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THE NATIONAL PLANNING AND THE ECONOMY OF THAILAND

by

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CHAPTER I. INTRODUCTION

The inspiration behind the study of the underdeveloped countries is generally concerned with the need to do something about the problems of poverty and backwardness in these countries. Since these developing countries are not a homogeneous group, and the problems facing them are both economic and non-economic, a case study is desirable. The following study deals particularly with Thailand, one of the Asian countries that, compared to the Western nations, is still poor and underdeveloped.

This study, primarily empirical in nature, is of the national planning and economic development in Thailand. The main purpose is to understand the functioning of economic systems and to establish an analytical framework within which one may discover the interrelations among the strategic variables in the process of development.

Thailand is still characterized as an underdeveloped country possibly because it is primary-producing; it faces population pressures, it has an economically backward population, it is capital-deficient, and it is foreign trade-oriented. The predominant problem of Thailand is to accelerate development, that is, to increase the rate of growth in real national income. This problem has at least three aspects: the reduction of unemployment, diversification of the country's economic base, and the balance of payments equilibria. It is unlikely that many of the important economic problems will be solved save by the initiative of the government. A basic weakness in the government's developing effort in the past has been a lack of guiding objectives; hence, its effort was unbalanced, uncoordinated and excessively diffused. By all means, national planning would be expected to

achieve coordination of projects, programs, and plans for sectors which
would lead to speedy and efficient achievement of the development goals
of the country. Up to this point, planning and development become ir-
revocably linked; it is an adequate instrumentality of economic development.

An alternative way of planning is by using an econometric model in
which a set of relations between the major economic variables is constructed
to describe the movement of the system through time. An econometric model
will provide a method of forecasting and formulating economic policy in
which each endogenous is estimated as a function of the predetermined vari-
ables. Furthermore, empirical knowledge of the nature of these relation-
ships is an essential contribution for development planning. This study
is presented in the following sequence.

Chapter II serves as general background for the study, including the
historical and geographical background; the political and economic situa-
tion before the national plan was adopted.

In Chapter III a conceptual and analytical view of Thailand's economic
system with emphasis on its performance while under the National Economic
Development Plan is presented; the purpose is to evaluate the effectiveness
of the plan and its future. This chapter deals particularly with the major
sectoral characteristics of agriculture, manufacturing, capital formation,
and foreign trade, and their structural changes relative to the preplanning
period.

In Chapter IV the structure of the model will be described in detail,
accompanied by reasons for choosing the particular relationships used. The
computation and comparisons of alternative solutions will also be illustrated;
the model is used to test feasibility and implications of existing plans.

CHAPTER II. SOCIO-ECONOMIC BACKGROUND

Historical Background

The Thai people originated in South China, South of the Yangtze valley. In A.D. 1253 they started migrating southward and settled in the land now known as Thailand. The country, then, was developed by migration and conquest (3, p. 1). Thailand covers an area of about 200,000 square miles in the heart of East Asia and has a population of about 33 million. The country stretches from latitude 5 30 North to 21 North, or not quite 1,000 miles. The longitudinal extent is half this distance, from 97 30 East to 105 30" East. Thailand falls entirely within the tropical climate region.

To foreigners, Thailand was more well known as Siam. The Thais themselves always call their country "Muang-Thai" meaning "Land of the Free", showing their pride in having never been colonized as had many other countries in South East Asia. This fact seems to color every aspect of Thailand's modern life (3, p. 21).

Thailand has been ruled by an absolute monarchy since the establishment of the country. Until 1932, it was successfully transformed into a constitutional monarchy by bloodless revolution. The present king, H.M. King Bhumipol, is assisted by Prime Minister Thanom Kittikachorn who acts as head of the government.

Economic history

The modern economic history of Thailand can be divided into two stages: from the period 1851 to 1932 and from 1933 up to the beginning of World War II.

The first stage began under the reign of King Monkut (Rama II), the fourth monarch of the Chakri Dynasty who ended the period of isolation. Before he assumed the throne, contacts with the west were limited. The Thai economy was almost self-sufficient, with minor trade with China. The economic conditions prior to his period was described my Muscat as follows:

> By contrast, the economy during the previous generations appears to have undergone very little change. The population was quite sparse in relation to the land available in the large central flood plain and occupied the most fertile strips of land adjacent to the Chao Phaya river and its many channels. The population was almost entirely occupied in agriculture, with rice the principle crop. Except in the North, farmers depended on rainfall and the annual flooding without benefit of an irrigation works. The economy was self-sufficient at all levels; there was little international trade and only minor domestic interregional trade. The society was extraordinary stable and insulated. There was abundant rice land, and a system of personal rather than landed feudal relations that permitted considerable geographic mobility for freemen (and even for slaves prior abolition of slavery in the first decade of this century) and permitted them to cultivate sufficient land to satisfy their consumption requirements and tax obligations, and to engage in extremely limited barter traffic. The economy had for many generations experienced little impulse toward change and few pressures that might induce adaptive alterations in economic behavior or methods (18, p. 11).

During his seventeen year reign, King Monkut transformed the country's outlook via closer relations with the West. The distinctive character was his readiness to accept the spread of Western civilization. Well informed about Western colonial aspirations, the King promptly accepted the treaty proposed by Great Britain and a later one by France in spite of his loss of power to extraterritorial rights (18, p. 4). This period was considered to be a transition from a closed to open economy.

In 1878, King Monkut was succeeded by his son, King Chulalongkorn, who was trained to cope with the drastic changes caused by the opening

of free trade. King Rama V followed his father's policy of westernizing; unfinished projects were continued and improved. In addition, he gave more emphasis to education than any other king in the history of the country and the first university was established during his reign. Furthermore, schools started to teach English as a second language. Most important, hundreds of students and official workers were sent abroad through King's scholarships.

A revolution in 1932 (that was initiated by King Rama VII) ushered in the second stage of modern economic history; this is considered to be the critical turning point for national development. No Thai government since 1932 has undertaken to halt western influence and assistance.

In Bert F. Hoselitz's terminology, the pattern of economic development during these two stages can be described as autonomous, satellitic and expansionist (8, p. 92). The Thai economy is autonomous because economic decision-making is widely dispersed. (The autonomous economy is identical with the classical model of the liberal economy, i.e., the United States of 1830-90). The satellitic concept is applicable to the Thai economy since development is apparent only in the export trade sectors like rubber, rice, tin and teak. Australia in the period up to 1914 was also categorized as satellitic. Finally, Thailand was described as expansionist since its gross domestic product rose from an expansion in either geographic area or exploitation of natural resources instead of increasing productivity of existing resources.

In spite of this development Thailand is still regarded as a poor and underdeveloped country. This judgment was based on the following factors:

1. Dominance of agriculture with low productivity.

2. Dependence on the export of primary products.

3. Inadequate educational systems.

4. Serious deficiency of entrepreneurship.

5. A feudal social and political structure.

6. Substantial inequality of income distribution.

Clearly further development is a crucial problem for the Thai government and private policy makers as well. The balance of this chapter presents a review of past national economic behavior in Thailand. Though the periods analyzed are dependent on the availability of data the emphasis is on the period after World War II up to 1961 when the first National Development Plan was adopted.

Sectoral Development Problems

The role of the main aggregate variables can be described in terms of their importance in gross domestic product, shares in the total labor force, and growth rates. This study, however, is occasionally limited by the lack of data and reliable sources of information. The major sectors discussed in the following sections are agriculture, foreign trade, and public sector.

Agriculture

Thailand is predominantly an agricultural country with a favorable geographical location and natural resource endowment. Geographically, Thailand is divided into four parts: the North, the Central Plain, the Northeast and the South.

The North is partly jungle country with many types of valuable woods, and partly fertile crowded valleys where people plant rice on small irrigated holdings. Central Thailand is the dominant political and economic region of the nation; it is also the major rice exporting area of the world. The Northeast is the least favored region of Thailand, having poor soils and relatively little rainfall. It is also isolated from ready communication with other regions by its position outside the Chao Phya Basin. The South is the Peninsula of Thailand which includes the narrow Isthma of Kra and the land bridge to Malaya and the Indonesian world. With an equatorial climate, the South is suitable for cultivating rubber, coconuts and fruit trees.

The simplest measure of the relative importance of the agricultural sector is the percentage share of the national labor force employed in agriculture. In 1850, as Ingram pointed out, the working population was almost wholly engaged in agriculture with rice as a major crop. Despite its dominance in the labor force, the relative share of agriculture was gradually declining in the early nineteenth century. The 1947 census showed that 84.78 percent of the "economically active population" was engaged in agriculture. This percentage share rose again in 1956, but dropped to 82.4 percent in 1960 (Table II.1). Compared to other sectors, agriculture still provides the largest employment opportunities. Table III.1 shows only a slightly increased percentage of the labor force engaged in manufacturing and construction industries over this period.

Table II.1. Percentage composition of economically active population by major industrial group[a]

	1947[b]	1956[c]	1960[d]
Agriculture, forestry, hunting and fishing	84.78	87.95	82.4
Manufacturing	2.18	2.08	3.4
Commerce	7.86	4.84	5.7
Construction, repair, demolition	0.09	0.28	0.5

[a]Source: Census 1947
Demographic survey 1956
Population census 1960.

[b]Economically active population 14 years and over.

[c]Economically active population 15 years and over.

[d]Economically active population 11 years and over.

The importance of agriculture in the nation's economy can also be measured by its contribution to gross domestic product. According to the National Income Accounts, agriculture served as a major income earner producing almost half of the national income.

In 1948, three years after World War II, agricultural production was exceptionally high accounting for almost 60 per cent of gross domestic product. Since then, its percentage share has been gradually declining. During 1952-1960, the agricultural product averaged 41.5 per cent of GDP. According to Table II.2, the relative sectoral shares have slightly changed within this period of nine years but agriculture still plays a

Table II.2. Percentage distribution of gross domestic product by in-
dustrial origin 1952-1960[a]

Industrial origin	1952	1953	1954	1955	1956	1957	1958	1959	1960
Agriculture (total)	43.9	43.5	40.0	42.0	40.0	39.5	39.7	38.4	39.0
Agriculture (crops)	32.8	32.3	28.5	30.4	31.1	28.8	30.4	29.7	30.0
Livestock	4.2	4.4	4.3	5.3	3.7	5.2	4.1	3.8	3.9
Fisheries	2.2	2.2	2.4	2.1	2.4	2.4	2.3	2.3	2.2
Forestry	4.7	4.6	4.8	4.2	3.2	3.1	2.9	2.6	2.6
Manufacturing	11.1	11.5	11.8	11.8	12.1	11.5	12.3	12.5	11.5
Construction	4.0	4.1	4.2	4.0	4.2	4.5	3.3	4.2	4.8
Communication and transportation	4.0	5.0	5.5	5.1	5.4	6.0	6.0	6.9	7.7

[a]Source: (25, pp. 16-17).

dominant role in the Thai economy relative to other sectors. During this
specific period, the share of agricultural production declined from 43.9%
in 1952 to 39.0% in 1960. This constitutes a decline of about 11.1%
or 1.2% per annum and resulted in an increase in the percentage share of
several sectors such as construction, communication, and transportation.

Agricultural production is comprised of crops, livestock, fisheries
and forestry. The most significant category is agricultural crop pro-
duction; rice is the most important crop since it is the principal food
for the Thai people. Though cultivation is scattered throughout the country
there is a concentration on the Central Plain and the adjoining delta
region of the Chao Phya River; the production of rice from the Central Plain

was almost half the total volume as shown in Table II.3. Over the period

indicated rice production increased approximately 32%. Its average

growth rate was considerably lower than those of kenaf and maize whose over-

all production rose rapidly within this six year period. The production

of maize and kenaf had increased by 700% and 1,400% respectively. The in-

ducement of rapid production growth stemmed from the expansion of export

markets and the sudden demand for these particular primary products. The

production of sugar cane, a second major crop, also rose at a high rate

due to the fact that it can be grown in virtually every part of the country.

Table II.3. Production of selected crops by area (1,000 metric tons)[a]

Crop	Years	Av. (%)	Total % inc. from 1956-60	Total	Cent. plain	North	North-east	South
Rice	1955/56			7,334	3,769	745	3,150	670
	1960/61	6.3	31.7	9,697	4,016	760	2,220	701
Maize	1955			67	29	3	33	2
	1960	142.3	711.8	544	332	25	154	33
Sugar cane	1955			2,639	1,359	276	1,012	52
	1960	200.2	1001.4	5,383	3,887	203	1,134	159
Kenaf	1955			10	-	-	10	-
	1960	348.0	1740.0	184	4	1	179	-

[a]Source: (32, p. 333).

The major trends in the structure of agricultural production are

summarized in Table II.4. Total production in 1960 was 42.22 percent

above the 1953 level, indicating an average increase during this period

of approximately 5.3 percent yearly. Other crops experienced an average

increase of about 25.1 percent per annum. Only forestry products have been declining possibly because of the yearly over-cutting which occurred over the time period.

Table II.4. Index of agricultural production (1953 = 100)[a]

	1935-1939	1953	1955	1956	1957	1958	1959	1960
Paddy	65.9	100	86.47	111.09	125.67	84.34	108.88	106.56
Rubber	48.2	100	135.88	139.34	138.63	143.32	177.26	174.09
Other crops[b]	11.0	100	129.18	150.92	169.90	170.13	223.27	300.47
Forestry prod.[c]	11.2	100	96.61	76.87	77.49	82.10	22.33	71.84
Fish	11.2	100	104.91	108.08	114.59	94.93	98.61	100.34
Total		100	99.98	116.97	129.19	103.89	129.18	142.23

[a]Source: (2, p. 9).

[b]Maize, mung beans, cassava, sugar cane, coconut, groundnut, castor beans, soybeans, sesame, cotton, jute, kenaf, ramie and tobacco leaves.

[c]Teak, yang-wood, firewood and charcoal.

Foreign trade

Since Thailand began trading with the west in 1855 its economic structure has changed substantially. External trade gradually trnsformed Thailand from self-sufficiency to an economy which specialized in a few products. Exports of primary products and raw materials were the major sources of revenue which financed the payment of imported products.

Money was introduced to Thailand at this time as a medium of exchange

in the international market. The increased money demand for primary products stimulated agricultural production which resulted in rapid growth of exports. The comparative advantage in agricultural trade started to bring prosperity to the Thai economy.

During the postwar period (up to 1956) the annual average revenue collected on exports was 28.6 per cent (Table II.5) peaking in 1952 as a consequence of the Korean War (1951-1953). The rate has declined since then and revenue collected on exports contributes about 2.9 per cent per annum to gross domestic product.

Table II.5. Revenue collected on exports[a]

Year	Revenue collected on exports as percentages of:[b]			Total government revenue percentage of GDP
	GDP	Total value of exports	Total government revenue	
1948	2.5	22.0	27.0	9.2
1949	3.6	29.0	41.8	8.7
1950	2.5	15.5	25.1	8.4
1951	2.8	17.7	30.8	9.2
1952	4.2	26.5	36.8	11.5
1953	3.2	18.5	27.2	11.9
1954	3.6	18.6	27.0	13.4
1955	2.1	10.7	17.4	12.0
1956	1.7	17.6	21.1	12.7
Annual av.	2.9	19.6	28.6	10.8

[a]Source: (38, p. 145).

[b]Revenue collected on exports includes export duties, profits of the Rice Bureau and "premiums" on rice exports and exchange profits.

The value of exports rose considerably between 1950-1952 because of the increased demand for rice, rubber and tin, for military and stock-piling purposes. The volume of imports, however, did not keep pace with exports in the prewar period or even the early phase of the Korean War. Imports started to rise more rapidly in 1952 as a result of an increased demand for manufactured merchandise. The figures in Table II.6 indicate that ratio of exports to imports has declined since 1952. The average ratio during 1947-1960 was 88 percent.

Table II.6. Annual trend in total external trade (million baht)[a]

	Exports (less re-exports)	Imports	Ratio of export to import (%)
1947	92.6	138.3	67
1948	200.3	174.7	115
1949	207.5	227.4	119
1950	342.4	262.5	130
1951	437.4	370.5	118
1952	455.1	552.4	182
1953	569.3	647.2	88
1954	610.6	702.2	87
1955	700.9	705.3	93
1956	671.7	765.5	88
1957	729.9	853.7	85
1958	619.3	823.7	75
1959	725.8	898.8	81
1960	842.2	966.2	88

[a]Source: (31, p. 287).

Like many other agricultural countries in Asia, Thailand has experienced persistent current account trade deficits. This deficit was partly due to the more rapid growth of imports compared to exports. In addition, export prices were always lower than the import prices of manufactured goods. As indicated in Table II.7 the average terms of trade during 1951-1960 was 98.

Table II.7. Terms of trade[a]

1951	82
1952	106
1954	106
1955	103
1956	95
1957	91
1958	97
1959	104
1960	100
Average	98

[a]Source: (39, p. 155).

Exports

Among the principal exports, rice is consistently the major source of export earnings and hence a key factor in the country's development. Rubber and tin are the next important foreign exchange earners followed by maize, tapioca and kenaf and jute. Table II.8 shows that rice dominated the export trade sector for the whole period from 1935 to 1960

Table II.8.   Thailand, value of exports commodities (million baht)[a]

Year	Rice	Rubber	Tin	Maize	Tapioca products	Kenaf and jute	Other	Total
1935-39(av.)	86.5	18.8	29.6	n.a.	n.a.	n.a.	42.9	177.8
1952	3,870	900	410	28	28	n.a.	715	5,983
1953	3,820	675	365	47	38	n.a.	8,889	6,80
1954	3,086	937	373	56	60	n.a.	1,493	6,02
1955	3,133	1,802	441	80	57	n.a.	1,609	7,16
1956	3,086	1,868	507	96	98	19	1,819	7,49
1957	3,943	1,689	531	74	138	46	1,716	8,14
1958	2,968	1,326	255	183	192	69	1,453	6,41
1959	2,576	2,336	434	250	224	88	1,652	7,53
1960	2,570	2,579	537	551	288	280	1,858	8,54
Total value (%)								
1935-9 (av.)	48.7	10.6	16.6	n.a.	n.a.	n.a.	24.1	100
1952-7 (av.)	51.6	19.4	6.5	0.9	1.0	0.2	20.3	100
1958-60 (av.)	35.9	27.6	5.4	4.4	3.1	1.7	21.9	100

[a]Source: (22, p. 25).

despite a slightly declining relative share; its average percentage share decreased from 48.7 percent in the prewar period to 43.5 percent thereafter. During 1952-1960, the value of rice exports declined at a rate of 3.8 percent per annum.

The value of rubber exports rose rapidly over this time period finally exceeding the value of rice exports in 1960. Its percentage share during

1958-1960 was 27.6 percent, over twice the comparable average figure for the 1930's.

Tin, once the second ranked export, lost its importance after World War II. Its share suddenly dropped to 5.4% during 1959-1960 while it contributed 16.6% in the previous decades. The export of maize, tapioca and kenaf, on the other hand, rose steadily since 1952.

The fluctuation in exports is due to cyclical economic patterns in industrial countries and their respective propensities to import. The rise of world consumption of natural rubber in the first half of 1959 increased the value of rubber exports to a level comparable to that of rice. Its price also fluctuated sharply with the changes in the demand for synthetic substitutes for natural rubber. The exports of tin rose and fell considerably between 1948 to 1958 as a result fluctuating demand in the United States; the latter accounted for an average of 25% of Thailand's tin exports from 1948 to 1958.

Imports

Thailand's imports have increased steadily since 1952 despite fluctuations in the value of exports. As shown in Table II.9 the most rapid growth in imports was in machinery. Its percentage share rose from 6.0 percent in 1948 to 22.6 percent in 1958, an average rate of increase of about 2.5 percent.

In this decade only food, drink, tobacco and manufactured goods experienced declining rates of growth. The volume of capital goods imports increased rapidly to meet the goals of national economic development. The

Table II.9. Percentage distribution of imports by commodity[a]

Commodity	1948	1958
Food, drink, tobacco	14.8	11.9
Manufactured goods	61.2	36.0
Machinery	6.0	22.6
Chemicals	4.6	9.2
Mineral fuels	6.4	10.9
Other products	7.0	9.4
Total	100.0	100.0

[a]Source: (32, p. 320).

construction of public utilities such as roads, railways, power plants and telecommunicative facilities have stimulated imports of intermediate goods such as crude petroleum, aluminum sheets and gypsum.

These figures suggest that the capacity of Thailand to import is greatly influenced by the export prospects of agricultural and mineral products in industrial countries. Often this trade has been influenced by climatic and other cyclical factors resulting in economic instability. Expert diversification would diminish this instability and enhance the prospects for achieving long term national development goals.

Public Sector

Historically economic activity in the public and private sectors has
been virtually indistinguishable. There are few activities in which the
government does not participate. "It owns and exploits forests and mineral
resources, processes agricultural products, manufactures numerous items,
monopolizes transportation and communications, engages in both foreign
and domestic trade, and functions as bankers for credit, savings, and
finance purpose" (3, p. 247).

Government has been a leading sector in the planning and direction of
national development. Its fiscal policy has attempted to promote economic
growth and stability. The principal sources of tax revenue and expenditure
programs are reviewed below.

Government revenue

Early in the nineteenth century, the major source of tax revenue was
opium and gambling. The latter amounted to 40 per cent of total tax revenue.
Direct taxes, consisting of a land tax and a capitation tax, were insig-
nificant, accounting for only 8 to 12 percent of total tax revenues (3,
p. 251).

In 1939, a new revenue code was adopted by the constitutional govern-
ment. Its objective was to shift the tax burden from farmers to business
and higher income groups and consequently the land and capitation taxes
were abolished. An income tax was introduced and has been continually re-
vised to meet the revenue needs of the government. Opium and gambling were
no longer major sources of revenue and were classified as illegal trans-

actions. Currently, the major sources of government revenue are taxes, public borrowing, and monopoly profits. Among these sources, taxes have been the major source of government revenue.

Thailand's tax system has included almost all the kinds of taxes adopted in advanced countries, but the rates were and are comparatively lower. Tax collections are administered by three major departments of the ministry of Finance, namely, the Custom, Revenue and Excise Departments.

The government depends heavily on indirect taxes which constitute almost half of the total revenue. In 1950, its percentage share was 51 percent (Table II:10). Revenue collected from indirect taxes increased from 72.83 in 1944 to 1084.93 million baht in 1950 with the yearly average rate

Table II.10. Sources of Thailand revenue (million baht)[a]

Source	1938	1941	1944	1950
Direct tax				
Income and salary taxes	1.85	3.30	22.87	111.98
Indirect taxes	43.02	64.61	72.83	1084.93
Import duties	30.58	33.76	11.78	557.75
Export duties	5.46	11.17	3.38	170.56
Excise taxes	6.98	19.68	57.70	356.62
Other sources	73.36	93.07	190.31	942.38
Total revenue	118.23	161.00	286.01	2139.29

[a]Source: (2, p. 252).

of 180 percent. Income taxes were a minor component and accounted for only 5-9 percent of annual revenue. Nevertheless, the net receipts from income taxes increased about 400% or 50% per annum from 1944 to 1950.

Since 1955, a tax on wealth has been included in direct taxes and revenues collected from direct taxes increased almost threefold. Table II.11 shows, however, that the average percentage share of direct taxes was still around 9 percent. The indirect tax has continued to be the mainstay of government revenue; it constituted more than half of total revenue. During 1955-1960, its average percentage share was approximately 73.5 percent with a 7 percent growth rate per annum.

Table II.11. Sources of Thailand revenue (million baht)[a]

Source	1955	1956	1957	1958	1959	1960
Direct tax						
Tax on income and wealth	312	354	380	405	428	594
Indirect taxes						
Import duties	1296	1413	1490	1614	1804	1940
Export duties	352	403	411	293	408	376
Excise taxes	2382	1466	1329	1802	1667	1988
Other sources	648	1014	971	991	965	1070
Total revenue	3990	4650	4681	5105	5272	5968

[a]Source: (40, p. 168).

Government expenditure

Government expenditures include payments for routine administration of the government, programs, and functions of the various ministries and other departments. Additional components are investment, economic and social services. Government activity is significant because it provides collective goods and services which are not supplied in the market. Also additional incomes will be generated in the process of providing public goods and services.

Government expenditures, as described above, are shown in Table II.12. Within this six-year period, the total expenditure increased approximately 38 percent averaging about 6.5 per cent per year. Investment, as a major component, constituted about 22 percent; its growth rate was 3 percent per annum.

Table II.12. Major components of government expenditure[a]

	1955	1956	1957	1958	1959	1960
Total expenditure	4968	5605	5745	6013	6498	6895
Defence	855	817	1567	1390	1439	1422
Economic services	100	109	240	340	473	459
Social services	355	436	1107	1497	1555	1791
Investment	1079	881	886	962	1272	1354

[a]Source: (40, p. 160).

CHAPTER III.   THAILAND UNDER THE NATIONAL DEVELOPMENT PLAN

The establishment of the National Development Plan received great impetus from the state visit of the International Bank Mission during the years 1957 to 1959. The primary purpose of the Mission was to help the government plan for national socio-economic development. Many recommendations were proposed for improving the efficiency of public administration such as budgeting, public works, and research and advisory services. Post-war development efforts were to be concentrated on education, transportation, communication, power and irrigation.

Along with this report, the International Bank Mission suggested the Thai government set up a National Development Board in place of the former National Economic Council with more emphasis on development. The National Development Board was recommended to be closely related to the Budget Bureau in the process of planning.

In 1960, the National Development Board was instructed to draw up the first National Development plan (1961-1966) to cope with the urgent need for economic and social development. The plan was to focus the attention of the people and of the government departments on development and the need to co-ordinate investment in all sectors of the economy.

The Organization of the National Development Plan

The plan is the responsibility of the National Economic Development Board (NEDB) that was created in 1959 as the central economic development agency with the Prime Minister serving as a chairman and 33 other government and non-government members appointed by the Council of Ministers. The

first National Development Plan was adopted in 1961. By 1963, the Plan was redrafted in order to cope with the problems of rapid population growth, lack of statistical information and shortage of skilled manpower. The scope of the second part of the plan (1964-1966) was broadened by covering the entire public sector, introducing manpower planning and more thorough economic, fiscal and monetary analyses. The planning staff had benefited a great deal from the experts assigned to the NEDB by the world Bank, A.I.D., International Labor Organization and Colombo Plan.[1]

The Objectives of the Plan

The principal targets and objectives of the first National Economic Development Plan were:

1. Raising the standard of living of the people through maximum utilization of economic resources in order to increase the national output and income.

2. The Gross National Product was expected to increase at an average of 6 percent per annum during the period 1964-1966. The Gross Domestic Product was expected to reach 77 billion baht in 1966.

3. With the population growing at 3 percent a year, per capita income would increase to over 2,400 baht in 1966.

4. Total gross private and public investment (fixed capital formation) was expected to account for about 15 percent of the gross domestic product during 1964-1966.

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[1] The purpose of Columbo Plan is to encourage economic development in South and South East Asia. The Columbo Plan countries are Australia, New Zealand, Canada, England, Japan, Ceylon and United States.

5. The aggregate output of agriculture was expected to increase 4 percent per annum over this period. Rice production in 1966 was expected to be 9.5 million tons.

6. Structural changes in the economy were expected to continue during the second phase of the plan with agriculture's share in the value of total gross domestic production dropping to 3.6 percent in 1966, while the share of industry, power, communication and transport continues to increase.

7. Economic growth in the private sector (especially investment) would be encouraged. Government financial resources were to be directed mainly toward the creation of the basic economic and social intrastructure in order to provide a healthy environment for the private sector. (27, p.3)

In addition to the Plan, rice development programs were proposed with the following features:

1. A proper water control system was to be established.

2. The method of breeding and seed multiplication was to be adopted. From various experiments, the most adaptable varieties with regard to yield, grain size and resistance to diseases and drought were sought for each locality. The goal was to set up stocks of these grains every year so that they eventually would be available for cultivation throughout the country.

3. Fertilizer was to be introduced to the farmers. Recently more accurate information on this subject has been made available for extension services.

4. Mechanization: recently a government controlled company was established and some joint ventures with foreign companies were encouraged for producing labor saving machinery suitable for small farms. This should give additional encouragement to farmers to change their old ways of tilling and harvesting the rice crop (29, p. 30).

During the Plan period, a Ministry of National Development was established early in 1963 as an operating agency with a planning office of its own with the purpose of co-ordinating departments which were in charge of carrying out the major economic development programs. It became responsible for the execution of a substantial proportion of total public investment under the Plan. The NEDB retained its sole responsibility as the central authority in economic development planning and other economic matters directly responsible to the Prime Ministers and the State Council of Ministers.

The Effect of Planning

Since Thailand is not a centrally planned economy, the establishment of a planning agency should lead to the best use of the numerous forecasts in various sectors of the economy. Moreover, it would help the essential parts of the public sector such as communication, irrigation, education and other public goods grow at fastest possible rate. The plan would also stimulate the growth and inflow of capital which were necessary to the growing economy.

Empirical evidence reveals that the expected rate of growth of the economy was hampered by the lack of trained manpower accompanied with a rapid population increase of approximately 3 per cent per annum.

Theoretically, with such a high rate of population growth, any progress
that might be expected could be lost unless the plan was carefully pre-
pared and executed.

Economic growth under the plan

Despite some unexpected obstacles, Thailand's First Six-year Plan
has been considerably successful in attaining its major objectives and
targets. The development during the plan period has brought about a high
rate of economic growth and significant structural changes in the national
economy.

In the first phase (1961-1963), only the growth of construction sector
considerably exceeded its growth in previous years. Construction output
in 1960 was 2,231 million baht, and 3,410 in 1963, an average annual growth
rate of 15.3 per cent. Before the establishment of the plan, construction
output amounted to 1,553 million baht in 1957 and only 1,957 in 1969, (22,
Table 4, p. 121). The average growth rate of construction output during
this period was 6 percent. In other sectors, the growth in 1960 and 1961
was not significantly higher than in the two previous years.

During the entire plan period (1961-1966), Gross Domestic Product has
substantially increased at an average annual growth rate of 7.2 percent
annum in real terms. Table III.1 shows that GDP in absolute terms increased
from 59.9 billion baht in 1961 to 92.2 billion baht in 1966, an average
annual growth rate of 7.4 percent per annum. The increase in GNP brought
about an improvement in per capita income and raised the average standard
of living. Per capita income at the end of 1966 was 2,787 baht, considerably

Table III.1. Some indicators of economic growth in the First Economic
Development Plan (million baht)[a]

| | First six-year plan | | Annual compound growth rate, 1961-1966 |
	1961	1966	
G_{NP}	59,876,000,000	92,230,800,000	72%
Per capita income	2,137	2,786	5.2%
Private consumption expenditure	43,861,400,000	61,630,200,000	7.3%
Gross fixed capital formation	9,220,200,000	20,331,500,000	16.7%

[a]Source: (26, p. 9).

higher than that of 1961 which was only 2,137 baht; its annual growth rate
was 5.2 percent. Private consumption and gross fixed capital formation
were also rising at a favorable rate suggesting that national income might
be further accelerated in the following years. The average increase in
per capita private consumption was 7.3 percent and the fixed capital forma-
tion was 16.7 percent.

Structural changes

The structure of Thai economy has changed considerably in the course
of development, particularly during the second phase. Table III.2 indi-
cates that the relative importance of agriculture declined as a result of
faster expansion of output in the non-agricultural sectors, especially
manufacturing, construction, and trade and services. The rapid growth of
secondary and tertiary sectors to a large extent reflects the emphasis of
the plan on the development of social infrastructure.

By the end of the first plan, the agricultural sector contributed only
33 percent of the Gross Domestic Product compared to 36.56 percent and 40.49
percent in the years 1957 and 1958 respectively. The industrial sector,
in contrast, considerably increased its share from 17.92 percent in 1957
to 21.00 percent in 1966. This change was partly due to the manufacturing
sector which contributed 13.5 percent to GDP in 1965, approximately 1.5
percent more than in 1963, the end of the first phase. Its average growth
rate was about 10 percent per annum during the whole plan period. Trans-
portation and communication, wholesale and retail trade also grew rela-
tively during this period; the rapid growth of tourism contributed to the
growth of these sectors.

Table III.2. Percentage distribution of gross domestic product by industrial origin at 1962 prices[a]

Industrial origin	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966
Agriculture	36.56	40.49	37.79	38.21	38.33	37.22	36.93	35.87	34.10	33.00
Industrial	17.92	16.11	17.29	17.15	17.22	17.62	18.78	19.48	20.35	21.00
Transportation and communication	5.53	5.20	6.09	6.58	6.48	6.81	6.37	6.73	7.05	7.00
Wholesale and retail trade	19.46	17.39	18.09	17.86	17.43	17.72	17.87	18.57	18.68	20.00
Services	20.56	20.80	20.75	20.19	20.54	20.63	20.04	19.34	19.82	19.00

[a]Source: (25, p. 25).

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The relative sectoral changes noted above are corroborated by data in Table III.3. The labor force absorbed by agriculture has been steadily declining since 1947, however, the rate of decrease during the plan was faster. From 1961 to 1966, the employed labor force engaged in agriculture has declined 3.2% while the percentage share of manufacturing in the total labor force increased 3% during this period. Construction and commerce also absorbed a greater portion of the labor force released by agriculture.

Table III.3. Distribution of the labor force by sector: 1961 and 1966[a]

Economic sector	1961		1966	
	Employment (in millions)	% of total	Employment (in millions)	% of total
Agriculture, forestry, hunting and fishing	10.34	83.1	11.62	79.9
Manufacturing	0.45	3.6	0.69	4.7
Construction	0.07	0.6	0.11	0.7
Commerce	0.74	5.9	1.03	7.1

[a]Source: (30, p. 52).

It should be noted that the trend toward diversification of the Thai economy is experienced not only among the major sectors of the economy but also within the agricultural sector itself. The share of other crops, besides rice, has amounted to about half of the total value of agricultural production during the plan period. The "other crops" include maize, sugar cane, corn, cassava, kenaf, cotton, tobacco and coconuts; their growth

rates were reported to be faster than that for rice. The decline in the percentage share of rice in the total value of agricultural production is expected to continue in the following years.

As seen in Table III.4, during the year 1938-1939, rice contributed about 62.6 per cent while the other crops constituted only 28.5 per cent of agricultural production. About twenty years later, their shares showed a significant difference relatively to the previous periods. The percentage share of the other crops rose to 46.2 percent in 1963, about the same percentage amount for rice.

Table III.4. Percentage shares of the value of major types of agricultural production in Thailand[a]

	1938-39	1948-50	1953-55	1958	1961	1962	1963
Rice	62.6	55.5	42.1	40.0	39.8	48.8	46.2
Rubber	8.9	8.8	11.4	8.8	9.1	8.0	7.6
Other crops	28.5	35.7	46.5	51.2	51.1	43.2	46.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[a]Source: (32, p. 329).

Sectoral Review

In this section, only the major sectors of agricultural and industry will be examined in detail. This study will be mostly concentrated on the period under the plan.

Agriculture

Since agriculture accounts for the largest proportion of the country's national income, and is the principal source of supplies for domestic commerce, industry and exports, it deserves special attention from the planners. The plan attempted to expand output to diversify crop production, improve production techniques, develop natural resources valuable to agriculture and increase productivity and income of the farm population.

The development programs in agriculture emphasized irrigation and flood control, agricultural research and extension on rice, rubber, fisheries, livestock, forestry and land development. The projected budget for this development was 4,621.5 million baht with almost half of it devoted to irrigation. The rest of the funds went to the improvement and expansion of agricultural research and expansion activities, and power and transportation.

The growth rate of total agricultural output has accelerated from less than 4 percent in the pre-Plan period to about 5 percent during the plan (25, p. 60). The expanded agricultural production partly was the result of the government's investments in irrigation, and other infrastructure facilities such as transportation and communication. By the end of the plan in 1966, the area under irrigation covered about 45%, 36%, 9% and 6.7% of the total cultivated land in the central, northern, southern and northeastern regions respectively (29, p. 33).

Table III.5 shows that the total irrigated area increased by 1.9 million rai, from 9.8 million rai in 1961 to 11.7 million rai in 1966 which is equal to about one fourth of the total cultivated land.

Table III.5. Increase of irrigated area during the first plan (1 acre = 2½ rai)[a]

	Irrigated area	
	1961 (rai)	1966 (rai)
State irrigation	8,615,000	9,666,100
People's irrigation	971,500	1,174,900
Water storage	210,000	360,000
Water conservation	-	500,000
Total	9,796,500	11,701,000

[a]Source: (30, p. 5)

The growth of agriculture output is shown in Table III.6. Rice constituted more than half of the total value-added over this period. Its contribution to the Gross Domestic Product increased 40 percent from 1960 to 1966. During the plan (1961-1966), rice increased at the rate of 3.6 per cent per annum. The second major product was rubber whose percentage share in the total value added was only 7 per cent. Its share started to decline as it had been increasing at a decreasing rate. From 1960 to 1961 its growth rate was 8 percent, comparatively higher than the rate of growth between 1965 to 1966 which was only 4 percent. Another important component of CDP was kenaf whose output in 1966 increased 120% from the beginning of the plan, an average growth rate of 20 percent per annum.

The real output of agriculture also rose substantially as shown in Table III.7. Rice was the major crop; its production increased from 8.1

Table III.6. Gross domestic product originating from crops at 1962 prices (million baht)[a]

	1960	1961	1962	1963	1964	1965	1966
Paddy (rice)	8,696.4	9,208.0	9,462.2	10,358.0	10,763.7	10,607.4	12,378.7
Rubber	1,218.4	1,327.2	1,393.2	1,414.1	1,501.8	1,516.8	1,555.5
Sugar-cane	577.7	412.8	326.9	490.4	525.8	362.7 362.7	284.2
Kenaf	462.3	508.4	565.5	767.0	1,149.5	934.8	1,094.5
Total value added	16,118.3	17,045.3	17,399.8	19,009.8	20,237.4	20,086.1	22,255.9

[a]Source: (25, p. 127).

Table III.7. Agricultural production under the plan

	1960	1963	1964	1966
Agriculture (thousand tons)				
Rice	6,770	9,279	10,029	9,218
Maife	554	858	935	1,200
Rubber	171	198	211	220
Kenaf/jute	188	219	310	550
Tapioca	1,222	2,111	1,557	1,650

[a]Source: (30, p. 16).

million tons in 1960-1963 to 9.6 million tons in 1964-1966. The average

growth rate of rice production was 18 percent during this period. The

other crops whose output has been increasing were maize, kenaf and tapioca.

The growth of maize was substantial, it rose from 550 thousand tons in 1960

to 1,200 thousand tons in 1966 which averaged 50 percent per annum. In

contrast, rubber, the second export earner, has declined in relative im-

portance.

Apart from the growth of agricultural production described earlier,

fisheries, forestry and livestock have also been successfully developed.

(Table III.8).

Fishing output expanded at a rapid rate through the improvement of

techniques and equipment. Three years after the establishment of the plan,

its annual rate of growth was 19.0 per cent, (25, p. 118). The promotion

of fish farming was accelerated through breeding and stocking programs,

and through development of fish hatcheries, ponds and production in rice

paddies. Deep sea fishing was also encouraged.

Forest resources used to provide many benefits for the economy, but

production of timber, both teak and non-teak has been declining steadily

in recent years. The forestry development programs under the plan concen-

trated on forest protection and research because of the widespread illegal

and destructive falling of valuable timber. As a result, about 2,000 areas

would be planted with teak seeding annually. By the end of 1963, forestry

experienced the average annual rate of growth of about 4.7 percent. The

deciduous forests, including teak and variety of timbers, are the major ex-

port earners in forestry.

Table III.8. Gross domestic product originating from fisheries and forestries at 1962 prices[a] (million baht)

	1958	1960	1961	1962	1963	1964	1965	1966
1. Fisheries								
Sea fish	441.6	452.8	600.7	736.1	922.6	1,571.6	1,776.3	2,014.6
Fresh water fish	318.2	474.3	434.9	427.1	622.6	594.8	633.3	655.4
Total value added	759.7	927.1	1,035.7	1,163.2	1,545.4	1,841.5	2,048.2	2,269.2
2. Forestries								
Teak	304.5	258.2	177.5	207.2	241.9	290.7	521.1	417.1
Yang	93.7	71.9	71.6	84.7	103.5	112.8	123.9	120.8
Other timbers	95.1	96.5	106.2	105.0	128.9	161.8	200.3	247.7
Charcoal and firewood	1,051.3	1,113.1	1,145.3	1,188.6	1,223.5	1,251.0	1,298.6	1,345.5
Total value added	1,859.4	1,827.1	1,799.5	1,934.0	2,091.7	2,150.3	2,454.9	2,457.2

[a]Source: (25, Tables 14 and 16; 26, Tables 14 and 16).

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Industry

Thailand's industrial structure was still under-developed in various aspects. About 40 percent of the labor force was engaged in the first stages of processing of the country's agricultural production. Another 40 percent were found in light industries namely, food, textiles, jewelry and tobacco products. By 1960, the industrial sector still absorbed only 4.2 percent of the total labor force.

The Thai government has attempted to get more industries established throughout the country since 1957; the law for protecting small and infant industries was issued a few years later. However, the government policies on promoting industrial development have met with little success. Most of the industrial activities are still concentrated in the capital city and its immediate vicinity. Few industries engaged in tin, mining and raw rubber, were located in the South; timber, tobacco and textiles were in the North, and jute, kinaf and silk in the Northeast.

In order to encourage industrial development, the plan's principal objective was to promote industrial expansion through private initiative. In addition, the Investment Board was set up to attract foreign investment and to create opportunities for small industries. The government has encouraged private investment by providing technical and extension services and financial assistance in the form of industrial loans which are sponsored by the Industrial Finance Corporation of Thailand (I.F.C.T.). By 1964, forth-three companies of several different industry groups received loans from the I.F.C.T. totalling 84.55 million baht, (Table III.8). Metal products industry, the second largest recipient of the loans, absorbed

19.1% of the whole amount. This assistance brought about substantial growth in the metal and machinery industry as can be seen from the growth of its share in the manufacturing sector.

Apart from the government's loan, industries also receive some special privileges under the promotion of Industrial Investment Act of 1962. This Act would provide benefits to both domestic and foreign investors in the form of tax exemptions and reduced export duties on capital goods and raw materials. Under the 1962 Act, industrial activities which may be promoted are classified into three groups according to their relative importance to the country. The industrial activities under the first group are those which are vital and necessary to the economy of the country such as iron smelting, steel making and agricultural machinery. The next group includes industrial activities that are less vital and necessary to the economy. The industries classified under the second group, for example, are passenger car and truck producing or assembling, agricultural machinery assembly, paper and electrical accessories. The third group represents the industrial activities other than the industries classified under the first two groups and includes seventy-eight industries.

Industries under the first category are granted automatic and complete exemption from import duties and business taxes on raw or necessary materials. The second group is granted a reduction of the duty and tax by 50 percent. The last group may be granted reductions of up to 33 1/3 percent, (Investment Board 1962; pp. 3-5).

The Act resulted in the growth of both foreign and domestic investment. The capital investment in all industries has increased almost three times

from the years preceding the plan. During the second phase of the plan, approximately 103 industries have been established with a capital investment of 4,754 million baht (26, p. 22).

Table III.9. Thailand, loans approved by the I.F.T.C. by industrial groups (1964)[a]

	Total	Textiles	Ceramics	Chemical- pharma- ceutical	Radio- elec- tric	Tobacco curing	Auto parts
				Industrial group			
No. of companies	43	4	3	3	3	4	2
Loans approved (million baht)	84.55	4.7	3.1	3.5	5.0	4.2	1.4

	Other metal products	Soap and vegetable oils	Rubber and plastic	Paper and products	Other
No. of companies	6	5	3	2	8
Loans approved	16.2	5.1	3.2	8.65	29.5

[a] Source: (22, p. 273, Table 11.5).

The growth of foreign investment is attributable to the Investment Board whose purpose is to attract foreign capital. In the beginning of the Plan, there were 103 applications of which 41 were approved. In contrast, 300 companies were granted promotional privileges during the period 1961 to 1965.

The accelerated growth rate of the manufacturing and industrial sectors were the major contributions of the first National Economic Development Plan coupled with the creation of the Investment Board and the enactment of the Industrial Promotion Act in 1962. Judging from the National Income Accounts, manufacturing output was growing considerably at an average annual rate of about 10 percent; this expansion was experienced mostly during the second phase of the plan. Between 1964 and 1966, the manufacturing sector was increasing at average annual rates of 13.9 percent.

It should be noted that value added in manufacturing is estimated from the total output of state enterprises, corporations, registered partnerships and other private establishments. The manufacturing sector includes more than 40 industries falling into 17 different groups as shown in Table (III.9); these data indicate that food manufacturing was the largest among the seventeen groups. It contributed about 30.2 percent of the total manufacturing output in the year prior to the adoption of the plan. Its share gradually declined throughout the entire plan period partly because of the expansion of the other sectors, especially metals and machinery. At the end of 1966, the percentage share of the food industry was only 23.8 per cent while the metal and machinery industry raised its share from 2.02 per cent in 1960 to 11.4 per cent in 1966. This growth was due to the encouragement of the government via loans from the Industrial Finance Corporation of Thailand.

Non-metallic industries were also major contributors to the overall growth rate of the manufacturing sector. Cement grew rapidly in order to keep pace with increasing construction demand. Though at present there

Table III.10. Gross domestic product originating from manufacturing (million baht)[a]

	1959	1960	1961	1962	1963	1964	1965	1966
1. Food	1,880.7	2,370.8	2,705.1	2,510.8	2,402.6	2,464.8	2,768.1	3,635.5
2. Beverages	642.6	689.3	794.9	880.8	927.3	1,007.3	1,318.6	1,541.4
3. Tobacco	879.0	865.9	996.8	1,008.5	1,031.3	1,232.6	1,403.7	1,566.4
4. Textiles	160.0	170.7	191.3	254.9	372.5	446.5	483.5	561.4
5. Footwear, other wearing apparel and made-up textile goods	265.7	279.0	287.3	296.8	306.9	317.2	327.9	338.9
6. Wood and cork products except furniture	289.2	293.8	348.4	472.0	558.9	655.9	692.1	759.9
7. Furniture and fixtures	87.5	86.4	100.1	100.5	104.9	112.4	144.9	164.6
8. Paper and paper products	24.0	21.4	18.8	24.4	44.9	59.3	59.8	69.9
9. Printing, publishing and allied industries	132.1	148.3	148.7	176.4	213.7	235.8	226.0	246.6
10. Leather and leather products except footwear	118.9	120.6	120.4	124.7	131.4	137.5	138.4	142.1
11. Rubber products	224.4	239.2	210.5	219.9	216.2	290.1	304.9	319.4
12. Chemicals and chemical products	421.4	459.0	467.1	521.6	621.9	705.9	765.1	901.5
13. Non-metallic mineral products except petroleum and coal	264.4	373.1	424.4	486.8	166.5	637.4	722.0	842.9
14. Basic metal industries	16.9	18.1	16.6	8.0	579.8	720.9	885.4	1,080.
15. Elec. machinery, apparatus, appliances, and supplies	27.1	32.5	40.4	29.1	8.7	13.0	12.3	11.
16. Transport equipment	41.7	253.3	245.9	277.1	26.3	32.5	32.5	36.
17. Metal, machinery and others	206.2	220.4	320.4	481.8	990.5	975.8	1,343.6	1,580.
18. Total value added	5,882.0	6,642.0	7,347.2	7,874.3	8,704.2	10,045.7	11,628.8	13,799.

[a] Source: (29, p. 18).

are only factories in Bangkok and its outskirts more cement factories

will have to be established to satisfy the urgent demand for both public

and private construction.

Cotton spinning and weaving industries have also expanded signifi-

cantly as did most of the other sectors shown in Table III.10. The tobacco

industry, however, showed a slight decrease in activity; its percentage

share dropped from 14.8% in 1960 to 12.1% in 1966.

The Future of Planning in Thailand

Twenty years after World War II, especially the period under the

First National Development Plan, Thailand has experienced a rapid rate of

economic growth, with real national income increasing over twice as fast

as population. It could be concluded that economic development was ap-

parent in the Thai economy. According to Adelman economic development is

defined as "the process by which an economy is transformed from one whose

rate of growth of per capita income is small or negative to one which

a significant self-sustained rate of increase of per capita income is a

permanent long-term feature. A society will be called underdeveloped if

economic development is possible, but incomplete" (1, p. 1).

To be sure, the national development plan is important in the country's

economic and social growth. In a so-called underdeveloped country like

Thailand, the government must play an active role in planning and initiating

economic development. This is simply because the government is a vital

institution for the introduction of purposive socio-cultural and technical

changes. Furthermore, it has the power to reallocate national resources

into appropriate sectors of the economy in order to increase the efficiency

of resource exploitation and technological innovation.

Adopting the First National Development plan (1961-1966), the government seemed to succeed in diversifying the economy by decreasing both the relative share of agricultural output in GDP and the total agricultural labor force. The other sectors of the economy, on the other hand, were growing during this period. Figure III.1 illustrates the time trends of GDP and its components. Despite its declining share, agriculture is still the major component of GDP and foreign trade. Three years after the plan began, about nine-tenths of the value of all exports were agricultural products. The continued dominance of agriculture stems from the limited non-agricultural resource base; agriculture will be able to experience continual growth in the near future provided that some special development programs are undertaken.

Besides these favorable results, the plan has also brought an improvement in the public sector itself. Planning introduces an element of coordination about the government departments and a new habit of thinking about the nation's overall economic problems. During the course of development under the plan, the government recognized that the shortage of well educated and skilled manpower along with the rapid population increase were the major bottle-necks to development.

The review of past trends and economic structural changes under the first plan will provide a basis for major policy proposals in bringing long term progress and stability of the nation. Consequently, the next national plan is expected to be more effective and successful than the first one. Among the future work to be done is the widening of plan coverage to put

GDP AT 1962 PRICES

6 YEARS PLAN PERIOD

FIRST PHASE

SECOND PHASE

PRE-PLAN
PERIOD

SHARE
OF
1966
GDP

100 —

90 —

80 —

70 —   21%

60 — SHARE
        OF   7%
        1957
50 — GDP   19%

40 — 18%
       6%   20%
30 — 19%

20 — 21%

                                                                     30%
10 — 36%

—

1957 58 59 60 61 62 63 64 65 66

LEGEND: IIIIIIIIIII INDUSTRY
          IIIIIIIIIII TRANSPORTATION
          IIIIIIIIIII SERVICES
          ▓▓▓▓▓▓   WHOLESALE & RETAIL TRADE
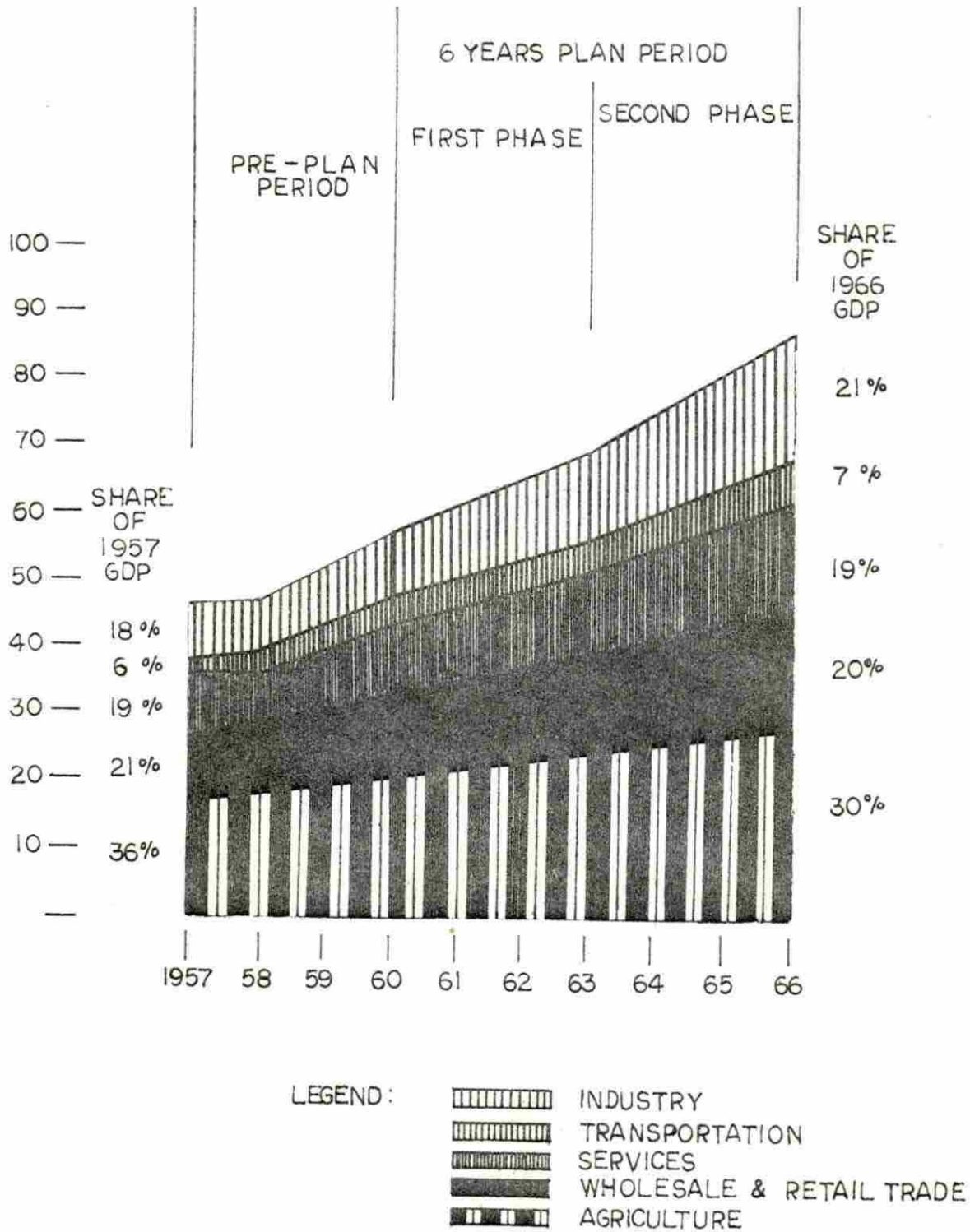   ▓II▓II▓II   AGRICULTURE

Figure 1. GDP shares by principal types of activity 1957-1966.

more emphasis on the development of the private sector, particularly in industry, trade and services. Another proposed policy is the establishment of functional relationships between projects and targets both for the individual sectors and for the economy as a whole. Lastly, there must be an integration of manpower planning with overall development planning.

Thailand is now in the course of her second Five-year National Development Plan covering the period from the end of the first plan to 1971. The second plan's objectives are widened and improved in many respects. Its frame-work was separated into two parts, namely, overall and sectoral development. The former represents the broad policies, objectives, growth targets, financial needs, manpower, regional development, and the role of the state enterprises; the latter constitutes the public development sector of the plan.

Four major areas newly introduced in the present plan are social, manpower, private sector and regional development. Social development was adopted in order to insure harmony among social and economic objectives. Since the shortage of labor was the most urgent problem, it required a thorough study by several institutions. Manpower planning was actually initiated in 1965, but the result is not yet apparent during the first plan period. Population growth, labor productivity, short and long term manpower demands and supplies by economic sectors and occupations were studied by the NEDB. A more important step was the assessment of education and human resources of the country by a joint Thai-USOM[1] human resources study task

[1]United States Operations Mission.

force. Development in education will have a direct impact on skilled manpower expansion; hence every step in the educational system has to be improved. The secondary education system was jointly studied by Ministry of Education and the NEDB in order to raise standards and expand capacity. Vocational education projects were promoted to strengthen and expand fourteen trade and industrial schools and nine agricultural schools. At the same time, the Institute for skill promotion, also initiated by the NEDB, was assigned to deal with workers who have already been in the labor force. Its purposes are to upgrade the proficiency of these workers, improve labor standards, and promote labor welfare. Apart from the government's development agencies, manpower development programs received assistance from some advanced countries like U.S.A., Australia and other countries in the United Nations. The Australian government helped in setting up the mechanic training centers of the Highway Department. The accelerated rural development program, involved in the training of heavy equipment operators, mechanics and construction workers, is assisted by A.I.D. Another agency is the Thailand Management Development and Productivity Agency which receives assistance from United Nations Development Assistance program.

As mentioned earlier, the second plan also placed more emphasis on the private sector, especially industrial investment. Private economic activities would be strongly promoted and stimulated by the provision of necessary economic infrastructure and healthy environment within which private enterprise can prosper.

Regional development programs were also adopted so that the development of the rural and remote areas would be accelerated. Since Thailand's

economy is similar to the so-called dual economy with the separation be-
tween the market and subsistence sectors, an improvement of the least de-
veloped sectors should decrease income inequality. Bangkok, the capital
city, is a sophisticated and moderately prosperous metropolis; a few miles
away is the world of rural under-development.

Planned economic structure and targets

The targets in the second plan are based on analysis of the capacity
of the economy for future growth. They are set at a higher level than in
the first plan. Table III.11 shows that GDP is expected to rise at 8.5%
per annum which implies a 5% increase in per capita income, allowing for a
3.3% population growth rate.

Table III.11. Gross domestic product targets for the second plan (at
1968 prices) (million baht)[a]

	Average annual growth rate 1961-1966	1971 targets GDP	1971 targets % distribution	Average annual growth 1967-1971
1. Agriculture	4.6%	34,031.7	26.0%	4.3%
2. Manufacturing	10.2%	17,799.8	13.6%	10.9%
3. Construction	12.3%	7,577.7	5.8%	11.4%
4. Transportation and communication	9.0%	11,217.4	8.6%	11.0%
5. Banking, Insurance and Real Estate	16.6%	7,527.7	5.7%	17.0%
6. Public Administra-tion and Defense	7.2%	7,741.2	5.9%	12.0%
7. Wholesale and retail trade	8.0%	24,154.8	18.6%	8.4%
8. Services	6.0%	11,960.4	9.1%	9.5%
9. GDP	7.3%	130,814.2	100.0%	8.5%

[a]Source: (30, p. 28).

The economy is to be more diversified by continuing to reduce the dependence of the Thai economy on agriculture. The percentage share of agriculture in GDP will decline from 33% in 1966 to 26% in 1971, with the average annual growth rate of 4.3% during the plan period. The principal growth sectors are manufacturing, construction, transportation, communication and banking, all increasing at more than 10% annually (Table IV.10). The proportion of the total labor force employed in agriculture will fall from 80% in 1966 to about 75% in 1971 (NEDB page 27).

The comprehensive scope of the plan has permitted the construction of targets for overall economic balance, including the interrelationships of investment, consumption and foreign trade. These targets for overall are shown in Table III.12. The private sector is expected to account for a higher proportion of GDP than the public sector, but its growth rate is to be less than the public sector's in 1971. Private consumption will constitute 62% of the national product, and increase at an annual rate of 8.2%. The resulting increase in per capita private consumption of nearly 5% per year reflects an appreciable rise in the standard of living of the populace in the next five years. Government consumption and investment will rise even more rapidly in spite of their smaller percentage share in GDP. In 1971, government consumption and investment are expected to contribute 12.8% and 7.2% respectively, growing at an annual rate of 13.3% and 10.8% respectively. In foreign trade, targets have been set on the basis of constant prices and the assumption of sustained international demand for Thai agricultural exports. Exports of goods and services will increase at an

Table III.12. Target overall economic balance during the second plan (at 1962 prices)[a]

	1971		1961-1966		1967-1971	
	Million baht	Percentage GDP	Million baht	Average annual growth rate	Million baht	Average annual growth rate
1. Gross domestic product	130,000	100.0%	433,900	7.0%	559,200	8.5%
2. Gov. sector	26,100	20.0%	66,500	10.2%	109,900	12.3%
Consumption	16,700	12.8%	41,300	7.9%	72,000	13.3%
Gross capital formation	9,400	7.2%	25,200	16.0%	37,900	10.8%
3. Private sector:	109,900	84.0%	373,600	7.0%	466,100	8.3%
Consumption	89,200	68.2%	306,100	6.0%	373,300	8.2%
Gross capital formation	20,700	15.8%	67,500	12.8%	92,800	8.7%
4. Foreign sector balance	-5,200	-4.0%	-6,200	-	-16,800	-

[a]Source: (30, p. 34).

annual rate of 7.2%. In contrast, the total value of imports of goods and services is estimated to grow by 9.3% per year primarily in response to the demand for imported capital goods.

CHAPTER IV. THE STRUCTURE OF THE THAI ECONOMY

The empirical studies in previous chapters show that economic structure of the Thai economy changed considerably after the adoption of the National Economic Development Plan in 1960. Consequently, the aim of this chapter is to provide basis for analyzing the structure of the economy via regression methods. This chapter is therefore concerned primarily with the estimation or measurement of the quantitative relationships among major macro-economic variables. The estimated model discussed in this chapter is of the aggregated, demand-oriented Keynesian type.

Generally, macro-economic models consists of sets of equations which express the main characteristics of a national economy. The model can be used as a tool in forecasting, trade cycle analysis, and in the formulation of public policy given that the model represents the real economic structure and there is sufficient stability in behavioral response.

Despite data deficiencies commonly found in developing countries, such as Thailand, increasingly attempts have been made to apply these methods to less developed national economies. The Indian model estimated by Narasimham (17) in 1957 is a notable example. More recently a method of Peru (6) and Argentina (20) have been completed; the latter excluded monetary or production function due to the lack of data. Morris (17) analyzed the Nigerian economy and encountered similar problems in extending sectors beyond those normally estimable from national accounting data. Most of these models are not used for predictive purposes.

An econometric macro-model for Thailand was first constructed by

Dr. Chinnawut Soonthornsima (23). His model contains 9 endogenous and 9 exogenous variables; there are 4 definitional equations so that 5 variables are explained by behavioral relations. These equations refer to: consumption, foreign trade, money supply, production and government revenue, all expressed in money terms. The equations are linear combinations of economic variables; there are no tests for serial independence of the residuals. Simple least squares is used to estimate the model and the sample size only covers the period from 1952-1960.

The model presented in this chapter is in part an extension of Dr. Soonthornsima's model, covering the period 1957-1967. Its structural equation includes prediction, money supply, public, private and foreign trade sectors. Ordinary least squares is also applied in estimating the equations. By means of Durbin-Watson tests the presence or absence of serial correlation in the errors in the dependent variables will be tested. Projections of major economic variables is presented in the last section.

Least Squares Estimate of Alternative Structural Equation Forms

Tables IV.1 through IV.9 show the results of alternatively specified equations for consumption, investment, imports, indirect taxes, production and money supply respectively. R^2 denotes the coefficient of multiple correlation. The calculated t-ratio of the estimate to its standard error is listed in parentheses below the coefficients of each parameter. Estimated constant terms are in all equations, but they are not shown in the tables. The last column shows the Durban-Watson statistic (d) at 5%

significance level. For one independent variable with this sample size,
if $d \leqslant 0.81$, reject the hypothesis of random disturbances in favor of that
of positive correlation. If $d \geqslant 1.07$, do not reject the hypothesis. If
$0.81 \leqslant d \leqslant 1.07$, the test is inconclusive. For equations with two and
three variables, the lower and upper limits of d are 0.70 and 1.35, 0.59
and 1.46 respectively.

List of variables

G_{NP}	Gross National Product
G_{Dp}	Gross Domestic Product
Y_D	Disposable Income
P_C	Private Consumption
$P_{C,D}$	Private Durable Consumption
$P_{C,ND}$	Private Non-Durable Consumption
G_R	Government Revenue
G_C	Government Consumption Expenditure
G_G	Total Government Investment Expenditure
T_{EX}	Export Duties
T_Y	Personal Income Taxes
T_D	Direct Taxes
T_I	Indirect Taxes
M_{GS}	Imports of Goods and Services
S_{DE}	Surplus on Current Account
E_M	Merchandise Exports
R_{MR}	Ratio of Import Duties to all Imports

E_{GS} Exports of Goods and Services

R_{EX} Ratio of Export Duties to all Exports

M_{CAP} Capital Goods Imports

M_{ND} Non-Durable Consumption Imports

T_T Income Terms of Trade

G_{PE} Gross Private Fixed Capital Formation

M_{PM} Imports of Processing Material

N_{YE} Net Factor Income

t Time

M_S Money Supply

ΔCR Change in Currency in Circulation

ΔRS Change in Foreign Reserve

D_d Demand Deposit Held by Public

B_b Government Borrowing from Central Bank

Public Sector

The government consumption

General government consumption expenditure represents those purchases of goods made by municipalities, general and local governments. The expenditures made by government enterprises are regarded as type of business outlay and are excluded.

The important components of government consumption expenditure (G_C) are salaries of officials and ordinary government operating expenses which are related to the revenue collected by the government through the budgetary process. This type of structural specification has been attempted by

Soonthornsima, but the estimated equation is unsatisfactory with a low R^2 and high standard error. The relationship between government consumption (G_C) and government revenue (G_R) is improved when the sample is extended to the present model's period. Table IV.1 shows that R^2 increased from 0.614 during 1952-1960 to 0.9870 during 1957-1967. The comparison of equation (G)C and (G_C^6) shows the relative instability of the coefficient on (G^R). The marginal shows government consumption is more sensitive to the change in government income during the period 1957-1967.

In the Nigerian economy, G_C proved to be statistically uncorrelated to G_R but its dependence on total taxes is highly significant (17, p. 96). The same is also true for the government consumption functions in the Peruvian and Argentinian models. As for the Thai economy, G_C is a nearly proportional function of total revenue, with a marginal propensity to consume equal to 0.7363. ($G_C(2)$ in Table IV.1) Equation $G_C(1)$ shows how G_C is affected by direct taxes (T_D) and indirect taxes (T_I) individually.

Historically, the Thai economy has depended heavily on export earnings; G_C is expected to be somewhat dependent on important foreign and domestic income sources. Equation $G_C(4)$ illustrated the alternative specifications, including gross domestic product and surplus on current account as independent variables. The coefficient on G_{DP} in equations $G_C(3)$ and $G_C(4)$ are quite comparable and significantly different from zero. Nevertheless, G_C is more affected by the changes in S_{DE} than in G_{DP}.

Table IV.1   Government consumption

Equation no.	Coefficient and t ratio of						R^2	Wrong sign	Durbin Watson
	T_D	T_I	$(D_T{+}I_T)$	G_{DP}	S_{DE}	G_R			
$G^C_{(1)}b_k$	3.123	0.305					0.9716	None	2.575
t_k	(1.844)	(1.012)							
$G^C_{(2)}b_k$			0.7363				0.9676	None	2.660
t_k			(16.39)						
$G^C_{(3)}b_k$				0.1024			0.9732	None	2.472
t_k				(18.09)					
$G^C_{(4)}b_k$				0.1193	0.3009		0.9827	None	2.031
t_k				(12.63)	(2.09)				
$G^{(C)}_{(5)}b_k$						0.5993	0.9876	None	2.838
t_k						(26.81)			
$G^{(C)}_{(6)}b_k$						0.4925	0.614	None	None
t_k									
a priori sign of coeff.	+	+	+	+	+	+			

Simple r 0.9838 0.9795 0.9837 0.9865 -0.7983 0.9833

Government revenue

As indicated in an earlier chapter, government revenue mainly comes from indirect taxes (Table II.11). In spite of the revision of the internal revenue code, the direct taxes, including the personal income and corporate income taxes, are still relatively small sources of revenue. At any rate, the government revenue will be studied aggregately and disaggregately.

In aggregative terms, government revenue (G_R) is best explained by gross domestic product as shown in the following equation.

$$G_R = -2025 + 0.1588 \ G_{DP} \quad R^2 = 0.9935 \quad D.W. = 2.39$$
$$(-6.7) \quad (37.19)$$

Both R^2 and t-ratio are highly significant, indicating a strong relationship between the two variables in spite of the negative intercept term. The rate of increasing of G_R with respect to G_{DP} is quite low, but consistent with Soonthornsima's model (23, p. 88). His equation, estimated from different periods, is as follows.

$$G_R = -1.2008 + 0.1529 \ G_{DP} \quad R^2 = 0.92$$

This implies that the marginal rate is rather constant and it is not incorrect to assume linear relationship between G_R and G_{DP}.

Separate equations are used to explain major components of government revenue which are direct, indirect, import duties, export duties and personal income tax collections.

Since direct taxes also include corporate income tax, they should be somewhat related to a measure of aggregate economic activity, that is G_{DP}. The following estimated equation is proved to be theoretically correct.

$$T_D = -647.3 + 0.02 \ G_{DP} \qquad R^2 = 0.9686 \qquad D.W. = 2.856$$
$$(-7.3) \qquad (16.67)$$

The significant negative intercept term is consistent with the progressive structure of taxation in Thailand. This result is comparable with the Nigerian model but its marginal and average rate is slightly greater (17, p. 102). Perhaps its tax system is a bit more effective than Thailand's.

The personal income taxes, as a main source of direct taxes collection, are likely to be a function of personal income instead of G_{DP}. The estimated equation is

$$T_Y = -383.3 + 0.015 \ Y_D \qquad R^2 = 0.9616 \qquad D.W. = 1.961$$
$$(-6.61) \qquad (5.01)$$

Since there is a negative constant, average tax rate is less than marginal rate which coincides with an existing progressive tax structure on personal incomes.

Indirect taxes are composed of imports, export duties and excise taxes, consequently the explanatory variables should be both foreign and domestic. The equations for indirect taxes contain no a priori wrong signs except for imports of non-durable goods (M_{ND}). Equation T_I explains indirect taxes quite well ($R^2 = 0.9832$) and most significant value of Durbin-Watson statistic. Hence, the variables that are used to explain indirect taxes are private consumption and imports of capital goods (Table IV.2). The coefficient on P_C is highly significant but rather smaller than that on M_{GAP}. This equation suggests that the government revenue will be increased

Table IV.2. Indirect tax

Equation no.	Coefficient and t ratio of				R^2	Wrong sign	Durbin-Watson
	P_C 4	M_{ND} 22	M_{GS} 15	M_{CAP} 21			
$I_t^{(1)}$ b_k t_k	0.210 (8.059)	-0.1098			0.9832	M_{ND}	2.374
$I_t^{(2)}$ b_k t_k			0.3735 (1.404)	0.2881 (0.4865)	0.9695	None	1.067
$I_t^{(5)}$ b_k t_k	0.1542 (3.734)			0.2927 (1.301)	0.9861	None	2.387
a priori sign of coefficient	+	+	+	+			
Simple r	0.9916	0.9204	0.9842	0.9808			

or decreased by the changes in the magnitude of P_C and M_{CAP}. Since the latter is a function of gross private capital formation, indirect taxes will be higher as a result of the growth of both private and consumption and investment.

Export (import) duties are explained by exports (imports) of goods and services and the ratio of export (import) duties to all exports (imports). Both equations contain significant coefficients on their two explanatory variables, but the multiple correlations are relatively low.

$$T_{EX} = -122.7 + 0.018 \ E_{GS} + 7347 \ R_{EX} \qquad R^2 = 0.6038$$
$$\phantom{T_{EX} =} (-.7741) \quad (2.56) \qquad (3.44) \qquad DW = 1.393$$

$$T_M = -2140 + 0.1792 \ M_{GS} + 11120 \ R_{MR} \qquad R^2 = 0.8894$$
$$ (-2.2) \quad (7.99) \qquad (2.47) \qquad DW = 2.270$$

The coefficients of E_{GS} and M_{GS} are the marginal tax rates on exports and imports respectively. It is seen that the marginal tax rate on exports is considerably low comparatively to the marginal tax rate on imports. This is consistent with the government policy to encourage exports by reducing export duties. The average and marginal rate in the first equation are approximately the same since the constant turn is not significantly different from zero (t = -0.7741).

Private Sector

Private consumption

Following the Keynesian model, private consumption is specified to be a function of disposable income. Time is used as an additional variable to estimate the extent of misspecification.

The estimated equations are:

1. $$P_C = 2548 + 0.767 \ Y_D \qquad R^2$$
    $$ (1.13) \quad (20.34) \qquad 0.9787$$

2. $$P_C = 22,210 + 0.2301 \ Y_D + 1988 \ t \qquad R^2$$
    $$ (2.69) \quad (1.04) \qquad (2.44) \qquad 0.9878$$

The private consumption functions indicate a nearly proportional relation between disposable income and private consumption expenditure. The marginal propensity to consume (mpc) is reduced sharply from 0.767 to

0.2301 as a result of the inclusion of time.

The value of mpc obtained in the first equation is comparatively higher than in some other developing countries like Peru and Argentina; the latter are 0.622 and 0.667 respectively (6, p. 155; 20, p. 69). This relatively high mpc suggests that government policies that might influence private consumption should have a substantial impact on the level of national income. The multiplier derived from the mpc, exclusive of government taxation, is $\frac{1}{1-0.767}$ or equal to 4.2 approximately.

The value of mpc is stable even when both P_C and Y_D are expressed at current prices. The latter equation is,

$$P_C = 3625 + 0.767 \; Y_D \qquad R^2 = 0.9864$$
$$\qquad\quad (25.38) \qquad\qquad DW = 2.649$$

Gross private capital formation

The annual increment of capital formation in Thailand can be measured from the changes in the values of four major components, namely

(1) imports of capital goods

(2) building and construction

(3) other domestic capital goods

(4) changes in inventories.

Only the imports of capital goods will be included in the equation because it is the only reliable source of data. In addition, the correlation coefficient between gross private capital formation and imports of capital goods is very high (0.9983).

$$G_{PF} = 46.23 + 3.73 \; M_{CAP} \qquad R^2 = \qquad S_E^2$$
$$\quad (0.1611) \; (52.01) \qquad 9967 \qquad 154,300$$

Table IV.3. Gross private fixed capital formation

| Equation no. | Coefficient and t ratio of | | R^2 | Wrong sign | Durbin-Watson |
	M_{CAP}	GNP			
$G_{PF}b_k$ t_k	3.732 (52.01)		0.9967	None	1.189
$G_{PF}bk$ t_k	2.645 (14.45)	0.1154 (6.034)	0.9994	None	1.858
a priori sign of coefficient	+	+			
Simple r	0.9983	0.9919			

This equation will be improved by adding one more important factor (G_{NP}) which was highly correlated with G_{PF} (.9919).

$$G_{PF} = -3914 + 2.65\ M_{CAP} + 0.1156\ G_{NP} \qquad R^2 \qquad S_E^2$$
$$\phantom{G_{PF} =}(-5.85)\ (14.45)\qquad (6.03)\qquad\quad 0.9944 \qquad 31,280$$

The t-ratios on M_{CAP} and G_{NP} in this equation are highly significant. The value of R^2 is higher with a lower S_E^2. This equation is preferable even though the correlation coefficient between M_{CAP} and G_{NP} is quite high (0.9843).

The relationship between gross private capital formation and imports of capital goods suggests that the main constraint to growth may be imposed by the export-import gap rather than the saving-investment gap.

Imports

Total imports demand consists of both consumer and capital goods which should be related to domestic income, import taxes, domestic investment and consumption. The inclusion of the income terms of trade (T_T) and the ratio of import taxes to all imports (R_{MR}) resulted in the negative sign on R_{MR} and relatively low multiple correlation coefficient (Table IV.4 M_{GS}). The combination of disposable income and ratio of import taxes to all imports improves the fit of the equation, but the negative sign still exists (M_{GS}). This negative sign is not theoretically incorrect since a decline in imports is expected as the ratio of import taxes to imports rises.

This equation is also estimated in the Nigerian model but there is a positive sign on R_{MR}, indicating that growth in imports has not been impeded by the steady increase in effective import tax rates (17, p. 105). The relatively high marginal propensity to import (mpi = 0.404) suggests that the impact of domestic policies on aggregate incomes is reduced by this leakage. As for the Thai economy, the marginal propensity to import is slightly lower (mpi = 0.305), implying that the income leakages are not so significant as in the Nigerian economy.

Equation M_{GS} and M_{GS} show the comparison between the effect of private consumption plus investment and the total consumption plus investment. These two equations are quite comparable as far as the coefficients are concerned. The fourth equation has a higher multiple correlation coefficient, but the D.W. test is inconclusive. Hence, the third equation with the inclusion of private consumption (P_C) and gross fixed capital formation (G_{PF}) is more statistically desirable. In both equations, investment

Table IV.4. Import of goods and services

| Equation no. | Coefficient and t-ratio of | | | | | | | r^2 | Wrong sign | Durbin-Watson |
	Y_D	R_{MR}	T_T	P_C	G_{PF}	G_C+P_C	G_I+G_{PF}			
$M_{GS}^{(1)}$	0.305 (13.9)	-21,680 (-1.6)						0.9621	None	1.839
$M_{GS}^{(2)}$		-68,410 (2.1)	520.9 (5.3)					0.7892	None	1.202
$M_{GS}^{(3)}$				0.044 (0.50)	0.529 (4.17)			0.9892	None	1.952
$M_{GS}^{(4)}$ (1957-67)						0.0542 (0.696)	0.5193 (3.62)	0.9927	None	1.043
$M_{GS}^{(5)}$ (1952-60)						0.1013 n.a.	0.3309 n.a.	0.95	None	n.a.
a priori sign of coefficient	+	-	+	+	+	+	+			
Simple r	0.975	-0.229	0.8215	0.9803	0.9944	0.9902	0.9961			

is shown to be more significant than consumption, judging by the sizeable coefficient and the t-ratio.

The last equation in Table IV.4 is the import demand function in Soonthornsima's model, having the same explanatory variables as in equation $M_{GS}^{(4)}$. The difference in the sample periods results in the instability of the coefficients on both investment and consumption, but investment still has more effect on imports than consumption.

The components of total imports which will be estimated are imports of non durable, processing material and capital goods. Their alternative specifications are shown in Tables IV.5 through IV.7, respectively.

Non durable consumption imports are hypothesized to be related to private consumption and disposable income, each estimated in separate equation. The first equation provides better fit with R^2= 0.8659 and the coefficient on P_C is highly significant with t = 7.6 (Table IV.5). Nevertheless, the coefficients on both variables are relatively comparable. The marginal propensity to import in $M_{ND}^{(1)}$ is only 0.022 or about 7/100 of the total marginal propensity to import obtained in equation   .

Table IV.5.   Import of non durable goods

Equation no.		Coefficient and t-ratio of Y_D	P_C	R^2	Wrong signs	Durbin-Watson
$M_{ND}^{(1)}$	b_k t_k	0.022 (5.88)	-	0.7934	None	2.773
$M_{ND}^{(2)}$	b_k t_k	-	0.032 (7.6)	0.8659	None	2.852
a. priori sign of coefficient		+	+			
Simple r		0.8907	0.9305			

Table IV.6. Import of processing material

Equation no.		Coefficient and t-ratio of			R^2	Wrong sign	Durbin-Watson
		G_{DP}	G_T	G_{PF}			
$M_{PM}^{(1)}$	b_k	0.051	~	~	0.9662	None	0.881
	t_k	(16.03)					
$M_{PM}^{(2)}$	bk	-	0.026	0.123	0.9727	None	1.261
	t_k	-	(2.99)	(5.1)			
a priori sign of coefficient		+	+	+			
Simple r		0.9829	0.9407	0.9861			

The two other components are expected to be functions of both government and private investment. The inclusion of G_{DP} in the imports of processing material equation is not satisfactory as indicated by the DW test (DW = 0.881). In spite of its high correlation coefficient (r = 0.9829). Government investment and gross private fixed capital formation provides a better fit with highly significant coefficent (Table IV.6, $M_{PM}^{(2)}$). The above remarks for the total imports equation are also true for this equation and the imports of capital goods equation. In both equations, private activity is more important than the government's. The marginal propensity to import of processing material is almost half of the marginal propensity to import of capital goods (Table IV.7, $M_{CAP}^{(2)}$). Among these imports, capital goods seem to be more highly sensitive to private investment. Taxes on imports play a minor role in all import functions. Hence, the government will influence the level of imports

Table IV.7. Import of capital goods

Equation no.		Coefficient and t-ratio of				R^2	Wrong sign	Durbin-Watson
		Y_D	R_{MR}	G_{PF}	G_I			
$M^{(1)}_{CAP}$ b_k t_k		0.1356 (11.5)	-9653 (-1.289)			0.9457	R_{MR}	1.482
$M^{(2)}_{CAP}$ b_k t_k				0.2487 (15.8)	0.06969 (1.23)	0.9972	None	1.236
a priori sign of coefficient		+	+	+	+			
Simple r		0.9776	-0.876	0.9983	0.9541			

primarily via its indirect influence on private investment activity.

Production function

The production function for the Thai economy is derived from Harrod Domar's growth model, but capital formation is used instead of capital stock because of the lack of data. The variables in this production function are capital formation and output in the previous year. Other productive factors such as land and labor are excluded because of similar data problems.

Table IV.8 shows two production functions based on 1952-1960 and 1957-1967 annual data respectively. The first equation is taken directly from Soonthornsima's model (23, p. 68). The second equation yields a better explanation with R^2 = 0.9861 and has a sufficiently high Durbin-Watson

value. The coefficients of $G_{I_{t-1}}$ and $G_{PF_{t-1}}$ are barely significant, but they are highly correlated with G_{DP} individually.

The difference in sample periods brings out substantial discrepancies between the coefficients in both equations. However, both indicate that the changes in government investment have the greatest impact on national production.

Table IV.8. Production function

Equation no.	Coefficient and t-ratio of			R^2	Wrong signs	Durbin-Watson
	$G_{DP_{t-1}}$	$G_{I_{t-1}}$	$G_{PF_{t-1}}$			
$G_{DP_t}(1)^a$ (1952-1960)	0.4160	4.0885	2.1199	0.872	None	-
$G_{DP_t}(2)$ (1957-1967)	0.5742 (3.03)	1.736 (1.185)	0.9549 (1.146)	0.9861	None	1.821
a priori sign of coefficient	+	+	+			
Simple r	0.9847	0.9268	0.9836			

[a] t-test and Durbin-Watson test are not available.

Money supply

Money supply is equal to currency in circulation in the last period plus the change of currency in circulation plus demand deposits held by the public ($M_t^S = C_{t-1}^r + \Delta C_t^r + D_t^d$). Two alternative forms of money supply

function are shown in Table IV.10. Change of currency in circulation and

demand deposits will be estimated separately. The first equation is taken

from Soonthornsima's model covering the period 1952-1960 (23, p. 91).

All variables in these equations are in money terms.

The multiple correlation coefficients in the C_R and D_D equations

in the second equation are significantly higher than for the first one.

All coefficients are highly significant except that of B_B (borrowing

from the central bank).

The money supply equation is,

$$M_S = C_{R_{t-1}} + 1176.6 + 0.07063 \, B_B + 0.3481 \, \Delta R_S + 0.08348 \, G_{DP_t}.$$

Table IV.9. Money supply

$$M_{S_t} = (C_{R_{t-1}} + C_{R_t}) + D_{D_t}$$

Equation no.	Coefficient and t-ratio of			R^2	Wrong sign	Durbin-Watson
	B_{B_t}	ΔR_{S_t}	G_{DP_t}			
$M_S^{(1)}$ C_{R_t}	.4199	0.4059		0.492	None	-
1952-1960 D_D			0.1065	0.935	None	-
$M_S^{(2)}$ C_{R_t} 1957-67	.07063	0.3481		0.6991	None	1.164
	(-0.8557)	(4.007)				
D_D			0.08348	0.9735	None	1.451
			(18.17)			
a priori sign of coefficient	+	+	+			

The Final Structural Equations

For the sake of simplicity, the best fitted equations will be summarized as follows.

The government sector

$$G_C = -1332 + 0.12\ G_{DP} + 0.35\ S_{DE}$$
$$(-3.2)\quad (12.6)\qquad (2.09)$$
$$R^2 = 0.9827$$
$$DW = 2.031$$

$$G_I = -25.26 + 0.2544\ G_{PF} - 0.0555\ S_{DE}$$
$$(-0.0538)\quad (4.966)\qquad (-0.224)$$
$$R^2 = 0.900$$
$$DW = 3.55$$

$$Y_G = -2025 + 0.1588\ G_{DP}$$
$$(-6.7)\qquad (37.19)$$
$$R^2 = 0.9935$$
$$DW = 2.390$$

$$I_T = -2425 + 0.1542\ P_C + 0.293\ M_{CAP}$$
$$(-2.05)\qquad (3.73)\qquad (1.3)$$
$$R^2 = 0.9861$$
$$DW = 2.387$$

$$D_T = -647.3 + 0.02\ G_{DP}$$
$$(-7.3)\qquad (16.67)$$
$$R^2 = 0.9686$$
$$DW = 2.856$$

$$T_Y = -383.3 + 0.015\ Y_D$$
$$(06.61)\qquad (15.01)$$
$$R^2 = 0.9616$$
$$DW = 1.961$$

$$T_M = -2140 + 0.1792\ M_{GS} + 11120\ R_{MR}$$
$$(-2.2)\qquad (7.99)\qquad (2.47)$$
$$R^2 = 0.8894$$
$$DW = 2.270$$

$$T_{EX} = -122.7 + 0.018\ E_{GS} + 7347\ R_{EX}$$
$$(-.7741)\qquad (2.56)\qquad (3.44)$$
$$R^2 = 0.6038$$
$$DW = 1.393$$

The private sector

$$P_C = 2548 + 0.767\ Y_D$$
$$(1.13)\qquad (20.34)$$
$$R^2 = 0.9787$$
$$DW = 2.686$$

$$P_{C,ND} = -11,730 + 0.7328\ Y_D$$
$$(-1.107)\qquad (4.147)$$
$$R^2 = 0.6565$$
$$DW = 2.629$$

$$G_{PF} = -3914 + 2.65\ M_{CAP} + 0.1154\ G_{NP}$$
$$(-5.8)\qquad (14.45)\qquad (6.03)$$
$$R^2 = 0.9994$$
$$DW = 1.858$$

The foreign trade sector

$$M_{GS} = 3969 + 0.044 \underset{(0.5)}{P_C} + 0.53 \underset{(4.17)}{G_{PF}} \qquad \begin{array}{l} R^2 = 0.9892 \\ DW = 1.952 \end{array}$$
$$\phantom{M_{GS} =} \underset{(1.6)}{}$$

$$M_{CAP} = 2.51 + 0.25 \underset{(5.8)}{G_{PF}} + 0.07 \underset{(1.23)}{G_I} \qquad \begin{array}{l} R^2 = 0.9972 \\ DW = 1.236 \end{array}$$
$$\phantom{M_{CAP} =} \underset{(0.03)}{}$$

$$M_{ND} = 1840 + 0.032 P_C \qquad \begin{array}{l} R^2 = 0.8659 \\ DW = 2.852 \end{array}$$
$$\phantom{M_{ND} =} \underset{(9.6)}{} \underset{(7.6)}{}$$

$$M_{PM} = 298.1 + 0.026 G_I + 0.123 G_{PF} \qquad \begin{array}{l} R^2 = 0.9727 \\ DW = 1.261 \end{array}$$
$$\phantom{M_{PM} =} \underset{(2.58)}{} \underset{(2.99)}{} \underset{(5.1)}{}$$

Production function

$$G_{DP_t} = 16840 + 0.5742 \, G_{DP_{t-1}} + 1.73 G_{I_{t-1}} + 0.9549 G_{PF_{t-1}} \qquad \begin{array}{l} R^2 = 0.961 \\ DW = 1.821 \end{array}$$
$$\phantom{G_{DP_t} =} \underset{(2.73)}{} \underset{(3.03)}{} \underset{(1.18)}{} \underset{(1.146)}{}$$

Money supply function

$$M_S = C^r_{t-1} + 1176.6 + 0.07063 \, B_B + 0.3481 \, \Delta R_S + 0.08348 \, G_{DP}$$

Projection of the endogenous variables

The set of structural equations discussed earlier not only tells us a great deal about the performance of the economy, but also enables us to predict what might happen in the near future. Statistically, the predictions derived from any econometric model may not be reliable if there exists serial correlation in the residuals. Hence, every structural equation in this model is selected when Durbin-Watson statistic indicates no serial correlations in the residuals.

To evaluate the model predictive ability one should work with the reduced form. It is possible to work with either ex ante or ex post predictions. Ex ante predictions are real predictions made in advance for which it is necessary to guess the unknown values that the predetermined variables will have. Possible errors in this prediction may be due to random disturbances, or to a faulty model or faulty guesses about the predetermined variables.

The reduced form is obtained by rearranging the structural equations in such a way that each endogenous variable is a function exogenous variable. To illustrate, the system is now in the form Ax = BY, where X is a vector of endogenous variables with coefficient matrix A and Y is a vector of exogenous variables and lagged endogenous variables with coefficient matrix B.

$$AX = BY$$

$$X = \begin{matrix} G_C \\ G_{DP} \\ G_I \\ G_{PF} \\ G_{NP} \\ Y_D \\ P_C \\ P_{C,ND} \\ M_{CAP} \\ M_{GS} \\ M_{PM} \\ M_{ND} \\ M_S \\ T_Y \\ I_T \\ D_T \\ \triangle C_R \\ \triangle R_S \\ D_D \end{matrix} \qquad Y = \begin{matrix} 1 \\ S_{DE} \\ N_{YF_{t-1}} \\ C_R \\ B_B \\ E_{GS} \\ F \\ G_{DP_{t-1}} \\ G^I_{t-1} \\ G_{PF_{t-1}} \\ D \end{matrix}$$

The solution of matrix X, given that A^{-1} exists, is A^{-1} BY which is illustrated in Table IV.10. From this matrix the value of some major macro economic variables, i.e., G_{DP}, G_I, G_C, P_C, G_{PP} , will be predicted. For the sake of simplicity, these endogenous variables will be written as functions of proper exogenous variables as follows:

$$G_{DP} = 16840 + 0.5742\ G_{DP_{t-1}} + 1.73\ G_{I_{t-1}} + 0.9549\ G_{PF_{t-1}}$$

$$G_C = 677.011 + 0.3009\ S_{DE} + 0.0685\ G_{I_{t-1}} + 0.2064\ G_{I_{t-1}} + 0.1139\ G_{PF_{t-1}}$$

$$G_I = -1747.4951 - 0.0645\ S_{DE} + 0.1013\ N_{YF} + 0.0582\ G_{DP_{t-1}}$$
$$+ 0.1753\ G_{I_{t-1}} + 0.0967\ G_{t-1}$$

$$P_C = 14395.125 + 0.0027\ S_{DE} + 0.6645\ N_{YF} + 0.3733\ G_{DP_{t-1}}$$
$$+ 1.1247\ G_{I_{t-1}} + 0.6208\ G_{DF_{t-1}} + -0.6859\ D$$

$$G_{PF} = -6769.7852 - 0.0355\ S_{DE} + 0.3982\ N_{YF} + 0.2286\ G_{DP_{t-1}}$$
$$+ 0.6889\ G_{I_{t-1}} + 0.3802\ G_{PF_{t-1}}$$

The values of the predetermined values, i.e., S_{DE}, D and N_{YF}, for the year in question before the year began are estimated by fitting them as functions of times. Then, these values are substituted into the above structural equation, and solve for the projected values of the jointly dependent variables. The results of the ex ante reduced form projections of these 4 variables are summarized in Table IV.11, accompanied with the targets established in the National Economic Development Plan discussed in the last chapter.

Table IV.10. The product of A^{-1} and B matrices

	1	S_{DE}	N_{YF}	C_r^{t-1}	B_b	E_{GS}	F	G_{DP}^{t-1}	G_I^{t-1}	G_{PF}^{t-1}	D
G_C	677.0110	0.3009	0.0	0.0	0.0	0.0	0.0	0.0685	0.2064	0.1139	0.0
G_{DP}	16840.0000	0.0	0.0	0.0	0.0	0.0	0.0	0.5742	1.7300	0.9549	0.0
G_I	-1747.4951	-0.0645	0.1013	0.0	0.0	0.0	0.0	0.0582	0.1753	0.0967	0.0
G_{PF}	-6769.7852	-0.0355	0.3982	0.0	0.0	0.0	0.0	0.2286	0.6889	0.3802	0.0
G_{NP}	16840.0000	0.0	1.0000	0.0	0.0	0.0	0.0	0.5742	1.7300	0.9549	0.0
Y_g	649.1909	0.0	0.0	0.0	0.0	0.0	0.0	0.0912	0.2747	0.1516	0.0
Y_d	15446.0625	0.0035	0.8663	0.0	0.0	0.0	0.0	0.4867	1.4664	0.8094	-0.8942
P_C	14395.1250	0.0027	0.6645	0.0	0.0	0.0	0.0	0.3733	1.1247	0.6208	-0.6859
$P_{C,N}$	-411.1211	0.0026	0.6348	0.0	0.0	0.0	0.0	0.3567	1.0745	0.5931	-0.6553
M_{CAP}	-1812.2617	-0.0134	0.1066	0.0	0.0	0.0	0.0	0.0612	0.1845	0.1018	0.0
M_{GS}	1014.3999	-0.0187	0.2403	0.0	0.0	0.0	0.0	0.1376	0.4146	0.2288	-0.0302
M_{PM}	-568.1602	0.0	0.0	0.0	0.0	0.0	0.0	0.0293	0.0882	0.0487	0.0
M_{ND}	2300.6438	0.0001	0.0213	0.0	0.0	0.0	0.0	0.0119	0.0360	0.0199	-0.0219
M_S	2229.2896	0.0065	-0.0836	1.0	0.0706	0.3481	0.3481	0.0000	0.0001	0.0001	0.0105
T_y	-159.3316	0.0001	0.0126	0.0	0.0	0.0	0.0	0.0071	0.0213	0.0117	-0.0130
I_t	1689.2776	-0.0035	0.1337	0.0	0.0	0.0	0.0	0.0755	0.2274	0.1255	-0.1058
D_t	-295.3440	0.0	0.0	0.0	0.0	0.0	0.0	0.0120	0.0362	0.0200	0.0
C_r	13.8889	0.0065	-0.0836	0.0	0.0706	0.3481	0.3481	-0.0479	-0.1443	-0.0797	0.0105
R_s	-1014.3999	0.0187	-0.2403	0.0	0.0	1.0000	1.0000	-0.1376	-0.4146	-0.2288	0.0302
D_d	2215.4019	0.0	0.0	0.0	0.0	0.0	0.0	0.0479	0.1444	0.0797	0.0

Table IV.11.   The prediction from the model and the targets from the
existing plan (constant prices)

	The prediction from the model				The plan's targets
	1968	1969	1970	1971	
GDP	108,421.1250	121,089.9375	135,456.4375	151,740.7500	130,000.0
G_C	10,440.6769	11,870.3477	13,502.5352	15,356.5117	16,700.0
G_I	7,790.2813	9,094.2344	10,570.1875	12,240.4609	9,400.0
P_C	69,335.4375	77,159.5625	86,087.3125	96,261.9375	89,200.0
G_{PF}	29,864.3477	34,928.9492	40,669.5273	47,173.6992	20,700.0

Judging from the predictions, the established goals are quite re-
alistic. They are, in fact, rather modest relative to the model's pro-
jections. From Table IV.11, the expected value of every variable, except
government consumption, is greater than the plan's target. In addition,
the rate of growth of the gross domestic product is expected to be 11 per-
cent, about 2 percent higher than that obtained from the Plan (Table III.
12). On the contrary, the role of the government sector is projected to
be decreased; it constitutes about 18.7 percent of G_{DP} which is lower
than the planning target about 2 percent. The private sector, therefore,
is the major component, producing approximately 90 percent of the national
product. The only unpleasant result suggested by the model is the large
deficit in the foreign trade sector; the amount is 19,291.8592 million
Baht comparatively higher than the existing target.

At any rate, the discrepencies between the two are not surprising since planning will be different from forecasting in that it is based on the assumption that the future course of production and other economic variables can be influenced and it aims at indicating the most desirable course. However, the elements of a hypothetical ideal model will be useful in analyzing the process of planning and the coordinating task of the macroeconomists in it (35, p. 6).

CHAPTER V. CONCLUSION

Thailand's experience with national planning can, in many respects, be called successful. The rate of growth during the planning period has been remarkably high -- more than enough to keep up with a population growth rate of 3 per cent, (see Chapter III). Nevertheless, it is still doubtful whether the Plan has led to the more rapid growth of the economy because we do not know what economic performance would have been in the absence of the planning. In any case, planning has succeeded in focusing attention on economic development as the principal objective of the government and of the nation. However, the planning process in Thailand has not yet gone far enough to achieve the perfect coordination of projects and plans for the sectors and regions.

Development planning in general has economic and social goals that are often in conflict; a greater achievement with respect to one goal often means a lesser achievement with respect to another. As a consequence, the complexity of development processes and the limitations of data necessitate the formulation of models. Judged by the absence of the auto-correlation in the residuals indicated by the Durbin-Watson test, the model developed in this study provides an adequate representation of the basic structure of the Thai economy. Hence, it can be used for forecasting purposes and policy formulation. According to Tinbergen a development planning model consists of the integration of a model of economic growth and a policy model. In his terminology, the economic variables are classified as exogenous (including targets and irrelevants)

and endogenous (including instruments and data). A quantitative economic policy model consists of a welfare function that is a function of target and instrument variables, an econometric model which sets up a structural relationship between target and instrument variables, and a set of boundary conditions or constraints on the targets, the irrelevant and instrument variables. The unknowns of this problem are the instruments and irrelevant variables; the targets and the data are given. At any rate, finding a solution to the model does not guarantee that the plan targets are practically or operational feasible and socially acceptable.

Statistically, this model can be improved by relaxing the assumption of linearity because it seems implausible that an economy can be described solely by linear relations. The model needs much better data than are currently available. A variety of further structural specifications will also improve the usefulness of the model as a planning tool.

The analysis of the growth process might be more fruitful if a two-sector model, including agricultural and industrial, is attempted. Obviously, a significant aspect of the economic growth is not only the growth itself but also the structural changes which take place over time. Accordingly, the rate of shift from agricultural to industrial production should indicate the major trends of economic development. In the process of growth, however, output of agriculture must increase in absolute terms although the share of the agricultural sector in aggregate output is declining; otherwise, industrialization and economic growth would be hampered. Consequently, it is necessary to make certain that the agricultural sector is developing along with manufacturing in order to achieve

balanced economic growth. The economy in Thailand is now expansive mainly because of the Vietnam war; therefore, the rate of growth is being influenced by extraordinary factors. The new economic plan must account for the eventually reduced levels of aggregate demand occasioned by the return to peaceful conditions in countries contiguous to Thailand.

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APPENDIX

The estimated model in Chapter IV is based on the following data, covering the period from 1957-1967. Every variable is in millions of Baht and constant prices.

Year	G_{NP}	G_{DP}	Y_d	P_C	P_{CD}	P_{CND}
1957	48,195.7	48,446.6	42,563.31	35,902.8	1,302.9	26,103.4
1958	48,571.7	48,723.2	43,132.01	35,132.5	1,188.54	25,553.7
1959	53,627.8	53,757.7	47,818.99	38,957.7	1,201.23	27,750.7
1960	59,352.4	59,442.9	52,249.60	41,827.7	1,218.46	29,463.1
1961	61,875.1	61,961.8	53,812.55	44,917.1	1,258.91	31,809.3
1962	65,208.6	65,307.0	57,128.8	47,040.7	1,461.1	33,674.0
1963	71,633.6	71,677.1	65,041.16	49,751.4	1,820.21	35,220.4
1964	79,951.0	76,041.7	63,271.53	52,093.8	1,984.03	35,981.6
1965	82,661.9	82,692.8	70,462.02	55,386.6	2,269.62	37,738.9
1966	91,802.2	91,861.0	74,827.50	59,258.0	2,661.19	40,443.6
1967	96,269.0	96,075.7	76,906.04	63,558.5	3,044.29	44,456.1

Year	G_C	G_G	G_I	T_{EX}	T_M	T_Y
1957	4,344.4	6,182.7	1,838.3	293.5	1,590.1	214.83
1958	4,188.3	6,163.6	1,975.3	302.7	1,671.3	238.92
1959	4,316.5	6,868.1	2,551.6	435.6	1,191.1	291.12
1960	5,673.5	7,143.9	1,470.4	520.5	2,183.3	433.54
1961	5,470.6	8,045.9	2,575.3	337.8	1,840.2	429.7
1962	5,832.9	8,482.0	2,649.1	358.5	2,503.9	433.8
1963	5,968.3	10,046.8	4,078.5	349.4	2,810.1	492.46

Year	G_C	G_G	G_I	T_{EX}	T_M	T_Y
1964	6,981.9	11,215.5	4,233.6	367.8	2,940.3	533.37
1965	7,721.6	13,556.2	5,834.6	405.3	2,960.6	674.24
1966	8,3633	13,204.4	4,841.1	365.5	2.795.83	675.30
1967	9,304.0	16,350.1	7,046.1	300.3	3,488.56	754.03

	D_T	I_T	M_{GS}	S_{DE}	E_M	R_{MR}
1957	371.29	3,553.3	9,556.3	-1,064.3	8,121.17	0.174
1958	363.81	3,731.1	8,700.5	-1,849.1	6,624.0	0.196
1959	405.07	4,286.4	9,928.4	-1,522.2	8,031.4	0.199
1960	601.43	4,951.2	10,564.4	-1,073.8	9,099.7	0.213
1961	704.76	5,280.6	11,036.9	-299.7	10,253.9	0.173
1962	728.0	5,337.9	11,858.4	-197.5	9,434.5	0.218
1963	823.2	6,615.5	13,715.8	-3,250.2	9,955.0	0.211
1964	920.89	6,873.9	15,281.5	-1,989.4	12,530.9	0.200
1965	1,211.34	7,730.5	17,261.7	-2,567.1	13,503.4	0.179
1966	1,164.82	8,232.5	18,201.8	-4,177.3	13,685.2	0.159
1967	1,369.73	9,520.6	19,900.2	-3,785.7	13,562.38	0.195

	E_{GS}	R_{EX}	M_{CG}	M_{EG}	T_T	G_{PF}
1957	9,221.6	0.036	2,040.1	2,988.6	94.37	6,927.7
1958	7,285.3	0.045	1,909.2	2,811.7	100.0	6,784.4
1959	8,647.4	0.054	1,905.5	3,151.1	107.22	7,611.8
1960	9,638.1	0.056	2,238.2	3,004.2	108.65	8,883.8
1961	11,281.1	0.033	2,633.4	3,351.3	104.3	9,918.4
1962	10,655.4	0.037	3,041.5	3,157.0	109.18	11,639.1

Year	E_{GS}	R_{EX}	M_{CG}	M_{EG}	T_T	G_{PF}
1963	11,385.7	0.034	4,013.1	3,160.8	108.59	15,077.5
1964	14,097.7	0.029	4,525.2	3,458.0	109.30	16,763.9
1965	16,087.2	0.029	5,052.5	3,594.6	110.05	18,783.5
1966	17,856.2	0.027	5,859.2	3,553.3	115.87	22,254.0
1967	18,830.3	0.023	6,838.3	3,825.8	116.8	25,369.0

	M_{PM}	N_{YF}	D_T+I_T	G_R	C_R	D_d
1957	1,207.1	-270.0	3,924.59	5,183.4	148.9	2,623.6
1958	1,207.5	-954.9	4,094.91	3,584.3	-69.0	2,947.9
1959	1,317.6	-129.9	4,691.47	6,037.8	280.6	3,291.5
1960	1,580.9	-90.5	5,552.63	6,778.0	260.7	4,039.5
1961	1,670.0	-86.7	5,985.36	7,450.0	462.8	4,563.7
1962	1,661.0	-98.4	6,065.90	8,007.0	61.7	4,519.9
1963	1,932.2	-43.5	7,438.70	8,817.0	130.1	5,177.7
1964	2,412.4	-90.7	7,794.79	9,955.0	586.7	5,628.8
1965	2,940.9	-30.9	8,941.84	11,345.0	890.5	6,151.4
1966	3,240.4	-58.8	9,396.32	12,912.0	1,357.7	6,855.9
1967	3,623.4	+193.3	10,890.33	14,869.0	500.0	7,963.2

	B_b	R_S		B_b	R_S
1957	2,289.0	34.1	1962	4,705.3	1,246.0
1958	5,213.0	-383.8	1963	3,469.2	912.2
1959	5,018.0	-37.2	1964	3,627.6	781.6
1960	4,978.0	897.6	1965	3,689.9	1,484.8
1961	4,699.7	1,570.6	1966	3,517.2	3,045.8
			1967	2,735.8	1,013.6