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THE DYNAMICS OF THE THAI ECONOMY --
AN APPLICATION OF THE OPEN, DUALISTIC
ECONOMY NATIONAL INCOME ACCOUNTING FRAMEWORK

by

Forrest E. Cookson

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P R E F A C E

This is the first part of a preliminary report on a study of the Thai economy. The dual economy accounting system (System II, Table XIII) discussed here has been developed by Douglas S. Paauw, Director of the Center for Development Planning, with the assistance of John C. H. Fei, Consultant.^{1/} Parallel studies of the Philippines and Thailand are being conducted within this common framework. Eventually, comparative studies will be made of the two economies.

FORREST E. COOKSON

^{1/} D. S. Paauw, A National Income Accounting Framework for Open Dualistic Economies, Field Development Planning Report #1, Center for Development Planning, National Planning Association, Washington, D. C., June 1966.

I. INTRODUCTION

This paper is an introductory study of the Thai economy from a viewpoint which emphasizes the characteristics of duality and openness. Information about the Thai economy is organized within a national income accounts framework in a manner designed to identify some of the important structural changes underlying the economic development of Thailand. A detailed discussion of the accounting framework is presented in Part II. This framework is developed at two levels; an aggregative level characterized by a single production sector and a level which disaggregates production into agriculture, industry, and government. Part III is a discussion of the aggregative level data. Part IV discusses the disaggregative level data.

The theory of economic growth is remarkably irrelevant to most problems connected with the analysis of development policies.^{1/} The single extant growth theory which sheds light on the inner dynamics of less-developed countries rests upon the dual economy hypothesis; there exist side by side a traditional sector and a modern sector and the former does not respond rapidly to market forces. Consequently, development is characterized by a gradual approach to an economically rational allocation of resources between the two sectors and the dynamics of development are to

^{1/} This can be seen by examining the most comprehensive modern survey, Hahn and Mathews, "A Survey of the Theory of Economic Growth," reprinted in Surveys of Economic Theory, Vol. II, Growth and Development, St. Martin's Press, New York (1965).

be found in the process of adjustment.^{1/} This contrasts sharply with the underlying assumption of most growth theory; i.e., that the growing economy is adequately described by a series of equilibrium states.^{2/} The usual assumption is that the above disequilibrium is associated with surplus labor in agriculture.^{3/} This is the most common, but not the only possible, manifestation of structural (i.e. persistent) disequilibrium.

The great difficulty with the dual economy theory is that it does not include the role of international trade. The neat picture of the development process that emerges from the analysis of the dual economy depends rather strongly on the assumption that the economy is closed or at best that the role of foreign trade in development is minor. For a large group of countries, of which Thailand is one, this seems to be a very bad assumption. The problem is not that the economic duality is an unsatisfactory approach, but that it must be restudied from a viewpoint which includes the international sector. This paper is meant to be a first step in this direction. The economy of Thailand is studied to provide an understanding of how the international sector interacts with the basic duality of the economy.

1/ John C. H. Fei and Gustav Ranis, Development of the Labor Surplus Economy, Irwin Press, Homewood, Illinois (1964) chapter 2, section 2 and chapter 6, section 2.

2/ This assumption is evident from the usual growth model which takes the aggregate production function and the consumption function (or saving function) as given and assumes that the demand for investment will be sufficient or can be made sufficient. This contrasts with the Keynesian aggregate demand approach which takes the demand for investment and the consumption function, while omitting the aggregate production function.

3/ Ranis and Fei, op. cit., p. 10, 13 and footnotes on page 13-14.

The duality of the Thai economy is one of its major characteristics. Although an overwhelming percentage of the population live outside urban areas, they contribute less than 50 percent of the national product. Roughly speaking, 80 percent of the population produces 40 percent of the national product; which implies that the ratio of the average labor productivity in agriculture to that in the rest of the economy is one to six.^{1/} Although such differences in average labor productivity are not a totally reliable guide, if marginal products were equal it would follow that the marginal product of labor in non-agricultural employment would decline rapidly. There is no apparent reason why this should be the case and available information on regional incomes indicate that there are great differences in per capita output^{2/} and wages.^{3/}

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- 1/ From National Income of Thailand 1959-1965, NEDB/NID/January 26, 1966. Preliminary Estimates (mimeo.). Table 5: 1960 share of agricultural output is 38.31%; Statistical Yearbook Thailand Number 25, Table 14; agricultural households 74.6% of total population.
- 2/ Regional Gross Domestic Product, Office of the National Economic Development Board, June 1965. Regional per capita income in 1963: North 1,581 baht; Northeast 1,229 baht; Central Plain 3,988 baht; South 2,597 baht.
- 3/ Real wage estimates are not available. Information is available from the household expenditure survey on monthly wage income and self employment income. See Household Expenditure Survey, Southern Region, Eastern Region, Northern Region, Advance Report. Also Statistical Yearbook Thailand Number 25, 1964, Tables 202 (page 435) and 207 (page 445) for Bangkok-Thonburi and Northeast respectively: (in baht)

Region	Towns		Villages	
	Wages	Self Employment	Wages	Self-Employment
Bangkok Thonburi	785.01	-	-	-
North East	405.01	565.08	64.80	121.57
Northern	224.53	503.77	73.92	210.66
Eastern	292.64	616.99	135.10	336.82
Southern	400.28	727.02	150.09	386.02

The open character of the Thai economy is apparent from the high ratio of imports to output (20 percent) and of exports to output (19 percent), not to mention the importance of government revenues derived from import and export taxes as well as the role of foreign private capital and foreign aid as a source of saving and foreign exchange and as a carrier of modern technology.

II. ACCOUNTING SYSTEM

A. Introduction

An accounting system is simply a way to organize data in a way which is most helpful to those who make use of the information. The accounting system used here is of a national income type; hence, the data presented in Parts III and IV rest upon official estimates of national product. The aggregate system of accounts attempts to extend slightly the information contained in the official accounts. The disaggregated system attempts to go somewhat farther beyond the usual national accounts framework.

For the analysis of development it is vital to work within a general equilibrium framework. That is, at least in principle, the analysis which embraces the entire economic system. Particular parts of the economy may be examined in greater detail within this overall framework, but the ramifications of particular economic events should be studied within the general equilibrium context. In what follows an attempt is made to cover all the economic transactions, and the system is basically a complete one.

The important distinction between stocks and flows must be kept in mind in what follows. In the accounting systems discussed in this section, all concepts are flows. That is, they represent money payments within an

annual period. At no point in these systems do stocks appear nor is the flow of factors of production considered. It is of course true that some of the flows affect stocks, but the stock concepts do not themselves appear.

To put this work in context, it should be recalled that any comprehensive analysis of an economy requires three components: (1) an accounting system which in effect defines the variables; (2) relationships between stocks and flows; and (3) behavioral hypotheses which describe how economic decision-making units behave. The study of development requires recognition of the importance of all three components. In this paper we are concerned only with the first of the three components.

B. Aggregative Level Accounts

This section reviews the basic national income concepts used. The economy is divided into five nexuses: the production nexus, the income disposition nexus, the government nexus, the financial nexus, and the foreign nexus. The five interrelated accounts are presented in Table 1. Definitions of symbols used in Table 1 are given in Table 2.

A nexus is a collection of the results of economic decisions: e.g., the production nexus reflects the production decisions made by the productive units of the economy; the income disposition or household nexus reflects the decisions made as to factor supply and to disposition of money income. There is no necessary correspondence between institutional arrangements and the functions included within a nexus. A rice farm, for example, is simultaneously involved in both production and income disposition.

The usual concepts of gross domestic product are used. With a single

production sector all inter-industry flows are suppressed, and the concept of national product is identical with the concept of value added by the production sector.

1. Production nexus

The production nexus reflects all of the production decisions made in the economy. For a single production unit it is always true that the following balance equation holds:

$$\begin{aligned} \text{Sales} = & \text{Wage payments} + \text{Profits} + \text{Depreciation} \\ & + \text{Indirect taxes} + \text{Payments for domestically} \\ & \text{produced goods} + \text{Payments for imports} \end{aligned}$$

If the balance equations for all production units are added together, then on the left-hand side one has the total value of sales in the economy and on the right, among other things, the total value of purchases (i.e. sales) of domestically produced intermediate goods. Subtracting this latter from total sales one obtains the value of sales for final uses. The final uses correspond precisely to the purchase of goods and services by each of the other four nexuses. In Table I these purchases are represented by private consumption C (purchases by the household nexus), investment $I_1 + I_2$ (purchases by the financial or I/S nexus), exports E (purchases by the foreign nexus), and government consumption $G + P_{3g}$ (purchases by the government nexus). All of these quantities appear on the right hand side of the production nexus account representing money flows into the production nexus.

TABLE I
AGGREGATE ACCOUNTING SYSTEM

PRODUCTION	
W	C
P ₁	I ₁
P ₂	I ₂
P _{3p}	E
P _{3g}	G+P _{3g}
M	
D	
T _i	

HOUSEHOLDS	
T _d	W
C	P ₁
S _p	i _{DG}

GOVERNMENT	
i _{DG}	T _i
G	T _d
P _{3p}	P ₂
S _g	A

FOREIGN	
E	P _{3p}
A	P _{3g}
S _f	M
	ΔR
	DS _p

I/S	
I ₁	S _p
I ₂	S _g
ΔR	S _f
DS _p	D

TABLE II

DEFINITION OF SYMBOLS

A	Inflow of foreign aid from foreign public sources (gross)
C	Private consumption
D	Depreciation of capital stock
DS _p	Debt service, principal repayment, on foreign public debt (gross)
E	Exports
G	Government collective consumption
I	Total investment in inventories and fixed capital
I ₁	Private total investment in inventories and fixed capital
I ₂	Public total investment in inventories and fixed capital
i _{DC}	Interest on domestically held government debt
M	Imports
P ₁	Profits of domestically owned capital (including rents, interest, etc.)
P ₂	Profits of state enterprises
P _{3g}	Debt service, interest payment on foreign public debt (net)
P _{3p}	Profits of foreign owned capital
ΔR	Change in level of foreign exchange reserves
S _g	Government saving
S _p	Private saving
S _f	Foreign saving (private)
T _d	Direct taxes
T _i	Indirect taxes
W	Wages

The other quantities in the balance equation give the total wage payments (W), the total returns to capital or profits ($P_1 + P_2 + P_{3g} + P_{3p}$), depreciation (D), indirect taxes (T_1), and payments for imports (M). (All imports are treated as intermediate goods but unlike domestically produced intermediate goods they originate outside the system.) All of these items are on the left hand side of the production sector account and represent outflows of funds to other nexuses.

The major conceptual difficulty in the above lies in the definition of the boundaries between intermediate and final goods. This is a classic problem in national income accounting and it suffices to note here that the definitions of the U. N. National Accounts System are used in Thailand.

The economic concept underlying the production sector is the production function. Physically, the production function relates factor use (e.g., man hours of labor and machine hours of capital) to output. The production units pay wages, profits, etc. for such factors. As output grows the factor inputs also grow. This growth in inputs is only partly reflected in the accounting system. It is possible to consider stocks of factors which can be drawn upon by the production units; i.e., there are potential man hours and machine hours which can be called upon by the production sector. The stock of potential machine hours grows with new investment; the stock of potential man hours grows with growing population. These stock concepts are of central importance in the analysis of growth, and it should be remembered that the study of such stock concepts is necessary. The conventional national accounting system implies that investment increases the stock of capital but

all other factors are either exogenous or can be treated as if they were equivalent to capital.

The sum of the left and right hand sides of the production account are of course equal,

$$W + P_1 + P_2 + P_{3g} + P_{3p} + M + D + T_i = C + I_1 + I_2 + G + P_{3g}$$

Gross domestic product (GDP) is defined as:

$$GDP = C + I_1 + I_2 + G + P_{3g} - M$$

or using the above equation

$$GDP = W + P_1 + P_2 + P_{3g} + P_{3p} + D + T_i$$

Gross national product (GNP) is:

$$\begin{aligned} GNP &= GDP - P_{3g} - P_{3p} \\ &= W + P_1 + P_2 + D + T_i \end{aligned}$$

Net national product (NNP) is:

$$\begin{aligned} NNP &= GNP - D \\ &= W + P_1 + P_2 + T_i \end{aligned}$$

National income (NI) is:

$$\begin{aligned} NI &= NNP - T_i \\ &= W + P_1 + P_2 \end{aligned}$$

These are the standard definitions of the aggregate measures of production.

The above equations relate them to the production nexus.

2. Income disposition or household nexus

The income disposition nexus deals with the way in which the private domestic economy utilizes its resources. Income is received from three

sources: wage payments by the production sector, profits before taxes but after depreciation, and interest payments on government debt owned domestically. There is no concept of retained earnings by business firms or of distributed profits to owners of capital. Instead, all profits are considered as paid to the household nexus. With available resources the household nexus purchases consumption goods, pays taxes, and saves. These three functions describe the transactions between the household nexus and other nexuses. There are no direct relationships between the household nexus and the foreign nexus although there are indirect ones which take place through the financial and production nexuses.

Consumption covers goods and services purchased by households to bring about welfare or utility for the individual. Note that consumption here is private in the sense that it covers goods and services consumed by the family. Direct taxes cover all income taxes, those on business profits as well as personal income. Subsidies are negative direct taxes. Saving formally corresponds to the purchase of financial assets from the financial nexus. This saving covers both business saving (except for depreciation) and personal saving. The balance equation for the household nexus is:

$$T_d + C + S_p = W + P_1 + i_{DG}$$

The stock concept associated with the household nexus is the level of financial assets. These financial assets are symbols of the ownership of capital by individuals. There are a multitude of forms such financial assets may take. Here there is no concern with the household's portfolio management problem; i.e., which financial assets to hold and in what amount. The only

question of concern is the size of the total stock of financial assets owned by households (including assets owned by business firms and so, indirectly, by the owners of the business firm). Changes in the level of the stock of financial assets is just equal to private savings, S_p .

It is implicitly assumed that on the average private business depreciation or capital consumption allowances are appropriate to enable the replacement of worn out capital. If this is so, then as long as this replacement is taking place, the definition of private saving given herein is appropriate. If, however, the depreciation allowances do not correspond to replacements of capital, there is a problem. Strictly speaking, it would be preferable in this latter case to treat private profits as though they included depreciation allowances and thus make private saving inclusive of such allowances so that private saving corresponds to changes in financial assets. If depreciation allowances exceed capital retirements, then the value of the financial assets representing the ownership of such a firm would be increased through the securities market and this would be recorded in the greater level of private saving in the schema presented here.

3. Government nexus

The concept of government used in the nexus is as the consumer of collective consumption. The production of collective consumption goods and services is located in the production nexus. The production nexus sells such collective consumption to the government nexus. This definition of the government nexus should be carefully noted. The production of non-collective consumption output by the government is not considered; however, when the

dual economy is studied this will change and production of collective consumption government will be explicitly treated.

The government receives funds from four sources: (1) direct taxes, (2) indirect taxes (3) profits from government enterprises, and (4) foreign aid. Direct taxes (T_d) are paid by business firms on profits and by individuals on income. Such taxes are construed as a transfer of funds from households to the government. Indirect taxes (T_i) are paid on all kinds of transactions carried out by business firms and individuals. The third source of funds, profits from government enterprises (P_2), represent total earnings after depreciation allowances are subtracted; of course, the enterprise may not return all of these profits to the Treasury. However, it is not the transactions between the enterprise and the Treasury which is relevant here; this is simply an accounting transfer reflecting management decisions as to the disposition of earnings. The relevant concept is the total earnings (after depreciation) of the enterprise; this represents a measure of the total resources available to the government from its enterprises. Finally, foreign aid (A), or all loans and grants from foreign public sources, is treated in a fashion parallel to the treatment of taxes as a source of funds for the government. It should be noted that new loans are treated as source of government funds but repayment of loans are treated as a drain on government saving. The reason for such an approach is to emphasize the total resources saved by the government, including foreign borrowing, while keeping separate the changes in real capital (I_2) from the changes in indebtedness (DS_p).

The government disposes of resources through purchases of a collective consumption nature ($G + P_{3g}$), through payments of interest on domestic borrowing, and through saving. The basic problem in treating the government is the appropriate valuation of purchases of collective consumption. Since such goods and services are not sold to the public, the usual treatment in national accounting is to value them at cost, where cost means intermediate goods plus wages and salaries. Interest on government debt is treated as a transfer payment (i.e., a negative tax). However in the view taken here interest on foreign aid debt (P_{3g}) should be treated as a factor payment, and consequently represents part of the cost of production of collective consumption. Thus the national accounts concept of the value of collective consumption is adjusted to take this into account. However, interest on domestic debt is treated in the conventional manner.

The government nexus is comprehensive. All levels of government are covered and consequently transfers between government units net out. The payment of principal on foreign public debt is considered to be an investment and so does not appear. The government nexus account does not correspond to an expenditure budget. An example of the latter for all government levels is given in Table III. In Table III, expenditures include debt service of principal (DS_p) and gross government investment (I_2). However, government saving does not appear; it is a derived concept which does not correspond to any expenditure. The definition of saving is made in order to show the contribution made by the government in financing, from the government nexus expenditures and receipts, the investment undertaken by the

government.

Underlying the flow concepts there are three stock concepts relevant to the system:

(1) The financial assets corresponding to government ownership of some of the stock of productive capital.

(2) Debts owed to foreign public sources as a result of foreign loans. Corresponding to these two stocks are their associated flows: net investment (I_2 less actual capital retirements) and net increase in foreign indebtedness (new foreign aid loans less DS_p).

(3) The level of domestic indebtedness. The associated flow concept is net government borrowing from the public and the central bank. This is the difference between government investment ($DS_p + I_2$) on the one hand and government saving (S_g), depreciation allowances on government owned capital, and decreases in Treasury money balances on the other.

4. Foreign nexus

The foreign nexus presents a summary of the relationships between the domestic economy and the rest of the world; that is, the left-hand side can be interpreted as sources of foreign exchange while the right-hand side represents uses of foreign exchange.

The sources of foreign exchange are exports (E), foreign assistance (A), and private foreign investment (S_f) (equals private foreign saving). The interpretation of the first two is straightforward. It should be noted that the way foreign aid is treated reflects the threefold nature of its role in development: (1) as a source of foreign exchange, hence its presence in

TABLE III

COMPREHENSIVE GOVERNMENT BUDGET

1. REVENUES:

T_i

T_d

P_2

A

D_2 (Depreciation allowances on government owned capital)

2. EXPENDITURES:

i_G

P_{37}

DS_p

G

I_2

3. DEFICIT = Expenditures - Revenues

= Borrowing from public

+ Borrowing from Central Bank

+ Change in Treasury demand deposits

See Table II for Symbol Definitions

the foreign nexus; (2) as a source of government revenues, hence its presence in the government nexus; and (3) as a source of saving since it affects the level of government saving. The meaning of private foreign saving is very involved. Depreciation includes that allowed for use of foreign-owned capital. The profits of foreign-owned capital (P_{3p}) do not include depreciation allowances. Consequently, if replacement of capital by foreign-owned firms proceeds at the same rate as capital consumption allowances, foreign private investment (S_f) corresponds to new capital assets owned by foreigners. However, if depreciation allowances are greater than replacement, part of excess funds (over what is needed for replacement of capital) may be transferred out of the country. These act as a negative private foreign capital inflow and reduce S_f . A similar argument holds in the opposite case. Foreign exchange may be used to finance imports (M), pay interest and principal on foreign public debt (P_{3g} plus DS_p), finance the transfer of profits earned by foreign owned capital (P_{3p}), and permit increases in foreign exchange reserves (ΔR). In the household and government nexuses the balancing item is saving, but in the foreign nexus the change in foreign exchange reserves plays the role of the balancing item.

The stock concepts in the foreign nexus are ownership of capital by foreigners, outstanding indebtedness of the government to foreign public sources of finance, and the level of foreign exchange reserves. The associated flow concepts are; private foreign investment (S_f); debt service of principal, less new borrowing through foreign assistance; and the change in foreign exchange reserves.

The balancing equation of the foreign nexus is:

$$E + S_f + A = M + P_{3g} + P_{3p} + DS_p + \Delta R$$

This corresponds to the balance of payments. The foreign nexus account is rearranged in Table IV to demonstrate its relationship to the balance of payments.

5. The financial or saving-investment nexus

The financial nexus summarizes the investments made by the economy and the sources of finance for such investments. Implicit in this account is the entire set of interrelated accounts of the financial system which integrate the monetary system into the accounting system.

The sources of financing investment are; private saving (S_p), government saving (S_g), foreign saving (S_f), and depreciation allowances (D). These sources finance gross investment in productive capital ($I_1 + I_2$), reduction in foreign indebtedness (DS_p), and changes in foreign exchange reserves (ΔR). The balance equation for the financial nexus is a statement of the equality of investment and saving:

$$S_g + S_f + S_p + D = I_1 + I_2 + DS_p + \Delta R$$

The financial system role is to provide a mechanism through which the various parts of the economy can save a different amount of resources than they invest and cover this difference by buying or selling financial assets. Thus the private sector invests I_1 (gross) and saves S_p , plus the relevant depreciation on privately owned capital (D_1). The net position of the private sector is:

$$I_1 - S_p - D_1 - S_f$$

TABLE IV

BALANCE OF PAYMENTS

Current account

Exports	E
Imports	- M
Profit Transfers	- D_{3p}
Interest Payments	- D_{3g}

Capital account

Foreign assistance (loans and grants)	A
Debt service on foreign loans	- DS_F
Private foreign investment	S_f

Balancing Movements

Change in foreign exchange reserves	- ΔR
-------------------------------------	--------------

since S_p , D_1 , and S_f are the funds available for investment from private domestic saving, depreciation allowances, and private foreign saving, respectively. The net position of the domestic private sector is given by the same expression, since the investment by private foreigners will equal the funds they provide according to the previously discussed definition of S_f .

The government sector's net position is:

$$I_2 + DS_p - S_g - D_2$$

where D_2 is depreciation allowances on government-owned capital. The net position of the government, plus the net position of the private sector, equal the change in foreign exchange reserves ($-AR$). This corresponds to the self-evident proposition that both the government and the private sector can invest more than they save by running down the reserve position; or alternatively, both may save more than they invest if foreign exchange reserves are increasing. However, when the foreign exchange reserves are constant, an excess of investment in one sector is financed by an excess of saving in the other. Table V presents all the possibilities.

TABLE V

DIRECTION OF INTER-SECTOR FINANCIAL FLOWS

PRIVATE	GOVERNMENT	ΔR
+	-	<u>+</u> , 0
+	+	-
-	-	+
-	+	<u>+</u> , 0

A (+) means investment greater than saving and a (-) means investment less than saving.

6. Detailed structure of financial nexus

This sector is somewhat different from the previous discussion since it is not required to understand the subsequent discussion dealing with the Thai economy. However, since intensive research is presently being undertaken with regard to the financial nexus in Thailand, this section is meant to provide a detailed framework for relating this research to the overall study of small open economies.

The financial nexus is divided into seven sectors: (1) households; (2) business firms; (3) foreigners; (4) state enterprises; (5) government (excluding state enterprises); (6) financial intermediaries (especially important here are the commercial banks); and (7) Central Bank. Table VI presents the details of the sub-accounts for each sector of the financial nexus. If the seven accounts are aggregated, the result is the financial nexus account of Table I. A partial aggregation can be made to display precisely the role of the organized and unorganized parts of the financial nexus (Table VIII). The implication of the view taken here is that the saving is given for each sector and then the sector decision makers choose how they will spread their saving among the various alternative assets.

The household sector deals with saving by households (S_{pp}). Saving by business firms is treated in the account labelled business firms. Available saving can be increased by borrowing from financial intermediaries (ΔL_1). Available resources are then used to increase

TABLE VI
 FINANCIAL NEXUS DETAILED ACCOUNTS
 (See Table VII for symbol definitions.)

<u>HOUSEHOLDS</u>		<u>BUSINESS FIRMS</u>		<u>FOREIGN</u>	
ΔI_1	S_{pp}	ΔM_2	D_1	ΔM_3	S_f
ΔB_1	ΔL_1	ΔB_2	S_{pb}	ΔB_3	
ΔN_1		ΔN_2	ΔX_{10}	ΔN_3	
ΔX_{10}		I_1	ΔX_{1uo}	ΔX_3	
ΔY_{1uo}			ΔL_2		
			ΔX_3		
<u>STATE ENTERPRISES</u>				<u>GOVERNMENT</u>	
ΔM_4	D_2			ΔM_5	S_g
ΔB_4	ΔL_4			ΔB_5	ΔN
ΔN_4	T			T	
$I_{2'}$				$I_{2''}$	
				DS_p	
				ΔZ	

TABLE VI (Continued)
FINANCIAL NEXUS DETAILED ACCOUNTS

<u>FINANCIAL INTERMEDIARIES</u>		<u>CENTRAL BANK</u>	
ΔN_0	ΔB	ΔN_7	ΔM
ΔM_0	ΔL_7	ΔL_7	ΔZ
$\Delta L_7 + \Delta L_0$		ΔR	ΔY
ΔY			

TABLE VII
ADDITIONAL SYMBOL DEFINITIONS

ΔB_1	Change in bank deposits by private households
ΔB_2	Change in bank deposits by business firms
ΔB_3	Change in bank deposits by foreigners
ΔB_4	Change in bank deposits by state enterprises
ΔB_5	Change in bank deposits by government (excluding state enterprises)
ΔB	Total of all ΔB_i s
D_1	Depreciation allowances on privately owned capital
D_2	Depreciation allowances on government owned capital
DS_p	Repayment of principal on foreign public indebtedness
I_1	Gross investment by business firms
I_2	Gross investment by state enterprises
$I_{2'}$	Gross investment by government (excluding state enterprises)
ΔL_1	Change in net loans by financial intermediaries to households
ΔL_2	Change in net loans by financial intermediaries to business firms
ΔL_4	Change in net loans by financial intermediaries to state enterprises
ΔL_6	Change in net loans held by financial intermediaries
ΔL_7	Change in discounted loans held by Central Bank
ΔM_1	Change in currency held by households
ΔM_2	Change in currency held by business firms
ΔM_3	Change in currency held by foreigners
ΔM_4	Change in currency held by state enterprises

TABLE VII (Continued)
ADDITIONAL SYMBOL DEFINITIONS

ΔM_5	Change in currency held by government
ΔM_6	Change in currency held by financial intermediaries
ΔM	Total of all ΔM_i s
ΔN_1	Change in government securities held by households
ΔN_2	Change in government securities held by businesses
ΔN_3	Change in government securities held by foreigners
ΔN_4	Change in government securities held by state enterprises
ΔN_6	Change in government securities held by financial intermediaries
ΔN_7	Change in government securities held by Central Bank
ΔN	Total change in government securities
ΔR	Change in foreign exchange resources
S_{pp}	Saving by private households
S_{yb}	Saving by business firms
S_f	Saving by foreigners
S_g	Saving by government
T	Transfers from government to state enterprises
ΔX_{10}	Change in private securities owned by households
ΔX_{1uo}	Change in private loans, direct investments to business firms (unorganized market transactions)
ΔX_3	Change in private securities, direct investments, loans by foreigners to business firms
ΔY	Change in reserve deposits of financial intermediaries at Central Bank
ΔZ	Change in government deposits at Central Bank

holdings of currency (ΔM_1); to increase bank deposits (ΔB_1) (in general, all deposits with financial intermediaries); to purchase government securities (ΔN_1); to purchase financial assets indicating ownership of part of the stock of capital (ΔX_{10}); and to make loans directly to business firms (ΔX_{1uo}).

Business firms have available retained earnings or business saving (S_{pb}) and depreciation allowances (D_1). Additional resources are available from increased sales of ownership certificates (securities) to households (ΔX_{10}) or foreigners (ΔX_3); increased borrowing from financial intermediaries (ΔL_2); and direct loans from households (ΔX_{1uo}). These resources are used to increase currency holdings (ΔM_2); increase bank deposits (ΔB_2); increase holdings of government securities (ΔN_2); and purchase capital goods (I_1).

Foreigners have available the resources which they choose to bring into the country (S_f) and these are used to increase foreign-owned currency (ΔM_3); to increase foreign-owned bank deposits (ΔB_3); to increase foreign-owned government securities (ΔN_3); and to purchase ownership in business firms (ΔX_3).

State enterprises have available depreciation allowances (D_2); transfers from the government (T); and possible borrowing from financial intermediaries (ΔL_4). The financial resources are used to increase currency holdings (ΔM_4); to increase bank deposits (ΔB_4); to increase holdings of government securities (ΔN_4); and to purchase capital goods (I_2).

TABLE VIII
AGGREGATION OF FINANCIAL NEXUS

REST OF NEXUS		BUSINESS FIRMS AND STATE ENTERPRISES	
I_{SP}	$\Delta M'$	I_1	D_1
ΔR	$\Delta B'$	$I_{2'}$	D_2
$I_{2''}$	$\Delta N'$	$\Delta M'$	S_{pb}
T		$\Delta B'$	T
$\Delta L'$	S_g	$\Delta N'$	$\Delta L'$
ΔX_{10}	S_{pp}		ΔX_{10}
ΔX_{1uo}	S_f		ΔX_{1uo}
ΔX_3			ΔX_3

Define $\Delta X_{10T} = T + \Delta L' + \Delta X_3 - \Delta M' - \Delta B' - \Delta N' + \Delta X_{10}$

REST OF NEXUS		BUSINESS FIRMS AND STATE ENTERPRISES	
I_{SP}	S_g	I_1	D_1
ΔR	S_{pp}	$I_{2'}$	D_2
$I_{2''}$	S_f		S_{pb}
ΔX_{10T}			ΔX_{10T}
ΔX_{1uo}			ΔX_{1uo}

Where

$$\Delta M' = \Delta M_2 + \Delta M_4$$

$$\Delta B' = \Delta B_2 + \Delta B_4$$

$$\Delta N' = \Delta N_2 + \Delta N_4$$

$$\Delta L' = \Delta L_2 + \Delta L_4$$

The government raises resources by saving (S_g), which includes foreign assistance, and by borrowing money through net sales of securities (ΔN). These resources are disposed of through increases in currency holdings (ΔM_5); increases in deposits at financial intermediaries (ΔB_5); increases in deposits at the Central Bank (ΔZ); repayment of principal of foreign loans (DS_p); transfers to state enterprises; and purchase of capital goods (I_2).

The financial intermediaries obtain funds through deposits from households, business firms, foreigners, state enterprises, and the government (ΔB), and by discounting to the Central Bank (ΔL_7). These assets are used to purchase government securities (ΔN_6), to increase holdings of currency (ΔM_6); to make loans to households, business firms, and possibly state enterprises ($\Delta L_6 + \Delta L_7$); and to maintain reserve balances at the Central Bank (ΔY). The profits (changes in net worth) of financial intermediaries are included in the production nexus and consequently influence private saving ($S_{pp} + S_{pb}$); an increase of one dollar in profits of a commercial bank will ceteris paribus lead to an increase in private saving and thus to a dollar increase in bank deposits. This dollar of bank deposits reflects the greater net worth of the bank. (The same argument holds for the Central Bank.)

The Central Bank obtains funds from the issuance of currency (ΔM); from reserve deposits of commercial banks (ΔY); and from government deposits. These financial resources are used to buy government bonds (ΔN_7); to discount commercial bank loans (ΔL_7); and to increase the level of foreign exchange reserves.

The effect of Central Bank operations in the system is now easily seen. First, the Central Bank can set minimum reserve requirements which serve to set a constraint on the freedom of the financial intermediaries to arrange their investment portfolios. Second, by buying government bonds the Central Bank can put arbitrary amounts of purchasing power in the hands of the government. Third, in highly developed capital markets the Central Bank's role as a buyer or seller of government securities affects the price of government securities and, consequently, the interest rates and the desired portfolios of financial intermediaries, business firms, and households. Finally, the discounting of commercial bank loans is a way of putting more financial resources in the hands of the banks and of encouraging or discouraging the increase in loans. Such operations will eventually lead to changes in investment and saving and thereby affect the real part of the economy.

Table VIII is an aggregation of the seven financial nexus sectors into two sectors: one account is for business firms and state enterprises; the other, for the rest of the financial nexus. These two accounts show the interrelations between the production side of the economy and everything else within the financial nexus. Next we note that the financing of business firms and state enterprises can come from internal sources, organized financial markets, and unorganized financial markets.

We define ΔX_{10T} as the total financing from organized markets:

$$\Delta X_{10T} = T + \Delta L' + \Delta X_3 - \Delta M' - \Delta B' - \Delta N' + \Delta X_{10}$$

where the symbols are as defined in Table VIII. That is, ΔX_{10T} is the net flow of resources from organized financial markets available to business firms and state enterprises for purchases of capital goods.

Internal financing is the sum of depreciation allowances and business saving:

$$D_1 + D_2 + S_{pb}$$

Finally, ΔX_{1uo} , the direct loans and investments by households, represent the unorganized market contribution. The sum of these equals investment in capital goods by state enterprises and business firms.

$$I_1 + I_2 = (D_1 + D_2 + S_{pb}) + \Delta X_{10T} + \Delta X_{1uo}$$

There is an additional complication which should be mentioned here. It has been implicitly assumed that the use of unorganized market financing is to finance the purchase of capital goods (consumer loans are, of course, netted out). General production requires not only capital goods but also working capital. If the currency holdings plus bank deposits were just equal to their required working capital (inventories are included in capital goods), the level of investment required would be $I_1 + I_2 + \Delta M' + \Delta B' + \Delta N'$ (assuming that government securities are held only as a form of cash less liquid than bank deposits).

The organized market financing is given by:

$$T + \Delta L' + \Delta X_{10} + \Delta X_3$$

The internal financing is given by:

$$D_1 + D_2 + S_{pb}$$

and the unorganized financing is given by:

$$\Delta X_{luo}$$

Which set of concepts is appropriate depends on an analysis of the flexibility and depth of the financial market.

7. An alternate set of aggregative accounts

In order to clarify the relationship between the detailed financial nexus accounts and the aggregate accounts in this section a different arrangement of the accounts is presented. Table IX presents these accounts, and Table X gives the necessary new definitions.

The major change is the separation of retained earnings from distributed earnings for both private enterprises and state enterprises. Thus, households have only distributed profits available for saving, and the government has only the state enterprises' profits transferred to the central government. As a result of this change, saving is identified in the production account--business saving (S_{pb}) and state enterprise retained profits (S_{gb}). Direct taxes paid by businesses must now be

listed in the production account. Consequently, profits transferred to households are after corporate income taxes.

Household saving (S_{pb}) is now that part of private saving which arises outside of businesses. Government saving (S_{gg}) is S_g less retained earnings of state enterprises. The significance of this presentation is to identify more precisely the sources of saving in the economy.

TABLE IX
AGGREGATE ACCOUNTING SYSTEM
(Variant 1)

<u>PRODUCTION</u>		<u>HOUSEHOLDS</u>	
W	C	T _{dh}	W
P _{1'}	I ₁	C	P _{1'}
P _{2'}	I ₂	S _{ph}	i _G
P _{3p}	E		
P _{3g}	G		
M	P _{3g}		
D ₁			
D ₂			
T _i			
S _{gb}			
S _{pb}			
T _{dh}			

TABLE IX
 AGGREGATE ACCOUNTING SYSTEM
 (Variant 1)

GOVERNMENT

i_G	T_i
G	T_{dh}
P_{3g}	T_{db}
S_{gg}	$P_{2'}$
	A

FOREIGN

E	P_{3p}
A	P_{3g}
S_f	M
	ΔR
	DS_P

I/S

I_1	S_{gb}
I_2	S_{gg}
R	S_{pb}
D_{sp}	S_{ph}
	S_f
	D_1
	D_2

TABLE X
ADDITIONAL DEFINITIONS AND IDENTITIES

D_1	Depreciation of privately owned capital
D_2	Depreciation of government owned capital
P_1'	Private distributed profits, rents, interest
P_2'	State enterprise profits returned to central government
S_{gb}	State enterprise saving
S_{gg}	Government saving from central and local government budgets
S_{pb}	Private business saving
S_{ph}	Private household saving
T_{dh}	Direct taxes paid by households
T_{db}	Direct taxes paid by business

$$D \equiv D_1 + D_2$$

$$P_1 \equiv P_1' + S_{pb} + T_{dh}$$

$$P_2 \equiv P_2' + S_{gb}$$

$$S_g \equiv S_{gb} + S_{gg}$$

$$S_p \equiv S_{pb} + S_{ph}$$

$$T_d \equiv T_{dh} + T_{db}$$

8. Aggregative accounting systems and development planning

Although the review of the aggregative accounting system in the previous section is meant to provide background for the presentation of the data in Thailand, it is useful at this point to mention the use of such systems to development planning. If planning is properly comprehensive it should be possible for the planner to develop a set of accounts similar to those of Table I for each year of the plan period. That is, a minimum condition for any satisfactory planning process is that it results in a forecast of the expected behavior of each nexus.

There are many methods by which this might be done. The simplest is to begin with a projection of the expected growth of gross domestic product, exports, and private foreign investment. Then, from available information on the relationship between capital stock and output, the investment requirements for achievement of the target growth rate are determined. The expected private sector investment is then estimated and the consequent required government investment determined.

From information on expected gross domestic product and investment it is usually possible to project imports. Then, from imports and exports, indirect taxes can be estimated. Profit transfers can be estimated from the expected private foreign investment. Depreciation can be estimated from expected investment and existing capital stock estimates or from the past relationship between output and depreciation allowances.

The forecast of expected private investment should enable one to forecast the income payments ($W + P_1$) to the household sector. Similarly,

government investment should indicate the expected profits of state enterprises. From household nexus income payments, direct taxes can be estimated. Each of these steps may require quite complex analysis; the method for making the projections must evolve from the efforts of skilled planners and the availability of data. It is impossible to lay down a priori procedures.

At this point, a tentative assumption is made; i.e., that the expected inflow of foreign assistance and associated interest and principal payments are known. The foreign nexus is now closed and the expected change in the level of foreign exchange reserves is worked out. A second tentative assumption that the level of government consumption is known, is also made. The production nexus now provides a residual estimate of consumption. Then, from the government nexus, one determines the level of government borrowing and interest payments, and from the household nexus, the level of household saving. The very procedure within the framework insures that the forecast is consistent. However, the planner must now investigate the implied consumption to see if it is consistent with past behavior of households. The implications of different foreign aid inflows and different government consumption programs should be studied. Finally, the process is repeated for different initial growth rates. On this basis several alternative forecasts of the aggregative accounts can be prepared. Associated with each will be a different growth rate, foreign assistance assumption, and government consumption program. The result is a set of feasible alternatives, each of which induces some degree of strain in the economy provides more or less consumption, or differently affects the foreign exchange reserves.

From these alternatives the government can choose the variant which seems most suited to national aspirations. Most of the planning effort outside of project preparation can be organized as a series of studies to supply one or more pieces of this aggregative accounts projection.

Since the aggregative accounts system is a small general equilibrium system, one is assured of comprehensiveness in its use. This comprehensiveness is one of the most important characteristics of good development planning: A large number of the significant interrelations between parts of the economy can be captured within a simple aggregative framework. It should be noted that this does not preclude a planning approach which studies industrial sectors intensively. On the contrary, such an approach simply helps to refine the investment requirements and the import projections.

C. The Dual Economy Accounting System

The aggregative accounting system is now sectorized to separate the agricultural sector from the industrial. This accounts system is shown in Table XI. The symbol definitions are given in Table XII. This set of accounts is then rearranged to arrive at Table XIII which gives an adjusted set of accounts. Additional definitions are given in Table XIV. The accounts are consistent with the aggregative accounts of Table I. This consistency is explicitly shown in Table XI. There is a basic change in viewpoint in these dual economy accounts insofar as the government is treated as both a producer and consumer of collective consumption. Consequently the production nexus has three sub-sectors: industry, agriculture, and government. The income disposition nexus also has three sub-sectors:

industry, agriculture, and government. The government sub-sector of the income disposition nexus corresponds to the government as a consumer of collective consumption at the aggregative level. Combined, the industry and agriculture sub-sectors of the income disposition nexus corresponds to the household or income disposition nexus at the aggregative level. Consequently, the number of nexuses is reduced to four for the dual economy accounting system.

1. Production nexus (System I: Table XI)

The production nexus splits into agricultural, industrial, and governmental components. It is necessary to distinguish between flows of goods and services between these components and flows to other nexuses: For each component of the production nexus, flows to the other three nexuses can be distinguished as can flows to other components of the production nexus or the domestic input-output flows.

The input-output structure is exceedingly simple. Since there are six possible gross inter-sectoral flows (i.e., for each sector there are two flows and so with three sectors, six altogether), there will be only three net flows between sectors. The three net flows specified here are: (1) the flow from agricultural production units to industrial production units (R); (2) the flow from agriculture to government (X_g); and (3) the flow from industry to government (Y_g). If the input-output matrix is:

	Agriculture	Industry	Government
Agriculture	0	x_{12}	x_{13}
Industry	x_{21}	0	x_{22}
Government	x_{31}	x_{32}	0

TABLE XI

DUAL ECONOMY ACCOUNTING SYSTEM I

1. Production Nexus

<u>AGRICULTURE</u>		<u>INDUSTRY</u>		<u>GOVERNMENT</u>	
$(W + P_1)_x$	$C_x = X_H + X_L$	$(W + P_1)_y$	$C_y = Y_L + Y_H$	W_g	$G + P_{3g}$
T_{ix}	I_x	T_{iy}	$I_y + M_i$	P_{3g}	
M_x	E_x	M_y	E_y	X_g	
	R	M_R	Y_g	Y_g	
	X_g	M_i			
		R			
		D			
		P_2			

IDENTITIES

$$\begin{aligned}
 (W + P_1)_x + (W + P_1)_y + W_g &= W + P_1 + P_{3p} \\
 T_{ix} + T_{iy} &= T_i \\
 M_x + M_y + M_i + M_R &= M \\
 I_x + I_y + M_i &= I \\
 E_x + E_y &= E \\
 C_x + C_y &= C
 \end{aligned}$$

AGGREGATE PRODUCTION NEXUS (TABLE I):

<u>PRODUCTION</u>	
$W + P_1$	C
T_i	$I = I_1 + I_2$
M	E
P_{3g}	$G + P_{3g}$
P_{3p}	
P_2	
D	

TABLE XI (Continued)

2. Income Nexus

<u>AGRICULTURE</u>		<u>INDUSTRY</u>		<u>GOVERNMENT</u>	
T_{dx}	$(W + P_1)_x$	T_{dy}	$(W + P_1)_y - P_3p$	i_{DG}	T_{dx}
Y_i	W_{gx}	Y_H	W_{gy}	G	T_{dy}
X_L		X_H	i_{DG}	P_3g	T_{ix}
S_L		S_H'		S_g	T_{iy}
					Λ
					P_2

IDENTITIES

$$T_d = T_{dx} + T_{dy}$$

$$S_p = S_L + S_H'$$

$$C = X_L + Y_L + Y_H + X_H$$

$$W_g = W_{gx} + W_{gy}$$

AGGREGATE HOUSEHOLD NEXUS (TABLE I)

(Formed from agriculture and industry sub-sectors)

T_d	$W + P_1$
C	i_{DG}
S_g	

TABLE XI (Continued)

AGGREGATE GOVERNMENT NEXUS (TABLE I)
(From government sub-sector)

G	T_d
i_{DG}	T_i
P_{3g}	A
S_g	P_2

3. Foreign Nexus

E_x	M_R
E_y	M_i
A	M_x
S_f	M_y
	P_{3g}
	P_{3p}
	DS_p
	ΔR

This is identical to the aggregate foreign nexus.

4. Financial or I/S Nexus

I_x	S_L
I_y	S_H'
M_i	S_g
DS_p	D
ΔR	S_f

This is identical to the aggregate financial nexus.

TABLE XII

SYMBOL DEFINITIONS FOR DUAL ECONOMY

$(W + P_1)_x$	Wage and profit payments from agricultural production
$(W + P_1)_y$	Wage and profit payments from industrial production
W_g	Wage payments from government production of collective consumption
W_{gx}	Government wage payments to rural households
W_{gy}	Government wage payments to industrial households
T_{ix}	Indirect taxes paid by agricultural productive units
T_{iy}	Indirect taxes paid by industrial productive units
M_x	Imports of agricultural goods for consumption
M_y	Imports of industrial goods for consumption
M_i	Imports of capital goods
M_R	Imports of intermediate goods
C_x	Sales of agricultural goods for consumption
C_y	Sales of industrial goods for consumption
I_x	Sales of agricultural goods for investment
I_y	Sales of industrial goods for investment
E_x	Sales of agricultural goods for exports
E_y	Sales of industrial goods for exports
R	Sales of agricultural goods to industry for intermediate use
Y_y	Sales of industrial goods to government for intermediate use

TABLE XII (contd)

X_g	Sales of agricultural goods to government for intermediate use
X_H	Consumption of agricultural goods by industrial households
X_L	Consumption of agricultural goods by agricultural households
Y_L	Consumption of industrial goods by industrial households
Y_H	Consumption of industrial goods by agricultural households
T_{dx}	Direct taxes paid by agricultural households
T_{dy}	Direct taxes paid by industrial households
S_L	Saving by agricultural households
S_H'	Saving by industrial households

(Other symbols defined in Table II)

TABLE XIII

DUAL ECONOMY ACCOUNTING SYSTEM II

1. Production Nexus

<u>AGRICULTURE</u>		<u>INDUSTRY</u>		<u>GOVERNMENT</u>	
V_x	R	V_y	Y_g	V_g	$G + P_{3g}$
	X_g	M_R	E_y	X_g	
	E_x	R	Y_a	Y_g	
M_x	X_a	M_i			
		M_y			

IDENTITIES

$$I_a = X_L + X_H + I_x$$

$$Y_a = Y_L + Y_H + Y_y + M_i$$

$$V_g = W_g + P_{3g}$$

$$K_d = X_a - M_x$$

$$Y_d = Y_a - M_y - M_i$$

$$V_x = (W + P_1)_x + T_{Lx}$$

$$V_y = (W + P_1)_y + D + T_{iy} + P_2$$

2. Income Nexus

<u>AGRICULTURE</u>		<u>INDUSTRY</u>		<u>GOVERNMENT</u>	
K_L	V_x	X_H	V_y	G	T_L
Y_L	W_{gx}	Y_H	W_{gy}	S_g'	T_H
S_L		S_H			
T_L		T_H			
		P_{3p}			

IDENTITIES

$$T_L = T_{ix} + T_{dx}$$

$$T_H = T_{ig} + T_{dy}$$

$$S_g' = S_g - A + P_{3g}$$

$$-i_{DG} + P_2$$

$$S_H = S_H' + D$$

TABLE XIII (Continued)

3. Foreign Nexus

E_x	M_R
E_y	M_i
Q	M_x
	M_y

IDENTITIES

$$Q = S_p + A - P_3 - DS_p - \Delta R$$

4. Domestic Nexus

I_x	S_L
I_y	S_H
M_i	S_g'
	$Q + P_{3p}$

TABLE XIV

SYMBOL DEFINITIONS FOR DUAL ECONOMY II

V_x	Value added by agricultural production
X_a	Sales of agricultural goods to domestic buyers
X_d	Sales of domestically produced agricultural goods to domestic buyers
V_y	Value added by industrial production
Y_a	Sales of industrial goods to domestic buyers
Y_d	Sales of domestically produced industrial goods to domestic buyers
V_g	Value added by government
S_i	Industrial householding saving including depreciation allowances
T_a	Tax burden on agricultural households
T_i	Tax burden on industrial households (net)
S_g'	Government saving concept ($S_g - A + P_{3g}$)
Δ	Balance of payments adjustment equal to deficit on balance of trade $(S_g' + A - P_3 - DS_p - \Delta R)$

Other symbols as defined in Table II and Table XII

Then

$$R = x_{12} - x_{21}$$

$$X_g = x_{13} - x_{31}$$

$$Y_g = x_{23} - x_{32}$$

The agricultural sector makes final sales of agricultural goods for consumption (C_x); for investment (I_x); and for exports (E_x); i.e., to each of the other three nexuses. All other sales of goods are to other parts of the production nexus (R and X_g). Earnings are used (1) to buy factor services of labor and capital ($(W + P_1)_x$); (2) to pay indirect taxes (T_{ix}); and (3) to purchase imports which will be consumed directly (I_x). The treatment of imports needs further explanation. If an agricultural firm uses an import as an intermediate good, it purchases this good from an importer (in the industrial sector), and this transaction is a negative contribution to R. But if an importer buys an agricultural good and sells it for consumption purposes, the value of the sale is counted as part of C_x , purchases from agricultural production units. Trade and transport markups of the importer, however, would be an intermediate good purchase by the agricultural production units. Hence, it is the latter who must pay for imports of agricultural goods for immediate consumption.

The industrial sector sells goods for consumption C_y , for investment ($I_y + M_i$), and for exports (E_y). In addition, intermediate goods are sold by agriculture (netted out in R) and to the government (Y_g). Payments

by industry cover wages and profits $(W + P_1)_y + P_2$, ^{1/} indirect taxes (T_{iy}) , depreciation allowances (D), and purchases (net) of intermediate goods from agriculture (R). Finally, imports for three different purposes are purchased: (1) for immediate consumption (industrial goods only) (M_y) ; (2) for immediate investment (M_i) ; and (3) for intermediate use (M_R) . This type of import may be resold to the government or to agriculture but such transactions would be recorded through the inter-sector flows.

The government sector, as part of the production nexus, sells collective consumption goods to the government, as part of the income disposition nexus. The value of such goods is set so as to equal the costs of production plus interest on foreign public loans. It is assumed that the state enterprise produces goods which are not collective and so should be included in the industrial sector. Similarly, sales of government enterprises are allocated to industry, not to government. The costs of production are just wage payments plus purchases of intermediate goods $(X_g$ and Y_g).

The sector concepts are related to the aggregate concepts through the identities listed in the production nexus of Table XI: First, total wages and private profits $((W + P_1)_x + (W + P_1)_y + W_g)$ include profits on privately owned foreign capital. Second, total indirect taxes are just the sum of the indirect taxes paid by the two non-government production sectors. Third, total imports are equal to imports for consumption $(M_x + M_y)$, investment (M_i) , and intermediate goods use (M_R) . Fourth, investment goods are

^{1/} P_2 , previously defined, represents profits of state industrial enterprises.

either imported, produced in the agricultural sector (I_x), or produced in the industrial sector (I_y). Fifth, exports originate in either the agricultural or industrial sector. Finally, total non-collective consumption is the total consumption of agricultural and industrial goods. Using these relationships, the aggregate production nexus account of Table I can be obtained by adding together the three sector accounts.

2. Income Disposition Nexus (System I: Table XI)

The income disposition nexus has three sectors; agriculture, industry, and government. It is a crucial assumption in the accounting system that agricultural households do not receive income from industrial production units and that industrial households do not receive income from agricultural production units. This is a very strong assumption and probably needs modification for countries where landlords make their homes in urban areas. The economist usually assumes that income is treated by the household the same way, regardless of its origin. In order to allow shifts in the relative importance of agriculture and industry to influence the evolution of saving in the economy, it is useful to identify household income with the sector of the production nexus from which the income originated. This presupposes that the household obtains its income from only one source. In Thailand, where land is largely owned by the farmer, this is not too bad an assumption. However, it is one which requires further investigation.

The agricultural households receive wages and profit payments from agricultural production units $(W + P_1)_x$ and from the government (W_{gx}) . That is, some households, where the wage earner is employed by the government, are

designated as agricultural and their wages become part of the income of agricultural households. Household income is used to pay direct taxes (T_{dx}), to purchase industrial consumption goods (Y_L), and to purchase agricultural goods, including production for subsistence, (X_L) and for saving (S_L).

Industrial households receive wages and profits from industries ($(X + P_1)_y - P_{3p}$). The payment of profits to private foreigners has been subtracted from wage and profit payments to industrial households. Part of government wage payments are to industrial households (W_{py}) and all of government interest payments on domestic debt (i_{DG}) are attributed to industrial households. This income is used to pay direct taxes (T_{dy}), to purchase industrial consumption goods (Y_H), to purchase agricultural consumption goods (X_H), and for saving (S_H).

The government household purchases collective consumption goods from the government production sector. To finance such purchases the government has taxes ($T_d + T_i$), foreign assistance (A), and profits of government enterprises. These resources are used for payment of interest on government debt (i_{DG}), purchases of goods from the government production sector ($G + P_{3g}$), and for saving (S_g).

The three sectors of the income disposition nexus can be readily aggregated to form the government and household nexuses of the aggregate account. This is done by using the identities of Table XI listed in the income nexus. These identities are all straightforward definitions of the aggregate variable as the sum of the relevant agricultural and industrial variables.

3. Foreign Nexus (System I: Table XI)

The foreign nexus is just the same as in the aggregative system, except that imports are broken down into four categories: agricultural consumption goods (M_x); industrial consumption goods (M_y); investment goods (M_i); and intermediate goods (M_R). Exports are broken down into those originating in agriculture (E_x) and those originating in industry (E_y).

4. Financial Nexus (System I: Table XI)

The financial nexus is essentially the same as the aggregate financial nexus. Private saving (S_p) is separated into that originating in agricultural households (S_L) and that originating in industrial households (S_H'). Investment is divided by the point of production of the capital good: (1) in the agricultural production sector (I_x); (2) in the industrial production sector (I_y); or (3) imported (M_i).

5. A Transformed System

The dual accounting system described above will now be rearranged to show some different aspects of the dual system. The essential point of this rearrangement is to suppress some of the detailed financial flows.

6. The Production Nexus (System II: Table XIII)

The agricultural sector earns resources by selling goods for final domestic use (X_a), for export (E_g), and for intermediate uses (net flows) (R and X). These resources are used to purchase imported agricultural goods for immediate consumption (M_x) and the remainder is value added or gross product originating (V_x). In addition it is useful to define the contribution of domestic production to domestic final use (X_d). This equals

domestic final use (X_a) less imports for immediate consumption (M_x). Value added is the sum of wages, profits, and indirect taxes for agriculture. It is assumed that all depreciation allowances are allocated to industry.

The industrial production sector earns resources by selling goods for final use (Y_a), for export (E_y), and for intermediate use (Y_e). These resources are used to purchase imports ($M_R + M_i + M_y$), to pay net for purchases from agriculture, and the remainder is value added (V_y). The contribution of domestic production to domestic final use (Y_d) equals total domestic final use, less imports for final use ($M_y + M_i$). Value added in the industrial sector is the sum of wage payments by state enterprises and private firms, indirect taxes paid by industrial sector firms, profits of industrial firms and state enterprises, and depreciation allowances. The government production sector is the same as for the first system, except that value added is defined as government wage payments plus interest payments on foreign loans.

7. The Income Disposition Nexus (System II: Table XIII)

The agricultural households receive the value added in agriculture (V_x), plus part of government wage payments (W_{gx}). This is used to finance consumption of agricultural goods (X_L), and industrial goods (Y_L), to pay taxes, both direct and indirect (T_L), and for saving (S_L).

The industrial households receive the value added in industry (V_y), plus part of government wage payments (W_{gy}). This is used to finance consumption of agricultural goods (X_H), and industrial goods (Y_L), to pay profits to private foreign investors (P_{3p}), to pay taxes (T_H), and for

saving (S_H). The treatment of taxes is slightly different. Taxes paid by industrial households are direct and indirect taxes as before, plus profits of government enterprises less interest on domestic government debt. The latter two items essentially enable one to use T_H as the total net demand on industrial households of the government. Saving (S_H) includes depreciation allowances which here were allocated to industrial households rather than directly to the financial nexus as in System I or the aggregated system.

The government household receives income from the industrial and agricultural households and uses this to purchase collective consumption (C) and to save (S_g'). Government household saving (S_g') does not include foreign assistance (A) but it does include interest payments on foreign loans.

8. The Foreign Nexus (System II: Table XIII)

The foreign nexus account is presented to emphasize exports and imports. Foreign exchange is spent to purchase imports and is earned from exports. The account is balanced with a net item, Q , which summarizes all other transactions of the foreign nexus. This balance item is defined as private foreign investment (S_f), plus foreign assistance (A), less profits of private foreign capital (P_{3p}), less interest payments on foreign public debt (P_{3q}), less debt service of principle on foreign public debt (DS_p), less changes in foreign exchange reserves (ΔR).

9. The Financial Nexus (System II: Table XIII)

Expenditures on capital goods are carried just as for System I, but financial investments are omitted. However, the saving components are now

defined in a different way. Saving by agricultural households is just the same as in System I, but saving by industrial households now includes depreciation allowances which were listed separately in System I, Government saving is now defined to exclude interest payments on foreign debt from government consumption and to exclude foreign assistance from government revenues. Finally, the balance item in the foreign nexus account replaces private foreign saving. All the financial flows and investments are netted out in $Q + P_{3p}$.

III. THE THAI ECONOMY 1957-64: THE AGGREGATE STRUCTURE

A. Introduction

In this part, a preliminary discussion of the aggregative structure of the Thai economy is made. From available economic data the Table II aggregative accounts have been pieced together. The aggregative accounts for the period 1957-1964 enable us to draw some conclusions about the important forces underlying the economic development of Thailand. (Revised national income data are available only from 1957 onwards.) It will be recalled that the approach to the analysis of growth can concentrate on factor inputs and how they increase through time or, alternatively, the analysis can concentrate on the shifting structure of the economy. This latter course is the one pursued in this section.

The data is presented in summary form in Table XV. In Table XVI, the ratios of the flows in a given year to gross domestic product in that year are given. In Table XVII, various averages of the ratios of Table XVI are given. Tables XVIII through XXXIII present the accounts year by year,

both in absolute and ratio terms.

First, a brief discussion of sources and methods is presented. Second, the structure of the Thai economy in 1964 is reviewed in detail. Here the important structural characteristics of the economy are examined. Third, the structural trends of the economy are examined for the entire period. Finally, the implications of these trends and the present structure for the medium term growth of the Thai economy are briefly examined.

B. Methods

The basic material from which the information is collected are: the national income accounts for 1957-65 (to be published by the National Income Division of the National Economic Development Board); the Bank of Thailand's Annual Reports; the budget information provided by the Budget Bureau, as well as published data in The Budget in Brief, for various years; the foreign trade data from the reports of the Customs Bureau; and, finally the various publications of the National Statistical Office, especially The 1964 Statistical Yearbook.

Consumption, depreciation, and investment estimates are all taken from the national income accounts, as is the value of gross domestic product. Exports and imports were determined from balance of payments data. Interest payments and government purchases of collective consumption are basically taken from Bank of Thailand reports and the national income accounts. Private profit transfers are available from the balance of payments and state enterprise profits from material made available by the National Economic Development Board. Indirect taxes were found from records of the

TABLE XV

SUMMARY OF AGGREGATIVE DATA
(Million Baht)

	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>
W+P ₁	38,506	38,101	40,764	46,223	49,820	53,685	57,943	63,350
P ₂	110	110	230	150	114	197	226	150
P _{3p}	+240	+230	+196	+200	+223	+231	+234	+301
P _{3g}	+10	-80	-60	-101	-130	-133	-194	-222
P ₃	253	150	136	99	93	98	40	79
M	9,448	8,709	9,601	10,236	10,979	12,236	13,602	15,232
T _i	4,980	5,410	5,840	6,570	6,870	6,840	7,220	8,130
D	1,783	1,830	1,930	2,158	2,458	3,007	3,738	4,558
	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>
T _d	340	360	380	582	540	728	780	850
C	35,013	36,426	38,240	40,771	44,312	47,151	50,335	53,856
I ₁	5,681	5,216	5,759	6,771	6,667	9,186	11,518	12,190
I ₂	1,452	1,438	2,046	2,539	2,983	3,040	3,731	4,708
I	7,133	6,654	7,805	9,310	9,650	12,226	15,249	16,898
E	8,733	7,187	8,329	9,545	11,221	10,986	11,357	14,206
G	4,188	4,223	4,187	5,396	5,281	5,833	6,022	6,761
G+P _{3g}	4,198	4,143	4,127	5,295	5,151	5,700	5,828	6,539

(Symbol definitions in Table II)

TABLE XV (Continued)
SUMMARY OF AGGREGATIVE DATA
(Million Baht)

	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>
S _p	3,253	1,665	2,374	5,170	5,298	6,166	7,258	9,094
i _{DC}	100	250	230	300	330	360	430	450
NS _p	211	127	977	323	354	293	354	603
S _B	2,497	2,253	3,980	2,546	3,386	3,901	4,041	3,811
A	1,365	866	1,887	1,354	1,343	2,196	2,073	1,670
S _f	30	531	630	709	508	740	1,515	1,475
ΔR	220	-402	132	950	1,646	1,295	949	1,437
GDP	45,868	47,305	50,485	55,937	59,887	65,132	69,065	74,444

(Symbol definitions in Table II)

TABLE XVI

SUMMARY OF AGGREGATIVE DATA AS PERCENT OF GDP
(100% = 1000)

	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>
W+P ₁	839	805	807	826	832	824	839	851
P ₂	002	002	005	003	002	003	003	002
P _{3p}	005	005	009	004	004	004	003	004
P _{3g}	000	-002	-001	-002	-002	-002	-003	-003
P ₃	005	003	003	002	002	002	000	001
M	206	184	190	183	183	188	197	205
T _i	109	114	116	108	115	105	105	109
D	039	039	038	038	041	046	054	061
	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>
T _d	007	008	008	010	009	011	011	011
C	763	770	757	728	740	724	729	723
I ₁	124	110	114	121	111	141	167	164
I ₂	032	030	041	045	050	047	054	063
I	156	140	155	166	161	188	221	227
E	190	152	165	171	187	167	164	191
G	092	090	083	097	088	090	087	091
G+P _{3g}	092	088	082	095	086	088	084	088

(Symbol definitions in Table II)

TABLE XVI (Continued)

SUMMARY OF AGGREGATIVE DATA AS PERCENT OF GDP
(100% = 1000)

	<u>1957</u>	<u>1958</u>	<u>1959</u>	<u>1960</u>	<u>1961</u>	<u>1962</u>	<u>1963</u>	<u>1964</u>
S _p	071	035	047	092	088	094	105	122
i _{DG}	002	005	005	005	006	006	006	006
DS _p	005	003	019	005	006	004	005	008
S _g	054	088	079	046	057	060	059	051
A	030	018	037	024	022	034	030	022
S _f	001	011	012	012	008	011	022	020
ΔR	005	-008	003	017	027	020	014	019

(Symbol definitions in Table II)

TABLE XVII

Averages of Ratios
(1000 = 100%)

	<u>1957/58/59</u>	<u>1960/61/62</u>	<u>1963/64</u>	<u>1957/58/59/60</u>	<u>1961/62/63/64</u>	<u>Whole Period</u>
W+P ₁	817	827	845	819	837	828
P ₂	003	003	003	003	003	003
P _{3p}	005	004	004	005	004	005
P _{3g}	-001	-002	-003	-001	-003	-002
P _{3p} +P _{3g}	004	002	001	004	001	003
M	193	185	201	191	193	192
T _i	113	109	107	112	109	111
D	039	042	058	039	051	045
T _d	008	010	011	008	011	010
C	763	731	726	755	729	742
I ₁	116	124	166	117	146	132
I ₂	034	047	059	037	054	046
I ₁ +I ₂	150	171	225	154	200	178
E	169	175	178	170	177	174
G	088	092	089	091	089	090
G+P _{3g}	087	090	086	089	087	088
S _p	050	091	114	061	102	082
i _{DG}	004	006	006	004	006	005

TABLE XVII (Continued)

Averages of Ratios
(1000 = 100%)

	<u>1957/58/59</u>	<u>1960/61/62</u>	<u>1963/64</u>	<u>1957/58/59/60</u>	<u>1961/62/63/64</u>	<u>Whole Period</u>
DS_p	009	005	007	008	006	007
S_g	074	054	055	067	057	062
A	028	027	026	027	027	027
S_f	011	010	021	009	015	012
Δ_R	000	021	017	004	020	012

(Symbol definitions in Table II)

Table XVIII

Thailand 1957

GDP = 45868

(All Figures in Million Baht)

PRODUCTION		GOVERNMENT	
$W + P_1 = 38,506$	$C = 35,013$	$G + P_{3g} = 4,198$	$T_i = 4,980$
$P_2 = 110$	$I_1 = 5,681$	$i_{DG} = 100$	$T_d = 340$
$P_{3p} = 240$	$I_2 = 1,452$	$S_g = 2,497$	$P_2 = 110$
$P_{3g} = 10$	$E = 8,733$		$A = 1,365$
$T_i = 4,980$	$G + P_{3g} = 4,198$		
$D = 1,783$			
$M = 9,448$			

HOUSEHOLDS		FOREIGN	
$T_d = 340$	$W + P_1 = 38,506$	$E = 8,733$	$DS_p = 211$
$C = 35,013$	$i_{DG} = 100$	$A = 1,365$	$P_{3g} = 10$
			$P_{3p} = 240$
$S_p = 3,253$			$M = 9,448$
		$S_f = 30$	$\Delta R = 220$

S/I	
$I_1 = 5,681$	$S_p = 3,253$
$I_2 = 1,452$	$S_g = 2,497$
$\Delta R = 220$	$S_f = 30$
$DS_p = 211$	$D = 1,783$

TABLE XIX

Thailand 1957

GDP = 100%

PRODUCTION		GOVERNMENT	
W+P ₁ = 839	C = 763	G+P _{3g} = 092	T _i = 109
P ₂ = 002	I ₁ = 124	i _{DG} = 002	T _d = 007
P _{3p} = 005	I ₂ = 032	S _g = 054	P ₂ = 002
P _{3g} = 000	E = 190		A = 030
T _i = 109	G+P _{3g} = 092		
D = 039			
M = 206			
HOUSEHOLDS		FOREIGN	
T _d = 007	W+P ₁ = 839	E = 190	DS _p = 005
C = 763	i _{DG} = 002	A = 030	P _{3g} = 000
			P _{3p} = 005
S _p = 071		S _f = 001	M = 206
			ΔR = 005
S/I			
	I ₁ = 124	S _p = 071	
	I ₂ = 032	S _g = 054	
	ΔR = 005	S _f = 001	
	DS _p = 005	D = 039	

TABLE XX

Thailand 1958

GDP = 47305

(All Figures in Million Baht)

PRODUCTION		GOVERNMENT	
$W+P_1 = 38,101$	$C = 36,426$	$G+P_{3g} = 4,143$	$T_i = 5,410$
$P_2 = 110$	$I_1 = 5,216$	$i_{DG} = 250$	$T_d = 360$
$P_{3p} = 230$	$I_2 = 1,438$	$S_g = 2,353$	$P_2 = 110$
$P_{3g} = -80$	$E = 7,187$		$A = 866$
$T_i = 5,410$	$G+P_{3g} = 4,143$		
$D = 1,830$			
$M = 8,709$			

HOUSEHOLDS		FOREIGN	
$T_d = 360$	$W+P = 38,101$	$E = 7,187$	$DS_p = 127$
$C = 36,426$	$i_{DG} = 250$	$A = 866$	$P_{3p} = 230$
			$P_{3g} = -80$
$S_p = 1,665$			$M = 8,709$
		$S_f = 531$	$\Delta R = -402$

S/I	
$I_1 = 5,216$	$S_p = 1,665$
$I_2 = 1,438$	$S_g = 2,353$
$\Delta R = -402$	$S_f = 531$
$DS_p = 127$	$D = 1,830$

TABLE XXI

Thailand 1958

GDP = 100%

PRODUCTION		GOVERNMENT	
W+P ₁ = 805	C = 770	G+P _{3g} = 088	T _i = 114
P ₂ = 002	I ₁ = 110	i _{DG} = 005	T _d = 008
P _{3p} = 005	I ₂ = 030	S _g = 050	P ₂ = 002
P _{3g} = -002	E = 152		A = 018
T _i = 114	G+P _{3g} = 088		
D = 039			
M = 184			

HOUSEHOLDS		FOREIGN	
T _d = 008	W+P ₁ = 805	E = 152	DS _p = 003
C = 770	i _{DG} = 005	A = 018	P _{3g} = -002
S _p = 035		S _f = 011	P _{3p} = 005
			M = 184
			ΔR = -008

S/I	
I ₁ = 110	S _p = 035
I ₂ = 030	S _g = 050
ΔR = -008	S _f = 011
DS _p = 003	D _i = 039

TABLE XXII

Thailand 1959

GDP = 50485

(All Figures in Million Baht)

PRODUCTION		GOVERNMENT	
$W+P_1 = 40,764$	$C = 38,240$	$G+P_{3g} = 4,127$	$T_i = 5,840$
$P_2 = 230$	$I_1 = 5,759$	$i_{DG} = 230$	$T_d = 380$
$P_{3p} = 196$	$I_2 = 2,046$	$S_g = 3,980$	$P_2 = 230$
$P_{3c} = -60$	$E = 8,329$		$A = 1,887$
$T_i = 5,840$	$G+P_{3g} = 4,127$		
$D = 1,930$			
$M = 9,601$			

HOUSEHOLDS		FOREIGN	
$T_d = 380$	$W+P_1 = 40,764$	$E = 8,329$	$DS_p = 977$
$C = 38,240$	$i_{DG} = 230$	$A = 1,887$	$P_{3g} = 196$
			$P_{3p} = -60$
$S_p = 2,374$			$M = 9,601$
		$S_f = 630$	$\Delta R = 132$

S/I	
$I_1 = 5,759$	$S_p = 2,374$
$I_2 = 2,046$	$S_g = 3,980$
$\Delta R = 132$	$S_f = 630$
$DS_p = 977$	$D = 1,930$

TABLE XXIII

Thailand 1959

GDP = 100%

PRODUCTION		GOVERNMENT	
W+P ₁ = 807	C = 757	G+P _{3g} = 082	T _i = 116
F ₂ = 005	I ₁ = 114	i _{DG} = 005	T _d = 008
P _{3p} = 004	I ₂ = 041	S _g = 079	P ₂ = 005
P _{3g} = -001	E = 165		A = 037
T _i = 116	G+P _{3g} = 082		
D = 038			
M = 190			
HOUSEHOLDS		FOREIGN	
T _d = 008	W+P ₁ = 807	E = 165	DS _p = 019
C = 757	i _{DG} = 005	A = 037	P _{3p} = -001
			P _{3g} = 004
S _p = 047		S _f = 012	M = 190
			ΔR = 003
∑I			
	I ₁ = 114	S _p = 047	
	I ₂ = 041	S _g = 079	
	ΔR = 003	S _f = 012	
	DS _p = 019	D = 038	

Table XXIV

Thailand 1960

GDP = 55937

(All Figures in Million Baht)

PRODUCTION		GOVERNMENT	
$W+P_1 = 46,223$	$C = 40,771$	$G+P_{3g} = 5,295$	$T_i = 6,055$
$F_2 = 150$	$I_1 = 6,771$	$i_{DG} = 300$	$T_d = 582$
$P_{3p} = 200$	$I_2 = 2,539$	$S_g = 2,546$	$P_2 = 150$
$P_{3g} = -101$	$E = 9,545$		$A = 1,354$
$T_i = 6,055$	$G+P_{3g} = 5,295$		
$D = 2,158$			
$M = 10,236$			
HOUSEHOLDS		FOREIGN	
$T_d = 582$	$W+P_1 = 46,223$	$E = 9,545$	$DS_p = 323$
$C = 40,771$	$i_{DG} = 300$	$A = 1,354$	$P_{3g} = -101$
			$P_{3p} = 200$
$S_p = 5,170$			$M = 10,236$
		$S_f = 709$	$\Delta R = 950$
S/I			
$I_1 = 6,771$	$S_p = 5,170$		
$I_2 = 2,539$	$S_g = 2,546$		
$\Delta R = 950$	$S_f = 709$		
$DS_p = 323$	$D = 2,158$		

TABLE XXV

Thailand 1960

GDP = 100%

PRODUCTION		GOVERNMENT	
W+P ₁ = 826	C = 729	G+P _{3g} = 095	T _i = 108
P ₂ = 003	I ₁ = 121	i _{DG} = 005	T _d = 010
P _{3p} = 004	I ₂ = 045	S _g = 046	P ₂ = 002
P _{3g} = -002	E = 171		A = 024
T _i = 108	G+P _{3g} = 095		
i = 039			
M = 183			

HOUSEHOLDS		FOREIGN	
T _d = 010	W+P ₁ = 826	E = 170	DS _p = 006
C = 729	i _{DG} = 005	A = 024	P _{3g} = -002
S _p = 092		S _f = 013	P _{3p} = 004
			M = 183
			ΔR = 017

S/I	
I ₁ = 121	S _p = 092
I ₂ = 045	S _g = 046
ΔR = 017	S _f = 013
DS _p = 006	D = 039

TABLE XXVI

Thailand 1961

GDP = 59887

(All Figures in Million Baht)

PRODUCTION		GOVERNMENT	
W+P ₁ = 49,820	C = 44,312	G+P _{3g} = 5,151	T _i = 6,870
I ₂ = 114	I ₁ = 6,667		T _d = 540
P _{3p} = 223	I ₂ = 2,983	i _{DG} = 330	P ₂ = 114
P _{3g} = -130	E = 11,221	S _g = 3,386	A = 1,343
T _i = 6,870	G+P _{3g} =		
+D = 2,458	5,151		
M = 10,979			

HOUSEHOLDS		FOREIGN	
T _d = 540	W+P ₁ = 49,820	E = 11,221	DS _p = 354
C = 44,312	i _{DG} = 330	A = 1,343	P _{3g} = -130
			P _{3p} = 223
			M = 10,979
S _f = 5,298		S _f = 508	ΔR = 1,646

I/s	
I ₁ = 6,667	S _p = 5,298
I ₂ = 2,983	S _g = 3,386
ΔR = 1,646	S _f = 508
DS _p = 354	D = 2,458

TABLE XXVII

Thailand 1961

GDP = 100%

PRODUCTION		GOVERNMENT	
$W+P_1 = 832$	$C = 740$	$G+P_{3g} = 086$	$T_i = 115$
$P_2 = 002$	$I_1 = 111$		$T_d = 009$
$P_{3p} = 004$	$I_2 = 050$	$i_{DG} = 006$	$P_2 = 002$
$P_{3g} = 002$	$E = 187$	$S_g = 057$	$A = 022$
$T_i = 115$	$G+P_{3g} = 086$		
$D = 041$			
$M = 183$			

HOUSEHOLDS		FOREIGN	
$T_d = 009$	$W+P_1 = 832$	$E = 187$	$DS_p = 006$
$C = 740$	$i_{DG} = 006$	$A = 022$	$P_{3g} = -002$
			$P_{3p} = 004$
$S_p = 088$			$M = 183$
		$S_f = 008$	$\Delta R = 027$

I/S	
$I_1 = 111$	$S_p = 088$
$I_2 = 050$	$S_g = 057$
$\Delta R = 027$	$S_f = 008$
$DS_p = 006$	$D = 041$

TABLE XXVIII

Thailand 1962

GDP = 65132

(All Figures in Million Baht)

PRODUCTION		GOVERNMENT	
$W+P_1 = 53,685$	$C = 47,151$	$G+P_{3g} = 5,300$	$T_i = 6,840$
$P_2 = 197$	$I_1 = 9,186$	$i_{DG} = 360$	$T_d = 728$
$P_{3p} = 231$	$I_2 = 3,040$	$S_g = 3,901$	$P_2 = 197$
$P_{3g} = -133$	$E = 10,986$		$A = 2,196$
$T_i = 6,840$	$G+P_{3g} =$		
$D = 3,007$	$5,112$		
$M = 12,236$			
HOUSEHOLDS		FOREIGN	
$T_d = 728$	$W+P_1 = 53,685$	$E = 10,986$	$DS_p = 293$
$C = 47,151$	$i_{DG} = 360$	$A = 2,196$	$P_{3g} = -133$
			$P_{3p} = 231$
			$M = 12,236$
$S_p = 6,166$		$S_f = 740$	$\Delta R = 1,295$
I/S			
	$I_1 = 9,186$	$S_p = 6,166$	
	$I_2 = 3,040$	$S_g = 3,901$	
	$\Delta R = 1,295$	$S_f = 740$	
	$DS_p = 293$	$D = 3,007$	

TABLE XXIX

Thailand 1962

GDP = 100%

PRODUCTION		GOVERNMENT	
W+P ₁ = 824	C = 724	G+P _{3g} = 088	T _i = 105
P ₂ = 003	I ₁ = 141	i _{DG} = 006	T _d = 011
P _{3p} = 004	I ₂ = 047		P ₂ = 003
P _{3g} = -002	E = 169	S _g = 060	A = 034
T _i = 105	G+P _{3g} = 088		
D = 046			
M = 188			
HOUSEHOLDS		FOREIGN	
T _d = 011	W+P ₁ = 824	E = 169	DS _p = 004
C = 724	i _{DG} = 006	A = 034	P _{3g} = -002
			P _{3p} = 004
			M = 188
S _p = 094		S _f = 011	AR = 020
I/S			
	I ₁ = 141	S _p = 095	
	I ₂ = 047	S _g = 060	
	AR = 020	S _f = 011	
	DS _p = 004	D = 046	

TABLE XXX

Thailand 1963

GDP = 69065

(All Figures in Million Baht)

PRODUCTION		GOVERNMENT	
$W+P_1 = 57,943$	$C = 50,335$	$G+P_{3g} = 5,828$	$T_i = 7,220$
$P_2 = 226$	$I_1 = 11,518$	$i_{DG} = 430$	$T_d = 780$
$P_{3p} = 234$	$I_2 = 3,731$	$S_g = 4,041$	$P_2 = 226$
$P_{3g} = -194$	$E = 11,357$		$A = 2,073$
$T_i = 7,220$	$G+P_{3g} = 5,828$		
$D = 3,738$			
$M = 13,602$			

HOUSEHOLDS		FOREIGN	
$T_d = 780$	$W+P_1 = 57,943$	$E = 11,357$	$DS_p = 354$
$C = 50,335$	$i_{DG} = 430$	$A = 2,073$	$P_{3g} = 234$
			$P_{3p} = -194$
$S_p = 7,258$			$M = 13,602$
		$S_f = 1,515$	$\Delta R = 949$

S/I	
$I_1 = 11,518$	$S_p = 7,258$
$I_2 = 3,731$	$S_g = 4,041$
$\Delta R = 949$	$S_f = 1,515$
$DS_p = 354$	$D = 3,738$

TABLE XXXI

Thailand 1963

GDP = 100%

PRODUCTION		GOVERNMENT	
$W+P_1 = 839$	$C = 729$	$G+P_{3g} = 084$	$T_i = 105$
$P_2 = 003$	$I_1 = 167$	$i_{DG} = 006$	$T_d = 011$
$P_{3p} = 003$	$I_2 = 054$	$S_g = 059$	$P_2 = 003$
$P_{3g} = 003$	$E = 164$		$A = 030$
$T_i = 105$	$G+P_{3g} = 084$		
$D = 054$			
$M = 197$			

HOUSEHOLDS		FOREIGN	
$T_d = 011$	$W+P_1 = 839$	$E = 164$	$DS_p = 005$
$C = 729$	$i_{DG} = 006$	$A = 030$	$P_{3g} = 003$
			$P_{3p} = -003$
$S_p = 105$		$S_f = 022$	$M = 197$
			$\Delta R = 014$

S/I	
$I_1 = 167$	$S_p = 105$
$I_2 = 054$	$S_g = 059$
$\Delta R = 014$	$S_f = 022$
$DS_p = 005$	$D = 054$

TABLE XXXII

Thailand 1964

GDP = 74444

(All Figures in Million Baht)

PRODUCTION		GOVERNMENT	
$W+P_1 = 63,350$	$C = 53,856$	$G+P_{3g} = 6,539$	$T_i = 8,130$
$P_2 = 150$	$I_1 = 12,190$	$i_{DG} = 450$	$T_d = 850$
$P_{3p} = 301$	$I_2 = 4,708$	$S_g = 3,811$	$P_2 = 150$
$P_{3g} = -222$	$E = 14,206$		$A = 1,670$
$T_i = 8,130$	$G+P_{3g} =$		
$D = 4,558$	$6,539$		
$M = 15,232$			
HOUSEHOLDS		FOREIGN	
$T_d = 850$	$W+P_1 = 63,350$	$E = 14,206$	$DS_p = 603$
$C = 53,856$	$i_{DG} = 450$	$A = 1,670$	$P_{3g} = 301$
			$P_{3p} = -222$
			$M = 15,232$
$S_p = 9,094$		$S_f = 1,475$	$\Delta R = 1,437$
S/I			
$I_1 = 12,190$	$S_p = 9,094$		
$I_2 = 4,708$	$S_g = 3,811$		
$\Delta R = 1,437$	$S_f = 1,475$		
$DS_p = 603$	$D = 4,558$		

TABLE XXXIII

Thailand 1964

GDP = 100%

PRODUCTION		GOVERNMENT	
W+P ₁ = 851	C = 723	G+P _{3g} = 088	T _i = 109
P ₂ = 002	I ₁ = 164	i _{DG} = 006	T _d = 011
P _{3p} = 004	I ₂ = 063	S _g = 051	P ₂ = 002
P _{3g} = -003	E = 191		A = 022
T _i = 109	G+P _{3g} =		
D = 061	088		
M = 205			
HOUSEHOLDS		FOREIGN	
T _d = 011	W+P ₁ = 851	E = 191	DS _p = 008
C = 723	i _{DG} = 006	A = 022	P _{3g} = -003
			P _{3p} = 004
			M = 205
S _f = 122		S _f = 020	AR = 019
S/I			
	I ₁ = 164	S _p = 122	
	I ₂ = 063	S _g = 051	
	AR = 019	S _f = 020	
	DS _p = 008	D = 061	

Ministry of Finance, the Budgets in Brief, and the Statistical Yearbook. This allowed the wages plus profits items to be estimated by residual.

Similarly, in the government nexus account, foreign assistance is available from the balance of payments and direct taxes from the same sources as indirect taxes. Government saving is estimated as a residual, as is private saving. The foreign nexus essentially corresponds to the balance of payments. With four nexuses in balance, the financial nexus is necessarily balanced.

The Thai national income accounts in fact present three official accounts: (1) an estimate of gross domestic product, by adding together a value added estimate for each sector. This estimate of the gross domestic product is used here as a reference in determining the relative importance of the different flows. (2) the consumption estimate. This is used directly in the system. (3) the investment estimate. This is also used directly in the system. By and large the GDP value added by industry estimate is the most detailed calculation and reflects the most raw data.

Thus the level of output of the Thai economy is known reasonably well. The problem of determining the structure of the economy is more difficult. The attempt made here is only a first step, and it should be possible to refine the estimates. The importance of being familiar with the structure of the economy was previously pointed out. For development planning it is absolutely vital to attempt to visualize the way the economy will develop under different plan decisions. To do this requires some knowledge of the structure of the economy and the effect of development on the structure.

Consequently, it is strongly believed that the Thai National Income Division should work toward the objective of presenting a more comprehensive picture of the structure of the economy. In particular, there is great need for information on wages, interest, rents, etc., to fill out the income side of the production nexus.

The data presented here are in current prices. The accounts balance because they are in money terms. If a real (constant price) value for a flow is required, then one must decide which of the price indexes is most appropriate. However, unless the same deflator is used for all flows, there is no longer any reason for the accounts to balance. On the other hand, the structure in a single year can be studied through the ratios of the flows to gross domestic product. Subsequent analysis will distinguish between real and price changes for certain flows.

C. The Thai Economy, 1964

In 1964, private consumption was 72.3 percent of gross domestic product, investment was 22.7 percent, exports 19.1 percent, and government consumption 8.8 percent. The level of investment is extremely high and reflects the substantial development effort being made. Exports obviously play a critical role in the economy, reflecting the deep involvement of the country with the rest of the world. Of the investment 27.7 percent was made by the government and 72.3 percent by the private sector.

The production nexus disposed of its resources by paying 85.1 percent of GDP as wages and private profits. State enterprise profits were only 0.2 percent of GDP, reflecting their small role in the overall performance

of the economy. Similarly profits on private foreign capital were only 0.4 percent of GDP, reflecting the small percentage of production capital owned by foreigners. Government interest payments on foreign debt were actually negative, representing the large earnings on Thai official holdings of foreign securities. Indirect taxes amounted to some 11 percent of GDP and depreciation allowances to some 6 percent. This latter figure can be interpreted by noting that the ratio of depreciation allowances to GDP equals the average capital output ratio divided by the average lifetime of capital goods. For a capital output ratio of three, this implies an average lifetime of 50 years. In an economy heavily dependent upon agriculture this is not an unreasonable figure. The final outlay in the production sector is for the purchase of imports, over 20 percent of GDP. Again this illustrates the very important role of international trade in the Thai economy.

The government nexus shows first the importance of different sources of financing. Indirect taxes are the most important, representing some 11 percent of GDP; next is foreign assistance (2.2 percent); third, direct taxes (1.1 percent); and finally, state enterprise profits (.2 percent). In relative terms, indirect taxes provide 76 percent of government resources; foreign assistance, 15 percent; direct taxes, 8 percent, and state enterprise profits, 1 percent. As is usually the case in less-developed countries, indirect taxes are the dominant source of governmental resources. However, the figures also indicate the importance of foreign aid as a provider of government resources. Since indirect taxes in Thailand depend heavily upon

imports and exports, the foreign nexus has a strong connection to the government nexus.

Turning to the disposition of government resources, the dominant item, as would be expected, was purchase of collective consumption (8.8 percent of GDP). A small amount represented interest payments on government bonds and the remainder, government saving. This shows a significant government saving capacity - 5.1 percent of GDP. However, recalling that the net contribution of foreign aid was 1.4 percent of GDP (foreign assistance less debt service of principal) government saving from domestic sources of revenue was 3.7 percent of GDP.

The household nexus data indicate that the income available to business firms and households was 85.7 percent of GDP. Of this 72.3 percent represented consumption; 12.2 percent saving; and 1.1 percent direct taxes. Hence, disposable income was 84.6 percent of GDP, and the average propensity to save out of disposable income was almost 16 percent. This, of course, includes saving by business firms.

The foreign nexus reveals the openness of the economy, both in terms of imports (20.5 percent of GDP) and exports (19.1 percent). Foreign assistance and private investment amount to 4.2 percent of GDP. These foreign exchange resources allowed the economy to finance repayment of debt service (0.5 percent of GDP), profit transfers (0.4 percent of GDP), and an increase of foreign exchange reserves (1.9 percent). The substantial increases in foreign exchange reserves indicate that the economy was not particularly short of either resources to finance investment or foreign

exchange. The aggregate data for the foreign nexus suggest the main contribution of foreign assistance or private foreign investment might lie in the accompanying skills that are essential to the execution of the projects.

Finally, turning to the financial nexus we see that the total supply of saving amounted to 25.4 percent of GDP. Of this, slightly less than half came from private saving, slightly less than a quarter from depreciation allowances, one-fifth from government saving, and less than one-tenth from private foreign investment. A different picture emerges if we define foreign saving as foreign assistance (gross) plus private foreign investment. Then government saving was 11.4 percent of total saving, and foreign saving 16.5 percent of the total. A further adjustment is required to include depreciation allowances. We assume that 20 percent of depreciation allowances originate in state enterprises. This may be an overestimate since the average lifetime is longer in the types of productive activity engaged in by most state enterprises. Furthermore, total government fixed capital formation has averaged not more than 25 percent of total fixed capital formation. With this depreciation figure, government saving as a ratio to GDP becomes 4.1 percent (government saving as defined by the government nexus less foreign aid plus state enterprise depreciation allowances) or 16 percent of total saving.

In summary, after allocation of depreciation allowances, the government provided 16 percent of total saving, 16.5 percent of foreign saving, and 69.5 percent of private saving. It must be recalled that this concept of saving includes financing increases in foreign exchange and repayment

of the principal on outstanding public debt. If these "investments" are removed, then the financial nexus account appears as follows:

(GDP = 1000)	
I ₁ = 164	S _p = 122
I ₂ = 063	S _g = 024
	S _f = 020
	D = 061

Allocating depreciation allowances and shifting foreign assistance to foreign saving, the account would appear as follows:

(GDP = 1000)	
I ₁ = 164	S _p ' = 171
I ₂ = 063	S _g ' = 022
	S _f ' = 034

In the latter formulation, of the saving available for purchases of capital goods and inventories (22.7 percent of GDP), the bulk came from private saving (75 percent of total 'real' investment); foreign sources provided 15 percent, and the remainder (10 percent) came from the government. Here the government's contribution to saving in the strict sense appears smaller but yet significant.

We can easily show the relative importance of borrowing and saving. The private sector provided savings equivalent to 19.1 percent of GDP. This came from private domestic saving (17.1 percent including depreciation) and

foreign private saving (2.0 percent). However, only 16.4 percent of GDP was invested in the private sector, the remainder going to the government. Consequently, there was a transfer of savings equivalent to 2.7 percent of GDP from the private sector to the government. The government provided savings representing 2.2 percent of GDP from the internal resources, plus 1.4 percent of GDP from foreign assistance (where principal repayment has been netted out). Together with the transfer of private savings, these financed government investment. In relative terms, therefore, 35 percent of government investment was financed from internal government sources, 22 percent by foreign aid, and 42 percent by borrowing from the private sector. These estimates are made after allowing the government to increase foreign exchange reserves, that is the increase in foreign exchange reserves is treated as a government expenditure.

In summary, we draw a few observations. First, the Thai economy remains predominantly private sector-oriented. The most significant contributions to saving and investment arise out of the private sector. At the aggregate quantitative level, of course, the strategic role of government activity tends to be obscured. Nevertheless, this should not deter one from recognizing the central role of the private sector. The economic development of Thailand is ultimately dependent upon the quality and extent of private entrepreneurship.

Second, the economy is closely tied to the international economy. Imports and exports are both significant parts of gross domestic product, and government revenues are closely linked to imports and exports. Furthermore, foreign assistance is a significant component of government investment.

Although private foreign saving is a relatively small part of the financing of private investment (12 percent), it is no doubt an important device for the transmission of special skills and entrepreneurship.

Finally, it should be evident that at the aggregate level the Thai economy is dominated by the consumption behavior of the population, and the investment behavior of the entrepreneurs. It is in the evolution of these economic variables that one must look for the sources of Thai economic development. We next turn to an examination of the dynamic behavior of the economy during the past eight years.