Chapter 5: Driving Forces - Occupation, Financial Access, Education

This chapter examines each of the key driving forces of the Thai economy in more detail, first in the contemporary economy and then historically. Geography and space are incorporated within each topic. Many of the details here will turn out to be of considerable consequence for the modeling efforts below. We address in turn occupation, financial access, and education.

Many industries are concentrated in and around Bangkok, though not exclusively--food/beverage/tobacco is concentrated in the Northeast. The point is that occupation and business enterprise matter in virtually all regions of the country. Most firms are small in terms of numbers of employees. SMEs account for over 95% of all firms, and about 50% of employment and capital. There is thus an overlap of the firms found in a Ministry of Industry registry, on the one hand, many with a capitalization of 10 million baht or less, with the larger firms of household surveys, on the other. This was a point discussed earlier, that non-farm enterprise is significant in the national accounts. The real point is that the use of household data to understand the macro economy is not strained but natural. Historically, there is a steady movement of households out of agriculture and into self-employment or employer categories. The latter have higher incomes and greater within-group inequality. These will be incorporated into and/or compared with the predictions of the choice models below. Satellite imagery shows the corresponding urbanization and deforestation, and the village/regional models will be used to understand these patterns. Initial household wealth seems to facilitate subsequent household transition into business, and the assets of a new business are lower if the household is not borrowing. Thus prior wealth, if it is low, appears as a constraint, a key feature to be incorporated into models with constrained selection.

At an aggregated level commercial banks seem to dominate access, credit extended, and number of branches. These typically are presented as key facts in country financial sector assessments, such as those conducted by the IMF. Often they are all we have to go on. But the aggregates can be misleading. In rural household data the Thai government's agricultural development bank, the BAAC, is the largest formal lender. So the formal sector needs to distinguish urban vs. rural actual/potential clients and ideally to distinguish the financial provider. The informal sector is quite significant in household and SME surveys - though at the aggregated formal level this sector is not measured at all. The role and impact of the informal sector will be assessed through the models below. In the Northeast many transactions are within the village, among relatives and non-relatives, whereas in the Central region out-of-village transactions rise in importance. The village may be an important entity, but its importance may decline

over time. More generally, the mix of lenders varies by region, and this is a key feature in the determination of obstacles to trade.

Some portion of household/businesses does not borrow at all. This motivates so-called dual sector models which feature autarky vs. intermediated sectors, and also work in the subsequent models which retain autarky as a viable choice. Loans among households and SMEs vary in size, interest rate, collateral (joint liability, asset-backed, nothing), and default consequences. Several of the models will allow variation on the supply side and/or demand side along some of these dimensions. Savings are in both financial accounts and rice. The latter is especially important in the Northeast, indicative of the low level of intermediation in the area.

Debt/asset ratios, the stocks, are relatively low, and typically rise with firm size or household wealth. This may be indicative of which kind of constraints are prevalent, through the models below. Use of funds for consumption smoothing and investment/finance, the flows, seem to vary with financial sector provider. Some aim for clientele at the middle or low wealth group. The various providers do have distinct policies. For example, the BAAC has a risk-contingency system in which loan repayment can be deferred or partially forgiven, though provisions are not charged appropriately. Village funds differ by policies, shown in the data to be correlated with success and failure in membership, saving, and lending growth. There appear to be gaps in services, and this historical and cross sectional variation is a key to preliminary financial sector assessment of impact below.

Historically, financial deepening is most obvious for the BAAC which operates now in most villages, least obvious for village funds which, until recently, blink on and off with success and failure, and mixed for commercial banks, which spread like contagion in nearby areas. By household, pre-existing wealth facilitates entry into the formal financial sector, as does education. Income differentials and inequality vary by access, no-access groups. The distribution of wealth is higher for those with commercial bank access, lowest for those who borrow informally, and concentrated in the middle for the BAAC. Evidently, there is a positive relationship between prior wealth and financial access, especially formal access, and so, again wealth as a constraint looms large.

Education levels vary over space, both across provinces and within provinces by proximity to major roads or towns. Secondary school are scattered, and many households have relatively low levels of education. Thus, varying levels of education should be taken into account in occupation choice and financial use, at least. The education of children still varies with parental wealth. Educational outcomes as part of constrained choice need to be studied further. Education is certainly a key variable in income, inequality, and poverty decompositions, as mentioned earlier. Income differentials have increased over time, and illiteracy has declined substantially. Inequality in income remains higher for the low education groups.

5.1 Occupation/Industrialization

5.1.1 The Contemporary Situation

The contemporary picture of industry shows that manufacturing of metal machinery and equipment is concentrated in the greater Bangkok areas but with nontrivial number of factories in the provinces, e.g., the corridor to the North, parts of the South, the Eastern seaboard, and the Northeast 'arc' swinging up from Nakorn Ratchasima to Ubon. In contrast, food and food processing is concentrated in the Northeast generally.
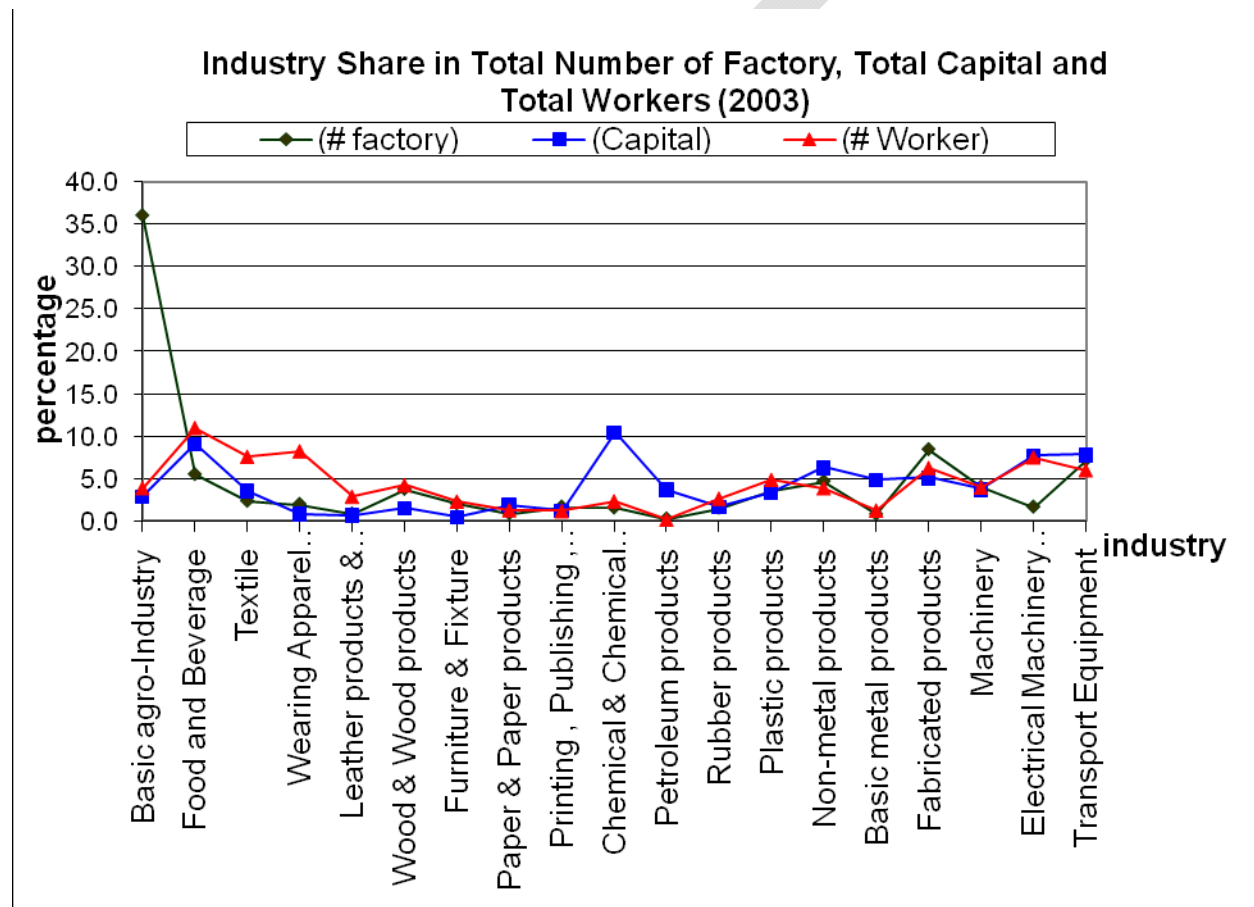
[Figure 5.1.1.1 Source: Office of Industrial Economics, Ministry of Industry]

Food and beverages, fabricated products, non-metal products, and transportation are among the largest manufacturing sectors in having a combination of all three criteria: number of factories, capital, and employment. See Figure 5.1.1.2. The single largest type by number of factories is agro-industry (which includes small rice mills), followed by fabricated products. The largest by employment are

food/beverage, textiles, wearing apparel, and electric machinery and supplies. The largest in terms of capitalization are chemical and chemical products, food/beverage/tobacco, and transport equipment.

	Firms		Employees		Registered capital	
	N	share (%)	N	share (%)	million BHT	share (%)
SMEs	124,771	97.9	1,605,815	50.4	1,218,856	52.0
Large enterprises	2,631	2.1	1,580,588	49.6	1,125,111	48.0
Total	127,402	100.0	3,186,403	100.0	2,343,967	100.0

[Table 5.1.1.2 Distribution of SMI's by Industry. Source: JBIC]

In Thailand, firms with 200 or fewer employees are termed SMEs (small and medium enterprise). See Table 5.1.1.3. As of 1996, these constituted 97.9% of all establishments, employed 50.4% of the employee workforce, and had 52.0% of the registered capital. There is relatively little variation by sector. Virtually all rice mills are SME's (excluded from the above totals already). On the other hand, a lower 88-89% of the number of firms in textiles, footwear, and petrochemicals are SME's.

Main Products	N	Total %
Final product	450	70.1
Intermediate output	180	28.0
Both	19	3.0
Base all respondents	642	100.0
Sales source	N	Total %
Domestic sales 100%	342	53.3
Domestic sales >50%	139	21.7
Domestic sales 50%: Export 50%	13	2.0
Export 51-100%	148	23.1
Base all respondents	642	100.0

Note: 1) Multiple answers

[Table 5.1.1.3 Major Products and Their Markets. Source: JBIC]

Table 3.8 Subcontracting Relationship with Multinationals or Local Firms

	Prime contractor of		Sub-contractor of		Neither	Base all respondents
	Foreign/multinational producers	Local companies	Foreign/multinational producers	Local companies		
N	36	206	33	90	286	642
%	5.6	32.1	5.1	14.0	44.5	100.0

Note: Multiple answers

[14] 24.9% of the total respondents said that they do not know the value of their fixed asset, thus implying that applying the value of fixed asset to SME definition will be difficult.

[15] A small enterprise is defined as a firm that fulfills two of the following three criteria: 50 or less employees, 10 million bahts or less capital, and fixed assets of 50 million bahts or less (capital and fixed assets were not available for some firms).

[16] A medium enterprise is defined as a firm that fulfills two of the following three criteria 51 to 200 employees, over 10 million and 100 million bahts or less capital, and fixed assets of over 50 million and 200 million bahts or less (capital and fixed assets were not available for some firms).

[Table 5.1.1.4. Subcontracting Relationships with Multinationals or Local Firms. Source: JBIC]

Fixed assets	Total	
	N	%
Less than 10m BHT	240	37.4
11-50m BHT	157	24.5
51- 100m BHT	44	6.9
101-200m BHT	41	6.4
NA	160	24.9
Base all respondents	642	100.0

Employees	Total	
	N	%
Less than 10 employees	137	21.3
11-50 employees	266	41.4
51- 100 employees	114	17.8
101- 200 employees	125	19.5
Base all respondents	642	100.0

Note: 1) as of June 1999, at cost

[Table 5.1.1.5. Fixed Assets and Number of Employees. Source: JBIC]

According to a Japanese JBIC survey, nontrivial numbers of SMEs are connected to international markets. Sales via exports exceed 50% of all sales for 23.1% of all SMEs, though 53.3% do rely on

domestic sales only. See Table 5.1.1.3. Likewise, in Table 5.1.1.4, from 5.6% to 32.1% are prime contractors for multi-national and local companies, respectively.

Important for the argument which follows is the size of the SME's assets. See Table 5.1.1.6. No less than 37% of all SME have assets less than 10 million baht (a more refined histogram is not available). For subsequent reference, 21% have less than 10 employees and another 41% have between 10 and 50 employees. Thus the bulk of SME's are small by most measures. Indeed, the Ministry of Industry's registry of firms uncovers many with less than 10 employees and registered capital of 50,000 to 1 million baht. See Table 5.1.1.7 for an example.

Name	Capital	Man Power	Horse Power
Entrepreneur 1	550,000	4	61.35
Entrepreneur 2	6,500,000	81	
Entrepreneur 3	1,601,000	10	40.36
Entrepreneur 4	362,000	3	26.02
Entrepreneur 5	3,970,000	27	636.83
Entrepreneur 6	200,000	5	9
Entrepreneur 7	1,250,000	10	33.54
Entrepreneur 8	190,000	5	
Entrepreneur 9	210,000	1	10.66
Entrepreneur 10	735,000	9	51.86
Entrepreneur 11	200,000	4	
Entrepreneur 12	292,000	2	44.11
Entrepreneur 13	750,000	2	11
Entrepreneur 14	380,000	7	30.75
Entrepreneur 15	450,000	4	35.81
Entrepreneur 16	55,000	8	47.26
Entrepreneur 17	142,000	2	12.25
Entrepreneur 18	50,000	7	10.04
Entrepreneur 19	234,000	217	39.09
Entrepreneur 20	25,000,000	69	14323.07
Entrepreneur	167,000,000	88	7180

21			
Entrepreneur 22	70,000,000	100	11126.17
Entrepreneur 23	15,500,000	42	1415.7
Entrepreneur 24	81,500,000	42	1425.89
Entrepreneur 25	205,400,000	70	
Entrepreneur 26		33	8230.5
Entrepreneur 27	492,000,000	151	6069.91
Entrepreneur 28	3,800,000	62	20.75
Entrepreneur 29	8,500,000	20	258.75
Entrepreneur 30	100,000	2	25.88
Entrepreneur 31	1,150,000	7	16.5

[Table 5.1.1.6. Example from Ministry of Industry Registry, Lop Buri. Source: Adapted from the records of the Thai Ministry of Industry]

Income Tercile	Whole Sample	Chachoengsao	Lop Buri	Buriram	Srisaket
All Households	175,824	260,492	118,817	121,898	59,379
Low	75,785	62,172	129,224	88,428	25,867
Medium	90,792	133,348	30,643	76,060	62,794
High	260,556	416,846	154,447	167,904	70,780

[Table 5.1.1.7. Average Costs of Household Business Assets. Note: Values are in baht, nominal values not adjusted for inflation or depreciation. At the time of data collection, 1000 THB $\approx$ USD $ 40.00. Table presents the results only for households that own businesses. Source: Adapted from Townsend Thai data]

Business type	Whole sample	Northeast	Central
Shrimp/shrimp and fish/fish	50	9	51
Shop	16	16	16
Trade	21	21	23
Restaurant/noodle shop	7	32	6
Transport and construction	278	855	181
Sewing/silk/embroidery	10	5	17
Mechanic/repair shop etc.	31	23	84
Rice threshing	47	59	12
Services (haircut, laundry, etc.)	20	25	14
Other	45	34	68
Total	32	19	38

[Table 5.1.1.8. Median initial investment by region and business type, 1000s of 1997 baht. Source: Paulson and Townsend (2004)]

One can also uncover firms in standard household surveys. The Townsend Thai data find 23% of households in 1997 with nontrivial business assets (not featured in a table). Table 5.1.1.8 shows the average costs of household business assets for households that have businesses. The highest tercile has 261,000 baht in assets, 417,000 in assets in Chachoengsao. As reported in Table 5.1.1.9, transport and construction firms in the Northeast have 855,000 in initial business investment. (Total household assets reach 1.18 million baht in Chachoengsao.) There are in fact some households in the monthly data with business assets from one to 9 million baht. See example in Table 5.1.1.10. Clearly the mid to high end of household enterprise is firmly co-mingled with the lower to mid range of the SME's. We can thus use the household survey data to study with some confidence the establishment of nonfarm enterprise.

| Village	Asset (Baht)	Type of Business
70737	1,680,000	shrimp farm, concrete factory
270230	9,065,612	construction equipment, construction job, gas station
490416	841,000	dig the well
530131	546,350	shop, rice mill, (small) bus

[Table 5.1.1.9. Households with Largest Business Asset in Each Province. Source: Adapted from Townsend Thai data]

5.1.2. History

Historically, there is a salient transition out of agriculture and into wage work and non-farm enterprise. The table from the SES, 1976-1996, indicates the decline in small farmers, from 44.5% to

23.8% of the population. Large farmers also declined from 6.3% to 2.5%, as did the few in fishing. There is a steady rise in the number of production workers, from 5.9% to 15.2%, and service workers, from 8.0% to 13.6%. The number of non-farm self employed is relatively flat, first falling and then, after 1990, rising.   More telling perhaps is the more or less steady increase in the number of non-farm employers from 1.3% to 3.2%. Related would be the increase in professional workers, from 4.1% to 6.6%. The number of households on 'assistance' rises from 3.5% to 12.1%. The models below will begin by aggregating some of these categories, again featuring the choice between wage and non-farm enterprise.
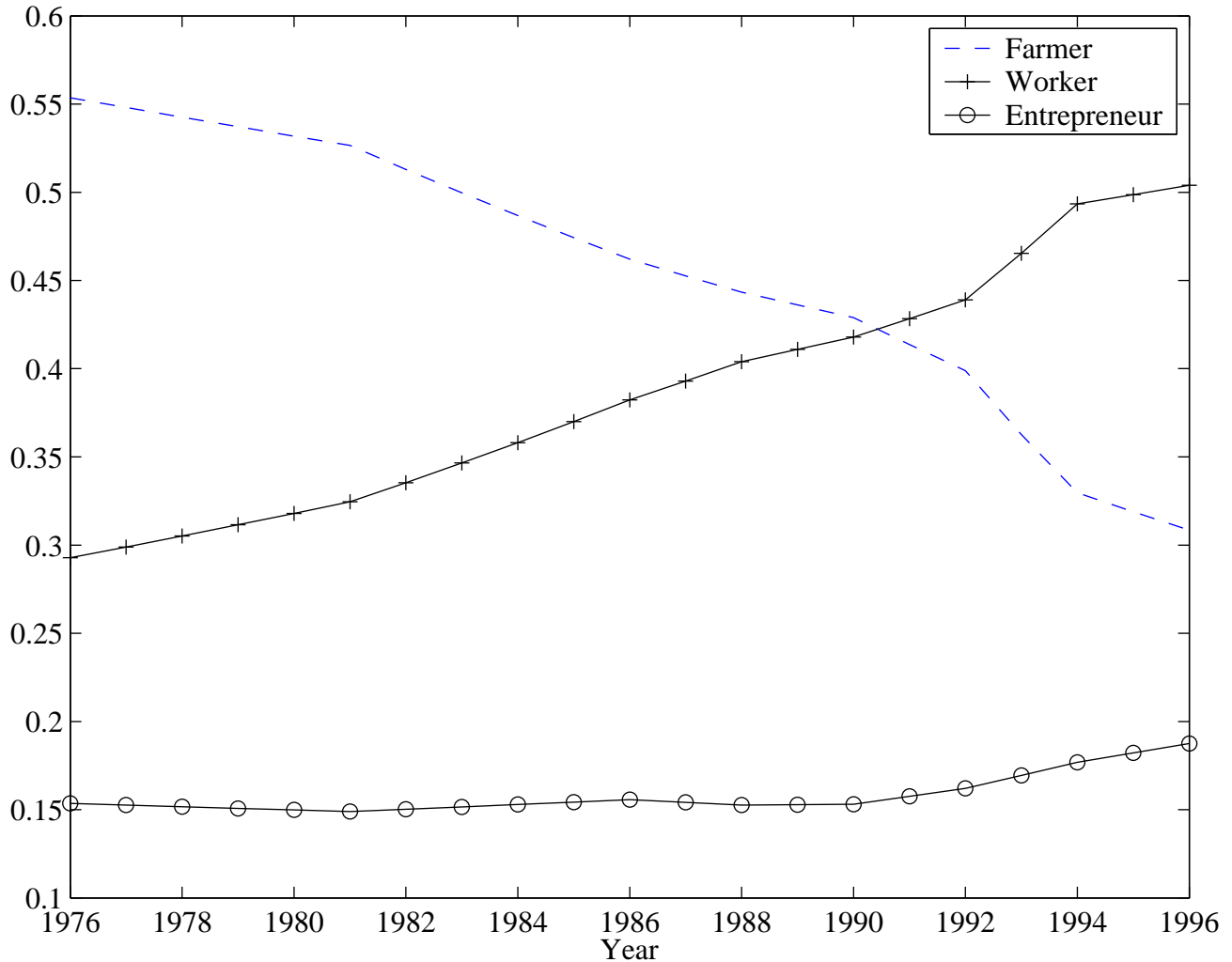
Figure 3. Occupational Transition in Thailand

[Figure 5.1.2.1.Trend of Occupational Composition. Source: SES, data Jeong and Townsend (2005)]

	1976	1981	1986	1988	1990	1992	1994	1996	1976-96	1976-86	1986-92	1992-96
OCCUPATION												
Small farmer	46.1	45.8	39.4	38.6	36.9	34.8	27.9	26.2	-19.9	-0.67	-0.77	-2.16
Fisher and other farmer	2.0	1.7	1.3	1.2	0.9	0.7	0.9	0.7	-1.3	-0.08	-0.10	0.01
Big farmer	7.6	6.7	7.1	5.0	5.4	4.8	3.0	3.0	-4.6	-0.05	-0.40	-0.43
Non-farm self employed	13.2	11.3	11.4	11.4	11.3	11.4	12.5	13.3	0.1	-0.18	-0.01	0.48
Non-farm employer	1.4	2.6	2.5	2.6	2.6	3.1	3.2	3.5	2.1	0.10	0.00	0.10
Own-account professional	0.1	0.1	0.1	0.0	0.1	0.2	0.3	0.2	0.0	0.00	0.01	-0.01
Farm worker	4.7	5.7	6.6	6.8	6.2	6.0	6.3	5.5	0.8	0.19	-0.10	-0.12
General worker	5.0	1.6	3.9	3.8	3.8	3.9	3.7	3.0	-2.0	-0.11	0.00	-0.24
Production worker	5.9	7.7	8.7	8.5	10.4	11.3	14.1	15.5	9.6	0.28	0.42	1.06
Service worker	7.4	7.9	8.3	9.7	10.7	11.1	12.3	12.8	5.4	0.10	0.47	0.40
Professional worker	3.7	4.4	4.6	5.3	5.0	5.2	5.8	6.2	2.5	0.09	0.10	0.25
Assisted	2.2	3.6	5.3	6.3	6.0	6.5	9.4	9.4	7.1	0.31	0.20	0.72
Rentier	0.5	1.0	0.7	0.8	0.8	0.9	0.7	0.7	0.2	0.02	0.05	-0.05
FINANCIAL PARTICIPATION												
Nonparticipant	93.5	89.8	89.3	84.7	80.4	78.1	75.5	73.4	-20.1	-0.41	-1.86	-1.19
Participant	6.5	1.02	10.7	15.3	19.6	21.9	24.5	26.6	20.1	0.41	1.86	1.19
EDUCATION												
No formal	18.3	12.5	8.6	7.6	7.1	6.9	6.2	5.6	-12.7	-0.97	-0.27	-0.34
Primary	73.1	76.1	78.6	77.4	76.4	74.9	73.2	71.8	-1.3	0.55	-0.63	-0.78
Secondary	5.4	6.3	6.1	6.9	8.3	8.9	10.3	11.4	6.0	0.07	0.47	0.63
Vocational	2.2	3.6	4.0	4.5	4.2	4.6	5.0	5.3	3.1	0.18	0.09	0.18
University or higher	1.1	1.5	2.7	3.6	4.0	4.8	5.3	6.0	4.9	0.17	0.34	0.31

[Table 5.1.2.2. Composition of Income Status Groups. (%) Source: Jeong (2008)]

Draft: July 2010

| Year	1976	1981	1986	1988	1990	1992	1994	1996	76-96[1]	76-86[2]	86-92[2]	92-96[2]
Occupation												
Small Farmer	637	799	649	749	844	911	1069	1309	3.7	0.2	5.8	9.5
Fisher & Other Farmer	875	1221	798	1305	1472	1982	2833	2370	5.1	-0.9	16.4	4.6
Big Farmer	1090	1361	1064	1425	2037	1546	1743	2379	4.0	-0.2	6.4	11.4
Non-farm Self-employed	1421	1645	1485	1654	1956	2244	2391	2961	3.7	0.4	7.1	7.2
Non-farm Employer	3422	3629	3525	3637	5647	6223	6607	6979	3.6	0.3	9.9	2.9
Own-account Professional	2536	2108	2455	7427	2843	13517	10851	7257	5.4	-0.3	32.9	-14.4
Farm Worker	715	748	616	676	753	833	942	1147	2.4	-1.5	5.2	8.3
General Worker	766	893	720	685	800	1056	1117	1391	3.0	-0.6	6.6	7.1
Production Worker	1217	1470	1388	1532	1674	1957	1787	2078	2.7	1.3	5.9	1.5
Service Worker	1521	2055	2122	2244	2498	3115	3231	3711	4.6	3.4	6.6	4.5
Professional Worker	2245	3082	3389	3837	4557	6127	6008	6964	5.8	4.2	10.4	3.3
Assisted	1233	1917	1645	1842	1796	2050	1942	2299	3.2	2.9	3.7	2.9
Rentier	1372	2238	2311	2125	4504	4301	4250	3774	5.2	5.3	10.9	-3.2

[Table 5.1.2.3. Average Income Profile (1990 Baht) Source: SES data, Jeong and Townsend (2005)]

The skills of these various categories of workers should be reflected in part in earned incomes. See Table 5.1.2.3. Small farmers, farmer workers, and general workers earn roughly the same amounts and are on the low end. On the high end are non-farm employer, own account professionals, and professional workers. The latter two have the largest increases in income over the 20 years. In between these highs and low income groups lie non-farm self employed, earning more than twice that of workers and about half that of employers and/or professionals. Some of the models below act as if wage work and subsistence agriculture are equivalent in income, and this is not far from the actual facts of the data. The income differences between self-employed and employer categories may have to do with the scale at which constrained households can operate, as in the models below.

Year	1976	1981	1986	1988	1990	1992	1994	1996	76-96[1]	76-86[2]	86-92[2]	92-96[2]
Occupation												
Small Farmer	0.180	0.179	0.217	0.216	0.230	0.229	0.275	0.288	10.8	0.37	0.20	1.48
Fisher & Other Farmer	0.216	0.395	0.253	0.377	0.381	0.514	0.887	0.467	25.1	0.37	4.34	-1.15
Big Farmer	0.236	0.239	0.296	0.285	0.504	0.326	0.334	0.400	16.4	0.60	0.51	1.84
Non-farm Self-employed	0.251	0.258	0.265	0.262	0.294	0.297	0.290	0.285	3.4	0.14	0.54	-0.32
Non-farm Employer	0.325	0.366	0.392	0.398	0.584	0.512	0.513	0.465	14.0	0.68	1.98	-1.17
Own-account Professional	0.183	0.344	0.379	0.728	0.294	1.372	0.932	0.349	16.6	1.95	16.56	-25.58
Farm Worker	0.133	0.161	0.207	0.163	0.160	0.201	0.191	0.189	5.6	0.74	-0.10	-0.30
General Worker	0.120	0.156	0.179	0.164	0.143	0.166	0.195	0.169	4.9	0.59	-0.21	0.06
Production Worker	0.173	0.219	0.243	0.247	0.247	0.272	0.247	0.250	7.6	0.69	0.50	-0.56
Service Worker	0.172	0.213	0.229	0.231	0.254	0.263	0.274	0.250	7.8	0.57	0.57	-0.33
Professional Worker	0.166	0.200	0.208	0.202	0.221	0.316	0.277	0.287	12.2	0.42	1.80	-0.71
Assisted	0.313	0.325	0.405	0.408	0.382	0.451	0.374	0.330	1.7	0.92	0.77	-3.03
Rentier	0.415	0.530	0.607	0.423	1.007	0.700	0.602	0.510	9.4	1.91	1.55	-4.75

[Table 5.1.2.4. Inequality Profile by Theil-L Index. Source: SES data, Jeong and Townsend (2005)]

Inequality is roughly correlated with the level of income. See Table 5.1.2.4. The lowest inequality groups are small farmers, as well as farm, general, production workers (though professional workers and own account professional have low inequality in income, an exception). The highest inequality groups are non-farm employers and non-farm self employed (but inequality is high for farmers, an exception).
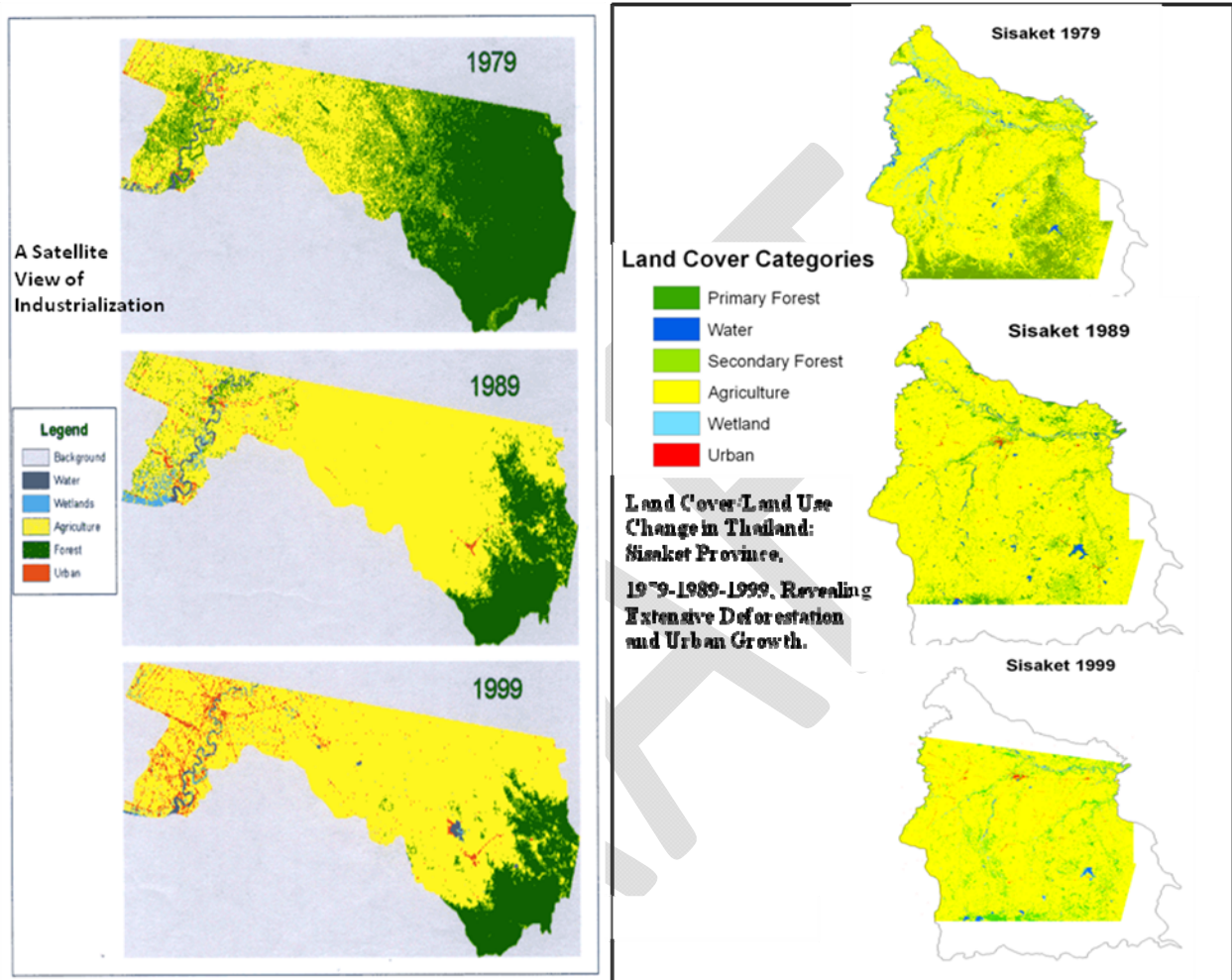
[Figure 5.1.2.5. Source: Felkner (2000)]

The occupation shifts out of farming and into other occupations is reflected in satellite imagery depicting deforestation and urbanization. The forests of eastern Chachoengsao (Figure 5.1.2.5) and southern Sisaket are now largely gone. Industrialization and construction along the corridor going from Bangkok to the eastern sea board in Chachoengsao and around Sisaket city are evident, in red, on the map. We shall try to explain these patterns, subsequently.

New Occupation of Household Head => Old Occupation of Household Head	Rice Farmer	Farmer, Other Crop	Shrimp Farmer	Construction	Business/ Skilled Trade	Professional/ Administrative	General Worker, Cleaner/ Janitor	Other	Total
Inactive/ No Occupation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.2
Rice Farmer	0.2	7.1	7.3	6.7	7.9	0.8	4.7	2.8	37.5
Farmer, Other Crop	1.4	15.4	2.8	1.0	3.9	0.2	1.8	1.4	27.8
Shrimp Farmer	0.0	1.2	2.0	0.2	0.6	0.0	0.0	0.2	4.1
Construction	0.2	0.6	0.4	0.2	1.0	0.2	0.4	0.4	3.4
Business/ Skilled Trade	1.4	1.2	2.0	0.8	4.9	0.4	1.2	0.6	12.4
Professional/ Administrative	0.0	0.6	0.0	0.0	0.6	0.4	0.4	0.4	2.4
General Worker, Cleaner/Janitor	0.8	1.8	1.0	1.8	1.6	0.0	0.8	0.6	8.3
Other	0.8	1.0	0.0	0.2	1.2	0.0	0.4	0.4	3.9
Total	4.7	29.0	15.4	10.9	21.7	2.0	9.7	6.9	100.0

[Table 5.1.2.6. Percentage Distribution of Occupational Changes Over Past Six Years. Source: Jeong, unpublished]

The transition from agriculture into non-farm occupations is often direct. By far the single most common movement in the Townsend Thai data, 1992-1997 retrospective, is out of the rice farmer category, into construction and business/skilled trade, shrimp and other crops, for a total of 37% of the rice farming population. See Table 5.1.2.6. Those farming other crops also make some such transitions, 28% in total. Movement into business and skilled trades is relatively large, and farmers also tend to switch crops.

Size of employment	Bangkok	Central	Northern	North-eastern	Southern	Total	Percentage for each size
1-9	10,019	4,935	1/602	2,415	1,526	20,497	63.3%
	(48.9%)	(24.1%)	(7.8%)	(11.8%)	(7.5%)	(100.0%)	
10-49	4,145	2,410	932	1,257	760	9,774	30.2%
	(45.2%)	(24.7%)	(9.5%)	(12.9%)	(7.8%)	(100.0%)	
50- 199	507	663	169	281	112	1,732	5.3%
	(29.3%)	(38.3%)	(9.8%)	(16.2%)	(6.5%)	(100.0%)	
200 and over	118	118	43	32	18	399	1.2%
	(29.6%)	(47.1%)	(10.8%)	(8.0%)	(4.5%)	(100.0%)	
Total	15,059	8196	2,746	3,985	2,416	32,402	100
	(46.5%)	(25.3%)	(8.5%)	(12.3%)	(7.5%)	(100.0%)	

[Table 5.1.2.7. Number of Factories Classifies by Size of Employment and Regions (1980). (* Excluding rice mills, sawmills, ice making and printing firms.) Source: Factory Control Division, Ministry of Industry]

Despite the prominence of SMEs in the contemporary Thai economy, firms were historically even smaller. A 1980 study from the Ministry of Industry, even excluding rice and saw mills, ice-making and printing , finds that 63.3 percent of firms had between 1 and 9 employees, with an additional 30.2 percent at between 10 and 49 workers. See Table 5.1.2.7. This is clearly a left-shifted histogram relative to the previous more contemporary 1996 data.   Akira (1989) compares the size distribution between 1963 and 1970 and again finds the distributions shifts left as one goes deeper into the past, even within those 7 years. The number of establishments with 10-49 workers was 62.5% in 1970 and increases to 84.3% as one goes back to 1963. The proportion of small establishments contributing to employment, value added, and wages and salaries likewise shifts left as one go backward in time.

The distribution of establishments (by type) in the most developed, Bangkok/Thonburi Areas in 1960 is listed in the table. See Table 5.1.2.8. Apart from matches and cement, most establishments are quite small, including those run by Chinese, where the average employment overall is 8.5 workers.

Type of Business	No. of Establishments			No. of Employees	Employees per Establishment
	Total	Thai	Foreign[a]		
Hardware	1,024	285	739	5,926	5.8
Printing, book binding	530	290	240	5,014	9.5
Saw milling	317	89	228	4,771	15.1
Weaving with handlooms[b]	382	15	367	4,527	11.9
Rice milling	149	92	57	2,625	17.6
Candles, joss sticks	111	34	77	2,148	19.4
Machinery repairing	283	122	161	2,096	7.4
Weaving with machines	185	16	169	2,052	11.1
Spinning	62	9	53	1,586	25.6
Pharmaceuticals	228	85	143	1,562	6.9
Flour milling	196	32	164	1,448	7.4
Matches	4	1	3	1,283	320.8
Garments[c]	29	8	21	1,116	38.5
Aerated water	47	14	33	1,005	21.4
Tobacco	94	23	71	825	8.8
Shellac	24	7	17	558	23.3
Soap[c]	13	2	11	550	42.3
Cement	1	0	1	521	521.0
Ice	43	24	19	510	11.9
Liquor	6	5	1	218	36.3
Total[d]	7,302	2,233	5,069	62,264	8.5

SOURCE: The Ministry of Industry (unpublished data).
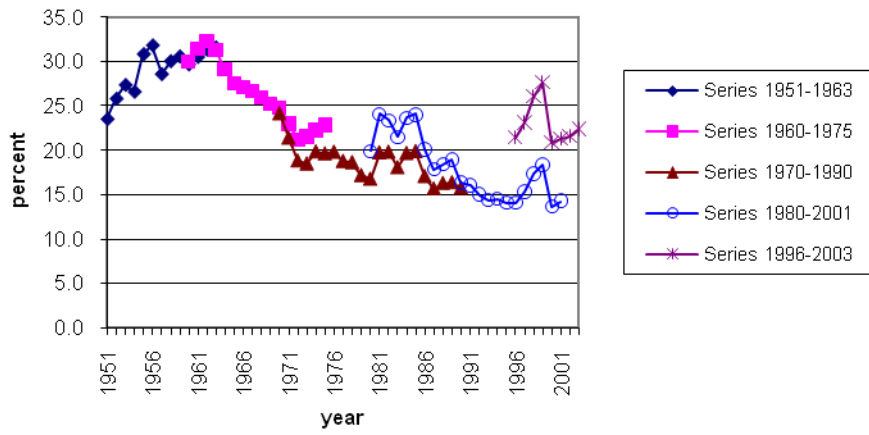[a]Mostly the Chinese group.
[b]Establishments with five looms or more.
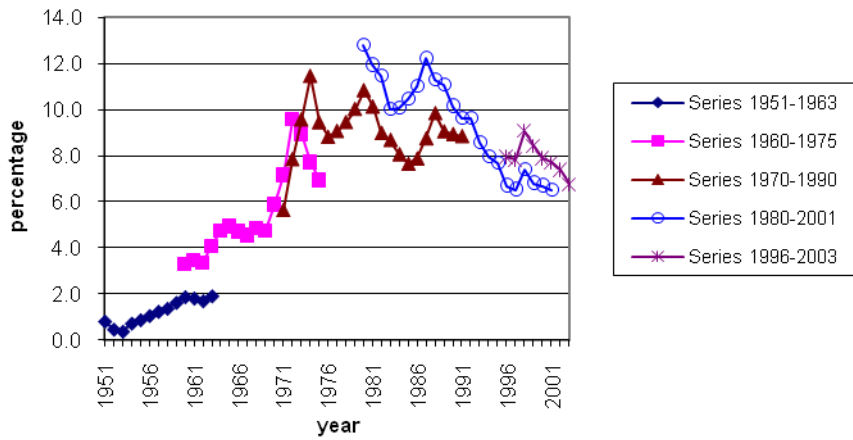[c]Establishments with five employees or more.
[d]Includes other businesses.

[Table 5.1.2.8. Establishments in the Bangkok-Thonburi area (1960). Source: Akira (1989)]

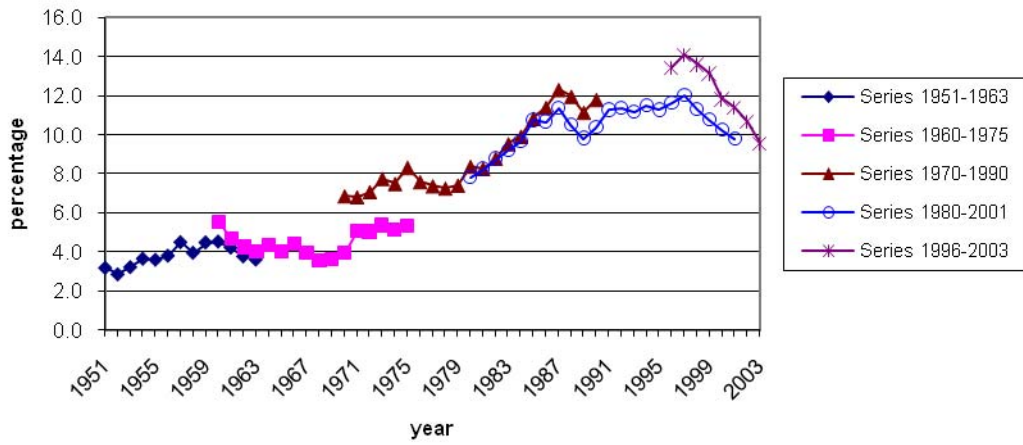## Figure1: Food and Beverage as percentage of Total Manufacturing (current price)

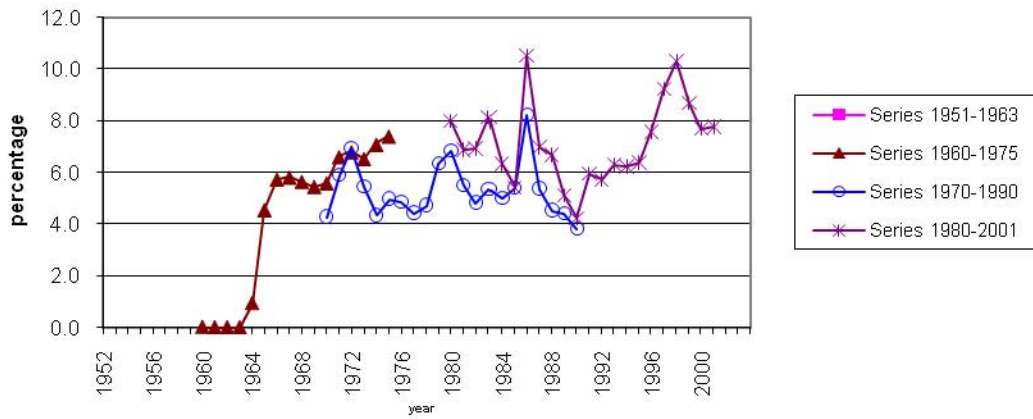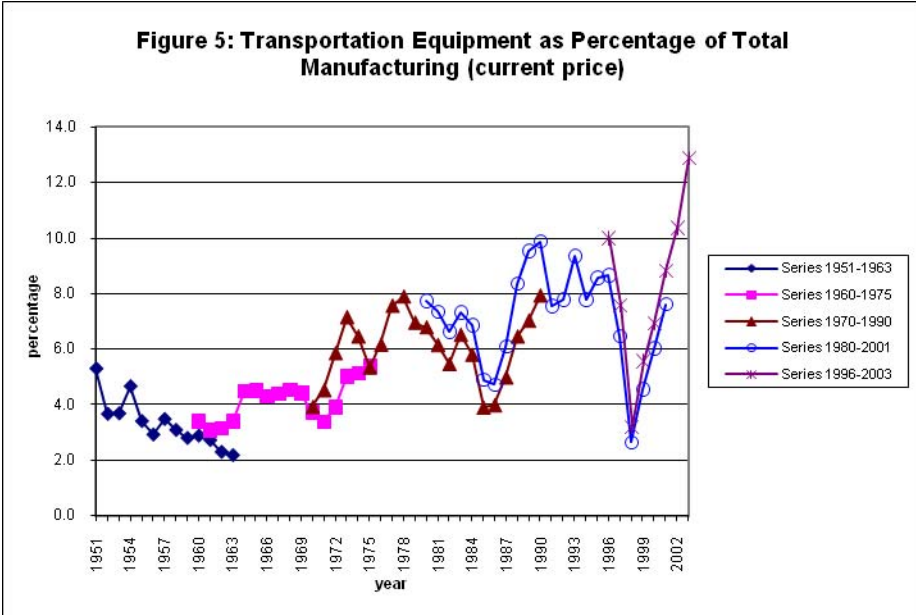## Figure 2:Textile as percentage of Total Manufacturing (current price)

Figure3: Wearing Apparel as percentage of Total Manufacturing (current price)

Figure 4: Petroleum refinery as percentage of Total Manufacturing (current price)

Figure 5: Transportation Equipment as Percentage of Total Manufacturing (current price)

[Figure 5.1.2.9 Source: Adapted from NESDB data]

One surmises from NESDB data that early on, the food and beverage sector was among the most important. However, it has been in decline since 1950. Textiles and wearing apparel peaked in the mid 80's. Transportation and petroleum have increased over time, but with cycles.
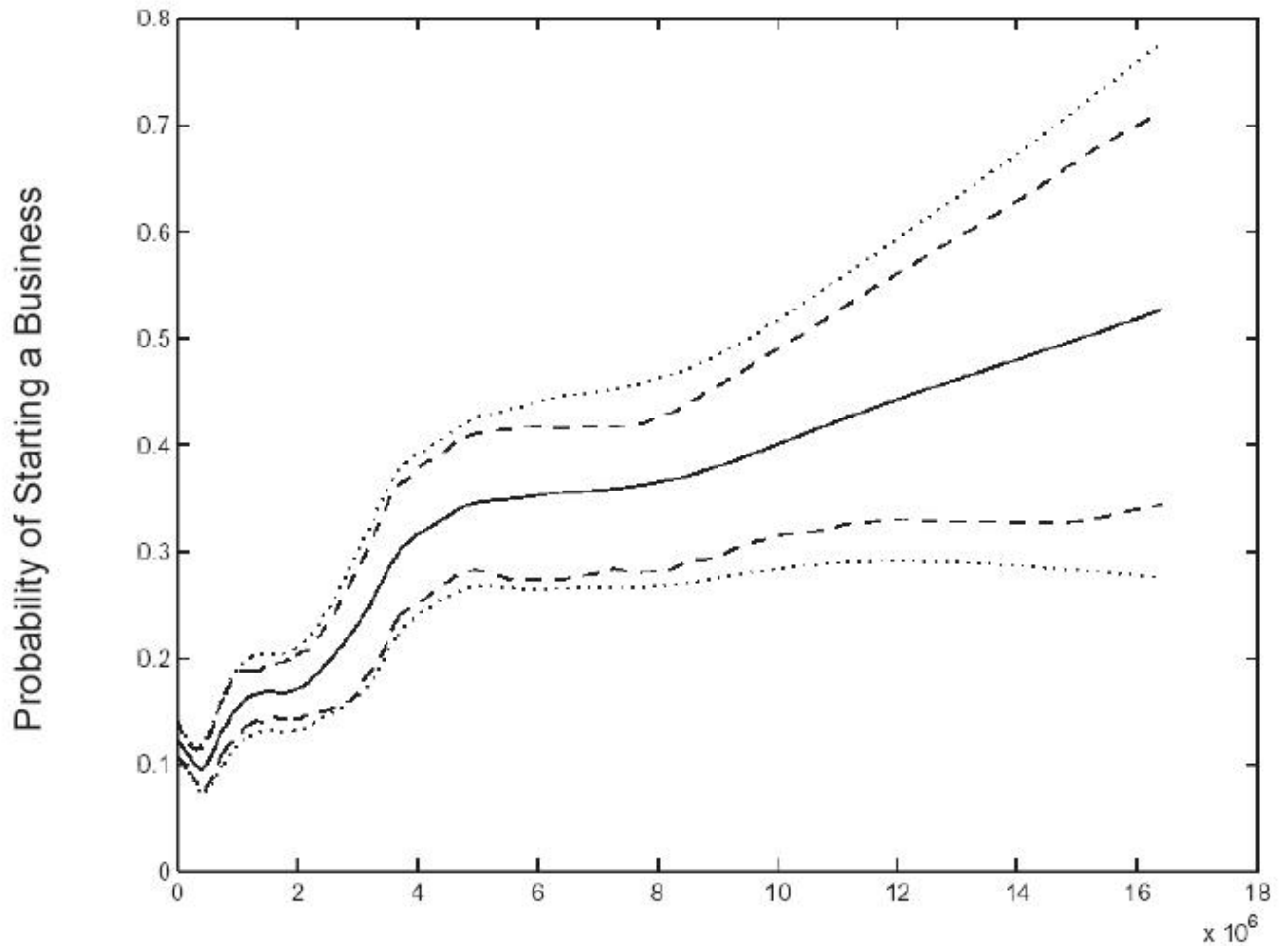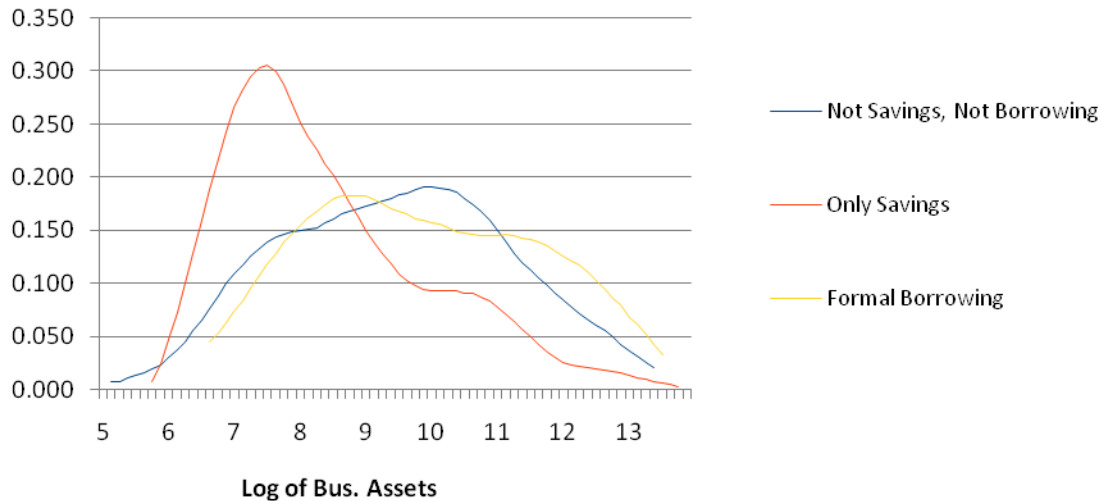
[Figure 5.1.2.10. Non-Parametric Relationship Between Starting a Business and wealth. Notes: y-axis indicates probability of starting a business (1992-1997), x-axis indicates prior wealth in 1992. Dashed line indicates 90% confidence interval, dotted line $= \pm 2\sigma$. Source: Paulson, Townsend and Karaivanov (2003)]

Despite non-trivial income gaps, movement of households into higher income categories has come slowly. The Townsend Thai data measures occupation transitions, as noted earlier, and also retrospective wealth. Non-parametric regressions reveal that the 1992 wealth of those still in farming helps to predict the fraction that makes a subsequent transition out of the farm and into other enterprise, 1992-1997. Standard errors do not overturn this conclusion, especially on the low end of wealth. It would thus seem there are barriers to entry, for example, imperfect credit markets. This is a key feature of the constrained household choice problems below.

Business less than one year old
Before 2002

Legend:
- Not Savings, Not Borrowing
- Only Savings
- Formal Borrowing

X-axis: Log of Bus. Assets
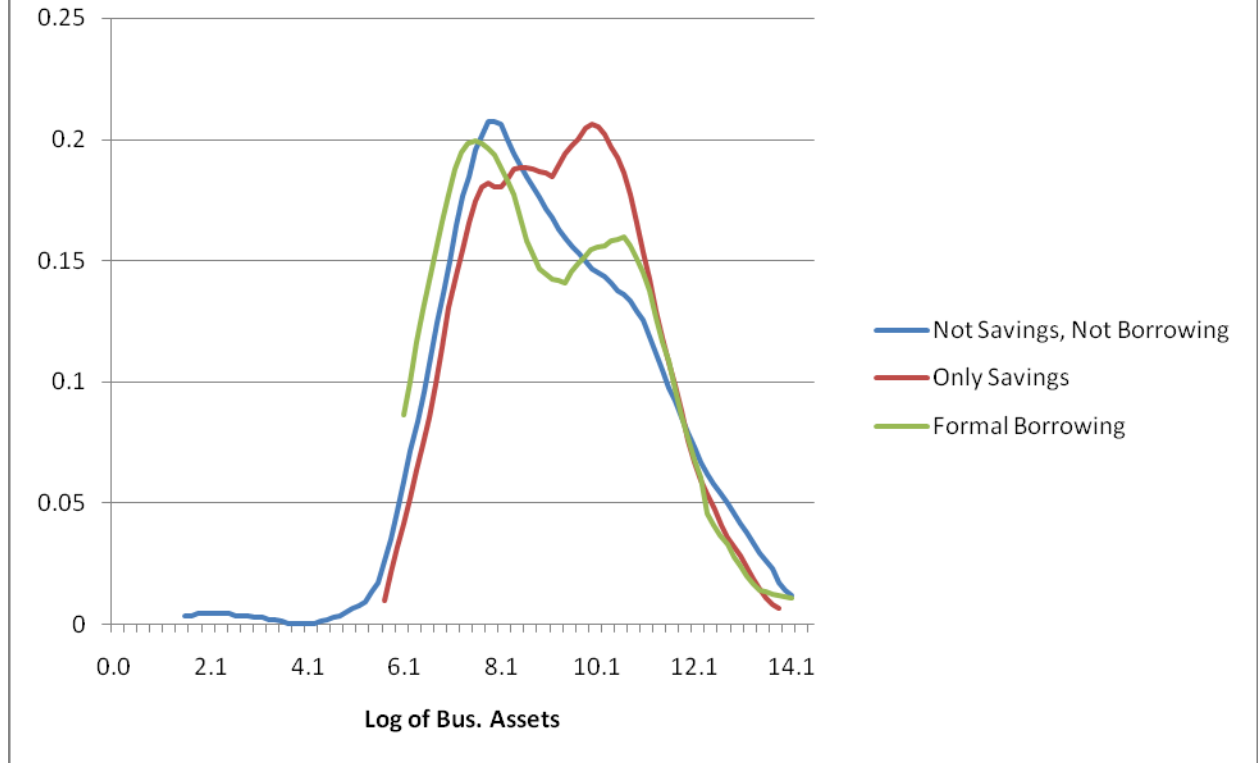
Business less than one year old
After 2002 included

[Figure 5.1.2.11. (top) Business less than one year old before 2002 and (bottom) Business less than one year old after 2002 included. Source: Townsend Thai data]

Related, for those in a new business, one year old or less, the distribution of business assets is shifted to the right if the household is able obtain formal borrowing, relative to those in financial autarky, who neither borrow nor save. (Interestingly, those with saving only are asset poor --see below for a model which rationalizes this conclusion).

However, for those starting business in the 1997 financial crisis, the picture is cloudy if not reversed. It is as if either a restricted financial system took its toll or the incentives to enter business shifted with changing income differentials. Paulson and Townsend (2005) find that start up investment was smaller than normal in this period, and households were less skilled. In short these businesses may have been a substitute for wage employment. Over the longer history and in the contemporary situation, that is not the typical case.

5.2   Drivers: Financial Situation – Contemporary Picture

5.2.1 The Contemporary Situation

Financial Institutions	No.	No. of branches	Assets[1]	Funds mobilized from households[1]	Credits extended[1]
Commercial banks	29	3171	5,626,661.2	2,642,854.2	4,825,056.5
Finance companies[2]	91	71	1,811,937.6	661,016.4	1,488,187.8
Credit foncier companies	12	0	8,517.7	6,151.6	6,742.3
Mutual fund management co.	8	195 funds	216,240.7	n.a.	n.a.
Government Savings Bank	1	543	237,442.2	205,374.2	56,256.7
Government Housing Bank	1	169	211,444.2	59,370.7	198,499.5
Bank for Agriculture and Agricultural Cooperatives (BAAC)	1	628	212,067.1	57,239.3	165,621.5
Industrial Finance Corp of Thailand (IFTC)	1	23	143,802.8	-	103,234.3
Small Industry Credit Guarantee Corporation (SIGC)	1	0	607.7	-	-
Small Industry Finance Corporation (SIFC)	1	1	1,887.6	-	698.4
Export-Import Bank of Thailand (EXIM bank)	1	2	34,623.8	-	30,744.6
Savings cooperatives	1127[3]	0	254,400.0[E]	181,750.0[E]	212,600.0[E]
Agricultural cooperatives	2832[3]	0	34,180.0[E]	17,150.0[E]	23,290.0[E]
Life insurance companies (including composite co.)	13	1216	145,172.9	116,738.9	31,847.2

1/ Unit: Million Baht

2/ Including finance and securities companies
3/ End of 1995
E/ Estimated

[Table 5.2.1.1. Key statistics of Thai financial institutions at end of 1996. Source: Bank of Thailand]

       A table summarizing the formal financial system shows that commercial banks in 1996 had four times the funds mobilized, and about the same multiple of the liabilities, as their nearest competitors, finance companies, and three times the level of assets. The Government Savings Bank (GSB), Government Housing Bank, and the Bank for Agriculture and Agriculture Cooperatives (BAAC) constitute the next largest group, though each is quite small in comparison. For example, the GSB had at best 33% of the funds mobilized by finance companies, and the BAAC lent about 12% relative to finance companies.

Lender Distribution by Number of Loans

Lender	All	CCS	LB	BR	SSK
Neighbor	7.8	8.6	7.8	8.4	6.5
Relative	15.9	16.9	14.2	17.2	15.0
BAAC	34.3	28.3	25.1	39.0	41.2
PCG	1.4	1.2	1.5	0.6	2.2
Comm. Bank	3.4	5.5	5.8	2.2	1.4
Ag. Coop.	10.0	14.0	13.3	5.1	9.6
Village Fund	1.0	0.6	0.5	1.6	1.0
Rice Bank	0.4	0.0	0.0	0.5	0.7
Moneylender	10.1	5.9	12.0	12.2	9.0
Storeowner	4.1	4.8	5.1	4.0	2.9
Supplier	0.2	0.3	0.4	0.0	0.3
Landlord	0.1	0.0	0.0	0.4	0.1
Purchaser	1.2	1.1	3.7	0.0	0.3
Other	10.0	12.4	10.5	8.5	9.6
Total	100.0	100.0	100.0	100.0	100.0

Lender Distribution of Total Credit

Lender	All	CCS	LB	BR	SSK
Neighbor	2.4	2.7	2.1	2.9	1.3
Relative	14.3	25.6	6.2	8.4	7.4
BAAC	28.6	25.1	22.2	39.9	38
PCG	1.2	0.2	0.9	0.1	7.4
Comm. Bank	15.8	15.9	26.2	6.4	5
Ag. Coop.	8.8	12.5	7.8	3.0	8.8
Village Fund	0.2	0.1	0.2	0.3	0.2
Rice Bank	0.0	0.0	0.0	0.1	0.1
Moneylender	6.0	3.6	7.2	8.3	7.5
Storeowner	6.9	6.4	5.4	12.8	2.7
Supplier	0.1	0.2	0.0	0.0	0
Landlord	0.0	0.0	0.0	0.2	0
Purchaser	2.9	0.3	9.2	0.0	0.3
Other	12.6	7.4	12.7	17.6	21.4
Total	100.0	100.0	100.0	100.0	100.0

[Table 5.2.1.2. (a) Lender distribution by number of loans and (b) Lender distributions of total credit.

Legend: CCS = Chachoengsao, LB = Lop Buri, BR = Buriram, SSK = Srisaket. (Left)

Source: Townsend Thai 1997 Survey, Kaboski and Townsend (1998)]

But household surveys in rural and semi-urban areas portray the opposite picture. In the Townsend Thai data, as in Table 5.2.1.2, commercial banks in 1997 have only 3.4 percent of all loans, or 15.8 percent by value. Much of this is the Central region, at 15-26%, rather than the Northeast, at 5.0-6.4%. The BAAC has 34.3% of all loans, 28.6% by value. This reaches 39.9% in the Northeast. The informal sector, missing of course from the previous Bank of Thailand table, is quite large, constituting 34% of the total, and even larger in total number of loans, as loans size can be small. The informal sector consists of a variety of players: neighbors, relatives, moneylenders, storeowners, input suppliers, landlords, and output purchasers. Note that one should not confuse the informal sector with stereotypical moneylenders as they are only part of the story. Of some interest, the variety of nontrivial lenders, formal and informal, is greater in the Central region – we might anticipate that intermediation seems to work differently there.

	All	*CCS*	*LB*	*BR*	*SSK*	*Korat*	*Nan*
Percent with Loans	68.0	57.0	60.6	76.9	77.7	57.3	59.8
Total Number of Loans	3467	661	817	1045	944	-	-
Not Borrowing	32.0	43.0	39.4	23.1	22.3	42.7	40.2

[Table 5.2.1.3. Loan Distribution by changwat. Legend: CCS = Chachoengsao, LB = Lop Buri, BR = Buriram, SSK = Srisaket. Source: Based on Gine (2001)]

	By number of households			*By amount of outstanding credits*
Percentage of households with debt	HADS (2004)	NSO (2002)	NSO (2004)	HADS (2004)
Formal credits only	70.0	71.0	70.0	62.1
Informal credits only	9.0	17.0	15.0	5.6
From both sources	21.0	12.0	15.0	32.3
Total	100.0	100	100	100.0

[Table 5.2.1.4. Shares of Formal vs. Informal Credits. Source: Adapted from Bank of Thailand estimates)]

The percentage of households not borrowing is 32% of the surveyed population of the Townsend Thai 1997 data. See Table 5.2.1.3. These households either lack access or choose not to borrow. This is lower in the Northeast, at about 23%, though in a TDRI study, the estimate is about 40%. The BAAC has a large role in the Northeast. Evidently, though, financial autarky is important (to be imposed exogenously or modeled below). Of those borrowing, the percentage of households using formal credit only is 62% to 70% of the borrowing population, according to a variety of surveys reproduced by the

Bank of Thailand, in Table 5.2.1.4. Those using the informal only are estimated at 6% to 17%. Of those in business, 34% self-finance while 36% use commercial banks/BAAC/formal, 17% moneylender/informal only, and 13% the combination of formal and informal. One may note the variety and combination of lenders, anticipating further analysis in the models below.

Borrower	*All*	*CCS*	*LB*	*BR*	*SSK*
Relative in village	30.3	24.8	25.6	31.9	36.8
Relative not in village	15.2	24.2	20.4	8.5	11.4
Nonrelative in village	39.7	31.7	35.5	47.2	40.8
Nonrelative not in village	12.6	19.3	14.0	8.9	10.5
Business partner	0.3	0.0	1.2	0.0	0.0
Other	2.0	0.0	3.5	3.4	0.5
Total	100.0	100.0	100.0	100.0	100.0

[Table 5.2.1.5. Borrower Distribution by changwat. Legend: CCS = Chachoengsao, LB = Lop Buri, BR = Buriram, SSK = Srisaket. Source: Kaboski and Townsend (1998)]

Borrower	*Avg. Loan Size (in 1000's)*	*Avg. Duration (months)*	*Avg. Interest Rate (annual)*	*% of Loans at Zero Interest*
Relative in village	14	17	13%	64.8
Relative not in village	58	15	19%	70.9
Nonrelative in village	13	12	46%	50.8
Nonrelative not in village	74	14	57%	44.3
Business partner	40	12	10%	50.0
Other	12	19	30%	26.7

[Table 5.2.1.6. Size, Duration, Interest Rate, Percent of Loans at Zero, Interest of Loans Lent, by Borrower. Source: Adapted from Townsend Thai data]

The variety in the informal sector, by region, is reflected in the Townsend Thai data in Table 5.2.1.5 in a number of ways. The largest categories of transaction partners in the Northeast are relatives and non-relatives in the village, whereas relatives and non-relatives not in the village rise in importance in the Central region. Non-relatives in the villages are the single largest category in both regions, however - 33% to 43%.

Interest rates vary, with large fractions at zero interest for relatives in and out of the village. See Table 5.2.1.6. Likewise, duration is longer for relatives in villages. In sum the village, or the family within the village, may constitute an important entity in finance risk-sharing networks. This will be tested in the work reported below. Average interest rates, even when positive, vary accordingly: low for

relatives in the village and high for non-relatives out of the village. Loan size is lowest for relatives in the village and highest for those not in villages, especially non-relatives. It seems the informal sector may change as the economy develops, toward larger loans at higher interest but of shorter duration.

	Working Capital				Capital Investment			
	1996	1997	1998	1999	1996	1997	1998	1999
Public financial institutions	3.6	3.4	3.7	3.7	2.5	2.6	2.6	2.2
Commercial banks incorporated in Thai/abroad	58.7	58.6	57.5	56.9	41.3	40.0	36.9	36.6
Finance companies	1.2	1.1	1.1	1.1	1.7	1.6	1.4	1.4
Informal financing	6.7	7.6	8.3	8.4	4.0	4.7	5.8	5.1
Overseas/Offshore financing	1.2	1.2	0.9	1.4	2.2	1.9	1.2	1.6
Other lending institutions for factoring, leasing	0.5	0.6	0.6	0.3	0.6	0.9	0.9	0.5
Sales proceeds	45.5	45.6	47.0	48.1	17.6	17.6	20.2	20.4
Company's internal reserves	20.6	21.2	23.2	23.4	15.0	15.0	15.6	15.4
Head Office	3.3	3.1	3.0	3.0	3.3	3.3	3.0	3.0

[Table 5.2.1.7. Source: JBIC]

Among SMEs in the Japanese JBIC survey, commercial banks in 1996 were the dominant source of credit, for 58% of survey respondents, and "informal" the dominant source for only 6.7%. See Table 5.2.1.7. This seems substantially different than the household numbers (though the questions were asked differently). Sample selection and the behavior of commercial banks require further investigation.

Lender	None	Land-borrower use	Land-lender use	Savings guarantee	Future crop guarantee	Other collateral	Single guarantor	Multiple guarantor	Other	Total
Overall	41.5	21.8	1.3	0.1	0.3	3.9	2.7	26.6	1.7	100.0
Neighbor	85.5	7.5	2.6	0.0	0.0	1.5	1.1	1.5	0.4	100.0
Relative	93.1	3.1	0.9	0.0	0.0	0.9	0.5	1.1	0.4	100.0
BAAC	9.8	31.9	1.0	0.2	0.2	4.1	2.0	48.4	2.5	100.0
PCG	36.2	6.4	2.1	6.4	0.0	2.1	10.6	36.2	0.0	100.0
Comm. Bank	1.7	77.1	2.5	0.0	0.0	9.3	5.9	0.9	2.5	100.0
Av. Coop	8.9	38.3	2.0	0.0	0.3	4.9	1.2	44.4	0.0	100.0
Village Fund	72.7	6.1	0.0	0.0	0.0	0.0	0.0	21.2	0.0	100.0
Rice Bank	63.6	0.0	0.0	0.0	9.1	0.0	0.0	9.1	18.2	100.0
Moneylender	62.8	21.6	2.0	0.0	0.9	3.5	3.8	2.9	2.6	100.0
Storeowner	72.7	4.9	0.7	0.0	0.7	5.6	9.8	4.9	0.7	100.0
Supplier	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Landlord	100.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	100.0
Purchaser	48.7	10.3	0.0	0.0	2.6	35.9	0.0	0.0	2.6	100.0
Other	39.7	6.7	0.6	0.0	0.3	4.1	5.8	39.7	3.2	100.0

[Table 5.2.1.8. Source: Townsend Thai data (1997), Kaboski and Townsend (1998)]

Collateral, as in Table 5.2.1.8, is often required for most household borrowing from commercial banks and also for many households borrowing from the BAAC and moneylenders. Land is the most common asset used, at 77%, 32%, and 22% for these providers, respectively. Physical collateral to loan ratios are high, at 15 overall. One guesses that land deeds cannot be subdivided even for small loans. It would thus seem from these data that default (and collateral) is a potential problem. The most common collateral alternative to physical collateral is some kind of joint guarantee, either with a single guarantor or with a group, at 29% overall and 50% of BAAC customers. Twenty one percent of those borrowing from village funds have group guaranteed loans.

But 41% of the sample of borrowers claims to have not needed collateral at all. This is especially true for loans from the informal sector, including moneylenders, but also from village funds. Enforcement may not be an issue in these cases. Distinguishing the informal sector from the formal sector is a task that lies ahead.

Duration of loans	Yes		No		NA		Total
	N	%	N	%	N	%	N
1996							
Less than 6 months	71	11.1	561	87.4	10	1.6	642
6 months or longer	87	13.6	544	84.7	11	1.7	642
12 months or longer	337	52.5	295	46.0	10	1.6	642
1997							
Less than 6 months	92	14.3	540	84.1	10	1.6	642
6 months or longer	96	15.0	536	83.5	10	1.6	642
12 months or longer	316	49.2	316	49.2	10	1.6	642
1999							
Less than 6 months	100	15.6	532	82.9	10	1.6	642
6 months or longer	92	14.3	540	84.1	10	1.6	642
12 months or longer	301	46.9	331	51.6	10	1.6	642

[Table 5.2.1.9. Collateral Requirement by Loan Period. Source: JBIC]

	1996		1997		1999	
	N	%	N	%	N	%
Land & building	307	79.7	295	81.7	284	80.7
Machinery & equipment	57	14.8	97	26.9	100	28.4
Stocks	87	22.6	105	29.1	101	28.7
Others	6	1.6	6	1.7	7	2.0
NA	4	1.0	6	1.7	7	2.0
Base all respondents	385	100.0	361	100.0	352	100.0

Note: Multiple answers.

[Table 5.2.1.10. Form of Collateral. Source: JBIC]

A surprisingly large number of loans to SMEs seem to be absent physical collateral. See Table 5.2.1.9. For example in 1996, 87.4% for loans less than 6 months in duration, 46% for loans 12 months or longer. Land, inventory, and some equipment provide the collateral for those needing it. See Table 5.2.1.10. Thus, relative to the household survey, physical collateral is less often required. Unfortunately, we know little about those borrowing in other ways. The best guess is that there are individual or personal guarantees of some kind, but more information is needed.

	Neighbor	Relative	BAAC	PCG	Comm. Bank	Ag. Coop.	Village Fund	Rice Bank	Moneylender	Storeowner	Supplier	Landlord	Purchaser	Other
Default Consequence														
None	18.5	44.0	3.7	0.0	2.5	6.2	0.0	0.0	14.5	14.1	50.0	0.0	15.4	9.4
Can't borrow from lender	61.9	45.7	47.1	63.0	42.0	49.3	43.8	81.8	48.4	38.0	37.5	0.0	53.8	48.8
Can't borrow from anyone	3.1	1.3	13.2	15.2	10.9	9.4	18.8	0.0	7.0	2.8	0.0	100.0	2.6	6.4
Other (incl. land repossession)	16.5	9.0	36.0	21.7	44.5	35.1	37.5	18.2	30.1	45.1	12.5	0.0	28.2	35.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[Table 5.2.1.11. Consequences of Default Distribution by Lender. Source: Adapted from Townsend Thai data]

One measure of default is a binary dummy from the BAAC survey, which equals one if the BAAC has ever, in the group's history, raised the interest rate as a penalty for late payment. 27% of groups responded affirmatively. This relatively high figure should not be taken as a mark against the BAAC lending program. Annual default rates are much lower, whereas this measure of default is over the entire history of the group (median group age is ten years). Further, imposing an interest rate penalty is one of the first remedial actions in a dynamic process the BAAC uses with a delinquent group.

Households are asked about the consequences of default, and the responses vary by lender. See Table 5.2.1.11. For commercial banks "land is repossessed (or other)" is the answer for 35.1% of the respondents, and "the borrower would not be able to use that lender again" for 49.3%. No consequences to default are reported for loans from relatives, at 44%, and from suppliers, at 50%, though "cannot borrow from that lender again" is about equal in importance. Of great interest, "cannot borrow from any lender" is a common response for loans from BAAC, PCG village funds, and also moneylenders, ranging from 7-18%. This answer may be an indicator of villages' level sanctions for the potential loss of village reputation. Evidently, loss of physical collateral is not the only sanction, both for formal and informal loans. This will be taken up in the models below.

| Reason	Income Tercile		
	Low	Medium	High
Bequests (Life Cycle)	11.52 %	13.08 %	16.05 %
Emergencies (Buffer/Insurance)	54.97 %	54.66 %	*51.97 %
Business Investment (Future Investment)	3.21 %	2.90 %	**6.35 %

[Table 5.2.1.12. Reasons for Saving by Income Tercile. Source: Adapted from Townsend Thai data. *indicates significance at 0.09 and ** indicates significance at 0.01]

Institution	Where Savings are Held, for the Whole Sample					Saving Institutions by Value: Differences in Changwats from Overall Sample (%) *			
	By Account (%)	By Value (%)	By Account (%)	Account Size	Avg. Change	CCS	LB	BR	SSK
Comm. Bank	12.88	55.59	22.70	74,201	19,314	+11	+16.5	-32	-41
Agric. Coop.	4.55	3.28	8.02	12,521	2,264	-	-	-2.5	-
BAAC	13.22	15.32	23.30	19,838	2,177	+3	-9.5	-9.5	+17
PCG	3.27	2.84	5.76	14,888	4,190	-2.5	+4.5	-2.5	-
Rice Bank	0.92	0.23	1.62	4,461	1,120	-	-	-	-
Jewelry	14.64	-	-	-	-	-	-	-	-
Cash	28.63	-	-	-	-	-	-	-	-
Rice Storage	18.50	14.41	32.61	13,176	-84	-9	-12	+33	+24
Gov't. Savings	1.06	1.14	1.87	18,143	5,128	-	-	-	-
Insurance	0.22	0.46	0.39	41,415	8,050	-	-	-	-

[Table 5.2.1.13. Source: Adapted from Townsend Thai data]

Borrowing is of course only half of the intermediation picture. The other half is saving. Households report emergencies, bequests, and business investment as motives for savings. See Table 5.2.1.12. These motives are implicitly assumed in the models below, featuring finance/business, risk sharing, and overlapping generations. By value, as in Table 5.2.1.13, 56% of savings are in commercial banks and 13% in BAAC accounts. Many respondents report having cash, jewelry, and/or gold in the house (though we do not have values). Rice in storage is a dominant mode of savings, reaching 47% by value in parts of the Northeast. In sum, savings takes place in formal and informal ways, and formal intermediation appears quite limited in some places.

Debt to Assets Ratios
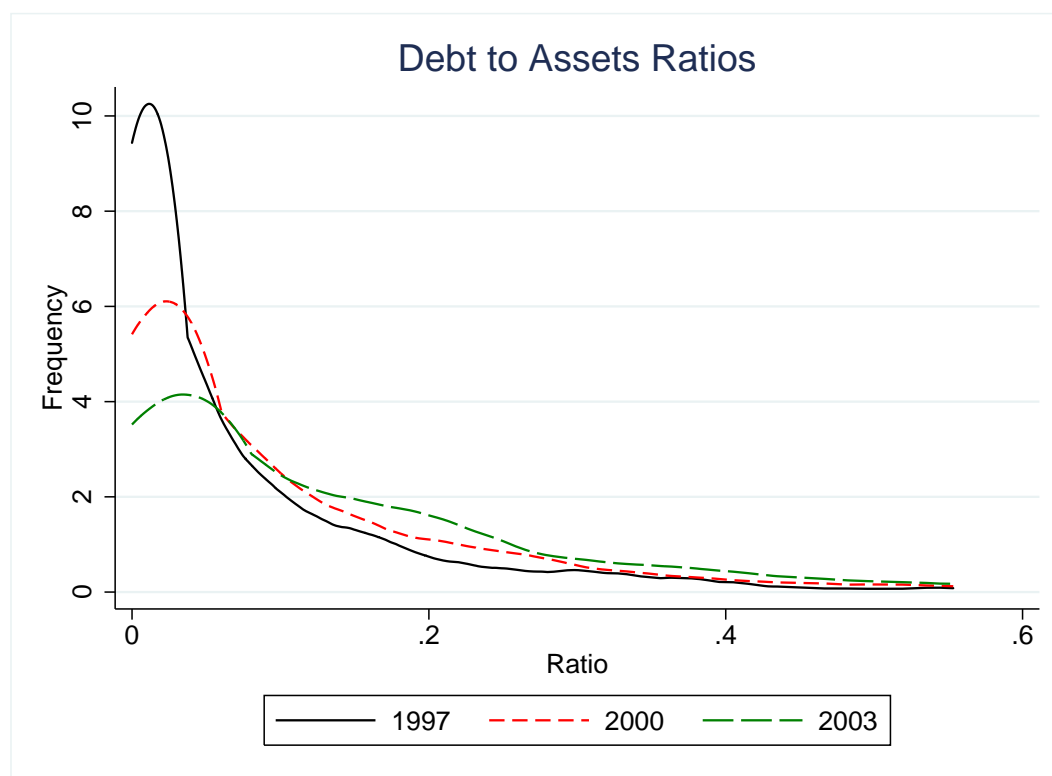
[Figure 5.2.1.14. Debt-to-Assets Ratio (Central Northeast). Source: Townsend Thai data]

Table 1: Mean Debt to Asset Ratio

Changwat	1997	1998	1999	2000	2001	2002	2003
Chachoeng	0.0796	0.0509	0.1011	0.1326	0.1388	0.1624	0.1791
Buriram	0.0742	0.2910	0.1361	0.1492	0.1715	0.2014	0.2425
Lopburi	0.0855	0.0955	0.1914	0.0929	0.1564	0.1682	0.2167
Sisaket	0.0935	0.1246	0.2578	0.1828	0.1762	0.1888	0.1894
Total CNE	0.0832	0.1405	0.1730	0.1403	0.1614	0.1810	0.2075
Satun							0.1597
Yala							0.0781
Total South							0.1191

Source: Townsend Data

[Table 5.2.1.15. Source: Adapted from Townsend Thai data]

One can measure the extent of intermediation by stocks or by flows. A revealing number is the debt/asset ratio, easily computed from balance sheets, if available. The medians of this ratio across provinces in 1997 are close to zero, rising from .03 to .05 by 2003. Though increasing, these are low numbers, indicative of limited credit on the supply and/or limited demand. Histograms (Figure 5.2.1.14) reveal a relatively high concentration of the population at or near zero debt, virtual financial autarky,

though the latter has diminished over time. Means are somewhat higher, rising from .08 to .20. The difference between the means and medians reveals the existence of a few relatively large debt holders. There is some regional variation, offering interesting exceptions: the debt/asset ratio is higher in the Northeast and lower in the South. The former may reflect BAAC outreach/targeting.

Summary statistics by size of the firm (Size = Total Assets)
Year: 2001 (Total number of observations = 4,086 firms)

I. Capital Structure

	1st Quartile	4th Quartile
All observations		
Number of observations	1,022	1,021
Total Assets (millions)		
Mean	5.46	286
SD	3.89	743
Debt to Asset Ratio		
Mean	1.25	0.71
SD	13.01	0.62
Liabilities Nominated in Baht (% of Total Liabilities)		
Mean	99.78	90.54
SD	2.88	21.14
Truncated Sample (Only firms with positive equities)		
Number of observations	843	881
Total Assets (millions)		
Mean	5.45	285
SD	3.82	738
Debt to Asset Ratio		
Mean	0.41	0.55
SD	0.35	0.26
Liabilities Nominated in Baht (% of Total Liabilities)		
Mean	99.73	90.36
SD	3.19	20.84

Regressions of Debt to Asset Ratio on Firm's Size

Dependent Variable: Debt to Asset Ratio	All Firms			Truncated Sample (Only firms with positive equities)	
Total Assets (million Baht)	Not significant (p = 0.997)	Not significant (p = 0.82)	-	$2.68*10^{-12}$ ** (p = 0.05)	-
Total Asset Quartile (1, 2, 3, or 4)	-	-	-0.16* (p = 0.10)	-	0.04*** (p = 0.00)
Industry Fixed Effects	Not controlled	Controlled	Controlled	Controlled	Controlled
No of Observations	4,081	4,081	4,081	3,444	3,444

Note: Significance levels * = 10%; ** = 5%; and *** = 1%

[Table 5.2.1.16. Source: Adapted from Thai Ministry of Industry (MOI) Data with Townsend and Samphantharak calculations]

	1997		1998		1999	
	N	%	N	%	N	%
3.0 or more	56	8.7	55	8.6	54	8.4
3.0 - 2.5	21	3.3	26	4	26	4
2.5 - 2.0	29	4.5	27	4.2	27	4.2
2.0 - 1.5	35	5.5	45	7	36	5.6
1.5 - 1.2	71	11.1	66	10.3	63	9.8
1.2 - 1.0	119	18.5	107	16.7	112	17.4
1.0 or less	236	36.8	246	38.3	254	39.6
NA	75	11.7	70	10.9	70	10.9
Base all respondents	642	100.0	642	100.0	642	100.0

[Table 5.2.1.17. Debt-Equity Ratio. Source: JBIC]

In the JBIC SME data, 37% of the firms have debt/asset ratios below one. See Table 5.2.1.16. For firms in the Ministry of Industry data, debt/asset ratios increase with size of the firm (gross assets), especially so when one eliminates from the sample bankrupt (negative equity) firms and controls for industry effects. See Table 5.2.1.17. These ratios for firms are larger than those for the household rural survey. The point is that in measures that use stocks, the financial system appears quite skewed, with levels of debt increasing more than proportionately with household assets and with firm size. Still, there are exceptions by region and sector. In several of the models below debt/asset ratios and how they move with wealth are revealing of underlying constraints.

	Consumption				Investment			
	All	Poor	Middle	Rich	All	Poor	Middle	Rich
Rental/Financial Income	.057***	.053	.040	.050	.016	.015	-.017	.025
	(.001)	(.011)	(.160)	(.131)	(.370)	(.644)	(.544)	(.456)
Government Transfers	.212***	.070**	.145***	.266***	.042**	.085***	.061**	.043
	(.000)	(.034)	(.000)	(.000)	(.017)	(.011)	(.033)	(.192)
Remittances	.091***	.062*	.101***	.090***	.028	.048	.051*	.024
	(.000)	(.062)	(.000)	(.006)	(.112)	(.145)	(.076)	(.468)
Formal Borrowing	.038**	.104***	.022	.034	.043**	.366***	-.002	.042
	(.029)	(.002)	(.456)	(.304)	(.014)	(.000)	(.930)	(.209)
- BAAC	.027	.047	.009	.029	.004	.091***	-.011	.016
	(.124)	(.158)	(.762)	(.380)	(.845)	(.007)	(.707)	(.623)
- Agric. Cooperatives	.020	.083**	.004	-.009	-.003	.340***	.017	.011
	(.272)	(.013)	(.889)	(.792)	(.885)	(.000)	(.565)	(.746)
- Commercial Bank	.012	dropped	.024	.020	-.004	dropped	-.029	-.007
	(.479)	-	(.410)	(.557)	(.824)	-	(.316)	(.828)
- PCG	.067***	.024	.034	.099***	.031*	-.006	.053*	.031
	(.000)	(.439)	(.242)	(.003)	(.082)	(.858)	(.066)	(.348)
Informal Borrowing	.063***	.008	.060**	.031	.138***	.011	.050*	.129***
	(.000)	(.807)	(.038)	(.347)	(.000)	(.739)	(.083)	(.000)
- Moneylender	.053***	.017	.103***	.017	.024	-.014	.062**	.022
	(.003)	(.606)	(.000)	(.604)	(.170)	(.688)	(.031)	(.517)
- Neighbor	.004	-.023	-.011	.035	.003	-.020	-.014	.003
	(.819)	(.489)	(.701)	(.300)	(.865)	(.558)	(.635)	(.927)
- Relative	.035**	.056*	.046	.017	.028*	.008	.033	.033
	(.051)	(.097)	(.112)	(.604)	(.093)	(.822)	(.253)	(.327)
- Store Owner	.052***	-.008	.017	.030	.179***	.054*	.030	.185***
	(.003)	(.803)	(.566)	(.374)	(.000)	(.105)	(.308)	(.000)
Lending	.026	.035	.040	.037	-.028	-.042	.020	-.025
	(.141)	(.286)	(.170)	(.260)	(.112)	(.210)	(.489)	(.442)
Formal Savings	.032*	.008	.034	.061*	.039**	.011	.037	-.041
	(.075)	(.810)	(.232)	(.067)	(.028)	(.731)	(.193)	(.222)
- BAAC	.005	-.020	.005	-.007	-.005	-.027	.027	.002
	(.782)	(.554)	(.874)	(.844)	(.775)	(.423)	(.346)	(.948)
- Agric. Cooperatives	.001	.065**	.014	.008	.016	-.068**	.005	.020
	(.962)	(.051)	(.620)	(.820)	(.382)	(.042)	(.869)	(.557)
- Commercial Bank	.058***	.017	.060**	.119***	-.069***	.051	.012	-.067**
	(.001)	(.608)	(.034)	(.000)	(.000)	(.128)	(.679)	(.045)
- PCG	.013	.040	-.022	.063*	.013	.033	.030	-.004
	(.455)	(.233)	(.441)	(.061)	(.466)	(.328)	(.309)	(.897)
Informal Savings/Rice	.011	.063*	.063**	.039	.013	.019	.044	-.033
	(.523)	(.058)	(.029)	(.239)	(.481)	(.565)	(.127)	(.320)
Household Assets	.056***	.060*	.051*	.027	.001	-.101***	-.069**	.010
	(.002)	(.070)	(.077)	(.415)	(.952)	(.002)	(.017)	(.769)
Livestock	-.043**	-.092***	-.080***	.007				
	(.015)	(.006)	(.006)	(.823)				
Productive Assets	.011	-.050	-.043	.035				
	(.526)	(.133)	(.133)	(.297)				

Notes: Frequent use is a dummy variable indicating whether the household had a particular type of transaction in 3 out of the 4 years in the panel. P-value in parenthesis.

[Table 5.2.1.18. Partial Correlation Coefficients of Consumption and Investment Deficit with Frequency of Use. Source: Alem and Townsend (2006)]
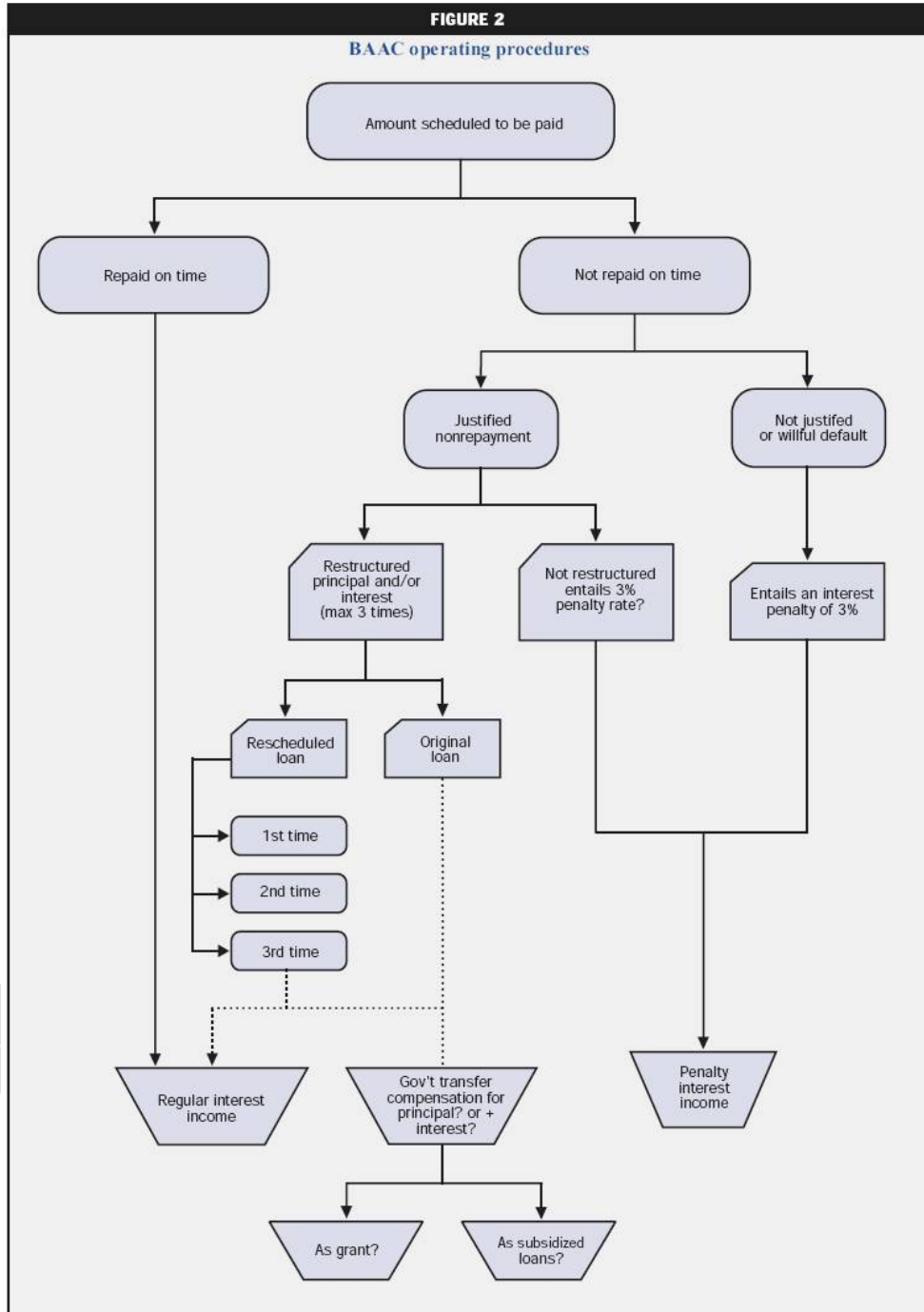
Flows are consistent with a less skewed picture. The excess of consumption over income must be financed, or a surplus saved. Likewise investment must be covered by cash flow from operations or

financed. The Townsend Thai annual panel stratified by wealth and lender/mechanism reveals in Table 5.2.1.18 that formal borrowing from the BAAC and from Agricultural Cooperatives, and rice stocks, are most used by the relatively poor. Notably, the poor have greater use than the rich of the formal financial system as far as the BAAC is concerned. The number of borrowers from commercial banks is too limited to allow an assessment, but this speaks for itself. Loans from informal sector and savings in commercial banks are more used by the middle and upper segments of the surveyed population. This belies the stereotypical picture of the informal sector as most prominent for the poor. Borrowing from relatives is an important informal exception. As might have been anticipated from the earlier discussion of provincial economies, remittances and government transfer are helpful for most categories of borrowers.

5.2.1.1   BAAC: Operating Systems and Imposed Regulation

To understand the use and impact of a financial institution it is necessary to understand its operating system. We use here BAAC as a primary example, as for this financial sector provider, and not some of the others, we have much more relevant information.

The BAAC has a system under which farmers can be granted relief via loan extension, interest reduction, or even principal forgiven. Until recently, loans could be delayed or restructured up to three times without penalty if the borrower were judged not to be in willful default. Occasionally, the government will pay off part of the loan for the farmer. In effect, this system is capable of providing insurance to farmers who experience *force majeure* events. The net present value of loan repayment is a function of idiosyncratic shocks. The magnitude of the impact on clients will be assessed below.

FIGURE 2
BAAC operating procedures

[Figure 5.2.1.19. BAAC Operating Procedures. Source: Yaron and Townsend (2001), original by the BAAC]

Percentage of original loan amount paid on time and belatedly against original maturity
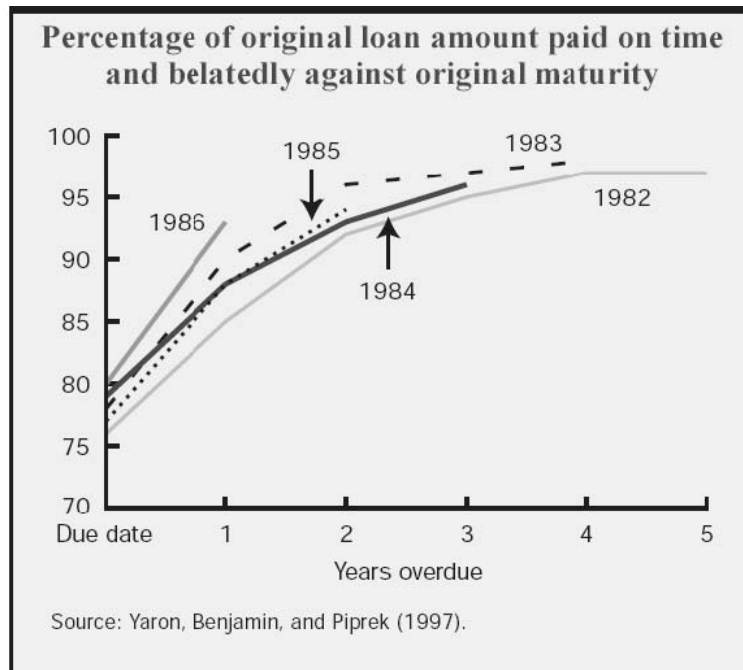
[Figure 5.2.1.20. Source: Yaron, Benjamin and Piprek (1997)]

BAAC provisioning for loan losses

Age of principal overdue	Loan loss provision rate (%)
< 1 year	10
> 1–2 years	30
> 2–3 years	50
> 3–4 years	70
> 4 years	100

Source: Data from Bank for Agriculture and Agricultural Cooperatives.

[Table 5.2.1.21. Source: Yaron and Townsend (2001)]

The percentage of BAAC loans paid on time starts at a relatively low 75-80%, based on 1980's data, but arrears history reveals that repayment rates rise to a relatively high 95% or over. Thus, based on experience, the BAAC should not provision linearly, as was recommended (more or less), and implemented, during the financial crisis. See Table 5.2.1.21. There of course should be an immediate provision as soon as the loan is overdue, and then the rate of residual, augmented provisioning should increase over time as it is less likely the loan will be repaid.

Changes in arrears by age, BAAC, 1997–99					
Years in arrears (age)	Amount in arrears, 1997	Percent change 1997–98	Amount in arrears, 1998	Percent change 1998–99	Amount in arrears, 1999	Average percent change, 1997–99
1	4,488	−40.53	6,272	−49.35	3,938	
2	1,246	−22.95	2,669	−25.03	3,177	
3	509	−22.00	960	−20.10	2,001	−33.23
4	295	−22.71	397	−20.40	767	−21.54
5	224	−20.98	228	−19.74	316	−21.21
6	73	−20.55	177	−17.51	183	−21.24
7	45	−17.78	58	−17.24	146	−19.27
8	29	−17.24	37	−18.92	48	−18.91
9	15	−16.56	24	−17.33	30	−18.35
10	136		126		124	−17.00
Total	7,060	55.07	10,948	−1.99	10,730	23.28
Outstanding from FY 1997	7,060	−33.77	4,676	−22.69	3.615	−28.44
Outstanding from FY 1998	—	—	10,948	−37.96	6,792	—

Note: Amounts are bahts in millions.
Source: Bank for Agriculture and Agricultural Cooperatives (1999).

[Table 5.2.1.22. Source: Yaron and Townsend (2001)]

    Of course provisions also need to take into account the possibility of adverse macro shocks. See Table 5.2.1.22. The amount one year in arrears was 4,488 million baht in 1997 and this falls with repayment to 2,669 million baht two years in arrears in 1998. Then, reflecting the crisis, the entire schedule shifts up: the amount one year in arrears in 1998 was 6,272 million, and this falls with repayment to 3,177 million two years in arrears in 1999. Aggregate shocks need to be taken into account in insurance arrangements.

BAAC profit and loss statement

	March 31, 1999		March 31, 1998		March 31, 1997	
	baht	%	baht	%	baht	%
Revenues						
Interest earned on loans to client farmers	19,768	82.33	21,187	86.98	19,704	79.88
Interest on loans to farmers' institutions	1,497	6.23	1,723	6.34	1,191	4.83
Interest on deposits with other banks	32	0.13	143	0.53	124	0.50
Interest on government bonds and promissory notes	542	2.26	2,266	8.34	2,040	8.27
Other income[a]	2,173	9.05	1,850	6.81	1,607	6.52
Total revenues	**24,011**	**100.00**	**27,170**	**100.00**	**24,665**	**100.00**
Expenses						
Salaries, wages, and fringe benefits	3,291	13.87	3,123	11.58	3,177	13.64
Interest paid on deposits	6,055	25.52	10,035	37.21	9,325	40.04
Interest on commercial bank deposits	—	—	261	0.97	280	1.20
Interest on borrowing and promissory notes	3,987	16.80	5,321	19.73	5,221	22.42
Loan expenses	31	0.13	27	0.10	163	0.70
Travel and per diem expenses	126	0.53	120	0.44	133	0.57
Provision for doubtful accounts	5,665	23.87	4,833	17.92	2,751	11.81
Bad debts written off	7	0.03	9	0.03	27	0.12
Other expenses	1,179	4.97	1,287	4.77	1,054	4.52
Depreciation on assets and leasehold amortization	592	2.50	616	2.29	600	2.57
Losses due to exchange rate fluctuation	1,983	8.36	550	2.04	557	2.39
Total expenses	**23,731**	**100.00**	**26,967**	**100.00**	**23,289**	**100.00**
Net profit	**280**		**203**		**1,377**	

[a]Other income includes government transfers among other items.
Note: Amounts are bahts in millions. Columns may not total due to rounding.
Source: Bank for Agriculture and Agricultural Cooperatives (1999).

[Table 5.2.1.23. Source: Yaron and Townsend (2001)]

Provisioning enters as a cost on the BAAC income statement. This is covered by revenue in the line marked 'other income' (income recompense plus other government transfers). In effect, the government is paying the premium for a mandatory insurance fund which benefits BAAC farmers' clients. Ideally, this would be administered as a lump sum transfer to branches (or even the farmers) who would then be allocated credit and insurance based on incentives.

Indirectly, BAAC clients are receiving the subsidy. More generally, the BAAC does lend at below market rates and does rely on a transfer from the central government. But we would like to know the magnitude of the subsidy and the benefits received by farmers. For costs, Yaron (2001) uses market prices for all sources of funds, including funds lent at concessionary rates. The costs should include appropriate provisions as noted.

The models below also use an outside market interest rate as the true cost of funds. Yaron's subsidy dependency index at 35% indicates the amount of an increase in the average on-lending rate that would have been necessary for the BAAC to cover all costs, assuming no substitution in borrower

behavior. Lending below that rate creates a distortion. The lending rate and overall subsidy are two variables that can be considered in the subsequent analysis in computing the distribution of gains and losses to policy change. An important point here is that Yaron's subsidy-dependence index (SDI) for the BAAC is not large. It is lower than for state owned financial institutions in most other countries. The subsidy and burden on Thai tax payers may not be high. It is also likely given the risk-contingencies in its loan contracts that the BAAC is providing considerable net benefits to farmers. Other financial institutions may not offer complete substitutes, in which case financial sector assessment should show a positive risk-sharing gain.

Correlations with Membership Growth		Correlations with Savings Growth		Correlations with Lending Growth	
Positive	Negative	Positive	Negative	Positive	Negative
Offer lending services	Saving is optional	Require minimum initial deposit	Standard savings accounts	Provide agricultural training	Institution is a buffalo bank
Require minimum initial deposit		Have membership application forms	Time deposit savings	Make cash loans	Make rice loans
		Pledged savings accounts	Only villagers can be members	Amount of savings used as evaluation criteria	
		Provide non-agricultural consultation or advice			
		Provide emergency assistance			

Other policies that were tested include among others: collateral required, guarantors required, payment frequency of six months or less, monitoring frequency of six months or less, borrowers who default can't reborrow, and all borrowers are monitored. These did not have significant relationships with growth.

[Table 5.2.1.24. Summary of Significant Correlations Between Relevant Institution Types/Policies and Growth/Failure. Source: Kaboski and Townsend (2005)]

The configuration of policies across the financial institutions operating in a given economy is likely to be different. Sometimes policies vary even among financial institutions of the same type. The example here is drawn from Kaboski and Townsend (2004). Village funds in Thailand vary considerably in whether or not they offer lending services, whether there is a required minimum initial deposit, if members fill out application forms, if savings must be pledged, if non agricultural consultation is provided, and whether or not there is an emergency service. These policies are associated in the data with positive intermediation: the growth in members, increases savings mobilized, and/or in funds lent. On the other hand, village funds that make rice or buffalo loans (not cash), offer optional or standard savings accounts, and restrict membership to villagers only are funds that are likely to shrink or fail. In short, there is (unnatural) variation in intermediation across various funds with distinct policies, and this will be exploited in assessing impact below. Indeed, policies which promote intermediation will be shown to be having a positive impact on customers and bad policies a negative one. (Unfortunately, we do not have the information in Thailand to do this for some of the other financial sector providers).

5.2.2 Financial Deepening: The History

The aggregated M3/GDP movement and other statistics presented in earlier chapters can be presented here at the institutional level. There are telling contrasts across the various providers, indicative of (potential) supply side variation.
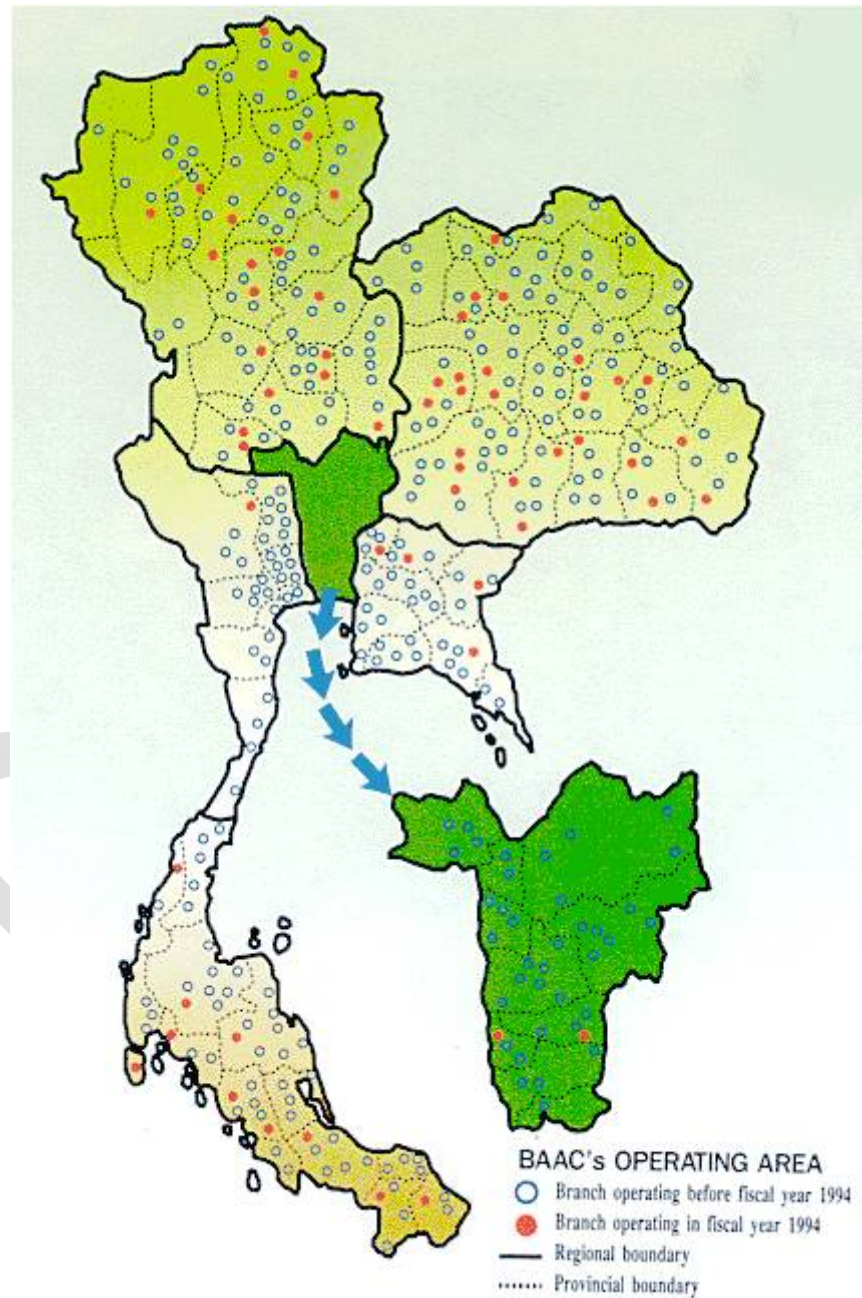
[Figure 5.2.2.1. Growth of BAAC Credit Branch Offices 1994. Source: BAAC Annual Report]
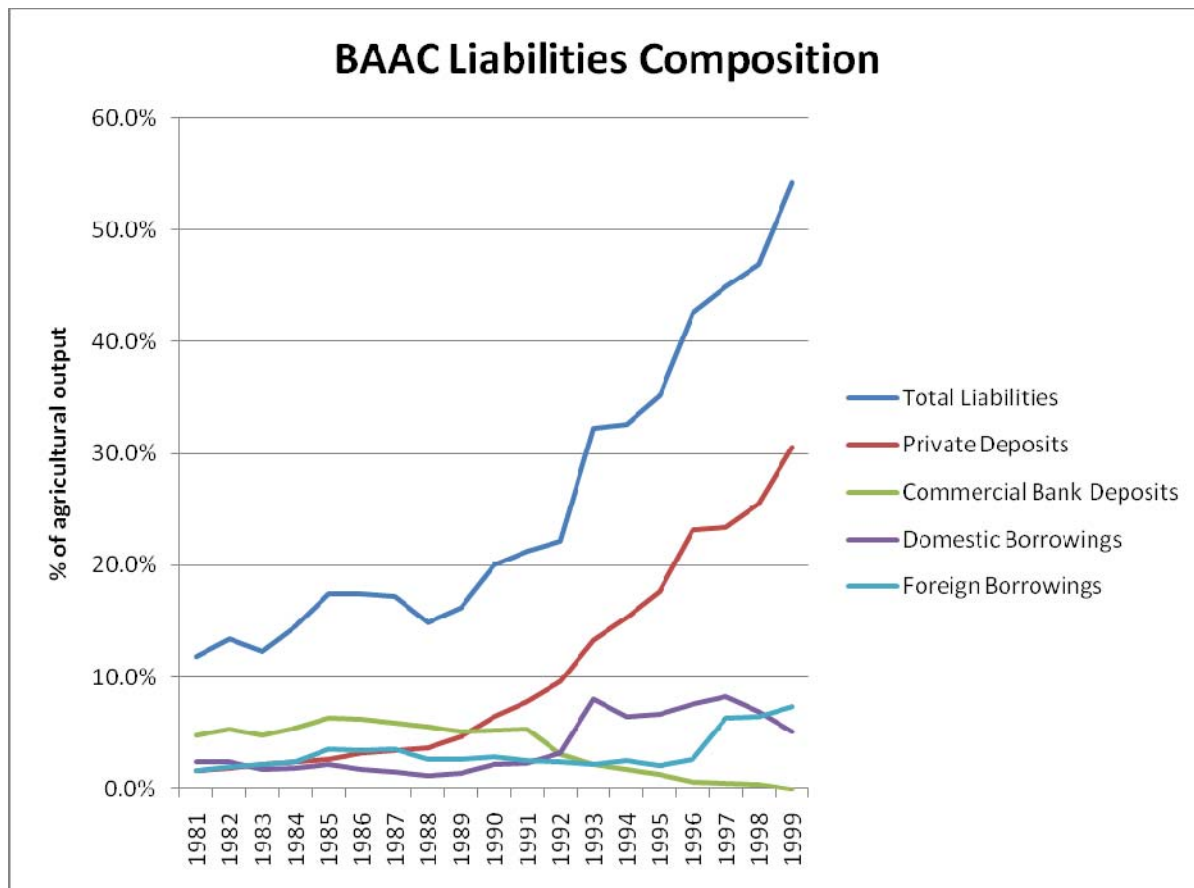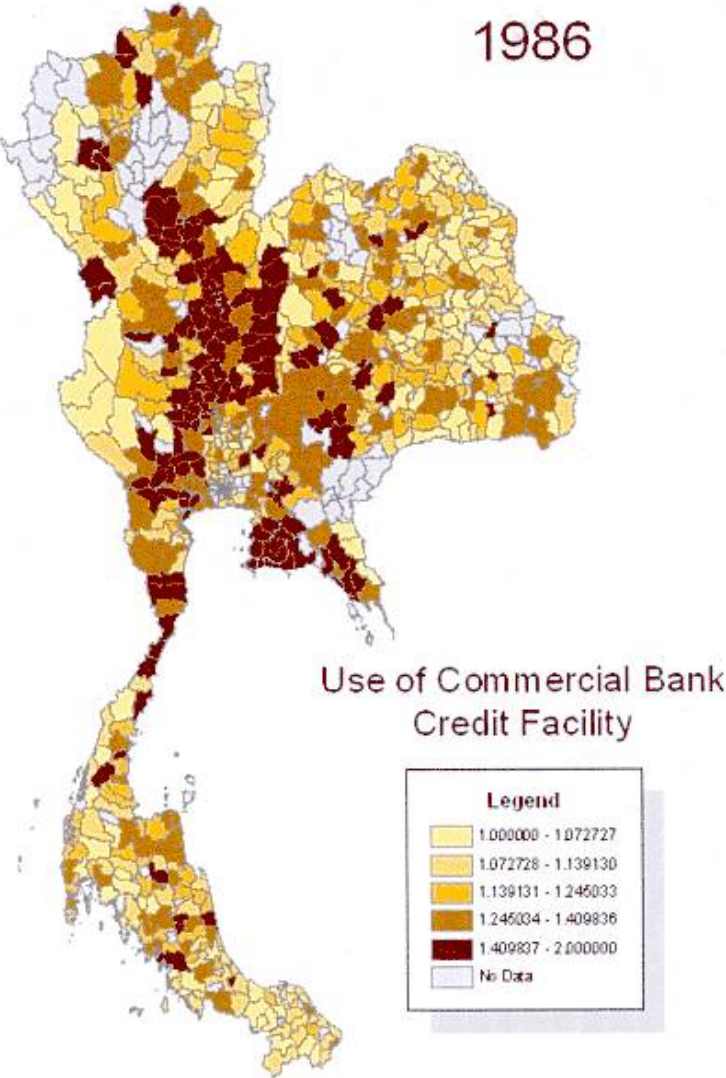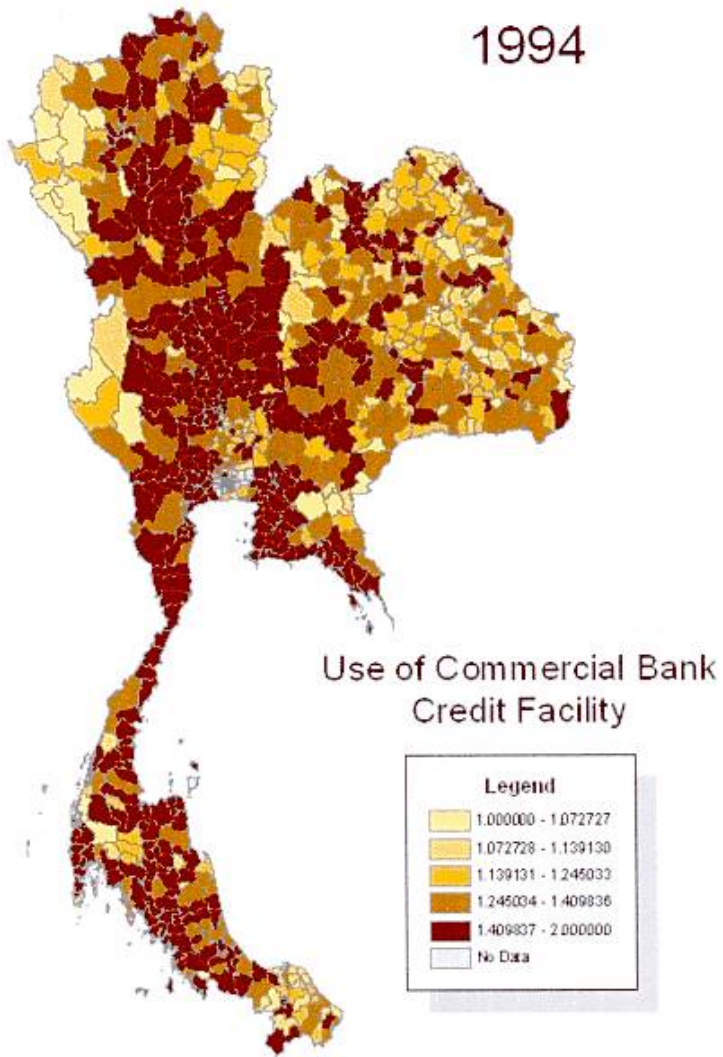
[Figure 5.2.2.2. Macro Version of BAAC. Source: BAAC Annual Report]

The BAAC expanded dramatically in the 1980's and 1990's. The map from the BAAC annual report indicates new branches opened in 1994 alone. The analogue for M3/GDP for the BAAC would be private deposits to agricultural output, or total liabilities to agricultural output. Both increase over time, with an accelerated expansion starting approximately in 1988 (there is no drop in the financial crisis). This expansion could bring increasing benefits to farmers, if the operating system functions as envisioned. On the other hand, village funds reported to be operational in CDD data prior to 1997 blink on and off over the years with little geographic pattern. Ironically this may help to identify impact, as noted.

Between the expanded and now virtually universal BAAC and the (previously) thin and erratic village funds lie the commercial banks. In the CDD data commercial banks are seen to expand over time and space via evident clustering. Commercial banks remain limited in many areas as late as 1994. Note in particular the relatively limited commercial bank access/use in the Northeast and far South in 1994. On the other hand, the expansion at the village level in the Central area province of Chachoengsao is evident.
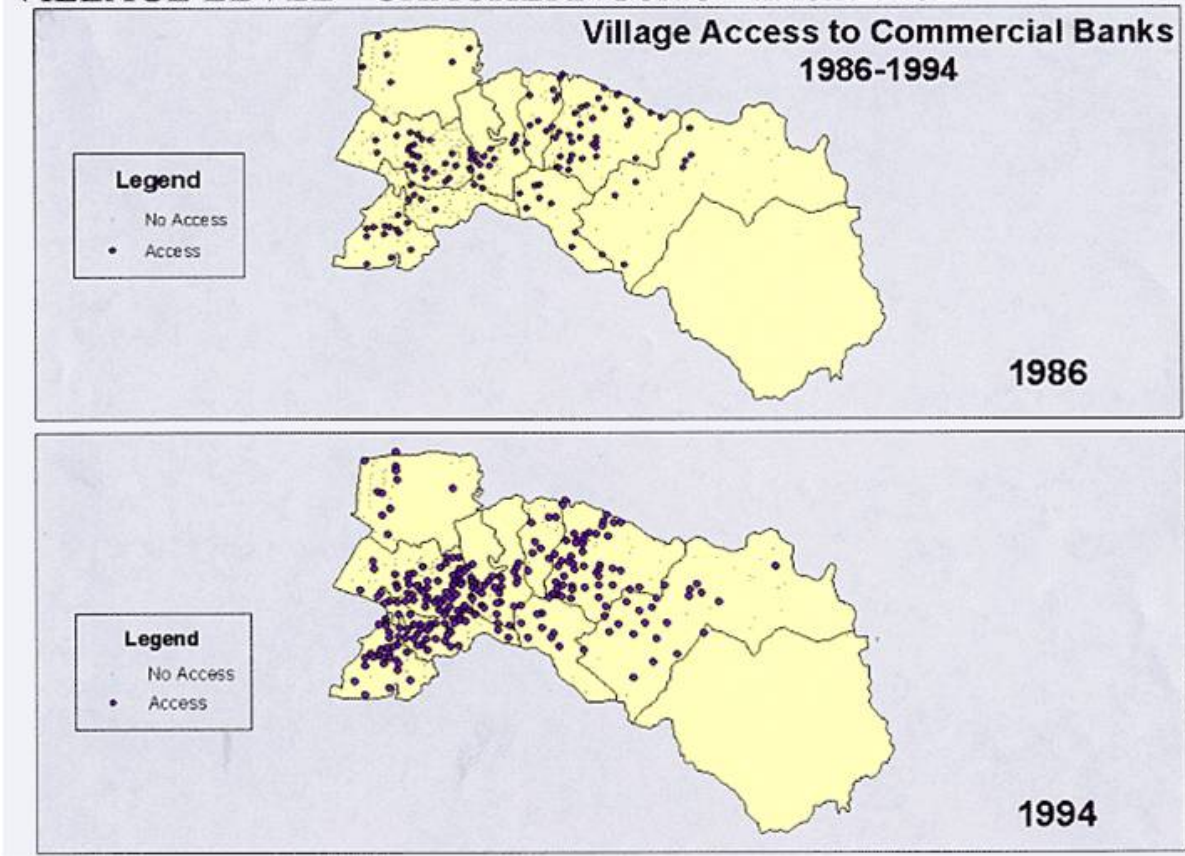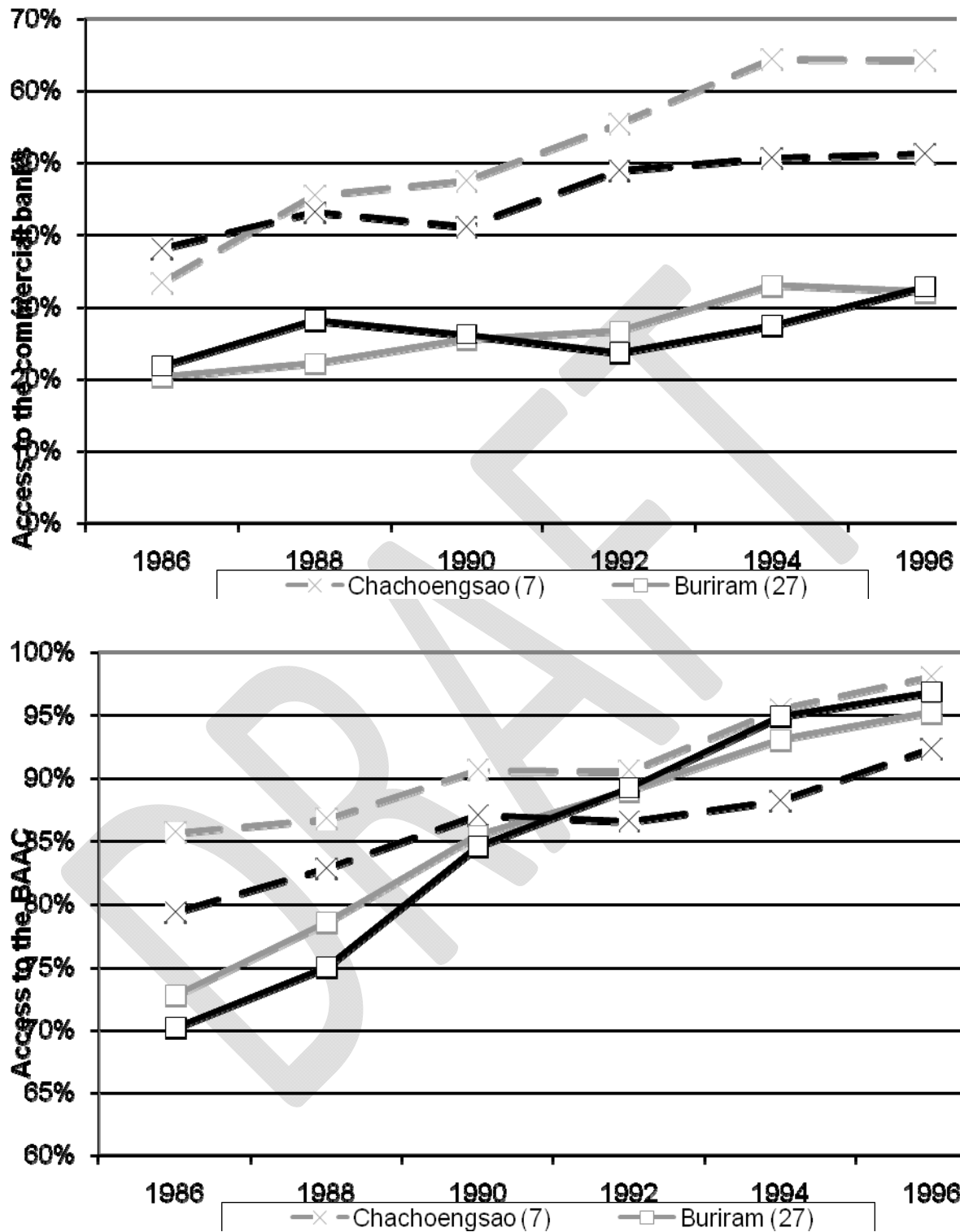
1986

Use of Commercial Bank
Credit Facility

Legend

	1.000000 - 1.072727
	1.072728 - 1.139130
	1.139131 - 1.245033
	1.245034 - 1.409836
	1.409837 - 2.000000
	No Data

1994

Use of Commercial Bank
Credit Facility

Legend
1.000000 - 1.072727
1.072728 - 1.139130
1.139131 - 1.245033
1.245034 - 1.409836
1.409837 - 2.000000
No Data

[Figure 5.2.2.3. Village Level – Chachoengsao – Increase. Source: Adapted from Townsend Thai data]

[Figure 5.2.2.4. Village Level – Chachoengsao – Increase. Source: Adapted from CDD Thai data]

[Figure 5.2.2.5. Percentage of villages with access to commercial banks (top) and those with access to the BAAC (1986-1996) (bottom) Source: Adapted from CDD Thai data]

In summary, there are striking differences over space and time (in Figure 5.2.2.5) between the expansion of the government operated BAAC and private sector/regulated banks. Initially, in 1986, the BAAC is more prevalent in the Central region, but the growth rate for the BAAC is higher in the Northeast. By 1996, BAAC prevalence in the Northeast is equal or greater than in the Central region. (This was noted in the Townsend Thai 1997 data). In contrast commercial bank prevalence is not only higher in the Central region in 1986, the expansion there over subsequent years to 1996 is higher as well.

Figure 10 - Geographical interaction of the change in the access to BAAC and commercial banks in selected provinces
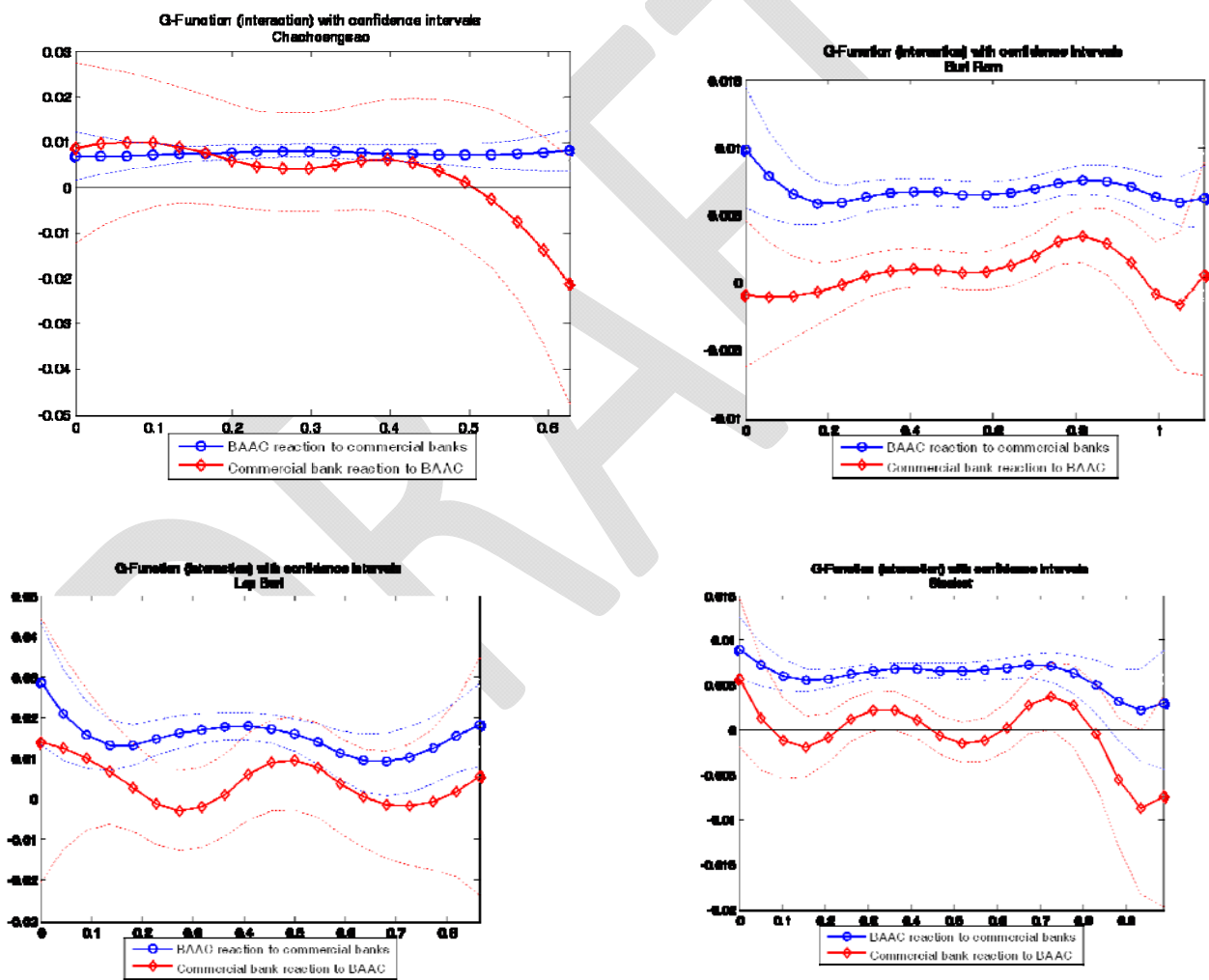
[Figures 5.2.2.6. Estimation of the g function (short regression) for the BAAC and commercial banks. Source: Assunçao, Mityakov and Townsend (2006)]

The contrasting spatio-temporal dynamic paths of the BAAC and commercial banks are evident locally, within provinces. Figures from 5.2.2.6 from Assunçao, Mityakov and Townsend (2006) display nonparametric graphs of the spatial correlation of the change in BAAC and commercial bank-use. Let $D_{i,j}$ an exogenously defined distance function between villages i and j. For example, it can be considered simply as $D_{i,j} = \| s_i - s_j \|$, where s_i is the location of village i. A general spatial autoregressive model of change variable y_i is given by:

$$y_i = \sum_{i \neq j} g\left(D_{i,j}\right) y_j + \beta' x_i + u_i \tag{5.2.2.1}$$

Figures show that expansion is flat for the BAAC, indicating that new customers are likely to fall anywhere in the province, but quickly decreasing to zero for commercial banks, indicating the contiguous, adjacent expansion of commercial bank access.

Year	1976	1981	1986	1988	1990	1992	1994	1996	76-96	76-86	86-92	92-96
Financial Participation												
Non-participant	93.5	89.8	89.3	84.7	80.4	78.1	75.5	73.4	-20.1	-0.41	-1.86	-1.19
Participant	6.5	10.2	10.7	15.3	19.6	21.9	24.5	26.6	20.1	0.41	1.86	1.19
Table A.3 Average Income Profile (1990 Baht)												
Year	1976	1981	1986	1988	1990	1992	1994	1996	76-96	76-86	86-92	92-96
Financial Participation												
Non-participant	943	1189	1079	1209	1296	1490	1678	2043	3.9	1.4	5.5	8.2
Participant	1956	2446	2464	2575	3327	3973	3912	4357	4.1	2.3	8.3	2.3
Table A.4 Inequality Profile by Theil-L Index												
Year	1976	1981	1986	1988	1990	1992	1994	1996	76-96	76-86	86-92	92-96
Financial Participation												
Non-participant	0.266	0.298	0.362	0.346	0.341	0.366	0.361	0.353	8.8	0.96	0.07	-0.32
Participant	0.358	0.327	0.415	0.423	0.480	0.521	0.498	0.434	7.6	0.58	1.75	-2.16

[Table 5.2.2.7. Composition of Income Status Groups (%). Source: Jeong (2008)]
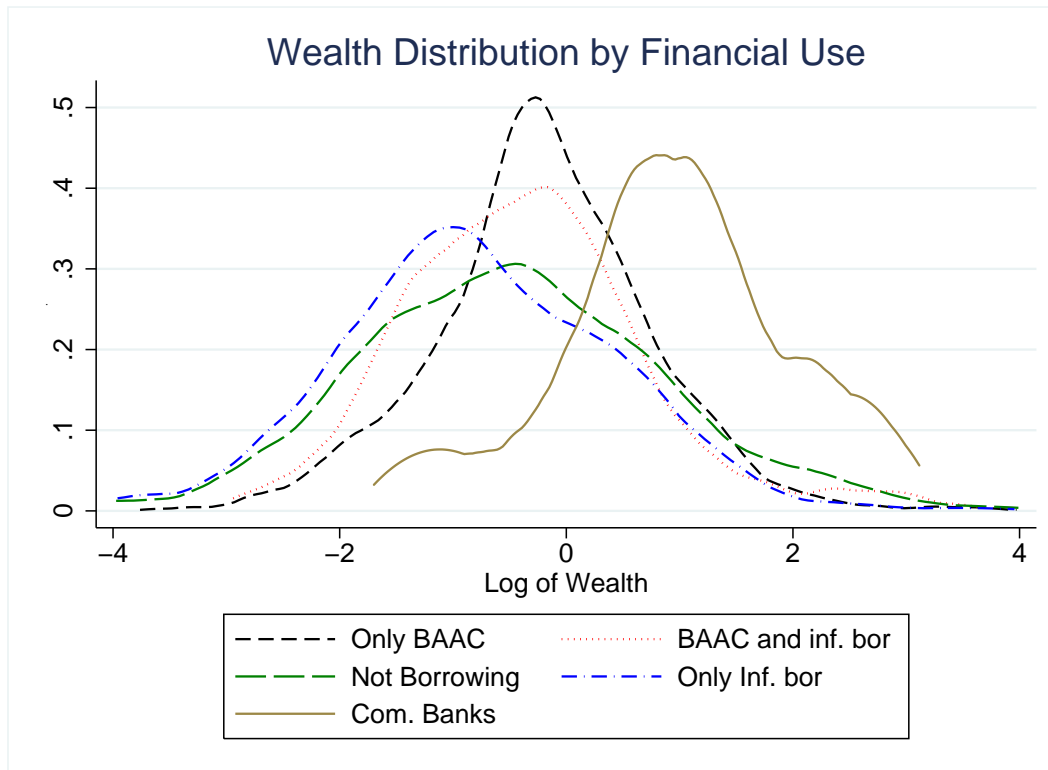
The SES, cross-sectional household surveys dating back to 1976 show an expansion in the fraction of households having a savings or credit transaction with a formal financial sector intermediary (BAAC, commercial bank, credit fancier). As described earlier, the percentage with access rises from 6.5% in 1976 to 26.6% in 1996. See Table 5.2.2.7. The associated income differential of those with access over those without is over two to one and increasing, except after 1992. This is what accounts for the contribution of the financial sector expansion to the growth of per capita income and, via the Kuznets

effect, to an increase in inequality. Inequality is also higher among the participant group, so there is an additional composition effect to the increase in inequality that comes with the increase in financial access.

Financial participation rate over wealth by education level
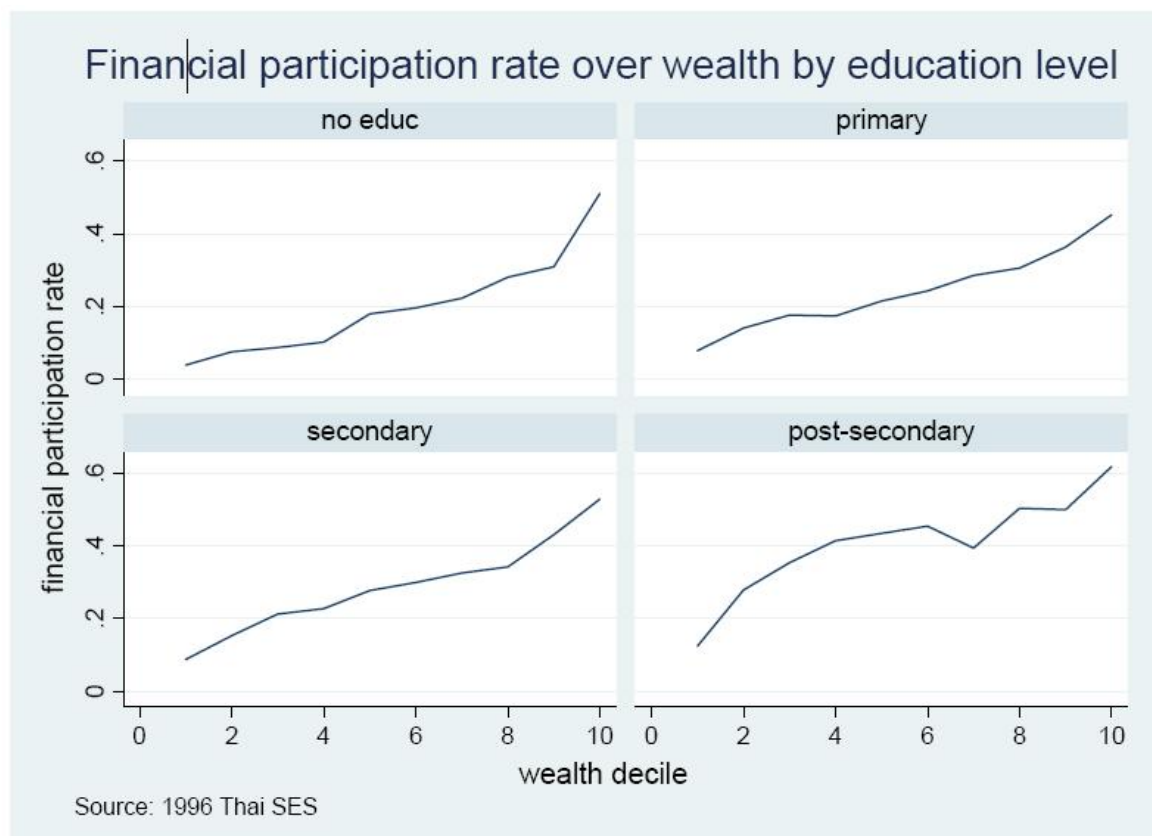
[Figure 5.2.2.8. Source: Jeong (2000)]

Behind the scenes of growth with increasing inequality lie the reduced form participation schedules. See Figure 5.2.2.8. For most education groups, access/use is increasing with wealth, though for the most part higher, the higher is education. Thus, ceteris paribus, increases in wealth and education would increase financial access. These participation schedules and the economy-wide dynamics are a key feature of the models below.

Wealth Distribution by Financial Use

Legend:
- ----- Only BAAC
- ········· BAAC and inf. bor
- – – – Not Borrowing
- –·–·– Only Inf. bor
- ——— Com. Banks

X-axis: Log of Wealth (−4, −2, 0, 2, 4)
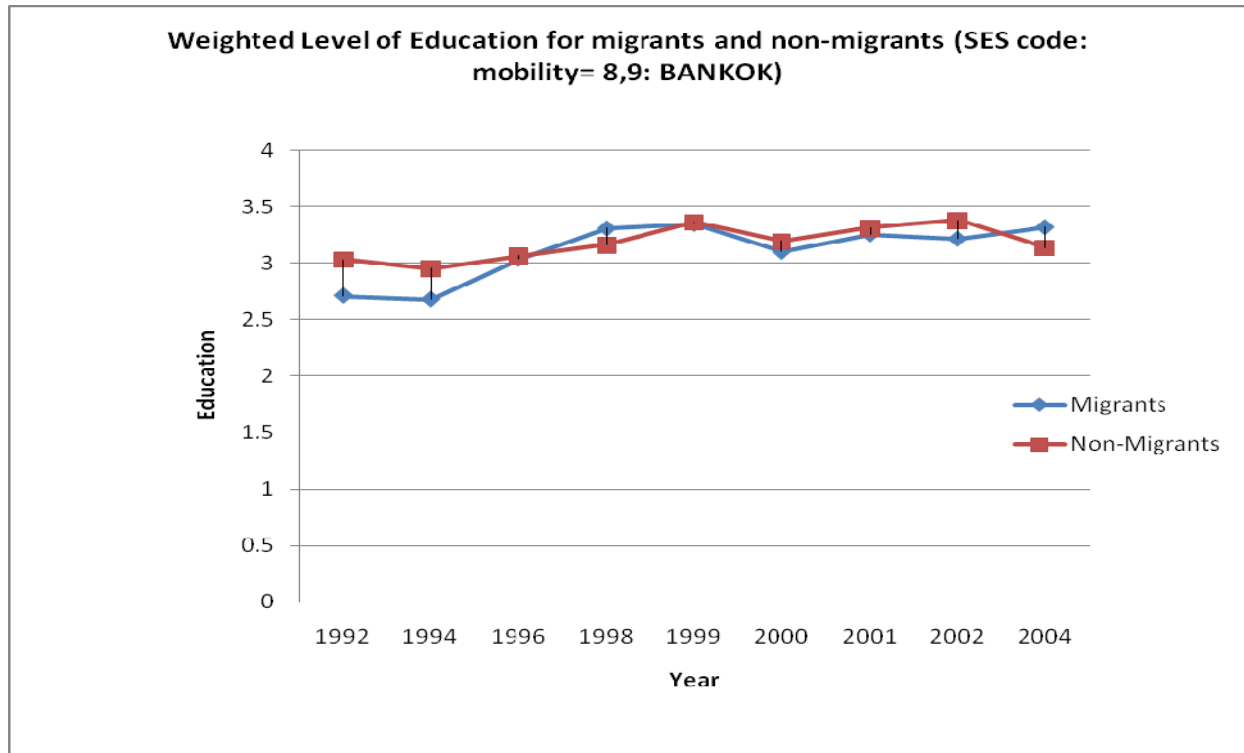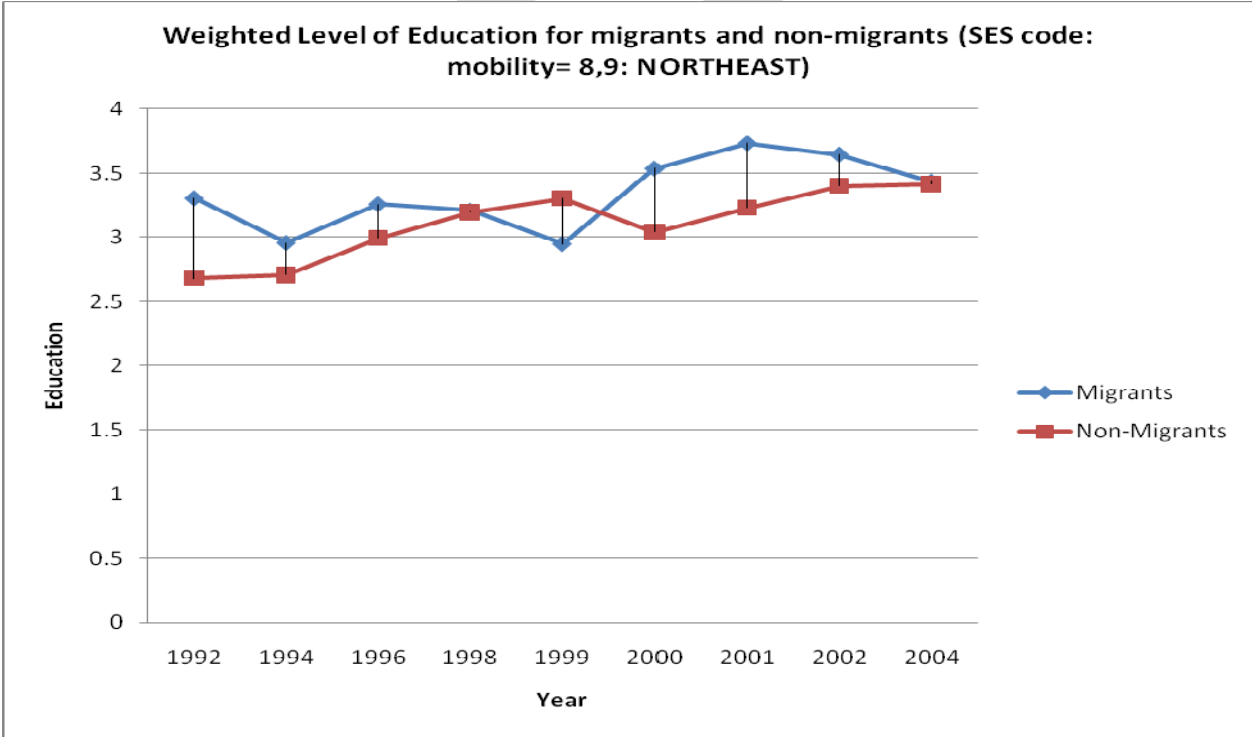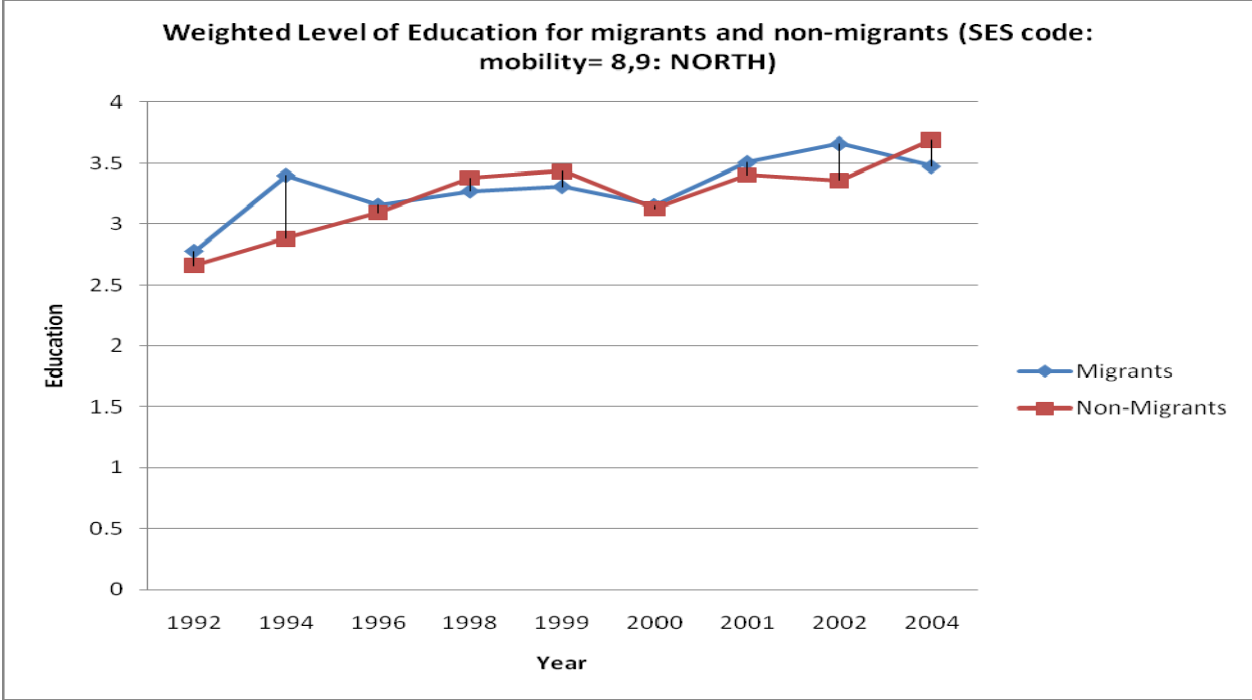Y-axis: 0, .1, .2, .3, .4, .5

[Figure 5.2.2.9. Households Wealth Distribution by Sources of Borrowing (1997-2004) Source: Townsend Thai data]
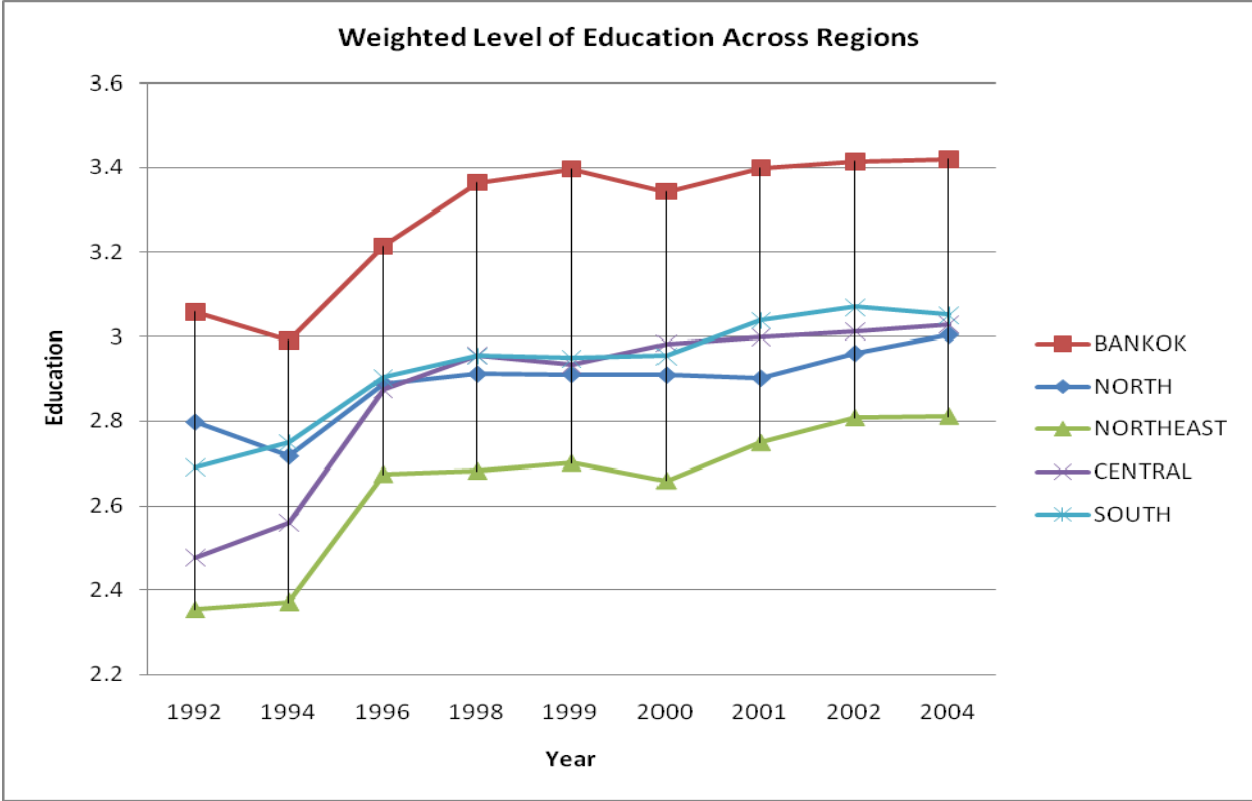
Related, those borrowing from commercial banks have higher levels of wealth than those borrowing from the BAAC, which in turn have higher levels of wealth than those not borrowing at all. But the lowest levels of wealth are those borrowing from the informal sector, lower than those not borrowing at all. The choice of borrowing methods, whether to self-finance, and the relation to wealth, are subjects to which we shall return subsequently.

5.3   Education

There are obvious differences in the level of education by region, with the greater levels of Bangkok metropolitan area outpacing the rest. Migrants to Bangkok, and for the most part migrants to the other regions, have higher levels of education than non-migrants.

Weighted Level of Education for migrants and non-migrants (SES code: mobility= 8,9: BANKOK)

Weighted Level of Education for migrants and non-migrants (SES code: mobility= 8,9: NORTH)

Weighted Level of Education for migrants and non-migrants (SES code: mobility= 8,9: NORTHEAST)

Draft: July 2010

Weighted Level of Education Across Regions
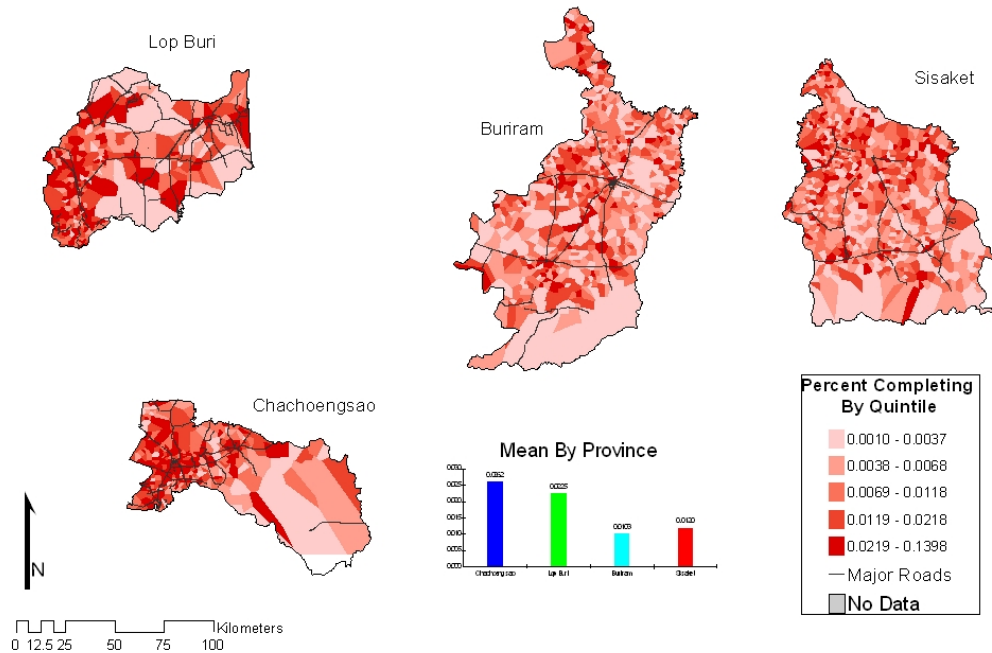
[Figure 5.3.1. Source: SES data]

Figure 8: 1986 Percent Completing Advanced Secondary Education

[Figure 5.3.2. 1986 Percent Completing Advanced Secondary Education. Source: Felkner and Townsend (2007)]

There are evident differences in the level of education locally, across and within provinces. See Figure 5.3.2. Education levels are lower in the Northeast, and the percent completing advanced secondary education is higher for those near urban areas and living near major road systems. This distance to secondary schools does vary by village, with evident clustering. See Figure 5.3.3.
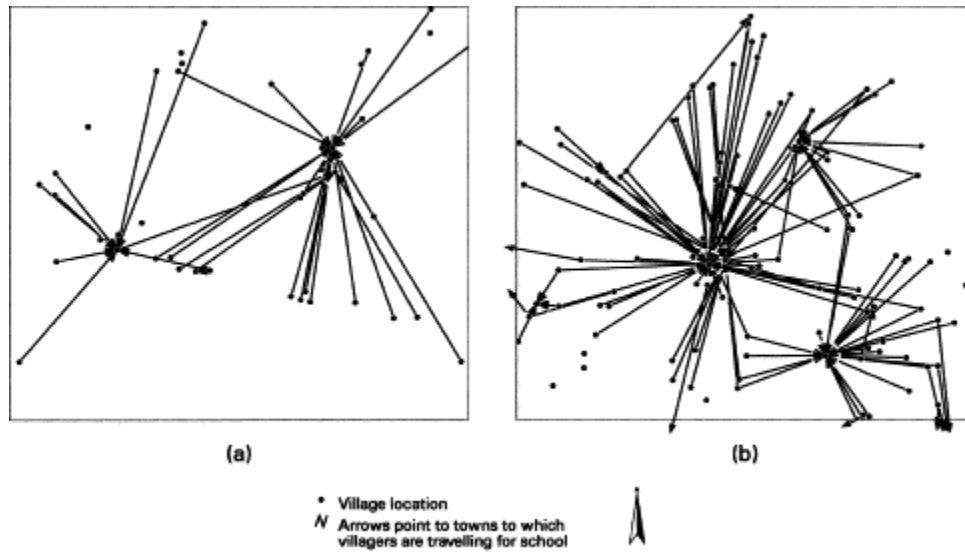
[Figure 5.3.3. Secondary School Network in Nang Rong. Note: The mean distance between all pairs of villages within Nang Rong district is 19.41 km. Source: Faust, et al. (1999)]

Results from simple regressions on the determinants of schooling attainment:

	(1) ASch	(2) PSch	(3) MSch	(4) InSch
Age	-0.019	0.016	0.005	-0.052
	(11.044)**	(6.48)**	(2.63)**	(35.68)**
AgeSq	0.002	-0.001	-0.001	0.005
	(10.522)**	(3.42)**	(3.93)**	(25.35)**
Female	-0.012	-0.106	0.048	-0.043
	(0.263)	(1.94)	(1.26)	(1.29)
FemaleAge	0.002	0.011	-0.004	0.005
	(0.763)	(3.53)**	(1.87)	(2.56)*
FemaleAgeSq	-0.003	-0.015	0.005	-0.007
	(1.180)	(3.80)**	(1.79)	(2.99)**
Female head	0.001	-0.001	0.000	-0.001
	(1.132)	(1.02)	(0.25)	(0.89)
OwnLand	-0.004	-0.044	0.020	0.008
	(0.378)	(1.85)	(0.97)	(0.49)
PlotArea	0.000	-0.004	0.002	0.002
	(0.172)	(0.93)	(0.66)	(0.88)
PlotDistance	0.001	-0.002	0.002	0.000
	(1.719)	(1.96)	(0.99)	(0.44)
HaveFridge	0.009	-0.071	0.050	0.048
	(0.819)	(3.09)**	(2.60)**	(3.13)**
HaveMotorCycle	-0.009	0.014	0.011	-0.028
	(0.925)	(0.66)	(0.59)	(2.07)*
Household has Non-householder Males	0.004	-0.002	-0.004	0.010
	(1.158)	(0.21)	(0.55)	(2.04)*
Household has Non householder females	0.001	0.006	-0.004	-0.007
	(0.146)	(0.71)	(0.69)	(1.29)
CHA	-0.032	-0.034	0.042	-0.005
	(3.120)**	(1.25)	(1.86)	(0.31)
LPB	-0.026	0.051	0.002	-0.022
	(2.139)*	(1.98)*	(0.07)	(1.27)
SSK	-0.023	0.008	0.083	0.067
	(2.003)*	(0.32)	(3.95)**	(3.91)**
Constant	0.411	0.357	0.095	1.263
	(11.176)**	(7.75)**	(2.80)**	(41.83)**
Observations	2783	2783	2783	2783
R-squared	0.229	0.14	0.04	0.62

[Table 5.3.4. Source: Townsend research note]

The determination of education at the household level has yet to be studied in detail, but evidently pre-determined wealth of the parents, and parents' education levels, play a role in the education of the children. Those with greater wealth, e.g., refrigerators, are more likely to have children in more advanced schools. See Table 5.3.4.
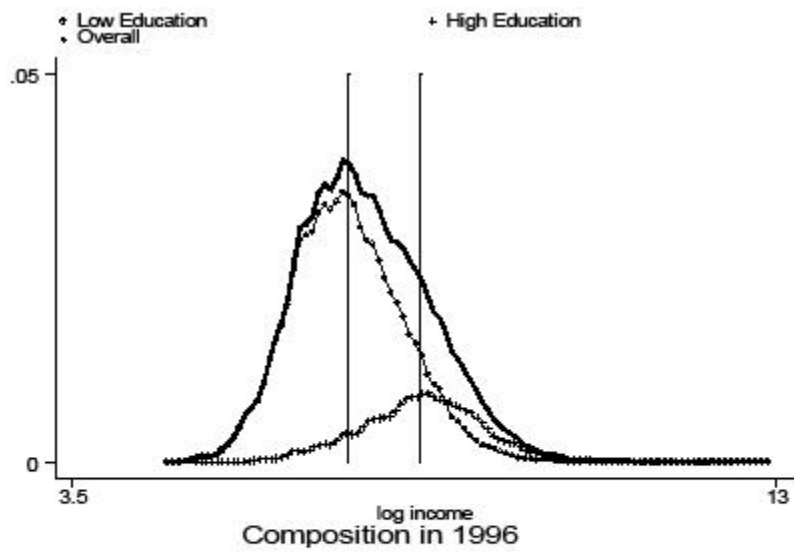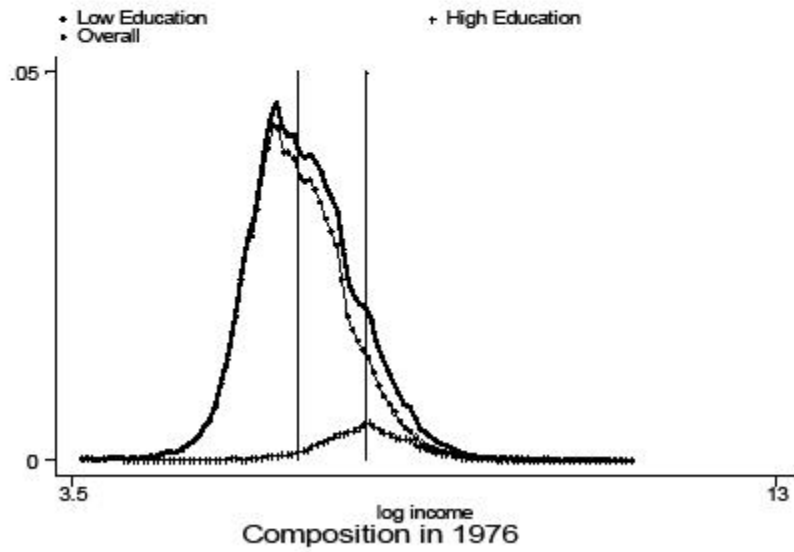
[Figure 5.3.5. Composition of Aggregate Distribution by Education. Source: Jeong (2000)]

Year	1976	1981	1986	1988	1990	1992	1994	1996	76-96	76-86	86-92	92-96
Education												
No Formal	18.3	12.5	8.6	7.6	7.1	6.9	6.2	5.6	-12.7	-0.97	-0.27	-0.34
Primary	73.1	76.1	78.6	77.4	76.4	74.9	73.2	71.8	-1.3	0.55	-0.63	-0.78
Secondary	5.4	6.3	6.1	6.9	8.3	8.9	10.3	11.4	6.0	0.07	0.47	0.63
Vocational	2.2	3.6	4.0	4.5	4.2	4.6	5.0	5.3	3.1	0.18	0.09	0.18
University/Higher	1.1	1.5	2.7	3.6	4.0	4.8	5.3	6.0	4.9	0.17	0.34	0.31

Table A.3 Average Income Profile (1990 Baht)

Year	1976	1981	1986	1988	1990	1992	1994	1996	76-96	76-86	86-92	92-96
Education												
No Formal	851	1111	890	994	1063	1153	1187	1420	2.6	0.4	4.4	5.3
Primary	908	1131	982	1116	1297	1445	1604	1945	3.9	0.8	6.6	7.7
Secondary	1861	2312	2253	2445	2970	3239	3369	3604	3.4	1.9	6.2	2.7
Vocational	2261	2825	3030	3268	3971	4614	4768	5209	4.3	3.0	7.3	3.1
University/Higher	3753	4802	4402	4525	5366	7816	7398	8299	4.0	1.6	10.0	1.5

Table A.4 Inequality Profile by Theil-L Index

Year	1976	1981	1986	1988	1990	1992	1994	1996	76-96	76-86	86-92	92-96
Education												
No Formal	0.270	0.310	0.355	0.330	0.331	0.408	0.365	0.356	8.59	0.85	0.88	-1.28
Primary	0.249	0.276	0.318	0.312	0.341	0.340	0.336	0.320	7.0	0.69	0.37	-0.52
Secondary	0.201	0.256	0.300	0.328	0.419	0.356	0.381	0.338	13.7	0.99	0.93	-0.45
Vocational	0.191	0.161	0.240	0.210	0.294	0.319	0.298	0.255	6.4	0.49	1.32	-1.61
University/Higher	0.187	0.209	0.180	0.204	0.243	0.320	0.248	0.253	6.6	-0.08	2.34	-1.67

[Table 5.3.6. Composition of Income Status Groups (%). Source: Jeong (2005), unpublished]

The bulk of the Thai population (by household head) has relatively low levels of education. The more highly educated constitute a larger, but still relatively small part of the population even by 1996. See histograms in Figure 5.3.5. As in Table 5.3.6, the fraction of the population with no formal education drops from 18.3 percent in 1976 to 5.6 percent in 1996. The fraction with secondary education increases from 5.4 to 11.4 percent, vocational from 2.2 to 5.3, and university/higher from 1.1 to 6.0. The income differential between the lowest and highest group was over 4 to 1 in 1976, and this increases to almost 6 to 1 as the growth of income is substantially higher for the more educated groups. This is what accounts for the contribution of education to the growth in per capita income, and via the Kuznets effect, to an increase in inequality. On the other hand within-group inequality is higher for the least educated groups, so the secondary composition effect lowers inequality.