

# Chapter 10: Financial Systems in Developing Economies: Growth, Inequality and Policy Evaluation in Thailand

Robert M. Townsend

## Summary and Conclusions

The data used in this manuscript come from a variety of sources. A comprehensive database research archive facilitates access to and use of Bank of Thailand macro data, provincial product data, a Community Development Department village census, Socio-Economic Income and Expenditure Surveys, Labor Force Surveys, the Population Census, as well as surveys of firms: Japanese JBIC, Stock Exchange of Thailand, World Bank, Ministry of Industry, and special efforts. GIS functionality allows these data to be displayed at the plot (household, farm, and firm), village, amphoe, and province level, depending on the identifiers and the original coding. Thus one can pick a key variable such as income and display it across the various datasets. Or, one can pinpoint an area of interest and zoom in and out at various levels of geographic aggregation, extracting data from the various surveys. Theorists inevitably need key variables with no counterparts in existing data, and this motivates acquisition of new data, as in the Townsend Thai initial 1997 survey, the 1997-2010 annual panel, and the 1998-2010 monthly micro panel. More specifically, many of the theories of occupation choice and risk-sharing were reviewed, as were existing data and standardized LSME, Family Life, and other questionnaires. Key variables not typically gathered and used in many of the analyses are highlighted in the text: e.g., penalties for default, whether or not borrowers cooperate in production decisions, measures of sharing in informal networks, the existence of monitoring, screening, and the riskiness of the borrower. In practice the power of this emerging database research archive is that it facilitates using various datasets in combination, as illustrated in various subsections.

Quite apart from theory, the measurement of variables and their interpretation should be consistent with standard accounting frameworks. This is emphasized in Chapter 2. A bonus of the approach is that it makes the micro and macro frameworks consistent with one another and with the general economic equilibrium – National Income and Product Accounts come from the income, balance sheet, and cash flow statements of firms as in corporate finance. One obvious benefit of the accounting framework is that double-entry book keeping, cross checks, and the need for consistency across the

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accounts create better measurement of variables or reveal shortcomings. The Townsend Thai monthly data are being organized in this way. Likewise, one is more sensitive to the timing of variables in the theories themselves, the distinction between stocks (assets, net indebtedness) and flows (cash flow, income), or the distinction between performance and liquidity. Unfortunately putty-putty models (i.e. where capital is malleable, easily combined with income, and potentially consumed) are much in use here as elsewhere, and make the distinction less important in theory than it seems to be in practice. Inequality in wealth and inequality in income are quite distinct from one another, for example. Indicators of financial access benefit from the distinction between stocks and flows as well, as the patterns are different from one another and different from more conventional stereotypical measures of access.

There are various ‘false’ or misleading dichotomies that do not come from the accounts per se but are sometimes mistakenly associated with them. One such dichotomy that comes from the national income accounts is the distinction between households as consumers and suppliers of factor inputs and firms as producers and sources of factor income. Households in developing countries are both consumers and producers. Fortunately, the financial and national income accounts do not require the distinction. One can do the requisite unified measurement of households as firms. Indeed, there is information on households as firms in standard income and expenditure surveys – information which is not inconsistent with the importance of non-farm proprietorships in the national accounts. This is featured in the material on occupation choice as a driving factor. Put bluntly, one can use household-based surveys to understand GDP. Perhaps the most dramatic example of this is the model of TFP using SES data. Households are not simply a source of aggregate demand or the beneficiaries/victims of wealth effects.

Another dangerous label is the distinction between formal and informal (underground) economies – often informal means unmeasured or unconnected to recognized institutions. Commercial banks are in the measured, formal sector, at least at an aggregated level for deposits and lending. Commercial banks appear to dominate other financial institutions in access, stocks and flows. Yet the distinction between formal and informal vanishes with measurement as in the Townsend Thai and other surveys, and with the recognition of important social structures: the family, family-related conglomerates, trading and joint liability partners, or networks. These are documented as playing relatively large roles. Again, none of that is inconsistent with the construction and use of financial and national product accounts; still, there is ample scope for improved survey design and for sampling which combines “households” with “firms”, as the terms are typically understood. Policy recommendations ought to include the design and implementation of not only standard but also more imaginative, innovative surveys.

The first few chapters of this book are thus intended to be a picture of Thailand as in operational general equilibrium models; thus the movement is from macro to micro and back again, repeatedly, and in various ways. Key facts at the outset are macro GDP growth, inequality recognizing uncertainty and heterogeneity, and poverty recognizing the evident distinction among income, consumption, and wealth, with wealth as a pre-determined constraint. The exposition in these early chapters deliberately features the facts and not methodological issues. Chapter 2 features the usefulness of spatial disaggregation, taking growth, inequality and poverty as well other topics/facts from the national level down to the provinces, to villages within provinces, to households within villages, to individuals within households, and then back to a Mekong basin in a cross-country comparison. Still, some level of organization and interpretation of the facts is required as a starting point for the choice of actual models. Both micro Kuznets decompositions and Macro TFP decompositions as in Chapter 4 are enormously useful guides for what to put into the models. In Thailand this highlights education, occupation choice/sector, and financial access as key driving forces of the dynamic general equilibrium. Chapter 5 does the same in a less structured fact-finding mission: it takes the driving forces behind growth, inequality, and poverty decompositions – namely, levels of education, financial sector access/use, and occupation choice/sector – and examines them one at a time at the national, province, village, and household level. Financial deepening and financial institutions are featured in these early sections, both as facts to be incorporated in the models and to set the stage for a rigorous financial sector analysis.

Benchmarks from the Baseline Neoclassical model are featured midway through the book, in Chapter 7, after the initial facts and two initial dual-sector models. However, in a policy-motivated research algorithm, tests of the benchmark standards might well come first. The point is that the tests can be carried out with relatively little data; thus the general equilibrium standard becomes operational quickly. If there were no major holes or imperfections, or the orders of magnitude of distortions were small, then there would be no reliable basis for policy remedies other than redistribution. There are two obvious points to stress in this context. First, even those without financial sector access may do well: lack of access does not create a prima facie case for intervention. Second, if there are distortions or gaps then it is important to know for whom. There may be gaps not only for those without financial sector access, potentially, but also for those with access as well. Gaps may have a rationale in obstacles to trade, or in policy distortions. The distinction is crucial as the latter are more easily remedied (apart from political considerations). Thus both of these hypotheses, distortions from obstacles versus distortions from policy, need to be brought into the research/policy algorithm. But first things first: are there gaps, how big are the gaps, and for whom?

Under the neoclassical standard, business starts and choice of economic sector should not be related to initial predetermined wealth, controlling for talent. It is not difficult to get wealth and occupation histories even in a one-time-only, cross-sectional survey. The Townsend Thai 1997 questions ask the household if each of many possible assets is held, if so, when acquired, and the value at that time. Earlier purchases still held can be depreciated. Land purchases and sales are memorable and easily tracked, though here one can estimate the contemporary value as the resale value. Likewise, households remember well the year of change of crop or change of primary activity of the head. Thus one ends up with a retrospective panel on wealth and on occupation transitions. Other household surveys such as those of IADB ask about the contemporary value of existing assets. One can also use a principal components measure of responses to simple, yes/no ownership-of-assets questions, as in the Thai SES survey, to create a latent variable for wealth (unobserved factor) which best explains the cross sectional ownership variance.

For the test of neoclassical separation, one can run a probit of transition into business over an interval of time onto preexisting, initial wealth and other characteristics, such as education and family composition. More non-parametric are the methods of Adonis Yatchew. In Thailand wealth in the probit is positive and significant and the standard error band for the slope coefficients of the locally linear regressions is up-sloping and narrow. Wealth matters and the distortion are substantial, apparently. There are worries that wealth, though taken as predetermined, is endogenous in a larger dynamic problem. But we know from Francisco Buera that the cross-sectional transitional gradient only understates the prevalence of credit constraints. Talented households may have more wealth prior to entry, but that is because credit constraints generate a demand for higher saving. The latter implication is also tested.

Those with access to the financial system might be presumed to be more likely to reach the neoclassical standard, that business starts and sector of occupation be unrelated to initial wealth. Here one equates financial access with measured use, momentarily. (In the choice model below, access and use are not equivalent.) In the Townsend Thai survey instrument one asks questions about borrowing and saving with informal and formal financial service providers, as is in some but not all existing surveys. The surveys also ask about whether the farm or enterprise could make more money and if so whether credit access is the problem. Then, either stratify the data into access, no-access groups, or append as an additional variable the interaction of wealth with an indicator of being a customer or member of a financial institution, possibly by type. In Thailand wealth facilitates access. For Bank for Agriculture and Agricultural Cooperative (BAAC) joint liability groups, wealth makes a borrower less likely to be

constrained. Thus Thailand is not neoclassical even for those with access. The credit market either suffers from a distortion or some obstacles to trade make wealth a key variable.

Likewise, initial investment in a business should be unrelated to initial wealth, overall and for those with access. In the Townsend Thai data we ask simply what the initial investment in the business was. Preexisting wealth is significant both before and after the financial crisis (but not during), in ordinary least squares regression equations for business investment. Histograms reveal that the distribution of initial business assets is shifted to the right for firms using the financial system.

Rates of return on assets (ROA) are another potential indicator of constraints. Marginal ROAs should be equated across households and technologies; otherwise there is a violation of the neoclassical standard. A simple measure of ROA is an income to wealth ratio. Income data is asked in an abbreviated way in the Townsend Thai survey, and wealth in that survey was discussed earlier. The ratio is an average rather than a marginal return, so some caution is in order. But in Thailand the range of returns is so large, from almost zero to 90%, that adjustments with additional controls for type of firm and with possible ranges for a capital share parameter, as in the Cobb Douglas production specification, are unlikely to overturn the dramatic results: low wealth households that say they could profit if able to expand their business have rates of return that are quite high, and high wealth households who say they are not constrained have rates of return that are quite low. A redistribution of resources from the latter group as lenders to the former group as borrowers would allow large gains, apparently. The gap is of course the obvious measure of insufficient intermediation. Similarly, one can use the income and balance sheet statements of firms, as in the Ministry of Industry survey, to compute the standard ROA ratios. Controlling for industry type, ROA is declining in firm size, measured by the value of fixed assets. Note also that the income measure used here is accrued income, not cash flow, a better measure of underlying, true performance.

For firms listed on the Stock Exchange of Thailand, ROA is also declining in debt. Thus debt alone, as an indicator access, does not make firms alike, of equal marginal return, as in the neoclassical model. The second, larger point is that the current financial system appears to direct credit to larger and less efficient firms, though other hypotheses are being explored. The political economy of this has yet to be determined.

When there is uncertainty, the neoclassical complete markets standard implies that household consumption should move with aggregate consumption of the risk-sharing group and not with household

specific income. It is as if all income were pooled, aggregating up idiosyncratic and aggregate shocks, so that only aggregate shocks remain. Aggregate consumption, after auxiliary smoothing, e.g. borrowing and lending with those outside the group, should then be distributed in the group population according to Pareto weights or wealth, and these are not functions of contemporary income/shock conditions. Aggregate consumption can be replaced in a regression by a time dummy, picking up the common aggregate shocks. Household consumption can be measured comprehensively as in an income expenditures survey. In the SES this is administered in a morning. Or, as in the Townsend Thai survey, information on a few key items is ascertained in a few minutes, specifically, 12 items which when weighted explain up to 70% of non-durable expenditures in the SES. Likewise, household investment should move with aggregate shocks and not with household specific cash flow. Investment in the panel is created by keeping track of household assets and their changes.

In Thailand the benchmark risk-sharing standard is rejected overall in household data. Vulnerability of consumption to income shocks appears more salient during the financial crisis in the Central region, and sensitivity of investment to cash flow shocks is a chronic problem in the Northeast. But households with low education, households with female heads, and the elderly do not seem more sensitive to idiosyncratic shocks than are other households. This is of enormous importance to policymakers who tend to single out these types of households as likely targets for safety net funding, either in emergencies or as long-term structural alleviation strategies. There is, however, a salient and important exception: low wealth households are consistently more vulnerable in both consumption and investment to adverse shocks across regions and time periods. Among these are poor farmers and wage earners. Thus it seems policymakers might redouble efforts to put in place social insurance and security systems for these households (though obstacles to trade as an explanation are explored below).

Data for firms from the Ministry of Industry tell a similar story. Controlling for sector, small and medium firms are much more likely to display sensitivity of investment to cash flow. Evidently, the SME programs already in place in Thailand, the SME bank and Small Industry Credit Guarantee Corporation, are not sufficient, though this finding is typical to most countries.

The permanent income standard is similar to the full risk-sharing standard and uses identical data. Transitory shocks should be saved; e.g. though income might move with a rainfall shock, consumption should not. The Thai SES data indicate that rainfall shocks are well covered. More persistent shocks such as slow moving rubber prices should show up in consumption, but the permanent income models tell us how much. The Thai SES data indicate rubber shocks are not well covered for all income groups.

The buffer stock, savings model is related – households can save but have limited borrowing. This raises the overall level of savings for low-wealth households, though consumption remains more sensitive to drops in income. The buffer stock model, when it fits well, is indicative of constraints on borrowing.

The point here is that consumption and income data are being used to judge the efficiency of the financial system; whether or not households borrow, the amount of their savings, and whether they have access/use of the financial system are at best proximate if not misleading criteria. Likewise, as with savings for households, capital asset ratios for financial institutions tell us little about overall efficiency. Similarly, regarding debt and repayment for households, the amount of lending and even loan recovery for financial institutions is not equivalent with overall efficiency. (Bankruptcy is treated as a transfer payment in national income accounts.) Some non-payment as a contingency in a loan contract can be a good thing for the household and well understood by an insuring institution. Existing standardized debt contracts with high repayment may not span the space of returns: it may be incomplete. Welfare may be gained for some, potentially by the introduction of new securities, for example, partial credit guarantees, or reinsurance. More generally, when an exogenously incomplete regime is tested and found to fit the data better than an endogenously incomplete regime, then there can be gains toward making the contracts/markets more complete. But steps in that direction may alter the distribution of income and so require potential compensation.

The BAAC has in place an operating system which allows some insurance. This insurance is distinguished from strategic default and litigation arrears, in which case a penalty of 3% is charged. Farmers experiencing natural disasters, other adverse events in nature (drought, flood, crop disease), and household-specific shocks (illness, fire) can request that the BAAC defer repayment of their loan. On occasion, with large regional shocks (such as the floods of 1995 and 1997) interest and some principal are forgiven. A credit officer must go into the field and verify damage – a version of costly monitoring. In principle, adverse events are coded and computerized, though we have yet to secure these data. Related would be BAAC flow of funds by branch and province, that is, BAAC net financial flows as a ‘response’ to real shocks as measured in secondary data.

The BAAC shortfall in revenue is paid by the government to the BAAC on behalf of the farmer clients. It appears in the accounts as an income-recompense transfer. Unfortunately, a single line item in the income statement mixes these insurance transfers with subsidies for targeted government projects.

Robert Townsend and Amir Yaron were able to confirm for specific years that income recompense transfers were substantially greater than transfers for government projects. In any event, the overall magnitude of the sum of the two was quite large: without it, reported BAAC profits would have been negative. More generally, the BAAC is on-lending to farmers at rates 1-2% below the market, so naturally it has losses. As Yaron has recommended, market prices for sources of funds should be used to make a realistic assessment of the actual costs to society of running the Bank. Likewise, loans with slow repayment should be provisioned according to historical arrears data, not via the mechanistic formula currently in use and recommended by international organizations during the crisis (essentially, straight-line provisions as a function of number of years in arrear). Use of historical arrears would also give a more realistic estimate of current costs and overall performance. This should be done, moreover, by branch and type of event.

Adjusted, market-based costs should then be compared to the net benefit farmers receive from the insurance implicit in the operating system. If farmers were willing to pay that net benefit to the bank in fees, and neither the BAAC nor customers altered their behavior, then the BAAC would in effect be breaking even. That is, the BAAC should exist if it passes this cost/benefit test, and should be shut down otherwise. Existence is not necessarily inconsistent with the receipt of a subsidy indirectly distributed by BAAC to client farmers. In some models it would be as if the lump sum subsidy went to farmers directly, with farmers then paying this back to BAAC in premia and fees. (However, a farmer would not have to use the bank to collect the subsidy, which in some instances can be a better arrangement as there is no distortion.) In sum, the Thai economy with institutions such as the BAAC may simply be at a point on the Pareto frontier, a competitive equilibrium with taxes/transfers. As for commercial banks and other financial institutions, we lack data from Thailand to get this far.

The discussion thus far has focused on the correlation of household/firm budget/cash flow deficits with financing devices. That is, the discussion featured correlation of new borrowing or failure to repay old debt with a short-fall between consumption and income, or a shortfall between investment and cash flow from operations (or for household/businesses essentially the sum of the two).

But caution is in order. A high correlation between a deficit and financing devices does not tell us if the movement of the financial instrument is sufficient to reach the benchmark consumption or investment standard. On the other end, not using a financial instrument or mechanism may indicate only that the household or firm is using yet some other, alternative device. The goal, then, is to come up with a score card which tells us whether a particular instrument or institution is truly helpful. In the language of

counterfactuals, we want to know whether a household or firm would suffer if the institution or its contracts disappeared. In other words: does the household/firm participate because there is a net gain? Would households/firms not currently participating benefit if they were given access?

Fortunately, we have data from some quasi-experiments exogenously varying intermediation that come about from financial sector policy changes. In some of these experiments there is an element of compulsion or, in the language of experiments and trials, unavoided treatment. In others there are selection issues, but, under some assumptions, instrumental variables allow determination of the average treatment effect. Granted that the choice problems that generate participation and subsequent actions need to be modeled, as in other chapters; this part of the manuscript should be taken as akin to tests of the neoclassical standard. A positive impact on production/investment/occupation from intervention is akin to the existence of a prior neo-classical anomaly.

A reading of the history of the Thai financial system generates the ideas that lie behind many of the policy changes and the availability of potential instruments. Financial sector reforms were implemented starting in 1986 or so, after some difficulties. These included the opening of new branches, the removal of interest rate restrictions on savings and on loans, and limits to existing social targeting. This is a classic financial liberalization period. The government, however, continued to play a role: the BAAC expanded, and village level funds were promoted by various independent ministries. While overall this was a period of very high growth, not everyone benefited equally, as we have seen from the inequality story. Next come the financial crisis and the contraction of commercial banks. Wealth losses, or their proxies, provide instruments for evaluation of impact of commercial banks lending. But again the government continued to play a role. The BAAC continued to expand, though selected client farmers were given the option of joining a debt moratorium program. (Program eligibility creates the instrument in this case.) Post crisis, the government has played an increasing role in the financial system. The million baht village fund program is a prominent example; \$25,000 was placed in each of 72,000 villages. Households in villages with fewer household units were more likely to receive new loans, and these new loans appear not to have been substitutes for existing loans. Short term village fund credit is thus instrumented with the inverse of village population size and binary time dummies indicating the dates of intervention.

In fact the instruments are most obvious when we proceed in reverse chronological order. The inverse of population size is a control in periods before the village fund intervention and seems, in any event, unrelated to things that were happening before the intervention. It is likely uncorrelated with the

error terms in the impact equation, especially if household and village controls capturing key heterogeneities are used as well. If it is presumed in addition that the error term in the impact equation for participants and non participants are identical or, more weakly, of constant average difference, then the IV -estimated parameter on the treatment variable in the second stage OLS regression is a measure of the local average gain (of those induced to receive the treatment who would not have been involved otherwise).

The impact/outcome variables in the million baht fund program are consumption, income, overall short term debt, assets, agricultural investment, business formation, number of households in business, levels and percent of loan over due, and interest rates. There seem to be real consequences over and above what would happen in the neoclassical with a lump sum transfer of wealth; though consumption goes up, net savings (in terms of physical assets) goes down while agricultural investment goes up. There is seemingly little impact in terms of number of households making a transition to business, but the number of households that remain in business may have increased as does business profits. The number of loans in default, and the fraction of loans in default, also increase, as does the interest rate.

The government did implement a BAAC debt moratorium program post-crisis. Though long term client farmers with less than 100,000 baht in debt could then delay payment of existing loans without penalty, farmers participating in the program could not take out new loans. A binary variable for eligibility is the instrumental variable, regressed onto actual participation in a two-stage least squares procedure. Impact assessment shows that most effects were neutral or statistically insignificant. But the point estimate on agricultural investment is troublesome. It is negative, the opposite of the positive coefficient for the expansionary village fund program. It is as if there was some compulsion in the decision to participate in the BAAC debt moratorium even though it may not have been beneficial. More generally, the debt moratorium sets a bad precedent if it creates an expectation on the part of farmers that they need not pay off BAAC debt generally, regardless of their underlying situation. This shortcoming is especially salient when compared with the BAAC traditional risk contingent operating system.

Banks, finance companies and other formal intermediaries with dollar-denominated loans experienced losses in the financial crisis from the exchange rate devaluation, losses not related per se to their own idiosyncratic situation. The pre-crisis level of dollar-denominated loans relative to total liabilities is in effect the instrument. This exogenous right-hand side variable has a significant negative sign in a regression onto the volume of on-lending. There are indications of Vickery that long-term customers suffered less from the associated contraction. However, as informative as such episodes might

be to an assessment of the role of financial institutions, they do beg for an explanation of the inefficiencies that brought on the crisis and for enhanced political economy models.

The village fund programs prior to the crisis were administered by various independent government ministries and NGOs such as Catholic Relief Services. The Townsend Thai 1997 survey elicited responses from all existing (and some past) institutions operating in the 192 sampled villages and secured the institutions' record books. The institutions are quasi-formal; they do keep records and often have bank accounts, but do not in general have their own offices. Many institutions received initial funding from parent sources, and these same government and non-government organizations offer advice, training, and end-of-year accounting assistance.

PCGs are the most common type of institution. They are often promoted by the Community Development Department which calls them 'village savings funds' because they aim to promote 'good savings habits' within the village. Members of PCGs are relatively less likely to be the poorest in the village and are more likely to be women. The second most common village institution is a rice bank, which usually makes small, short-term, emergency consumption loans. These loans are in rice and at high interest. Rice banks are promoted by the Department of Agriculture and used as vehicles for the introduction high yield varieties of seed. Members are generally required to donate a given amount of rice at the founding of the institution, hopefully as a self-sustaining fund. Women's groups are distinguished more by their female membership than financial activities. Some promote new occupations such as silk weaving in the Northeast. Buffalo banks lend cattle, with the loan repaid when the initial buffalo gives birth. If the buffalo dies or does not give birth, no further loans can be made.

The outcome variables are the ones emphasized in the theories: transition to business, occupation change, risk-sharing, alleviation of constraints, and asset growth. Specifically, we can gauge the average impact on the whole village population by regressing outcome variables onto whether or not there was a fund in the village with a certain policy. Some policies such as training and savings plans are shown to promote intermediation: growth in membership, in funds mobilized, and on lending. Other policies such as lending in kind are shown to lead to disintermediation and potential failure. We do not distinguish for this part who in the village is a member or participant, as this allows non-participants to benefit indirectly, a local equilibrium effect. To get treatment on the treated from certain types of funds we regress outcomes onto an instrumented version of whether the village likely had the type of fund in question in a given year. Instruments are created by the headmen responses to retrospective questions eliciting history, CDD data

indicating hot spots of likely activity of credit officers/ministries, and surprising instances in which a village is predicted to have a fund of a given type but did not and vice versa.

We find evidence in support of the theory for positive impacts of village institutions on asset growth. Institutions which seem to succeed in membership, savings mobilization, and lending are institutions have higher positive impact. Cash loans are associated with stability and expansion of services while rice lending institutions and buffalo banks are associated with contraction and failure. Three specific policies associated with institutional success in intermediation (offering training services, savings services, and pledged savings accounts) were each individually associated with 5-6% faster asset growth. Institutions with emergency services, flexible savings accounts were 10-29 percentage points less likely to reduce consumption and/or key inputs in a year with a bad income shock. There is more evidence in support of job mobility than in constrained occupation choice per se. Women's groups and pledged savings accounts increase the probability of switching jobs. But emergency services lower the probability of starting a business. The most robust result is that institutions which intermediate successfully help reduce by 8 percent the reliance on money lenders, our indirect measure of being constrained.

The bottom line policy recommendations from this analysis are straight-forward but of some consequence. Rice bank, buffalo banks, and funds making in kind loans should be presumed not helpful and, unless local analysis indicates otherwise, shut down. Initial training in non-agricultural activities is to be encouraged. Training in accounting was requested by numerous committees on site visit. Having application forms is helpful, as is expanding membership beyond the village. Surprisingly, apart from emergency funds, optimal and flexible savings plans are not helpful, while time deposits and pledged savings accounts are a good thing. On-lending helps as does using savings information as a consideration in lending. Many but not all of these policies were part of the relatively new million baht fund program.

A similar evaluation procedure can be applied to the 1997-2002 annual panels in an evaluation not only of village funds, but also the BAAC, Agricultural Cooperatives, commercial banks, money lenders, and informal savings in rice. Instruments for being a member or customer in 1996, in addition to those discussed earlier, include distance to the district center. The further the distance, the less likely a household will be a member or customer of an Agricultural Cooperative or Production Credit Group, or use informal trade credit, but the opposite is true for the BAAC and for use of rice in storage (in the Northeast). It is more difficult to find instruments for commercial banks use. Controlling for observed household and village characteristics, the propensity scores for most of the financial institutions are positively related to subsequent use in the panel of the institution in savings and/or borrowing.

The bottom line score card from this evaluation is that the BAAC and Agricultural Cooperatives are helping in the smoothing consumption from idiosyncratic shocks, but less so the smoothing of investment from variation in cash flow. The opposite is true of commercial banks, more helpful in investment than consumption. PCGs help in both consumption and investment smoothing in the Northeast. The informal sector helps both also, in both regions. Rice storage is helpful in the smoothing of consumption in the Northeast. Some of the policy conclusions are novel for Thailand. The stated objective of eliminating money lenders and the informal sector would at best seem premature. Existing formal intermediaries are only hitting limited segments of the market and only for some functions, but we do not know if this is about the operating systems, regulation, or the obstacles.

The net effect of the 1986 financial liberalization was to allow the formal financial system to expand rather dramatically. Unfortunately, we lack detailed knowledge of the implementation of the program and so far have had trouble securing historical records. So, at a crude level, for the analysis here, we take the expansion to be exogenous and assess impact via the dual sector structural models, described again below

In sum, variation coming from inter-temporal shocks (growth and crisis), the political economy of segmented markets, or preconceived government programs can give us useful instruments. They leave little doubt that financial sector innovations promoting intermediation in Thailand have been helpful. Unfortunately, we still lack crucial knowledge about operating systems and exogenous supply side variation for certain financial institutions such as commercial banks. We also lack the details of some specific government policies. More on the legal system and how disputes are adjudicated – bankruptcy and collateral – would also be helpful.

To move beyond neoclassical anomalies and the impact of innovations, we need to discover how choices are made and the nature of constraints. We need to know whether or not there are obstacles to trade, document their type, and measure their severity. We need to assess in this context the distribution of gains, and potential losses, to financial sector policy change.

Models of occupation choice are modified to allow moral hazard, potential default, or a combination of the two. No obstacles, that is, the full-information, full-commitment model is embedded as alternative for sake of comparison. Most obstacles deliver an up-sloped schedule of wealth to business transition. But these models with their various combinations of impediments to trade differ quantitatively

and are tested against one another. In these models a household can decide how much to borrow and/or save. The different qualitative implications are checked in the data as well. Finally, investments in the business, effort, ROA, and the degree of insurance are endogenous within some of the models. For example, financial institutions take into account the possibility of project failure, and an endogenous interest rate bears a default premium relative to fixed costs of outside funds. Wealth is endogenous and related to talent. There is limited commitment, and this is what restricts the level of loans. But households are forward looking and can choose the level of pre-business savings. The model determines as well the speed of entry, the size and growth of new firms, and consumption jumps. Implications of endogenously incomplete contracts (e.g. limited only by moral hazard) are compared to exogenously limited incomplete regimes (e.g. a borrowing and lending regime with bankruptcy or a savings only regime). One tests again for statistically significant differences. In one of the models households decide whether to borrow formally, informally, or in combination. Limited commitment from the borrower for formal sector loans limits loan size, while there is full commitment for loans from the informal sector but a higher interest rate. There are potential transactions cost in both sectors. The maximum likelihood routine in effect searches over regions where one, another, both, or neither obstacles may be present in an attempt to fit the combination-of-lender data.

We discover from this work that credit markets are imperfect. More specifically, moral hazard is a problem overall and particularly in the Central region, and limited liability is a problem, especially in the Northeast. This may help fine-tune policy initiatives directed at improvement: monitoring would appear to have a payoff in the Central region and asset collateralization or enhanced penalties for default more critical in the Northeast. The contemporary financial system may be incomplete in lacking risk contingencies, as was anticipated earlier. More surely the financial system was incomplete in the past, approximately a savings-only regime. There is direct evidence for limited commitment overall in pre-business saving rates and in households that are constrained yet use money lenders, only or in combination with the formal system. The legal system deserves closer scrutiny. Transactions costs appear to play some role. These are positive for commercial banks access, so universal access would seem an inappropriate goal. But transactions costs are smaller, virtually zero, for the informal sector. Still, even the formal sector costs are low in comparison with those estimated from dynamic models of transition. This may indicate that there have been policy distortions.

Models of joint liability and data on repayment problems also tell us something about constraints. Note that default rates are used here to determine the prevalence and type of obstacles. Tested are models of whether there is joint determination of project risk when outsiders are uninformed, whether a

borrowing member is monitored internally by a non-borrowing member, whether there can be strategic default despite formal and informal penalties, and whether there is adverse selection so that the riskier potential customers are the ones actually borrowing. Decisions include type of project, effort in projects, monitoring, and strategic default. Insights come from the models' predictions for correlations of repayment with co-movement of project returns, loans size, interest rate, and productivity, the existence of screening, cost of monitoring, cooperative behavior among borrowers, outside credit options, and official and unofficial penalties. Methods are largely non-parametric, with sign restrictions coming from concavity and so on. It is found again, in this alternative model with different data, that moral hazard is a problem overall and especially in the Central region, and limited liability a problem overall and especially in the Northeast.

The model of whether to borrow under joint liability or as an individual in a relative performance regime assumes that moral hazard is the underlying problem. Groups facilitate risk-sharing, as in the neo-classical full-commitment, full-information model, but this comes with a distortion created by moral hazard – collusion in choice of effort against a poorly informed outsider. In an individualistic relative performance regime the outsider can give borrowing members high-powered incentives to work hard, so they repay, but in this financial regime insiders are presumed to suffer from moral hazard as well. Likewise, collusion among insiders is mitigated but only a cost. The insight provided by this comparison of regimes is that the level of wealth and the distribution of wealth among potential joint liability customers determine the optimal choice of loan contract. Low wealth and wealth inequality are forces for group joint-liability loans. This is supported in the data; implicitly, then, the premise of moral hazard is supported as well. Likewise, the implication of the adverse selection model is that safer types are not borrowing. Covariation in project returns also makes household less likely to borrow. Both these implications are supported in the data. Policymakers should be aware in making complaints about limited access that lenders may be coping with an adverse selection problem.

Each of the models with obstacles takes as given a price or policy variable. These can be altered in policy experiments at estimated parameter values. We can thus back out the distribution of gains, or losses. We can assess the likely impact of policies typically considered elsewhere or evaluate policies which are already part of the Thai financial scene. Specifically examined are further reductions (and increases in an on-lending rate. The impact of potential remedies for the limited commitment, default problem are captured albeit crudely by weakening the borrowing constraint parameter as in allowing other aspects of wealth to serve as collateral. The welfare gain from alleviating the moral hazard problem is examined (to be compared with a cost of doing so). Direct wealth transfers and wealth transfers via bank

losses are examined. A reduction in transactions costs or nearer access to financial institutions or agglomeration centers is as is the gain of going from autarky to an otherwise incomplete regime.

The overall conclusion is that the distribution of gains of many of these policy changes is skewed toward low wealth high talent households. Which particular policy instrument is most effective seems to depend on the underlying impediment to trade. Interest rate subsidies have a big impact on some of the talented poor if there is moral hazard, but interest rate subsidies reaches more households with a lower average impact when there is limited liability. The point is that different households suffer differently from the impact of alternative constraints. One way to see this is to go from moral hazard as a constraint to limited liability as a constraint. Moral hazard is the more damaging constraint for some of the poorest households. In an interesting comparison, Xavier Giné finds enhanced enforcement to be more effective than interest rate subsidies and which are in turn more effective than nearby branches and the creation of village funds.

Virtually all of these results use of the full structure of the presumed models. Curiously, the impact of bank placement and the lowering of transactions costs might be assessed via instrument variables and two stage least squares, as in the earlier impact studies. The conditions for a valid instrument, that it facilitate access and not alter outcomes or relative gains, are satisfied in some of the models under specified assumptions. On the other hand, those conditions can be violated, even in the partial equilibrium context. More generally, the equilibrium consequence of wealth redistributions and collateral policies include movements in the prices of assets, the prices of firms, and again in wages. Unfortunately these are not picked up in difference-in-difference or other IV specifications.

Dynamic mechanism design models have both positive and normative implications. Poverty and wealth inequality are endogenously determined in models of selection across methods of borrowing. The more general point is that with moral hazard, incentives to work hard in order to ensure project success are marshaled not only with contemporary outcomes but also with future promises and threats. Thus an unsuccessful outcome comes with lower future wealth. If projects fail together, then local wealth is decreased but its dispersion in the population remains. Conversely, if one project succeeds while another fails, inequality should increase. Low wealth and increased inequality are forces for group lending. Conversely, initial homogeneity and uniform success are forces for the individualistic relative performance regime. Thus, networks are endogenous and evolving – as should be the method of lending. No single policy is always best.

Models with long run transition dynamics take us back to the heart of the manuscript. A financial liberalization which (exogenously) extends access in the population to formal financial institutions can explain growth with increasing and then decreasing inequality. An evolving distribution of wealth and endogenous prices are key. Such models can also explain the movement in TFP and the decline in observed rates of poverty. A welfare analysis compares the gains and losses in end-of-period wealth across economies with and without the financial liberalization. Unfortunately, in this model with myopic savings and bequests, there is no natural overall utility metric. Here instead the wealth and income gain for the talented poor is computed for various years one at a time, and shown to be quite large. Transition dynamics also puts the focus back on poverty and inequality. Poverty is reduced over time though access to the financial system, in the short and medium run, and increases in the (unskilled) wage, in the longer run. Likewise, financial access creates inequality as at first only a few of the poor can gain from profitable businesses, but eventual increases in the wage reduces profits and increases the incomes of those without access, in effect, a big catch up effect. The models also establish that there can be losses for some with increases in the wage, again, a political economy motive for financial repression. Difference-in-difference comparisons within a given economy for those with access and those without would not pick this up. Instrumental variable assessment of impact in an economy without price changes may yield the desired treatment on the treated, but the necessary assumptions are restrictive. Structural models can also be used to examine the impact of international capital flows and of an expanded informal sector. Neither matter much under current estimates. On the other hand, an improved transportation system which increases proximity to agglomeration hot spots has a large impact.

A second transition model with transactions costs is forward looking. Again the evolving endogenous distribution of wealth is key. This model picks up large transactions costs for the educated and urban segments of the potential market, as if there were a policy distortion. How the political economy of repression and segmentation might have created this distortion is a story yet to be told. Evidently the gains from liberalization fall largely on the middle class – those that would be glad to enter and pay transactions cost but apparently were not allowed to do so. In this context surprise wealth redistributions from rich to poor can slow down subsequent growth. But if wealth redistributions or bank branch expansions are anticipated, and enter non-linearly, then the instruments which work well in static contexts have an impact on outcomes in the dynamic setting, negating their use.

The version of this model which best tracks the average trend of inequality, growth, and financial deepening has transactions costs which are estimated to be quite large. The problem of the model with

lower costs is that the transition happens too quickly. Thus estimates of transactions costs in static choice models with micro data can be in conflict with what is needed for the dynamic macro transition models. This is exemplary of the kinds of tensions which are explored openly throughout the manuscript. Another is the need to reconcile the apparent role of aggregate shocks in the macro economy with the plethora of much larger idiosyncratic shocks in the micro data. Still, the manuscript never claims to have all the answers. Rather, it seeks to display via well-worked examples methods for integrated research, of micro with macro and of models with data. That is, the purpose of the manuscript to put existing pieces together into a coherent whole. This naturally creates new, unanswered questions and orders the priorities for the continuing research in Thailand and in other countries.