The Impact of the External Sector on the Thai Economy and Its Determinants

Atchana Wattananukit

Teerana Bhongmakapat

RESEARCH TEAM

Project Director	:	Dr. Narongchai Akrasanee
Researchers	:	Dr. Atchana Wattananukit
		Dr. Teerana Bhongmakapat
Research Assistants	:	Ms. Chariya Lerthattakornsathit
		Ms. Boonrat Tiensirisak
Coordinators	:	Ms. Jaruwan Chontanawat
		Ms. Netrsuda Saligupta
		Ms. Deunden Nikomborirak
Support Staff	:	Mr. Supote Peerapisit
		Ms. Pawadee Kongtrakul
		Ms. Phimchai Boukoed
		Ms. Varaya Toraninpanich
		Ms. Nootchanart Phumphruke

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Abbreviations

CES	=	The Constant Elasticity of Substitution
CGE	=	Computable General Equilibrium
DFI	=	Direct Foreign Investment
DSR	=	Debt-Service Ratio
IMF	=	International Monetary Fund
GDP	=	Gross Domestic Product
LDC	=	Less Developing Countries
LES	=	Linear Expenditure System
SAM	=	A Social Accounting Matrix

LIST OF CONTENTS

LIST OF TABLES

LIST OF TABLES (continued)

LIST OF FIGURES

EXECUTIVE SUMMARY

For more than two decade the external sector has played a very crucial role in Thailand's economic growth and dynamism. The dramatic economic recovery witnessed in recent years has been driven by considerable export expansion and an influx of direct foreign investment. The growth of this external sector has produced the most visible change in Thailand's economy. Given the right direction our external sector will not only sustain its long run of economic growth, but it can also foster an industrial explosion.

The objective of this study has been to explore and evaluate the impact of Thailand's external sector on domestic performance. General approaches were based on a macroeconometric model and CGE. These two models were adopted to answer following questions: To what extent does the external sector affect the overall domestic economic growth? Does export expansion improve the country's financial stability or does it induce more imports resulting in a worsening balance of trade? Have the majority of Thai people benefited from this recent rapid export expansion? How does it affect overall income distribution of the country? How do manufactured exports and agricultural exports differ in terms of their impact on growth stability and income distribution in the country? The answer to these questions will provide a reliable basis for policy implementation and must be addressed to improve policy choice.

A large proportion of empirical evidence found in this study has convinced us that export expansion and domestic economic growth will have a positive impact. A hypothetical 1 percent increase in exports of goods and services leads to an approximately 0.32 percent increase in real GDP and 0.46 percent in terms of nominal GDP. In addition, the study team found that the contribution of export value added to total GDP during 1986-1988 was about 33.74 percent of total GDP growth.

Export expansion does, however, raise the overall inflation of the economy. It has been found in this study that a 1 percent rise in exports leads to an 0.17 percent increase in the GDP deflator.

Export growth also creates a considerable amount of imports. The study team confirmed this when testing whether the recent surge in imports resulted from an investment boom; from the consumption of luxurious commodities; or from export expansion. The results showed that although investment did have the highest import value, followed by consumption, export ranked first in terms of induced imports (its direct import quota is nil). Therefore, a one baht increase in exports leads to the highest induced import when compared to an equal

increase in investment or consumption. The overriding reason for this high induced import figure of behalf of exporting industries is technology, which usually imported because of their quality consciousness.

Because of this continuing heavy import dependence export growth, especially of manufactured products, exerts a huge drain on the balance of trade. Our results seemed to suggest that the recent export expansion failed to improve the country's balance of trade. However, in terms of internal financial stability, this export expansion has helped, according to our data, to increase government revenue at a faster rate than its expenditure which has result in reducing the government's deficit and borrowings.

The study team also investigates structural change in respect to the causality pattern between export growth and industrial development. The results revealed that, up to 1987, export expansion led to increasing the role of manufactured outputs in the Thai economy. Such findings lend plausibility to the export-led growth strategy of industrial development.

The impact of export expansion on income distribution has been investigated through both the macroeconometric model and the CGE. Test results would suggest that a hypothetical one percent increase in exports leads to an approximate 0.41 percent rise in wages, 0.64 percent in the income of unincorporated enterprises, and 0.61 percent in corporate incomes.

Simulated results from CGE model showed that during 1983-1987, increased export earnings lead to a slightly worsening income distribution. However, these results may be somewhat underestimated since the simulation was done under the assumption that world prices would remain constant and reflect a similar pattern of export earnings. However, the adverse impacts of export expansion on income distribution are higher if the consumer price index rises. For instance as a result of increasing export demand a decreasing real income was felt in agricultural households, low income state enterprises and government households.

Comparison between the impact of agricultural versus manufactured exports shows that, given the same structure of exports, manufacturing exports lead to higher growth and provided more financial stability, but, unfortunately, worsened the income distribution situation. Manufactured exports effectively raise various household incomes, but provide insufficient benefits to agricultural and low income government households.

On analysis the sources of export growth between 1984-1987 revealed two major components of income and effect on price. Growth of world income accounts for about 57 percent of Thailand's overall export expansion, while the relative price (in term of foreign currency) accounts for approximately 18 percent . The rest is

explained by other factors, besides income and price effect, for instance; the evolution of the product cycle; an increasing number of exporters; market and product diversification; and market penetration.

Although placing increasing dependence on trade and finance affects domestic performance in both positive and negative ways, a small developing country like Thailand, does not have many alternatives. A certain reliance on external trade and foreign capital is important if the country is going to reach its targeted growth and stability. Nevertheless, Thailand needs to rationalize this external sector in order to sustain a high rate of economic growth.

Export led growth strategy should be considered a high priority if the country is to achieve long-term growth and adapt to structural change. Bearing in mind the adverse impact of rapid export expansion on income distribution, measures to improve income distribution should be pursued during this period for two main reasons: (1) rapid export expansion hurts low income households; and (2) the considerable growth contributed by export expansion will make any income distribution measures relatively easy to implement.

The strong income effect which increase foreign demands for Thai exports makes Thailand more vulnerable to any changes in world economic situation, especially those from the three major countries: the United States, Japan and EEC. This calls for higher degree of market flexibility and product diversification.

THE IMPACT OF THE EXTERNAL SECTOR ON THE THAI ECONOMY AND ITS DETERMINANTS

1. INTRODUCTION

For the past two and a half decades, the Thai economy has experienced an increasing dependence on foreign trade and finance. The growth of Thailand's external sector, especially in trade and foreign finance, is the most recent visible change in the Thai economy. Indeed, one must admit that Thailand's impressive economic expansion since 1986 can be explained partly by the growth of the external sector in terms of the export boom and the large influx of foreign direct investment.

After going through the difficulties of the two oil shocks, the worldwide economic recession, and the increasing protectionism of the early eighties, Thailand has been able to maintain an excellent record of adjustment, achieving a high rate of growth coupled with a rapid expansion of its external sector. Since the last half of 1986, external trade and finance have expanded to stimulate the momentum of the country's growth.

The high level of exposure to international trade can be seen from the rising GDP share of merchandise exports and imports, which increased from 28.35 percent in 1970 to 62.54 percent in 1988. If trade in services is included, the degree of exposure (GDP share) was as high as 79.20 percent in 1988 (see Table 1.1). Not only trade, but external financing (including direct investment and loans) has made Thailand able to afford its economic development and industrialization despite its history of low-level domestic savings.

The increasing level of exposure of the Thai economy on the international market has important implications for the country's overall performance. On one hand, the external sector allows for rapid growth and dynamism, as well as industrialization through export expansion and foreign finance. On the other hand, it makes the Thai economy more vulnerable to changing world circumstances and the attitudes of major industrial countries. Some interesting questions concerning the present situation and the Thai economy's high degree of exposure are as follows: Is Thailand, in the long-run likely to continue healthy economic growth caused by expansion of manufactured, exports and intensive foreign investment? To what extent does the external sector affect overall domestic economic performance? What types of policies does Thailand need to develop toward the external sector in order to sustain a high rate of growth and, at the same time, be less vulnerable to world economic circumstances? Will export expansion improve the country's balance of trade, or will it induce more import leakage and resulting in worse balances. Have the majority of the Thai people benefited from rapid export expansion?

Table 1.1 : Percentage of Merchandise Exports & Imports in GDP

(Million baht)

	1970	1975	1980	1985	1988
Merchandise					
Exports	14772	45007	133197	193366	403570
Imports	27009	66835	188686	251169	513114
Service					
Exports	10095	16552	43529	85880	149089
Imports	4059	10391	32383	70627	95066
Total					
Exports	24867	61559	176726	279246	552659
Imports	31066	77226	221069	321796	608180
GDP	147385	303319	658509	1014399	1465736
% Of Merchandise Exports/GDP	10.02	14.84	20.23	19.06	27.53
% Of Merchandise Imports/GDP	18.33	22.03	28.65	24.76	35.01
% Of Merchandise Exports & Service/GDP	16.87	20.30	26.84	27.53	37.71
% Of Merchandise Imports & Service/GDP	21.08	25.46	33.57	31.72	41.48

Source: Bank of Thailand, Monthly Bullentin, various issues.

How does it affect the overall income distribution? Which sector gains most from the high degree of exposure of the Thai economy? These are the questions currently being discussed. To answer them we performed an empirical study on the impact of the external sector on domestic economic performance. The study allowed us to quantitatively analyze the relationships between the external sector and major macroeconomic variables.

This paper, therefore, is an attempt to present results from our examination of the increasing openness of the Thai economy. In it we analyze the impact of the external sector on important macroeconomic objectives including growth, structural change, internal and external economic stability, inflation, employment, and income distribution. This empirical study is intended to provide insight into the role of the external sector in the Thai economy, with the expectation that the results would provide guidance in choosing external strategies for economic development. Indeed, the right direction toward our external sector might not only sustain long-term economic growth, but might engine an industrial take-off which would make Thailand the "fifth tiger" of the Asian NICs. In addition, the right direction toward our external sector could make the Thai economy immune to world economic fluctuations and instability.

The contents of this paper include an introduction and statement of objectives (section 1); an overview of the role of the external sector (section 2); a discussion of the models and sources of data (section 3); the results of the impact of the external sector on major macro-economic variables (section 4); and conclusions and policy implications (section 5).

2. OVERVIEW OF THE ROLE OF THE EXTERNAL SECTOR IN THE THAI ECONOMY

The last two-and-a-half decades have witnessed the increasing importance of the external sector as a driving economic force in Thailand. The increasing openness of the Thai economy is expected to open opportunities to overcome the weaknesses of small markets, gain access advanced technology and information, and bridge the savings and investment gap. On the other hand, as the degree of its exposure increases, Thailand will tend to be more vulnerable to world economic instability and slowdowns. Below we begin an overview of the role of the external sector, including exports, imports and capital flows and their implications on the overall past economic performance.

2.1 Export Growth and Structural Change

Theoretically and empirically, the growth of exports is widely recognized as the key factor engineering successful economic development in many countries, especially NICs. First, exports reduce production costs through enlarged market size and economies of scale. Second, export growth improves the quality of domestically produced commodities to meet international standards. Third, exporting industries are able to access advanced information on the world market, and gain marketing and consulting expertise. Finally, these industries benefit from the use of modern technology and modern management approaches.

The role of exports in the Thai economy may be seen in the share of merchandise exports in total GDP. In 1970, the share of merchandise exports was 10.02 percent of total GDP, increased to 20.23 percent in 1980, and reached 27.53 percent in 1988. If trade in services is included, in 1988, the share of merchandise goods and service exports was recorded to be as high as 37.71 percent (see Table 1.1). As shown in Table 2.1, the average value of exports during the 1960s was about 12,000 million baht per year. Four commodities--rice, rubber, tin, teak--accounted for three-fourth of all Thai exports. In the first half of the 1970s, the average value of exports was about 27,000 million baht per year--a growth rate of 30 percent per year. This increase in export value was due mainly to the world market commodity boom which increased the price of Thailand's major export items such as rice, rubber, maize, tin and sugar. Export values declined by about 10 percent in 1975, but gradually picked up at rate of 16-35 percent throughout the second half of the 1970s. In the early 1980s, Thai exports slumped again due to the second oil crisis, the worldwide economic recession, the increasing trend of protectionism adopted by developed countries, and the depressed commodity prices of Thailand's major exports. The export value growth rate during the first half of the 1980s was, on the average, 10.7 percent per year--the rate at which Thai exports grew in the early sixties. However, when the Thai economy regained its growth momentum after the third quarter of 1986, export values increased to 299,853

4

Table 2.1 : Nominal Value and Growth rate of Exports (1960-1988)

Year	Exports Value (Million baht)	Growth rate (%)
1960	8614	
1961	9997	16.1
1962	9529	-4.7
1963	9676	1.5
1964	12339	27.5
1965	12941	4.9
1966	14099	8.9
1967	14166	0.5
1968	13679	-3.4
1969	14709	7.5
1970	14772	0.4
1971	17275	16.9
1972	22491	30.2
1973	32226	43.3
1974	49799	54.5
1975	45007	-9.6
1976	60797	35.1
1977	71198	17.1
1978	83065	16.7
1979	108179	30.2
1980	133197	23.1
1981	153001	14.9
1982	159728	4.4
1983	146472	-8.3
1984	175237	19.6
1985	193366	10.3
1986	233383	20.7
1987	299853	28.5
1988	403570	34.6

Average	Million baht per year	Growth rate
1961-64	10385	10.1
1965-69	13919	3.7
1970-74	27313	29.1
1975-79	73649	17.9
1980-84	153527	10.7
1985-88	282543	23.5

Source : Bank of Thailand, Monthly Bullentin, various issues.

million baht in 1987 and 403,570 million baht in 1988, representing annual growth rates of 28.5 and 34.6 percent respectively.

As Thailand has gone through a period of rapid growth and structural change for more than two decades, not only have we witnessed export expansion, but we have also experienced structural change in exports. Manufactured goods have played an increasing role in Thailand's total exports; its share increased from 10 percent in 1971 to 36.7 percent in 1981 and reached 65.6 percent in 1988. When the share of manufactured exports outpaced agricultural exports for the first time in 1985, most believed that this was only a short-run phenomenon resulting from a price slump in Thailand's primary commodity exports. But, since then, the share of manufactured goods has maintained a higher level than primary exports. In 1988, the share of manufactured exports was 65.6 percent, compared to 33.8 percent for primary exports (see Table 2.2).

As shown in Table 2.3, the manufacturing sector has become more export-oriented since the share of exports over output increased in many sectors. Export-oriented industries whose export-over-output ratios were higher than 20 percent in 1985 were: rubber and rubber products, non-ferrous metal, electrical machinery and appliances, food, and others. Industries whose export-over-output ratios were higher than 10 percent were textiles, leather, wood, plastic products, ceramics, iron, and steel.

Japan and The United States were the main outlet for Thailand's exports in the 1960s and 1970s until the United States became the leading market. The share of Thai exports to the United States was 13.44 percent in 1970, 12.64 percent in 1980 and increased to 20.04 percent in 1988; the share of Thai exports to Japan dropped from 25.52 percent in 1970 to 15.09 percent in 1980 and 15.96 percent in 1988. The United States market for Thai exports surpassed that of Japan in the 1980s.

Thai export values have increased considerably over the past 15 years; however, under Thailand's past exchange-rate policy, foreign exchange earned from exports was exchanged for overvalued baht. This bias against export earnings discouraged further exports and hurt those who earned and created foreign exchange. The devaluation of the baht and the elimination of the export tax (especially the rice premium) considerably stimulated exports. Many economists believe that the devaluation of the baht in 1984 contributed considerably to the present export boom.

2.2 Import Growth and Structural Change

The value of imports, as shown in Table 2.4, increased over fifty-fold--from 9,622 million baht to 513,114 million baht--in 1988. The drastic increase in import values occurred between 1973 and 1980 because of the skyrocketing price of oil. After 1981, import values grew at an average annual rate of 4.68 percent as a result of the

Table 2.2 : Distribution and Growth of Exports by Economic Sector

(%)

Economic sector	Percentage distribution					Average growth rate			
	1971	1976	1981	1984	1988	1971-76	1976-81	1981-84	1985-88
Agricultural products	62.6	51.8	49.0	45.5	26.5	23.8	18.3	2.4	13.2
Fishery products	2.9	4.4	4.5	5.0	5.2	40.4	19.6	9.4	25.3
Forestry products	1.5	1.7	0.1	0.1	0.2	31.8	-32.9	-10.1	30.7
Mineral products	13.7	6.7	7.9	4.4	1.9	11.7	23.5	-13.7	-9.0
Manufacturing products	10.0	26.0	36.7	44.2	65.6	55.6	28.2	11.6	40.2
Others	9.3	9.4	1.8	0.8	0.7	28.5	-14.2	-20.7	23.6
Total exports a/	100.0	100.0	100.0	100.0	100.0	28.6	19.6	4.9	28.1

Note : a/ Excluding re-exports

Source : Bank of Thailand, Table of Exports classified by Sector,
Monthly Bulletin, various issues.

Table 2.3 : Export-output Ratio by Industry : 1975, 1980, and 1985

(Million baht)

Industry	Export			Value of Output			Export-Output Ratio (%)		
	1975	1980	1985	1975	1980	1985	1975	1980	1985
Food	19,076.3	49,725.2	67,372.4	87,309.3	153,397.9	227,275.9	21.8	32.4	29.6
Beverages	9.0	98.1	379.4	8,335.7	16,191.2	33,125.4	0.1	0.6	1.1
Tobacco	572.0	1,125.3	1,524.1	8,022.7	14,217.8	19,012.5	7.1	7.9	8.8
Textiles	2,722.0	12,122.7	23,627.5	33,769.2	88,492.7	154,158.9	8.1	13.7	15.3
Leather	129.1	1,123.1	2,879.3	2,208.4	4,978.1	17,122.0	5.8	22.6	16.8
Wood & wood products	1,473.0	2,017.6	3,018.0	8,611.0	23,025.0	23,856.0	17.1	8.8	12.7
Paper & paper products	82.0	404.0	527.2	6,323.8	23,213.1	19,521.8	1.3	1.7	2.7
Basic industrial chemicals	41.4	434.0	1,060.6	3,316.1	5,014.5	5,218.8	1.2	8.7	20.3
Chemical products	167.0	546.0	723.6	6,620.5	18,242.2	19,941.3	2.5	3.0	3.6
Refineries & petroleum products	252.0	90.0	1,785.7	16,839.2	50,467.7	67,789.6	1.5	0.2	2.6
Rubber & rubber products	3,546.0	13,238.8	12,302.2	6,016.9	16,471.9	20,209.3	58.9	80.4	60.9
Plastic products	138.0	616.0	1,114.7	2,455.6	5,332.2	7,616.5	5.6	11.6	14.6
Ceramics and earthware	18.5	312.0	393.1	420.0	1,905.9	2,557.9	4.4	16.4	15.4
Glass and glass products	31.0	138.0	525.6	1,424.6	2,153.3	4,154.1	2.2	6.4	12.7
Other non-metallic products	593.0	142.0	122.1	3,840.7	12,547.8	22,775.4	15.4	1.1	0.5
Iron & steel	105.0	1,035.7	2,029.6	6,497.7	11,103.9	17,350.2	1.6	9.3	11.7
Non-ferrous metals	2,396.0	15,923.1	5,814.8	4,153.3	19,204.0	7,162.7	57.7	82.9	81.2
Fabricated metals	216.0	1,201.6	2,636.7	4,213.0	8,276.2	15,008.0	5.1	14.5	17.6
Machinery	81.0	682.0	1,135.0	4,842.9	13,365.4	14,759.5	1.7	5.1	7.7
Electrical machinery and appliances	464.0	6,776.9	10,695.8	4,275.9	20,432.1	29,293.4	10.9	33.2	36.5
Transport equipment	25.0	145.0	91.4	15,783.2	44,908.7	4,787.9	0.2	0.3	1.9
Other manufacturing	1,046.0	4,620.6	11,140.0	5,508.7	9,823.7	27,193.1	19.0	49.1	41.0
Total	33,185.2	112,717.7	150,898.9	240,788.3	562,765.3	759,891.4	13.8	20.0	19.9

Source : Calculated from 1975, 1980 and 1985 Input-Output Tables.

Table 2.4 : Nominal Value and Growth rate of Imports (1960-1988)

Year	Imports	
	Value (Million baht)	Growth rate (%)
1960	9,822	
1961	10,287	6.9
1962	11,504	11.8
1963	12,803	11.3
1964	14,253	11.3
1965	15,433	8.3
1966	18,504	19.9
1967	22,188	19.9
1968	24,103	8.6
1969	25,966	7.7
1970	27,009	4.0
1971	26,794	-0.8
1972	30,875	15.2
1973	42,164	36.6
1974	64,044	51.8
1975	66,835	4.4
1976	72,877	9.0
1977	94,177	29.2
1978	108,899	15.6
1979	146,161	34.2
1980	188,686	29.1
1981	216,746	14.9
1982	196,616	-9.3
1983	236,609	20.3
1984	245,155	3.6
1985	251,169	2.5
1986	241,358	-3.9
1987	334,209	38.5
1988	513,114	53.5
Average	Million baht per year	Growth rate
1961-64	12,212	10.3
1965-69	21,239	12.9
1970-74	38,181	21.4
1975-79	97,790	18.5
1980-84	216,762	11.7
1985-88	334,963	22.6

Source : Bank of Thailand, Monthly Bullentin, various issues.

economic recession. As the Thai economy gradually picked up after the second half of 1986 and achieved the dramatic growth of 1987 and 1988, import values considerably increased from 241,358 million baht in 1986 to 334,209 million baht in 1987, and 513,114 million baht in 1988.

As shown in Table 2.5, oil imports rose very rapidly in comparison to non-oil imports. Oil import values increased 24.35 times between 1970 to 1985, while non-oil import values rose 7.88 times. Due to the two oil crises, the oil price increased by a factor of 15.53 from 1970 to 1985, while the non-oil import price increased only by a factor of 3.8 times. However, after 1985, the weakening price of oil imports fell to only 9.47 times their 1970 level, reduced import values. The reduction, however, was partially offset by an increase in non-oil imports, both in terms of price and quantity.

Thailand's three-decade industrialization process has been accompanied by an increasing dependence on imports. Although the country has developed its manufacturing sector, increasing manufactured output has induced a corresponding acceleration of imports. However, Thailand might have successfully reduced its consumer product imports, since their share of total import value decreased from 34.97 percent in 1960 to 12.65 percent in 1975 and to 7.58 percent in 1988 (see Table 2.6).

Unfortunately, the share of intermediate and raw materials increased from 18.15 percent in 1960 to 24.10 percent in 1975 and to 35.05 percent in 1988. In addition, the share of capital goods also showed an increasing trend, from 24.60 percent in 1960 to 33.27 percent in 1975 and to 39.73 percent in 1988. The same table shows that the share of fuel and lubricants increased considerably between 1970 and 1980. Reduced imports of consumer product and increased imports of intermediate product and capital goods reflect the fact that the import substitution policy pursued in the past did not successfully reduce Thailand's imports; what it did was change the structure of its imports.

The ratio of imports to total demand provides us with basic information on the degree of import dependence of the Thai manufacturing sector. The ratios of imports over total demand by in 22 industrial subsectors were calculated from the 1985 Input-Output table. As shown in Table 2.7, the sectors with more than a 50-percent import dependence were: machinery (81.7%); transport equipment (61.2%); and electrical machinery and appliances (50.1%). The industrial sectors whose ratio of imports over output ranged from 25-50 percent were: paper and paper products (47.6%); fabricated metal (45.0%); basic industrial chemicals (31.8%); chemical products (31.5%); petroleum products (29.9%); and glass and glass products (25.2%). Clearly, Thailand depended on capital or technology-intensive commodity imports. Low import dependence levels were found in labor-intensive or natural resource-based industries, including the food, textile, leather, beverage, tobacco, wood product, rubber, ceramic, plastic, and other nonmetal industries.

The two countries on which Thailand's goods imports most depended were Japan and the United States. Total imports from Japan were

Table 2.5 : Import Indices

	1961	1965	1970	1975	1980	1985	1987
Import value							
Oil	43.45	58.09	100.00	611.12	2521.81	2435.34	1922.28
Non-oil	37.58	57.05	100.00	213.14	528.55	787.88	1172.77
Total	38.09	57.14	100.00	247.45	698.60	929.95	1237.40
Import volume							
Oil	36.58	54.62	100.00	127.49	193.11	156.84	202.98
Non-oil	32.58	52.63	100.00	108.28	179.59	207.21	274.95
Total	32.89	52.84	100.00	109.74	176.44	186.08	246.52
Import price							
Oil	118.79	106.37	100.00	479.35	1305.90	1552.60	947.05
Non-oil	115.44	108.40	100.00	196.84	293.19	380.23	426.54
Total	115.79	108.15	100.00	225.49	395.95	499.75	501.95

Source : Calculated from BOT data.

Table 2.6 : Share of Imports a/

	1960	1965	1970	1975	1980	1985	1988
I. Consumer goods	34.97	26.65	19.36	12.65	10.22	9.54	7.58
A. Non-durable:	26.58	18.91	12.91	7.70	6.50	5.10	3.97
B. Durable :	8.39	7.74	6.45	4.95	3.73	4.44	3.61
II. Intermediate products and raw materials	18.15	20.80	24.90	24.10	24.01	30.17	35.05
A. Chiefly for consumer goods:	10.71	13.79	15.32	15.44	14.94	20.35	23.17
B. Chiefly for capital goods:	7.44	7.01	9.57	8.66	9.08	9.82	11.88
III. Capital goods	24.80	30.94	34.70	33.27	24.42	30.02	39.73
Machineries	14.08	17.44	22.74	22.00	16.75	20.13	28.26
Non-electrical machinery and parts:	10.61	13.63	17.49	17.91	10.81	13.82	17.71
Electrical machinery and parts	3.47	3.81	5.25	4.08	5.94	6.31	10.55
Others	10.52	13.50	11.96	11.28	7.67	9.89	11.48
IV. Other imports	22.28	21.61	21.04	29.98	41.35	30.27	17.64
Vehicles and parts:	7.85	9.42	8.16	6.80	3.66	3.70	5.78
Fuel and lubricants:	10.65	8.77	8.62	21.30	31.13	22.58	7.57
Miscellaneous	3.78	3.42	4.26	1.89	6.55 b/	3.99	4.29
V. Total imports	100	100	100	100	100	100	100

Source : Bank of Thailand, "Imports by Economic Classification Monthly Bulletin " , various issues.

Note   : a/ Excluding military aid.
         b/ Excluding imports of aircraft which have been taken into account in the balance-of-payments statistics
            for the actual import month.

Table 2.7 : Import Dependence

Industry	Import	Total Demand	Import in Total Demand (%)
	1985	1985	1985
Food	5,690,992	178,429,883	3.2
Beverages	612,482	19,806,967	3.1
Tobacco	359,817	17,611,053	2.0
Textiles	1,714,777	83,541,668	2.1
Leather	200,227	12,986,942	1.5
Wood & wood products	203,159	10,158,235	2.0
Paper & paper products	2,817,876	5,918,898	47.6
Basic industrial chemicals	479,371	1,505,266	31.8
Chemical products	6,286,686	19,949,454	31.5
Refineries & petroleum products	3,245,817	10,842,033	29.9
Rubber & rubber products	870,483	13,977,276	6.2
Plastic products	367,888	4,259,921	8.6
Ceramics and earthenware	85,646	1,216,988	7.0
Glass and glass products	409,037	1,625,396	25.2
Other non-metallic products	547,194	8,736,897	6.3
Iron & steel	473,861	2,968,503	16.0
Non-ferrous metals	1,187,030	7,866,996	15.1
Fabricated metals	6,620,348	14,726,938	45.0
Machinery	24,311,217	29,746,434	81.7
Electrical machinery and appliances	24,580,224	49,093,814	50.1
Transport equipment	4,190,716	6,850,795	61.2
Other manufacturing	6,877,141	28,418,208	24.2
Total	92,131,989	530,238,563	17.4

Source : Calculated from the 1985 Input-Output Table.

Table 2.8 : Thailand 's Balance of Trade and Cuurent Acoount

Year	Balance of Trade		Current Account	
	Million Baht	% of GDP	Million Baht	% of GDP
1970	-12244.8	8.3	-5196.9	3.5
1971	-9940.9	6.5	-3632.7	2.4
1972	-8884.6	5.2	-1062.7	0.6
1973	-10802.4	4.9	-997.2	0.4
1974	-14302.2	5.1	-1784.6	0.6
1975	-20161.2	6.6	-12368.3	4.1
1976	-11084.9	3.2	-8977.9	2.6
1977	-25598.8	6.3	-22391.7	5.5
1978	-28540.0	5.8	-23444.9	4.8
1979	-47053.1	8.4	-42591.2	7.6
1980	-57984.6	8.8	-42409.4	6.4
1981	-65781.9	8.7	-56049.3	7.4
1982	-36136.7	4.4	-23138.2	2.8
1983	-89237.1	9.8	-66285.7	7.3
1984	-68795.8	7.1	-49468.3	5.1
1985	-61671.5	6.1	-41924.8	4.1
1986	-14368.7	1.3	8514.5	0.6 a/
1987	-43827.8	3.6	-9319.0	0.8
1988	-102171.2	7.0	-42238.2	2.9

Note : a/ surplus

Source : Bank of Thailand.

deficit during those years. The contribution of the service account surplus to the trade deficit was again strongly pronounced, (as it had been in the early seventies) after 1986 when we had a current account surplus for the first time in many years. Since then, the surplus of net services and unrequired transfers considerably increased due to tourism and remittances from Thai workers abroad. It did help keep the current account deficit as low as 0.8 percent of the GDP in 1987 and 2.9 percent in 1988, despite a 3.6 percent and 7.0 percent trade deficit (as a percentage of the GDP) in 1987 and 1988, respectively.

2.3 External Financing

The process of economic and industrial development requires an increased allocation of resources for capital formation. Indeed, the problem of inadequate private savings due to low per capita income is quite common in many developing countries that cannot generate more exports to meet their investment goals. These developing countries, in general, have two alternatives with which to cope with the shortage of domestic private savings: (1) the government may make an effort to mobilize savings through the direct appropriation of private-sector income; (2) the government may utilize foreign savings as foreign investment, loans, and aid to finance domestic investment. This method, according to Chenery and Strewt (1966) is a powerful engine of growth since it increases domestic investment, which raises the level and productivity of capital stock.

What enabled Thailand to afford its rapid economic development and industrialization in spite of its low level of domestic savings was external financing. Since the early sixties Thailand has been able to develop its industrial sector without serious constraints on foreign exchange. Capital inflow from abroad in terms of foreign direct investment, loans, portfolio investment, and foreign aid offset the trade deficit resulting from the influx of capital goods and intermediate product imports required for the process of industrialization. External financing helped the country to fill the savings-investment gap and finance the current account deficit.

Direct Foreign Investment

There are two acceptable reasons why direct foreign investment (DFI) is usually better than loans; (1) DFI provides equity participation of the investor, particularly in the manufacturing sector. Returns from investment which are derived directly from the venture might be ploughed back into that activity or into other activities; (2) it is believed that direct foreign investment contributes to employment creation, transfer of technology from abroad and access to international markets and knowledge. These processes are very crucial for industrial development since they strengthen interlinkages in the manufacturing sector as well as promote exports.

Direct foreign investment increased from about 890 million baht in 1970 to 4,379 million baht in 1985 (see Table 2.9). Its share

Table 2.9 : Net Foreign Capital Inflows

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Direct Investment	891	808	1427	1605	3836	1745	1614	2164	1011	1048
	(35.92)	(46.64)	(39.17)	(54.63)	(42.37)	(22.50)	(17.42)	(15.49)	(6.80)	(3.10)
Portfolio Investment	237	101	277	211	195	27	-22	2	124	2131
	(9.56)	(5.80)	(7.61)	(7.18)	(2.16)	(0.35)	(0.23)	(0.01)	(0.84)	(6.31)
Foreign Loans	1351	824	1939	1122	5023	5983	7671	11802	13723	30588
	(54.51)	(47.56)	(53.22)	(38.18)	(55.48)	(77.15)	(82.81)	(84.50)	(92.36)	(90.59)
Private	1199	554	1702	94	3770	3924	3468	6196	2460	9896
	(48.35)	(31.98)	(46.72)	(3.21)	(41.63)	(50.60)	(37.43)	(44.36)	(16.56)	(29.31)
Long-term	1015	399	1393	-1198	2638	1324	689	969	764	6329
	(40.95)	(23.05)	(38.24)	(40.79)	(29.14)	(17.07)	(7.44)	(6.94)	(5.14)	(18.74)
Short-term	183	155	309	1292	1131	2600	2779	5226	1696	3567
	(7.40)	(8.93)	(8.48)	(44.00)	(12.49)	(33.53)	(29.99)	(37.42)	(11.42)	(10.56)
Public	153	270	237	1028	1254	2058	4203	5606	11263	20692
	(6.16)	(15.58)	(6.49)	(34.98)	(13.85)	(26.54)	(45.37)	(40.14)	(75.80)	(61.28)
Long-term	153	270	237	1028	1254	2058	4203	5606	11263	20692
	(6.16)	(15.58)	(6.49)	(34.98)	(13.85)	(26.54)	(45.37)	(40.14)	(75.80)	(61.28)
Short-term	0	0	0	0	0	0	0	0	0	0
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Total Capital Inflow	2479	1733	3643	2938	9055	7755	9264	13967	14858	33767
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Table 2.9 (Continued) : Net Foreign Capital Inflows

(Million Baht)

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989p a/
Direct Investment	3816	6363	4339	8192	9624	4379	6880	4712	27629	17135
	(7.52)	(11.54)	(11.31)	(23.62)	(16.49)	(8.51)	(60.60)	(22.32)	(39.31)	(25.63)
Portfolio Investment	1034	19	610	340	-87	3859	2517	12862	11191	13598
	(2.04)	(0.03)	(1.59)	(0.98)	(0.15)	(7.50)	(22.17)	(60.92)	(15.92)	(20.34)
Foreign Loans	45887	48748	33397	26149	48827	43195	1956	3539	31472	36111
	(90.44)	(88.42)	(87.10)	(75.40)	(83.66)	(83.98)	(17.23)	(16.76)	(44.77)	(54.02)
Private	20674	14678	12322	9735	32614	11385	3149	-1063	31871	35096
	(40.75)	(26.62)	(32.13)	(28.07)	(55.88)	(22.14)	(27.74)	(5.04)	(45.34)	(52.50)
Long-term	13828	8269	3898	6949	15619	611	-6237	-6787	1984	10067
	(27.25)	(15.00)	(10.17)	(20.04)	(26.76)	(1.19)	(54.93)	(32.15)	(2.82)	(15.06)
Short-term	6847	6409	8424	2786	16996	10774	9386	5723	29887	25029
	(13.49)	(11.62)	(21.97)	(8.03)	(29.12)	(20.95)	(82.67)	(27.11)	(42.52)	(37.44)
Public	25213	34070	21075	16414	16213	31810	-1193	4602	-399	1015
	(49.69)	(61.80)	(54.96)	(47.33)	(27.78)	(61.85)	(10.51)	(21.80)	(0.57)	(1.52)
Long-term	24394	27199	23075	18461	17330	35485	-864	4726	-424	-2946
	(48.08)	(49.34)	(60.18)	(53.23)	(29.69)	(68.99)	(7.61)	(22.39)	(0.60)	(4.41)
Short-term	819	6871	-2000	-2047	-1117	-3675	-329	-124	25	3961
	(1.61)	(12.46)	(5.22)	(5.90)	(1.91)	(7.15)	(2.90)	(0.59)	(0.04)	(5.93)
Total Capital Inflow	50737	55130	38346	34681	58365	51433	11353	21112	70292	66844
	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)	(100.00)

Note : a/ : Data refer to January-June
        p : Preliminary

Source : Bank of Thailand, Monthly Bulletin, Various issues.

18

constituted approximately 42.5 percent of all capital inflow. After 1975, the share fluctuated between 3.1 percent to 60.6 percent. In 1979, the DFI share dropped to only 3.1 percent but gradually picked up at a level of approximately 11 percent during the early eighties and fluctuated around 8 to 23 percent during 1983-85. Since 1986, when the Thai economy recovered from its economic slump, there has been a sharp rise in DFI. The amount of DFI increased five-fold, from 4,712 million baht in 1987 to 27,629 million baht, in 1988. During the first six months of 1989, DFI totaled 17,135 million baht, which is more than the total DFI over 1985, 1986 and 1987.

BOI data also reveals that, for the past few years, foreign direct investment has risen drastically. The number of applicants for BOI privileges soared from 431 projects in 1986 to 1,058 in 1987; it reached 2,146 in 1988. The share of foreign capital increased from 30.6 percent of total registered capital in 1980, to 44.7 percent in 1985, to 51.8 percent in 1988.

Many factors account for the increasing amount of direct foreign investment in Thailand. First of all, government practices (since the 1960 Investment Promotion Act) have supported DFI, providing generous incentives to promote direct investment from abroad. Apart from this, Thailand, since it is endowed with relatively abundant resources, cheap labor, and political and social stability, attracted a growing number of foreign investors to engage in manufacturing production.

The increasing amount of foreign direct investment over time, particularly in recent years, may also be attributed to external factors. As developed countries and Asian NICs faced the problem of rising wage rates and needed to expand their markets in the fast-growing economies of developing countries, they relocated their production in these countries, including Thailand. These countries were attracted by the good investment atmosphere--ranging from the abundance of resources, cheap labor, social and political stability, and the generous incentives provided by Thai government. The only factor which seems to be slowing down DFI at present is perhaps Thailand's inadequate infrastructure, which is considered the major bottleneck of the Thai economy.

A large proportion of the total DFI is concentrated in the industrial sector. In 1988, about 59.0 percent of all DFI went to the following industrial sub-sector: electrical appliances (22.8%); chemicals (7%); food (4.5%); metal and non-metal product (7.1%); and textiles (3.9%). The rest was put into: trade (14.2%); services (9.1%) financial institutions (7.9%); and construction (7.0%). Sectors like agriculture and mining are not as attractive when compared to other sectors (see Table 2.10).

During 1970-1980, investment from the United States was the highest, constituting about 35-40 percent of all foreign direct investment. During the eighties, however, Japanese investment surpassed the United States to become first in terms of foreign investment--except for 1985 when the United States share of investment rose to 54.13 percent of the total, compared to 35.02

Table 2.10 : Pattern of Direct Foreign Investment by type of Business0

(Percent)

Type of Business	Percentage Share					Annual Growth rate			
	1980	1985	1986	1987	1988	1980-85	1985-86	1986-87	1987-88
1 Financial Institution	-5.9	-29.2	7.4	-81.5	7.9	-41.6	139.9	-852.5	56.9
2 Trade	19.5	24.3	25.8	17.9	14.2	7.4	67.4	-52.6	364.3
3 Construction	20.5	36.2	18.0	28.6	7.0	15.1	-22.1	9.2	43.7
4 Mining & quarrying	15.5	11.8	3.5	4.1	1.5	-2.4	-53.4	-20.1	120.7
4.1 Oil exploration	11.6	9.8	3.4	5.3	1.4	0.5	-45.0	6.3	58.8
4.2 Others	3.9	2.0	0.1	-1.3	0.3	-7.4	-95.6	-1460.5	124.1
5 Agriculture	5.5	1.8	2.9	6.2	1.1	-10.3	159.6	44.9	6.1
6 Industry	26.6	31.0	30.6	100.0	59.0	5.8	55.4	123.5	245.9
6.1 Food	2.4	9.0	4.1	8.4	4.5	33.9	-27.7	39.3	210.8
6.2 Textiles	-0.4	1.3	1.2	21.2	3.9	125.8	44.3	-1072.8	9.0
6.3 Metal based and non-metallic	1.3	-2.9	-0.5	7.8	7.1	29.5	71.4	1114.2	434.6
6.4 Electrical appliances	11.8	6.4	9.0	24.1	22.8	6.6	120.4	84.2	455.1
6.5 Machinery & transport equipme	2.4	0.7	0.2	3.4	2.6	-10.6	-146.6	1173.2	354.8
6.6 Chemicals	5.6	11.2	7.0	16.4	7.0	18.0	-0.9	79.4	122.9
6.7 Petroleum products	0.1		0.1	-0.3	3.0			292.7	5275.9
6.8 Construction materials	0.0	0.9	0.1	0.2	0.1	92.2	-85.9	103.7	143.6
6.9 Other	3.1	0.4	9.8	16.8	7.9	9.7	254.0	17.5	176.6
7 Services	18.3	24.3	11.8	24.8	9.1	8.8	-23.8	44.1	116.0
7.1 Transportation & travel	5.6	4.3	3.7	4.7	1.5	-1.5	29.2	-13.7	84.5
7.2 Housing & real estate	4.0	7.0	0.6	6.8	3.2	15.1	-86.9	702.0	176.3
7.3 Hotels restaurant	2.3	5.1	1.5	2.1	2.0	20.6	-55.0	-0.7	460.3
7.4 Other	6.4	7.1	6.0	11.2	2.4	6.7	23.0	27.2	26.3
Total	100.0	100.0	100.0	100.0	99.8				
(Million baht)	3816.0	4379.2	6880.2	4711.5	27628.7	2.8	57.1	-31.5	486.4

Source : Bank of Thailand.

20

percent from Japan. In 1987, due to the appreciation of the yen, the share of Japanese investment in Thailand, like in many other developing countries, increased to 69.38 percent; the US share was 16.87 percent. Japanese investment was concentrated in the manufacturing sector (mainly in the textile, electrical appliance and electronics, machinery and transport equipment, construction and trade sectors), while US investment emphasized the mining sector (in particular the exploration and development of minerals) and industrial trade and services (see Table 2.11). Recently, the share of foreign investment from Asian NICs increased to about one-third of the total DFI; most of it went to manufacturing-sector production such as textiles, electrical and electronic equipment, and machinery and transport equipment.

The External Debt

After the mid-1970s, the role of foreign borrowing to fill the gap in domestic savings investment and trade grew very rapidly. As shown in Table 2.9 the total amount of capital inflow in the form of long- and short-term foreign loans increased from 1,351 million baht in 1970 to 43,195 million baht in 1985, representing shares of 54.51 and 83.98 percent in total capital inflow. However, in 1986-1987, the amount of foreign loans dropped sharply due to the decreasing amount of disbursement in conjunction with the increasing amount of debt-service payments on private long-term borrowing. Also during 1986-1987 the share of foreign loans dropped to 16-17 percent of all net capital inflow, but then it gradually picked up to remain at a 45-55 percent level during 1988-1989.

The same table shows that after 1985 public long-term borrowing dropped very sharply, since the Thai government recognized the increasing seriousness of the country's debt-service problem. Before that, public borrowing constituted a large amount of the external debt, particularly since the Third Plan. In fact, during the early years of economic development, the government limited the amount of foreign borrowing to 50-60 million US dollars. However, the increase in public external borrowing was quite pronounced, rising from 334.7 million US dollars (during the Second Plan) to 1,303.7 million US dollars (during the Third Plan). The need to provide infrastructure, and explore and develop the energy sector resulted in a sharp rise in public borrowing and support for the military--to a large extent, necessary--added to the need for external borrowing during the Fourth Plan.

At the beginning of the 1980s, after two oil crises and the experience of a worldwide recession, Thailand increased its borrowing to finance trade and the current-account deficit (resulting from skyrocketing oil prices) and to make up for the shortfall in government revenue that had accompanied the economic slowdown. The result of increasing its reliance on foreign borrowing--rather than pursuing appropriate domestic demand management through fiscal, monetary, and price policies--was that Thailand accumulated outstanding debts and, unavoidably, a high debt-service ratio. As

Table 2.11 : Pattern of Foreign Direct Investment by Country of Origin

(Percent)

Country	Percentage Share					Annual Growth Rate			
	1980	1985	1986	1987	1988	1980-85	1985-86	1986-87	1987-88
U.S.A	19.14	54.13	18.80	16.87	11.34	26.6	-45.4	-38.5	294.0
Japan	23.65	35.02	44.32	69.38	52.80	11.2	98.8	7.2	346.2
EEC.	13.98	9.11	17.68	19.95	8.15	3.4	14.6	87.8	139.4
U.K	2.16	2.78	3.56	6.98	3.20	8.1	105.6	34.2	169.0
W.Germany	6.86	2.80	2.33	9.51	2.25	6.4	-3.6	179.5	38.7
France	0.34	3.27	1.32	2.82	1.02	61.7	-38.4	48.0	112.9
Netherlands	0.58	-0.98	-0.84	1.58	1.05	-14.4	-34.6	126.3	288.8
Italy	4.02	0.26	1.15	0.15	0.10	14.0	607.1	-90.3	291.8
Australia	1.02	-1.81	2.09	0.55	0.15	-8.4	182.0	-82.2	61.5
Canada	-1.13	0.84	0.53	0.24	0.21	23.3	-1.6	-69.1	430.4
Switzerland	1.94	1.80	4.01	16.68	2.04	1.3	249.1	185.0	-28.3
Asian NICs	35.24	-6.83	21.54	-26.17	28.93	-4.2	583.7	-183.3	748.5
Hong Kong	27.96	14.82	13.89	-36.55	11.03	-8.9	45.1	-282.9	277.0
Korea	0.25	0.08	0.07	0.47	1.08	-6.3	239.4	385.0	1238.1
Singapore	6.98	-25.63	5.86	-4.68	5.39	-39.2	135.8	-154.8	775.6
Taiwan	0.05	3.90	1.92	14.59	11.43	280.6	-22.7	421.1	359.6
ASEAN-4	4.02	0.89	-0.60	-0.09	-1.59	11.8	-211.0	110.3	9895.5
Brunei		0.08	0.05	0.04			-59.5	31.3	-65.0
Indonesia	0.10	0.16	0.10	0.05	-1.77	11.8	-2.9	-64.4	-20362.5
Malaysia	3.96	0.42	0.11	-0.09	0.02	-13.4	-58.1	-216.5	482.6
Philippines	-0.04	0.23	-0.86	0.01	0.01	44.7	-682.3	100.7	850.0
Other	2.16	6.85	-8.37	2.59	-2.03	2.5	-90.1	-13.8	-458.5
Total	100	100	100	100	100				
(Million baht)	3816.0	4379.2	6880.2	4711.5	27828.7	2.8	57.1	-31.5	486.4

Source : Bank of Thailand.

22

shown in Table 2.12, the country's total outstanding debts increased from 1,346 million US dollars in 1975 to 15,362 million US dollars in 1988, representing an average annual growth rate of 20.6 percent compared to 13.5 percent during 1965-1975. Of this amount, public borrowing accounted for, on the average, 70 percent of the total outstanding debt between 1975-1988, compared to an average of 55 percent before 1975. The amount of public outstanding debts increased from about 228 million US dollars in 1965 to about 12,342 million US dollars in 1988 (representing a growth rate of 19.0 percent per annum), while the private outstanding debt rose from about 150 million US dollars in 1965 to 3,019 million US dollars in 1988 (revealing an annual growth rate of 13.9 percent). The high rate of growth of the outstanding public debt was attributed to increased state enterprise borrowings due to the expansion of the public utilities in the second half of the 1970s, in particular, electricity, energy, and transportation.

The accumulated amount of the outstanding external debt resulted in more debt-service payments (the amount of resources transferred to service debts). Table 2.13 summarizes the burden of Thailand's external debts. A glance at the data shows that Thailand's debt burden increased very rapidly, from 164 million US dollars in 1970 to 2,677 million US dollars in 1988, revealing a growth rate of 16.8 percent per annum. The burden from servicing their debts was higher in the public sector than in the private sector, since the public sector debt service payment rose from 40 million US dollars in 1970 to 1,623 million US dollars in 1988 (or at average annual growth rate of 22.8 percent) while the private sector payment increased from about 124 million US dollars in 1970 to approximately 1,054 million US dollars in 1988 (or at a growth rate of 12.6 per year).

The debt burden, measured by the ratio of debt service payments to export earnings, fluctuated around 10 percent over 1972-1977. After 1978, the ratio fluctuated in the range of 14-22 percent, to reach its peak of 21.9 percent in 1985. In fact, a debt-service ratio (DSR) of 20 percent can be potentially dangerous and can indicate a possible financial crisis. According to the IMF (1981), a debt-service payment ratio of less than 10 percent is acceptable; Thailand has never achieved this level, except in 1974.

The increasing DSR trend which had been obvious since 1978 may be attributed to many internal and external factors. The need to build up infrastructure to foster economic and industrial development, and the failure to boost and allocate domestic savings were the two most important internal factors. Externally, the increasing DSR trend was boosted by reduced export earnings resulting from the worldwide economic recession in the early 1980s; the sluggish demand for primary commodities; the deterioration of the commodity terms of trade; and high interest rates. The strong appreciation of the US dollar in the first half of the 1980s and the strong yen in the second half also contributed to a rising debt-service burden, since a large proportion of the debt was dominated by the dollar and the yen. Fortunately, in the past two years, the DSR has declined from 20.1

Table 2.12 : Total Long Term Foreign Outstanding Debt

(Million US$)

Year	Foreign Outstanding Debt			Percentage Distribution		
	Private	Government	Total	Private	Government	Total
1965	150.0	227.6	377.6	39.7	60.3	100.0
1966	170.2	268.3	438.5	38.8	61.2	100.0
1967	224.0	279.9	503.9	44.5	55.5	100.0
1968	268.7	299.0	567.7	47.3	52.7	100.0
1969	339.3	321.4	660.7	51.4	48.6	100.0
1970	401.2	348.0	749.2	53.6	46.4	100.0
1971	425.3	368.1	793.4	53.6	46.4	100.0
1972	505.4	388.6	894.0	56.5	43.5	100.0
1973	461.2	442.1	903.3	51.1	48.9	100.0
1974	648.0	513.1	1161.1	55.8	44.2	100.0
1975	736.2	609.9	1346.2	54.7	45.3	100.0
1976	785.1	818.8	1603.9	48.9	51.1	100.0
1977	879.8	1141.5	2021.4	43.5	56.5	100.0
1978	930.6	1780.7	2711.3	34.3	65.7	100.0
1979	1243.4	2707.6	3951.0	31.5	68.5	100.0
1980	1751.4	3948.4	5699.8	30.7	69.3	100.0
1981	2098.6	5072.8	7171.4	29.3	70.7	100.0
1982	2296.3	6017.7	8314.0	27.6	72.4	100.0
1983	2663.3	6861.8	9525.1	28.0	72.0	100.0
1984	3372.0	7422.1	10794.1	31.2	68.8	100.0
1985	3369.9	9403.4	12773.3	26.4	73.6	100.0
1986	3117.1	10952.5	14069.6	22.2	77.8	100.0
1987	2837.0	12889.4	15726.4	18.0	82.0	100.0
1988	3019.4	12342.3	15361.6	19.7	80.3	100.0

Source : Balance of Payments Section, Bank of Thailand, Various issues.

24

Table 2.13 : Debt Service : 1965-1988 a/

	Debt service payments b/			Export earning c/	Debt service ratio (%)		
	Private	Public	Total		Private	Public	Total
1965	37	30	68	747	5.0	4.1	9.1
1966	41	33	74	937	4.4	3.5	7.9
1967	49	37	86	1,026	4.8	3.6	8.4
1968	70	39	109	1,029	6.8	3.8	10.6
1969	94	43	137	1,073	8.8	4.0	12.8
1970	124	40	164	1,093	11.4	3.7	15.0
1971	157	41	198	1,210	13.0	3.4	16.3
1972	137	45	182	1,532	8.9	2.9	11.9
1973	213	55	268	2,087	10.2	\2.6	12.8
1974	195	61	256	3,086	6.3	2.0	8.3
1975	285	76	361	2,852	10.0	2.7	12.6
1976	291	87	378	3,560	8.2	2.4	10.6
1977	320	123	444	4,110	7.8	3.0	10.8
1978	624	200	824	4,968	12.6	4.0	16.6
1979	648	296	944	6,457	10.0	4.6	14.6
1980	790	438	1,227	8,313	9.5	5.3	14.8
1981	704	625	1,329	8,987	7.8	7.0	14.8
1982	710	813	1,523	9,167	7.7	8.9	16.6
1983	820	923	1,742	8,999	9.1	10.3	19.4
1984	997	1,035	2,033	10,194	9.8	10.2	19.9
1985	1,094	1,095	2,190	9,998	10.9	11.0	21.9
1986	1,119	1,278	2,397	11,928	9.4	10.7	20.1
1987	1,129	1,457	2,587	15,366	7.3	9.5	16.8
1988	1,054	1,623	2,677	21,390	4.9	7.6	12.5

Note : a/ Debts which mature in more than one year.

b/ Repayable in foreign currencies only.

c/ Earnings from goods exports and non-factor services.

Source : Balance of Payments Section, Bank of Thailand.

percent (in 1986) to 16.8 percent (in 1987) and to 12.5 percent (in 1988) due partly to the dramatic expansion of exports in recent years and partly to government awareness of the debt problem; indeed, the government limited the amount of external borrowing to 1,000 million US dollars in fiscal 1987 and 1988 in order to drop the DSR down to an acceptable level. Although the ceiling of $US 1,000 million was revised again this year, and raised to $US 1,200 million for fiscal 1989, the government aims to reduce the DSR to under 9 percent.

In fact, heavy reliance on external borrowing to bridge the saving-investment and trade gap is by no means bad, as long as the return on the use of the funds is higher than the interest rate. Nevertheless, any debt-led growth strategy must be carefully pursued. An increasing debt burden would have an adverse effect on long-run economic growth and financial stability, since it implies that domestic resources will be drained from the country to service the debt. Thailand has recognized the problem and has successfully cut back overspending--especially in the public sector--to slow down the accumulation of debts outstanding. Such a direction was appropriate for sustaining long-term economic growth and stability, although it may affect short-term growth in certain areas.

Portfolio Investment

Unlike direct foreign investment or external borrowing, whose role in external financing predominated for a long time, portfolio investment has become an increasingly important kind of capital inflow just in the last few years. Before that, the portfolio investment role was minimal, since its share constituted at most 2 percent of the total net capital flow (see Table 2.9). The amount of portfolio investment jumped significantly, from 2,517 million baht in 1986 to 12,861 million baht in 1987; it has maintained more or less that level since then.

The significant increase in the amount of portfolio investment in 1987 may be attributed to the influx from Hong Kong. The net inflow of portfolio investment from Hong Kong increased from 868 million baht in 1986 to almost ten times that in 1987; this constituted 60 percent of the total. The second country in the top three in 1987 was the United Kingdom, which once, during 1981-1985, was the first in terms of portfolio investment--about 79 percent--in Thailand. Nevertheless, portfolio investment from the United Kingdom has varied from one-forth to one-third of the total since 1986. Throughout 1988 and the first half of 1989, there has been an influx from Singapore which constitutes about 40 percent of the total inflow (see Table 2.14).

2.4 Source of Export Growth

The recent emergence of the Thai economy as a highly dynamic exporter of manufactured products inspired us to a examine the sources of this successful development and growth. This extraordinary rise in

Table 2.14 : Portfolio Investment Patterns

Source	1981-1985 a/				1986				1987			
	Inflow	Outflow	Net	Share	Inflow	Outflow	Net	Share	Inflow	Outflow	Net	Share
Hong-Kong	1454.1	790.6	663.5	12.7	1,320.9	453.0	867.9	34.5	8,597.6	885.7	7,711.9	60.0
Japan	74.7	58.4	16.3	0.3	5.4	13.1	(7.7)	(0.3)	254.1	149.6	104.5	0.8
Singapore	475.7	64.5	411.2	7.9	351.6	41.8	309.8	12.3	2,536.7	1,345.7	1,191.0	9.3
United Kingdom	4160.6	40.8	4119.8	79.0	795.3	16.4	778.9	30.9	4,347.3	1,575.0	2,772.3	21.6
United Stated	232.7	98.0	134.7	2.6	518.2	8.2	510.0	20.3	1,213.2	232.2	981.0	7.6
Other	272.5	402.8	-130.4	(2.5)	62.1	4.2	57.9	2.3	199.4	98.4	101.0	0.8
Total	6670.3	1455.1	5215.1	100.0	3,053.5	536.7	2,516.8	100.0	17,148.3	4,286.6	12,861.7	100.0

Source	1988				1989 b/			
	Inflow	Outflow	Net	Share	Inflow	Outflow	Net	Share
Hong-Kong	2,050.4	2,090.6	(40.2)	(0.4)	2,844.8	22.3	2,822.5	20.8
Japan	1,385.0	197.6	1,187.4	10.6	74.5	37.8	36.7	0.3
Singapore	10,172.4	6,201.1	3,971.3	35.5	9,198.0	2,918.1	6,280.0	46.2
United Kingdom	9,984.7	6,180.2	3,804.5	34.0	6,199.7	2,638.6	3,561.1	26.2
United Stated	3,064.4	727.5	2,336.9	20.9	884.3	653.5	230.7	1.7
Other	1,103.1	1,171.8	(68.7)	(0.6)	943.7	278.0	665.7	4.9
Total	27,760.0	16,568.8	11,191.2	100.0	20,143.0	6,546.3	13,596.7	100.0

Notes: a/ Total 1981-1985
        b/ Only quarter 1, 2

Source: Balance of Payment Section, Bank of Thailand.

manufactured commodity exports stimulated questions about the underlying sources of export growth. Although it is widely accepted that both external and domestic factors are responsible for the recent success of Thai exports, it was of great interest to study this export growth to see whether it was mainly externally driven or internally generated. This section, therefore, presents results of our study on the qualitative and quantitative causes of export growth, in the hope that they may serve as guidelines for exchange-rate and export-promotion policy. ·

Whether trade dynamism is driven externally or internally is widely discussed by economists. Riedel (1984) believed that supply rather than demand factors principally determine export performance in developing countries. Bradford (1987) also expects a positive relationship between a high rate of structural change in manufacturing and the dynamic performance of manufactured product exports. Rapid structural change in exports is expected to reflect and follow from rapid internal structural change. In contrast, using the causality test on the relationship between the growth of the manufacturing sector and export performance (discussed in section 4.4), the study team found a one-way relationship between overall exports and the growth of the manufacturing sector, which indicated that the growth of overall exports caused changes in Thailand's economic structure, with an emphasis on manufacturing. The results imply an export-led industrial development growth strategy. It seems to be that external forces, rather than internal factors, especially foreign demand, principally determined the growth of exports.

As a consequence, the study team, basing its analysis on the demand-determined nature of exports, examined the quantitative export-demand function. Here, the foreign demand for Thai exports was assumed to be influenced by the relative export price in foreign currency and world income. Relative price in foreign currency was intended to capture the cost-competitive characteristics of Thai exports (determined by domestic producer cost and exchange rate); world income was used to reflect the effect of the world trade volume, or the income of the major industrialized countries.

The econometric estimation of overall exports (at current and constant 1984 prices) and manufactured exports (at constant 1984 prices) shown in the Appendix 1 reveals that both world income and the relative price of exports compared to other major competing countries, (in terms of foreign currency) significantly determined Thai exports. The income elasticity of Thailand's overall exports was about 2.19 in the short run and 2.86 in the long run, compared to a 2.25 long-run elasticity for Thai manufactured exports as estimated by the World Bank.

The results seem to suggest that during 1987-1988, if the real income (at constant 1984 prices) of the major industrialized countries had grown at 1.8 percent per year (as it had in the early 1980s) instead of the 3.5 percent, as was the case, the value of Thai exports would have grown at 16.9 percent in 1987 and 18.6 percent in 1988 (at constant prices), instead of 23.5 percent and 25.7 percent, respectively, as actually occurred.

28

Based on the above regression results, the sources of Thailand's export growth were calculated; we found that about 57.3 percent of the total real export growth between 1984-1987 came from the expansion of the world-trade volume represented by an increase in the income of the major industrialized countries (see Table 2.15 or figure 2.1).

The most important income effect on Thailand's export growth comes mainly from exports to the United States. In the past, Thai exports to the United States, which constituted, on the average, about 15.8 percent of total exports between 1980-1987, fluctuated relatively less and constituted a very large volume--even in the early 1980s when the dollar and baht both appreciated against the Japanese yen and European currencies. It seems that what made Thai exports sensitive to the demand growth of the United States--the dominant factor in Thailand's exports to the United States--was the effect of income rather than price. As a consequence, this suggests that the Unites State's economic adjustment to correct its fiscal and trade imbalances under a demand-management policy, would reduce the import demand from the United States and, would affect Thai exports to some extent. Prospects for Thailand's near-future economic performance consequently, rely heavily on the question of the United States's economic adjustment.

The growth of world income was the major source of Thailand's exports growth. Thailand's export performed exceptionally well and even better than the East-Asian average. In the past, such performance can be explained by the increasing demand of developed countries, particularly the United States.

The changes in the relative prices of Thailand's exports compared to those of other major competing countries was the other important factor responsible for Thailand's export growth. However, there were two main factors implicit in this relative price change: (1) the exchange-rate effect; and (2) the relatively low wage and production cost that improved to Thailand's cost competitiveness. These two effects, unfortunately, could not be extracted from our cost-competitiveness effect due partly to the nature of our export-demand function and partly from the fact that the real effectiveness of exchange-rate policy depends on whether a large number of countries adopt the same policy. Nevertheless, as in other ASEAN countries, the exchange-rate effect has been significantly pronounced in Thailand's export growth. Part of Thailand's export success over the last few years has relied on the competitive exchange rate. About 18.7 percent of our export growth was a result of changes in cost competitiveness, which encompasses both changes or reductions in domestic production costs (compared to costs of other major importing countries) and changes in the real effective exchange rate.

During the 1970s when the baht was pegged to the dollar, the over-valued baht was corrected as the dollar depreciated relative to most other currencies. This resulted in the devaluation of the baht against other major currencies and helped to improve the cost competitiveness of Thai exports compared to that of our major

Table 2.15 : Source of Export Expansion a/

	World income	Cost competitiveness	Residual
Total Exports	57.29	18.67	24.04
Major Manufactured Exports			
Food processing	85.39	13.85	0.76
Textiles	34.71	0.15	65.13
Wood	1.56	20.15	78.29
Rubber	36.78	24.44	38.77
Non-metallic	21.47	32.01	46.51
Engineering	30.32	12.77	56.92

Note : a/ Exports are measured at constant 1984 prices.

Figure 2.1
Source of Export Expansion 1/
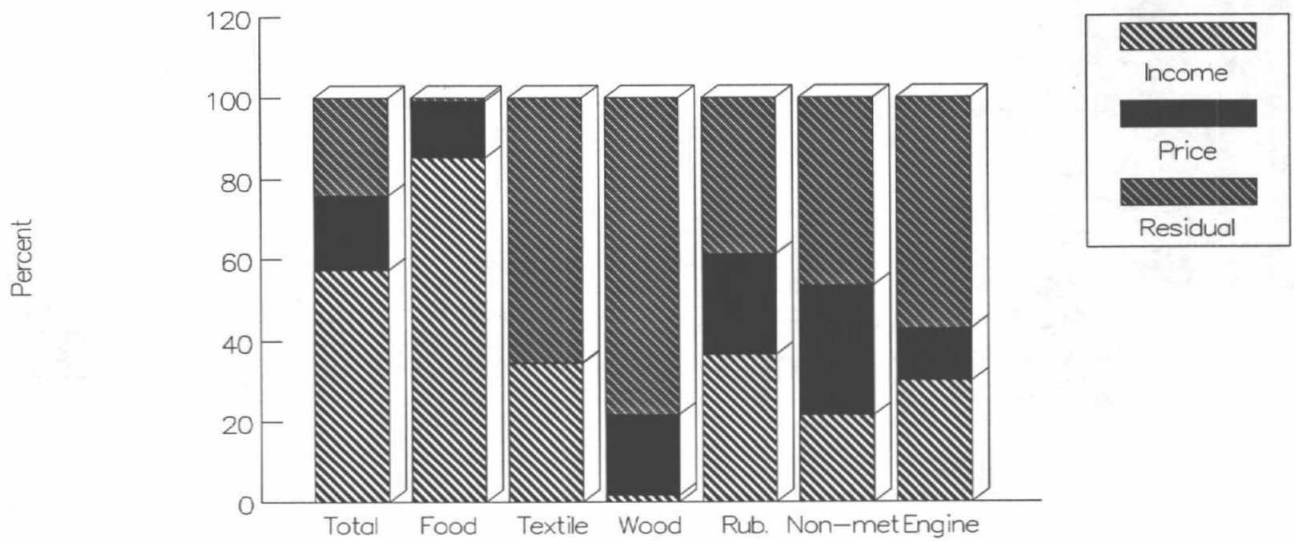
Note: 1/ Exports are measured at constant 1984 price.

competitors. As shown in figure 2.2 the relative price index of overall exports was relatively low. However, the situation changed in the period 1979-1985 as the U.S. dollar appreciated, eroding Thailand's competitiveness. In 1981, although the baht was devalued against the U.S. dollar by 8.7 percent, the effect was, unfortunately, largely offset by the strong dollar (to which the baht was pegged against other major currencies). During this period the relative price of Thai exports was rather high as shown in the Figure. The baht was devalued again in November 1984, by about 17 percent. This time the exchange system was also changed; the baht was no longer pegged to the U.S. dollar but to a basket of currencies. Since this last devaluation, Thailand has experienced a major real currency depreciation--from the combined effect of the baht depreciation and the rapid appreciation of the Japanese yen and European currencies relative to the U.S. dollar--to which, despite the basket pegging system, the baht has been closely tied. Such depreciation caused Thai exports to regain their competitiveness. Then, exports to Japan and the EEC (due to the depreciation of the baht against these currencies) accelerated.

It seems that the price effect describes the flow of Thai exports to the EEC and Japan, whereas the income effect explains exports to the United States.

Apart from the income and price effects discussed above, we also found that about 24 percent of the total change in real exports which occurred during 1984-1987 was influenced by other factors. This kind of export expansion (which did not depend on changes in world income or cost competitiveness) was relatively high in almost all manufactured export, groups except for food processing for which this "residual" aspect (that could not be explained by income and price) was very low (see Figure 2.1). Thus, it called for a qualitative analysis, since the quantitative analysis insufficiently explained this aspect of export expansion. An analysis of some factors explaining this "residual" is presented below.

The evolution of the international product cycle characterizes exports of fast-growing economies like Asian NICs and other developing countries. Due to the yen appreciation and Japanese restructuring, markets were liberalized in the country and some Japanese products were relocated in Asian NICs and then to second generation NICs like Thailand. In addition, due to rising wage rates and loss of cost competitiveness, especially in labor-intensive commodities, those industries have been relocated in countries besides Japan.

With the increasing success of Japan and the NICs and the resulting rise in income and wages, these countries have been forced to move towards the production and export of increasingly sophisticated manufactured products and, at the same time, spin off more, simple labor-intensive activities. This phenomenon has created opportunities for second-generation NICs to develop and export such commodities.

Figure 2.2
Relative Price of Thai Exports 1/
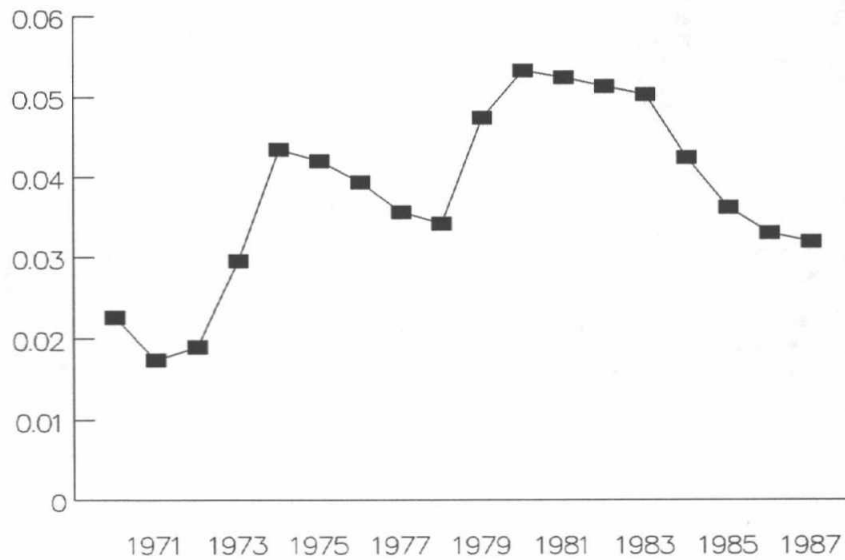
33

The labor-intensive and less sophisticated industries spun off from Japan and the first-generation NICs have spread to Southeast Asia, the ASEAN Four and the People's Republic of China. This phenomenon has been characterized as a flock of flying geese led by Japan with the Republic of Korea, Taiwan, Hong Kong and Singapore following, and the second-generation NICs flying behind. This flying goose pattern is the result of changes in labor cost and competitiveness in Japan and the ASEAN NICs, which forced them to move towards capital and technology-intensive industries and spin off their labor-intensive industries to second-generation NICs. The phenomenon repeated itself, happening once again as before when the Asian NICs had taken over the many industries that had been dominated by Japan.

As the international product cycle evolved, flows of foreign capital, technology, management and marketing know-how have been diffused and transmitted to Thailand due to the country's abundance of labor. Thailand's agricultural sector plays a crucial role in the industrial development process, acting as a reserve labor supply to meet the increasing demand of the manufacturing sector, which keeps wages at relatively low levels. In Thailand direct foreign investment and output of manufactured goods expanded according to the evolution of the product cycle. Once production in Thailand (as a host-country for Japanese and first-generation NIC industries) reached certain capacity, exports started moving back to the home country. This recent phenomenon is easily observed in many industries, for instance, in electrical and electronic appliances.

The evolution of the international product cycle explains a large proportion of the increase in exports in certain industrial subsectors--for instance the chemical, rubber and petroleum; engineering; nonmetal; textiles; and wood subsectors.

An increase in Thai exports may be partially explained by Thailand's world market penetration. However, its share accounts for less than 2 percent of LDC manufactured exports. An increasing market share, therefore, explains Thailand's recent export expansion--besides this overall market growth. In addition, perhaps Thai exporters are not more cost competitive than other developing countries, but there are an increasing number of them.

The initial small share of Thai exports and the import restrictions adopted by major industrialized countries imposed against the Asian NICs have favorably resulted in an increase in Thai exports. Thailand seems to have benefited from being a marginal supplier of various manufactured goods. Protectionist practices did not seriously constrain Thai exports during this period.

The shifting composition of exports and the evolving Thai export market share by geographic destination are two significant factors which explain the increase in Thai exports. As the global distribution shows (see in Table 2.16), the major destinations of Thai exports are Japan, the United States, and the EEC, who, together,

Table 2.16 : Direction of Thailand's Export in 1976-1987

(Percentage)

Major Trading Country	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
World	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Japan	25.98	19.77	19.81	21.17	15.09	14.19	13.72	15.08	13.00	13.36	14.07	14.90
United States	9.97	9.61	10.92	11.19	12.65	12.94	12.81	14.95	17.18	19.67	17.95	18.62
EEC 1/	21.94	22.03	26.79	23.40	25.70	21.68	23.40	21.19	20.53	18.55	21.48	22.24
Australia	0.99	0.91	0.88	0.97	1.07	1.14	1.07	1.47	1.64	1.75	1.81	1.85
New Zealand	0.05	0.06	0.07	0.18	0.07	0.09	0.19	0.19	0.14	0.12	0.16	0.19
Hong Kong	4.87	4.65	5.31	4.86	5.07	4.80	4.96	4.97	3.79	4.04	4.03	4.16
Replublic of Korea	1.00	0.78	0.89	0.96	0.76	2.10	1.18	1.43	1.65	1.86	2.73	1.32
Total ASEAN	17.17	18.09	15.54	16.85	18.36	14.77	15.79	15.70	14.20	14.28	14.26	13.54
Brunei Darussalam	0.13	0.19	0.14	0.12	0.14	0.16	0.12	0.15	0.14	0.00	0.00	0.15
Indoniasia	5.19	6.06	1.70	3.57	3.63	1.93	2.65	1.88	0.63	0.61	0.66	0.53
Malaysia	4.20	5.32	5.23	4.41	4.50	4.55	5.23	4.48	4.72	4.98	4.34	3.32
The philippines	0.96	0.31	0.45	0.22	0.36	0.29	0.50	1.06	0.31	0.75	0.33	0.61
Singapore	6.69	6.21	8.03	8.53	7.73	7.84	7.29	8.13	8.40	7.94	8.93	8.94
Rest of the World	18.03	24.11	19.80	20.44	23.23	28.28	26.88	25.01	27.88	26.35	23.51	23.18

Note : 1/ Countries in EEC in 1976-1978 not included Ireland, Denmark, Greece, Portugal and Spain.
Countries in EEC in 1979-1980 not included Greece, Portugal and Spain.
Countries in EEC in 1981-1984 not included Portugal and Spain.

Source : 1976-1986 : Foreign Trade Statistics of Asia and the Pacific, 1975-1978, Vol XI, Series B,UN.
Foreign Trade Statistics of Asia and the Pacific, 1979-1982, Vol XV, Series B,UN.
Foreign Trade Statistics of Asia and the Pacific, 1981-1985, Series A,B,UN.
Quarterly Bulletin of Statistics for Asia and the Pacific, Vol XVII No.4, Dec 1987, UN.
1987 : Foreign Trade Statistics of Thailand, December 1987.

take up about half the export share. This share of the export market is declined from 57.89 percent in 1976 to 48.81 percent in 1981, and increased again to 55.79 percent in 1987 due to an increasing share of exports to the United States. It can be seen from the Table that exports to "the rest of the world" have increased over time from 18.03 percent in 1976, to 23.23 in 1980, and to 27.88 percent in 1984. In 1987, the share slightly decreased to 23.18 percent due to a huge increase in export value--especially to the United States. Other important countries included in this group are Canada, Bangladesh, India, Switzerland, the Union of Soviet Socialist Republics, and some countries in Africa. This diversification in export destination is another factor explaining Thailand's past export growth.

In terms of product diversification, there has been a continuous trend to increase the importance of manufactured exports over primary exports, including agricultural, fishery, forestry, and mineral products. The diversification of products manufactured for exports also increased. Although five product groups account for more than 75 percent of all Thai manufactured exports (namely, processed food, textiles, garments, electronic goods--mainly integrated circuits--,and jewelry), other manufactured exports have become increasingly significant. Among these are footwear, furniture, leather, rubber, and plastic.

And, taking into consideration the broad commodity classification of export items, .this degree of product diversification its even understated. For instance, under the broad commodity group of "processed food," there are numerous export items including canned fruit, canned seafood, frozen seafood, and others. Therefore, product diversification is another important factor which explains Thailand's recent expansion of exports.

3 THE MODELS

The previous section reviewed the increasing openness of the Thai economy from the 1970s until the present. It is obvious that the Thai economy relies heavily on external trade and financing, which is by no means always bad. It is, perhaps, an unavoidable process in economic development. Increasing involvement in the international economy and in international finance can have both positive and negative results. On the one hand, involvement may contribute to economic growth and dynamism. Indeed, international finance can fill the domestic resource gap that enables a country to develop the infrastructure required for industrialization. On the other hand, increasing dependence on foreign trade and finance implies that the country may not be immune to international economic and political circumstances. This section is, therefore, a discussion of the models used for analyzing the impact of the external sector on domestic economic performance. The analysis is aimed at exploring the effects of export expansion on major macroeconomic variables including growth, income distribution, import dependence, current account, structural change, and inflation.

To analyze the impact of Thailand's external sector on domestic economic performance, two types of models were used: (1) an econometric model modified from the so-called "LINK system" developed by Nijathaworn and Arya (1987); and the CGE model--a multisectoral analysis based on the interdependencies within and across sectors in consumption, production, and trade. The reason why two types of models were used here is that a macroeconometric model is suitable for short-term forecasts and for simulating the impact of the external sector on growth and stability, while the CGE model is more sensitive to answering questions about income distribution, sectoral growth, and resource allocation. In this study, they were complementary, providing empirical evidence for examining the impact of various aspects of export growth.

3.1 Macroeconometric Model

The macroeconometric model constructed for this study was modified from the "LINK system" in two major ways: (1) exports, which are exogenously determined in the LINK system, were treated as endogenous variables here; and (2) the modified model tends to describe the behavior of the financial and money sectors in less detail than the LINK system, while its treatment of the trade sector is quite extensive. Such treatment will allow us to examine the impact of the external sector in detail. The constructed model consists of 73 equations and 84 identities that describe the behavior and accounting relationships among 157 endogenous and 101 exogenous economic variables using a framework of national income accounts. The main characteristics of the model may be summarized as follows (they are described in detail in the Appendix):

1. The model (like the "LINK model" from which it was modified) has some ability to formulate links between the supply and demand sides of the economy by using the 1984 Input-Output Table. Such links not only provide a basis for analyzing the impact of demand on sectoral output but also the impact of production cost on sectoral prices.

2. The model is a Keynesian type model in the sense that the components of final demand in national income identity (including consumption, capital formation, government expenditures and exports) determine sectoral GDP through the 1984 I-O matrix and assume a fixed proportion between sectoral output and value added. This demand-determined model typically generates short-term projections or addresses stabilization issues. However, it may not be suitable for the agricultural sector, which is rather supply-determined.

3. Data from the 1984, 180-sector, I-O Table were aggregated into 16 sectors as shown in Appendices 2 and 3. These consist of one agricultural sector; one mining sector; and eight industrial subsectors including: (1) the food processing industry; (2) the chemical, rubber, and petroleum industries; (3) the engineering industry; (4) the textile industry; (5) the nonmetallic industry; (6) the paper industry; (7) the wood and wood product industry; and (8) other manufactured commodities; and six service subsectors: (1) construction, (2) wholesale and retail trade, (3) transportation and communication, (4) banking and insurance, (5) public utilities and (6) other services.

4. The Producer's cost was determined by weighting prices of intermediate inputs, the import price, and the wage and capital cost, based on the sector's input structure shown in 1984 I-O Table. The sectoral price is defined from the producer's cost, by adding a mark-up and an indirect tax which were assumed to be exogenous here. Sectoral prices affect export prices and also export demand. Since general price levels, in this study are explained in terms of cost-plus pricing, the model does not assume instantaneous price adjustment to clear the market. In sum, the model constructed intends to let final demand drive domestic output; whereas the cost of production determines the price level. Whenever there is a shock in term of trade, it will first affect the cost of production, then the export price and the sectoral price which, in turn, affect final demand (components) and output.

5. The external sector of the model deals with exports, imports and capital inflow as direct foreign investment, portfolio investment, and short- and long-term borrowings by the private and public sector. Foreign demand for Thai exports in each sector is determined by the relative export price in foreign currency, the exports of major competitors, and the world trade and foreign income volume, implying that we did

38

not use the small-country assumption for our exports. Imports by sector are explained mainly by level of income, the relative sectoral domestic and import price, and, perhaps, bank credit. The world supply of imported goods was assumed to be infinitely elastic so that the import price is exogeneously determined from abroad. Direct foreign investment is exogeneously determined by world income and by the potential GDP relative to the actual GDP. We found that portfolio investment is hardly explained by conventional variables like domestic growth expansion, world income or relative interest rates--as a result of the nonsystematic increase of portfolio investment since 1986. Long-term private borrowing was postulated to depend upon the GDP, the foreign rate of interest, the exchange rate and the domestic-lending rate, while we assumed that long-term public borrowing is influenced by the government deficit, economic growth, and the interest payment on foreign debts. Short-term borrowings were assumed to be exogenous.

The balance-of-payments equation closes the system, thus equating the trade deficit to foreign capital inflow. However, since the exchange rate was assumed to be exogenous, it can generate a disequilibrium in the foreign exchange market, which is offset by equilibrating capital inflow.

6. For other final demand components, we postulated that consumption expenditures are of the Keynesian type--in the sense that income level is the major explanatory variable. After households allocate income to consumption, interest payments, taxes and transfers, the rest becomes household savings. Expenditures in the fixed capital formation of the private sector relate to the level of the previous year's real GDP and real resources available--a firm's income, changes in bank credit, and the net private-sector capital inflow.

7. Public outlay and revenue, including those of the central government, local government, and state enterprises, were analyzed from an accounting framework. Some components were assumed to be exogenous while some were assumed to be endogenous. For instance, current government expenditures, direct taxes, and government borrowing were treated as endogenous variables.

Model Estimation and Solution

Based on an aggregated 16x16-sector matrix of the 1984 Input-Output table, we first computed coefficients appearing in sectoral price equations and estimated value-added and demand-converter equations. Behavioral parameters in the model were estimated from time-series data between 1970-1987 using the OLS method, which provides unbiased estimators for certain restrictive assumptions. All real variables were based on 1984 prices. The listing of the estimated model is in Appendix 4.

The model was then solved dynamically for the period between 1983-1987, using the Gauss-Siedel technique; the comparison of predicted and actual results reported in Appendix 5 demonstrates quite satisfactory model performance. However, there are still large errors in the balance-of-payments and monetary bases that require further, future elaboration and extension of the model's financial sector.

3.2 Computable General Equilibrium Model

In order to assess the impact of the external sector on domestic performance, a computable general equilibrium approach is also useful. Moreover, the computable general equilibrium approach is very appropriate when one is considering effects on the size distribution of income. This is tantamount to saying that other modeling approaches would not be capable of performing this function.

The computable general equilibrium model used for the numerical quantification of the impact of the external sector--particularly on growth, the current account deficit, and income distribution--is a version of the computable general equilibrium model developed at TDRI. It is a nonlinear multisectoral model in the tradition of the one created by Herbert Scarf at Yale University and further articulated and developed by CGE modellers at the World Bank.

Model Dimensions

The model consists of five types of institutions: households, private corporations, the government, state enterprises, and the rest of the world. In order that impact on income distribution can be analyzed, households were disaggregated into 19 categories according to the occupations of household heads and levels of income. Five different household occupations were used: agricultural household; private-sector; non-agricultural household; government employee; and state-enterprise employee. For each occupation, households were categorized into five income groups based on the income quintile in which they fell. Since there are very few state-enterprise households in the fourth quintile, they were ignored in the fourth quintile analysis, but were included in the fifth quintile's.

There are 27 activities, on the production side, subscripted by i, $i = 1,.....,27$ as listed below:

1. Paddy
2. Other major crops
3. Fruit and vegetables
4. Other agriculture
5. Fishing
6. Slaughtering
7. Canning and food processing
8. Rice milling
9. Beverages
10. Tobacco processing
11. Other foods
12. Clothing

13. Wood-paper-rubber products
14. Basic industries
15. Appliances
16. Other household items
17. Other industries
18. Fuel
19. Utilities
20. Construction
21. Hotels and restaurants
22. Transportation
23. Real estate
24. Public administration
25. Education
26. Health
27. Other services

In the model, each production activity required the use of intermediate inputs, labor, capital and, for some activities, agricultural land. There were four types of labor supply:

1. labor used for production activities i, i = 1,...,4
2. labor used for private production activities i, i = 5,...,27 except
3. labor in government, and
4. labor in state enterprises

The first two types of labor supply were here named agricultural labor and private, non-agricultural labor, respectively. Capital employed in activities i, i = 1, ..., 5, was called "agricultural capital." Capital used in other activities was therefore called "non-agricultural capital." Land, another factor of production, was used only in sector i, i = 1, ..., 4.

There are six types of demand for goods and services intermediate demand, household consumption, government consumption, tourist consumption, exports, and, finally, investment demand. The demand for intermediate goods, household consumption goods, government consumption goods, and for investment goods consist of both that produced domestically and that imported from abroad.

Model Specifications

Cost-minimizing producers use intermediate inputs combined with value added in fixed proportions. Intermediate requirements also involve fixed coefficients across intermediates in different sectors. Certain substitution possibilities were, however, allowed for among primary factors of production. Labor and capital were combined using the constant elasticity of substitution (CES) aggregation function, reflecting that labor and capital are neither perfect substitutes nor complements. In agricultural activities, except for fisheries, the labor-capital composite had to be used in conjunction with agricultural land according to the CES aggregation function. Such a multi-level substitution structure thus allowed us to differentiate

degrees of substitution among primary inputs. The production technology can be summarized as follows:

1. The producers, by assumption, maximize profit in a perfectly competitive environment. They therefore behave as price-takers and earn normal profits.

2. Final household demand functions are derived from the utility-maximization problem. The utility function used was the two-stage LES-CES system. Private consumers allocate their budget to consume composite goods according to the LES system, whereas each composite good is a CES aggregation of domestically produced goods and imports. Such a system allows the income elasticities of demand to differ from unity.

3. Other types of final demand are not derived from the utility maximization problem. However, they are CES composites of domestic goods and imported goods.

Given the aggregation level used in our analysis, the assumption concerning the hypothesis that domestic commodities and imported commodities are not perfect substitutes and are combined according to the CES function is reasonable. We therefore applied this assumption widely, and, since all imports were considered competitive imports, the CES composites occur not only in consumption and investment, but are part of intermediate demands as well. This is not to say that all commodities are composites. In the model, there are 23 composite commodities corresponding to the 23 imported goods, and the rest are purely domestic products. Figures 3.1 and 3.2 summarize substitution possibilities in production and final demand.

Exports and domestic sales are perfect substitutes. In world markets, exports and other countries' exports are not perfect substitutes. To avoid some complications, export demand was assumed to depend on the relative price of export sales in terms of foreign products with constant export demand elasticities with respect to relative prices. If such elasticities approach infinity, the corresponding export demands are approximately horizontal (as in the case of the small-country assumption which is not very realistic). Of course, each export demand also includes the exogenous component, i.e. the shift factor.

FIGURE 3.1 Substitution Possibilities in Production

```
                          Gross Output
                               :
        ------------------------------------------
        :                            :    LEONTIEF
        :                            :
    Value Added                  Intermediate
        :                            :
     ----------------- CES           :
     :              :                :
Capital Labor     Land               :
  Composite         --------------------------------------------
     :              :          :          :          :
     :              :          :          :          :
  ---------------              :
  :           : CES        Composite
  :           :        Intermediate Input
Capital     Labor               :
                                :
                     ------------------- CES
                     :                 :
                  Domestic          Imported
                   Input             Input
```

LEONTIEF
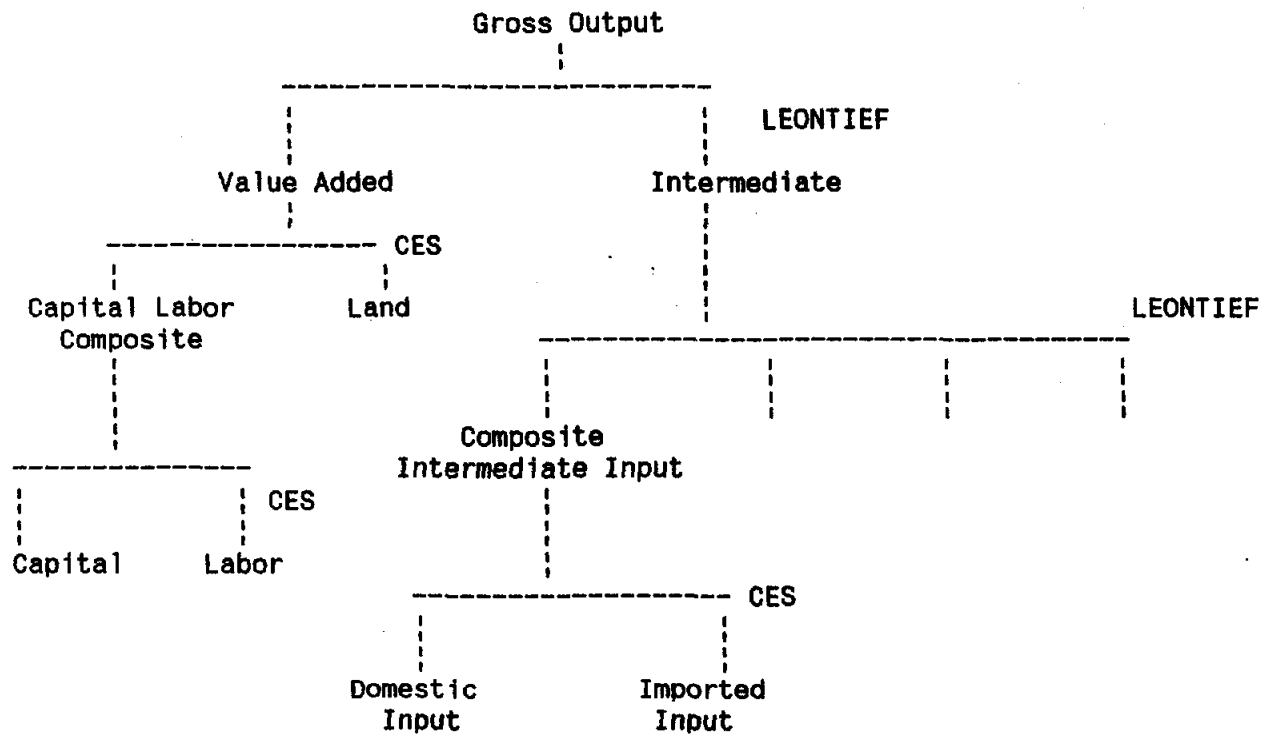
FIGURE 3.2 Substitution Possibilities in Final Demand

```
        Private Consumption                  Other Final Demand

              LES                                    |
               |                                     |
               |  CES                                |  CES
        ------------------------            ------------------------
        |                   |              |                     |
        |                   |              |                     |
        |                   |              |                     |
     Domestic           Imported        Domestic             Imported
     Commodities        Commodities     Commodities          Commodities
```
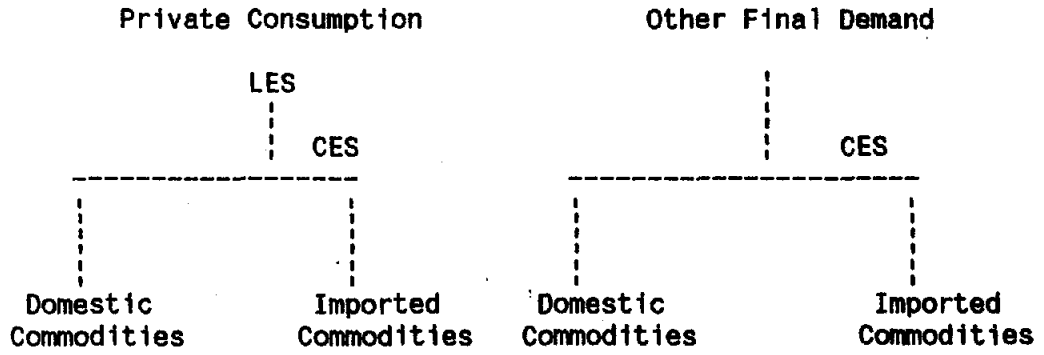
Parameterization

As in other CGE models, the parameterization procedure is deterministic in nature. In determining parameter values, a social accounting matrix (SAM) of 1984 was constructed and used as a benchmark data set.1/ In addition, since the SAM does not provide sufficient information in determining all parameters, certain parameter values had to be obtained exogenously. Thus, the extraneous parameters used were the various elasticities of substitution in production and consumption and the price elasticities of export demand price.

It was assumed in the model that the elasticities of substitution in production were relatively close to one. In agriculture, the elasticity of substitution between labor and capital is 1.1 and between land and composite capital-labor is 0.8. In other sectors, the values are 1.2 for light industries and the other services, and 0.8 for the other sectors.

The elasticity values of substitution between imports and domestic product demand, to reflect the aggregation level of the model, are also fairly low. Appendix 6 shows the elasticity values used for private consumption and other demand (including intermediate demand).

The last elasticity value set used to complete the parameterization process involved price elasticities for export-demand functions. The values are relatively high for agricultural exports and very low for transportation and other services. Appendix 7 shows the export elasticities used.

Incorporating the SAM and the extraneous parameter values mentioned above, the model was therefore calibrated and ready for policy experimentation.

1/

For a description of the social accounting matrix (SAM) used, see Chalongphob Sussangkarn, et.al. (1988), pp. 60-85.

4. IMPACTS OF THAILAND'S EXTERNAL SECTOR ON
DOMESTIC PERFORMANCE

In this section, both macroeconometric and CGE models are used, whenever suitable, to analyze the impact of the external sector with an emphasis on export expansion.

4.1 Export Expansion and Economic Growth

There is a great deal of statistical evidence which supports the important effect of exports on economic growth, including studies by Michaely (1977), Balassa (1978), Taylor (1981), Febler (1982), and Kavoussi (1984). These studies, based on cross-sectional data, found a positive correlation between exports and economic growth of developing countries. While Michaely used a simple Spearman rank correlation, others used multiple regression analyses by regressing output growth rate on factor supplies of labor, capital, and exports. The coefficient of exports on economic growth varied from 0.04 to 0.11, implying that, for developing countries, a one percent increase in exports leads to a 0.04 to 0.11 percent increase in their real growth rate.

Theoretically, export expansion mitigates foreign exchange constraints and enables the domestic economy to import the capital and intermediate goods required for the process of economic and industrial development. A country with specialization and a comparative advantage in certain commodities could experience growth, if it concentrates on those sectors in which it has greater relative productivity.

In fact, there are two types of specialization through trade. The first type is sectoral specialization with an increasing volume of inter-industry trade. Such specialization is based on classical or neoclassical trade theory, which predicated high exports in some sectors and high imports in some others through increasing inter-industry trade. The second type of specialization is through diversification within sector. This type of specialization conformed with new theory of international trade under imperfect competition or "product cycle." Export trade expansion, therefore, plays a variety of roles in the process of industrialization. It allows a country to separate the structure of production and the structure of demand.1/

It is commonly believed that the recent economic rebound of the Thai economy was propelled by export expansion which increased from 16.87 percent in real terms in 1986, to 23.53 percent in 1987, and 25.71 percent in 1988.

1/

Chenery H, Robinson S and Syoquin M (1986), p.209.

46

The most direct measure of the impact or contribution of exports on growth is the domestic value added in incremental exports. According to World Bank estimates, the contribution of exports to GDP growth increased from an average annual rate of 0.7 percent of the GDP during 1970-75, to 1.6 percent between 1976-80, 1.1 percent between 1981-85, and rose to as high as 2.7 percent of the GDP between 1986-1988. However, the calculation was made assuming that the ratio of domestic value added to gross exports was 0.5 for manufactured exports and 0.8 for non-manufactured exports. These figures were derived from Korean data, as data from Thailand were not available.

The study team, therefore, attempted to find the ratio of domestic value added in total gross exports by utilizing data from the 1984 Input-Output (I-0) table. A hypothetical increase in exports in a certain sector results in an increase in total domestic value added. Detailed calculations are presented in Appendix 8. Table 4.1 summarizes the calculation ratios of domestic value added to gross exports by sector. We found that a 1 baht increase in exports of agricultural products leads to a 0.91 baht increase in total domestic value added (taking into account the direct and indirect effects of a final demand increase through industrial sector interlinkages). Manufacturing sector ratios ranged from 0.51 in the chemical, rubber, and petroleum industries to as high as 0.89 in the food processing and wood industries. Service sector ratios are relatively high, varying from 0.79-0.96 baht. Compared with the ratios of 0.8 and 0.5 for the non-manufacturing and manufacturing sectors, respectively, as proposed by The World Bank, our results seem to be relatively high.

Based on the fixed ratio of domestic value added in gross exports calculated above, the contributions of total and manufactured exports between 1971-1988 were calculated. They are presented in Table 4.2. Here, the ratio of total domestic value added to gross exports was 0.73 for manufactured exports and approximately 0.89 in terms of total exports.

It was found that the contribution of export value added (measured by domestic value added in incremental exports as a percentage of the GDP) soared from 2.38 percent of the GDP between 1971-1975 to 4.44 percent during 1986-88. A look at Table 4.2 also confirms the fact that manufactured exports have been the important driving force of the Thai economy in the recent past. Their contribution rose from, on average, 0.59 percent of the GDP during 1981-85 to an average value of 3.36 percent in 1986-88; this was due to the fact that manufactured exports constitute an increasing share of Thailand's total exports year after year--from 35.47 percent in 1975 to 60 percent in 1987. The growth of manufactured exports was recorded at about 35.09 percent in 1986, 45.57 percent in 1987, and to 40.26 percent in 1988.

The same Table also demonstrates the ratio of export reliance measured as the ratio of export value-added growth (domestic value added in incremental exports) over GDP growth. It was found that, over the past few years, the Thai economy became increasingly reliant on exports: the ratio increased dramatically from 12.92 percent in the

Table 4.1 : Domestic Value Added Generated from Exports : 1984

Sector	Increase in Exports (Million Baht)	Increase in Value added (Million Baht)	Ratio of Domestic value added to exports
Agriculture	1,814.20	1,852.83	0.91
Mining	1,107.09	1,018.55	0.92
Manufacturing			
Food	6,157.46	5,473.27	0.89
Textiles	2,159.82	1,771.91	0.82
Wood	243.73	216.06	0.89
Paper	33.20	22.88	0.69
Rub.,chem.,petroleum	1,439.74	737.75	0.51
Non-metal	110.51	90.01	0.81
Engineering	1,855.42	1,186.13	0.64
Other manufacturing	769.65	624.89	0.81
Service			
Trade	1,474.97	1,415.08	0.96
Transport & communication	540.27	425.40	0.79
Bank,insure & real estate	277.06	267.06	0.96
Other services	543.75	501.55	0.92

Source : Calculated from 1984 Input - Output Table .
        (Detailed calculation is presented in Appendix 8).

Table 4.2 : Contribution of Exports to GDP growth (at 1972 prices)
            (period average, as % of the GDP)

	1971-1975	1976-80	1981-85	1986-1988
GDP growth rate	16.0	16.8	9.1	13.2
Contribution of export value added a/				
Manufactured exports	0.83	1.28	0.59	3.36
Total exports	2.36	2.66	1.17	4.44
Export reliance ratio b/	14.87	15.85	12.92	33.74

Note   : a/ The domestic value added in the incremental exports
              as a percentage of the GDP.
         b/ The ratio of export value added growth (a) and GDP growth.

first half of the 1980s to 33.74 percent during 1986-1988. The ratio is fairly high compared to historical values. However, the figures are closed to the level of export reliance experienced by Taiwan during 1971-75 (approximately 38%), or by the Republic of Korea during the same period (29%).

As mentioned before, the results summarized in Table 4.2 are the direct effect of export expansion on domestic value added. At this point, however, we have not taken into consideration the multiplier impact of exports or the second round effect--although it is not difficult to imagine larger figures than those presented above. To estimate the size of the total impact of exports on GDP growth, both the macroeconomic and CGE model were used to simulate an alternative scenario.

We ran the simulation to find out what would have happened to GDP growth had Thai exports in 1985-87 not grown at the rates that they actually did; so, we assumed a rate only 50 percent of the actual rates.

The results of the macroeconometric model simulation indicated that if exports grew at 50 percent of the actual rate between 1985-87, the level of real GDP would be 5-6 percent less than the actual values, or about 9-13 percent for nominal GDP. In terms of elasticity, as shown in Table 4.3, a one percent increase in total exports resulted in about a 0.32 percent increase in real GDP, or a 0.46 percent increase in nominal GDP.

In regard to each component in final demand, components in the GDP (see Table 4.3), increased as exports expanded due to the multiplier effect. The stimulated results show that a one percent increase in exports leads to a 0.27 percent increase in real private consumption; a 0.40 percent rise in investment; and a 0.11 percent increase in government expenditures. The investment component in final demand is driven mostly by export expansion, whereas government expenditures (which have been curbed to certain level in the recent past) show the smallest export impact through the multiplier effect.

Table 4.3 The Impact of a 1 percent Increase in Exports of Goods and
         Services

```
-----------------------------------------------------------------
Macroeconometric Model
      nominal GDP                              0.46
      real GDP                                 0.32
      real private consumption                 0.27
      real capital formation                   0.40
      government expenditure                   0.11

CGE
      nominal GDP                              0.44
      real GDP                                 0.31

-----------------------------------------------------------------
```

In regard to sectoral GDP classified into 16 sectors, the results of a macroeconometric model simulation indicate that a 1 percent increase in total exports in the short run leads to different increases in value added for various sectors. The sectors which have been driven, to a large extent, by exports are those that: (1) constituted a large share in total exports; (2) have strong linkage effects; (3) have low import content or leakage from the economy; and (4) have a small base but have increased at a very rapid rate in recent years. Among those sectors are food processing (0.65%); textiles (0.48%), trade (0.51%); utilities (0.45%); transportation (0.44%). The summary of the impact of a 1-percent increase in exports on sectoral value added is presented in Table 4.4.

The Table clearly shows that service sector growth rates attributed to export expansion are relatively high due to their strong linkage effects and relatively low import leakage values. The growth stimulus in the manufacturing sector had a strong linkage effect to sectors like construction, trade, transportation, and utilities. In 1984, as is shown in Table 4.5, the service sector (4.14), the rubber, chemical and petroleum (2.21) sector, the agriculture sector (2.16) and the trade sector (2.09) have very strong forward linkages. Those with strong backward linkages include the food processing (2.26), construction (2.09) and textiles (2.09) sectors.

The impacts of export growth on sectoral value added, which were discussed above, were based on the present export structure and the 1984 I-O Table that describes the interdependence as well as the import content of those sectors.

The impact of export expansion on economic growth is confirmed by this study as well as by previous research. We can thus imply from the empirical evidence that Thailand desires both to accelerate growth of industrial output and industrial exports. Improving its cost competitiveness by increasing productivity, and improving quality or some other attribute of this type are major concerns in reducing per-unit cost of output and hence boosting the country's export growth to sustain long-run economic growth and dynamism.

4.2 Exports and Economic Stability

As mentioned before, increasing Thailand's degree of exposure, as has occurred in recent years, not only stimulates economic growth but, unfortunately, makes the country more vulnerable to the changing social, economic, as well as political circumstances, of the major developed countries. Thailand becomes less immune to economic fluctuations in international trade and finance. This section, therefore, examines the impact of the external sector on economic stability.

With respect to internal economic stability, a hypothetical increase in exports by one percent results in an increase in the GDP deflator by 0.17 percent. The figure may be underestimated because the model does not take price adjustments into consideration when the

Table 4.4 : Impact of a 1 % Increase in Total Exports of Goods and Services
on Sectoral Value Added

Sector	% Growth
Agriculture	0.19
Manufacturing	
Food	0.65
Textiles	0.48
Chemical. rubber, petroleum	0.26
Wood and wood products	0.14
Paper and paper products	0.42
Non-metallic	0.02
Engineering	0.24
Services	
Trade	0.51
Transportation & telecommunications	0.44
Public utilities	0.45
Banking & insurance	0.40
Other services	0.31

Source : Calculation from Model estimated

Table 4.5 : Forward and Backward Linkage Effects

Sectors	Description	Forward linkages				Backward linkages			
		1975	1980	1982	1984	1975	1980	1982	1984
1	Agriculture	2.40	2.29	2.35	2.16	1.30	1.34	1.41	1.64
2	Mining	1.28	1.30	1.49	1.48	1.22	1.18	1.29	1.57
3	Food	1.42	1.38	1.48	1.48	1.91	1.93	1.98	2.26
4	Textiles	1.83	1.92	1.94	1.72	1.91	1.96	2.03	2.09
5	Wood	1.23	1.29	1.21	1.18	1.81	1.70	1.71	1.82
6	Paper	1.25	1.34	1.13	1.11	1.57	1.55	1.41	1.81
7	Rub.,chem.&petro.products	2.28	2.00	2.11	2.21	1.39	1.33	1.34	1.51
8	Non-metal	1.18	1.26	1.29	1.35	1.78	1.75	1.89	1.99
9	Engineering	1.87	1.64	1.86	1.71	1.64	1.67	1.77	1.72
10	Other manufacturing	1.11	1.11	1.14	1.23	1.65	1.71	1.70	1.58
11	Public utilities	1.31	1.33	1.56	1.37	1.77	1.37	1.71	1.71
12	Construction	1.13	1.04	1.07	1.55	1.83	1.84	1.94	2.09
13	Trade	2.09	2.11	2.00	2.09	1.24	1.22	1.26	1.30
14	Services	2.11	1.99	2.30	4.14	1.46	1.45	1.47	1.68
	Total	22.47	22.00	22.91	24.77	22.47	22.00	22.91	24.77

Source : Computed from Input-Output Table of Thailand 1975, 1982 and 1984.
(aggregated into 14 x 14 matrix).

final demand component (for instance, exports) rises; here, price is determined, mainly by producer cost. In addition, a glance at past data shows that Thailand's price stability record is quite impressive, despite the 14 percent devaluation of the baht in November 1984 and the subsequent depreciation of the baht relative to Japanese and European currencies. During the eighties (except in 1981), inflation rates remained in the range of 0.9-5.2 percent, with at an average rate of less than 4 percent, even though exports were expanding at a relatively rapid rate. This occurred because Thailand usually responded to excess demand by increasing imports rather than increasing domestic prices.

However, at present, some price pressure has built up since 1987, particularly in agriculture-based commodities. The recently increasing inflation rate has been attributed to the rapid rise in final demand components. The recent dramatic increase in private investment, strong private consumption, and export expansion make the Thai economy susceptible to inflation this year and next year, particularly when the price of fuel cannot be controlled at its present level. The expected inflation rate in the near future may be somewhat higher since it will incorporate the "cost-push" effect rather than the "demand-pull" effect which seems to characterize the present price pressure.

Since the problem of the external indebtness of the Thai economy has been a matter of concern (especially in the mid-1980s), it proved interesting to examine the impact of export expansion on government and private debts. Table 4.6, shows that a 1 percent increase in exports of goods and services leads to a 0.46-percent increase in government revenue, whereas government expenditures increase by only 0.11 percent; this results in a reduction in the government deficit by about 2 percent. However, the effect of export expansion on total government revenue may be overestimated, since the simulated growth of direct and indirect taxes was about 0.46 percent in response to a 1 percent growth in exports. However, in recent years, government revenue has shown an increasing trend, as actual tax revenue increased from 13.2 percent of the total GDP to approximately 16.2 percent in 1988. The relatively low level of government expenditure in response to exports is reflected in historical records: the Thai government has consistently curbed its expenditures since 1982. In fact, the initial impetus for fiscal retrenchment during the first half of the eighties came from the need to restore stability to the Thai economy, which had suffered from fiscal and external imbalances. The government became more conscious about the seriousness of overspending and accumulated both internal and external borrowings. Therefore, the government tended to reduce its previously active role and encouraged the private sector to participate in, for instance, infrastructure, construction, and public utilities--activities which had been traditionally undertaken by the government. As a result, many public investment programs were severely hit. At present, the constraints on the government budget seem to have relaxed due to the urgent need to improve infrastructure and to accelerate the technological potential of personnel and institutions in the manufacturing sector. Thus, the figure of a 0.11 percent increase in government expenditures in response to a 1 percent increase in export is somewhat understated.

Table 4.6 : Impact of a 1 % increase in Exports on the Internal and External Balances

----

	% Growth
Inflation	0.17
Public Sector	
Government expenditures	0.11
Government revenue	0.46
Government deficit	-2.04
Government borrowing	-3.03
External Balance	
Balance of trade	0.08
Real imports	0.43
Long-term foreign borrowing by public sector	-0.73
Long-term foreign borrowing by private sector	-0.15

Source : Calculated from Model estimated.

Since government revenue increases relatively more than government expenditures as exports grow, the government deficit and borrowings decline about 2.04 percent and 3.03 percent, respectively, as exports rise by 1 percent.

This study also found that if exports had grown at 50 percent of their actual rates between 1985-1987, the total value of goods and service imports would have been 19-20 percent less than the actual amount. In terms of elasticity, a 1 percent increase in exports results in about a 0.72 percent increase in total imports. Results on imports by sector attributed to simulated export expansion are presented in Table 4.7. The Table shows that 1 percent export expansion induced more imports from the engineering commodity group (1.68%), and the non-metal group (1.74%), and that these simulated induced import figures reflect the import-dependent nature of Thailand's manufacturing sector. In fact, the figures could be higher if we had taken into account the recent sharp increase in petroleum imports due to increased consumption and the rise in the oil price. The high level of import dependence will be discussed in detail in the following section.

Thailand did not succeed in improving its balance of trade and current account, regardless of its recent, significant export growth, because of the high level of induced imports. The estimated impact shows that 1 percent export expansion leads to an insignificant increase in the balance of trade by 0.05 percent

Since the macroeconomic model is relatively unsatisfactory in predicting the balance of trade, the current account, and the balance of payments, their impact of export growth on the external balance was reinvestigated using the CGE model.

4.3 Export Growth and Import Dependence

The Thai economy has been driven on a crest of export growth since 1987. In 1988, exports grew by 34.6 percent. Meanwhile, imports increased by about 53.5 percent. In the first four months of 1989, exports grew by 34.1 percent over exports during the same period last year, whereas imports increased by 36.6 percent. It seems that increased exports are always accompanied by increased imports. The result is a worse balance of trade situation--by 133.3 percent in 1988 and by 41 percent in the first four months of this year compared to the same period last year. In fact, increased imports were due to several factors. The investment boom has resulted in the increased importation of capital goods, whereas the export boom has led to increased imports of intermediate goods and raw materials.

This section attempts to explore two issues: (1) to investigate the degree of import dependence of the Thai economy; and (2) to see whether "exports" is the major component in final demand which induces relatively more imports. In other words, the study team calculated direct- and induced-import content for a 1 baht increase in each component of final demand consumption, investment, government

56

Table 4.7 : Impact of 1 % Export Growth on Imports by Sector

Sector	% Growth of Imports
Agriculture	0.62
Manufacturing	
Food	0.44
Textiles	0.58
Non-metallic	1.74
Engineering	1.68
Chemical, rubber, petroleum	0.26
Wood and wood products	0.65
Paper and paper products	0.37
Other industries	1.39
Services	0.15
Total goods and service imports	0.72

expenditure, and exports, to see whether the high import value mainly resulted from the investment boom, or from the higher consumption of luxurious goods, or from export expansion.

Each production process requires inputs which are either supplied domestically or imported. Input industries also need inputs from other industries as well. In this sense, industries are linked and interdependent through the use of intermediate products. Therefore, the usual Leontief input-output framework was used here. The 16x16 aggregated input-output matrix (A) can be written as:

$$A \quad = \quad Ad + Am \tag{1}$$

where $\quad$ Ad $\quad = \quad$ matrix of domestic input coefficients

$\quad$ Am $\quad = \quad$ matrix of imported input coefficients

$$X \quad = \quad (I - Ad)^{-1} F \tag{2}$$

where $\quad$ X $\quad = \quad$ vector of gross output
$\quad\quad$ F $\quad = \quad$ 16 x 4 matrix of final demand components

Import content matrix R can be written as:

$$R \quad = \quad Am(I - Ad)^{-1} \tag{3}$$

It can be seen from the equation that the sum of column vector j of the R matrix represents the total import content of the final product in the jth industry.

Since final demand F consists of domestic and import components (i.e, Fd and Fm), let H, Hd and Hm be the percentage distribution of final demand F, and let H be defined as:

$$H \quad = \quad Hd + Hm \quad \text{where} \quad \sum^{16} Hfi = 1, \ f = C,I,G,X \tag{4}$$

Then, we have

$$Nf \quad = \quad R(Hdf) \quad\quad f = C,I,G,X \tag{5}$$

Nf denotes the amount of imports induced by 1 baht of the fth component of final demand. The import content of 1 baht of any final demand, Mf, is therefore equal to the sum of direct imports Hmf and induced imports Nf:

$$Mf \quad = \quad Hmf + Nf \quad\quad f = C,I,G,X \tag{6}$$

Sector	Share of Imports in total intermediate input			Share of Imports in Total demand			Share of Imports in Total input			Total import content of Final Product			Export / Output		
	1975	1980	1982	1975	1980	1982	1975	1980	1982	1975	1980	1982	1975	1980	1982
Agriculture	8.7	9.9	10.2	2.3	2.6	2.2	1.8	2.5	3.0	13.1	16.0	7.7	6.0	5.2	5.4
Mining	14.6	23.7	15.7	66.6	68.9	63.9	2.5	3.7	3.5	26.6	24.2	9.2	11.6	11.0	6.2
Food	3.8	5.4	4.5	3.0	5.5	4.1	2.6	3.8	3.1	13.6	17.4	9.8	17.0	25.7	30.3
Textiles	22.1	19.0	17.4	7.8	5.7	5.5	14.7	12.9	11.8	40.9	28.6	24.1	7.2	12.4	14.0
Wood	4.5	10.1	12.7	1.8	5.0	11.3	2.7	5.4	7.0	15.5	11.4	13.2	14.6	7.5	12.6
Paper	38.7	37.8	55.0	20.7	16.1	26.9	24.0	22.9	34.1	53.0	39.6	40.6	1.2	1.5	1.9
Rubber, chemical, petroleum	60.3	66.6	68.0	28.1	35.4	32.7	40.9	46.6	48.6	69.5	70.6	53.5	8.5	11.7	8.7
Non-metallic	10.8	15.7	9.1	14.2	16.4	6.4	6.5	9.9	6.0	31.1	17.4	22.0	8.4	2.9	2.8
Engineering	37.7	33.7	29.7	47.0	40.4	33.3	26.4	23.9	20.9	55.4	44.8	33.4	7.3	20.1	11.1
Other manufacturing	19.1	22.9	24.2	21.6	30.1	33.4	9.6	12.9	13.3	31.3	23.8	21.5	12.9	37.8	33.1
Public utilities	6.8	58.4	17.3	0.1	1.0	1.5	3.9	38.2	10.1	34.4	59.6	23.7	0.0	0.0	0.0
Construction	15.2	16.6	10.6	0.0	0.0	0.0	9.6	10.9	6.9	32.5	24.0	19.9	0.0	0.0	0.0
Trade	5.2	12.6	15.0	0.0	0.0	0.0	0.9	2.1	3.0	9.1	15.8	6.3	6.7	6.8	7.0
Transport	6.3	21.0	19.5	2.0	3.0	5.2	2.9	11.9	11.5	27.2	30.7	28.6	4.1	3.7	3.0
Services	5.8	8.8	8.3	2.4	5.0	8.6	1.5	2.2	2.0	11.0	15.1	5.6	0.0	0.0	0.0
Other services	5.2	5.7	29.5	22.3	69.8	53.9	5.2	5.7	29.5	28.8	6.1	40.6	0.0	0.6	45.3
Total	16.5	22.2	19.8	11.3	14.6	13.2	7.3	10.6	9.7	-	-	-	6.8	9.5	9.2

Source : Computed from the 1975, 1980 and 1982 Input-Output Tables, Input-Output Section,
National Accounts Division, National Economic and Social Development Board.

The results of this analysis of Thailand's import dependence are summarized in Table 4.8, which used the I-O table between 1975-1982, import shares in total intermediate inputs, in total input, and in total supply, as well as the total import content of final products calculated using equation 3. Sectors that use proportionately more imported intermediate inputs, which increase over time are: the petroleum and chemical industries, the paper industry, other manufactured products industries, transportation, public utilities, and other services. And the sectors which process a large share of imports as total intermediate inputs and total inputs, but which have decreasing trends over time are the mining, engineering, and textile industries.

A glance at the share of imported commodities in total demand (intermediate and final), shown in the second column of Table 4.8, reveals that Thailand relied heavily on mineral, chemical and petroleum, engineering, paper and other manufactured product imports. However, the degree of import dependence declined in the engineering sector, since its import share of total demand declined from 47 percent in 1975, to 40 percent in 1980, and reached 33.3 percent in 1982. Although Thailand has become increasingly independent in terms of petroleum products through indigenous exploration and the development of domestic energy, the ratio of petroleum and chemical imports was still high, increasing from 28.1 percent in 1975, to 35.4 percent in 1980, and dropping slightly to 32.7 percent in 1982 due to the drop in oil prices. The decreasing share of imports in total demand in engineering, nonmetal, textiles, and other sectors reflect the fact that import-substitution effects also exist. These sectors' products replace imports to a certain extent. However, some sectors still show increasing dependence on foreign supplies in total demand; they include the wood, transportation, and telecommunications sectors, as well as other services sectors.

In terms of total direct and indirect import content, the sectors with the highest import content in 1982 were: chemical and petroleum (53.5%); paper (40.6%); engineering (33.4%); transport and telecommunications (28.6%); and textiles (24.1%). However, there seems to be decreasing trend in import content in most of the sectors. The trend reflects stronger linkages among industrial subsectors, making Thailand less dependent on imports now than in the past.

Looking at the export-output ratios of the various sectors, we find food, textile, wood, engineering, and other such manufacturing sectors to be export-oriented industries, since each export share constituted more than 10 percent of its total 1982 output. Nevertheless, the import content of these export-oriented industries' final products were relatively high except for the food processing and, perhaps, the wood-product industries. Therefore, it is not surprising to see an influx of imported commodities to Thailand during the period that exports were booming.

Technology can explain much of the import content in Thailand's export-oriented industries. In export industries where product quality is of major concern, adopted technology is usually imported

from abroad and, in most cases, requires much imported input. That is why the import share in total intermediate inputs and total inputs was unusually high between 1975 and 1982--the establishment period for many exporting industries--a trend which is expected to decrease. The technology imported introduced for export purposes has had a significant impact on domestic and foreign market production and has increased the overall import dependence of the Thai economy. Local inputs may be unsuitable for use in the production process and, hence, weaken the links among manufacturing subsectors and between the agricultural and manufacturing sector.

We also used 1975, 1980 and 1982 I-0 Tables1/ to examine the question of import contents in final-demand components, calculating induced imports, the value of imported intermediates need to produce a unit value of final demand, (Nf), and direct imports (Hmf) shown in equation (4)-(6). (Detailed calculations are presented in Appendix 9). Tables 4.9 and 4.10 summarize the import content of final-demand components. The results may confirm the obvious: that, among final demand components, investment has the highest import content, since 1 baht of increased investment demand leads to 0.35-0.50 baht of imports. Of this amount, about 0.18-0.24 baht (or one-half) is induced imports. The highest import content of investment demand stems from the relatively large number of engineering products required directly and indirectly--about 0.14-0.32 baht as compared to 0.01-0.06 baht in other demand components. However, the import content in investment demand decreased from 0.497 baht in 1975 to 0.4352 baht in 1980 and to 0.3485 baht in 1982. The declining import content may be attributed to strong linkages in Thailand's manufacturing sector and the country's ability to replace imports with domestic inputs through its import-substitution industrial development strategy.

In 1975 and 1980, exports was the item after investment which led to high imports. It was estimated that for a 1 baht increase in exports, imports rose by about 0.23 baht in 1970 and 0.29 baht in 1980, whereas a 1 baht rise in consumption resulted in rises of 0.22 baht and 0.28 baht in imports. The propensity to import when either exports or consumption increases was similar, but the composition of the imports was different. Since there are no direct imports in total exports, imports induced from increased exports of 1 baht accounted for 0.22 baht and 0.29 baht in 1975 and 1980, respectively. It should also be pointed out here that the export component of final demand leads to the most induced imports, when compared to other demand components--except in 1975 when the figure for induced imports generated by investment was 0.24, whereas the figure for induced exports was 0.22 baht. In 1980, imports induced by a 1 baht increase in exports totaled 0.28 baht while the figures were 0.21 baht for consumption, 0.20 for investment, and 0.19 for government expenditures.

1/

Data obtained from Input-Output section, National Account Division, NESDB.

Table 4.9 : Thailand's Import Dependence : Import Content of Final Demand by Sector 1975-1982

Sector	Private Consumption Expenditures			Capital Formation			Goverment Consumption Expenditures			Exports		
	1975	1980	1982	1975	1980	1982	1975	1980	1982	1975	1980	1982
Agriculture	0.0111	0.0080	0.0052	0.0019	0.0016	0.0024	0.0061	0.0028	0.0011	0.0111	0.0077	0.0084
Mining	0.0358	0.0392	0.0425	0.0340	0.0149	0.0336	0.0359	0.0322	0.0210	0.0579	0.0663	0.0505
Food	0.0153	0.0241	0.0125	0.0007	0.0005	0.0004	0.0130	0.0198	0.0046	0.0116	0.0136	0.0092
Textile	0.0110	0.0083	0.0074	0.0015	0.0005	0.0011	0.0047	0.0032	0.0014	0.0092	0.0065	0.0075
Wood	0.0004	0.0009	0.0006	0.0018	0.0061	0.0065	0.0003	0.0007	0.0003	0.0005	0.0011	0.0009
Paper	0.0073	0.0083	0.0057	0.0038	0.0017	0.0027	0.0134	0.0129	0.0052	0.0038	0.0043	0.0032
Chemical	0.0690	0.0952	0.0568	0.0421	0.0480	0.0351	0.0497	0.0674	0.0262	0.0720	0.0890	0.0442
Non-metallic	0.0023	0.0019	0.0012	0.2578	0.0194	0.0042	0.0024	0.0022	0.0003	0.0012	0.0012	0.0008
Engineering	0.0402	0.0359	0.0294	0.1441	0.3249	0.2430	0.0376	0.0235	0.0106	0.0473	0.0627	0.0353
Other manufacturing	0.0062	0.0086	0.0091	0.0005	0.0075	0.0115	0.0051	0.0077	0.0048	0.0017	0.0047	0.0098
Public utility	0.0001	0.0004	0.0009	0.0001	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001	0.0000	0.0000
Construction	0.0001	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001	0.0000	0.0000	0.0001	0.0000	0.0000
Trade	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Transportation	0.0021	0.0036	0.0085	0.0000	0.0000	0.0000	0.0014	0.0063	0.0084	0.0000	0.0000	0.0000
Service	0.0098	0.0264	0.0366	0.0019	0.0057	0.0039	0.0138	0.0253	0.0078	0.0018	0.0075	0.0036
Unclassified	0.0080	0.0174	0.0055	0.0066	0.0122	0.0040	0.0075	0.0460	0.0036	0.0074	0.0145	0.0045
	0.2185	0.2782	0.2218	0.4970	0.4352	0.3485	0.1911	0.2499	0.0953	0.2258	0.2791	0.1758

Source : Calculated from 1975, 1980 and 1982 Input-Output Tables.

62

Table 4.10 : Thailand's Import Dependence :Direct and Induced Imports in Final Demand Component, 1975-1982

	1975			1980			1982		
	Direct Imports	Induced Imports	Total	Direct Imports	Induced Imports	Total	Direct Imports	Induced Imports	Total
Private consumption expenditures	0.0424	0.1761	0.2185	0.0673	0.2109	0.2782	0.0856	0.1362	0.2218
Capital formation	0.2559	0.2411	0.4970	0.2308	0.2044	0.4352	0.1733	0.1752	0.3485
Goverment consumption expenditures	0.0272	0.1639	0.1911	0.0615	0.1884	0.2499	0.0168	0.0785	0.0953
Exports	0.0000	0.2258	0.2258	0.0000	0.2791	0.2791	0.0000	0.1758	0.1758

Note   : Computed from Appendix 9.

Source : Calculated from 1975, 1980 and 1982 Input-Output Tables.

In 1982, due to many factors, the import content in all components of final demand generally declined. As the oil price dropped, the value of the imported content of petroleum and chemicals declined. A glance at the Table reveals that the chemical and petroleum import contents in all final-demand components consistently declined between 1980 and 1982. Moreover, if we look at the amount of induced imports, exports is still the major component in final demand, generating the most induced imports. The import content of export demand decreased from 0.293 baht in 1980 to 0.176 baht in 1982, or by approximately 40.0 percent, whereas the import content of consumption demand dropped by about 20.3 percent over the same period. If we look at the highest value of direct imports in consumption compared to other demand components, in conjunction with the rising trend between 1975-1982, we see that the figure reflects, to some extent, that the consumption of luxury goods is one factor explaining Thailand's large import values.

Exports generated the highest amount of induced imports compared to other final demand components. This confirms the fact that exports can be viewed as having more induced import dependence than other components, in order to meet the demand for intermediate products and raw materials. At the same time, the nature of the Thai economy (with its low level of capital goods) makes the country rely directly and indirectly on foreign supplies. The Thai people's consumption pattern for imported luxury goods was also added to characterize the high degree of import dependence of the Thai economy.

A comparison of Mf (Nf and Hmf) reveals that a change in domestic demand (investment and consumption) was the main cause of high dependence on direct imports. Meanwhile, a change in external demand (exports) was the main cause of high dependence on induced imports. Therefore, it is not surprising that we have seen a sharp rise in both imports and exports over the past two years. The post-1987 investment boom has led to an influx of direct and indirect imports, whereas Thailand's recent export expansion has generated further induced imports. In addition, increasing consumption demand due to increased income resulted in more imports. As mentioned earlier, it has also been found that the relatively large proportion of intermediate inputs is met by imports. This has led to a high dependence of domestic industries on foreign sources and to low-level linkages among domestic industrial sectors. Attempts to replace imports with domestic products through the second-stage import-substitution strategy may reduce the degree of Thailand's import dependence and strengthen the interlinkages among domestic industries. This will also result in a gain in the economy if those import-substitution industries are operated efficiently.

Since Thailand's manufacturing sector depends heavily on imported inputs, the major determinant of total direct and indirect production efficiency is the proportion of import content. Industries with a very high production effect are those that are strongly linked to other domestic industries or the agricultural sector of the food processing industry.

4.4 Export Growth and Structural Economic Change

We next examined the impact of export growth on structural change in the Thai economy. In particular, we investigated the development of the manufacturing industry by applying a causality test between export growth and industrial development[1] in order to shed some light on the additional contribution of export growth to Thailand's economic transformation over the past two-and-a-half decades.

Establishing causality patterns between export growth and industrial development has important implications for economic policy. On the one hand, if there exists a definite one-directional causality between expansion of exports and industrial development (in other words, if export expansion leads to an increasing role for the manufacturing sector), then it lends credence to the export-led growth strategy of industrial development, since exports not only promote GDP growth but also promote structural economic transformation. On the other hand, if the causation process is in the opposite direction (in other words, if the development of the manufacturing sector results in the growth of exports), then it implies that the development of the manufacturing industry may be a prerequisite for developing countries to expand of their exports. However, if the causation process is bi-directional (in other words, if both export growth and industrial development are mutually determined--as is empirically evidenced in Taiwan, the Republic of Korea, Hong Kong, Singapore[2]), then export growth and industrial development are mutually beneficial and reinforcing. If this is the case, then alternative strategies to export promotion may be needed to structurally transform developing economies. To test the causality between export expansion and the growth of the manufacturing sector in Thailand, we explored the relationships between exports and manufactured products as follows:

$$MFG = f (X: \text{three past lags and three future lags}) \quad (1)$$
$$MFG = f (X: \text{three past lags}) \quad (2)$$
$$X = f (MFG: \text{three past lags and three future lags}) \quad (3)$$
$$X = f (MFG: \text{three past lags}) \quad (4)$$

where MFG = manufacturing sector output (in million baht)
        X = manufactured exports (in million baht)

Using time-series data between 1964-1984, coefficients of the above four regressions were estimated (as shown in Appendix 10). If causality runs from the independent variable to the dependent variable, the future values of the independent variable in the regression equation should have a coefficient which differs insignificantly from 0 as a group. To test whether they are

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[1]
Chow P. "Causality Between Export Growth and Industrial Development." Journal of Development Economies, March 1987.

[2]
Ibid.

65

insignificantly different from zero as a group, the Chow test was employed.[1]/

The F statistic calculated from equations (1) and (2) was 0.87, which indicates that the development of Thailand's manufacturing sector does not lead to export growth. However, the F-statistic calculated from (3) and (4) was 8.69, implying the causality of export growth on the development of the manufacturing sector. The results confirm that Thailand's export growth has significantly influenced the process of industrial development, as has been found in Hong Kong, the Republic of Korea, Taiwan, Singapore, Israel (bi-directional causality) and Mexico (unidirectional causality).[2]/

The finding here is rationalized by the fact that export growth can expand Thailand's limited domestic markets and contribute to the economies of scale necessary for industrial development. In addition, export growth expands the dimension of competition within the international market. Competition promotes the allocation of resources from less productive sector to relatively more productive sector.

Surprisingly, when the same procedure was applied on a sectoral basis to see whether the growth of outputs of a certain sector was caused by export expansion in that sector, contradictory results were found. Here, calculated F-statistics (as shown in Table 4.11) indicated that the only sector whose output growth was driven by its own sectoral exports was the food-processing industry. In other words, the nature of export-led growth was pronounced only in the food-processing sector. In contrast, the sectors in which the growth of exports resulted from or could be explained by the development of their own sectoral output were the textile, non-metal, and engineering sectors. The results imply that the development of these sectors was a prerequisite to the expansion of its exports.

In other words, it implied that the development of those industries made them more competitive and enhanced their comparative advantage which promoted exports of those sectors.

4.5 Export Growth and Income Distribution

To investigate the role of the export sector in the development of the domestic economy, it is important to examine income inequality as a possible result of changes in the export sector. Although the issues of foreign trade and income distribution are considered important by international academic communities and policy planners,

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[1]/

using the F-statistics calculated by $F = \dfrac{(SSR2-SSR1)/df2-df1}{SSR1/df1}$

where SSR2 denotes a sum of the square residual of equation i and dfi is the degree of freedom of equation i.

[2]/

Ibid.

66

Table 4.11 : Calculated F-Statistics by Sectors

Sector	F-statistic a/	F-statistic b/
Mining	0.89	0.12
Food processing	2.52	3.94
Textiles	49.14	1.05
Wood	0.72	0.98
Paper	6.62	0.45
Chemical	1.40	1.02
Engineering	14.48	0.53
Non-metallic	25.63	1.34
Other industry	3.86	0.77

Note : a/ Testing the hypothesis that increased sectoral output does not
          cause export growth in that corresponding sector.
       b/ Testing the hypothesis that export growth does not
          explain growth of manufactured output.

very few studies have been conducted.2/

However, the hypothesis that income inequality tends to worsen and then improve as an economy develops is well-known and has been empirically supported. Kuznets (1955) first suggested the U shaped relationship. Such a relationship was explained later by Field in terms of uneven growth between the urban-industrial and the rural-agricultural sectors.

Thailand is no exception. One growing pain of the Thai economy in the past two decades, despite the country's economic growth and transformation, has been increasing income disparity. Although Thailand has achieved an impressive record of overall economic growth, the problems of poverty and the widening income gap still remain.

This section, therefore, aims to analyze the impact of export growth on income distribution. We first used the macroeconomic model but then turned to the CGE model because of its comparative advantage over the macroeconometric model in terms of its income distribution aspects.

Preliminary results on the impact of export expansion on income distribution was achieved using the macroeconometric model. A hypothetical 1 percent increase in export growth led to an approximately 0.41 percent rise in wage payments and a 0.64 percent increase in the income of unincorporated enterprises. As a result, the share of wages in GDP increased relatively slower than the share of income of unincorporated enterprises. While ratio of wages to GDP rose by 0.04 percent in response to this 1 percent export growth, the ratio of income of unincorporated enterprises to GDP increased by 0.10 percent (see Table 4.12). However, since wage payments are not the only income source in most households, a comparison between the ratios of wage and income of unincorporated enterprises to GDP are not a good indicator of the effect of export growth on income distribution.

We next examined the impact of export growth on income distribution using the CGE model.

How Export Earnings May Affect Household Income

The question of who will lose and who will gain--in relative terms--from international trade has been the focus of trade theories for a long time. According to the well-known Stopler-Samuelson Theorem, protection benefits the factors used intensively in the protected sector. An increase in export demand for a sector thus benefits the factors used intensively in that sector. In contrast, opening up to international trade should benefit abundant factors and hurt scarce factors. However, such theoretical statements are not easily applied to policy making. Only 18.30 percent of the labor force is employed in the private sector. If we include government employees as wage earners, this only makes up about 24.75 percent of

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Examples are Little, Scitovsky and Scott (1970) and Adelman (1984).

Table 4.12 : Simulation Results of the Impact of export growth on Income Distribution

	% growth
Wage payment	0.41
Income of unincorperated enterprises	0.54
Corperated factor income	0.61
Wage / GDP	0.04
Income of unincorperated enterprises / GDP	0.09
Corperated factor income / GDP	0.08

the labor force. Therefore, the impact of export expansion on factor incomes would not sufficiently indicate the resulting pattern of income earnings. More importantly, the size distribution of income is associated with income distribution at the household level. The sources of income in each household are therefore particularly important.

In Thailand, a household receives some income from almost all sources. Table 4.13 provides data on the sources of income earnings for different household groups. Agricultural households only earn about 27.27 percent and 26.88 percent of their income from agricultural wages and agricultural profits, respectively. Non-agricultural profits are also sizable, since they account for almost 27 percent of agricultural household income. The non-agricultural households in the private sector, however, rely on their profits, but about 32 percent of their income comes from non-agricultural wages. Therefore, changes in relative factor prices on factor payments may not indicate exactly what happens to household income. This is partly true to a lesser degree for government households and state enterprise households.

How an increase in export demand would affect the size distribution of income thus depends on several factors, such as sources of household income earnings, household consumption patterns, input-output linkages, and the pattern of export growth.

Different sources of household income are one factor influencing the way export growth affects the size distribution of income. Relative prices resulting from export growth will determine factor incomes received by each household type. The data on sources of income earnings by household occupation and income class as shown in Table 4.13 indicate that private household incomes are not very much affected by changes in relative factor prices, i.e. sectoral wages relative to sectoral profits. For example, agricultural households, on the average, earn 27.27 percent and 26.88 percent of their income from agricultural wages and agricultural profits respectively. The income of non-agricultural households group, is distributed less equally between its wages and its profits. Nevertheless, its non-agricultural profits account for only about 53 percent, whereas its non-agricultural wages account for 32 percent of its income earnings. Households whose income derives from work in the government and state enterprises rely on some non-agricultural profits, but essentially their earnings are highly affected by wages paid by the government and state enterprises. Thus, while the incomes of government and state enterprise households can be somewhat predicted by factor prices, i.e. wages, the resulting changes in relative factor prices are not very helpful in explaining the changes in household income (classified by aggregated occupations) for other types of households, especially agricultural households.

When household types are classified based on income level, changes in factoral incomes do not seriously affect their income differences (see Table 4.14). Households in all quintiles get about 50 percent of their income from profits, and changes in profits tend to be allocated quite equally among all households.

Table 4.13 : Sources of Income by Occupation

(percentage share)

	Agricultural Household	Non-agricultural Household	Government Household	State enterprise Household	All Households
Agricultural wage	27.27	1.06	0.83	0.57	8.76
Agricultural profit	26.88	1.14	1.01	0.69	8.72
Government wage	1.78	1.86	51.94	3.14	8.94
State enterprise wage	0.15	0.51	0.93	58.30	2.00
Non-agricultural wage	7.27	32.17	7.53	6.46	20.66
Non-agricultural profit	26.80	53.38	20.95	16.95	39.98
Transfer income	4.13	3.54	3.54	5.02	3.75
Property income	5.73	6.33	13.26	8.88	7.20
Total	100.00	100.00	100.00	100.00	100.00

Table 4.14 : Sources of Income by Income Group

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	All
Agricultural wage	3.18	12.59	21.30	28.31	29.60	8.76
Agricultural profit	3.76	12.47	20.11	25.66	25.31	8.72
Government wage	12.19	4.89	1.70	0.54	0.11	8.94
State enterprise wage	2.83	0.84	0.13	0.00	0.02	2.00
Non-agricultural wage	22.62	22.46	15.08	8.73	7.70	20.66
Non-agricultural profit	42.91	38.36	33.74	28.69	29.19	39.88
Transfer income	4.05	3.53	3.27	2.73	2.43	3.75
Property income	8.47	4.85	4.68	5.34	5.63	7.20
Total	100.00	100.00	100.00	100.00	100.00	100.00

In Tables 4.13 and 4.14 it is interesting to see that changes in relative product prices (or relative sectoral growth), rather than relative factor prices (or relative factor earnings) are likely to indicate relative changes in household earnings. When households are classified by aggregated occupations, non-agricultural households rely very much on non-agricultural value added. Although agricultural households receive almost 60 percent of their income from agricultural production (in terms of agricultural wages and profits), 34.07 percent of their income comes from (private) non-agricultural activities. This means that the income sources of agricultural households are highly diversified, a fact that helps agricultural households to respond to any changes that hurt agricultural production but favour non-agricultural activities.

The picture becomes clearer when households are considered according to income levels. Table 4.14 shows that higher income groups tend to benefit from non-agricultural production, whereas lower income households tend to depend on agricultural value added. The top 20 percent of households earn 6.94 percent and 65.53 percent of their income from agricultural and non-agricultural activities, respectively. The households 20 percent poorest of, in contrast, respectively have 54.91 percent and 36.89 percent as shares of their income from the agricultural and non-agricultural sectors.

Exports directly affect household income by encouraging domestic production. As a result, the pattern of export growth will determine directly the changes in sectoral value added and hence household income. Table 4.15 summarizes the export growth pattern along with the annual growth rates of merchandise exports for 1983-1987. Since exporting paddy is prohibited, paddy exports were assumed nil in our analysis. We assumed that special exports or exports of non-factor services, grew at around 20 percent per year. As implied by the data on sectoral export growth rates, Thailand's exports during the last several years were increasingly diversified towards manufactured goods relative to agricultural products.

Nevertheless, the export pattern gives only some indication of how export growth may affect sectoral output and thus household income. Some indirect effects may be crucial here. An increase in household income will more or less raise household consumption, leading to the role of consumption and consumption patterns. Households with higher propensities to consume will help generate higher demand for goods and services while the consumption pattern will influence the allocation of household budget for consumption towards products intensively consumed. As implied by Engel's Law, the shares of consumption are associated with the level of household income. Table 4.16 provides information on consumption patterns by household. It generally confirms the validity of Engel's Law and suggests that lower income households are likely to spend more of their income on agricultural-related products, particularly food. The role of input-output linkages is very similar to consumption in the sense that the sector with stronger domestic input coefficients is likely to encourage higher production. Moreover, if the production of a sector requires inputs from various sectors, the export growth of

Table 4.15 : Annual Growth Rates of Thailand's Exports during 1982-1987

Sector	1983	1984	1985	1986	1987	Average 1982-87
Other major crops	-3.14	14.04	-24.35	17.37	-56.56	-10.53
Vegetables & fruits	-15.39	15.23	53.07	-6.56	-12.18	6.84
Other agriculture	-16.64	26.62	14.31	-11.21	-8.81	0.85
Fishing	-7.57	9.32	14.20	15.32	47.47	15.75
Slaughtering	-12.06	2.66	22.08	12.40	-18.92	1.23
Canning & food processing	6.89	25.10	24.24	43.74	25.42	25.06
Rice milling	-10.32	26.37	-13.10	-9.74	11.70	1.36
Beverages	-1.70	37.56	13.68	-30.50	24.17	8.64
Tobacco processing	-26.25	-10.14	-3.67	-6.23	-13.56	-12.37
Other foods	-29.36	4.81	0.03	23.17	10.56	1.84
Clothing	2.04	36.30	19.39	31.30	56.97	29.20
Wood-paper-rubber products	20.59	14.10	11.69	22.01	48.09	23.30
Basic industries	-23.78	13.10	22.68	-18.29	12.17	1.18
Appliances	17.72	12.97	30.38	44.85	51.00	31.38
Other household items	25.14	35.42	19.12	40.22	65.33	37.05
Other industries	24.36	54.20	44.89	16.37	76.20	44.00
Fuel	-21.51	1262.24	493.64	-25.25	19.65	345.79
Other services	-36.52	-3.22	11.09	6.26	72.84	10.09

Table 4.16 : Consumption Patterns by Household

	Quintile	Food	Beverages	Hotel & Resturant	Tobacco	Clothing	Other household items	Utilities	Fuel	Others	Total Consumption
Agriculture	1	24.39	5.33	4.05	1.69	11.54	12.26	0.67	6.09	34.01	100.00
Agriculture	2	32.83	4.59	3.60	1.69	12.58	11.07	0.51	6.62	26.51	100.00
Agriculture	3	36.77	4.79	2.67	1.60	13.08	11.18	0.46	6.37	23.09	100.00
Agriculture	4	42.94	3.46	1.92	1.74	11.87	11.10	0.42	5.69	20.84	100.00
Agriculture	5	44.45	3.16	1.65	1.65	13.39	10.83	0.41	5.12	19.33	100.00
Nonagriculture	1	19.60	6.68	11.07	2.06	8.15	9.37	1.38	11.27	30.43	100.00
Nonagriculture	2	30.80	6.86	8.69	2.69	8.38	10.78	1.17	8.75	21.89	100.00
Nonagriculture	3	35.46	4.37	5.33	2.52	8.49	13.56	0.76	7.24	22.26	100.00
Nonagriculture	4	41.44	3.27	4.50	2.18	10.28	11.80	0.67	6.97	18.89	100.00
Nonagriculture	5	45.22	3.58	3.78	1.90	10.06	12.84	0.79	6.00	15.82	100.00
Government	1	19.90	6.26	9.22	1.84	9.20	12.41	1.13	10.14	29.69	100.00
Government	2	32.03	6.14	6.12	2.71	8.92	11.40	0.87	9.02	22.61	100.00
Government	3	39.83	5.57	5.89	2.46	10.57	12.50	0.60	6.72	15.86	100.00
Government	4	37.87	3.27	6.14	1.59	9.24	11.22	0.47	9.39	20.82	100.00
Government	5	35.54	2.47	3.68	1.52	5.68	8.29	0.70	23.13	18.98	100.00
State enterprise	1	19.62	5.62	10.10	2.54	9.10	9.20	1.13	14.45	28.25	100.00
State enterprise	2	28.11	4.26	6.62	2.66	11.55	7.60	0.51	12.70	25.99	100.00
State enterprise	3	55.94	5.55	6.88	2.91	0.04	7.64	0.58	1.92	18.53	100.00
State enterprise	5	68.64	4.14	0.13	2.02	0.24	9.04	0.13	0.40	15.25	100.00
All households		27.10	5.70	7.42	1.99	9.87	10.75	0.98	8.95	27.24	100.00

that sector will lead to an overall balance of growth in the production economy.

Export Growth and Income Distribution:
Methodology and Results

Since there are several factors that may directly and indirectly affect the size distribution of income, the impact of export growth should be numerically assessed in a general equilibrium setup. Thus, the CGE model as described in section 3.2 was used in conjunction with the 1984 social accounting matrix to capture the general equilibrium effects of export expansion on the income earnings of various households.

In our analysis, certain plausible assumptions had to be made: (1) we assumed that the pattern of export growth was the same as the average figure during 1983-1987; (2) investment and government spending were assumed to be exogenous, whereas foreign savings and, thus, current account deficits are residual; (3) capital used in either agricultural or non-agricultural production is a sector-specific factor. Land is also specific to particular agricultural activities; (4) export expansion has no impact on wages in the government sector and in state enterprises, although wages in state enterprises are more likely to be adjusted upward; (5) sectoral supplies increased demand such that the corresponding product prices rise at the reasonable rates suggested by the econometric model used; and (6) export expansion is a demand-side phenomenon, meaning that the export sector was assumed to be essentially stimulated by external demand factors, i.e. the shifting components of the export demand functions.

Table 4.17 shows the impact of a 10-percent increase in total goods and service exports on the distribution of nominal income. According to the GINI coefficients which summarize the overall degrees of income distribution, export growth slightly raises income inequalities. As a result of 10 percent export growth, the GINI index is increased by only 0.221 percent, from 0.554 to 0.555. Such a change in the GINI coefficient suggests that export growth does not encourage overall income equalities and probably hurts income distribution if export growth is sufficiently sizable.

Given the details appearing in Table 4.17, the non-agricultural households with income falling in the first three quintiles gain the most. Their earnings increase by around 4.97 percent to 5.10 percent. Only non-agricultural households receive income at rates higher than the average growth rate of 4.05 percent. Income growth rates of agricultural households range from 3.40 to 3.60 percent.

It is clear that in terms of household income growth rates, non-agricultural households gain the most. Agricultural households may be categorized as average gains, whereas government households and state enterprise households gain little from export growth. State enterprise households, in fact, gain the least (see Table 4.18 for accompanying income shares and the classification by aggregated occupation).

76

Table 4.17 : The Impact of a 10 Percent Increase in Total Goods and
Service Exports on the Size Distribution of Nominal Income

	Quintile	Percentage growth
(1) Nominal Income		
Agriculture	1	3.402
Agriculture	2	3.623
Agriculture	3	3.497
Agriculture	4	3.398
Agriculture	5	3.466
Nonagriculture	1	4.970
Nonagriculture	2	5.099
Nonagriculture	3	5.041
Nonagriculture	4	4.878
Nonagriculture	5	4.835
Government	1	2.053
Government	2	2.037
Government	3	2.111
Government	4	2.353
Government	5	2.328
State enterprise	1	1.654
State enterprise	2	1.128
State enterprise	3	0.502
State enterprise	5	1.351
All households		4.047
(2) Gini index		0.221

Table 4.18 : The Impact of a 10 Percent Increase in Total Goods and
Service Exports on Nominal Household Income by Occupation

Occupation	Percentage share		% Growth
	---	---	---
	Pre-change	Post-change	in income level
Agriculture	29.99	29.83	3.49
Nonagriculture	53.57	54.06	4.99
Government	13.86	13.59	2.05
State enterprise	2.58	2.52	1.61
All	100.00	100.00	4.05

While export growth has a relatively clear impact on nominal income of households by occupation, it does not have such a serious impact on household earnings by income level. In Table 4.19, the first two quintiles gain more than the average households, i.e. their incomes grow by 4.08 and 4.20 percent, respectively. But the other lower income groups also earn at rates that are not far below the average rate of 4.06 percent.

The impact of export growth on income distribution can, however, be more serious if higher consumption prices are taken into account. Table 8 shows the percentage growth rates of nominal household income and the corresponding change in GINI coefficients.

According to Table 4.20, the GINI index rises by 0.239 percent-- from 0.554 to 0.556--indicating a slightly adverse impact (due to higher prices) on income distribution. Higher consumption prices affect the agricultural household group the most. However, agricultural households still benefit from export expansion much more than do government households and state enterprise households (see the aggregated figures in Tables 4.21 and 4.22).

Table 4.23 indicates explicitly the numerical changes in consumer prices faced by various types of households. Agricultural households are worse off, mostly from consumer price increases. State enterprise and government households with relatively low incomes are affected more than average. Generally, non-agricultural households and high-income groups with government and state enterprise occupations are affected less than average. It is noteworthy that, if export demand growth leads to some inflation, certain households--especially low-income state enterprise households and upper-middle-income or high-income government--households may be worse off in real terms.

4.6 Agricultural Exports Versus Manufactured Exports

Thailand, like many other developing countries, is currently facing structural adjustment problems to foreign exchange shortages and low incomes. During the last few years, Thailand's impressive economic growth is strongly associated with the country's export boom. The question still remains, however: "What export products will most benefit the country?"

In our analysis, we examined the growth of agricultural exports and manufactured exports. In general, agricultural production is considered to give better forward linkages to other sectors, to require less imported machinery and materials, and to benefit low-income families and domestic markets. However, agricultural export prices tend to be low and unstable. The Newly Industrialized Countries, such as The Republic of Korea and Taiwan, gained their reputation from exporting manufactured goods. But, for some developing countries, increasing manufactured exports may lead to a deteriorating income-distribution situation. Usually, since pro-agricultural strategies are highly associated with self-reliance and closed-economy ideologies, agricultural-export strategies may be considered the middle road between pro-agricultural strategies and

79

Table 4.19 : The Impact of a 10 Percent Increase in Total Goods and
          Service Exports on Nominal Household Income by Income Class

| Household group | Percentage share | | % Growth |
	Pre-change	Post-change	in income level
Quintile 1	63.12	63.13	4.08
Quintile 2	18.58	18.61	4.20
Quintile 3	9.81	9.80	3.95
Quintile 4	5.45	5.43	3.87
Quintile 5	3.04	3.03	3.66
All	100.00	100.00	4.06

Table 4.20 : The Impact of a 10 Percent Increase in Total Goods and
Service Exports on the Size Distribution of Real Income

	Quintile	Percentage growth
(1) Real Income		
Agriculture	1	2.036
Agriculture	2	2.270
Agriculture	3	2.153
Agriculture	4	2.048
Agriculture	5	2.112
Nonagriculture	1	3.677
Nonagriculture	2	3.821
Nonagriculture	3	3.726
Nonagriculture	4	3.560
Nonagriculture	5	3.530
Government	1	0.785
Government	2	0.774
Government	3	0.837
Government	4	1.028
Government	5	1.023
State enterprise	1	0.403
State enterprise	2	-0.176
State enterprise	3	-0.803
State enterprise	5	-0.007
All households		2.741
(2) Gini index		0.239

Table 4.21 : The Impact of a 10 Percent Increase in Total Goods and
           Service Exports on Real Household Income by Occupation

| Household group | Percentage share | | % Growth |
	Pre-change	Post-change	in income level
Agriculture	29.99	29.81	2.14
Nonagriculture	53.57	54.07	3.70
Government	13.86	13.59	0.79
State enterprise	2.58	2.52	0.36
All	100.00	100.00	2.74

Table 4.22 : The Impact of a 10 Percent Increase in Total Goods and
Service Exports on Real Household Income by Income Class

| Household group | Percentage share | | % Growth |
	Pre-change	Post-change	in income level
Quintile 1	63.12	63.14	2.79
Quintile 2	18.58	18.61	2.89
Quintile 3	9.81	9.80	2.62
Quintile 4	5.45	5.43	2.32
Quintile 5	3.04	3.03	2.32
All	100.00	100.00	2.75

Table 4.23 : The Impact of a 10 Percent Increase in Total Goods and
Service Exports on Consumer Prices by Household

Household	Quintile	Percentage growth
Agriculture	1	1.339
Agriculture	2	1.323
Agriculture	3	1.316
Agriculture	4	1.322
Agriculture	5	1.326
Nonagriculture	1	1.247
Nonagriculture	2	1.230
Nonagriculture	3	1.266
Nonagriculture	4	1.273
Nonagriculture	5	1.260
Government	1	1.256
Government	2	1.253
Government	3	1.263
Government	4	1.311
Government	5	1.292
State enterprise	1	1.246
State enterprise	2	1.307
State enterprise	3	1.315
State enterprise	5	1.356
All households		1.272

export-led industrialization. In fact, there seems to be no way to generalize about the superiority of one approach to the other without first doing a careful analysis of the relevant conditions of the particular country concerned.

In this section, the relative merits of the two alternative export strategies--agricultural-export and manufactured export strategies--are compared. The experiments were performed using the CGE model described in section 3.2.

The agricultural export-approach refers to a situation in which agricultural exports grow evenly by 10 percent. Agricultural exports here include rice and meat. Similarly, the manufactured-export approach allowed only manufactured exports, except rice and slaughtering products, to grow by 10 percent. Other variables (such as investment and factor supplies) were assumed unchanged. Service exports and world prices were also fixed.

The simulation results on the impact on growth, the current account deficit, and income distribution follow.

Growth and Sectoral Growth1/

In terms of production growth, manufactured exports have a greater impact on value added than do agricultural products do (see Table 4.24). A 10-percent increase in manufactured exports encourages overall production by 1.96 percent, whereas, a similar increase in agricultural exports, increases the total value added by only 0.69 percent. The major reason why manufactured exports are so dominant is that they account for around 60 percent of the total export of goods and services, while the agricultural export share accounts for only 25 percent.

Nevertheless, the export elasticities of sectoral output are largely the same. A 10 percent increase in agricultural export demand results in about a 3.19 percent increase in agricultural value added. The elasticity of manufacturing production with respect to agricultural exports is 3.1, which is reasonably high--as high as agricultural exports. Interestingly, manufactured exports seem to have a somewhat stronger backward linkage to the agricultural sector. This supports the argument that manufactured export-led growth is preferable to agricultural export-led growth in terms of production. Moreover, although both approaches have a favorable impact on the service sector, manufactured exports encourage service production much more than do agricultural exports. However, non-manufacturing industries are negatively affected by both strategies, mainly because they compete for resources with manufacturing industries.

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    Since factor supplies are assumed unchanged, agricultural and manufactured exports essentially affect only the demand for goods and services. Changes in value added appearing in this section are, for convenience, in nominal terms.

Table 4.24 : The Impact of a 10 Percent Increase in Agricultural and
            Manufactured Export Demand on Value Added

	(Percentage growth)	
	Agricultural Export Simulation	Manufactured Export Simulation
Agriculture	3.19	0.67
Major Crops	3.43	0.10
Other Agriculture	2.95	1.23
Industries	0.18	2.37
Manufacturing	0.25	3.10
Other Industries	-0.09	-0.41
Services	0.35	2.04
Total GDP	0.69	1.96

The Current Account Deficit

As expected, external instability is reduced by either agricultural exports or manufactured exports. As a result of its large proportion of total exports, "manufactured exports" remarkably improve the country's current account deficit, which, under the simulation, would be reduced by 15 percent (see Table 4.25). Total merchandise exports are, respectively, raised by 4.864 and 0.705 percent due to increased agricultural and manufactured exports. Either type of export growth has a serious effect on the export structure. Manufactured exports hurt rice and other food product exports, whereas agricultural exports jeopardize non-agricultural exports.

Both approaches lead to more imports, particularly merchandise imports. Nonetheless, manufactured exports lead to relatively more merchandise imports, particularly of machinery and raw materials.

Income Distribution

Table 4.26 shows the impact on income distribution of growth in the demand for agricultural and manufactured product exports. According to GINI coefficient results, agricultural exports highly improve income distribution, whereas manufactured exports create slight income inequalities. The GINI indices are, respectively, reduced by 0.433 percent and increased by 0.181 percent.

In the case of agricultural export growth, low-income farmers i.e. agricultural households in the fourth, fifth, and third quintiles, benefit the most. They, respectively, receive about 2.147 percent, 2.081 percent and 1.986 percent more than their benchmark earnings. High-income farmers also are better off than households with any other occupation. Other household types which earn greater income than the average rate of 0.774 percent are government households in the fourth and fifth quintiles. Non-agricultural households in the lowest income class are more or less better off—to about the same degree as the average households. The earnings of other household types increase only slightly. Thus, it may be concluded that agricultural exports favor the lower-income classes, particularly farmers (see also Tables 4.27 and 4.28 for aggregated figures.)

In contrast, manufactured exports, on the average, make only non-agricultural households better off than average households. Given household occupations, manufactured exports are not significantly biased for or against any income class in particular (see Table 4.26 for details). If households are aggregated by occupation, it is also clear that non-agricultural households benefit more than any other, while farm households receive slightlyless than the average income—a percentage rate of 1.789 (see Table 4.29). Government households and state enterprise households do not benefit much from manufactured export growth and are probably worse off if inflation accompanies export expansion. Table 4.30 also supports the argument that manufactured exports generally favor high-income groups more than low-

Table 4.25 : The Impact of a 10 Percent Increase in Agricultural and
Manufactured Export Demand on The Current Account Deficit

	(Percentage growth)	
	Agricultural Export Simulation	Manufactured Export Simulation
Total exports	0.52	3.62
Merchandise exports	0.71	4.86
-Rice	3.93	-2.14
-Other foods	1.92	-0.77
-Other exports	-0.16	7.45
Tourism and other	-0.18	-0.67
Total imports	0.09	0.48
Merchandise imports	0.10	0.54
Current account deficit	-2.02	-15.13

Table 4.26 : The Impact of 10 Percent Increase in Agricultural Exports and
Manufactured Exports on Income Distribution

	Quintile	(Percentage growth)	
		Agricultural Export Simulation	Manufactured Export Simulation
Agriculture	1	1.665	1.831
Agriculture	2	1.759	1.417
Agriculture	3	1.986	1.319
Agriculture	4	2.147	1.247
Agriculture	5	2.081	1.294
Nonagriculture	1	0.310	2.306
Nonagriculture	2	0.408	2.339
Nonagriculture	3	0.533	2.293
Nonagriculture	4	0.651	2.195
Nonagriculture	5	0.769	2.150
Government	1	0.149	0.960
Government	2	0.319	0.919
Government	3	0.543	0.917
Government	4	1.159	0.922
Government	5	0.984	0.939
State enterprise	1	0.131	0.770
State enterprise	2	0.109	0.525
State enterprise	3	0.028	0.230
State enterprise	5	0.529	0.564
All households		0.774	1.789
GINI index		-0.433	0.181

Table 4.27 : The Impact of a 10 Percent Increase in Agricultural Export Demand
on the Size Distribution of Income

| Household group | Percentage share | | % Growth |
	Pre-change	Post-change	in income level
Agriculture	29.99	30.31	1.87
Nonagriculture	53.57	53.35	0.35
Government	13.86	13.77	0.17
State enterprise	2.58	2.57	0.13
All households	100.00	100.00	0.77

Table 4.28 : The Impact of a 10 Percent Increase in Agricultural Export Demand
on the Size Distribution of Income

| Household group | Percentage share | | % Growth |
	Pre-change	Post-change	in income level
Quintile 1	63.12	62.91	0.44
Quintile 2	18.58	18.62	1.01
Quintile 3	9.81	9.88	1.50
Quintile 4	5.45	5.51	1.87
Quintile 5	3.04	3.07	1.90
All households	100.00	100.00	0.77

Table 4.29 : The Impact of a 10 Percent Increase in Manufactured Export De
on the Size Distribution of Income

| Household group | Percentage share | | % Growth |
	Pre-change	Post-change	in income level
Agriculture	29.99	29.85	1.34
Nonagriculture	53.57	53.85	2.31
Government	13.86	13.74	0.96
State enterprise	2.58	2.56	0.75
All households	100.00	100.00	1.79

Table 4.30 : The Impact of a 10 Percent Increase in Manufactured Export Demand
          on the Size Distribution of Income

| Household group | Percentage share | | % Growth |
	Pre-change	Post-change	in income level
Quintile 1	83.12	83.16	1.86
Quintile 2	18.58	18.58	1.81
Quintile 3	9.81	9.79	1.61
Quintile 4	5.45	5.43	1.42
Quintile 5	3.04	3.03	1.41
All households	100.00	100.00	1.79

income groups. Since the growth rates of earnings received by all quintiles are not sizably different, manufactured exports only slightly worsen the country's income distribution.

In sum, no approach dominates the other in terms of all development objectives concerned. Manufactured export growth is preferred to agricultural-export growth only in terms of growth and improvement in the current account. Agricultural-export growth is only preferable in meeting the income distribution objective. Although manufactured exports are very effective in raising the incomes of various households, they may not sufficiently benefit agricultural households and, probably, low-income government households; thus, the manufactured export approach is *Pareto* superior to the agricultural export approach (see Table 4.26). Therefore, several crucial questions still remain: Do agricultural product exports have bright prospects? Do manufactured exports sufficiently raise income of the poor, particularly of farm and government households? Most probably, a combination of the two alternative approaches should be suggested. Indeed, most probably, certain effective and practical   policy instruments which can be used to redistribute income without jeopardizing economic growth should be found and pursued to support the objective of more equitable income distribution while Thailand pursues an   export-led industrialization path.

5. CONCLUSION AND POLICY IMPLICATION

Growth of the external sector, especially in terms of trade and foreign investment, was the most visible change seen in the Thai economy recently. Merchandised exports expanded at the rate of 28.48 percent in 1987 and 34.59 percent in 1988. Of this, the share of manufactured exports increased dramatically from 26.00 percent in 1976 to 65.55 percent in 1988.

Many economists believed that the economic success shown since 1986 could be attributed to Thailand's export boom, and a large influx of foreign direct investment. Impressive records of economic expansion as well as political stability have attracted foreign investors, especially those from Japan and Taiwan, to invest in industries where Japan and the Asian NICs are losing their competitiveness.

This increasing exposure to international trade and finance can be interpreted in both positive and negative aspects. On one hand, it has been widely accepted that trade is the engine of growth. Empirical evidence derived from both the macroeconometric and CGE models used in this study, show that a one percent increase in exports leads to about 32 percent increase in real GDP when the multiplier effect of export expansion is taken into consideration.

Foreign capital, including direct investment, loan and portfolio investment brings added resources to the development of the country's infra-structure, and bridges the domestic saving-investment gap, as well as the trade gap. However, outstanding accumulated debt can be viewed as a future drain on resources, resulting in structural imbalance in foreign trade and capital flow.

On the other hand, the increasing openness of the Thai economy exposes the country to the vulnerability and fragility of world economic situation. To specialize in international trade would make the country heavily dependent on the economic and political decisions of major industrialized countries. As its external sector expands, Thailand becomes more vulnerable to external shocks and decisions. Many factors already affect the domestic performance of the Thai economy through external trade and investment. Among those are protectionism, increasing foreign interest rates, rising oil prices, a slugglish demand for primary commodities, and deterioration of terms of trade through the demand management and stabilization policies of industrial countries. During the last two decades, these external factors exerted a significant impact on Thailand's economic performance including growth, structural change, income distribution, economic stability and import dependence.

In this study it was found that export expansion has an important implications on domestic stability. A one percent increase in exports leads to an 0.17 percent increase in the GDP deflator.

95

Import dependence, especially of induced imports (or the value of intermediate imports needed to produce one unit value of output) on Thai exports implies that a rapid expansion of manufactured exports requires a considerable increase in these intermediate imports. It is in accordance with the two-gap model that treats foreign exchange as a constraint on growth.

It is, therefore, not surprising to find that even with growth in manufacturing exports, the manufacturing sector may exert a net drain on the balance of trade directly and indirectly. Together with the rapid acceleration of Thai exports, there are also huge increases in induced imports to support manufacturing production, resulting in growing balance of trade deficits. Unless the country successfully develops this second stage import substitution of intermediate and capital goods, export expansion will generate worsening balance of trade. However, the causes of this net negative effect of export expansion on balance of trade are difficult to unravel, since export expansion has also generated higher growth and increased imports. Nevertheless, Thailand's high import dependence, countries to make the country more susceptible to external economic change.

The study team also tested whether the influx of imports in recent years resulted mainly from the investment boom, higher consumption of imported commodities, or from export expansion. The results revealed that while domestic demand, including both investments and consumption, were the main cause of high direct import dependence, expansion of the export market was the main cause of high induced import dependence, largely in the form of imported technology.

To determine the impact of export growth on the economic structural change of the Thai economy the study team investigated the relationship between export growth and industrial development. A definite one-directional causality pattern from export expansion to industrial development was found. This, therefore, lends credence to support the export led growth strategy of industrial development. Surprisingly, when the same procedure was applied on a sectoral basis, the result is contradictory. Export led growth was found only in the food processing industry, other manufacturing sectors including textiles, nonmetal and engineering show that industrial development in those sectors is a prerequisite for expansion into the export market, to make them more competitive and enhance their comparative advantage.

The results from macroeconometric model on income distribution suggests that a hypothetical one percent increase in export leads to approximately 0.41 percent rise in wages, 0.64 percent rise in unincorporated enterprises income and 0.61 percent in corporate factor income. However, since most Thai householders are not wage earners, we investigated the income distribution effect of exports through the CGE. The simulation showed that during 1983-1987 increased export earnings led to a slightly worsening income distribution. However, the simulation was done under the assumption that world prices would remain constant and reflect a similar pattern of export earnings. The result seems to be under estimated and as not come close to the extent that was actually observed during 1981-1986. It may be concluded that the rapidly worsening income distribution trend during 1981-1986 did

not arise from a general growth of exports but from the decreasing trend of primary commodity prices during this period. Nevertheless, the empirical results indicate that export expansion has had an adverse effect on income distribution, and if export demand growth leads to a higher inflation rate, agricultural households will sutter most. State enterprises and government households with a relatively low incomes will find their real income decreasing.

Comparision between the impact of agricultural exports and manufactured export expansion revealed that, under the present structure of Thai exports, manufacturing exports had a greater impact on value added than those of agriculture products. The reasons why manufactured export, are so dominant are: (1) the relatively large proportion of manufactured exports in total exports; and (2) strong backward linkages. However, in regard income distribution, manufactured exports create some income inequalities, whereas agricultural exports close the income distribution gap. Although manufactured exports are very effective in raising various household incomes, due to its strong growth effect, they may not yield sufficient benefits to agricultural households and probably also the low income government households.

Analysis of foreign demand for Thai exports revealed that there can be little doubt that income and price effects determined export growth. Foreign demand for Thai exports partly depends on world volume of trade or world income - an external factor that is beyond our control. The sector that shared a relatively large proportion of world income export growth is food processing. It was found that the price accounts for about 18 percent of total real export growth in 1984-1987. This figure is a combination of two major factor: (1) the change in Thailand's real effective exchange rate compared to other major foreign currencies; and (2) changes or reduction in the production costs of Thai exports. Some sectors showed an improved cost competitiveness; among these are nonmetal (32.01%), rubber (24.44%) and wood (20.15%). It is rather surprising that the traditional Thai export, textiles, has not demonstrated favorable cost competitiveness in recent years.

There also exists about 24.04 percent of total export growth which can not be explained by income and price effects. A qualitative analysis may shed some light on this "residual." Among those factors involved, perhaps, are the evolution of international product cycles; diversification of Thai exports in terms of product and destination; or an increase in the number of exporters who have been attracted by the generous export promotion incentives provided by Thai government. In terms of increasing diversification of trading partners, this be interpreted as increasing penetration in the world market and increasing independence. Thailand therfore gains more economic and political leverage though these international contacts.

Policy implications, have been confirmed in this study in the relationships found between export expansion, and economic growth and structural change. An export led growth strategy should be considered a high priority. It is expected that this will contribute to sustaining the successfully economic and industrial development which

has been experienced during the past few years. Although one is aware of its adverse impact on income distribution and a high inflation rate which hurts fixed income earners, does not mean that Thailand should not promote exports. However, some policy measures are required to correct these adverse impacts, especially in this period of rapid growth, for two main reasons: (1) more rapid expansion of external sector would result in widening the income gap and higher lead to a rate of inflation; and (2) expansion of external sector generates overall economic growth which will result in higher income levels and GDP. Measures to reduce the income distribution gap can be undertaken relatively easily, when compared to coping with a period of economic recession or slow growth. Policies to reduce income disparity can more easily be implemented under the favorable conditions of economic prosperity.

The strong income effect of foreign demand for Thai exports makes Thailand very vulnerable to changes in the world economic situation, especially economic changes in the United States, EEC, and Japan. Thailand should implement a higher degree of flexibility in order to respond to economic instability.

The high degree of import dependence in the Thai economy, especially that which was induced by export growth, reflects low inter-industry linkages and perhaps a weak economic base. Although large proportion of imports have been of capital and intermediate products, the second stage of import substitution should be more selective. Emphasis should be placed on product diversification within existing industries, especially in those areas where high value sophisticated goods demand a greater degree of skill.

Export promotions have resulted in small adverse effect on income distribution. These adverse impacts would be higher if exports were not labor intensive. As export industries, especially labor intensive ones, expand they rapidly absorb labor which will eventually lead to higher wages. And if labor is relatively the cheapest factor, the effect of export promotion is to enhance the higher comparative advantage seen in the manufacturing sector as a whole.

For the past two decades Thailand has achieved spectacular economic success, most noticably in recent years, and it has dealt with the problems of economic recession since the early eighties. The primary cause of Thailand's economic recession is its dependence on foreign countries especially the United States, Japan, and the European Community, created by its export oriented industry. Steps need to be taken to introduce more diversification in terms of commodities and destination.

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