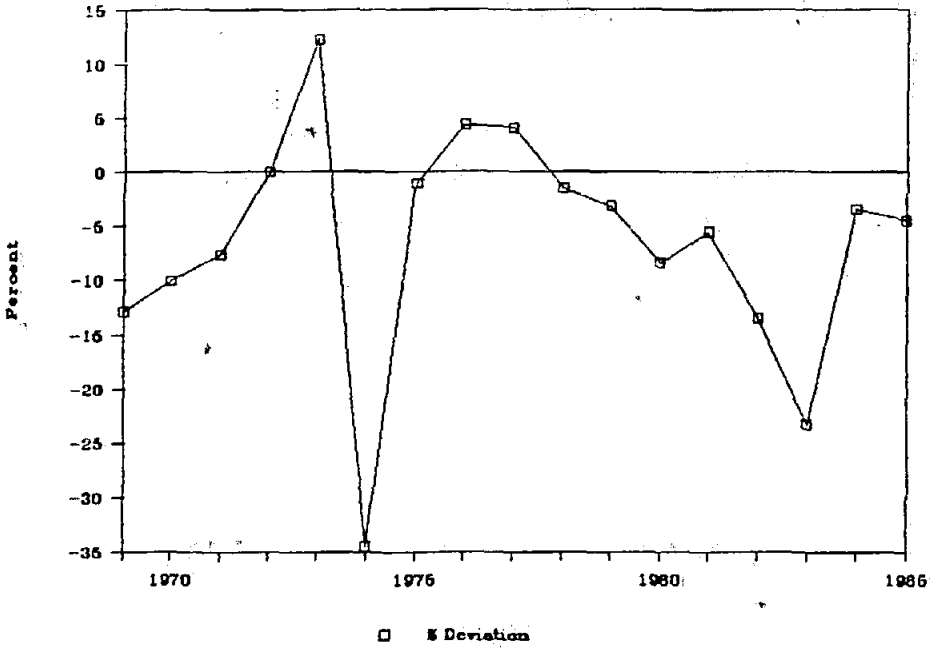
Plus sign refers to baht undervaluation against the foreign currency.

Figure 7

Percentage Deviation

Between Baht and Hongkong dollar

(Based on Consumer Price Index, 1972=100)



Minus sign indicates overvaluation of baht.

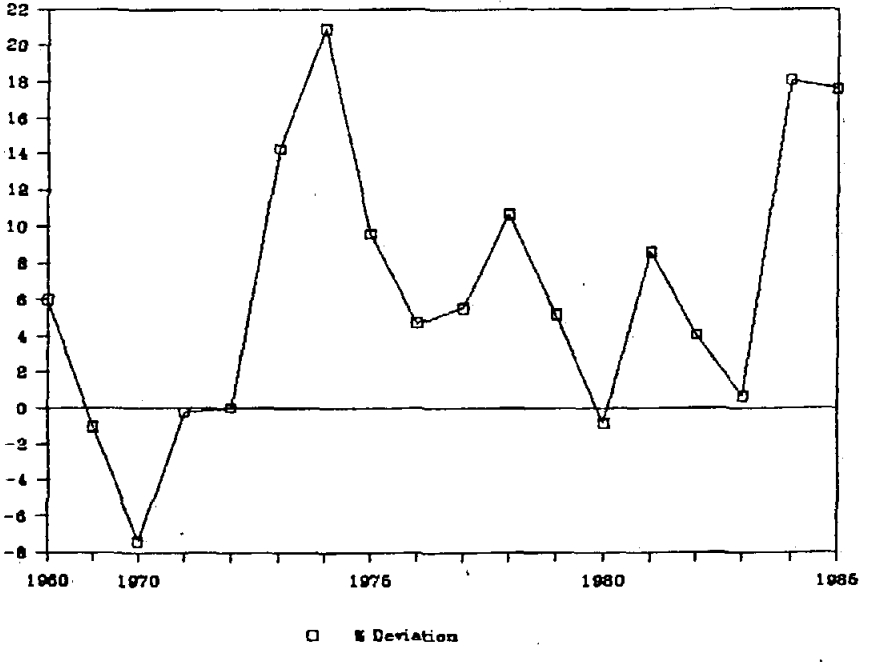
Plus sign refers to baht undervaluation against the foreign currency.

Figure 8

Percentage Deviation

Between Baht and Singapore dollar

(Based on Consumer Price Index, 1972=100)



Minus sign indicates overvaluation of baht.

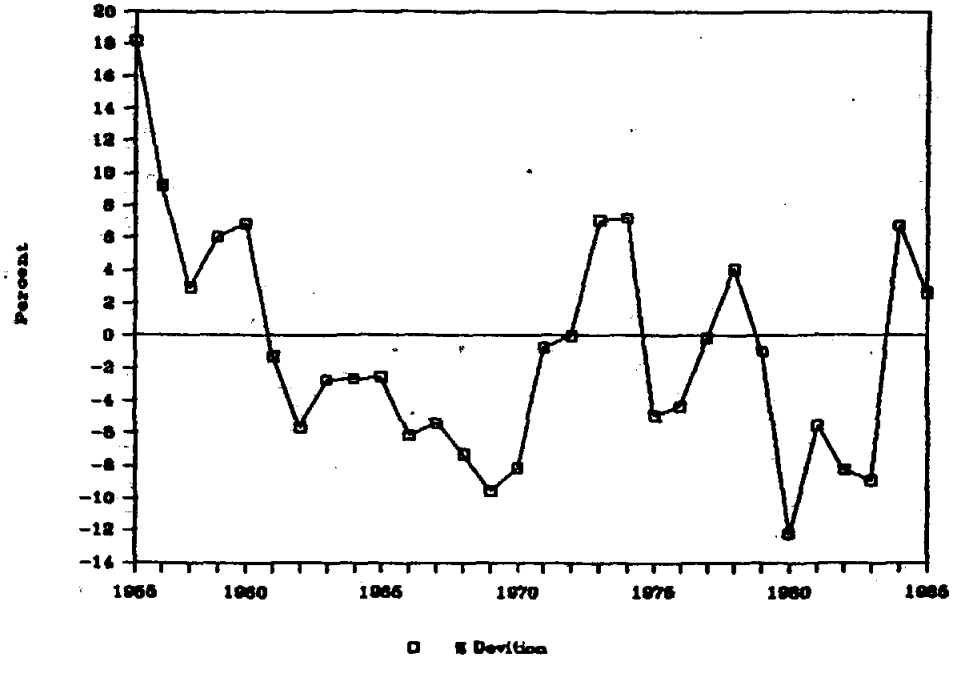
Plus sign refers to baht undervaluation against the foreign currency.

Figure 9

Percentage Deviation

Between Baht and Malaysian dollar

(Based on Consumer Price Index, 1972=100)



Minus sign indicates overvaluation of baht.

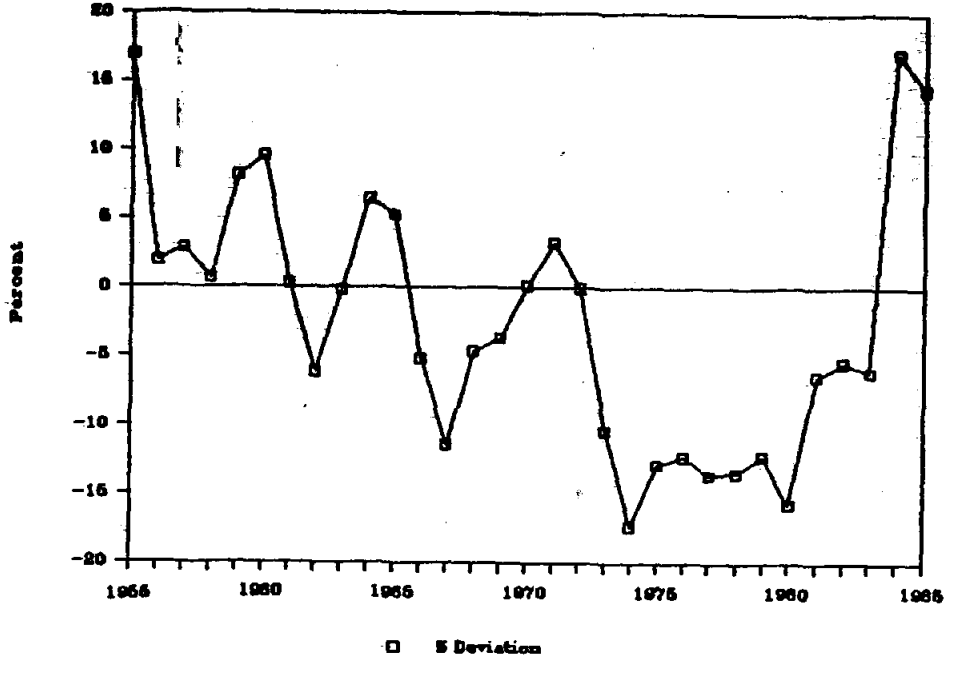
Plus sign refers to baht undervaluation against the foreign currency.

Figure 10

Percentage Deviation

Between Baht and U.S.dollar

(Based on Wholesale Price Index, 1972=100)



Minus sign indicates overvaluation of baht.

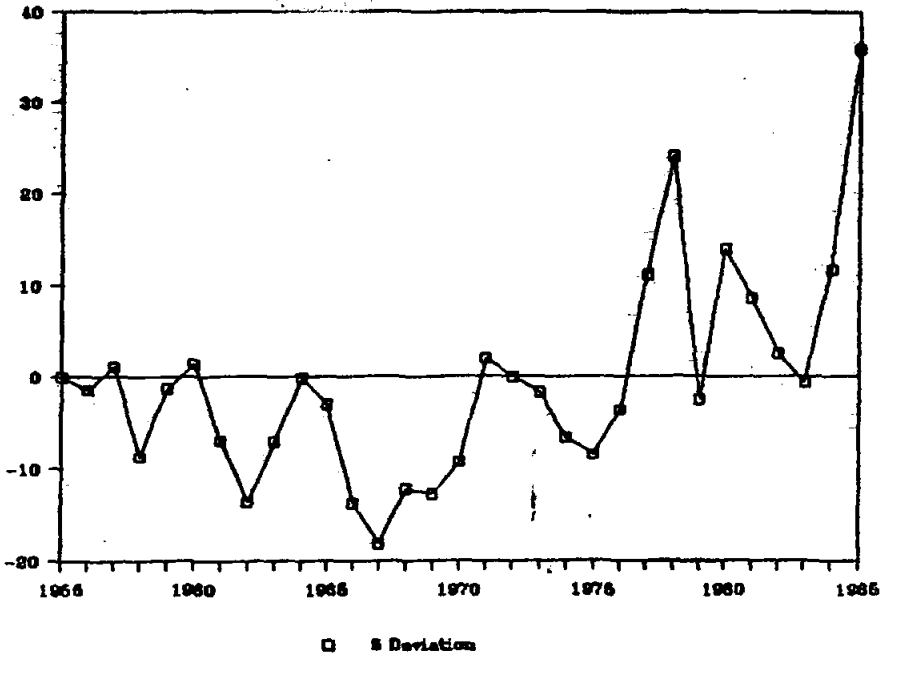
Plus sign refers to baht undervaluation against the foreign currency.

Figure 11

Percentage Deviation

Between Baht and Japanese Yen

(Based on Wholesale Price Index, 1972=100)



Minus sign indicates overvaluation of baht.

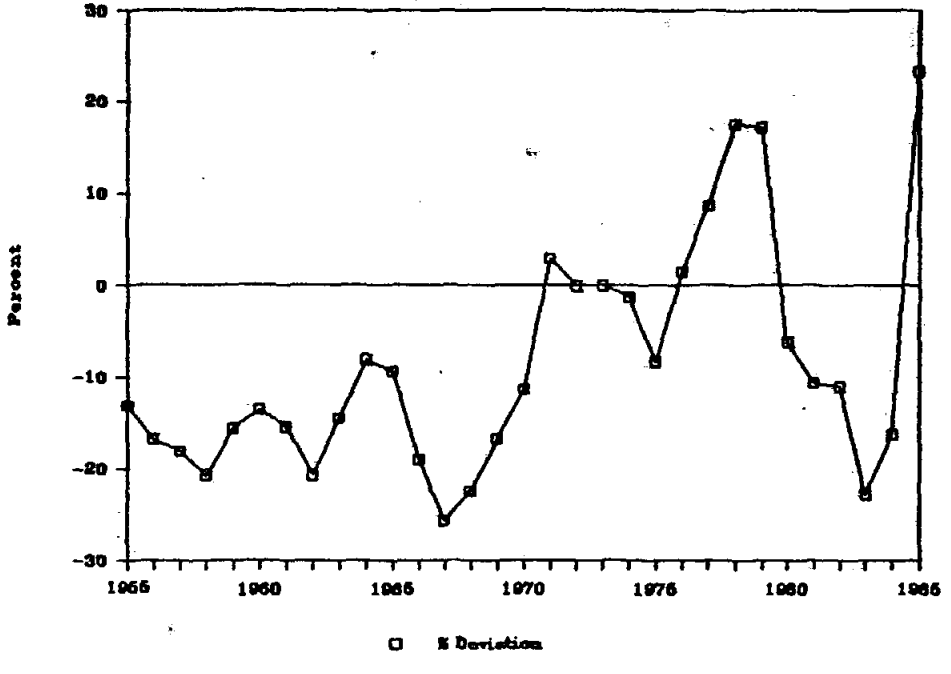
Plus sign refers to baht undervaluation against the foreign currency.

Figure 12

Percentage Deviation

Between Baht and Deutsche Mark

(Based on Wholesale Price Index, 1972=100)



Minus sign indicates overvaluation of baht.

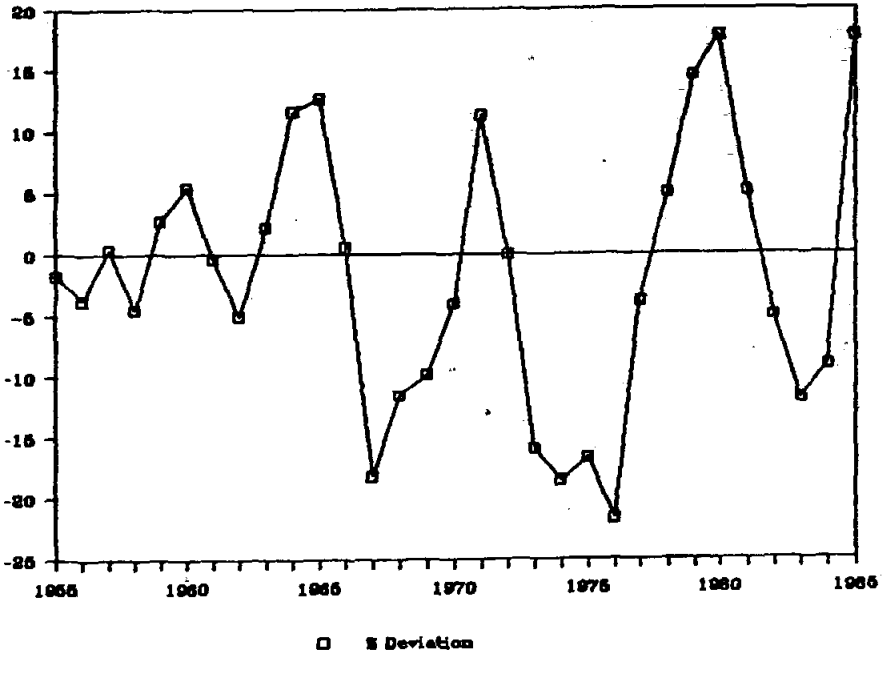
Plus sign refers to baht undervaluation against the foreign currency.

Figure 13

Percentage Deviation

Between Baht and Pound sterling

(Based on Wholesale Price Index, 1972=100)



Minus sign indicates overvaluation of baht.

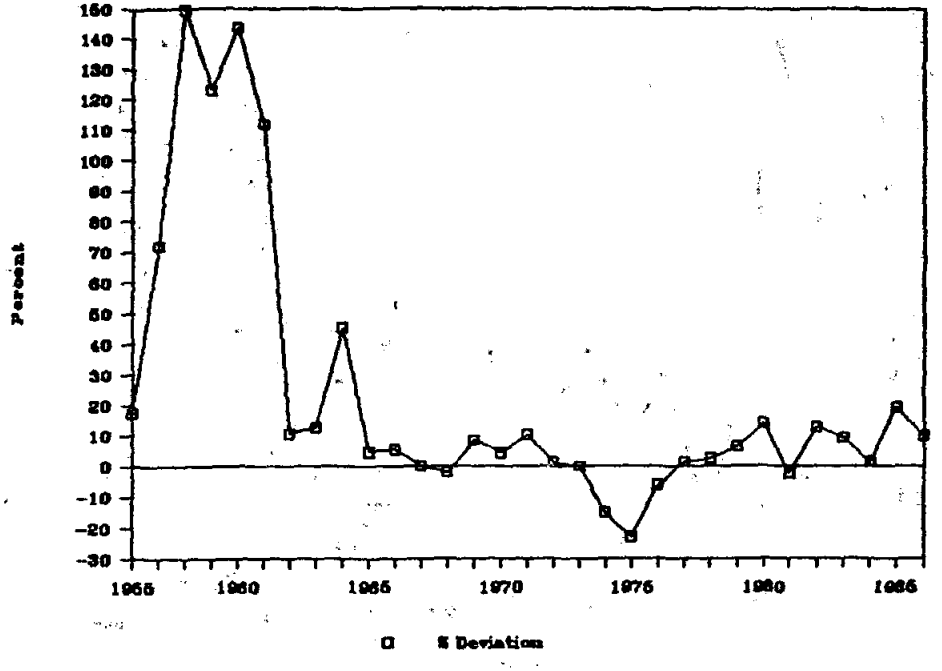
Plus sign refers to baht undervaluation against the foreign currency.

Figure 14

Percentage Deviation

Between Baht and Korea Won

(Based on Wholesale Price Index, 1972=100)



Minus sign indicates overvaluation of baht.

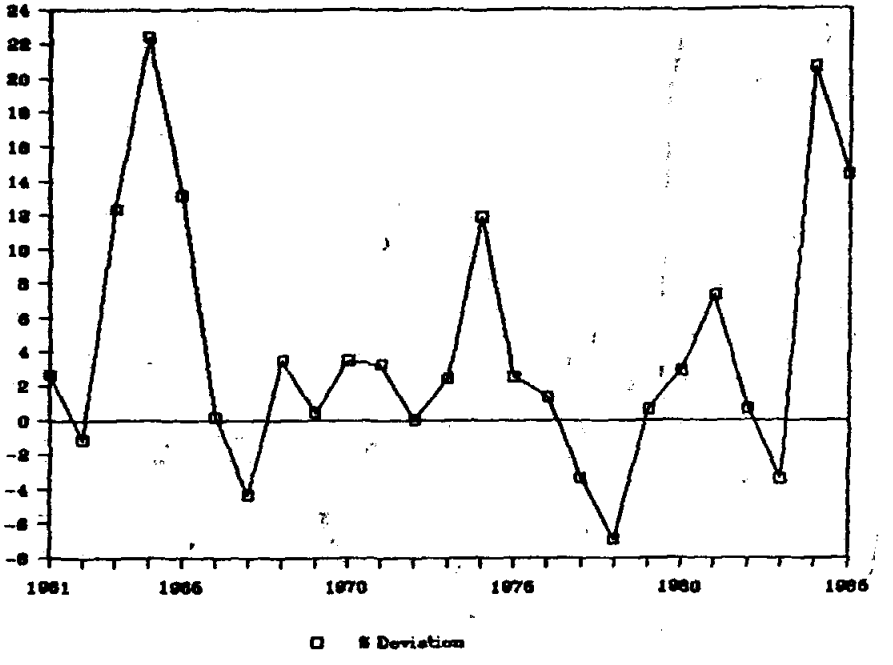
Plus sign refers to baht undervaluation against the foreign currency.

Figure 15

Percentage Deviation

Between Baht and Taiwan dollar

(Based on Wholesale Price Index, 1972=100)



Minus sign indicates overvaluation of baht.

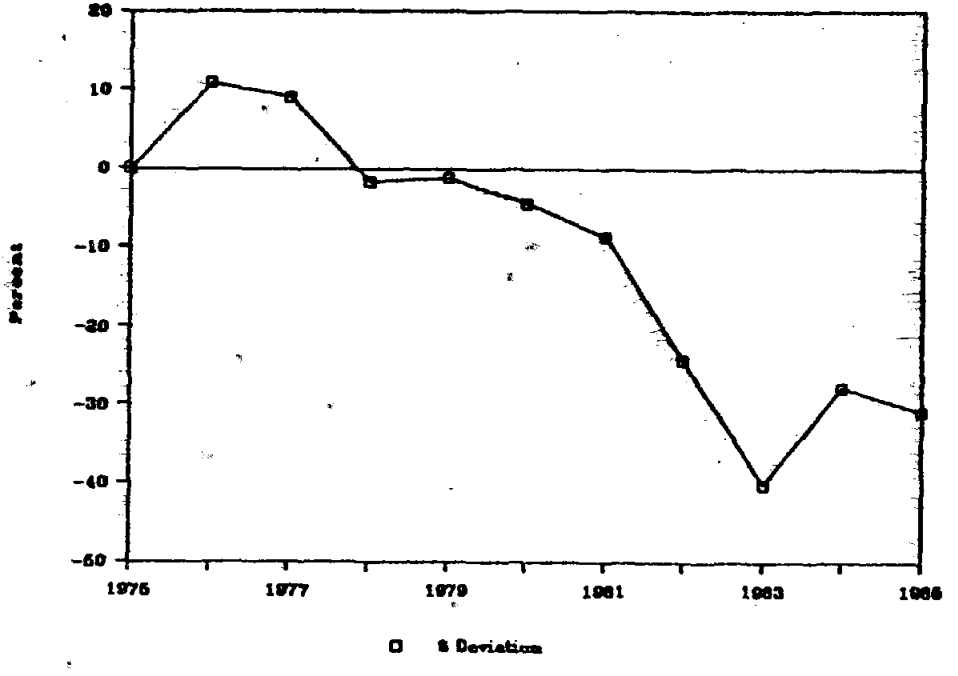
Plus sign refers to baht undervaluation against the foreign currency.

Figure 16

Percentage Deviation

Between Baht and Hongkong dollar

(Based on Wholesale Price Index, 1975=100)



Minus sign indicates overvaluation of baht.

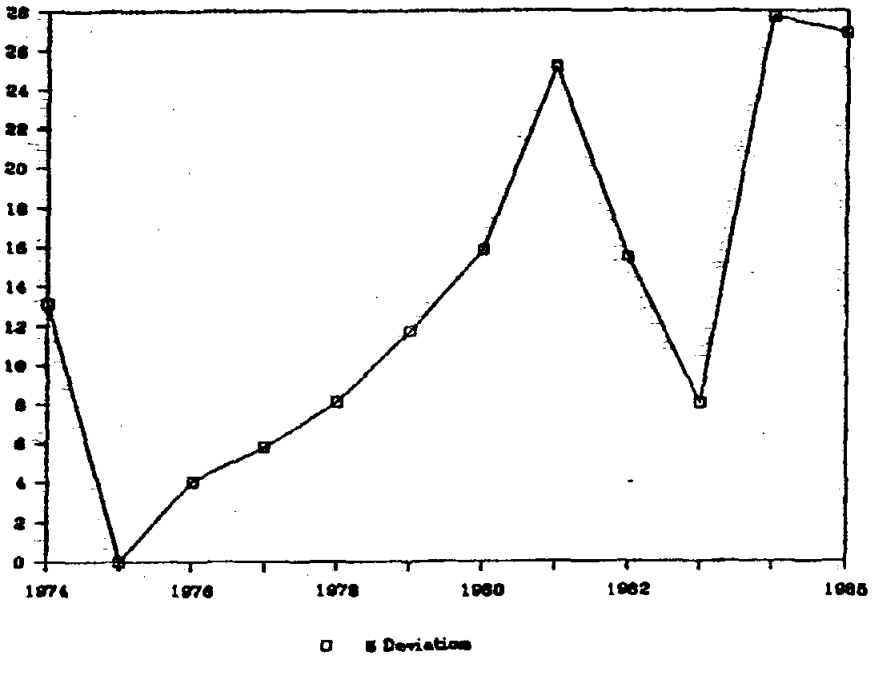
Plus sign refers to baht undervaluation against the foreign currency.

Figure 17

Percentage Deviation

Between Baht and Singapore dollar

(Based on Wholesale Price Index, 1975=100)



Minus sign indicates overvaluation of baht.

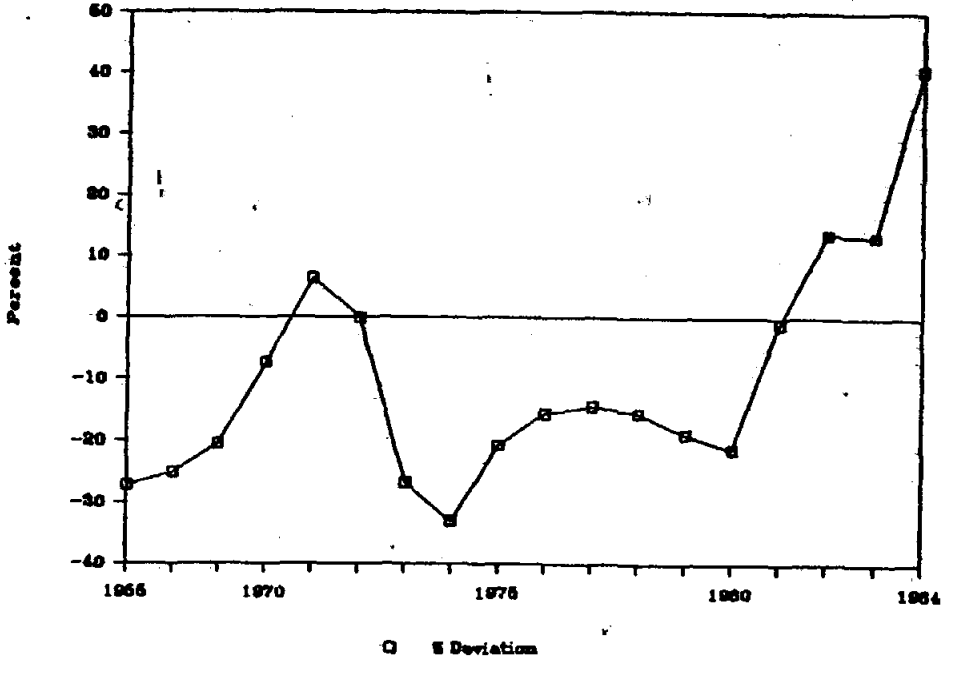
Plus sign refers to baht undervaluation against the foreign currency.

Figure 18

Percentage Deviation

Between Baht and U.S.dollar

(Based on the Index of Unit Value of Export in U.S.dollar)



Minus sign indicates overvaluation of baht.

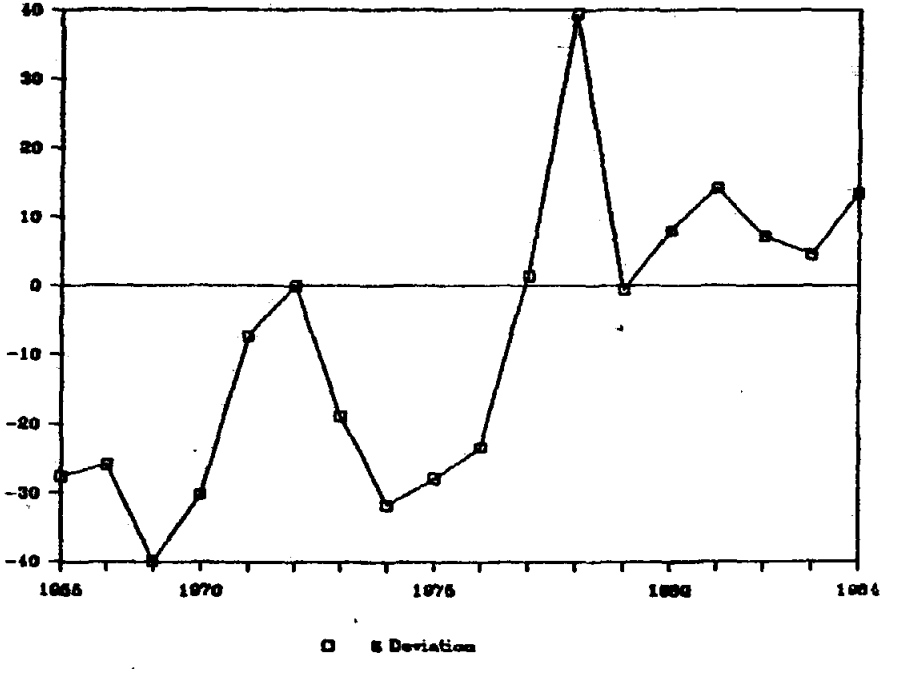
Plus sign refers to baht undervaluation against the foreign currency.

Figure 19

Percentage Deviation

Between Baht and Japanese Yen

(Based on the Index of Unit Value of Export in U.S.dollar)



Minus sign indicates overvaluation of baht.

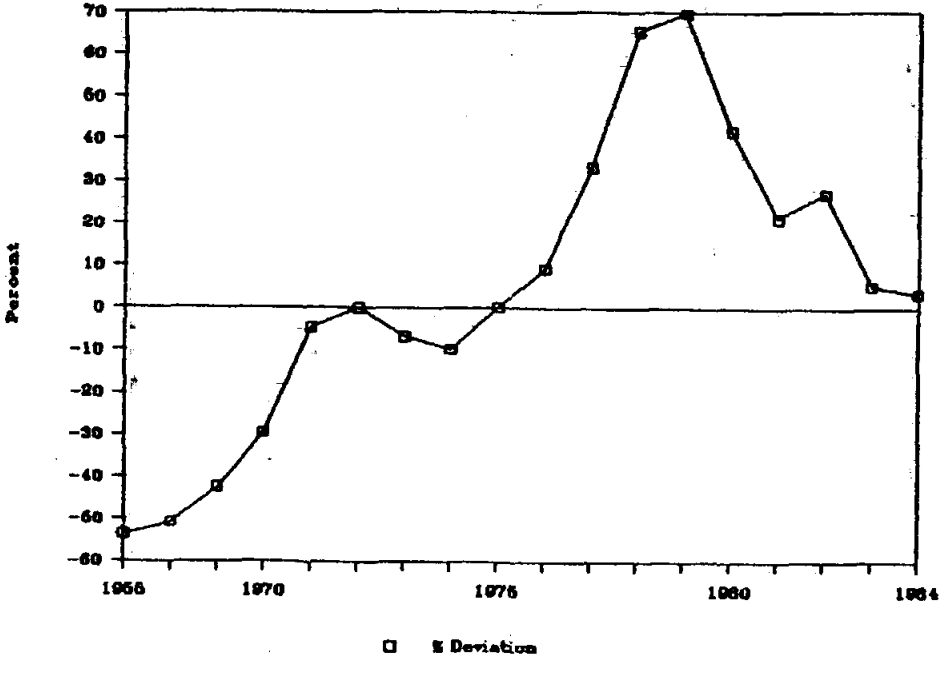
Plus sign refers to baht undervaluation against the foreign currency.

Figure 20

Percentage Deviation

Between Baht and Deutsche Mark

(Based on the Index of Unit Value of Export in U.S.dollar)



Minus sign indicates overvaluation of baht.

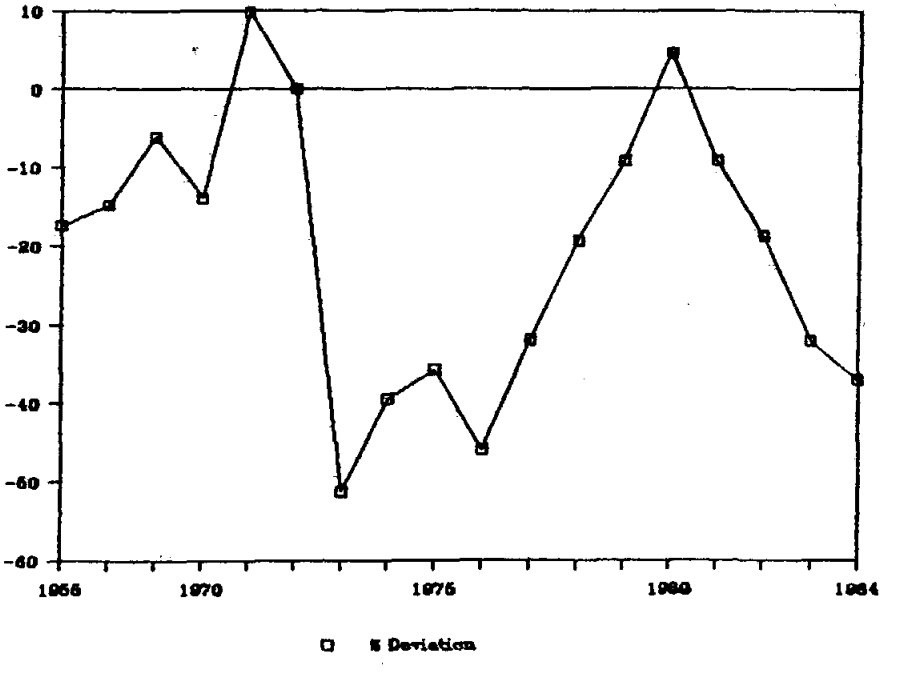
Plus sign refers ot baht undervaluation against the foreign currency.

Figure 21

Percentage Deviation

Between Baht and Pound sterling

(Based on the Index of Unit Value of Export in U.S.dollar)



Minus sign indicates overvaluation of baht.

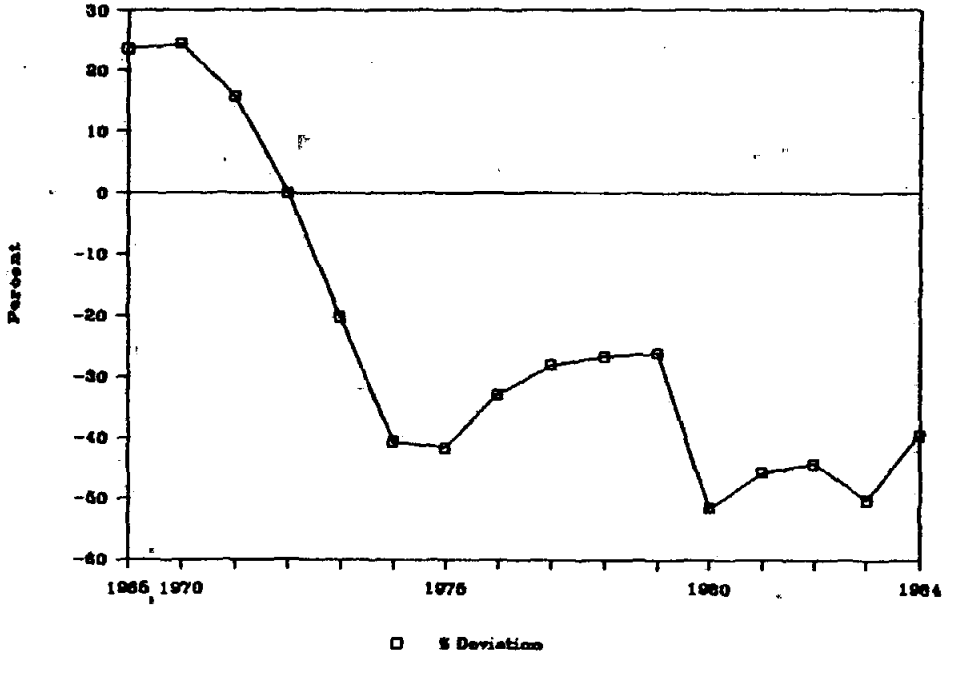
Plus sign refers to baht undervaluation against the foreign currency.

Figure 22

Percentage Deviation

Between Baht and Korea Won

(Based on the Index of Unit Value of Export in U.S.dollar)



Minus sign indicates overvaluation of baht.

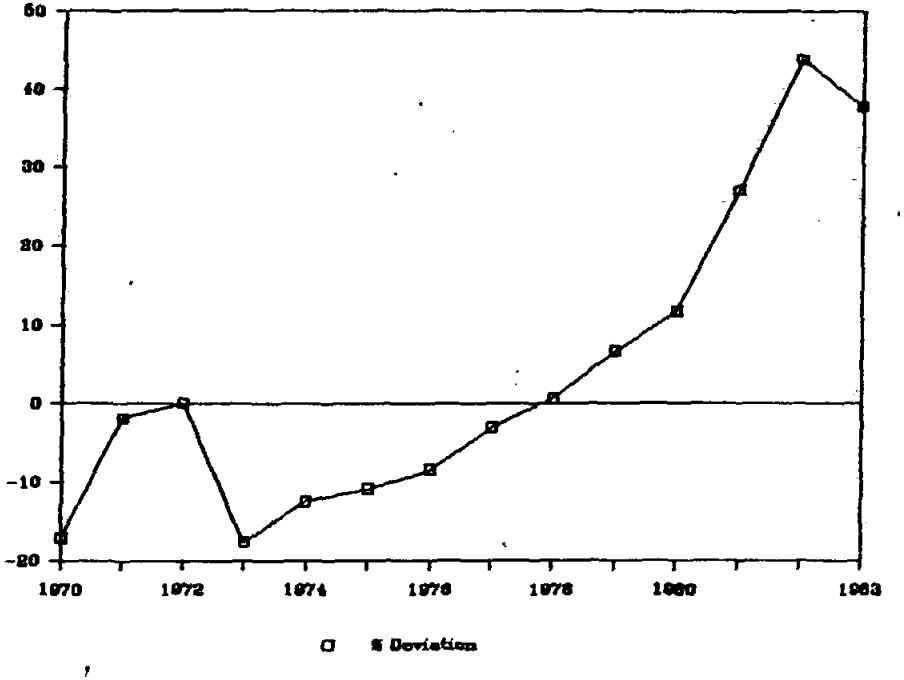
Plus sign refers to baht undervaluation against the foreign currency.

Figure 23

Percentage Deviation

Between Baht and Taiwan dollar

(Based on the Index of Unit Value of Export in U.S.dollar)



Minus sign indicates overvaluation of baht.

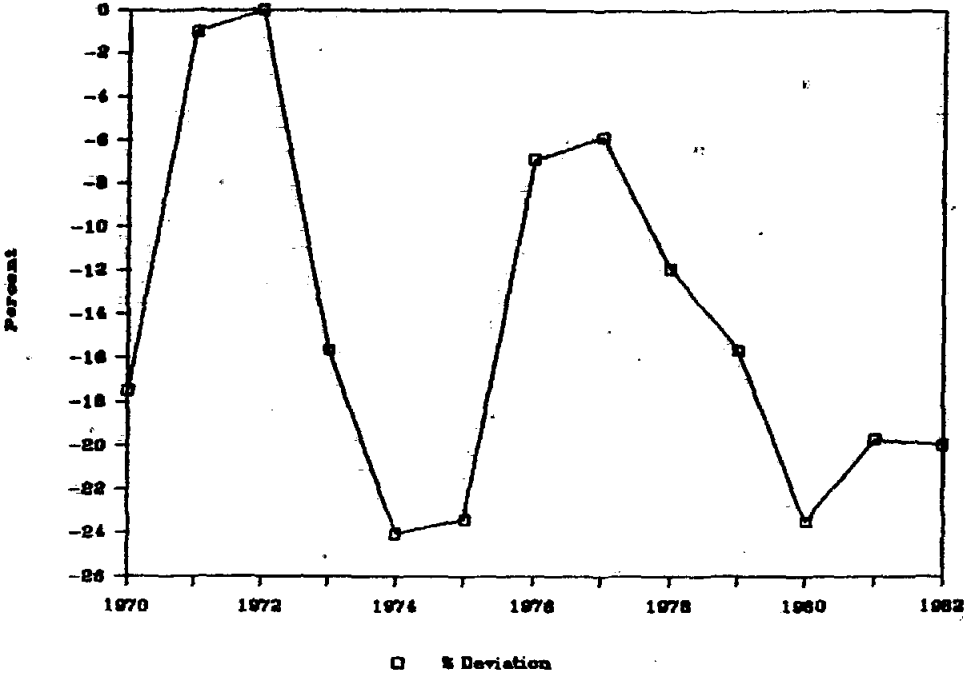
Plus sign refers to baht undervaluation against the foreign currency.

Figure 24

Percentage Deviation

Between Baht and Hongkong dollar

(Based on the Index of Unit Value of Export in U.S.dollar)



Minus sign indicates overvaluation of baht.

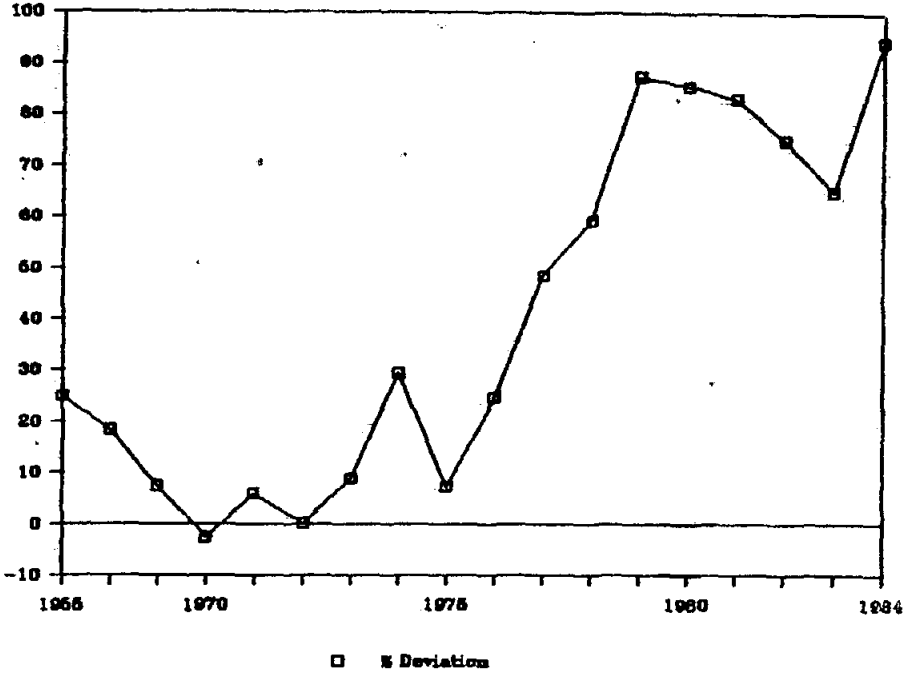
Plus sign refers to baht undervaluation against the foreign currency.

Figure 25

Percentage Deviation

Between Baht and Malaysian dollar

(Based on the Index of Unit Value of Export in U.S.dollar)



Minus sign indicates overvaluation of baht.

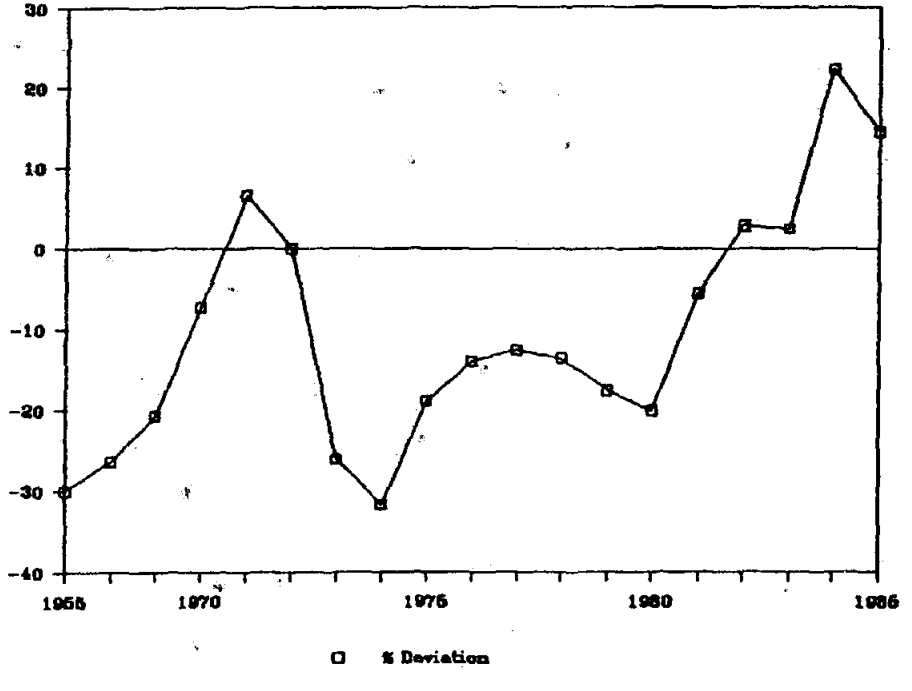
Plus sign refers to baht undervaluation against the foreign currency.

Figure 26

Percentage Deviation

Between Baht and U.S.dollar

(Based on the Index of Unit Value of Export in Domestic Currency)



Minus sign indicates overvaluation of baht.

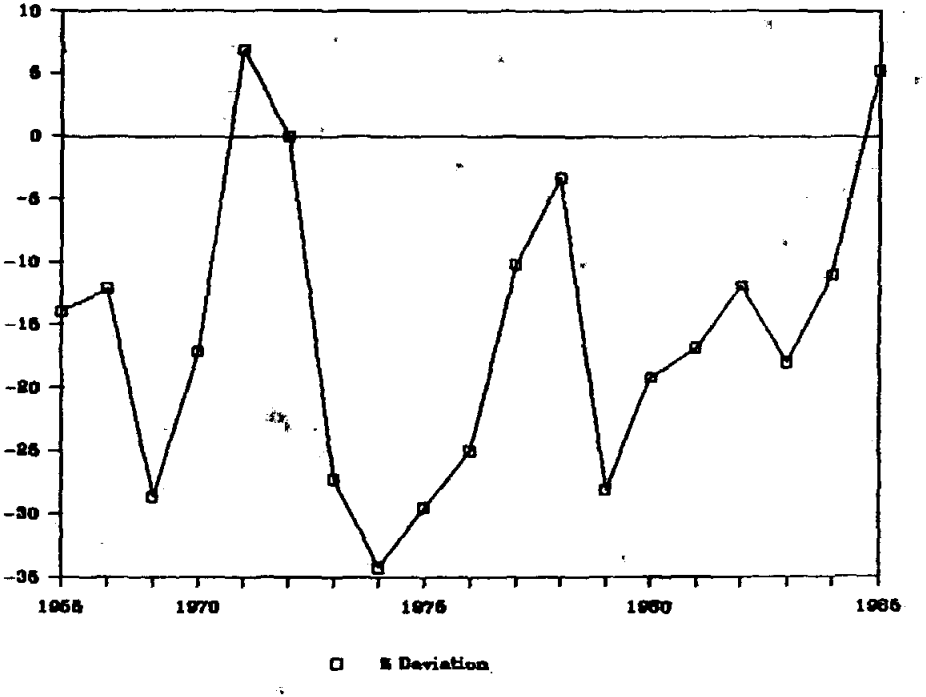
Plus sign refers to baht undervaluation against the foreign currency.

Figure 27

Percentage Deviation

Between Baht and Japanese Yen

(Based on the Index of Unit Value of Export in Domestic Currency)



Minus sign indicates overvaluation of baht.

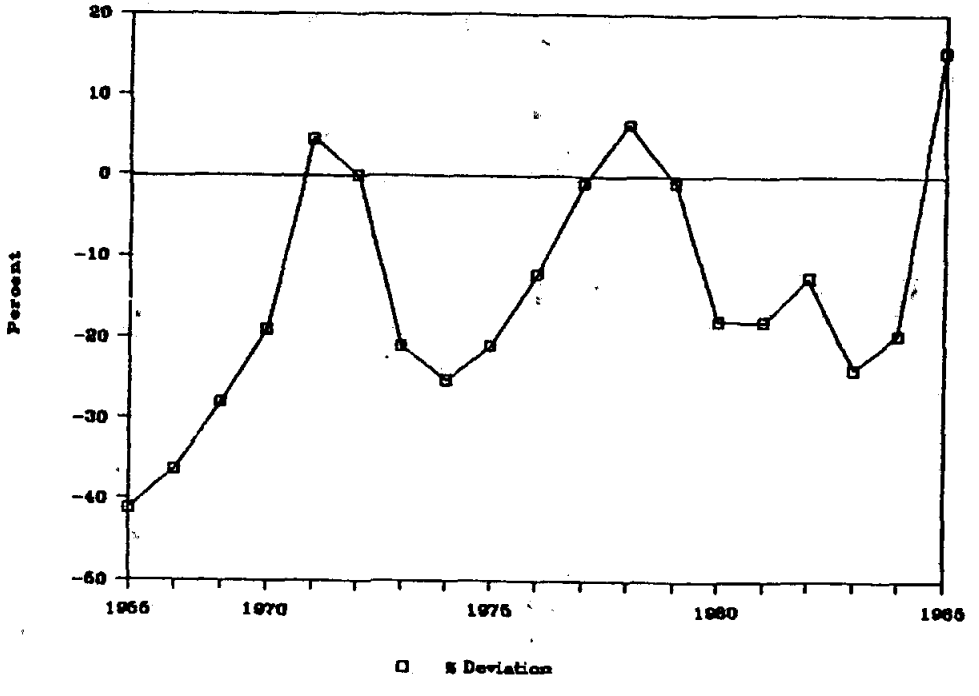
Plus sign refers to baht undervaluation against the foreign currency.

Figure 28

Percentage Deviation

Between Baht and Deutsche Mark

(Based on the Index of Unit Value of Export in Domestic Currency)



Minus sign indicates overvaluation of baht.

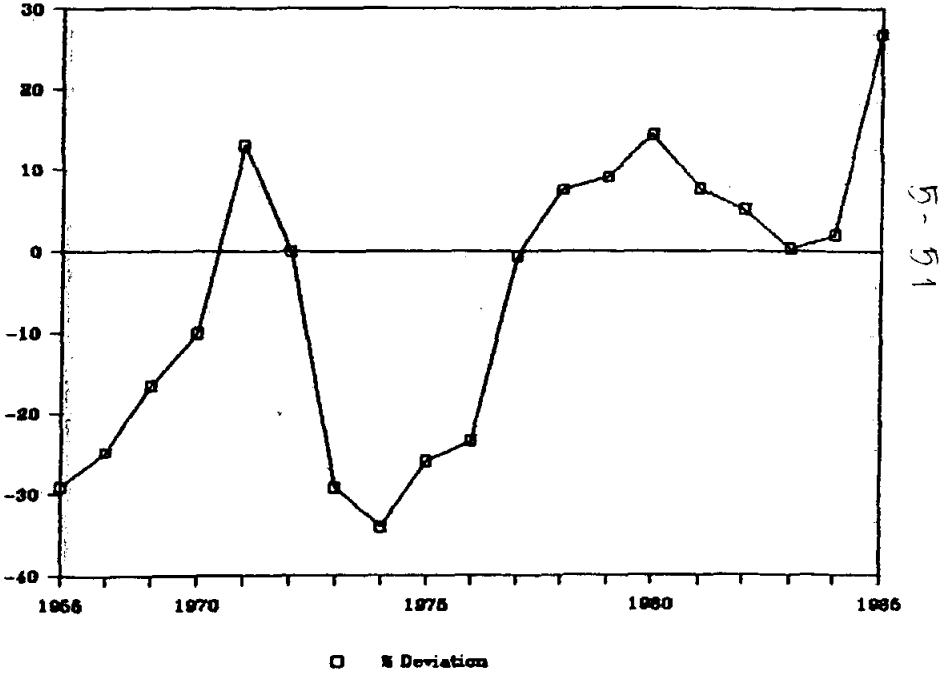
Plus sign refers to baht undervaluation against the foreign currency.

Figure 29

Percentage Deviation

Between Baht and Pound sterling

(Based on the Index of Unit Value of Export in Domestic Currency)



Minus sign indicates overvaluation of baht.

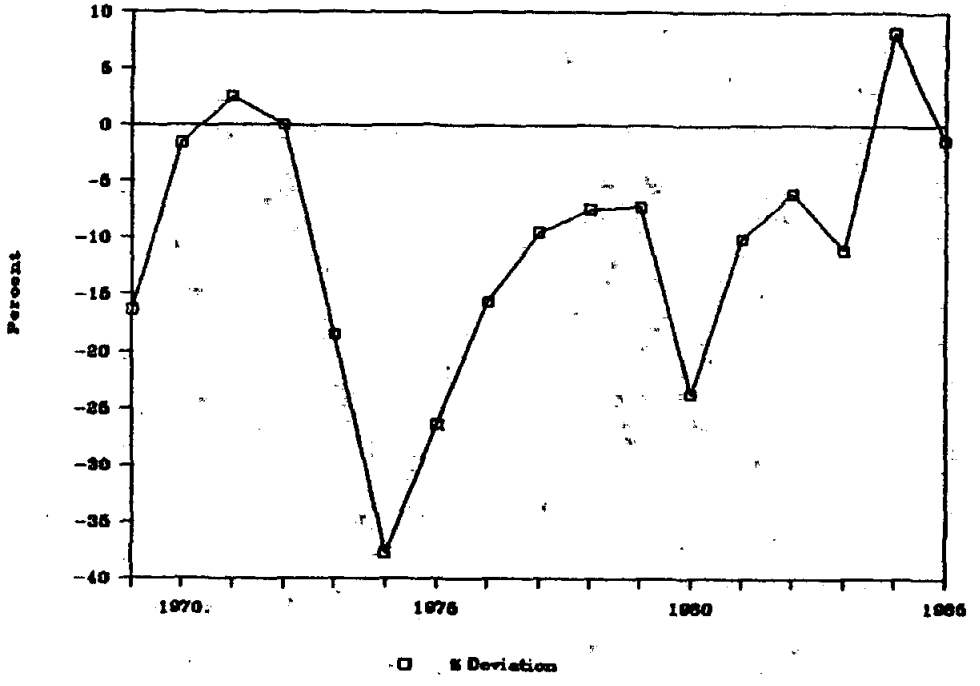
Plus sign refers to baht undervaluation against the foreign currenc

Figure 30

Percentage Deviation

Between Baht and Korea Won

(Based on the Index of Unit Value of Export in Domestic Currency)



Minus sign indicates overvaluation of baht.

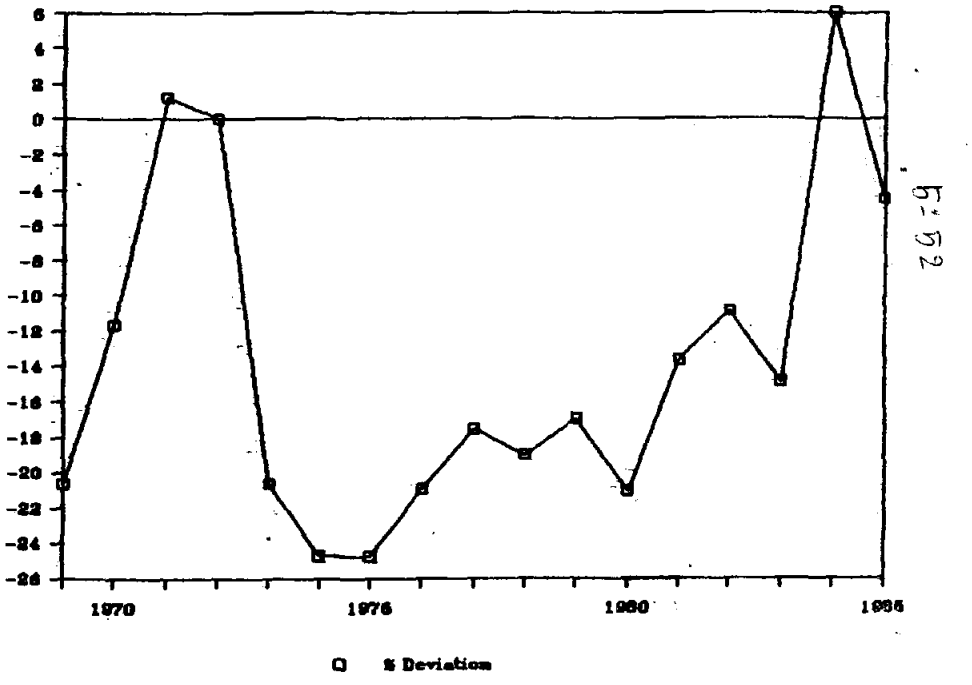
Plus sign refers to baht undervaluation against the foreign currency.

Figure 31

Percentage Deviation

Between Baht and Taiwan dollar

(Based on the Index of Unit Value of Export in Domestic Currency)



Minus sign indicates overvaluation of baht.

Plus sign refers to baht undervaluation against the foreign currenc

Table 4

Share of United States, Japan, Germany, United Kingdom and ASIAN NICs
In World Export Market, 1955-1985

(Percent)

	1955	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Value of World Trade (Billions of U.S.$)	87.3	105.3	100.7	106.5	118.1	122.7	128.1	140.6	157.0	170.4	187.0	195.3	217.8	249.2	286.5
World	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
United States	17.821	19.822	17.795	16.566	17.444	17.145	16.951	16.634	16.975	16.156	16.275	16.201	15.917	12.051	15.093
Japan	2.304	2.714	2.857	3.245	3.434	3.452	3.838	3.878	4.250	4.960	5.228	5.347	5.955	6.417	6.743
Germany	7.014	8.133	8.749	9.208	9.666	10.311	10.339	10.368	10.338	10.512	10.779	11.142	11.427	11.578	11.947
United Kingdom	9.699	9.317	9.429	9.344	8.983	9.025	8.879	8.718	8.204	8.104	7.898	7.421	7.099	7.081	6.782
Hongkong	0.507	0.501	0.519	0.539	0.583	0.561	0.600	0.621	0.645	0.671	0.708	0.782	0.801	0.874	0.877
Korea	0.021	0.021	0.017	0.019	0.028	0.033	0.043	0.062	0.076	0.103	0.134	0.164	0.209	0.250	0.291
Taiwan	n.a.	0.141	0.155	0.147	0.139	0.159	0.170	0.236	0.276	0.264	0.287	0.328	0.362	0.421	0.517
Malaysia	1.103	0.868	0.803	0.977	1.005	0.864	0.833	0.779	0.704	0.725	0.672	0.623	0.618	0.663	0.589
Singapore	1.261	1.079	1.019	1.055	0.962	0.881	0.871	0.807	0.577	0.576	0.589	0.584	0.584	0.622	0.542
Thailand	0.384	0.374	0.306	0.337	0.348	0.389	0.358	0.329	0.378	0.365	0.363	0.349	0.302	0.284	0.248

Source : 1. Directorate-General of Budget, Accounting and Statistics, Statistical Yearbook of The Republic of China, various issues.
2. United Nations, International Trade Statistics Yearbook, various issues.
3. Economics Office ASIAN Development Bank, Key Indicators of Developing Member Countries of ADB, various issues.

Table A (Continued)

Share of United States, Japan, Germany, United Kingdom and ASIAN NICs
In World Export Market, 1955-1985

(Percent)

	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
Value of World Trade (Billions of U.S.$)	321.0	382.2	532.7	789.2	809.7	919.8	1044.1	1206.5	1530.6	1874.7	1851.2	1716.2	1665.6	1764.5	1784.3
World	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
United States	13.756	13.025	13.404	12.488	13.352	12.547	11.611	11.916	11.892	11.777	12.626	12.369	12.040	12.349	11.946
Japan	7.514	7.611	6.949	7.029	6.894	7.317	7.766	8.140	6.684	6.958	8.184	8.063	8.824	9.617	9.929
Germany	12.169	12.228	12.683	11.324	11.137	11.140	11.308	11.807	11.225	10.288	9.512	10.281	10.173	9.732	10.307
United Kingdom	6.884	6.276	5.564	4.840	5.363	4.931	5.350	5.627	5.645	5.876	5.523	5.653	5.502	5.314	5.674
Hongkong	0.896	0.899	0.952	0.756	0.744	0.922	0.921	0.952	0.989	1.052	1.178	1.223	1.318	1.605	1.692
Korea	0.333	0.425	0.605	0.565	0.628	0.839	0.962	1.054	0.984	0.934	1.148	1.273	1.468	1.657	1.657
Taiwan	0.642	0.782	0.841	0.714	0.654	0.886	0.894	1.050	1.051	1.055	1.216	1.292	1.507	1.724	1.720
Malaysia	0.512	0.451	0.572	0.537	0.475	0.576	0.582	0.614	0.724	0.691	0.636	0.701	0.847	0.934	0.865
Singapore	0.549	0.573	0.686	0.736	0.664	0.716	0.789	0.840	0.930	1.033	1.133	1.211	1.311	1.364	1.278
Thailand	0.259	0.283	0.294	0.310	0.273	0.324	0.334	0.339	0.346	0.347	0.380	0.405	0.382	0.420	0.399

Source : 1. Directorate-General of Budget, Accounting and Statistics, Statistical Yearbook of The Republic of China, various issues.
2. United Nations, International Trade Statistics Yearbook, various issues.
3. Economics Office ASIAN Development Bank, Key Indicators of Developing Member Countries of ADB, various issues.

Table 8

Share of Japan, Germany, United Kingdom and ASIAN NICs
In The U.S. Market, 1967-1984

(Percent)

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
World Export to U.S.																		
(Billions of U.S.$)	26.82	33.09	36.04	39.95	45.56	55.56	69.48	101.00	96.90	121.79	147.86	182.20	217.39	250.28	271.21	253.03	267.97	338.19
WORLD	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
JAPAN	11.18	12.25	13.56	14.71	15.93	16.32	13.93	12.33	11.79	12.88	12.78	14.51	12.95	13.13	14.69	15.77	16.24	17.85
GERMANY	7.29	8.22	7.22	7.83	8.01	7.65	7.69	6.37	5.58	4.68	4.98	5.80	5.34	4.94	4.39	4.94	4.93	5.26
United Kingdom	6.38	6.20	5.88	5.49	5.48	5.38	5.26	3.98	3.89	3.52	3.46	3.79	3.91	3.97	4.91	5.34	4.81	4.36
TAIWAN	0.62	0.84	1.10	1.41	1.88	2.25	2.41	2.01	1.88	2.49	2.45	2.67	2.59	2.69	2.92	3.37	4.20	4.40
KOREA	0.44	0.60	0.81	0.93	1.01	1.27	1.40	1.45	1.49	2.40	1.98	2.24	2.00	1.77	2.02	2.37	2.85	2.96
HONGKONG	1.86	1.92	2.26	2.36	2.17	2.25	2.09	1.62	1.62	1.98	1.96	2.07	1.97	2.01	2.12	2.33	2.54	2.63
SINGAPORE	0.06	0.09	0.15	0.20	0.30	0.48	0.67	0.55	0.55	0.57	0.60	0.61	0.70	0.79	0.81	0.90	1.11	1.22
MALAYSIA	0.73	0.73	0.85	0.68	0.59	0.54	0.63	0.77	0.80	0.77	0.90	0.88	1.03	1.07	0.84	0.77	0.82	0.83
THAILAND	0.36	0.24	0.26	0.25	0.21	0.21	0.20	0.18	0.24	0.24	0.24	0.26	0.30	0.35	0.37	0.38	0.39	0.42

Source : 1. Directorate-General of Budget, Accounting and Statistics, Statistical Yearbook of The Republic of China, various issues.
2. United Nations, International Trade Statistics Yearbook, various issues.
3. Economics Office ASIAN Development Bank, Key Indicators of Developing Member Countries of ADB, various issues.

Table 1

Percentage Deviation of the Actual Foreign Exchange Rate
from the Estimated Purchasing-Power-Parity (PPP) Rate, 1955-1985, B/US.$

(1972 = 100)

Year	Official or Market Exchange Rate (B/US$)	Purchasing Power Parity Rate [a] (B/US$)	Percentage Deviation [b] (%)
1955	21.23	22.10	-3.82
1960	21.14	22.42	-5.73
1965	20.83	23.35	-10.79
1970	20.93	21.43	-2.35
1971	20.83	20.61	1.54
1972	20.93	20.93	0.00
1973	20.38	22.76	-10.47
1974	20.38	25.51	-20.14
1975	20.40	24.62	-17.13
1976	20.40	24.23	-15.79
1977	20.40	24.45	-16.55
1978	20.38	24.52	-16.86
1979	20.43	24.22	-15.68
1980	20.63	25.56	-19.28
1981	23.00	26.09	-11.84 (-20.93 [c])
1982	23.00	25.88	-11.14
1983	23.00	26.00	-11.54
1984	27.15	25.15	7.95 (-8.55 [c])
1985	26.65	24.89	7.07

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] It is based on the consumer price index comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of the baht against the U.S. dollar. Roundings are made to two decimal points after calculations.

[c] There were two relatively large official devaluations during 1981-1984. Had the baht not been devalued by 1.07 and 8.7 percent in May and July 1981, the overvaluation of the domestic currency would be, by purchasing-power-parity, 20.93 percent in 1981. The devaluation of the baht by 14.81 percent in November 1984 reverted the baht from overvaluation to undervaluation.

Table 2

Percentage Deviation of the Actual Foreign Exchange Rate
from the Estimated Purchasing-Power-Parity (PPP) Rate, 1955-1985, B/Yen

(1972=100)

Year	Official or Market Exchange Rate (B/Yen)	Purchasing Power Parity Rate [a] (B/Yen)	Percentage Deviation [b] (%)
1955	0.06	0.10	-39.69
1960	0.06	0.10	-41.97
1965	0.06	0.08	-31.20
1970	0.06	0.07	-19.79
1971	0.07	0.07	-3.52
1972	0.07	0.07	0.00
1973	0.07	0.07	1.68
1974	0.07	0.07	-5.36
1975	0.07	0.07	-0.83
1976	0.07	0.06	8.51
1977	0.09	0.06	33.06
1978	0.10	0.07	57.76
1979	0.09	0.07	29.95
1980	0.10	0.08	36.08
1981	0.10	0.08	24.61
1982	0.10	0.09	13.76
1983	0.10	0.09	12.97
1984	0.11	0.09	25.01
1985	0.13	0.09	53.40

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] It is based on the consumer price index comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 3

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1955-1985, B/DM

(1972 = 100)

Year	Official or Market Exchange Rate (B/DM)	Purchasing Power Parity Rate [a] (B/DM)	Percentage Deviation [b] (%)
1955	5.04	6.94	-27.38
1960	5.07	7.10	-28.61
1965	5.20	6.88	-24.23
1970	5.74	6.89	-16.72
1971	6.40	6.57	-2.57
1972	6.54	6.54	0.00
1973	7.54	7.05	6.88
1974	8.46	8.21	3.05
1975	7.78	8.16	-4.67
1976	8.63	8.14	6.00
1977	9.69	8.44	14.78
1978	11.15	8.87	25.68
1979	11.00	9.36	26.02
1980	10.53	10.64	-1.01
1981	10.20	11.28	-9.56
1982	9.68	10.52	-8.03
1983	8.44	11.32	-25.40
1984	8.62	11.15	-22.65
1985	12.42	11.17	11.12

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the consumer price index comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 4

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1955-1985, B/UK Pound

(1972 = 100)

Year	Official or Market Exchange Rate (B/UK Pound)	Purchasing Power Parity Rate [a] (B/UK Pound)	Percentage Deviation [b] (%)
1955	59.52	64.00	-7.05
1960	59.27	65.02	-8.84
1965	58.38	60.35	-3.27
1970	50.10	54.75	-8.49
1971	53.42	50.17	6.46
1972	49.14	49.14	0.00
1973	47.34	51.91	-8.81
1974	47.85	55.77	-14.19
1975	41.28	47.26	-12.65
1976	34.73	42.19	-17.69
1977	38.88	39.17	-0.74
1978	41.48	39.06	6.21
1979	45.43	37.80	20.16
1980	49.20	38.39	28.16
1981	43.88	38.67	13.50
1982	37.13	37.48	-0.91
1983	33.36	37.15	-10.20
1984	31.69	35.71	-12.08
1985	38.50	34.48	11.63

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the consumer price index comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 5

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1955-1985, B/KRW

(1972 = 100)

Year	Official or Market Exchange Rate (B/KRW)	Purchasing Power Parity Rate [a] (B/KRW)	Percentage Deviation [b] (%)
1955	0.42469	0.02691	57.76
1960	0.32523	0.18300	77.72
1965	0.07664	0.10055	-23.78
1970	0.06609	0.06306	4.82
1971	0.05606	0.05569	0.67
1972	0.05246	0.05246	0.00
1973	0.05126	0.05866	-12.61
1974	0.04210	0.05861	-28.17
1975	0.04216	0.04932	-14.53
1976	0.04216	0.04455	-5.40
1977	0.04215	0.04346	-3.03
1978	0.04213	0.04099	2.77
1979	0.04220	0.03808	10.81
1980	0.03126	0.03544	-11.78
1981	0.03283	0.03293	-0.28
1982	0.03072	0.03231	-4.92
1983	0.02891	0.03241	-10.79
1984	0.03281	0.03196	2.67
1985	0.02994	0.03195	-6.29

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the consumer price index comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 6

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1955-1985, B/TWS

(1972 = 100)

Year	Official or Market Exchange Rate (B/TWS)	Purchasing Power Parity Rate [a] (B/TWS)	Percentage Deviation [b] (%)
1955	-	-	-
1960	-	-	-
1965	0.61965	0.45841	13.32
1970	0.52190	0.50918	2.50
1971	0.52190	0.49693	5.02
1972	0.52190	0.52190	0.00
1973	0.53478	0.57663	-7.26
1974	0.53568	0.57797	-7.35
1975	0.53614	0.43741	22.57
1976	0.53614	0.47982	11.74
1977	0.53614	0.50190	6.82
1978	0.53587	0.52721	1.64
1979	0.56610	0.55949	1.18
1980	0.57210	0.58865	-2.81
1981	0.60702	0.54583	11.21
1982	0.57550	0.53374	7.84
1983	0.57044	0.55453	2.87
1984	0.68699	0.56618	21.34
1985	0.66792	0.59244	12.74

Sources : 1. International Monetary Fund, International Financial Statistics, various issues.
2. Directorate-General of Budget, Accounting and Statistics, Statistical Yearbook of The Republic of China, various issues.

[a] The calculation is made on the consumer price index comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 7

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1965-1985, B/HK$

(1972 = 100)

Year	Official or Market Exchange Rate (B/HK$)	Purchasing Power Parity Rate [a] (B/HK$)	Percentage Deviation [b] (%)
1955	-	-	-
1960	-	-	-
1965	3.65	4.19	-12.90
1970	3.45	3.84	-10.07
1971	3.45	3.74	-7.61
1972	3.68	3.68	0.00
1973	4.03	3.59	12.24
1974	2.57	3.92	-34.47
1975	4.05	4.09	-1.04
1976	4.36	4.18	4.37
1977	4.42	4.24	4.09
1978	4.24	4.30	-1.49
1979	4.12	4.25	-3.14
1980	4.01	4.38	-8.41
1981	4.04	4.28	-5.53
1982	3.53	4.08	-13.44
1983	2.95	3.85	-23.25
1984	3.47	3.59	-3.47
1985	3.41	3.57	-4.45

Sources : 1. International Monetary Fund, International Financial Statistics, various issues.
2. United Nations, Statistical Yearbook for Asia and The Pacific, various issues.

[a] The calculation is made on the consumer price index comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 8

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1960-1985, B/$

(1972 = 100)

Year	Official or Market Exchange Rate (B/$)	Purchasing Power Parity Rate [a] (B/$)	Percentage Deviation [b] (%)
1955	-	-	-
1960	6.91	6.52	5.94
1965	6.81	6.88	-1.07
1970	6.79	7.34	-7.38
1971	7.22	7.23	-0.23
1972	7.42	7.42	0.00
1973	8.20	7.17	14.27
1974	8.81	7.28	20.93
1975	8.19	7.46	9.61
1976	8.31	7.94	4.67
1977	8.72	8.27	5.50
1978	9.42	8.51	10.70
1979	9.46	9.00	5.13
1980	9.86	9.94	-0.83
1981	11.23	10.34	8.62
1982	10.91	10.48	4.04
1983	10.81	10.74	0.68
1984	12.47	10.56	18.07
1985	12.66	10.77	17.59

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the consumer price index comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 9

Percentage Deviation of the Actual Foreign Exchange Rate
from the Purchasing-Power-Parity (PPP) Rate, 1955-1985, B/M$

(1972 = 100)

Year	Official or Market Exchange Rate (B/M$)	Purchasing Power Parity Rate [a] (B/M$)	Percentage Deviation [b] (%)
1955	6.94	5.67	18.17
1960	6.91	6.47	6.83
1965	6.81	6.99	-2.56
1970	6.80	7.40	-8.16
1971	7.25	7.31	-0.75
1972	7.43	7.43	0.00
1973	8.31	7.76	7.09
1974	8.81	8.22	7.20
1975	7.88	8.29	-4.95
1976	8.05	8.41	-4.36
1977	8.62	8.63	-0.12
1978	9.24	8.88	4.11
1979	9.33	9.42	-0.96
1980	9.28	10.57	-12.20
1981	10.26	10.86	-5.56
1982	9.91	10.80	-8.26
1983	9.84	10.80	-8.93
1984	11.20	10.49	6.75
1985	10.98	10.71	2.58

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the consumer price index comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 10

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1955-1985, B/US$

(1972 = 100)

Year	Official or Market Exchange Rate (B/US$)	Purchasing Power Parity Rate [a] (B/US$)	Percentage Deviation [b] (%)
1955	21.23	20.83	1.92
1960	21.14	19.29	9.57
1965	20.83	19.79	5.24
1970	20.93	20.89	0.20
1971	20.93	20.26	3.28
1972	20.93	20.93	0.00
1973	20.38	22.74	-10.40
1974	20.38	24.66	-17.37
1975	20.40	23.41	-12.87
1976	20.40	23.25	-12.26
1977	20.40	23.62	-13.62
1978	20.39	23.55	-13.41
1979	20.43	23.27	-12.23
1980	20.63	24.49	-15.76
1981	23.00	24.58	-6.41 (-16.07 [c])
1982	23.00	24.31	-5.38
1983	23.00	24.50	-6.11
1984	27.15	23.19	17.09 (-0.82 [c])
1985	26.65	23.27	14.51

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the wholesale price index comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of the baht against the U.S. dollar. Roundings are made to two decimal points after calculations.

[c] There were two relatively large official devaluations during 1981-1984. Had the baht not been devalued by 1.07 and 8.7 percent in May and July 1981, the overvaluation of the domestic currency would be, by purchasing-power-parity, 16.07 percent in 1981. The devaluation of the baht by 14.81 percent in November 1984 reverted the baht from overvaluation to undervaluation.

Table 11

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1955-1985, B/YEN

(1972 = 100)

Year	Official or Market Exchange Rate (B/YEN)	Purchasing Power Parity Rate [a] (B/YEN)	Percentage Deviation [b] (%)
1955	0.05884	0.05971	-1.45
1960	0.05901	0.05821	1.39
1965	0.05772	0.05952	-3.04
1970	0.05852	0.06450	-9.27
1971	0.06648	0.06520	1.96
1972	0.06930	0.06930	0.00
1973	0.07277	0.07408	-1.78
1974	0.06770	0.07253	-6.65
1975	0.06685	0.07305	-8.48
1976	0.06967	0.07230	-3.64
1977	0.08500	0.07650	11.11
1978	0.10478	0.08439	24.15
1979	0.08521	0.08744	-2.55
1980	0.10163	0.08916	13.98
1981	0.10459	0.09630	8.61
1982	0.09787	0.09548	2.51
1983	0.09905	0.09965	-0.60
1984	0.10812	0.09676	11.74
1985	0.13292	0.09786	35.83

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the wholesale price index comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 12

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1955-1985, B/DM

(1972 = 100)

Year	Official or Market Exchange Rate (B/DM)	Purchasing Power Parity Rate [a] (B/DM)	Percentage Deviation [b] (%)
1955	5.04	6.05	-16.72
1960	5.07	5.86	-13.52
1965	5.20	5.74	-9.40
1970	5.74	6.47	-11.35
1971	6.40	6.22	2.91
1972	6.54	6.54	0.00
1973	7.54	7.54	0.02
1974	8.46	8.56	-1.24
1975	7.78	8.49	-8.34
1976	8.63	8.51	1.50
1977	9.69	8.82	8.59
1978	11.15	9.48	17.61
1979	11.88	10.06	17.21
1980	10.53	11.24	-6.28
1981	10.20	11.41	-10.64
1982	9.68	10.88	-11.05
1983	8.44	10.94	-22.81
1984	8.62	10.30	-16.30
1985	12.42	10.07	23.37

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the wholesale price index comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 13

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1955-1985, B/UK POUND

(1972 = 100)

Year	Official or Market Exchange Rate (B/UK POUND)	Purchasing Power Parity Rate [a] (B/UK POUND)	Percentage Deviation [b] (%)
1955	59.52	61.80	-3.69
1960	58.27	56.19	5.53
1965	58.38	51.81	12.68
1970	50.70	52.19	-4.01
1971	53.42	47.99	11.32
1972	49.14	49.14	0.00
1973	47.34	56.30	-15.92
1974	47.85	58.78	-18.59
1975	41.20	49.63	-16.66
1976	34.73	44.32	-21.64
1977	38.88	40.42	-3.79
1978	41.48	39.53	4.95
1979	45.43	39.66	14.55
1980	49.20	41.77	17.80
1981	43.88	41.76	5.10
1982	37.13	39.11	-5.05
1983	33.36	37.86	-11.87
1984	31.49	34.56	-9.14
1985	38.50	32.72	17.66

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the wholesale price index comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 14

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1955-1985, B/KRW

(1972 = 100)

Year	Official or Market Exchange Rate (B/KRW)	Purchasing Power Parity Rate [a] (B/KRW)	Percentage Deviation [b] (%)
1955	0.4246	0.2472	71.76
1960	0.3252	0.1535	111.84
1965	0.0766	0.0726	5.51
1970	0.0661	0.0599	10.25
1971	0.0561	0.0554	1.26
1972	0.0525	0.0525	0.00
1973	0.0513	0.0603	-15.02
1974	0.0421	0.0547	-23.02
1975	0.0421	0.0448	-6.00
1976	0.0421	0.0416	1.43
1977	0.0421	0.0411	2.50
1978	0.0421	0.0396	6.49
1979	0.0422	0.0370	13.97
1980	0.0313	0.0320	-2.96
1981	0.0328	0.0291	12.73
1982	0.0307	0.0281	9.38
1983	0.0289	0.0286	1.13
1984	0.0328	0.0275	19.29
1985	0.0299	0.0273	9.85

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the wholesale price index comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 15

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1955-1985, B/TWS

(1972 = 100)

Year	Official or Market Exchange Rate (B/TWS)	Purchasing Power Parity Rate [a] (B/TWS)	Percentage Deviation [b] (%)
1955	-	-	-
1960	-	-	-
1965	0.5195	0.4591	13.14
1970	0.5219	0.5043	3.50
1971	0.5219	0.5064	3.26
1972	0.5219	0.5219	0.00
1973	0.5348	0.5221	2.42
1974	0.5355	0.4785	11.91
1975	0.5361	0.5228	2.55
1976	0.5361	0.5289	1.38
1977	0.5361	0.5547	-3.35
1978	0.5359	0.5758	-6.94
1979	0.5661	0.5625	0.63
1980	0.5721	0.5559	2.91
1981	0.5870	0.5457	7.30
1982	0.5756	0.5719	0.65
1983	0.5704	0.5905	-3.40
1984	0.6870	0.5695	20.63
1985	0.6679	0.5842	14.33

Sources : 1. International Monetary Fund, International Financial Statistics, various issues.
2. Directorate-General of Budget, Accounting and Statistics, Statistical Yearbook of The Republic of China, various issues.

[a] The calculation is made on the wholesale price index comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 16

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1975-1985, B/HK$

(1975 = 100)

Year	Official or Market Exchange Rate (B/HK$)	Purchasing Power Parity Rate [a] (B/HK$)	Percentage Deviation [b] (%)
1955	-	-	-
1960	-	-	-
1965	-	-	-
1970	-	-	-
1971	-	-	-
1972	-	-	-
1973	-	-	-
1974	-	-	-
1975	4.05	4.05	0.00
1976	4.36	3.93	10.86
1977	4.42	4.05	9.05
1978	4.24	4.31	-1.71
1979	4.12	4.17	-1.23
1980	4.01	4.20	-4.50
1981	4.04	4.43	-8.72
1982	3.53	4.67	-24.42
1983	2.95	4.93	-40.07
1984	3.47	4.81	-27.89
1985	3.41	4.94	-30.95

Sources : 1. International Monetary Fund, International Financial Statistics, various issues.
2. United Nations, Statistical Yearbook for Asia and Pacific, various issues.

[a] The calculation is made on the wholesale price index comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 17

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1974-1985, B/$$

(1975 = 100)

Year	Official or Market Exchange Rate (B/$$)	Purchasing Power Parity Rate [a] (B/$$)	Percentage Deviation [b] (%)
1955	-	-	-
1960	-	-	-
1965	-	-	-
1970	-	-	-
1971	-	-	-
1972	-	-	-
1973	-	-	-
1974	8.81	7.79	13.14
1975	8.19	8.19	0.00
1976	8.31	7.98	4.07
1977	8.72	8.24	5.81
1978	8.42	8.72	8.11
1979	8.66	8.47	11.67
1980	8.85	8.51	15.81
1981	11.23	8.97	25.14
1982	10.91	9.45	15.42
1983	10.81	10.01	8.02
1984	12.47	9.76	27.78
1985	12.68	9.98	26.85

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the wholesale price index comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 18

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1955-1984, B/US$

(1972 = 100)

Year	Official or Market Exchange Rate (B/US$)	Purchasing Power Parity Rate [a] (B/US$)	Percentage Deviation [b] (%)
1955	21.23	29.17	-27.22
1960	21.14	28.22	-25.08
1965	20.83	26.21	-20.52
1970	20.93	22.57	-7.28
1971	20.93	19.69	6.29
1972	20.93	20.93	0.00
1973	20.38	27.81	-26.74
1974	20.38	30.41	-33.00
1975	20.40	25.70	-20.64
1976	20.40	24.15	-15.51
1977	20.40	23.82	-14.35
1978	20.39	24.14	-15.54
1979	20.43	25.20	-18.94
1980	20.63	26.21	-21.28
1981	23.00	23.21	-0.90 (-11.12 [c])
1982	23.80	20.23	13.72
1983	23.00	20.29	13.35
1984	27.15	19.30	40.65 (19.17 [c])
1985	-	-	-

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the Index of Unit Value of Export in US dollar comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of the baht against the U.S. dollar. Roundings are made to two decimal points after calculations.

[c] There were two relatively large official devaluations during 1981-1984. Had the baht not been devalued by 1.07 and 8.7 percent in May and July 1981, the overvaluation of the domestic currency would be, by purchasing-power-parity, 11.12 percent in 1981. The devaluation of the baht by 14.81 percent in November 1984 reverted the baht from overvaluation to undervaluation.

Table 19

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1955-1984, B/YEN

(1972 = 100)

Year	Official or Market Exchange Rate (B/YEN)	Purchasing Power Parity Rate [a] (B/YEN)	Percentage Deviation [b] (%)
1955	0.0588	0.0813	-27.61
1960	0.0590	0.0797	-25.91
1965	0.0577	0.0961	-39.93
1970	0.0585	0.0838	-30.17
1971	0.0665	0.0716	-7.19
1972	0.0693	0.0693	0.00
1973	0.0728	0.0896	-18.83
1974	0.0677	0.0992	-31.74
1975	0.0669	0.0928	-27.97
1976	0.0697	0.0910	-23.48
1977	0.0850	0.0837	1.52
1978	0.1048	0.0752	39.38
1979	0.0852	0.0856	-0.54
1980	0.1016	0.0941	8.02
1981	0.1046	0.0915	14.31
1982	0.0979	0.0912	7.30
1983	0.0991	0.0947	4.64
1984	0.1081	0.0953	13.51
1985	-	-	-

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the Index of Unit Value of Export in U.S.dollar comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 20

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1955-1984, B/DM

(1972 = 100)

Year	Official or Market Exchange Rate (B/DM)	Purchasing Power Parity Rate [a] (B/DM)	Percentage Deviation [b] (%)
1955	5.04	10.87	-53.65
1960	5.07	10.29	-50.76
1965	5.20	9.04	-42.59
1970	5.74	8.14	-29.52
1971	6.40	6.70	-4.48
1972	6.54	6.54	0.00
1973	7.54	8.08	-6.72
1974	8.46	9.35	-9.60
1975	7.78	7.76	0.23
1976	8.63	7.90	9.30
1977	9.69	7.27	33.35
1978	11.15	6.74	65.46
1979	11.80	6.95	69.62
1980	10.53	7.42	41.89
1981	10.20	8.39	21.52
1982	9.68	7.61	27.18
1983	8.44	8.02	5.34
1984	8.62	8.32	3.65
1985	-	-	-

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the Index of Unit Value of Export in U.S.dollar comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 21

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1955-1984, B/UK POUND

(1972 = 100)

Year	Official or Market Exchange Rate (B/UK POUND)	Purchasing Power Parity Rate [a] (B/UK POUND)	Percentage Deviation [b] (%)
1955	59.52	72.09	-17.43
1960	59.27	69.51	-14.72
1965	58.38	62.13	-6.04
1970	59.10	58.16	-13.87
1971	53.42	48.67	9.76
1972	49.14	49.14	0.00
1973	47.34	96.94	-51.17
1974	47.85	79.16	-39.55
1975	41.20	64.20	-35.78
1976	34.73	64.30	-45.99
1977	38.88	57.19	-32.02
1978	41.48	51.42	-19.33
1979	45.83	50.03	-8.21
1980	49.20	47.02	4.63
1981	43.88	48.32	-9.19
1982	37.13	45.74	-18.81
1983	33.36	49.19	-32.17
1984	31.48	49.96	-37.16
1985	-	-	-

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the Index of Unit Value Export in U.S.dollar comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 22

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1965-1984, B/KRW

(1972 = 100)

Year	Official or Market Exchange Rate (B/KRW)	Purchasing Power Parity Rate [a] (B/KRW)	Percentage Deviation [b] (%)
1955	-	-	-
1960	-	-	-
1965	0.0766	0.0620	23.59
1970	0.0661	0.0531	24.44
1971	0.0561	0.0484	15.86
1972	0.0525	0.0525	0.00
1973	0.0513	0.0643	-20.26
1974	0.0421	0.0709	-40.60
1975	0.0421	0.0721	-41.57
1976	0.0421	0.0627	-32.73
1977	0.0421	0.0585	-28.00
1978	0.0421	0.0573	-26.52
1979	0.0422	0.0570	-25.98
1980	0.0313	0.0644	-51.46
1981	0.0328	0.0604	-45.60
1982	0.0307	0.0550	-44.20
1983	0.0289	0.0580	-50.18
1984	0.0328	0.0541	-39.33
1985	-	-	-

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the Index of Unit Value of Export in U.S.dollar comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 23

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1970-1983, B/TW$

(1972 = 100)

Year	Official or Market Exchange Rate (B/TW$)	Purchasing Power Parity Rate [a] (B/TW$)	Percentage Deviation [b] (%)
1955	-	-	-
1960	-	-	-
1965	-	-	-
1970	0.5219	0.6291	-17.04
1971	0.5219	0.5318	-1.86
1972	0.5219	0.5219	0.00
1973	0.5348	0.6497	-17.69
1974	0.5355	0.6110	-12.36
1975	0.5361	0.6011	-10.81
1976	0.5361	0.5853	-8.41
1977	0.5361	0.5529	-3.04
1978	0.5359	0.5323	0.66
1979	0.5661	0.5309	6.62
1980	0.5721	0.5121	11.72
1981	0.6070	0.4774	27.14
1982	0.5756	0.4090	43.91
1983	0.5704	0.4137	37.88
1984	-	-	-
1985	-	-	-

Sources : 1. International Monetary Fund, International Financial Statistics, various issues.
2. Directorate-General of Budget, Accounting and Statistics, Statistical Yearbook of The Republic of China, various issues.

[a] The calculation is made on the Index of Unit Value of Export in U.S.dollar comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 24

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1970-1982, B/HK$

(1972 = 100)

Year	Official or Market Exchange Rate (B/HK$)	Purchasing Power Parity Rate [a] (B/HK$)	Percentage Deviation [b] (%)
1965	-	-	-
1966	-	-	-
1967	-	-	-
1970	3.45	4.18	-17.51
1971	3.45	3.48	-0.98
1972	3.60	3.60	0.00
1973	4.03	4.77	-15.63
1974	4.13	5.44	-24.07
1975	4.05	5.29	-23.42
1976	4.36	4.68	-6.88
1977	4.42	4.69	-5.85
1978	4.24	4.81	-11.91
1979	4.12	4.88	-15.64
1980	4.01	5.24	-23.50
1981	4.04	5.04	-19.76
1982	3.53	4.41	-19.97
1983	-	-	-
1984	-	-	-
1985	-	-	-

Sources : 1. International Monetary Fund, International Financial Statistics, various issues.
2. United Nations, Statistical Yearbook for Asia and The Pacific, various issues.

[a] The calculation is made on the Index of Unit Value of Export in U.S.dollar comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 25

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1955-1984, B/M$

(1972 = 100)

Year	Official or Market Exchange Rate (B/M$)	Purchasing Power Parity Rate [a] (B/M$)	Percentage Deviation [b] (%)
1955	5.94	5.55	25.05
1960	6.01	5.84	18.37
1965	6.01	6.34	7.36
1970	6.00	5.98	-2.64
1971	7.25	6.85	5.72
1972	7.43	7.43	0.00
1973	8.31	7.64	8.76
1974	8.81	8.81	29.37
1975	7.80	7.35	7.21
1976	8.05	6.46	24.65
1977	8.62	5.80	48.58
1978	9.24	5.80	59.34
1979	9.33	6.97	87.58
1980	9.28	5.80	85.74
1981	10.25	5.60	83.32
1982	9.91	5.65	75.26
1983	9.84	5.95	66.19
1984	11.20	5.75	94.55
1985	-	-	-

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the Index of Unit Value of Export in U.S.dollar comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 26

Percentage Deviation of the Actual Foreign Exchange Rate
From the Purchasing-Power-Parity (PPP) Rate, 1955-1985, B/US$

(1972 = 100)

Year	Official or Market Exchange Rate (B/US$)	Purchasing Power Parity Rate [a] (B/US$)	Percentage Deviation [b] (%)
1955	21.22	30.32	-29.98
1960	21.16	28.70	-26.33
1965	20.83	26.28	-20.74
1970	20.93	22.57	-7.27
1971	20.93	19.65	6.49
1972	20.83	20.93	0.00
1973	20.38	27.55	-26.05
1974	20.38	29.82	-31.68
1975	20.46	25.16	-18.93
1976	20.40	23.71	-13.95
1977	20.40	23.35	-12.64
1978	20.39	23.61	-13.64
1979	20.43	24.79	-17.59
1980	20.63	25.81	-20.07
1981	23.00	24.35	-5.53 (-15.28 [c])
1982	23.00	22.37	2.80
1983	23.00	22.46	2.42
1984	27.15	22.21	22.27 (-1.56 [c])
1985	26.65	23.28	14.47

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the Index of Unit Value of Export in Domestic Currency comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of the baht against the U.S. dollar. Roundings are made to two decimal points after calculations.

[c] There were two relatively large official devaluations during 1981-1984. Had the baht not been devalued by 1.07 and 8.7 percent in May and July 1981, the overvaluation of the domestic currency would be, by purchasing-power-parity, 15.28 percent in 1981. The devaluation of the baht by 14.81 percent in November 1984 reversed the baht from overvaluation to undervaluation.

Table 27

Percentage Deviation of the Actual Foreign Exchange Rate
from the Purchasing-Power-Parity (PPP) Rate, 1955-1985, B/YEN

(1972 = 100)

Year	Official or Market Exchange Rate (B/YEN)	Purchasing Power Parity Rate [a] (B/YEN)	Percentage Deviation [b] (%)
1955	0.0588	0.0684	-13.94
1960	0.0590	0.0671	-12.10
1965	0.0577	0.0809	-28.64
1970	0.0585	0.0706	-17.13
1971	0.0665	0.0622	6.94
1972	0.0693	0.0693	0.00
1973	0.0728	0.1001	-27.29
1974	0.0677	0.1030	-34.24
1975	0.0669	0.0948	-29.51
1976	0.0697	0.0929	-25.03
1977	0.0850	0.0946	-10.14
1978	0.1048	0.1083	-3.29
1979	0.0852	0.1185	-28.09
1980	0.1016	0.1258	-19.21
1981	0.1046	0.1258	-16.85
1982	0.0979	0.1110	-11.87
1983	0.0991	0.1208	-18.01
1984	0.1081	0.1215	-11.04
1985	0.1329	0.1264	5.15

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the Index of Unit Value of Export in Domestic Currency comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 28

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1955-1985, B/DM

(1972 = 100)

Year	Official or Market Exchange Rate (B/DM)	Purchasing Power Parity Rate [a] (B/DM)	Percentage Deviation [b] (%)
1955	5.04	8.57	-41.20
1960	5.07	7.96	-36.35
1965	5.20	7.23	-28.05
1970	5.74	7.09	-19.04
1971	6.40	6.12	4.59
1972	6.54	6.54	0.00
1973	7.54	9.55	-21.08
1974	8.46	11.31	-25.26
1975	7.78	9.86	-21.09
1976	8.63	9.83	-12.19
1977	9.69	9.79	-0.99
1978	11.15	10.48	6.41
1979	11.80	11.89	-0.82
1980	10.53	12.84	-17.96
1981	10.20	12.44	-17.99
1982	9.68	11.08	-12.63
1983	8.44	11.09	-23.85
1984	8.62	10.74	-19.69
1985	12.42	10.75	15.48

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the Index of Unit Value of Export in Domestic Currency comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 29

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1955-1985, B/UK POUND

(1972 = 100)

Year	Official or Market Exchange Rate (B/UK POUND)	Purchasing Power Parity Rate [a] (B/UK POUND)	Percentage Deviation [b] (%)
1955	59.52	83.87	-29.03
1960	59.27	78.82	-24.80
1965	58.38	69.98	-16.58
1970	50.10	55.71	-10.08
1971	53.42	47.29	12.96
1972	49.14	49.14	0.00
1973	47.34	66.80	-29.14
1974	47.85	72.49	-33.99
1975	41.28	55.72	-25.91
1976	34.73	45.37	-23.45
1977	38.86	39.10	-0.55
1978	41.48	38.57	7.56
1979	45.43	41.61	9.17
1980	49.20	43.04	14.33
1981	43.88	40.74	7.71
1982	37.13	35.32	5.13
1983	33.36	33.24	0.36
1984	31.48	30.79	1.98
1985	38.50	30.37	26.75

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the Index of Unit Value Export in Domestic Currency comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 30

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1965-1985, B/KRW

(1972 = 100)

Year	Official or Market Exchange Rate (B/KRW)	Purchasing Power Parity Rate [a] (B/KRW)	Percentage Deviation [b] (%)
1955	-	-	-
1960	-	-	-
1965	0.0766	0.0916	-16.33
1970	0.0661	0.0672	-1.58
1971	0.0561	0.0547	2.51
1972	0.0525	0.0525	0.00
1973	0.0513	0.0629	-18.50
1974	0.0421	0.0676	-37.75
1975	0.0421	0.0573	-26.40
1976	0.0421	0.0500	-15.65
1977	0.0421	0.0466	-9.48
1978	0.0421	0.0455	-7.45
1979	0.0422	0.0455	-7.21
1980	0.0313	0.0410	-23.78
1981	0.0328	0.0365	-10.08
1982	0.0307	0.0327	-6.10
1983	0.0289	0.0325	-11.07
1984	0.0328	0.0303	8.20
1985	0.0299	0.0303	-1.34

Source: International Monetary Fund, International Financial Statistics, various issues.

[a] The calculation is made on the Index of Unit Value Export in Domestic Currency comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

Table 31

Percentage Deviation of the Actual Foreign Exchange Rate from the Purchasing-Power-Parity (PPP) Rate, 1965-1985, B/TWS

(1972 = 100)

Year	Official or Market Exchange Rate (B/TWS)	Purchasing Power Parity Rate [a] (B/TWS)	Percentage Deviation [b] (%)
1955	-	-	-
1960	-	-	-
1965	0.5195	0.6546	-20.64
1970	0.5219	0.5908	-11.68
1971	0.5219	0.5156	1.21
1972	0.5219	0.5219	0.00
1973	0.5248	0.6738	-20.64
1974	0.5365	0.7113	-24.72
1975	0.5361	0.7125	-24.75
1976	0.5361	0.6779	-20.92
1977	0.5361	0.6502	-17.55
1978	0.5359	0.6619	-19.05
1979	0.5361	0.6818	-16.96
1980	0.5721	0.7246	-21.05
1981	0.6070	0.7034	-13.70
1982	0.5756	0.6460	-10.91
1983	0.5704	0.6705	-14.92
1984	0.6870	0.6481	6.00
1985	0.6679	0.6998	-4.55

Sources : 1. International Monetary Fund, International Financial Statistics, various issues.
2. Directorate-General of Budget, Accounting and Statistics, Statistical Yearbook of The Republic of China, various issues.

[a] The calculation is made on the Index of Unit Value Export in Domestic Currency comparison.

[b] Minus sign indicates overvaluation of the baht by purchasing-power-parity while plus sign refers to undervaluation of baht against the foreign currency. Roundings are made to two decimal points after calculations.

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CHAPTER 6

PROTECTIONISM, COMPETITION AND COMPETITORS

Juanjai Ajanant

6.1 INTRODUCTION

The proliferation of protectionism worldwide has without any exception, affected both importing and exporting countries. For importing countries, the cost of protection must be borne by consumers. In several declining industries, the structural adjustment tends to be stalled by trade relief. In recent times, due to the policy shift from tariff regime towards non-tariff measures, the government revenue collection is no longer an important factor in trade importing barriers. Exporters and exporting countries suffer from protectionism in so far as the total revenue of exports may decline and the growth rate cannot be maintained. The extent of decline in export earnings depends on whether the terms of trade of the products in question have declined or increased, given a smaller volume of exports vis-a-vis free trade volume. Subsequent adverse effects of falling export revenue will be felt across the economy, depending on the extent of openness of the economy and close linkage between exporting sectors and the rest of the economy.

The experience of Thailand in encountering many erected barriers to free trade has been mixed, based on the accounts of trade performance in 1986 and 1987. A school of thought existing in Thailand, suggests that protectionism tends to favour Thai export products. This argument is based on the good performance of export

earnings of each product which escalate, as protectionism appears on the horizon. This argument is not only a fallacy, but is based on short-term empirical data. Protectionism, which led to a good performance of Thai exports, can be grouped into the following:

(a) share of Thai exports is small and has not reached the threshold of the 'hypothetical' limits;

(b) share of Thai exports is large and benefits from good terms of trade; and

(c) other major exporting countries are faced with severe protectionism and thus Thai exports simply enjoy the high growth rate of exports due to more opportunities.

Textile and garments can be grouped in (a) during the mid-1970's onward because they had not reached the threshold limits set by the importing countries. In most cases, the Thai share constitutes a small percentage. In the last 5 years, the limit has been reached and there has been a good performance due to the terms-of-trade factor. That is, the quantity may have been restricted, but the unit value has surged ahead. Products that fall into category (b) are processed foods, where the Thai share is not only large but appear to dominate other exporters. Canned items (especially canned pineapple and canned tuna) fit into these categories. With a substantial share of the world market, the cost-price margin is the decisive factor in determining profitability. As terms of trade is good, the performance of these industries is phenomenal.

In the last category (c) we can add several items to this growing list. Many products, which did not exist before 1980, began to appear by 1983, due to the hostile trading environment as the world economic recession appeared in 1982. Products previously produced by Japan and NICs, appeared among Thai exports, due to relocation and joint venture. Toys and footwear belong to this group. A rapid growth of those two products is recorded in terms of double-digit statistics throughout the last five years.

The other school of thought argues from the theoretical position, that protectionism hurts Thailand. Closure of market access, VERs and QRs limit the growth of Thai exports, and abrupt change in administered protection leads to a chaotic trading environment. Unfortunately, there is little evidence to support that this has extensively happened to Thailand.[1/] The obvious exception to this are the rice and tapioca exports to the world markets. We can strongly argue that under the free trade regime, both Thai rice and tapioca can dominate the world markets and export earnings would have been good even in 1986, when the U.S. Farm Act produced poor terms of trade for rice.

Despite a good performance of Thai exports in general amidst the growing threat of protectionism, we shall adhere to the basic notion that, "free-trade is better than protection". This treatise is well-proven for many countries which, have now reached the developed country

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1/ One of the recent studies is Juanjai Ajanant and Paitoon Wiboonchutikula (1987), "An Analysis of Foreign Barriers to Exports of Thailand," prepared for ADB/TDRI.

status. It is also based on a long-term development of Thailand. While a good short-term good export performance cannot be simply disregarded as a flash in the pan, we can argue that this performance is shrouded in many uncertain elements. Broad negative external shocks, such as an appreciation of the Thai baht, abrupt closures of markets and many other measures by importing countries, can disrupt the Thai economy.

This section will examine three broad issues related to the export opportunities of Thailand in the foreseeable future. Section (ii) analyzes the multitude of protectionist mechanisms which have been a source of concern to trade policy-makers. It shall discuss the form the causes and the extent of protectionism. Section (iii) argues that Thailand is competing with many rivals in the international market. This rivalry will persist in the near future and the outcome is undecisive. The last section discusses the possible impact of protectionism against Thai products. It also dwells on an alternative strategy to avoid the adverse impact due to increasing protectionism.

6.2 INDICES OF HOSTILE TRADING ENVIRONMENT

To measure the extent of hostility of the trading environment, is a delicate job which one can impose on oneself. In general, we have to look at (a) tariff imposition and (b) imposition of non-tariff measures. An examination of the prevailing tariff among developed countries, Thailand's major export markets, reveals very little this is negativity. Lavergne (1983) derived the level of import duties in 1980

Table 1

Duty Reduction since 1934 under the U.S. Trade Agreements Program

GATT conference	Proportion of dutiable imports subjected to reductions	Average cut in reduced tariffs	Average cut in all duties	Remaining duties as a proportion of 1930 tariffs
1. Pre-GATT, 1934-47	63.9%	44.0%	33.2%	66.8%
2. First Round, Geneva, 1947	53.6	35.0	21.1	52.7
3. Second Round, Annecy, 1949	5.6	35.1	1.9	51.7
4. Third Round Torquay, 1950-51	11.7	26.0	3.0	50.1
5. Fourth Round, Geneva, 1955-56	16.0	15.6	3.5	48.9
6. Dillon Round Geneva, 1961-62	20.0	12.0	2.4	47.7
7. Kennedy Round, 1964-67	79.2	45.5	36.0	30.5
8. Tokyo Round, 1974-79	n.a.	n.a.	29.6	21.2

a

Source: Real Philippe Laverge, The Political Economy of U.S. Tariffs. Unpublished Ph. D. thesis, University of Toronto, 1981.

b

These percentages do not take into account the effects of structural changes in trade, or inflation on the average tariff level.

Table 2

Average Import Duties in Industrial Countries
Before and After Tokyo Round

	US		Japan		EEC	
	1979	1985	1979	1985	1979	1985
Raw Materials /a	0.7	0.2	1.4	0.4	0.1	0.1
Semi-Manufacture	4.4	3.0	6.5	4.5	5.5	4.1
Manufacture	8.1	5.6	12.4	5.9	9.7	6.8
All products /a	6.3	4.3	5.4	2.7	6.5	4.6

/a
excluding pretroleum

Note : Duty Rates based on 1977 trade weights.
Source: The World Bank, Thailand Country Economic Report 1986.

for the U.S. and found that after the Tokyo Round (1974-1979), the U.S. duties had fallen by about 80% (Table 1).[2/] In addition, the average import duties of three major trading partners (i.e. the U.S., EEC and Japan) in 1985 remain quite low. They range between 4-8% for all products (Table 2). It is sufficient to indicate that GATT multilateral trade negations, which went through eight successive rounds, have produced positive results in so far as lowering the average tariff level to 4-8%.

While the average tariff level has been lowered, other measures have been applied in increasing number. To appreciate the extent of NTB which exist today, one has to look at the following:

5.1.1 quantitative import restrictions;

5.1.2 voluntary export restraints;

5.1.3 measures for the enforcement of decreed prices;

5.1.4 tariff-type measures; and

5.1.5 monitoring measures.

6.2.1 Quantitative Import Restrictions

consist of:

o Prohibitions and embargoes on the importation of a product. A prohibition may be total, may admit exceptions at the discretion of the competent authority, or may operate only under certain conditions.

2/ R.P. Lavergne (1983) The Political Economy of U.S. Tariffs: An Empirical Analysis, New York, Academic Press.

- o Quota Ceilings (specified in value or quantitative terms) are imposed on the importation of a produce for a given period of time; these may be global, country specific, or seasonal.

- o Discretionary import authorization. Permission to import is granted at the discretion of competent authorities. These are often used for the administration of quantitative limits.

- o Conditional import authorizations. Permission to import is subject to the importer undertaking commitments in areas other the importation, or to specified overall economic conditions (such as export performance, or the purchase of an equivalent quantity of domestic output), or the unavailability of domestic supply.

6.2.2 "Voluntary" Export Restraints

"Voluntary" export restraints (VERs) are agreements between an exporter and importers as to the maximum amount of exports (specified in value or quantity terms) to be purchased within a given period of time. This category includes, inter alia, bilateral agreements on textile trade reached within the framework of the Multifiber Arrangement (MFA) that indicate specific limits, consultation levels, and export controls. Although voluntary export restrictions are administered by exporting countries, they are monitored by importing countries, and their imposition is the result of successful protectionist requests by importing countries.

6.2.3 Measures for the Enforcement of Decreed Prices

- o Variable levies. Import charges set periodically to equalize the import price with a decreed domestic price

- o Minimum price systems. A minimum import price is set by the importing country, and import prices below, the decreed minimum, trigger an additional duty or some other penalty.

- o "Voluntary" export price restraints. This category covers agreements between the exporter and the importer on the minimum price to be observed by the exporter.

6.2.4 Tariff-type Measures

- o Tariff quotas. Two tariff rates are applied, the higher rate coming into operations when the quantity of imported goods exceeds a specified level.

- o Seasonal tariffs. Different tariff rates are applied to the same (agricultural) product according to the time of year.

6.2.5 Monitoring Measures

- o Price and volume investigations, surveillance. Formal investigations of charges by domestic producers about unfair trading practices of an exporting country; formal monitoring of the evolution of imports of sensitive products, with or without prior import authorization, being required. While an investigation is probably necessary to determine the facts, there

is evidence that the inquiry process itself has a protective effect, independent of the eventual findings.[3/]

The investigative process (or continued surveillance) generates uncertainty about an exporter's continuing access to the market and creates an incentive for the exporting firm to raise its price, whether or not it is guilty of an illegal practice. A surveillance process is often the means by which a government monitors "voluntary" price maintenance agreements or volume restraint agreements. Surveillance is often the precursor to more formal import restrictions, or a signal to exporters to practice "self-restraint", to avoid a more formal "voluntary restraint". "Automatic" import licensing procedures are often restrictive; for example, they serve to police bans on imports from certain countries or to funnel all imports of a product through a government-authorized association of import-competing local producers of that product or of products of a finished goods made from that product.

o Antidumping and countervailing duties. In theory, antidumping duties are levied on a product that is sold in the importing country at a lower price than in the exporting country. Countervailing duties are levied to offset export rebates or subsidies with the rationale that such measures create a situation

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3/ Finger, J. M. (1981), "The Industry-Country Incidence of 'Less than Fair Value' Cases in U.S. Import Trade," Quarterly Review of Economics and Business, Summer 266-79.

which more closely approximates the outcomes that would exist under free and fair trade regimes. William Dickey's study of antidumping practices in the United States, finds that such measures have a greater disincentive on imports than do comparable "fair trade" (mainly antitrust) regulations on domestic firms' sale and they do, in fact, constitute protection of domestic prodders.[4/]

Nogues, Olechowski and Winters (1986 (a), 1986 (b)) conducted an extensive study under the auspices of UNCTAD and the World Bank to measure non-tariff measures.[5/ 6/] They employ the following formula

$$I = \frac{\Sigma_{q \epsilon Q} \; \Sigma_{x \epsilon X} \; W_{q_x} \; N_{q_x}}{\Sigma_{q \epsilon Q} \; \Sigma_{x \epsilon X} \; W_{q_x}}$$

to apply to (i) own import coverage ratio (I_c), measure the sum of the value of a country's input groups affected by NTBs over the total value of its imports of that group; (ii) the world trade

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4/ Dickey, William L. (1979), "The Pricing of Imports into the United States," Journal of World Trade Law 13 (May-June) 238-56).

5/ Nogues, J., A. Olechowski, and L.A. Winters (1986) "The Extent of Non-tariff Barriers to Imports of Industrial Countries," World Bank Staff Working Paper 789, Washington, D.C.

6/ Nogues, J., A. Olechowski, and L.A. Winters (1986), "The Extents of Non-tariff Barriers to Industrial Countries's Imports," The World Bank Economic Review, Volume 1, Number 1, September 1986, pp. 181-199.

Table 3

The Extent of Industrial Economies' NTBs to Exports From Industrial and Developing Economies, 1983

Index	Industrial economies	Developing economies		
		All	Major manufacturing exporters	Major borrowers
Coverage ratio				
Own imports (I_c)	21.0	34.3	26.5	35.4
World trade (I_w)	17.1	27.0	24.6	29.4
Frequency ratio (I_f)	8.8	18.6	18.1	19.4

Note: Sixteen industrial market importers, all products, all selected NTBs.

Table 4

A Comparison of Industrial Economies'NTBs on Agricultural and Manufactured Exports of Industrial and Developing Economies, 1983

Index	Industrial economies		Developing economies	
	Agriculture	Manufactures	Agriculture	Manufactures
Coverage ratio				
Own imports (I_c)	40.5	14.5	31.2	21.3
World trade (I_w)	46.1	13.2	30.5	20.5
Frequency ratio (I_f)	31.9	6.7	25.6	17.4

Note : Sixteen industrial markets, all selected NTBs.

Table 5

The Change in the Extent of Industrial Economies' NTBs on Imports from Industrial and Developing Economies

Index	All economies	Industrial economies	Developing economies
Coverage ratio			
Own imports (I_c)	1.5	2.2	1.1
World trade (I_w)	1.8	2.3	1.1
Frequency ratio (I_f)	0.3	0.1	0.9

Note : Sixteen industrial markets, all products, all selected NTBs, differences between indexs for 1983 and 1981 in percentage points.

coverage ratio (I_w) for each of the commodities imported by a country, measures the sum in the value of world trade of an import group affected by that country's NTBs, over the total value of world trade in that commodities group; (iii) the frequency ratio (I_f) simply registers the relative frequency with which countries impose NTBs, on their commodity imports.

We reproduced the results of their study in relation to the exports of developing countries, in Table 3, 4, and 5.

Based on these three sets of evidence, it can be reported that:

(a) NTBs are significantly more prevalent on imports of developing countries than from industrial economies and this is true for all individual markets. The absolute extent of NTB coverage is larger in the case of developing countries' imports. For example, the value (in 1981 US$) of imports from developing countries, subject to NTBs, is $86 billion compared to $81 billion in the case of imports from industrial countries.

(b) NTBs are less prevalent on industrial economics' imports of agricultural goods from developing countries than on those from other industrial economics, but that the reverse is true for manufactures. Nevertheless, developing economies are still faced with more barriers to agricultural exports than to manufactures. Since agriculture accounts for a higher

share of imports from developing economics than from industrial ones, agricultural protection still contributes to the differential incidence at the aggregate level. In manufactured goods, developing countries face more barriers than industrial ones in textiles and footwear.

(c) Between 1981 and 1983, there was a net of 2,486 in the number of NTBs recorded. The NTBs in place in 1983 covered $12.8 billion more of 1981's imports than did those in 1981. These figures refer to only new NTBs and not to any tightening of existing ones. Furthermore, new NTBs were imposed on a larger number of smaller trade flows from developing countries and a smaller number of large flows from industrial ones.

Without any attempt to plagiarize these results, one is bound by solid evidence to suggest that the trading environment has been plagued with more protectionism than ever. The form of protection may have changed, but the substance remains to indicate a rising trend of protectionism.

The rising trend of protectionism has been explained by economist to be the result of trade deficits, and an inability of importing countries to compete head on with imports. Thus, simple theory reaches the simple conclusion of more protection at the expense of other trading nations. Baldwin (1985) in a stimulating work, tried to use four politico-economic models to determine the behaviour of public officials in the U.S. towards increased competition from overseas and

towards the outcry of declining industries.[7] The four models are as follows:

(a) common interest or pressure groups;

(b) adding machine model;

(c) status quo model; and

(d) social change model.

The common interest model was based on Olson (1965) and his subsequent work.[8] According to Olson, the formation of an industry organization that is able to obtain sufficient funds from its members to lobby effectively, is more likely, if the number of firms in the industry is small, and benefits from protection are unevenly distributed among firms. Caves(1986) formulated the adding machine model to be based on imperfect knowledge among voters, as well as the voting decisions are made on a multitude of public policy issues.[9] An elected officer cannot possibly satisfy every voter on very issue. Therefore, in order to maximize his or her re-election, he or she may adopt the position that represents the view of the majority of voters. So far as import policy is concerned, this may mean that individuals in industries are subject to foreign competition. The status quo model

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7/ Baldwin, R. E. (1985) The Political Economy of U.S. Import Policy MIT Press.

8/ Olson, Mancer, (1965) The Logic of Collective Action: Public Goods and the Theory of Groups, Harward University Press.

9/ Caves, R.E. (1976), "Economic Models of Political Choice: Canada's Tariff Structure," Canadian Journal of Economics, Number 2, pp. 278-300.

was so named by Lavergne (1983)[10] who hypothesized that current import duty levels and recent duty changes will be positively correlated with historical duty levels. Government officials are conservative and have a regard for existing property rights (even in the form of rents generated by protection) or give a cautious response to the uncertainty associated with the effects of change. The social change model is based on analyses by Ball (1967), Constantopoulos (1974) and Fieleke (1976).[11] [12] [13] They maintain that the U.S. officials seek on social justice ground to reduce the degree of income inequating in the economy by raising the standards of the lower income groups. Consequently in trade policy, they shield low-income and low-skilled workers from job displacement by maintaining relative high tariff.

Armed with data on tariff costs in the Kennedy and Tokyo Rounds, Baldwin ran regression analyses to test the above models to explain the import policy of the U.S. He reported that each model performs reasonably well, with the status quo model performing exceptionally

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10/ See Lavergne (1983), op. cit.

11/ Ball, D.S. (1967), "United States Effective Tariffs and labor's Share, Journal of Political Economy, pp. 183-187.

12/ Constantopoulos, M. (1974), "Labour Protection in Western Europe," European Economic Review, pp. 313-318.

13/ Fieleke, N. (1976), "The Tariff Structure for Manufacturing Industries in the United States: A Test of Some Traditional Explanations," Columbia Journal of World Business, Number 4, pp. 98-104.

well. Nonetheless, he concludes that these tests were conducted on a short-term basis and may fail the general behavioral patterns. Furthermore, public officials differ in their personality, background, experience and approaches: these may tend to be a determining factor in deciding public policy. Among the developed countries, we have also found that the U.S. is the most legal-minded in enforcing import policy changes. Hufbauer and et al (1985) stated that the President is global-minded, while the U.S. Congress is constituency-minded; indicating that the President is more pro free-trade than the Congress.[14/] Baldwin also found that the House is more likely to take the nonindustry-specific provisions while the Senate manifests itself to a great extent as import relief for particular industries.

While there has been little testing of similar models for Japan and the EEC, Baldwin's works and his followers serve to note the importance of political behavior in deliberating import policy among major developed countries. Similar examples can be found in Japan and the EEC over the issues of import relief for agricultural products.[15/] This will serve as a stepping stone in Thailand's policy alternative in combating protectionism later on.

14/ Hufbauer, B.C., D. T. Berliner and K. A. Elliott (1985), Trade Protection in the United States: 31 Case Studies, Institute of International Economics, Washington, D.C.

15/ Keijiro Otsuka and Yukiro Hayami (1986), "Revealed Preference in Japan's Rice Policy," in Kym Anderson and Yukiro Hayami, ed., The Political Economy of Agricultural Protection, University of Hawaii Press.

6.3 COMPETITION AMONG RIVALS

One theory which has been the "bread and butter" of the economists is the "perfect competitive" whereby competitive firms are numerous and each one is small in relation to the total market volume. This cornerstone has been used frequently both in the domestic economy and in the international market place. Leaving aside the domestic competition, small traders do not matter much in world trade. If they are small volume traders at the world scale, they are faced with an elastic demand. In short they are at the mercy of the world market. At the present time, there is a growing emphasis on small and medium industries which are capable of exports. It will be agued here that they do not fit well into the market at the global scale in term of costs, volume and price competition. The only bright spot for SMI, is their flexibility in terms of searching for alternative escape routes to avoid catastrophe.

Thailand's exports of both agriculture and manufactured goods are in general full of competitors in the world markets. Some products are less competitive than others but they can sell due to various factors. In the real world, differentiated products are certainly the rule, not the exception. Krugman (1977) maintained that differentiated products compete with one another and each product may exhibit the Chamberlinian monopolistic competition.[16/] One brief survey of Thai export covers

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16/ Krugman, P.R. (1979), "Increasing Returns, Monopolistic Competition, and International Trade, Journal of International Economics, Number 4, pp. 469-479.

Table 6

Products and Rivals

	Products	Rivals
1)	Rice	U.S., China, Australia
2)	Tapioca	Indonesia, Brazil, China, Vietnam
3)	Rubber	Indonesia, Malaysia
4)	Tin	Indonesia, Malaysia
5)	Raw sugar	Philippines, Brazil, Cuba, EEC
6)	Canned pineapple	Philippines, Ivary Coast
7)	Canned tuna	U.S., Samoa, Philippines, Taiwan, Japan
8)	Textile and garments	OECD, Hong Kong, Taiwan, ASEAN and Latin American and China
9)	Toys	Hong Kong, Taiwan, Singapore and Japan,
10)	Jewelry	Hong Kong, India, Israel, Italy
11)	Footwear	Hong Kong, S.Korea, Japan, India
12)	Plastic products	Hong Kong, Singapore

Source : Ministry of Commerce.

the following products: (a) rice, (b) tapioca (c) rubber, (d) tin, (e) raw sugar, (f) canned pineapple, (g) canned tuna (h) textile and garments, (i) toys, (j) jewelry, (k) footwear, (l) plastic products and (m) leather products. These products together contribute about 70% of Thai merchandise exports in any given period between 1980-1985.

There has not been a study of the concentration ratio at the 5-digit level in Thailand, and it is vague to presume that those economic activities are dominated by large firms. In so far as the exporting firms and their export volumes is concerned, each product line is frequently controlled by four or five large firms. For example, rice is dominated by five large firms accounting for up to 2,000,000 metric tons of exported rice in 1986. Seventy percent of Thai sugar export is controlled by one trading firm (a joint effort of 23 sugar mills). A further study should be conducted and may reveal that the concentration ratio is high among five large exporting firms of each industry.

Table 6 was constructed based on information made available by the Department of Business Economics, Ministry of Commerce. The competitor countries in the Table are not exhaustive by any means. It represents the next competitors which Thailand may face in the international market. Among commodities such as rice, rubber, tin and sugar, prominent rivals are easily identified because items are land or resource-based products. Market prices alone do not entice new entry into competition. Predatory pricing and cartels of some forms of international agreements tend to be the characteristics of the world

market situation. Other types of products do compete in prices, which in some years are very intense. Textile and garments are faced with quota limits. Items 9 to 12 have recently emerged as new products and actually have replaced the existing suppliers in the NICs. Both canned pineapple and canned tuna have benefited immensely from an abundance of raw-materials and the misfortune of the Philippines in recent years. Both canned items now hold a very large share of most major markets.

While items 1 to 5 may have been on the export front for many decades, the rapid emergence of items 6 to 12 is the result of several factors. We cannot discuss the establishment of production without dwelling on the favorable domestic policies manifested in terms of pro-export fiscal, monetary, and exchange policies. But the decisive edge must be given to the favorable factors originating in other countries. Many products have been on the NICs export lists for some time and cease to be cost competitive due to a rapid rise of money and real wage of labour in those countries. In addition, many countries have reached the quota limit early and had to relocate their excess production elsewhere. In the last two years, the strong currencies of many NICs have pushed the prices of many products beyond competitiveness. Whether these trends will continue, remains to be seen. The most probable scenario is that Thailand can only reach limits then the trade account pressurize the appreciation of the baht vis-a-vis other currencies, notably the U.S. dollar.

6.4 POLICY CHOICE FOR THAILAND

By way of summary, this short survey has pointed out that:

(a) there is a misunderstanding of good export performance, as caused by protectionism.

(b) the long-term export performance can be adversely effected by excessive protection among Thailand's trading partners;

(c) based on a study by the World Bank, the presence of NTBs hurts the exports of developing countries especially agricultural exports;

(d) based on Baldwin's study, the pro-protectionist stand among trade policy-makers can be explained by political economy models;

(e) the promotion of SMI to further Thai exports may not be the solution to increasing Thai exports due to their scale economies constraints; and

(f) Thai exports face more competitors, especially among heavily-traded items but competition among 'new' products is not so intense.

It appears that Thailand faces a critical trading environment as we approach the next decade. Also it is no longer valid to discuss diversification of products and markets. A new paradigm consists of:-

(a) a long-range policy stand to be adopted by policy-makers;

(b) new inputs to be forwarded by the academics; and

(c) preparation among traders to face a more hostile trading climate.

Thus far, policy-makers have shifted Thailand's trade regime towards a neutral position, whereby exports are preferred to imports. This effort should continue, firstly, because cost competitiveness is crucial and, secondly, to ensure volume of exports. There is a growing need to mobilize resource to open up markets. Resources must be used to lobby and negotiate for greater access to foreign markets. Negotiation at the GATT multilateral round should be top priority to continue the multilateral trading system under which Thailand can benefit. Best people should be recruited to perform various tasks. This should include people from every circle, not only in the ministries concerned.

Academics have been less active in recent years to offer new approaches to trade problems. Trade issues are political, as much as economic issues. There must be new input from both political scientists and economists, to serve as pointers to new policy activities. Issues to be explored are enormous and cannot be expounded here.

Among traders in Thailand, there is a general concensus of difficult trading times ahead. Limited market access and intense competition will prevail. In this environment we cannot expect SMI to perform a herculean task to push for exports. It is impossible to ask a midgit to pitch against a giant in the world market. Instead we anticipate that large firms in Thailand will spearhead the development of new products to offer to the world market, and thus promote Thailand's prosperity.