

The Thai Economy: Growth, Inequality, Poverty, and the Evaluation of Financial Systems

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ABSTRACT

This book evaluates the financial system of Thailand, a proto-typical developing economy in Asia. Specifically the manuscript evaluates the impact of financial institutions, markets, and policies on growth, inequality, poverty, and the welfare of households and businesses. A repeated theme is the description of the Thai economy as an integrated micro/macro, general equilibrium system, with the choice of diverse individual agents, limited by obstacles to trade, aggregated up to explain macro variables.

The financial system comprises the role of informal and formal financial sectors in the intermediation of savings and credit and the allocation of idiosyncratic and aggregate risk. If markets and institutions were perfect, and there were no policy distortions, then certain benchmark standards would be implied. Relative to these benchmarks there are many anomalies, even for those using formal credit and savings instruments. Likewise, various government program innovations, and plausibly exogenous variation in access to intermediation, have had nontrivial impact on households and businesses. More generally, enhanced finance is established to be correlated with and causally related to growth of GDP and poverty reduction, though with mixed consequences for the distribution of income.

Quantification of the distribution of gains, losses and macro impact of financial policy variation also requires a specification of why markets, contracts, and institutions may appear in combination to be

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incomplete. Candidate obstacles to trade include moral hazard, adverse selection, limited liability, collateral/default, and transactions costs. These are tested against one another, and against exogenously limited/incomplete markets, with parameters estimated and obstacles quantified. The impact of policy variation on gains and losses and on growth, inequality and poverty varies within the apparent financial regime. Policy recommendations follow naturally.

OUTLINE

The manuscript proceeds as follows. Chapter 1 presents some salient facts related to growth, inequality, poverty, financial deepening and policy variation. Chapter 2 presents key conceptual frameworks for measurement of stocks such as assets, and flows such as income: corporate financial and national income accounts. The standard demand and payment decompositions are useful but recommended as well are non-standard levels of (dis)aggregation, e.g. kinship groups, networks, villages, and family conglomerates. Spatial disaggregation, from the national economy down to provinces, counties, households and individuals is indeed taken up in more detail in Chapter 3.

Macro TFP decompositions of GDP growth and micro, Kuznets decompositions of income change and inequality establish as in Chapter 4 that education, occupation/sector transitions, financial access, and geography are common and key. Chapter 5 thus examines each of these driving forces in more detail, both in contemporary Thailand and historically.

Chapter 6 presents the first of a series of micro/macro dual sector models, built upon the findings of the early chapters. These initial models emphasize occupation/activity choice, with the financial sector either expanding exogenously as in one model, literally imitating the data, or chosen and growing endogenously in a second. Both these models are applied at successively finer levels of geographic disaggregation- macro, regional, village and household levels. Success and failures indicate the importance and impact of financial sector policy, as well as modifications to take into account in the subsequent models. For example, both the initial models imagine that finance or risk sharing is perfect for those with access. This is scrutinized in the data in Chapter 7, and anomalies are documented. Related, Chapter 8 establishes with econometric models that new government programs or cross sectional/temporal variation in policies and/or institutions can sometimes have a large direct impact on various household/business outcomes.

Chapter 9 provides a better interpretation of the anomalies, a more nuanced interpretation of the observed impact of actual interventions/variation, and fine-tuned policy recommendations. It introduces structural models with moral hazard, adverse selection, and limited commitment as well as transactions costs. Obstacles to trade are established to be salient features of the Thai financial landscape. Considered are models of occupation choice, default rates, whether to borrow under individual or joint liability, and whether to borrow formally versus informally. Obstacles can be distinguished and the quantitative importance of policy options determined. There is apparent regional variation in obstacles and evidence of incomplete markets. Financial regime and policy variation in this context have rich implications for both the distribution of gains and macro dynamics. The financial system and industrial organization of the economy are jointly determined with growth, inequality, and poverty.

We offer a summary of the financial sector evaluation strategy of the manuscript and specific policy conclusions. Supporting appendices A and B describe the Townsend Thai project and the data base research archive which is supporting the analysis.

Executive Summary

This book evaluates the financial system of Thailand, a prototypical developing Asian economy. Thailand is intended as a leading example. The method of analysis developed here can be applied to emerging markets more generally, and to other countries. Here the financial system comprises both the role of informal and formal financial sectors in the intermediation of savings and credit and the allocation of idiosyncratic and aggregate risk.

The book thus evaluates the impact of specific financial institutions, markets for credit and insurance, and government policies on growth, inequality, and poverty at the macro, regional, and village level. It delivers the distribution of gains and losses to households and businesses from finance-induced growth and financial sector policy variation. Methods include parametric and non parametric estimation, calibration, and model simulation, typically in combination. Data come from the author's own Thai surveys in as well as secondary data assembled in a research data base archive with GIS functionality.

Here is the fundamental premise: If markets and institutions were perfect and there were no policy distortions, then certain benchmark standards would be implied. Relative to these benchmarks there are many anomalies in the Thai economy, even for those using formal credit and savings instruments. Initial wealth facilitates entry into business and facilitates investment for those in business.

Many households and businesses appear to be constrained in occupation choice, and estimated rates of return are high for constrained low wealth household and low for unconstrained high wealth households. Poor households and SME enterprise are particularly vulnerable in consumption and investment to variation in income and cash flow. Some apparently insurable shocks such as movement in international rubber prices are not covered. There is other evidence of exogenously incomplete financial regimes.

Thus government program innovations and plausibly exogenous variation in access to intermediation have had nontrivial impacts on households and businesses. The new one million baht village funds program seems to have increased consumption, agricultural investment, and total borrowing above and beyond village fund credit, while raising default rates and lowering assets/savings. Running in reverse, a Bank for Agriculture and Agricultural Corporations (BAAC) debt moratorium program has a neutral if not negative impact. Arguably exogenous variation in village funds by policy (emergency services training, monitoring, pledged saving) and by type (rice bank, buffalo bank, production credit group, women groups) implies variation in impact (asset accumulation, risk sharing, occupation choice, and reliance on money lenders). Instrumented variation in access allows an assessment of particular financial institutions (commercial banks, BAAC (Bank for Agriculture and Agricultural Cooperatives), village funds, informal sector) providing a score card/rating system for the impact on consumption and investment smoothing.

More generally, enhanced finance is established to be correlated with and, in the models, causally related to growth of GDP and poverty reduction, though with mixed consequences for the distribution of income. Macro, total factor productivity is largely explained, and the TFP numbers make much more sense, when we model the Thai economy with its explicit micro foundations. Otherwise TFP is negative for manufacturing and several sub-periods. Initially, an access-no access dichotomy is used, that is, there are some in the intermediated sector and some without access, though the former group expands over time. Micro Kuznets decompositions computed from socio economic survey data establish that increasing access/use of the formal sector along with high and increasing income differentials account for a nontrivial part of growth of per capita income and increasing inequality, albeit with other factors including education and sector shifts. Financial access, occupation/sector choice, and education are shown to play key roles in the contemporary Thai economy and in Thai historical data. A model of occupation choice with an exogenous financial driver explains well the upturn in the Thai economy at the time of a financial liberalization, and a model with endogenous financial access and no policy distortions delivers observed long term historical trends but not that upturn. These same models are then used as we zoom in on areas of interest. Regional and village analysis with these same models reveals the impact of the

government operated BAAC expansion targeting credit and gaps in private commercial bank services. These indicate the potential political economy impact of market segmentation. Variation over time is also important. The impact of the financial crisis, which restricted intermediation, and the subsequent increased in government participation in the financial sector, with its current impact, is again part of the analysis. Subgroups such as village networks and family related conglomerates are also studied.

A repeated theme is the description of the Thai economy as an integrated micro macro system, with the choices of diverse individual agents aggregated up to explain group, village, regional and macro variables. Choices are shown to be constrained by real obstacles to trade. Pre-determined, low levels of wealth limit not only financial access but also occupation choice and education of children. Indeed transitions of households from farming and wage work to non-farm business, and the role of small and medium enterprise, are key ingredients in the Thai economy, not only in the past but also in the contemporary system. The dynamic evolution of the economy is thus determined by an evolving distribution of wealth. This is featured in early parts of the manuscript. Latter additions include other obstacles. There seems to be moral hazard in entrepreneurial effort and project choice. There seems to be adverse selection, the exclusion of safer customers from the loan market. There seem to be limited commitment problems, with loan size limited by collateral or wealth, and a tendency for strategic default limited by unofficial sanctions. Apparently, there are transactions costs, varying with household and village characteristics, such as distance to a bank office. Each model has its blend of observable variables (e.g., wealth, distribution of wealth, division into collateral, roads, schooling) and unobserved variables (e.g., talent, latent firm size, heterogeneity in risk preferences, safe vs. risky types/technologies).

Tests distinguishing the models indicate that the mix of obstacles varies by region. Further, some of the transactions costs may pick up the policy distortion of deliberately segmented markets. Finally, as noted earlier, contracts may be incomplete even beyond the associated, revised benchmark standards that take these obstacles into account.

More generally endogenous choices with impediments to trade and policy variation all play an important role in observed outcomes. Models of occupation choice limited by moral hazard, limited liability, or a combination of the two make selection into entrepreneurship, investment, and rates of return all functions of wealth and talent. But the models take as given which objects can be used as collateral, and how much is needed, administered interest rates, and transportation costs associated with existing road, and bank infrastructure. A model of endogenous access to formal credit, and another with a combination of formal with informal credit, show how access choices are constrained by pre determined

accumulated wealth, education/talent, the scale of potential enterprise, and current locations of the borrower. Again these models take as given transactions costs, the location of the bank, interest rates, and the legal system/collateral guarantees. An alternative model of whether to borrow, and how much to borrow, tests for adverse selection, taking as given lender imposed limits on loan size and opportunity costs related to individual and village characteristics. A model of the method of borrowing, i.e., individually with relative performance evaluations or as a group under joint liability, takes as given preexisting levels of wealth, inequality in the distribution of wealth, the covariance in project return, and of course the possibility in the economy of borrowing in these two ways. Many of the variables should evolve over time as part of the optimal dynamics of the larger system but there may be policy restrictions. Models relating project risk to default test for moral hazard, strategic default, and adverse selection, taking as given interest rates, joint liability co payments, official penalties for default, screening and/or cooperation among joint liability partners, the number of potential alternative lenders and again, the possibility of borrowing in groups. Many of these are policy decisions or control variables.

There are thus nontrivial gains and losses to financial policy variation and, again, consequences for growth, inequality and poverty. Financial liberalization facilitating access to intermediaries and weakening wealth constraints is shown under a variety of the models to have a distribution of gains which is particularly high for the talented poor. An evaluation of specific policy options shows that impact is a function of estimated impediments to trade. With transactions costs and limited commitment, enhanced collateral is more effective than is placement of the formal sector into villages or interest rate subsidies. When savings, hence wealth, is endogenous, enhanced collateral and more generous credit limits speed up life cycle mobility. But the impact of wealth redistribution via subsidies and lowered interest rates can be large when moral hazard is a concern. Dominating, however, is movement on the extensive margin, the order of magnitude of gains for the poor who move from no access to limited access of some kind. The general equilibrium effect of price changes from financial liberalization can cause losses for existing firms that hire unskilled labor. Domestic liberalization is the cause of a surge in growth, thus rising wages (associated with the fall in inequality). Augmented capital availability via foreign capital inflows could in principal be expansionary, and welfare improving, but at estimated parameter values the effect is small and, in any event much of this seems to have been squandered. New roads and easier access to agglomeration synergies lower business entry costs. This can even dominate the credit effect: new roads alter substantially the path of regional development. But if credit markets are distorted by implicit government policy, there are gains to their removal, shown in Thailand to be particularly high for the educated, rising middle class near main roads and towns. Wealth redistribution from the middle class to the relatively poor can slow down growth. In short, the incompleteness of financial regimes, their

evolution, and government policy can, through business formation and investment, alter growth rates, inequality, and poverty.

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Chapter 1: Growth, Inequality, Poverty, and Financial Deepening

This chapter presents the salient facts related to growth, inequality, financial deepening, and policy variation. Growth has been high the past 50 years, but with a sharp drop in 1997, and recession years of following the financial crisis. But the trend of long term industrialization dominates the data. Thailand has gone through a demographic transition. Inequality has been increasing since at least 1976, but peaks in 1992. There has been a steady decrease in the fraction of poor and distance of the poor from the poverty line. However, in panel data poverty is a transient phenomenon if income data are used. Consumption especially moves slowly. Health and wellbeing has steadily improved. Financial deepening displays astounding trends relative to the US. Part of that starting in 1986 can be attributed to a financial liberalization, but foreign capital inflows increased at the same time. By the 1990's commercial bank regulation appears deficient. Post crisis, government involvement in the financial sector has increased.

Chapter 2: Conceptual Frameworks for Measurement

This chapter presents key conceptual frameworks for measurement of stocks and flows. National income accounts are based on corporate financial accounts. These distinguish stocks in the balance sheets from cash flow, which is distinguished in turn from (accrued) income. Yet the national income accounts and the "circular flow" diagram envision little production in the household sector. Still, non farm proprietary income has been large, dominating corporate profits. Private investment has the largest share of GDP, commoving strongly with it. There is much production in the household sector, and households in a developing economy need to be thought of as firms as in corporate finance. There are discrepancies between the income /savings numbers of household surveys and from those of the national accounts. The

manuscript emphasizes non-standard levels of aggregation, e.g., kinship networks, villages, and family-related industrial conglomerates.

Chapter 3: Regional Economies - Spatial Disaggregation

This chapter spatially disaggregates the national economy into provinces, then counties (amphoes), villages, households, and individuals. Provincial product displays great differences from high to low, and in the fractions attributed to manufacturing versus agriculture. The process of transition has changed over time, recently with lack of convergence. Poverty rates differ much across provinces. Inequality in provincial product from manufacturing is much greater than inequality in non farm income in household surveys. A simple model of endogenous household migration out of agriculture in the provinces to manufacturing in Bangkok, with remittances, can explain much of the apparent difference. Projections establish the spatiotemporal patterns of income growth. There is initial concentration and then relatively dramatic convergence. Across village inequality is high when the level of income is low within provinces. There is unevenness in development. At the household level, income change is hard to predict from macro/temporal shocks alone, even in the financial crisis. Occupation and geography matter. Variation in ground cover also helps to determine the timing of good and bad years. More generally, households experience a variety of idiosyncratic and regional shocks; for example, deviations in rainfall or deviation of international rubber prices. Households vary in diversification strategies such as migration, despite shocks and sources of heterogeneity. But Northeast Thailand, after decades of growth, differs dramatically from its Mekong basin counterparts in Cambodia, Laos, and Vietnam.

Chapter 4: Micro Kuznets and Macro TFP Decompositions

Within sector TFP growth is negative for manufacturing and services, and positive for agriculture. Distinguishing time periods, TFP growth is negative except for the acceleration of income in the late 1980's. Decomposition by credit access will reconcile these anomalies. Decomposition of average income change into changes within sector or groups and population shifts from low to high income groups shows the importance of financial access as well as education, occupation/ sector shifts, and urban rural movements. Likewise, Kuznets decompositions using the Theil index show inequality change attributable to diverging average incomes across occupation and sector categories and to population shifts for education and financial access. Poverty reduction can be attributed to the very same variables, especially to sectoral/occupation shifts.

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

In this chapter we examine each of these driving forces in more detail, both in the contemporary economy and then historically. We address occupation, financial access, and education in turn.

Many industries are concentrated in and around Bangkok, though not exclusively, and food/beverage/tobacco is concentrated in the Northeast. Most firms are small in terms of numbers of employees, less than 200. SME's account for over 95% of all firms and about 50% of employment and capital. There is an overlap of firms found in the MOI registry with the larger firms of household surveys. Historically, here is a steady moment of households out of agriculture and into self employment or employer categories; the latter have higher incomes and greater within group inequality. Satellite imagery shows urbanization and deforestation. Initial household wealth facilitates household transition into business, and the assets of new businesses are lower if the household is not borrowing.

At an aggregated level commercial banks dominate access, credit extended, and number of branches, but in rural household data, the Bank for Agriculture is the largest formal lender and the informal sector is high also. In the Northeast transactions are within the village, among relatives and non relatives; in the Central region out-of-village transactions rise in importance. The mix of lenders also varies by region. Loans vary in size, interest rate, collateral, and default consequences. Savings are in financial accounts and rice. Debt/asset ratios are low. Use of funds for consumption smoothing and investment/finance varies with wealth, with distinct patterns also by provider, some aiming for clientele at the middle or low income group. The BAAC has a risk contingency system in which loan repayment can be deferred or principal partially forgiven. Village funds differ by policies, correlated with success and failure in membership, saving, and lending growth. Financial deepening is most obvious for the BAAC which operates now in most villages, least obvious for village funds which blink on and off with success and failure, and mixed for commercial banks, which spread like contagion. Pre-existing wealth facilitates entry into the formal financial sector, as does education. Income differentials and inequality vary by access, no-access groups. Distribution of wealth is higher for those with commercial bank access, lowest for those who borrow informally, and concentrated in the middle wealth group for the BAAC.

Education varies across provinces and varies within provinces by proximity to major roads or towns. Secondary schools are further away from the typical rural village than are elementary schools.

Many households have low levels of education, and the education of children still varies with parental wealth. Income differentials have increased over time, while the number illiterate has declined substantially.

Chapter 6: Integrated Micro Macro models with Dual Financial Sectors

This chapter presents the first two micro/macro dual sector models. The first model emphasizes the transitions of household from subsistence agriculture or wage work into non farm enterprise. Without intermediation, this transition is facilitated by pre determined wealth and also by talent which lowers the fixed costs of establishing business. Micro data allows estimation and identification of the key underlying parameters of the production function. A second sector allows perfect intermediation at an equilibrium interest rate. Unrestricted migration across sectors is allowed at an equilibrating wage. The intermediated sector is given increasing weight over time, exactly as in actual participation data. Savings rates and cost of living parameters are calibrated given an estimate of the initial distribution of wealth. Simulations illustrate the importance of financial liberalization to observed growth spurts and deliver the distribution of gains and losses to liberalization in the population. Foreign capital inflows were not the big driver. Decomposition of total factor productivity shows financial deepening explains that key, widely used macro residual.

A second model emphasizes the information and risk sharing advantages of the formal financial sector. Fixed and marginal transactions costs yield a wealth threshold below which households remain in autarky, smoothing with accumulated wealth, diversifying into risky and safe activities. Average returns, the range of shocks, risk aversion, the preference discount rate, and transactions costs are either calibrated or estimated. The scale of fixed costs is determined relative to the initial distribution of wealth. Simulations establish that the model can explain well observed trends but not the spurt in growth rate at the time of financial liberalization. Incorporating financial sector policy as a prior distortion allows an estimate of the distribution of gains to liberalization: these favor the middle class. Related, the model tends to over predict financial deepening for the educated and urban population, as if there were policy restrictions.

Both these dual sectors models are estimated and simulated at the village level. Both models do well with temporal trends. The occupation choice model does well with spatial and reduced forms patterns if the cost of business entry is inversely proportional to distance to agglomeration centers. New

roads have a large impact on regional development. The endogenous financial participation model allows estimation of entry costs which vary across space and by provider. Costs are estimated to be lower for those far from main roads and lower for those using the Bank for Agriculture, revealing again an apparent distortion. Wealth redistributions can slow down growth in urban centers.

At the household level, the models do well with temporal trends and do well qualitatively with growth and inequality decompositions. Aspects of the end of period simulations match observed distributions of income. But the models over emphasize the access or occupation dichotomies relative to the data, which have more co-movements across categories and groups than in the models. Models also overdo the financial dichotomy: there are more firms in the data in the non intermediated sector than a dichotomous model would imply, and likewise less risk sharing (more diversity) in the intermediated sector.

Chapter 7: Neoclassical Benchmarks and Anomalies for Those with Access

If markets and institutions were perfect, and there were no policy distortions, then certain benchmark standards would be implied. Relative to these benchmarks there are many anomalies in the Thai economy, even for those using formal credit and savings instruments, unlike the dual sector models. Initial wealth facilitates entry into business and facilitates investment for those in business. Many households and businesses appear to be constrained in occupation choice, and estimated rates of return are high for constrained low wealth household and low for unconstrained high wealth households. Poor households and SME enterprise are particularly vulnerable in consumption and investment to variation in income and cash flow. Some villages and family related industrial groups offer protection. Some apparently insurable shocks such as movement in international rubber prices are not covered for a large segment of the population.

Chapter 8: Impacts – Experimental and Econometric Program Evaluations

Government program innovations and plausibly exogenous variation in access to intermediation have had nontrivial impact on households and businesses. The new “million baht” village program seems to have increased consumption, agricultural investment, and total borrowing above and beyond village fund credit, while raising default rates and lowering assets and savings. Running in reverse, a Bank for Agriculture debt moratorium program has a neutral if not negative impact. Arguably exogenous variation in village funds by policy (emergency services training, monitoring, pledged saving) and by type (rice

bank, buffalo bank, production credit group, women's' groups) implies variation in impact (asset accumulation, risk sharing, occupation choice, and reliance on money lenders). Instrumented variation in access allows an assessment of commercial banks, BAAC, village funds, and the informal sector, providing a score card/rating system for the impact on consumption and investment. A discussion compares and contrasts instrumental econometric policy evaluations with the impact in dual sector choice models.

Chapter 9: Obstacles to Trade, Enhanced Models of Selection, and the Impact of Policy Variations

It is established in this chapter with structural choice models and data on occupation choice, default rates, choice of type of loan contract, and source of funds that moral hazard, limited commitment, transactions costs and other obstacles to trade are salient features of the Thai financial landscape. This chapter tests one model from another and/or quantifies the damage from various impediments. There is regional variation. There is also evidence of incomplete markets. Financial regime change and policy variation in this context have rich implications for both the distribution of gains and losses and for macro dynamics.

The model of occupation choice with heterogeneous talent is modified to make endogenous the choice of whether or not to borrow. Specifically, unobserved effort (moral hazard), the possibility of default (collateral/wealth backed loans), and both problems together, simultaneously, and exogenously limited regimes (savings only, borrowing and lending with bankruptcy but incomplete risk sharing) are all taken to the data on (predetermined) wealth and occupation transitions. Underlying parameters of preferences (risk aversion, work aversion), technology (marginal productivity of capital), and talent (relation to education and wealth) are estimated for each regime, and the best fit is determined from non nested likelihood comparisons. Moral hazard alone accounts well for the data in the Central region, while moral hazard and limited liability may act in combination in the Northeast. Experiments with policy variation allow computation of the distribution of gains and losses to exogenous variation in (regulated) interest rates, losses (wealth transfers) to branch banks, enhanced collateral (larger borrowing limit), and movement from limited to more complete regimes (to be balanced by costs). Interest rate subsidies can yield surprisingly high gains for a few poor talented households if there is a moral hazard problem, and smaller gains for a larger group when limited liability is the problem.

One cannot distinguish in the data the information constrained moral hazard regimes from one with more limited insurance. A savings only regime fits the data best in the distant past, but the models as they stand without transactions costs (or policy restrictions) do not do well with historical paths. When limited only by wealth interacted with the constraints, models with information or legal impediments tend to go to steady states (without growth) too quickly. More successful are the partial equilibrium life cycle predictions; those who will eventually set up enterprises save as in the data at higher rates and enter business at limited scales. Ironically, the observed wealth-to-occupation transitions are shown in this context to be downward biased estimates of the gains to wealth transfers or the weakening of collateral constraints. Larger gains come from changed access on the extensive margin.

Selection across formal and/or informal lenders can also help to quantify the importance of underlying impediments to trade and help to select among policy options. Households vary in underlying characteristics: productivity, potential scale of enterprise, wealth, and the availability of collateral. Borrowing from formal lenders is at a relatively low interest rate but entails transactions costs and limited, asset-backed loans. Borrowing from informal lenders is at a high interest rate but without enforcement problems. This structural model of selection is estimated via maximum likelihood methods. Transactions costs are low for the informal sector, and most effective policies involve enhanced collateral or weakened default possibilities. This dominates placement of village funds (lower transactions costs) and interest subsidies.

Data on repayments rates in joint liability groups also allow, with explicit choice based models, an assessment of the importance of obstacles to trade. Joint liability partners may jointly select with outside knowledge the risk of their projects. This might be mitigated by monitoring, of non borrowing members. Borrowers in a joint liability group may play a strategic game of whether or not to repay, with the outcome determined as a Nash equilibrium. Alternatively, households with safer projects decide not to borrow. In all these models an increase in the interest rate lowers repayment rates while an increase in productivity raises them. But more often sign restrictions distinguish the models. Data on whether the BAAC has raised its interest rate on borrowing groups, as an indicator of default, is coupled with data on the magnitude of joint liability payments, correlation across project returns, cooperative behavior, loan size, and the prevalence of additional credit options. Again, the information models fit best in the Central region and overall, and here strategic default fits best in the Northeast. Likewise joint liability borrowing may dominate individual borrowing, making customers better off and the lender no worse off. Under

certain conditions joint liability lending dominates individual lending, if the interest rate is allow to clear the market.

Enhanced models of selection focus on the choice of individual versus joint liability loans, if either. The BAAC offers both individual (collateralized) and joint liability mutual loans. We observe in the data borrower choices over these as a function of the wealth. As wealth increases, prevalence of group loans first decrease and then increases, as in a model comparing relative performance versus group regimes. Dispersion of wealth among potential joint liability borrowers increases the prevalence of joint liability loans. Related again is the model of adverse selection. A measure of the risk of project/household types conforms to the model prediction: safe types borrow less. Low correlation of project returns enhances joint liability loans. CDD covariates are entered, and an interpretation is that selection of participation on the extensive margin, and selection into and across contracts on the intensive margin, will be robust to supply side variation in financial infrastructure. The evolution of wealth, poverty, inequality, networks, and the organization of industry are co-determined with optimal financial contracts in these models.

Chapter 10: Summary and Conclusion

This chapter concludes with a summary of the financial sector evaluation strategy of the manuscript and offers specific policy conclusions. Supporting Appendices A and B describe the Townsend Thai project and the data base research archive which supports the analysis.

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