

## Chapter 2: Conceptual Frameworks for Measurement

This chapter draws on standard accounting concepts to present a conceptual framework for measurement of stocks, such as assets and wealth, and flows, such as income and consumption, along with traditional decompositions. National income accounts are based on corporate financial accounts, so in the measurement there is a close and clean link between micro economics and macro economics. These accounts distinguish assets and liabilities in the balance sheet, from (accrued) income (with saving as additions to net worth) and from cash flow as in a budget constraint. These accounts and the distinction between stocks and flows are drawn throughout this book, when discussing financial sector access/use, for example, and of course the models.

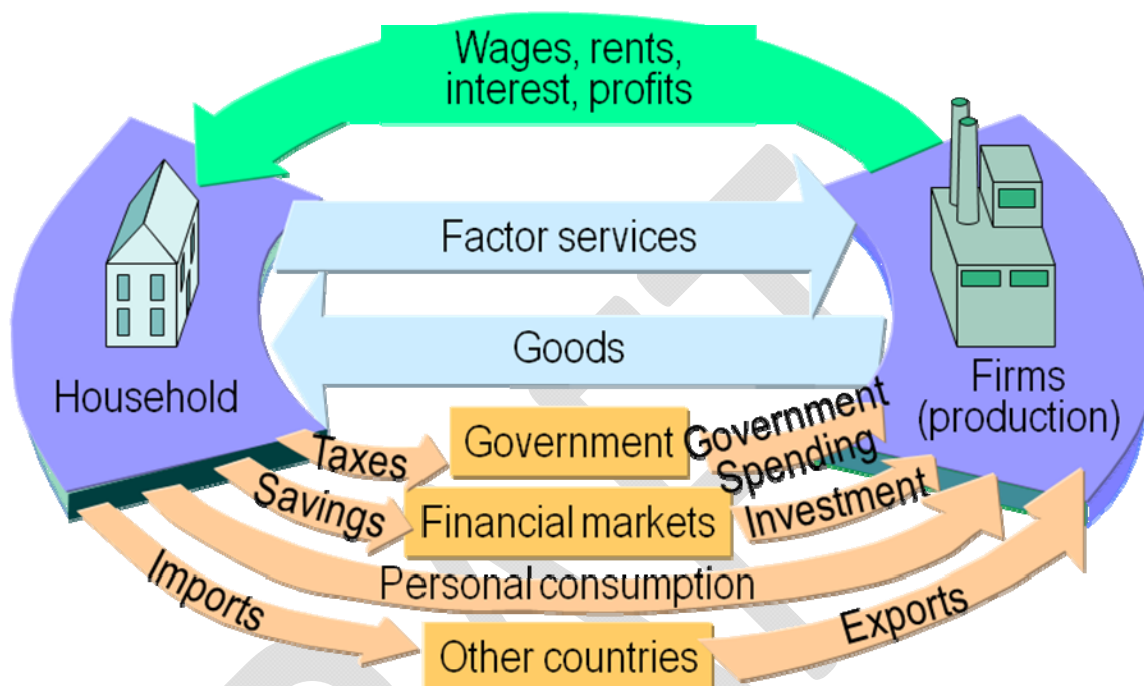
The unity of the accounts and measurement also means that, in principle, development economics, corporate finance, and macro-economics all come together. Yet in practice the traditional accounting model of national income accounts and the associated “circular flow” diagram envision little production in the household sector. For these and other reasons there are discrepancies between national income accounts and data from household surveys.

Still, even as estimated in the national accounts, non-farm proprietary income has been large relative to other factor payments. Non-farm proprietary income still dominates corporate profits, for example. Emphasizing the importance of domestic growth, private investment has the largest share of GDP and strongly tracks it. Data from an ongoing household survey and constructed balance sheet, income, and cash flow accounts show there is indeed much production in the household sector and the distinction between households and firms is blurred. The book emphasizes non-standard levels of aggregation, as well, such as kinships networks, villages, and family-related industrial conglomerates.

### 2.1 The Standard Accounting Model: National Income Accounts

The standard accounting model of an economy uses a “flow of funds” concept, as illustrated in Figure 2.1.1., “The Circular Flow”. In this model, households provide factors such as labor, land, and financing to firms who produce the economy’s goods and services, paying back wages, rent, interest, and residual profits. In particular, financial markets and institutions mobilize savings and allow firms to invest. There is an obvious separation in this conceptualization between households as consumers and firms as producers, with rare exception.

# The Circular Flow



[Figure 2.1.1. The Circular Flow. Based on: Colander (2004)]

Measures of GDP thus start logically with the accounts of firms; the balance sheet, income statement, and cash flow statement of corporate financial accounts (Table 2.1.2.) form the basis for the construction of the national balance sheet and income and statements. Wages, interest, and rent in the income statement are among the cost of goods sold or goods produced for inventory. Retained earnings and dividends are a residual, adding to a firm's net assets or payment to its owners. Current assets and liabilities, real and financial, are listed on the balance sheet, with the difference as stockholders equity. Cash flows can be attributed to real activity, financing, or asset changes. The main difference between corporate and national accounting, beyond rearrangement categories, is the treatment of inventories. Goods produced but not yet sold are not counted as income in corporate financial accounting.

**Table 1.—Balance Sheet of a Business Firm**

December 31, 19\_\_

Assets	Liabilities and stockholders' equity
<b>Current assets</b> Financial assets Cash and equivalent Accounts receivable Inventories <b>Securities</b>	<b>Current liabilities</b> Loans Accounts payable <b>Bonds</b> <b>Stockholders' equity</b> Capital stock Retained earnings
<b>Fixed assets</b> Plant and equipment <i>Less: Accumulated depreciation</i> Land <i>Less: Accumulated depletion</i>	
<b>Total assets</b>	<b>Total liabilities and stockholders' equity</b>

**Table 2.—Statement of Income and Retained Earnings of a Business Firm**

For Year Ended December 31, 19\_\_

Sales, net of discounts
<i>Less:</i> Cost of goods and services sold
Purchased materials
Purchased services
Wages and salaries
Depreciation
Depletion
Indirect business taxes
Beginning inventory
<i>Less:</i> Ending inventory
<i>Equals:</i> Operating income
<i>Plus:</i> Interest and dividends received
<i>Less:</i> Interest paid
<i>Plus:</i> Gains (net of losses) on sales of fixed assets and securities
<i>Equals:</i> Net income before tax
<i>Less:</i> Corporate income tax
<i>Equals:</i> Net income after tax
<i>Less:</i> Dividends paid
<i>Equals:</i> Additions to retained earnings

[Table 2.1.2. Source: U.S. Bureau of Economic Analysis (1985)]

BUSINESS				HOUSEHOLDS			
Production Account				Production Account			
Uses		Sources		Uses		Sources	
Wages and salaries	110	Sales		Wages and salaries	5	Sales to consumers	5
Capital consumption allowances	10	To consumers	125				
Net interest		To government	25				
Interest paid		To business of plant and equipment	25				
To households	6	To foreigners of goods and services	20				
To government	2	Less: Purchases from foreigners of goods and nonfactor services	10				
To foreigners	5	Change in inventories	5				
Less: Interest received							
From foreigners	3						
From households	4						
From government	1						
Indirect taxes	10						
Profits	55						
Charges against gross business product	190	Gross business product	190	Charges against gross household product	5	Gross household product	5
Appropriation Account				Appropriation Account			
Uses		Sources		Uses		Sources	
Profits tax	20	Profits	55	Personal taxes	20	Wages and salaries received	
Dividends paid				Purchases	12	From business	110
To households	10			From businesses	5	From household	5
To foreigners	5			From households	5	From government	20
Less: Dividends received from foreigners	5			Interest paid		Interest received	
Undistributed profits	25			To businesses	4	From business	6

		To government	1	From government	4
		To foreigners	5	From foreigners	5
		Saving	15	Dividends received	
				From business	10
				From foreigners	5
				Transfer payments	10
Distribution of profits and saving	55	Profits	55	Personal taxes, outlays, and saving	17
				Personal income	5
Saving-Investment Account			Saving-Investment Account		
Uses		Sources		Uses	
Sources		Uses		Sources	
Plant and equipment purchases	25	Undistributed profits	25	Net acquisitions of financial assets	39
Change in inventories	5	Capital consumption allowances	10	Less: Net increase in liabilities	24
Net acquisitions of financial assets	105			Saving	15
Less: Net increase in liabilities	100				
Gross investment	35	Gross saving	35	Gross investment	15
				Gross saving	15

[Table 2.1.3. Production, appropriation, and saving-investment accounts. Source: U.S. Bureau of Economic Analysis (1985)]

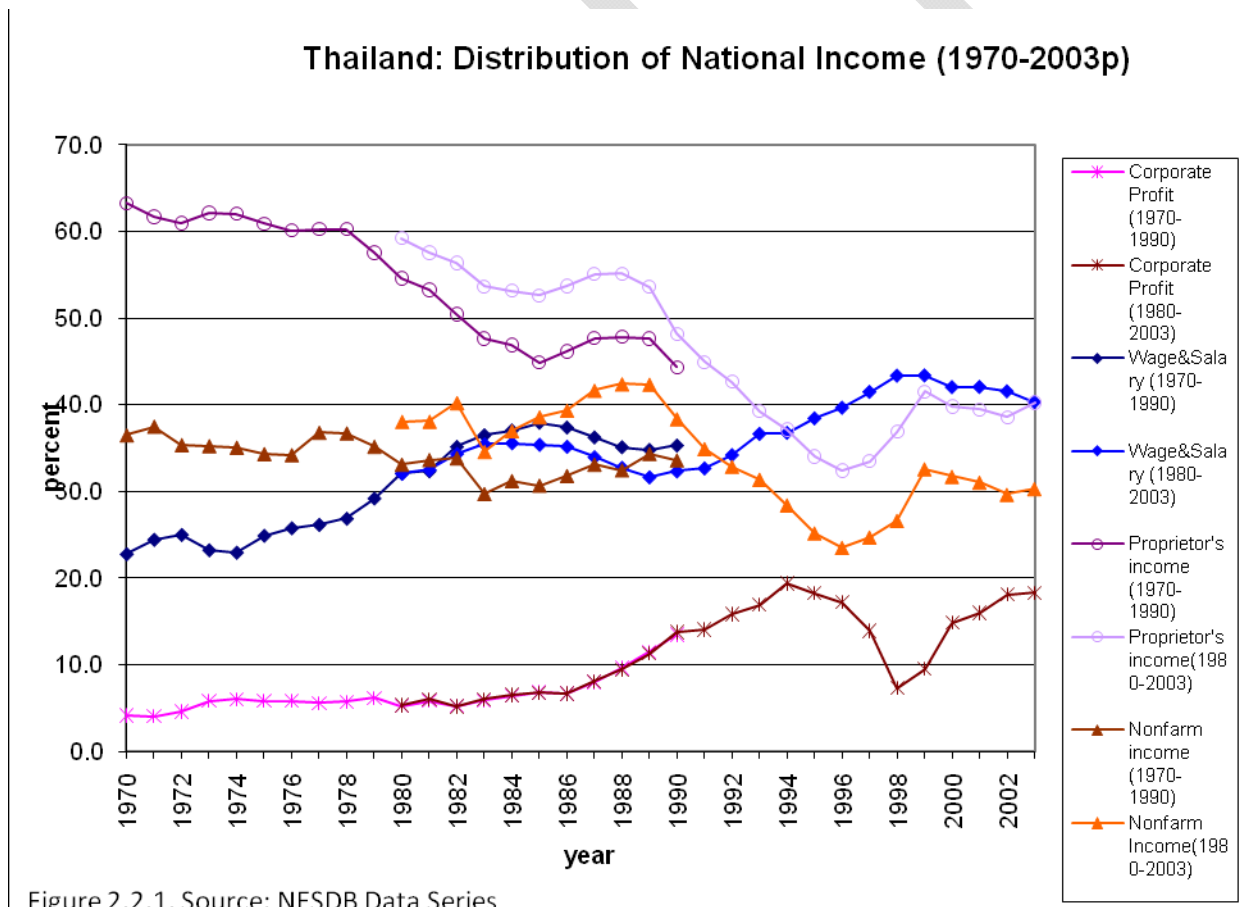
Inclusion of government accounts and foreign sector accounts, with remittances and investment abroad, completes the construction of the national income accounts, as shown in Table 2.1.3. These include the production accounts, appropriations accounts and saving-investment accounts, and they reflect the standard accounting model, with sector accounts revealing the conceptualization of households as consumers and not as firms, in consonance with the circular flow diagram.

## 2.2 Standard Decompositions in the Standard Model: Unincorporated Enterprise, Private Investment

Standard decompositions reveal some striking findings in the Thai national accounts:

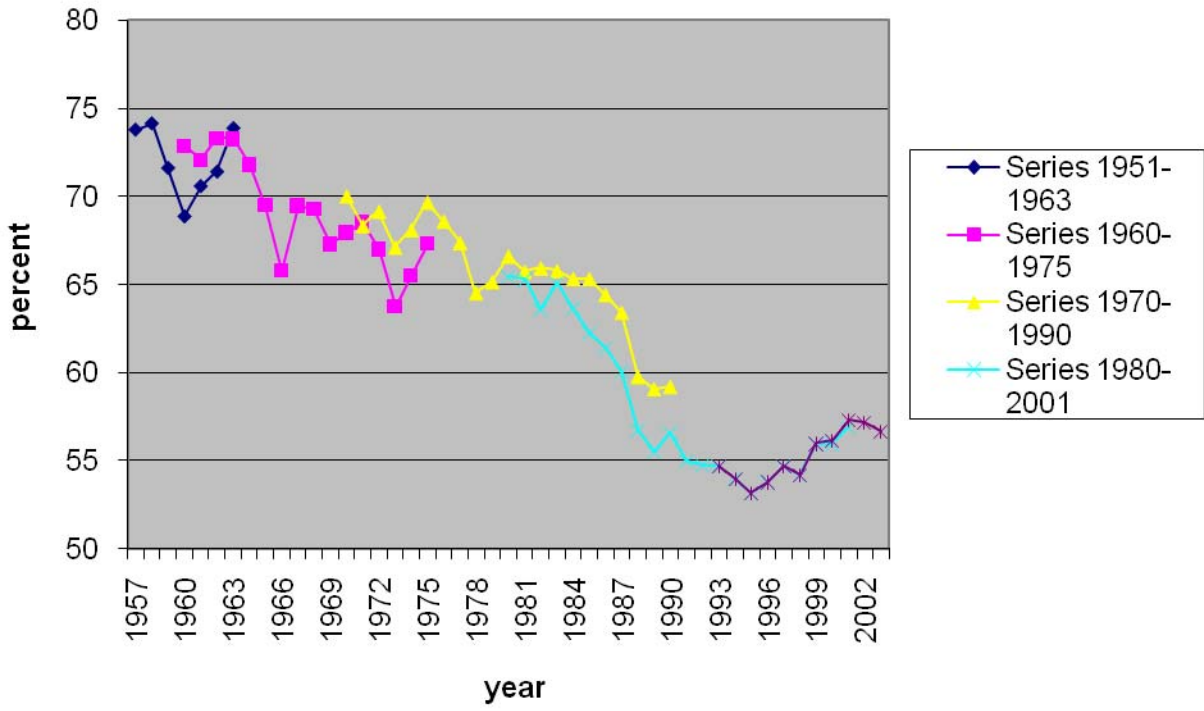
### Income Decomposition

- Farm and non farm proprietary income in 1970 in Thailand was large, about 64% of national income, and corporate profits was small, at only 5%. This disparity, while less considerable, remains in the contemporary Thai economy, at 40% and 18% for proprietor and corporate income, respectively.
- Wage income at 22% of all income in 1970 rose more or less steadily to peak at 45% in 1997, equal to or exceeding proprietor income. Wages earnings have declined slightly since 1997.
- Non-farm enterprise has been at least half of all proprietor/enterprise income. Non-farm proprietor income peaked at about 43% of all income in 1988, declined to 23% in 1997, and then regained some of its former importance, rising to approximately 30% in 2002.
- Non-farm enterprise is dominated only by wage earnings, at 40%. All enterprise (farm and non-farm) is roughly equal to wages. All these exceed corporate profits, at only 18%. In sum, non-farm enterprise has been and remains a pillar of the Thai economy.

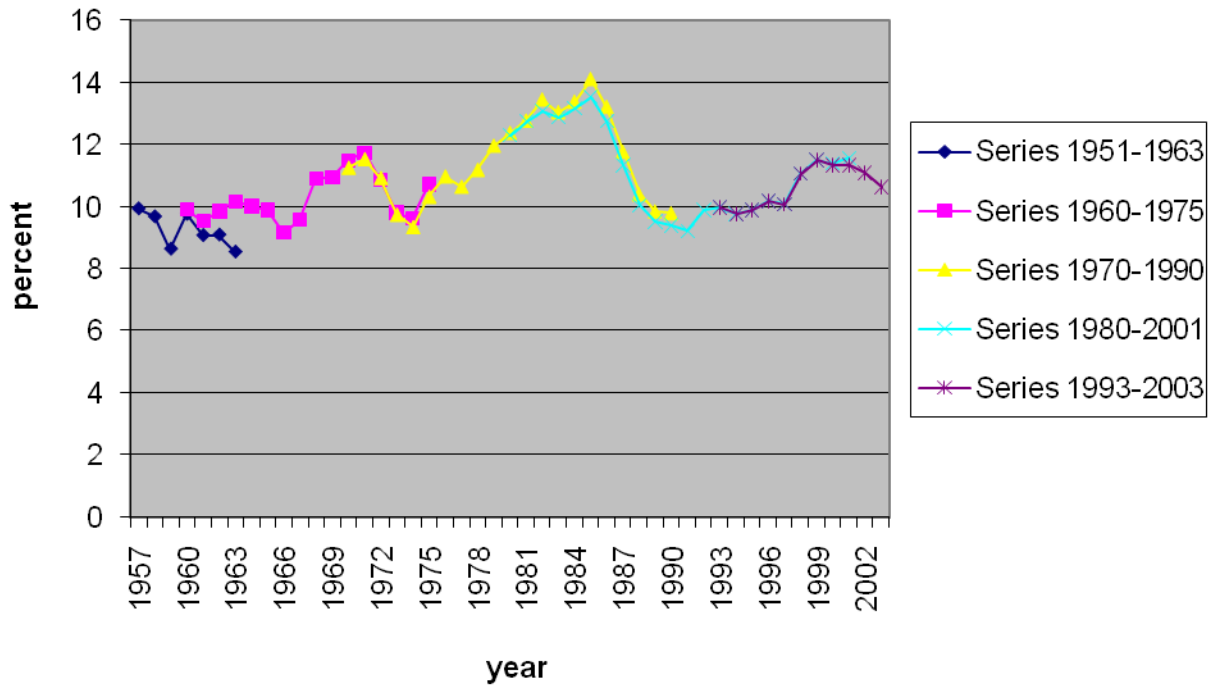


[Figure 2.2.1. Source: Adapted from NESDB data]

Private Consumption share of GDP (current price)



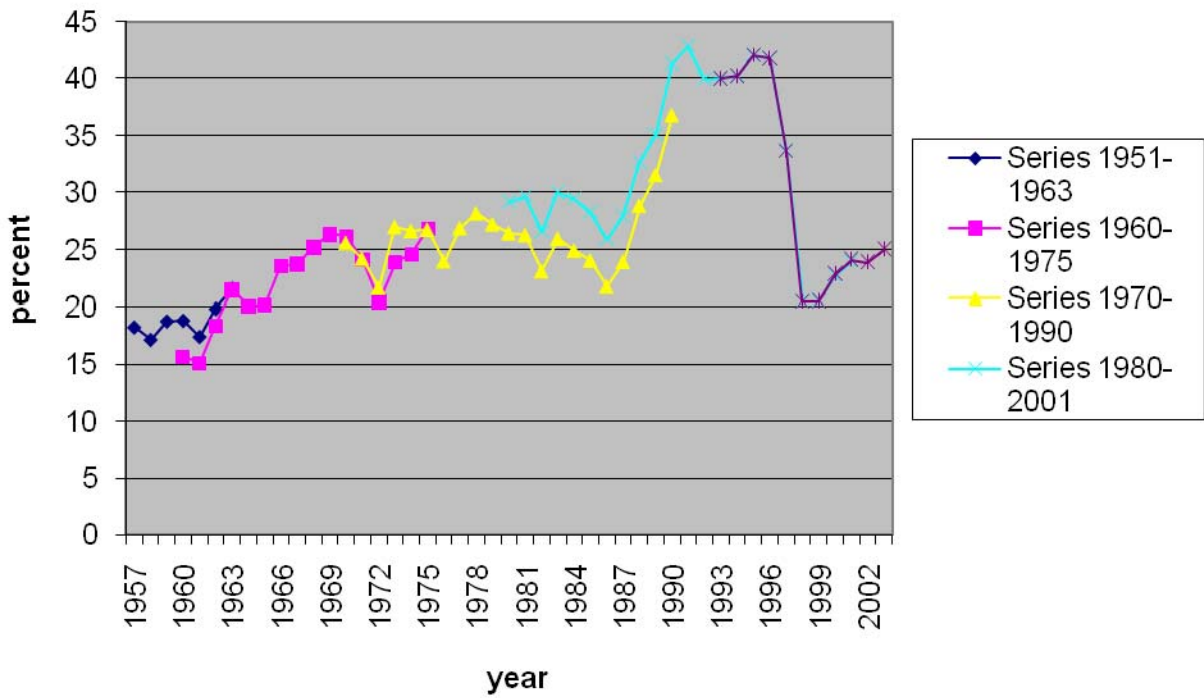
### Government share of GDP (current price)



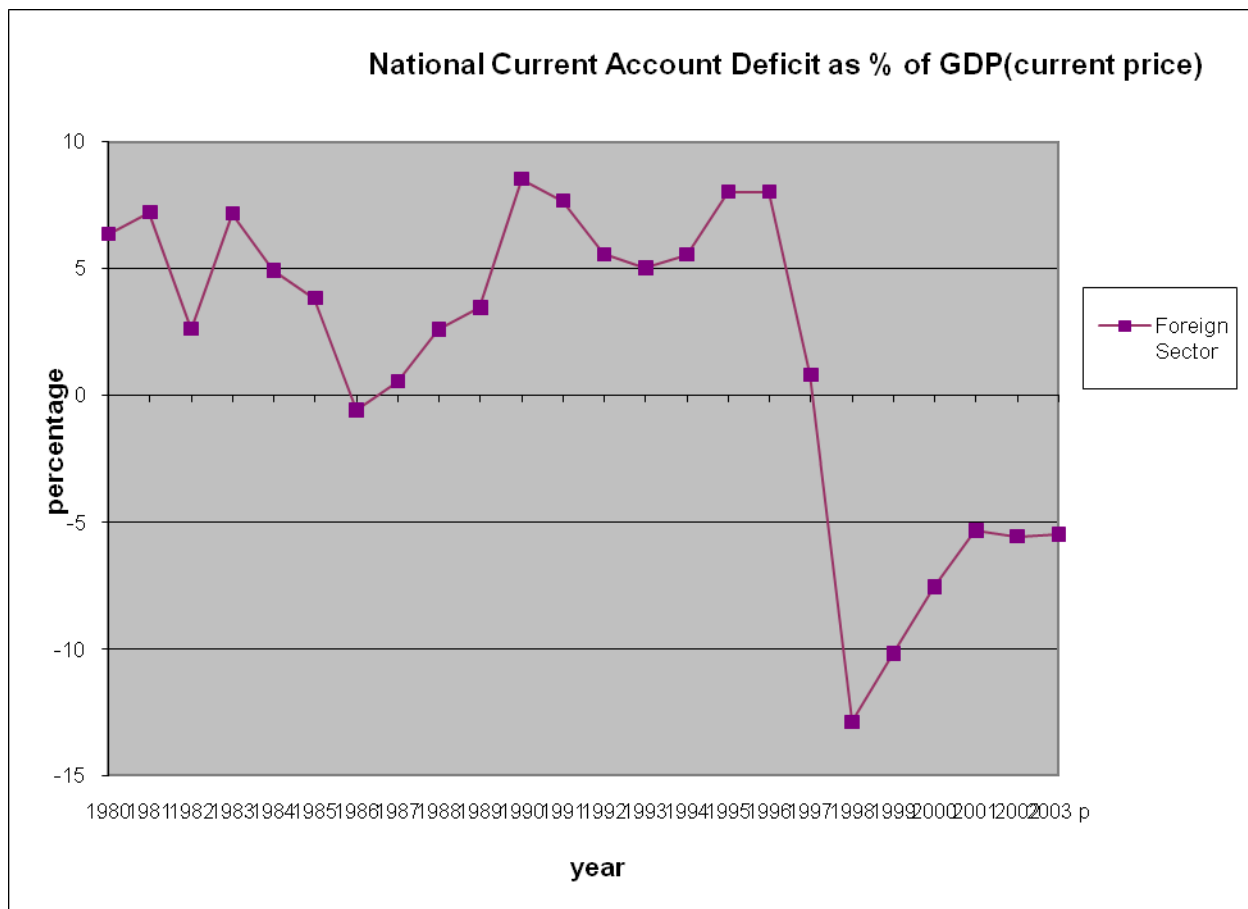
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### Investment share of GDP (current price)



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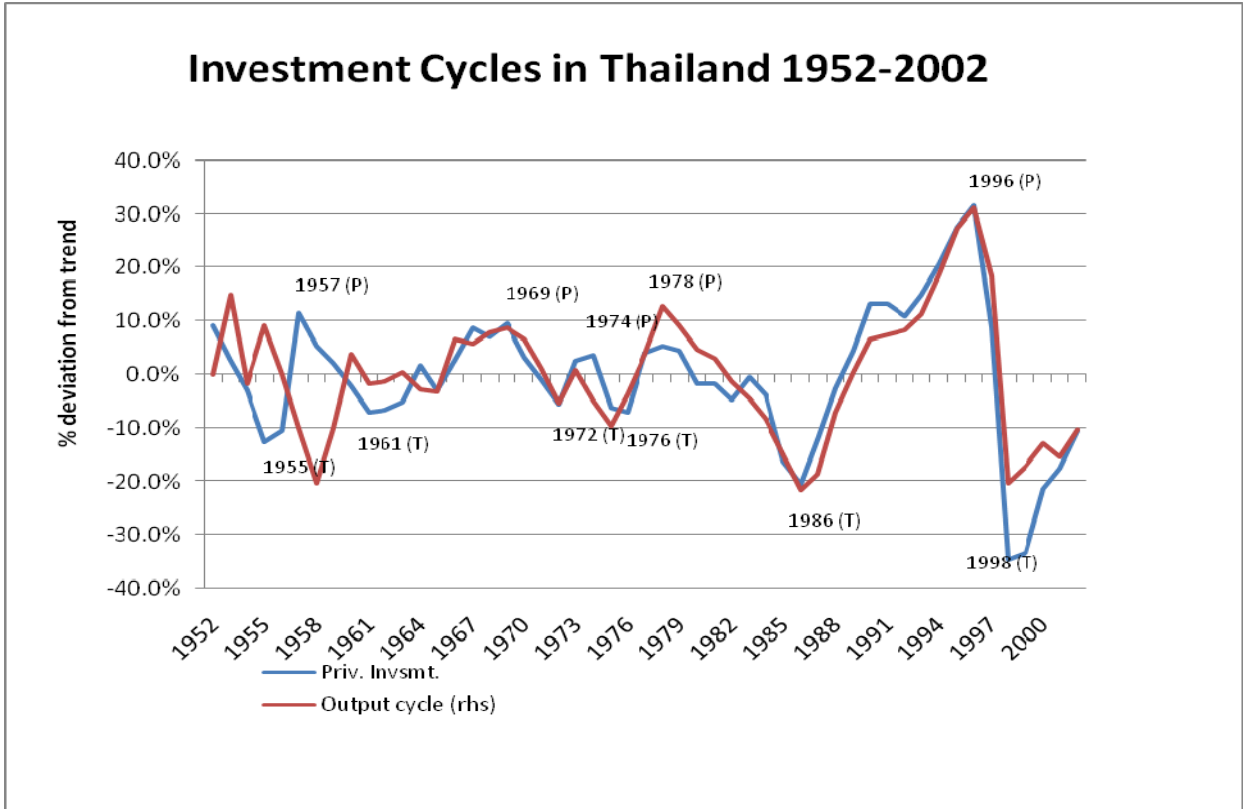


[Figure 2.2.2. Components of GDP. Source: Adapted from NESDB data (upper three) and Bank of Thailand data (lower)]

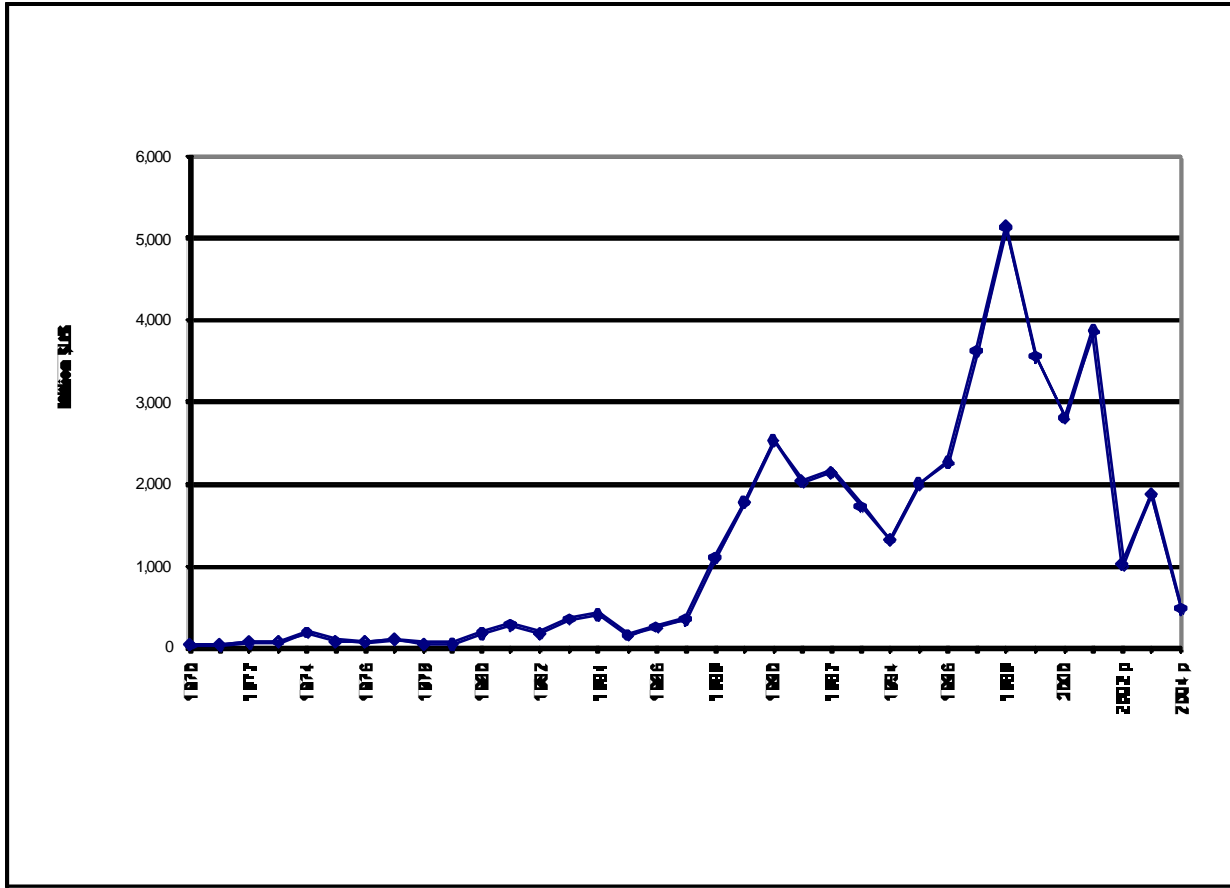
### Demand Decomposition

A demand decomposition of national product, Figure 2.2.2, highlights the related importance of investment.

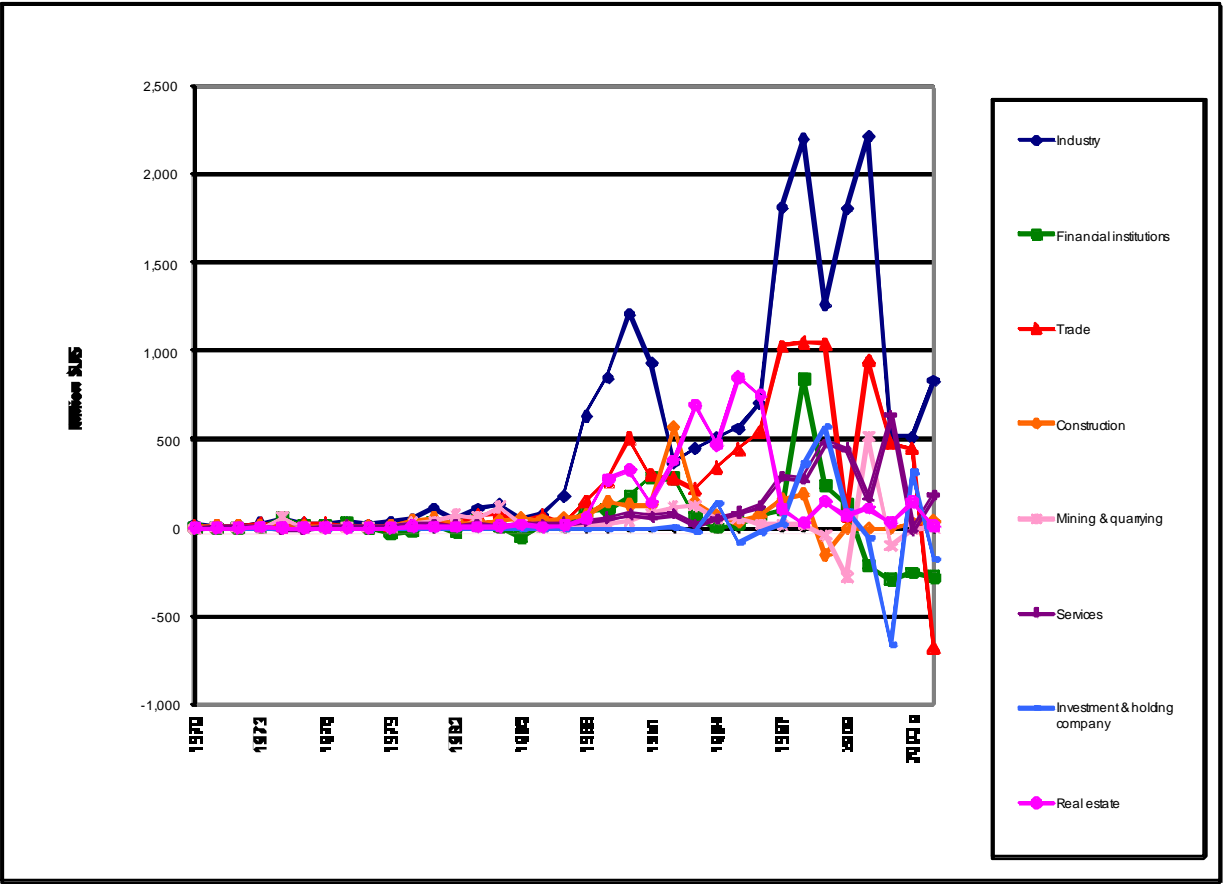
- Consumption, as a percent of GDP, has the largest share, at 75% in 1957, though this has declined steadily, to about 55% recently.
- Government's share is much lower, at around 10% on average with no obvious patterns.
- Investment share moves from 17% in 1957 to over 40% in the 90's, with a subsequent decline in the crisis to 20%, now rising slowly.
- Private investment tracks GDP quite closely, as illustrated in Figure 2.2.3. Deviations from trend in both series move almost in parallel since 1965.



[Figure 2.2.3. Thailand's Investment Cycles. Adapted from Bank of Thailand data]



[Figure 2.2.4. Thailand's Net Flow of Direct Investment (1997-2004p). Source: Adapted from NESDB data]



[Figure 2.2.5. Net Flow of FDI by Sector. Source: Adapted from NESDB data]

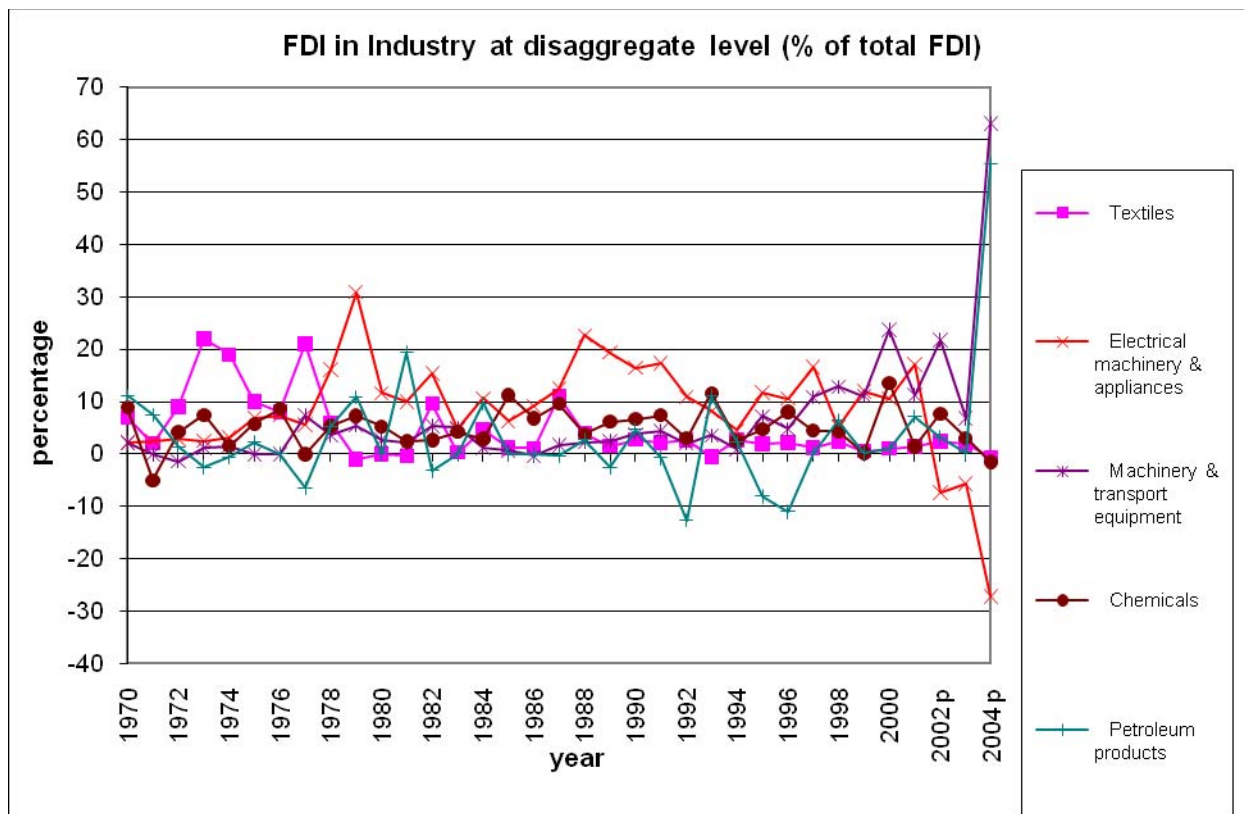


Figure 2.2.6. FDI in Industry at Disaggregate Level (% of Total FDI). Source: NESDB data series

[Figure 2.2.6. FDI in Industry at Disaggregate Level (% of Total FDI). Source: Adapted from NESDB data]

Some of that investment was foreign direct investment (FDI). Prior to 1997, FDI in Thailand was approximately of the same order of magnitude as the current account deficit, which varied up to 8% of GDP. The deficit moved to a relatively large surplus after the currency devaluation of 1997, though it has declined since then. The order of magnitude of FDI is displayed in Figure 2.2.4. The single largest type of FDI, as depicted in Figure 2.2.5, is in industry, followed by trade, though pre-crisis flows into real estate are evident. Within industry, as depicted in Figure 2.2.6, the primary sector moves from textiles, to electrical machinery and appliances, and then to machinery and transport equipment. Akira (1999) argues that foreign investment has been critical during various periods; for example, investment by Chinese nationals in small scale enterprises such as hardware and weaving played an important role in the 1960's.

In sum, private investment seems closely correlated to movements in GDP. Much but not all of this is domestic investment. Factor payment data show that non-farm proprietorships play a large role in the Thai domestic economy, so investment in non-farm proprietorships has likely been substantial.

## 2.3 Refining the Standard Accounting Model: The Construction of Households as Firms

We can refine the standard flow-of-funds accounting model by thinking of households as firms. For example, Samphantharak and Townsend (2005) provide an integrated view of households as producers. Given sufficient micro-data of proper design, we can use standard accounting instruments to construct financial accounts for households as if they were firms engaged in production, and thereby enable measurement that cannot be accommodated by the standard conceptualization. Such accounts allow estimates of the contribution of households to national product through production and investment. Both household firms, and households running firms, can be viewed through the lens of these accounts and the measurements compared.

We model households as firms as follows. We use household surveys to obtain the necessary micro-data; the Townsend Thai monthly data provide much of the necessary information for the construction of the balance sheet, income, and cash flow accounts. Household net worth can be viewed as equity, consumption as dividends, gifts as equity issue, and the household budget constraint as the firm cash flow constraint. We distinguish savings a budget surplus as in the cash flow statement versus savings as retained earnings as in the balance sheet. Net worth balances the difference between assets and liabilities. Changes in net worth from one accounting period to the next come from savings. Cumulative saving is the sum of historical retained earnings. Net savings is the change in overall retained earnings, and this must show up as an increase in assets or a decrease in liabilities.

The income statement reports revenues and costs from production activities (cultivation, livestock, business, labor) as well as interest income and expenses, capital gains, depreciation, and losses. Here, as with standard corporate accounts, income is reported on an accrual basis: expenses are subtracted as costs only at the time of the sale of product. (An exception is agricultural harvest which can be treated as goods sold and then repurchased to be put in finished goods inventory). Changes in work in progress inventory are one way to keep track of cash flow expenses not yet subtracted. Net income, revenues less costs, is allocated into household consumption (dividend) and savings (changes in retained earnings).

The rate of return on total assets (ROA) measures a household's performance in using assets to generate earnings from all sources.

Cash flow is a much more volatile measure of "income" than is net accrual income. Cash flows move with financing, consumption, and investment of course. But more to the point, the remainder of cash flow, flow from production activities, fluctuates substantially more than net income.

An example drawn from the data will illustrate the technique as well as the potential complexity of the constructed accounts. We choose a relatively wealthy household, A, engaged in a small-to-medium business enterprise, and a relatively poor household, B. The accounts are illustrated in Tables 2.3.1 through 2.3.4.

**Table A1 Balance Sheet of Household A**

Month	5	6	7	8	9	10	11	12	13	14	15	16
Cash in Hand	1,966,139	1,862,121	1,701,863	1,663,257	1,593,938	1,504,906	1,531,443	1,484,738	1,448,589	1,407,044	1,362,112	1,311,011
Account Receivables	688,971	805,259	952,359	1,059,382	1,126,773	1,207,075	1,269,435	1,320,273	1,373,029	1,422,880	1,473,025	1,524,025
Deposits at Financial Institutions	167,271	167,969	168,094	156,799	157,474	157,469	189,549	201,194	240,759	240,304	240,249	240,194
ROSCA (Net Position)	33,000	37,000	41,000	11,500	16,050	20,600	25,150	28,450	7,750	10,750	16,750	23,750
Other Lending	153,136	153,136	153,136	153,136	153,136	153,136	153,136	153,136	153,136	153,136	153,136	153,136
Inventories	1,346,939	1,440,729	1,576,481	1,697,413	1,842,527	1,986,251	2,111,673	2,238,242	2,356,958	2,486,177	2,609,586	2,744,157
Livestock	326,280	323,018	319,787	316,590	313,424	310,289	313,186	310,055	336,954	333,585	330,249	326,946
Fixed Assets	967,342	973,759	970,949	968,151	965,365	962,591	959,828	957,076	954,336	951,608	948,890	946,185
Household Assets	598,758	596,261	593,775	591,299	588,833	586,378	583,933	581,498	579,073	576,658	574,253	571,859
Agricultural Assets	66,104	65,829	65,554	65,281	65,009	64,737	64,468	64,199	63,931	63,664	63,399	63,135
Business Assets	2,479	11,669	11,620	11,572	11,523	11,475	11,428	11,380	11,332	11,285	11,238	11,191
Land and Other Fixed Assets	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000	300,000
<b>Total Assets</b>	<b>5,649,079</b>	<b>5,762,991</b>	<b>5,883,669</b>	<b>6,026,228</b>	<b>6,168,687</b>	<b>6,302,317</b>	<b>6,553,400</b>	<b>6,693,163</b>	<b>6,871,511</b>	<b>7,005,483</b>	<b>7,133,997</b>	<b>7,269,404</b>
Total Liabilities	1,132,310	1,280,270	1,425,465	1,570,660	1,715,855	1,861,050	2,116,245	2,260,056	2,403,867	2,547,678	2,679,744	2,827,946
Account Payables	1,078,505	1,228,465	1,375,660	1,522,855	1,670,050	1,817,245	1,964,440	2,111,635	2,258,830	2,406,025	2,541,475	2,693,525
Other Borrowing	53,805	51,805	49,805	47,805	45,805	43,805	151,805	148,421	145,037	141,653	138,269	134,421
Total Household Net Wealth	4,516,769	4,482,721	4,458,204	4,455,568	4,452,832	4,441,267	4,437,155	4,433,107	4,467,644	4,457,806	4,454,253	4,441,459
Contributed Capital (Initial Wealth)	3,439,250	3,439,250	3,439,250	3,439,250	3,439,250	3,439,250	3,439,250	3,439,250	3,439,250	3,439,250	3,439,250	3,439,250
Cumulative Net Gifts Received	-6,664	-6,046	-6,357	-6,319	-7,576	-6,635	-7,233	-7,181	-6,774	-7,000	-6,335	-4,198
Cumulative Savings (Retained Earnings)	1,084,182	1,049,517	1,025,311	1,022,637	1,021,158	1,008,652	1,005,139	1,001,038	1,035,168	1,025,555	1,021,338	1,006,406
<b>Total Liabilities and Household Net Wealth</b>	<b>5,649,079</b>	<b>5,762,991</b>	<b>5,883,669</b>	<b>6,026,228</b>	<b>6,168,687</b>	<b>6,302,317</b>	<b>6,553,400</b>	<b>6,693,163</b>	<b>6,871,511</b>	<b>7,005,484</b>	<b>7,133,997</b>	<b>7,269,405</b>

[Table 2.3.1. Source: Samphantharak and Townsend (2007)]

**Table B1 Balance Sheet of Household B**

Month	5	6	7	8	9	10	11	12	13	14	15	16
Cash in Hand	16,529	16,804	24,661	24,276	25,339	23,673	26,507	26,645	26,405	27,846	34,133	36,610
Account Receivables	0	0	0	0	0	0	0	0	0	0	0	0
Deposits at Financial Institutions	120	140	160	180	200	220	240	260	280	300	320	340
ROSCA (Net Position)	0	0	0	0	0	0	0	0	0	0	0	0
Other Lending	0	0	0	0	0	0	0	0	0	0	0	0
Inventories	3,772	5,878	444	0	0	0	0	350	2,478	1,238	1,418	7,540
Livestock	940	930	881	872	864	900	891	882	813	860	812	1,403
Fixed Assets	14,918	14,866	14,814	14,763	14,712	14,661	14,610	14,560	14,510	14,459	14,410	14,360
Household Assets	12,418	12,366	12,314	12,263	12,212	12,161	12,110	12,060	12,010	11,959	11,910	11,860
Agricultural Assets	0	0	0	0	0	0	0	0	0	0	0	0
Business Assets	0	0	0	0	0	0	0	0	0	0	0	0
Land and Other Fixed Assets	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
<b>Total Assets</b>	<b>36,278</b>	<b>38,619</b>	<b>40,960</b>	<b>40,092</b>	<b>41,114</b>	<b>39,454</b>	<b>42,248</b>	<b>42,697</b>	<b>44,486</b>	<b>44,704</b>	<b>51,092</b>	<b>60,253</b>
Total Liabilities	7,800	7,800	4,500	4,500	4,500	4,500	4,500	4,500	6,140	6,140	6,560	5,640
Account Payables	0	0	0	0	0	0	0	0	0	0	0	0
Other Borrowing	7,800	7,800	4,500	4,500	4,500	4,500	4,500	4,500	6,140	6,140	6,560	5,640
Total Household Net Wealth	28,478	30,819	36,460	35,592	36,614	34,954	37,748	38,197	38,346	38,564	44,532	54,613
Contributed Capital (Initial Wealth)	26,580	26,580	26,580	26,580	26,580	26,580	26,580	26,580	26,580	26,580	26,580	26,580
Cumulative Net Gifts Received	410	1,319	3,494	4,015	5,785	5,982	9,247	10,193	12,326	13,298	14,777	12,754
Cumulative Savings (Retained Earnings)	1,488	2,920	6,386	4,997	4,249	2,392	1,922	1,423	-560	-1,314	3,175	15,279
<b>Total Liabilities and Household Net Wealth</b>	<b>36,278</b>	<b>38,619</b>	<b>40,960</b>	<b>40,092</b>	<b>41,114</b>	<b>39,454</b>	<b>42,248</b>	<b>42,697</b>	<b>44,486</b>	<b>44,704</b>	<b>51,092</b>	<b>60,253</b>

[Table 2.3.2. Source: Samphantharak and Townsend (2007)]



**Table A2 Income Statement of Household A**

Month	5	6	7	8	9	10	11	12	13	14	15	16
Cultivation							3,200	11,676	11,676	11,676	11,700	
Livestock	30,485	27,753	26,180	21,780	26,730	28,050	39,000	39,600	79,600	39,600	33,000	31,900
Livestock Produce	28,985	27,753	26,180	21,780	26,730	28,050	33,000	39,600	39,600	39,600	33,000	31,900
Capital Gains	1,500						6,000		40,000			
Fish and Shrimp												
Business	184,360	145,360	183,875	152,890	160,455	167,295	249,440	169,460	175,855	166,170	167,150	170,000
Labor	11,440	11,440	11,440	11,440	11,440	11,440	11,440	10,056	11,440	10,096	10,100	10,000
Others	6,000	3,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000	6,000
<b>Total Revenues</b>	<b>232,285</b>	<b>187,553</b>	<b>227,495</b>	<b>192,110</b>	<b>204,625</b>	<b>212,785</b>	<b>309,080</b>	<b>236,792</b>	<b>284,571</b>	<b>233,542</b>	<b>227,950</b>	<b>217,900</b>
Cultivation								1,468	1,468	1,468	1,468	
Livestock	31,944	30,281	27,642	22,813	21,715	19,225	20,371	25,573	27,787	30,064	28,059	27,048
Capital Losses												
Depreciation (Aging)	3,281	3,263	3,230	3,198	3,166	3,134	3,103	3,132	3,101	3,370	3,336	3,302
Other Expenses	28,663	27,018	24,412	19,615	18,549	16,090	17,268	22,441	24,687	26,694	24,723	23,745
Fish and Shrimp												
Business	220,176	167,323	199,933	150,300	159,472	173,440	262,931	182,317	186,649	173,751	174,006	177,608
Labor											150	100
Others												
<b>Total Cost of Production</b>	<b>252,120</b>	<b>197,604</b>	<b>227,575</b>	<b>173,112</b>	<b>181,187</b>	<b>192,665</b>	<b>283,302</b>	<b>209,358</b>	<b>215,905</b>	<b>205,283</b>	<b>203,684</b>	<b>204,756</b>
Interest Revenue												
Interest Expense	55	55	55	75	55	55	55	55	35	55	55	55
Other Expenses	2,794	2,783	2,810	2,798	2,786	2,775	2,763	2,751	2,740	2,729	2,717	2,706
Depreciation of Fixed Assets	2,794	2,783	2,810	2,798	2,786	2,775	2,763	2,751	2,740	2,729	2,717	2,706
Insurance Premium												
Extraordinary Items												
Capital Gains												
Capital Losses												
<b>Net Income</b>	<b>(22,684)</b>	<b>(12,889)</b>	<b>(2,945)</b>	<b>16,125</b>	<b>20,597</b>	<b>17,290</b>	<b>22,960</b>	<b>24,627</b>	<b>65,891</b>	<b>25,475</b>	<b>21,494</b>	<b>10,383</b>
Consumption	9,035	9,362	8,145	10,849	8,566	16,186	9,663	1,472	3,005	6,332	(2,399)	9,105
Savings	(31,719)	(22,251)	(11,090)	5,276	12,031	1,104	13,296	23,155	62,886	19,143	23,892	1,278

[Table 2.3.3. Source: Samphantharak and Townsend (2007)]

**Table B2 Income Statement of Household B**

Month	5	6	7	8	9	10	11	12	13	14	15	16
Cultivation	110	3590	5100	130	90	160	100	110	130	330	200	9160
Livestock						45				155	40	600
Capital Gains						45				55	40	600
Livestock Produce										100		
Fish and Shrimp	500						500				70	
Business										960		
Labor							300	390			7660	9800
Others	160	150	160	160	160	160	250	250	160	150	160	180
<b>Total Revenues</b>	<b>770</b>	<b>3740</b>	<b>5260</b>	<b>290</b>	<b>250</b>	<b>365</b>	<b>1150</b>	<b>750</b>	<b>290</b>	<b>1595</b>	<b>8130</b>	<b>19740</b>
Cultivation		800										2660
Livestock	313	9	49	9	9	9	9	9	69	8	9	8
Capital Losses	300		40						60			
Depreciation (Aging)	13	9	9	9	9	9	9	9	9	8	9	8
Other Expenses												
Fish and Shrimp	574						24				108	
Business												
Labor											60	
Others												1080
<b>Total Cost of Production</b>	<b>886</b>	<b>809</b>	<b>49</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>33</b>	<b>9</b>	<b>69</b>	<b>8</b>	<b>177</b>	<b>3748</b>
Interest Revenue												
Interest Expense												
Other Expenses	52	52	52	51	51	51	51	321	50	50	50	50
Depreciation of Fixed Assets	52	52	52	51	51	51	51	51	50	50	50	50
Insurance Premium								270				
Extraordinary Items				6	342	116	74					
Capital Gains				6	342	116	74					
Capital Losses												
<b>Net Income</b>	<b>-168</b>	<b>2879</b>	<b>5159</b>	<b>236</b>	<b>533</b>	<b>421</b>	<b>1140</b>	<b>421</b>	<b>171</b>	<b>1537</b>	<b>7903</b>	<b>15942</b>
Consumption	2432	1447	1693	1856	1290	2309	1610	919	2154	2291	3414	3839
Savings	-2600	1432	3466	-1619	-758	-1888	-470	-498	-1983	-754	4489	12103

[Table 2.3.4. Source: Samphantharak and Townsend (2007)]

As can be seen from the balance sheet (Table 2.3.1), household A holds cash, inventory and fixed assets, specifically milk cows, land, and household assets. This is consistent with the fact that the household's main economically productive activities are livestock and a retail store. The remainder of their assets consists of deposits at financial institutions and accounts receivable from trade credit. Liabilities consist of borrowing from other households and account payables to suppliers. The debt to asset ratio increases over time during the 48-month period, from 20% to 55%. Average total assets over the 48 months is 9.57 million baht (0.23 million US dollar). Out of this value, the household's wealth accounts for 4.96 million baht (0.12 million dollar).

On average, the primary source of revenue for household A is the trading of animal feed (75%), recorded under business revenue. Other revenue comes from milk cows (16%), recorded under livestock revenue, and from labor supply (4%). The household also grows hay, used as livestock feed. Primary expenses are associated with the purchase of animal feed, which the household resells. Aging cattle are explicitly treated as a depreciation expense. Capital gains associated with the birth of calves and their maturation are also explicitly included. Capital losses are associated with premature death of an animal, at the current value, hence net of depreciation. Average total net income is 80,405 baht (2,010 US Dollars) per month. The average savings rate out of net income is high (67%). Cash flow for this household is different from accrual income, due primarily to changes in the animal feed inventory, changes in accounts receivable (trade credit), and depreciation.

Household B, the relatively poor household, has average assets and average wealth of 86,044 baht (2,151 dollars) and 81,730 baht (2,043 dollars), respectively. Its primary assets consist of cash and inventories. The only liabilities are loans from other households. Revenue comes from infrequent wages (36%) and cultivation of rice (31%). Costs of rice cultivation are high but also infrequent. The average total net income is 1,835 baht (46 dollars) per month. Saving is frequently negative with the average over the 52 months around 45%. The difference between cash income and accrual income is from rice inventory.

From Table 2.3.5 we see that the ROA of household A is considerably lower than the ROA of household B. This comes from a combination of two aspects of the data. First, household A is less productive relative to its Lop Buri counterparts: the ROA of 12.93% is lower than the 15.32% lower quartile in that province. Second, household B is more productive relative to its Sisaket counterparts: the ROA of 49.95% is higher than the third quartile ROA in that province, 32.02%. For both households rates of return to equity, ROE, dominate ROA as if both households might consider borrowing more. The debt/asset ratio of the poor household B is quite low.

	<b>Household A</b> [1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> Province Quartiles]	<b>Household B</b> [1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> Province Quartiles]
<b>Rate of Return on assets (ROA), %</b>	12.93% [15.32, 22.37, 32.11]	49.95% [14.63, 23.17, 32.02]
Profit Margin Ratio for ROA	21.13% [-90.25, 30.87, 61.29]	52.22% [-42.02, 28.29, 59.34]
Asset Turnover Ratio	0.39 [0.28, 0.38, 0.48]	0.59 [0.22, 0.33, 0.46]
<b>Rate of Return on wealth (ROE), %</b>	15.95% [18.24, 25.23, 37.05]	52.85% [17.96, 27.25, 44.76]
Profit Margin Ratio for ROE	21.10 % [-144.87, 25.81, 58.71]	52.22 % [-90.74, 8.54, 51.73]
Asset Turnover Ratio	0.39 [0.28, 0.38, 0.48]	0.59 [0.22, 0.33, 0.46]
Asset to Wealth Ratio	1.81 [1.04, 1.13, 1.29]	1.07 [1.09, 1.20, 1.41]
<i>Debt to Wealth Ratio</i>	<i>0.81</i> [0.04, 0.14, 0.28]	<i>0.07</i> [0.09, 0.20, 0.42]

[Table 2.3.5. Monthly Average of Annualized Rates of Return on assets (ROA), Annualized Rate of Return on wealth (ROE) and their components. Notes: Numbers in brackets below are the quartiles and median of the respective province; Lop Buri for household A, and Sisaket for household B. Source: Samphantharak and Townsend (2007)]

The variability of income and risk in the underlying environment is evident in many key variables. We emphasize first that cash flow for each household has a much higher coefficient of variation than does accrued net income, specifically 2.98 versus 0.87 for household A and 2.88 versus 1.81 for household B. This was the guess which motivated the distinction and construction of the accounts from the outset. Relative to the province, household B has a relatively low variation of cash flow, while household A is closer to the median. Both household have relatively low coefficients of variation of net income. More generally Sisaket appears to be a riskier environment than Lop Buri, consistent with the ordering of A versus B.

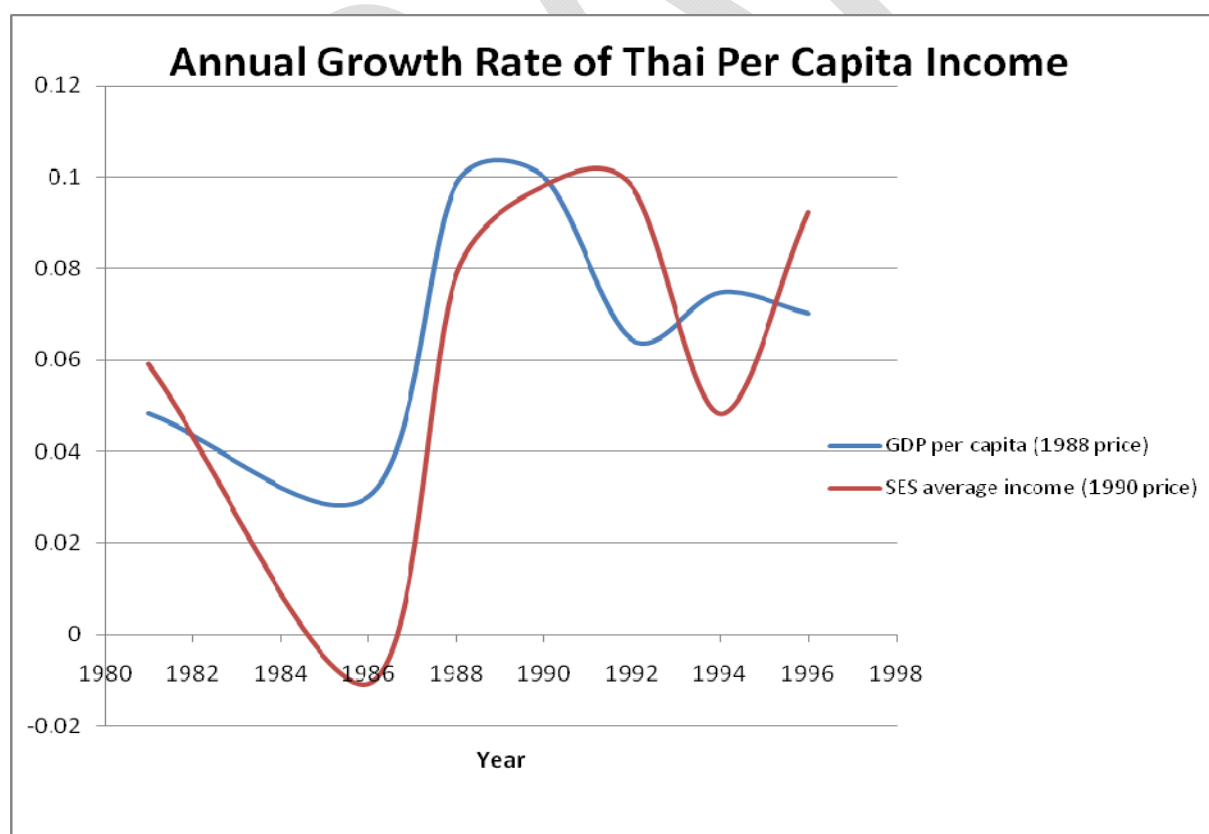
Consumption variability is in turn lower than the variability of net income, evidence of considerably smoothing, naturally enough. Consumption variability remains higher in Sisaket than in Lop

Buri, but now the ordering of A and B is reversed, higher for A at .65 than for B at .46. One might infer the household B is smoothing better than its provincial counterparts. Variability of investment is large.

Variable	Household A	Household B
	[1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> Province Quartiles]	[1 <sup>st</sup> , 2 <sup>nd</sup> , 3 <sup>rd</sup> Province Quartiles]
Cash Flow	2.98 [1.22, 2.25, 4.07]	2.88 [3.10, 4.01, 6.96]
Net Income	0.87 [0.91, 1.46, 2.25]	1.81 [1.86, 2.30, 2.95]
Consumption	0.65 [0.53, 0.91, 1.39]	0.46 [0.56, 0.94, 1.76]
<i>Consumption of Household</i>	<i>0.30</i> <i>[0.30, 0.38, 0.48]</i>	<i>0.60</i> <i>[0.51, 0.62, 0.69]</i>
<i>Production</i>	<i>0.66</i> <i>[0.56, 1.02, 1.60]</i>	<i>0.64</i> <i>[0.88, 1.53, 2.75]</i>
Capital Expenditure	4.78 [3.63, 5.71, 10.35]	- [4.14, 6.36, 10.92]

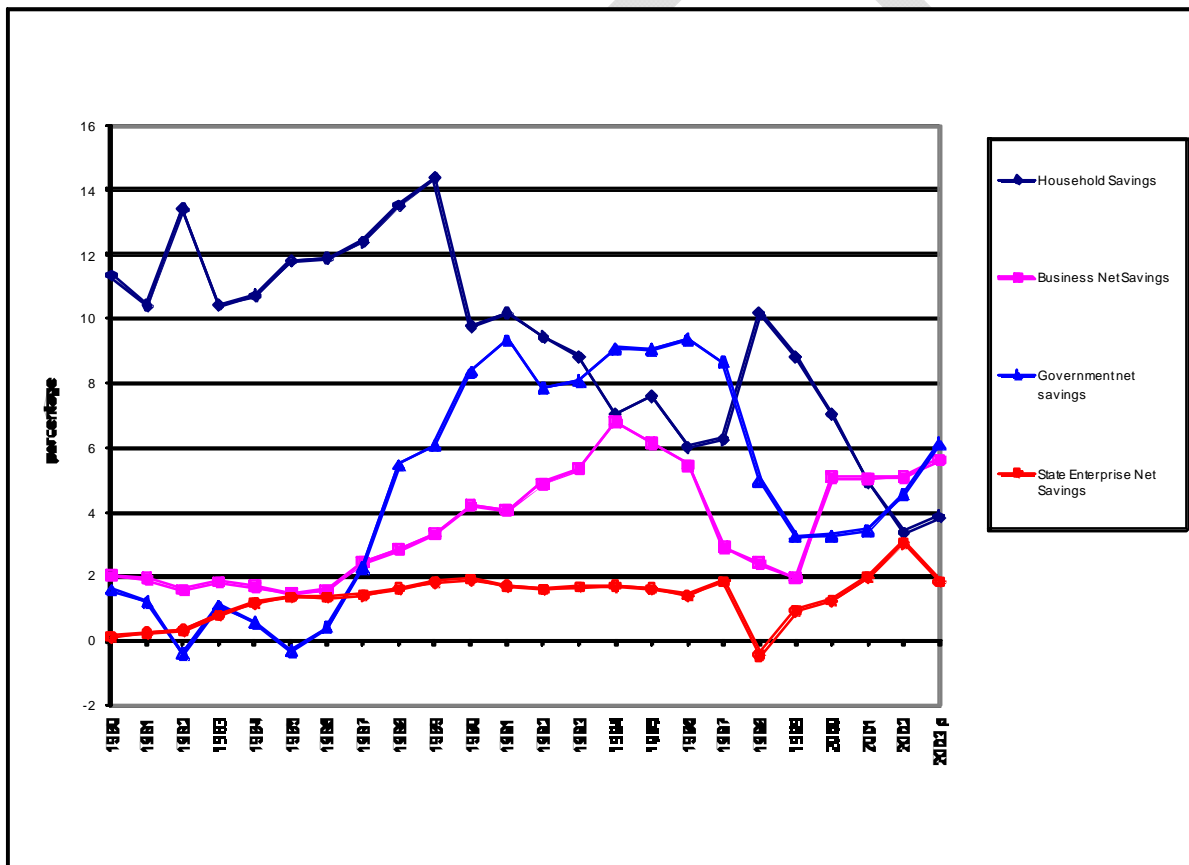
[Table 2.3.6. Coefficients of Variation. Numbers in brackets are quartiles and medians of the respective province. Source: Samphantharak and Townsend (2007)]

## 2.4 Discrepancies Between Household and National Income



[Figure 2.4.1. Annual Growth Rate of Thai Per Capita Income. Source: Jeong (2000)]

The construction of such household accounts clearly depends on the existence of data of sufficient quality and quantity. In principle, national accounts could be constructed from a complete census of such micro-accounts, but in practice there will be limitations to existing data. Proper survey design can provide reliable representative data, but even then we can expect to see discrepancies between measurements based on the macro-data of national accounts and measurements based on accounts constructed from micro-data. Thus Thai GDP as measured in the national income accounts is not equivalent with household income as measured in socio-economic surveys, even accounting for the foreign sector. These income measures move roughly in parallel, but they are off in levels. See Figure 2.4.1.



[Figure 2.4.2. Source: Adapted from NESDB data]

Quartile	SAVE1/income			SAVE2/income		
	Unadjusted	Adjusted	Difference	Unadjusted	Adjusted	Difference
Income less than 1,658 baht	-0.69	-0.61	0.07	-0.51	-0.44	0.07
Income between 1,658 and 2,850 baht	-0.24	-0.18	0.06	-0.09	-0.04	0.05
Income between 2,850 and 4,915 baht	-0.10	-0.05	0.05	0.04	0.09	0.05
Income greater than 4,915 baht	0.08	0.12	0.04	0.21	0.24	0.03

*Notes:* SAVE1 is income minus expenditure on all goods; SAVE2 is income minus expenditure on nondurable goods.

[Table 2.4.3. Savings Rates by Income Quartile, Using Unadjusted and Adjusted Savings Measures, 1981. Source: Paxson (1992)]

According to national accounts, Paxson (1992) finds that the fraction of total household disposable income that was saved was approximately 15.5% in 1975, 16.5% in 1980, and 14.5% in 1981; see also Figure 2.4.2 for other savings rates. In contrast, estimates of total national household disposable income and total household savings (using inflation-adjusted SAVE1, as in Paxson) constructed from SES data produces savings rates of 7.9% in 1975 and 4.9% in 1981. Even accounting for biases due to inflation, it still appears that households tend to underreport income relative to consumption.

A second caveat concerns accounting categorization. Household investment in income-producing activities needs to be conceptualized as savings allocated to real capital assets rather than consumption. For example, some consumer durables may be better classified as investment rather than consumption. The treatment of dividends (consumption) versus retained earnings (investment) in financial accounts reminds us this is an important distinction.

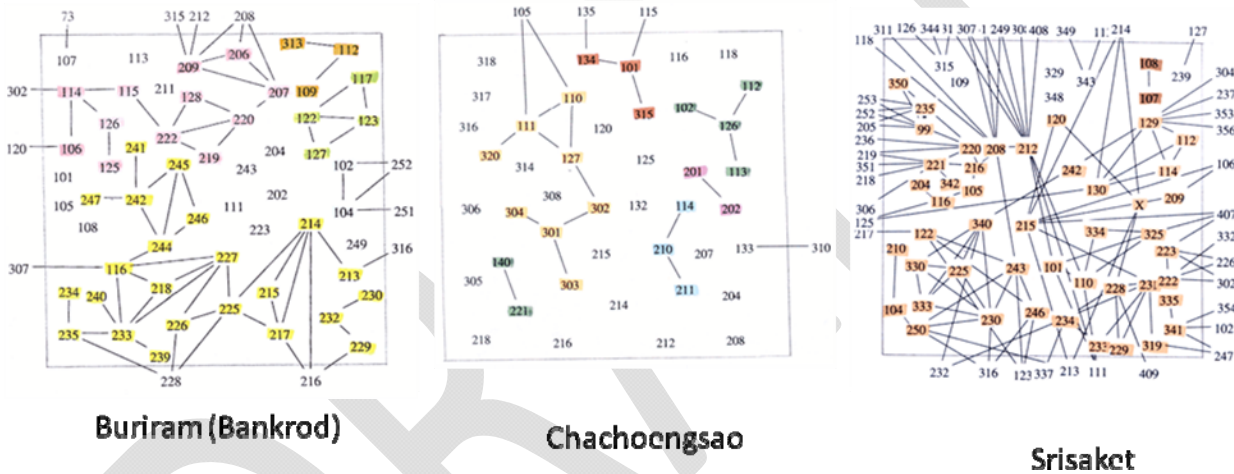
## 2.5 Aggregates: Elaboration of the Refined Model

In the standard flow-of-funds accounting model, firms and households occupy privileged positions, the former as producer and the latter as consumer. In section 2.3 we discussed the refinement of this accounting measurement framework to accommodate households as producers. In this section, we elaborate the refined model to accommodate unconventional aggregates, such as kinship networks, built on the foundation of household accounts. These aggregates are unconventional, insofar as they are not usually the subject of economic analysis, but the measurement framework remains that of conventional, standard accounting techniques.

Measurement and construction of financial accounts begins at the level of the individual household or enterprise. But these are social entities; they and their members are enmeshed in social and cultural networks of various kinds. They also exist in space, and are enmeshed in a geographic and

ecological network of roads, waterways, fields, forests, and the like. Groups of households involved in common social and/or geographic relations can be conceptualized as economic units, just as households can be conceptualized as firms. The construction of household accounts as described in section 2.3 can thus be elaborated to support the construction of accounts measuring any of these aggregates. These constructions can in turn be aggregated, added up to portray the situation of any larger aggregate. Obviously one can stop short of aggregating all the way up to the national level.

## Family Networks in Villages

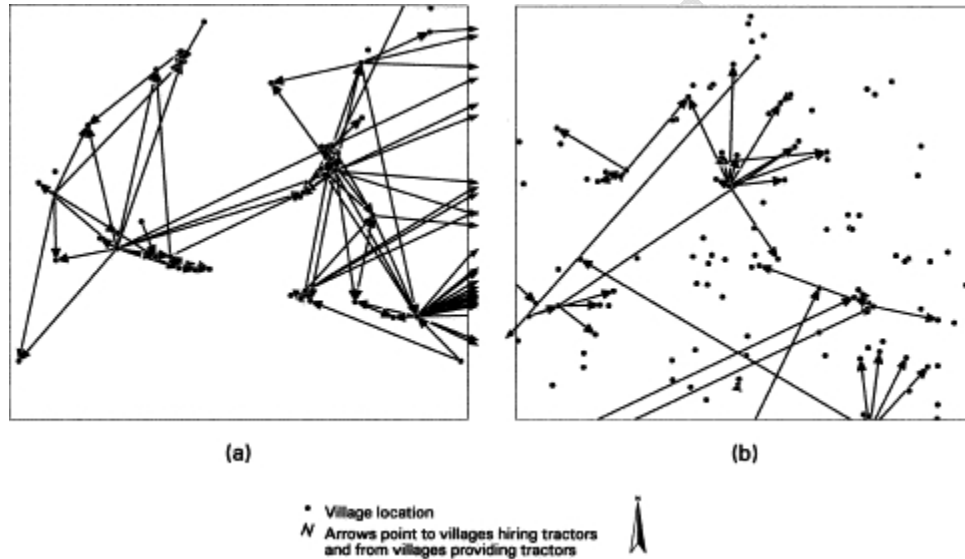


[Figure 2.5.1. Family Networks in Villages. Source: Townsend Thai Panel data with Krislert Samphantharak]

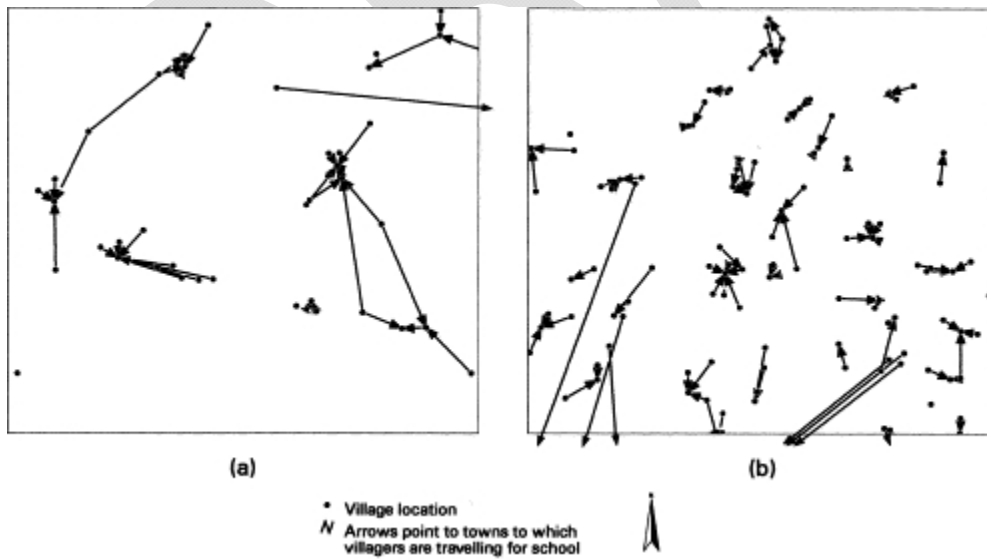
Within Thai villages, for example, households may be related by blood and/or marriage to larger kinship groups. A typical village seems to have two or three dominant groups and a smaller number of disconnected households. But in some villages the groups are thin, whereas in others, virtually everyone is connected. Figure 2.5.1, depicting networks from Chachoengsao, Sisaket, and Buriram illustrates these various possibilities. An arrow indicates a direct family connection across households in the ongoing

monthly Townsend Thai survey or in the initial, one-time-only census (households outside the box). Colors indicate the different groups or dynasties. Subsequent analysis aims to see if the dynasty as a unit plays a social and economic role.

There may also be patterns in the relations across villages, for example, villages connected by labor or tractor market transactions, common elementary schools, or Buddhist temples, as illustrated in the GIS of the Faust, *et al.* (1999) Nang Rong project in Buriram: depicted in Figures 2.5.2.a and 2.5.2.b.



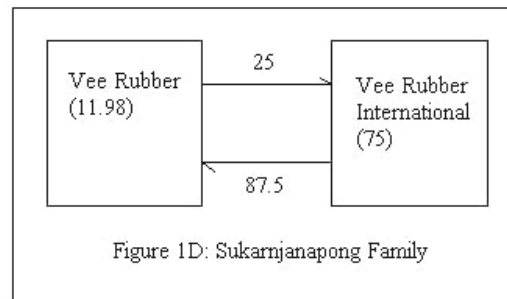
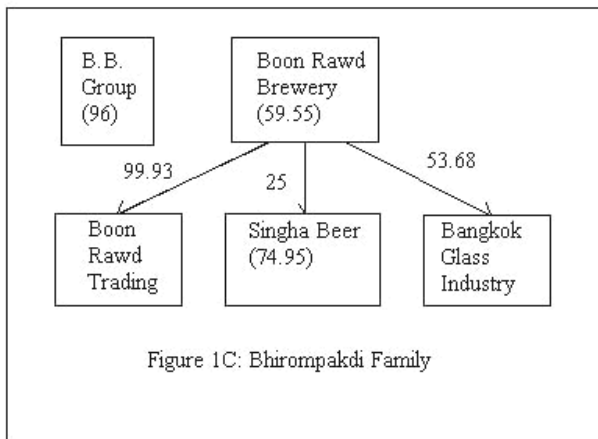
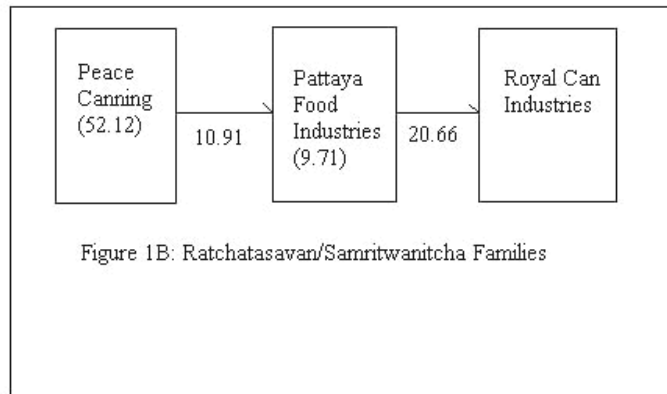
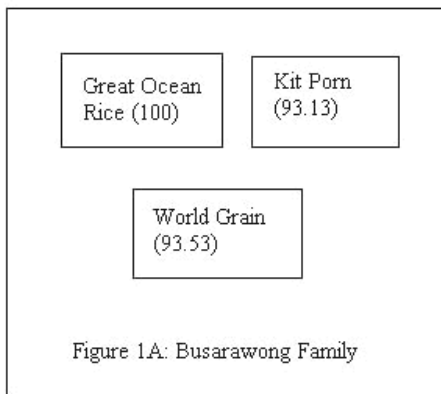
[Figure 2.5.2.a. Tractor Hiring Network in two regions of Nang Rong. Source: Faust et al., (1999)]



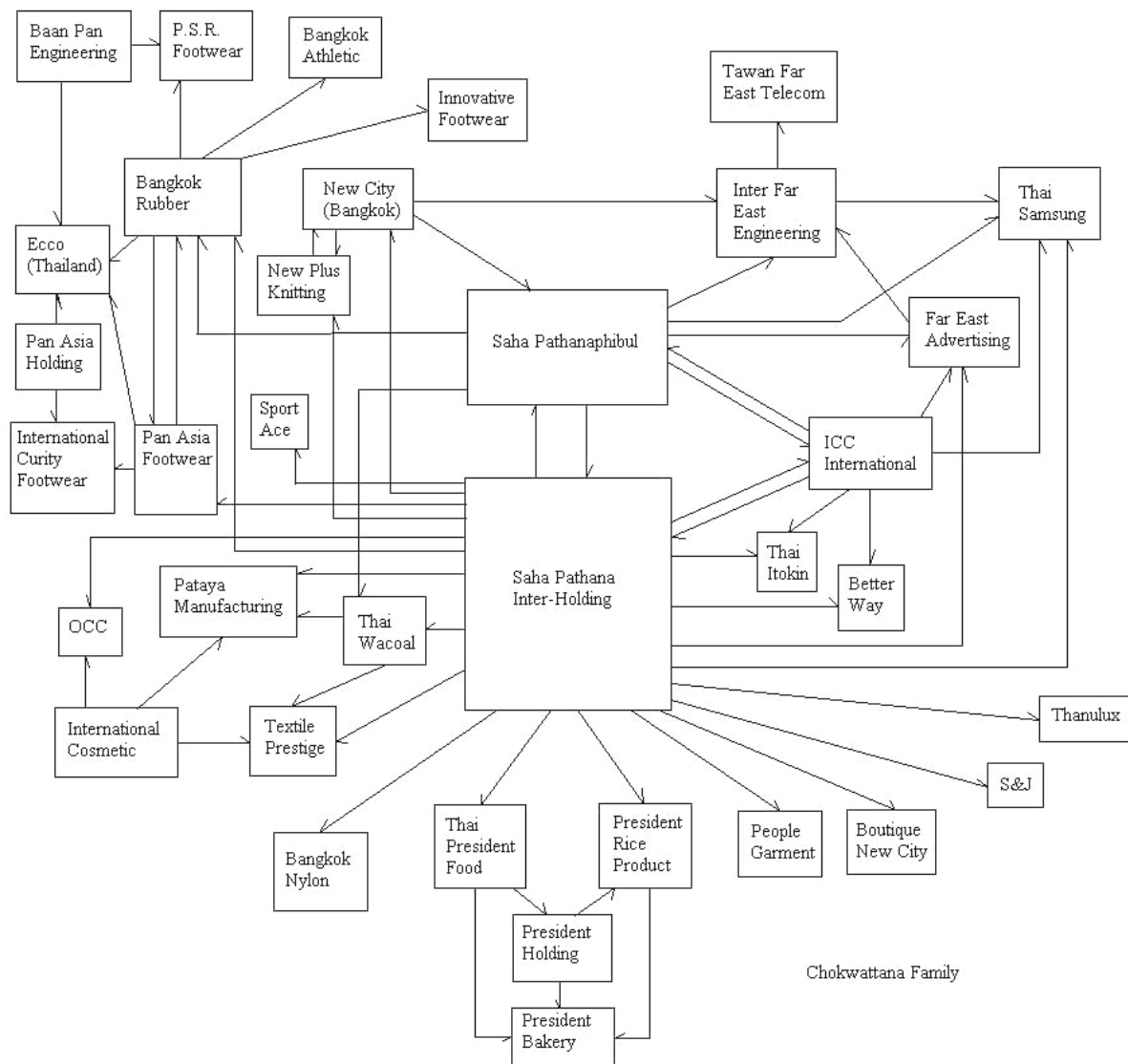
[Figure 2.5.2.b. Elementary School Network in two regions of Nang Rong. Source: Faust et al., (1999)]



Families may continue in importance even though villages may diminish in importance, as the country develops. Industrial conglomerates, including some of the largest firms in Thailand, are connected through family, marriage, and cross share holdings. Some of these structures are relatively simple; with a family holding a large number of shares in each of various units, vertically or horizontally. But others are more complex with chains of cross holdings – family connections are not well captured by simple indicators of shares directly held. Compare Figures 2.5.3 and 2.5.4. Again, the issue is whether a family-related conglomerate plays a role as a unit above and beyond the individual firms of which it is comprised.



[Figure 2.5.3. Examples of Simple Group Structures. Source: Samphantharak (2002)]



[Figure 2.5.4. Example of Groups with Many Chain Shareholdings, Many Cross Shareholdings and Many Pyramids. Source: Samphantharak (2002)]