

A. REMOVING FINANCIAL BOTTLENECKS TO LABOR PRODUCTIVITY

1. *Robert Townsend, University of Chicago**

A) APPROACH

(1) Background

The National Institute of Health (NIH) and the National Science Foundation (NSF) in the U.S. have been funding through the National Opinion Research Center (NORC) and the University of Chicago a large socio-economic/institutional survey in Thailand which serves as a major input for this paper. The funding was received and the surveys designed prior to the crisis with the goal of understanding and analyzing the structural underpinnings of Thai growth at that time. A particular goal was the evaluation of the role of various kinds of financial institutions, both informal and formal, running the gamut from the family and networks of friends and relatives to finance companies and commercial banks. In designing the study, a particular concern was the observation that prior growth was associated with increasing inequality and apparent financial deepening. Increasing inequality had long been a concern of the Thai government, and to some extent financial deepening, or at least targeted credit through a particular set of institutions, has been promoted as a partial remedy. In summary it was thought important at the time of the design of the project to understand the role that these various financial and social institutions were playing in growth, inequality, and financial deepening.

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Clearly the crisis has made this research project more important than ever for three reasons:

First, because our initial survey was completed by the end of May 1997, and because the crisis was severe and in large part unanticipated, we now have baseline or benchmark data available which tell us what conditions were like in semi-urban and rural areas prior to the crisis, that is, prior to the abrupt economic changes which are now taking place. Indeed, a resurvey of 33% of the original sample was funded graciously by the Ford Foundation. This will tell us how socio-economic conditions have changed, that is, what the impact of the crisis has been on households and small businesses both in areas close to Bangkok and areas in the relatively poor Northeast. We will also see from the resurvey the role that informal and formal financial institutions are playing in buffering if not exacerbating aggregate if not idiosyncratic shocks. This evaluation of the role of the various financial institutions is consistent with the initial design of the project, though, of course, we too did not envision such severe shocks.

Second, we can see from the pre-crisis data if there are barriers to productivity associated with the pre-crisis financial structure. This provides a basis for a discussion of altered financial sector policies to facilitate economic recovery and promote growth in the medium term. Basically, the data show that even if there had been no crisis, substantial improvements in labor productivity would have been attainable through financial sector reform. That is, financial sector reform would have improved growth and attenuated increasing inequality in the medium term. With the advent of the crisis and the apparent need to place the Thai economy on a more secure footing, reforms of the financial sector would now seem to be more important than ever.

Third, the extraordinary database of this project combined with the latest advances in economic theory can help us think through financial sector reforms which might mitigate the possibility of future crisis. That is, the project may provide helpful suggestions for the regulation of financial companies, commercial banks, and other financial institutions and provide guidance for the formulation of monetary and macro policy. The focus is less on recapitalization, as important as that may be, and more on medium and long-term regulation; portfolio diversification, the documentation and the monitoring of procedures in lending, incentives and liability, and public disclosure.

Related, in June 1998, we began implementation of a continuing month by month survey of a subset of our original sample. The information from this ongoing survey can be used in monitoring the process of transition and recovery and thus might help the Thai government to evaluate the economic, social, and monetary policies it is implementing.

(1) Sample Selection and Methodology

We proceeded by imaging from theory what the true story underlying Thai growth with inequality and financial deepening might have been, or more formally, by writing down and simulating a variety of economic models. This generated a list of variables crucial to telling whether a particular story or model has any validity, and this list formed the basis for the questionnaires and the field research. The theories under consideration included models with liquidity constraints in human capital formation, in occupation choice, and in input financing; models of growth with costly investment in financial infrastructure; and models which take into account private information and incentives and thus deal with the details of financial contracting and possibilities for regulatory/monetary reform.

The institutions under consideration are national level institutions (commercial banks, finance companies, insurance companies, and the government savings bank); county or village-level institutions (rice banks, production credit groups (PCGs), rotating credit associations, and local indigenous funds); informal institutions (money lenders, traders, shopkeepers, and networks of family and friends); and interactions among these.

The initial NIH and NSF funded baseline survey covered the provinces of Lopburi and Chachoengsao, both relatively near Bangkok. Part of Lopburi coincides with the fertile rice bowl of Asia, an area also suited for cultivating other profitable cash crops, and part of Chachoengsao contains an important industrial corridor making its way to the formerly booming Eastern seaboard. The survey also covered the provinces of Buriram and Srisaket in the Northeast. Srisaket is perhaps the poorest province in Thailand, and Buriram provides an example of a "transition" province as one moves closer toward Bangkok. The gain from this deliberately chosen contrast is evident. Indeed, our survey data confirm that average wealth, income, and consumption cover both the extremes of Thailand's semi-urban and rural areas as well as of areas in between. Roughly, wealth, consumption, and income are rank-ordered, from low to high; Srisaket, Buriram, Lopburi, and Chachoengsao.

Of course there would be other ways to generate this contrast, that is, other ways to choose provinces. We used the following method. Within the central and northeast areas, provinces were chosen because at least one amphoe¹ in each province was selected by the Thai Socio-Economic Survey (SES)² from 1976 - 1992. We thus have a baseline history of each province that we can use to better understand the retrospective and contemporary data of our own survey.

Within each province, 12 tambons³ were selected in a stratified random sample, the stratification ensuring an ecologically balanced sample, that is, ensuring an unbiased selection of the various diverse areas even within a province, see Binford, Lee, and Townsend (forthcoming). In particular, the stratification was used in Srisaket, Buriram, and also Chachoengsao to ensure the inclusion in the sample of two upland if not partially forested tambons. Data on reflectants and a factor analysis confirmed that in Srisaket, the southern tier tambons looked substantially different from the rest, at least from the point of view of satellite imagery. Buriram is similar in the same respect. Chachoengsao was known to contain heavily forested regions on its eastern border. Landsat images from Lopburi, on the other hand, displayed no evident pattern, and there the selection of the 12 tambons was entirely random, that is, not stratified at all.

Within each tambon, 4 villages were selected at random. This clustering made the logistics of these ambitious surveys a little bit easier and was consistent with the goal of evaluating the various financial institutions. That is, it was hoped that within the relatively small area of a tambon, there would be relatively little ecological or environmental variation, at least from one village to the next, while prior experience suggested relatively large variation in informal and formal institutions from one village to the next.

Within each village, we selected 15 households entirely at random. We got soil samples from one plot of each of the first ten of these households to measure natural productivity of the environment, and there was a short questionnaire to accompany the household soil sample. We also got the history, procedure, and records of all village or tambon level financial institutions, and we interviewed up to two joint liability groups of the Bank for Agriculture and Agricultural Cooperatives (BAAC) if the BAAC functioned in that village. Finally, we interviewed the headman or key informant of each village to get the village history, with dates, and to get general contemporary information. In summary, then, we have pre-crisis socio-economic and financial data on 2880 households, 606 small businesses, 192 villages, 161 local financial institutions, 262 BAAC borrowing groups, and soil samples of 1880 agricultural plots. For the sake of clarity below we refer to this as our own initial baseline survey.

The Ford Foundation funded a resurvey of four of the original tambons of each of the four provinces. The four tambons of each province were selected at random from the original

¹ amphoe = Thai word for district

² This household survey is conducted every two years by the Thai Government's National Statistical Office (NSO)

³ tambon = Thai word for sub-district

survey, from a list of 12. Within each resurvey tambon we have, of course, selected the same villages and the same households that were interviewed in the initial survey, with a successful reinterview rate of about 94%. We also resurveyed the headman and the local financial institutions. The resurvey began in mid April of 1998, and was completed by the end of May. This time frame is deliberately chosen to be identical with the period in which the initial survey was conducted, one year later. Again, for clarity, we refer to this below as our resurvey data.

We have also deliberately selected one tambon in each province from the original 12 which displayed minimal ecological variation, according to the analysis of the soil data (nitrogen, acidity, cat-ion exchange capacity) and which simultaneously displayed maximal institutional variation. We have designed a monthly survey to get more exact data for the institutional evaluation, beginning with a census (in May), then continuing with the collection of baseline information (replicating in part the resurvey questions) in June and July, and then with monthly sampling beginning in August. We hope to continue this monthly survey for up to two years. We thus end up with 42% of the original sample for the resurvey and the possibility of tracking diverse areas of the Thai economy through crisis, transition, and hopefully growth. We call the monthly surveys our own "micro" survey data, but at the time of writing we have nothing yet to report.

Some words of caution are in order. The results reported below are still preliminary. Indeed, we have pressed hard to use the data to get results which can be helpful now, today, to Thai policy makers, but this is not a substitute for carrying out the longer term and more exacting analysis. Second, the results of the resurvey are even more preliminary. We report here on 90% of the data and are in the process of the second round double blind computer entry. We hope to have available a more complete summary soon. Third, and on the other hand, we do have the capacity to generate reports on specialty topics (e.g. savings, borrowing and informal lending, the scope of village institutions, the role of the BAAC borrowing groups, and other reports) at the request of government, private or international agencies.

A) RESULTS

(1) Liquidity and Financing Constraints

The first story of Thai growth starts with the notion that internal credit markets are relatively poor and that to finance or to expand entrepreneurial business activities, one needs to accumulate wealth. Those in the labor force with talent or high productivity may wish to change occupations, from subsistence labor to entrepreneurship for example, or to expand the size of existing businesses. But in the absence of credit, only the relatively wealthy can do so. Initially, wages are relatively low, while those able to finance themselves in business make extraordinary profits, contributing to high and rising inequality. Over time, the economy accumulates real physical capital, giving rise eventually to increasing wages. The fruits of growth trickle down slowly to the poor. An example of a formal model in this vein is Bernhardt and Lloyd-Ellis (1993).

In this context, the spread of intermediation -- as with increased lending on the part of the BAAC, the spread of commercial bank branches, the establishment of village-level production credit groups, or other past policy interventions -- has an important role to play. Households and businesses with access to this intermediation can choose occupations and scale without constraints. That is, only talent or ability will matter, not initial or accumulated wealth. This will not only be more efficient for the households and businesses themselves, it will also be associated with high levels and high growth of national income.(see Moloche and Townsend (forthcoming) for numerical simulations).

This model of Thai growth does receive substantial support in the SES data of the National Statistics Office and in our own survey data. As shown by Hyeok Jeong (1998) in his University of Chicago dissertation, structural shifts have been important for long run average income growth. That is, shifts of the population from unskilled to increasingly educated, from agricultural to industry, and from rural to urban areas account for 37% of the household income growth in Thailand from 1976 to 1994. In semi urban and rural areas, shifts from agriculture and wage labor into entrepreneurship are of particular importance in explaining the growth of average income, even more so than in urban areas. But industrialization and education shifts have also contributed to rising inequality in rural areas, as the relatively few who do move into the associated high income groups benefit the most and as the gaps between groups have widened. Particularly impressive is the role of financial deepening in rural areas, accounting for 22% of growth and 35% of the increased inequality, roughly consistent with the model.

The pre-crisis data show that in 1997, about 21% of the households of the survey own businesses (see Jeong and Townsend, 1998). Though most use family labor only, 23% hire up to five workers, and a handful of rural enterprises have up to 20 employees. Clearly, the potential for growth and employment is there, but the ability to start these businesses depends primarily on accumulated savings, not on credit. For example, 72% of the assets used to start a business were financed with cash, only 2.7% came from private gifts, 2.4% from the BAAC, and 2.3% from commercial banks, with the rest in residual categories. Thus the story of poor credit markets carries a lot of weight in the actual data. The credit numbers are somewhat higher for non-asset startup costs, but still the BAAC finances only 15% of the total.

Indeed, 53% of pre-crisis household businesses say they would make more profits if they could expand (by borrowing). The most constrained are shop owners and the least are shrimp farms, with traders around the average. More formal but very preliminary logistic regressions show that a business is more likely to be constrained in scale the lower is wealth and the lower is access to commercial credit. No doubt related, the ability to become an entrepreneur in the first place is facilitated by wealth and access to commercial bank credit, and, also revealing perhaps, by high BAAC/Coop credit. This provides direct evidence for the micro underpinnings of the model. These tests are being done as in earlier literature, e.g., Evans and Jovanovic (1989), Feder (1988), and Benjamin (1992).

Only 125 out of 2880 households had loans from commercial banks at the time of the pre-crisis survey. For a data summary see Kaboski and Townsend (1998). Commercial banks do lend 36.3% of their own total to business, but by account purpose this is only 8% of the business credit market. The BAAC does finance the bulk of pesticide, herbicide, and fertilizer but also provides some business loans, amounting to 17.4% of its own total and by account 35% of the business credit market. But overall, the rural credit market is seen as limited, with family and neighbors themselves the largest providers of housing and loans for the purchase of consumer durables.

(1) Risk, Diversification, and Financial Deepening

A second story for Thai growth with inequality and financial deepening takes a modern financial markets point of view, emphasizing diversification and the optimal allocation of risk-bearing. In this model (see Greenwood and Jovanovic 1989), the construction of financial infrastructure is costly. That is, there are fixed costs to expansion and marginal costs for ongoing use. Relatively low wealth and high fixed costs can keep some of the population cut off from access to financial institutions, except perhaps for access to local support systems, e.g., those connected to remittances and migration (see Paulson 1994). These households and small businesses must diversify across activities, keeping average productivity low. As wealth accumulates slowly, reinvestment of savings is low and growth is also slow. In contrast, relatively wealthy households enter the financial system, at either the village, regional, or national level. A combination of mutual funds for savings and

equity or return-contingent borrowing allows them to diversify financial risk. In the end, they specialize in production and occupations, choose higher productivity activities (even if these involve high risk), and have higher income growth (see Townsend and Ueda (forthcoming) for numerical simulations).

The relevance of this model to Thailand is reinforced by the SES and initial survey data. To be noted first is that there is much risk involved not only with investments financed by foreign capital inflows but even within the domestic financial system more generally. But there are also ample, and perhaps unrealized, possibilities for diversification. For example, from 1988-90, some amphoes in the northeast had growth of 114% but others had shortfalls of -77% (see Figure 2 in Townsend, *Journal of Economic Perspectives*, 1995). As summarized in table 1 from Townsend (1995), we regressed growth in income on time, regional, and community type fixed effects. We found that there are common components in income growth for farmers, especially in the central plains and northeast, but the residual variance remains high and is in principle diversifiable. There are also few fixed effects of any kind for entrepreneurs, suggesting that idiosyncratic, uncorrelated, and diversifiable risk is enormous. In our own initial survey data, households name the worst and the best year in the last five. In a preliminary regression with that year as the dependent variable, we find tambon-specific fixed effects, suggesting great variation from one tambon to another in the timing of bad and good years. Likewise, a typical tambon in the survey, Hua Chang in Srisaket, shows that even within a tambon, the four villages and 60 households of the initial survey are not usually having a bad year at the same time (see figure 1). In sum, there appear to be possibilities for diversification at virtually all geographical levels, even at the local scale.

Some of the financial institutions under consideration do take actual households and businesses in the right direction, that is toward an optimal allocation of risk-bearing as predicted by the model. In his University of Chicago dissertation, using SES amphoe level data on income and consumption and Community Development Department (CDD) data on access to financial institutions, Anant Chiarawongse (1998) shows that the ability of an amphoe to insure itself against idiosyncratic, amphoe-specific income shortfalls is enhanced by the intensity of BAAC involvement and, to a lesser extent, by the presence of commercial banks. In our own initial retrospective survey data, very preliminary results show that the likelihood of having to reduce consumption expenditures in a bad year is lessened in the northeast by being a member of a production credit group, while in the central plains and near Bangkok, it is lessened by being a member of a women's group. Wealth also buffers consumption (see also the related Thammasat MA dissertation of Anan Pawasutipaisit (1997) using data from the pretests of the survey instruments)⁴.

In the absence of explicit or implicit insurance, economists predict that people will borrow and lend to smooth, as in Zeldes (1989) and especially, Paxson (1992) using the Thai SES data. If there are credit limits, people may save even more (see Deaton 1989). Indeed, according to the initial survey, the dominant motive for saving across all types of savings accounts is precaution for emergencies (55%), followed by 13.8% for bequests, 10.6% for old age, and 8% for children's education (see Seiler and Townsend 1998). The point is that other methods for the reallocation of risk appear missing. This can have an adverse impact on the availability of long term savings, presumably for the financing of industry and other productive enterprises.

One should also understand that the informal systems may be playing an important and previously unmeasured buffering role. Though exceptional, in Buriram there is more in value in rice storage than in all other accounts combined. Table 2 summarizes these and other results. Households do complain on occasion about inability to access financial institutions, even for purposes of saving.

⁴ For a larger literature on risk sharing, see Altonji, Hayashi, and Kotlikoff (1992), Altug and Miller (1990), Cochrane (1991), Deaton (1994), Mace (1991), Paulson (1994), and Townsend (1994), and on production see Morduch (1990).

(1) Optimal Financial Contracts and Procedures With Private Information and Incentive Problems

The third story of Thai growth takes the realistic point of view that optimal insurance and credit contracts are constrained by private information and incentive problems (see Aghion and Bolton 1994, Ma and Smith 1996, and Piketty 1994). The poor in particular may be constrained in their access to credit because the costs of monitoring a borrower's project by a bank is high or because repayment of principal plus interest is so large relative to profits after repayment that the borrower has little incentive to be diligent and to work hard. Initially, then, as with the earlier models, growth proceeds unevenly, with the poor depending on their limited wealth or only limited, imperfect financing. Further, there will not be full insurance, even for those with access to the financial sector, precisely because it is difficult for the bank to verify underlying conditions or because borrowers must be given an incentive to work hard, to benefit in good times and be penalized in bad, to bear responsibility for their actions. That is, borrowers, and non-borrowers, of course, will be exposed to risk and will experience fluctuations.

Still, this story alone does not rationalize any degree of unequal growth or limited insurance. The overall outcome depends on three factors: the technology of production and capital accumulation, risk aversion, and a priori information structures. For example, if labor and capital inputs are highly complementary, then there is a tendency for the poor to get more credit, even more than the relatively rich, precisely because in equilibrium they are working hard, providing much labor on their own project (see University of Chicago dissertation of Andreas Lehnert, 1998). That is, credit finances capital inputs, these are particularly productive when labor effort is high, and the poor at low relative wealth work hard, (though obtaining less consumption). Similarly, the higher the degree of risk aversion, the greater the degree of insurance. It is rare indeed that insurance is precluded entirely. Related, bank verification and monitoring costs may be substantial, but schemes with limited probability verification usually dominate simple, noncontingent debt. Depending on the role of these three factors, the second portfolio story of Thai growth should not lead us too far astray.

The more general implication of this model is that, with information and incentive problems, the implicit or explicit nature of credit/insurance arrangements and the procedures which banks and financial institutions actually use can make large differences in the ability to access credit. In the medium to long term, they can make a difference in the degree of overall growth and the extent of inequality. Therefore, it is crucial to ask how we can identify inefficiencies which can be remedied. The literature on mechanism design teaches us various lessons in this respect.

First, sorting and screening of customers by offering a variety of incentive compatible contracts is highly desirable. For example, risk averse customers will prefer high interest rates in return for some flexibility in repayment. Similarly, allowing cosigners to take on liability for a defaulting borrower's nonrepayment can induce customers to sort into diligent groups *ex ante*, taking advantage of what they know about one another (see Becker and Murphy 1994, Ghatak 1998, and Ashok Rai 1997).

Second, banks may not only assign the level of credit or credit financed inputs, but also restrict customers away from other lenders, if they can do so. In effect, the lender takes a more active role in managing the enterprise and looks more like a holder of equity. Similarly, optimal contracts are long term contracts (see Townsend 1982, and Green and Oh 1991). Competition for the provision of loan contracts should take place *ex ante*, in a market for long term contracts, so to speak, not *ex post*, after an understanding is entered into, as this undercuts the ability to monitor the use of credit (Edward C. Prescott and Townsend 1984). This may give the appearance of segmented markets, as in Siamwalla, et al. (1990) for Thailand and Aleem (1990) for Pakistan, but it does not mean that markets are inefficient or exploitative.

Third, and related, customers can be given the option of reporting difficulties which occur after a loan is granted, but before repayment is due. A financial institution can then reschedule loans; for example, by giving the borrowers the option of repaying even more in present value terms in return for paying less now (see Prescott 1995).

Fourth, simple debt contracts which require repayment of principal and interest, except in the event of bankruptcy, may not allow the bank to take on sufficient risk and to benefit in good times, and may give borrowers adverse incentives (see Lehnert, Ligon and Townsend 1998).

Fifth, it is sometimes optimal for individual borrowers to pool funds, risk, and available labor, in effect acting as a single group or client in their relation with the outside bank. This is especially true when internal information and monitoring possibilities are good, when individual project returns are not too correlated so there is much internal risk to share, and, surprisingly, when individual clients do not have similar wealth⁵. The more general point is that there can be an optimal degree of financial hierarchy⁶. Moving upward from the bottom of the hierarchy to the ultimate market or lender, such an hierarchy can encompass: cosigners of any individual loan, explicit borrowing groups, cross-village assistance, cross-regional intermediation through a centralized lender or market, and ultimately perhaps the central bank. Still, there is not a uniform formula prescribing the optimal degree of hierarchy, not a fixed rule which is independent of preferences, technologies, and a priori information structures. The degree of hierarchy, the degree and stages of joint liability, and whether or not one should use borrowing groups depends on the underlying environment. When the project returns of individual clients are highly correlated, for example, both banks and customers are better off if the banks compare project returns across these clients to decide whether or not to make exceptions (see Holmstrom 1982).

Sixth, and related, financial institutions such as banks can be viewed themselves as clients or agents in their relationship to each other and to the central bank. Banks may provide loans to each other or enter into contingent risk agreements, and the central bank may provide liquidity or act as a lender of last resort (see Holmstrom and Tirole 1998, and Townsend 1989). But the optimal degree of this implicit, if not explicit, insurance depends on the ability of banks to monitor or verify one another, and of the Central Bank to monitor the banks in close coordination with the Office of Supervision. Similarly, depositors or noteholders of these banks, though adverse to risk, should be given at least some degree of risk and should bear some degree of liability if the bank's portfolio goes bad (see Chari 1989, Diamond and Dybvig 1983, and Wallace 1988). A lesson from the theory of incentives is that it is an error for the Central Bank to underwrite ex ante too much of the risk of a given troubled financial institution, bailing out ex post depositors, noteholders, and other banks if not the holders of equity. Taxes to achieve fiscal balance, or inflation taxes otherwise, fall upon the public in unmeasured and ill-documented ways. Incentives might also be improved by greater disclosure.

There is some support from pretests, field research leading up to the surveys of this project and the preliminary data that more finely tuned incentive contracts can make a difference in access to credit and thus to productivity and growth with lessened inequality.

First, the typical experience with the funds of a successful Production Credit Group is that there are risk contingencies implicit in the repayment agreement. In a given year, one can find that 10 - 20% of borrowing clients have not paid back loans, but virtually all will do so by the end of the second year. The headman or committee usually know the adverse condition which triggers the slow payment, or at least are confident, and correctly so, that ultimate repayment is forthcoming. An exception occurs when a truly poor or very unlucky client fails to repay some or all of the loan, but even here these terms are often accepted by

⁵ see Holmstrom and Milgrom 1990, Itoh 1991 and Prescott and Townsend 1996.

⁶ see Bond (1998) in his University of Chicago dissertation, Diamond 1984, and Krasa and Villamil 1992.

the committee not as a willful default but as a need for insurance or welfare, sometimes paid by an explicit fund collected from all ex ante.

The BAAC has similar, though not officially documented, provisions in its loan contract and collection procedures. At certain times, much of the staff in a BAAC branch office will be out in the field verifying actual circumstances of client borrowers who have communicated in advance the existence of difficulties. About 55% of group heads in our initial survey say that, in the past, they have informed the BAAC of potential difficulties and the vast majority claim this has been helpful to all. Though overall BAAC operational costs are high, ultimate repayments are good and the BAAC covers most of its costs. An ongoing project with Jacob Yaron of the World Bank will document better how the implicit insurance system works.

More generally, the BAAC uses joint liability groups for small borrowers without formal collateral, and the project will document the precise degree to which customer sorting, internal monitoring, and internal risk sharing are playing a role (see Ahlin, Sakuntasathien, and Townsend 1998). For example, as regards screening, virtually 88% of the BAAC group members in our survey have a near relative in the same BAAC group, and 39% of the groups claim there was someone who wanted to join who was screened out. They also acknowledge, however, that the BAAC goes beyond character and relationships to look at income, assets, and credit history. As regards monitoring, if one member announces he cannot pay the BAAC, 84% of the groups say there is an investigation. Only 10% say they have actually paid off another member's loan, but there is much internal borrowing and lending, and this can accomplish much the same thing. 98.5% of members do verify that loans would otherwise be cut off for all members.

Less formal and therefore less evident groups may also be working in the way theory predicts. It is evident in the survey data, for example, that the general degree of help and assistance through networks of friends and relatives is extraordinarily high. With 81% and 80% of Chachoengsao and Srisaket households sharing meals outside the household, 75% and 90% sharing labor, 59% and 75% sharing equipment, and 87% and 77% sharing money. Note that informal networks remain high even in the central area. Certainly, most clients have loans from multiple sources. More specifically, some borrow from the formal sector and then onlend to others. As for the reverse, it is well known from the work of Amar Siamwalla et al. (1990) that not a small number of BAAC clients borrow from an informal source to pay off a BAAC loan. Our own initial survey confirms that moneylenders are indeed a huge escape hatch. We add to this that the informal loan and insurance market in a village does not necessarily consist of stereotypical money lenders only but is much deeper, again with a variety of loan types and differing relationships. The general point is that finance and insurance from the informal sector can be a good thing, especially if it is thought about in tandem with the formal sector. This might also give one pause in uniformly condemning the relationship commercial banks have with their customers or of customers with each other, though these practices deserve and require measurement and documentation.

As noted, commercial banks have lent relatively little to the households and small businesses investigated in our initial semi urban and rural survey. The average ratio of collateral value to loan value is 30 to one as reported by customers, though commercial banks say they will lend up to 60 to 80% of collateral value. One can draw the hypothesis, to be checked carefully in the survey data, that relative to the BAAC and village funds, banks are less actively involved in monitoring and in explicitly assuming the risk of client enterprise. But again, some of these practices are implicit, if as yet poorly documented.

(1) Impact of and Response to the Crisis: Resurvey Results

The economic crisis and agro-climatic shocks have not hit Thailand's semi-urban and rural areas uniformly (see Pawasutipaisit, Sakuntasathien, and Townsend, forthcoming). Table 3 displays the number and percent of households responding that the last twelve

months period was worse in terms of income than the year before. Within the central region there is great variety, with Lopburi having 55% of households claiming lower income than the year before the crisis, and 41% claiming so in Chachoengsao. Even within Lopburi there is variety, with one of the four tambons showing only 25% having lower incomes. There is more uniformity in Chachoengsao, where the income of virtually half of households has remained unchanged over the two years in question. An even greater contrast is afforded by a comparison of Buriram and Srisaket in the Northeast. While 60% of households had a bad income year in Buriram, only 30% had so in Srisaket. Within Srisaket, there is variety across tambons as well. More generally, and consistent with the notion that ex ante diversification might have been possible, we note that for 11% and 22% of households in Chachoengsao and Lopburi, respectively, and 17% and 39% in Buriram and Srisaket, respectively, the post-crises year was a relatively *good year*. Ironically, this fact lowered the sample size for some of the results reported below.

Related, a large amount of measured variety is revealed by histograms plotting per capita income growth over the two-year period. For those claiming that last year was a worse year, income growth varies from -150% to +150%. Consistent in a way with their earlier answer, however, this distribution is shifted to the right for those claiming to have had a better year, with some mass in the far right tail. We note, of course, that any such histogram should not be taken literally as the income data of any given household are noisy, we but not the households converted income to per capita terms, and absolute and relative prices have changed, making real welfare comparisons delicate.

One can attempt to paint a picture of the causes of these ups and downs by decomposing nominal household income into its various sources, then adding up over households. There are modest shifts: remittances are down from 14.1% to 12.1% of the total, and wages and salaries are down from 35.5% to 29.7%. In contrast, business income and farm income are up from 5.4% to 6.8% and 38.3% to 39.6%, respectively. There is variation by province, however. For example, business income increased from 5.7% to 11.9% in Lopburi, while farm income declined there. The histograms of the percentage changes of the various income components are also revealing the underlying variety. While remittances, and to some extent also wage and salary income, have much mass in the negative range, farm income is more uniformly distributed.

Stratification by the bad year versus good year responses restores some order. In Lopburi, Srisaket, and Buriram, those who claim to have had a good year are typically those with a larger percentage of income from farm sources, while in Chachoengsao, those in business and with wage and salary income are those who have had a good year.

The initial survey and resurvey offer mixed evidence for the negative picture of a large number of unemployed industrial workers returning to villages. Household size is quite stable, with a relatively large number of households experiencing no change. Positive and negative changes roughly balance out. A related question is whether households had returning those members who had previously migrated. Though 11.82% of households say yes, an even larger number report increased outmigration, namely 18.42%. Thus net outmigration would seem to be positive. Net outmigration is the largest in the northeast, especially in Srisaket, with 12.95% of households receiving at least one member and 23.66% losing one member. Unfortunately, due to the lack of benchmark panel data, we do not know if this is peculiar to the crisis or due to chronic outmigration.

Interviews with the headman of each of the survey villages do, on the other hand, reveal some increased unemployment. Out of 16 villages in each province, seven and nine villages in Chachoengsao and Lopburi, respectively, and 14 and 15 in Srisaket and Buriram, respectively, have a headman reporting increased unemployment. Only one headman in Lopburi reported less unemployment. At the same time, headmen report increases and decreases in work in factories, namely 2 and 9, respectively, in Chachoengsao; 6 and 1 in Lopburi; 2 and 12 in Srisaket; and 1 and 5 in Buriram, with the rest of the 16 headmen reporting no change. New factories near one survey village were reported in Lopburi and

Buriram, and no nearby factories were shut down. Similarly, the results on work in construction vary across villages with activities in this sector going up in some and down in others. The number of households involved in livestock is down, especially in Srisaket, while the number of households growing crops has increased in Chachoengsao. Results are mixed for Lopburi.

The impact of agro-climatic shocks is the dominant reason cited by households for having had a bad year (see table 4). Drought is the dominant response in all four provinces, with the percentage of households giving this reason ranging from 47% to 71%. An exception is Srisaket with 31%. Floods are also mentioned by 24% of households in Srisaket and pests by 10% in Chachoengsao. Six - seven percent of households report to have worked fewer days, with the exception of Lopburi, where 19% do so. Low output prices, high input prices, educational expenses, and illness are additional factors mentioned by some. The latter reasons are given even more often when households are asked for secondary causes. It should be emphasized that these adverse events can be quite serious for households experiencing them.

An average of 22% of the households report having established new businesses over the past 12 months, ranging from a low of 17% in Lopburi to a high of 31% in Chachoengsao. For those who run existing businesses, a comparison of the last 12 months with the year before reveals that output is down for 42% to 58% of the household businesses. Though value of output is up 18% to 43%, profitability is down for 32% to 43% across provinces. There are, however, a minority who report increased output and increased profitability. Apart from that, few complain about quantity, quality, or wages of workers and few complain about changes in credit. This does not presume they had credit in the first place, however.

Response strategies to these problems, which are crucial to understanding potential impact, vary across households and regions. Households reporting a relatively low income year were asked how they responded. Their first unsolicited response is emphasized and recorded in table 5. Then, after prompting, households were asked to rank-order their three most important responses. These are recorded with equal weight in table 6.

‘Reducing consumption’ is the most common unsolicited response among households in the central region. It also shows up as the most important rank-ordered response in not only Lopburi and Chachoengsao, but also in Buriram. Surprisingly, however, reducing consumption does not show up as a dominant rank-ordered response in Srisaket.

‘Working harder’, and, to a lesser extent, ‘migration’ and ‘finding additional jobs’ are frequently reported unsolicited responses. However, as a rank-ordered response, ‘working harder’ moves from the second most common response in the central areas to the third and fifth most common response in Buriram and Srisaket, respectively.

Finally, ‘reducing productive inputs’ is a relatively uncommon response in all provinces except Chachoengsao, where it shows up as fourth most important.

In summary, there seems to be a direct impact of the agro-climatic shocks, if not the economic crisis, on consumption, work, and productive-inputs. The overall impact on consumption, work, and inputs is largest in the central region, consistent with the notion of an inverse correlation between real impact and the level of “development”. On the other hand, a very preliminary pooling of four provinces reveals that drops in income show up at a positive but low value as drops in consumption. The elasticity is 0.14. One naturally wonders how households and small business have managed to buffer so well, at least on average. We can group responses into various categories in this regard.

The first category is the self-insurance category. For example, ‘use of rice in storage’ is a typical unsolicited response in the Northeast, and after reflection it shows up as the first and second most common rank-ordered response in Srisaket and Buriram, respectively (recall the earlier discussion on the use of rice and other savings as buffer stocks).

Similarly, ‘use of financial savings’ is a typical unsolicited response, showing up as the third most frequent rank-ordered response in both provinces of the central area, and fourth in Srisaket. ‘Selling jewelry, land, or livestock’ is quite common as an unsolicited response, too. As a rank-ordered response, ‘selling jewelry’ is the fifth most common in Lopburi and ‘selling livestock’ is the third and fourth most common in Srisaket and Buriram, respectively. Direct evidence on the use of land is mixed. Fewer households sold land in the last 12 months than in the year before, but the headmen note land sales in two to four of the 16 villages of each province.

‘Use of formal credit’ varies with the institution used. ‘Got help from the BAAC’ shows up in unsolicited responses quite often, except in Lopburi. It is, in fact, the second most common rank-ordered response in Srisaket and the fifth most common in Chachoengsao. Notably, none of the other *formal* credit institutions show up at this level as playing a significant role, not ag-coops, commercial banks, nor village organizations.

‘Informal help and assistance’ does rival the BAAC, however. ‘Help from relatives’ is a common unsolicited response in all four provinces, and it shows up as the fourth most common rank-ordered response in Lopburi. Similarly, ‘money lenders’ are mentioned in the northeast for not a small number of households, and also in Lopburi, and this is the fifth most common rank-ordered response in Buriram. ‘Help from nonrelatives’ is mentioned in unsolicited responses in Lopburi.

The initial survey and resurvey also ask direct questions about help and assistance from friends and relatives and attempts to gauge the strength of informal networks. A striking pattern emerges. ‘Help among relatives in the form of meals received or given’ is up relative to the year before the crisis, but ‘exchange of equipment and money’ are down. ‘Labor exchange’ is unchanged. With respect to ‘help among nonrelatives’, the outcome is different: there is no change in shared meals, and labor exchange is down. Otherwise, Lopburi is confirmed as a place where networks are important; help in the form of money among relatives *and* nonrelatives actually went up.

Ongoing analysis hopes to better document the consumption, work, and production impact of recent adverse shocks, portraying possible differences in self insurance, formal credit and informal community response across regions. Needless to say, this goal is very consistent with the initial design of the project.

A) POLICY RECOMMENDATIONS

(1) Commercial Banks

Because commercial banks are relatively inactive in the semi-urban and rural areas of Thailand, especially on the lending side, every effort should be made to remove obstacles. Commercial banks should be free to set their own on-lending rates, with a premium for agriculture and small business if they view the risks and costs to be high. The Bank of Thailand should reconsider its use of minimum retail rates, MRR, with uniform markups. This does not preclude the prevention of monopsonistic inefficiencies. Related, the new foreclosure law should create a legal and social climate under which penalties and stigma are attached to nonperformance and default on the part of borrowers. Commercial banks should enter into clearly understood and explicit contracts with farmers and small businesses, contracts which allow rollovers and adjustments to external shocks. Thus, loans affected by such shocks would not be counted as non-performing loans per se, but increased provisioning might be necessary, depending on analysis of the historical data. Related, documentation of customer screening, communication, and direct disclosure should receive much more emphasis in regulatory changes, as should more conventional levels of loan diversification, through investment into a diversified portfolio of agricultural assets, avoiding excessive

concentration in real estate. The overall presumption should be full public disclosure of procedures and portfolios. Finally, interactive research should continue to explore actual or potential barriers in lending to agriculture and small business by commercial banks.

(1) Bank for Agriculture and Agricultural Cooperatives

The BAAC charter should be modified to allow lending to business, health, and housing, dropping all references to percentage ceilings of any such activities and leaving behind the idea that only farm households are the real targets of BAAC lending. Any implicit or explicit understanding that the BAAC and commercial banks should not compete with one another should be dropped insofar as ex ante competition is concerned, while long-term multi-period contracts should be respected. Related, the BAAC should charge customers competitive on-lending rates, covering the costs of such loans with a reasonable margin. Concessionary sources of funds, at below market rates, should be priced internally at market rates, and if certain target groups receive concessional on-lending, the subsidy to them should in turn be made explicit. Contractual arrangements for risk mitigation and procedures for internal communication and monitoring should be made even more explicit, again for reasons of clarity and to avoid the appearance of non-performing loans. A full array of savings and insurance instruments should be offered at market rates. Full disclosure should be maintained, and the issue of BAAC equity (or profits sharing) to BAAC loan officers, customers, and farmers in general should be encouraged.

(1) Village Funds

Production credit groups (PCGs) and other indigenous funds should also be studied as a potential vehicle for the expansion of Thai rural credit. Indeed, cooperative movements were the starting points for the contemporary financial grants of Germany and Japan, and there is no reason in principle why a similar development could not take place in Thailand. A first step is to gain a better understanding of the successes and failures of PCGs, and of the great institutional and socio-economic variation over villages within a tambon. This is part of the ongoing research project. New PCGs might be established, or existing PCGs expanded and connected one to another. Tambon or amphoe level associations should be designed with an awareness of the possibility of increased risk diversification, that is, by maintaining local provisions for "insurance" and incentive compatible welfare, and extending these to larger areas. Standardization, formalization, and uniform accounting need not rule out these provisions. The government savings bank might lend to community groups, but only as the rating system is put into place.

(1) Tiered Lending

An alternative to direct lending by banks or by the BAAC would be the use of PCGs and other village organizations as second tier lending and saving institutions. In that spirit, greater accessibility by those in rural and semi-urban areas to mobile bank vans, atm's, and other facilitators might be promoted if these can be made self-funding by user fees at appropriate fixed and marginal costs.

(1) Bank of Thailand

The financial system should move toward full and complete disclosure of portfolios and lending procedures, substantially altering laws requiring secrecy. The central bank should make explicit the rules for limited deposit insurance with liability clearly delineated in advance.

(1) Information Systems

The Thai government should consider a two-pronged strategy to make full use of improved information systems in the formulation of economic and social policy. One prong would work toward connecting the many pieces of useful socio-economic information that are currently scattered across various Thai ministries. The second prong would envision the collection of additional useful information through repeat surveys. In this way, data and candidate models can be used to track the evolution of the economy and be available for monetary, regulatory, and other policy evaluation on a systematic basis.

Table 1: Common Region, Year and Community Type Effects in Income and Consumption Growth Rates

** = significant at 5% level, * = significant at 10%													
Different Occupation Groups					Different Measures of Income and Consumption								
F test for:		All Households		All Farmers		Rice Farmers		Entrepreneurs		All Income	No In Kind	Wages	Food
		Y	C	Y	C	Y	C	Y	C	Y	Y	Y	C
1	N: 75-81											*	
2	N: 81-86												
3	N: 86-88					**							
4	N: 88-90								*	**	**		
5	N									**	**		
6	NE: 75-81										**		
7	NE: 81-86												
8	NE: 86-88			**				**		*			*
9	NE: 88-90	**	**	**	**	**	**	**	**	**	*		**
10	NE	**		**	**	**		**			*		**
11	C: 75-81												
12	C: 81-86												
13	C: 86-88			**		*	**						
14	C: 88-90			**	**	**							
15	C			**	**	**							
16	S: 75-81												
17	S: 81-86												
18	S: 86-88												
19	S: 88-90	**	**	*					**				
20	S												
21	B: 75-81												
22	B: 81-86												
23	B: 86-88			*									
24	B: 88-90	**		**	**								**
25	B			**									

Notes: This table presents the results of F-tests for the joint significance of dummy variables for common fixed effects. The dependent variables are demeaned income (Y) and consumption (C) growth rates. Where the division is by occupation, consumption is equal to expenditures on food, clothing, shoes, and tobacco; and income is equal to wages, profits from farming, entrepreneurial income and income-in-kind. A * indicates that the test is significant at the 10% level, ** indicates significance at the 5% level, N = North, NE = Northeast, C = Central, S = South, B = Bangkok. Reproduced from Townsend, Journal of Economic Perspectives (year, number, pages?).

Table 2: Percent of Savings by Institution/Region

	Chachoengsao	Lopburi	Buriram	Srisaket
Commercial bank	66.76	72.10	23.24	14.50
Ag coop	04.18	3.27	.70	2.72
BAAC	18.58	5.92	5.87	32.72
PCG	0.31	7.48	.33	3.12
Rice bank	0	0	6.63	1.01
Rice storage	5.42	2.43	47.61	38.62

Table 3: General comparison between this year and last year (from household resurvey)

Province:	Chachoengsao	Lopburi	Buriram	Srisaket
Last year is worse than the year before	86 (41%)	114 (55%)	133 (60.2%)	67 (30%)
Last year is better than the year before	23 (11%)	46 (22%)	50 (22.6%)	70 (31.4%)
Unchanged income	101 (48%)	48 (23%)	38 (17.2%)	86 (38.6%)
# of households	210	208	221	223

Table 4: Reason for Bad Income - % of Households

Province:	Chachoengsao	Lopburi	Buriram	Srisaket
Flood	1.16	.88	.75	23.58
Drought	62.79	47.37	70.68	31.34
Pests	10.47	1.75		
Other reason low crop yield	2.33	1.75	7.52	4.48
Low price of output	9.30	7.02	3.01	8.96
High input price	2.33	2.63	1.50	4.48
Education expense higher	1.16		.75	1.49
Need extra money for ceremony		.88		
High investment costs	1.16	3.51	2.26	4.48
Expenses due to illness		3.51	1.50	1.49
Building expenses higher			2.26	1.49
Death in family				
Worked fewer days	5.81	19.30	7.52	5.97
Bad year for household business	2.33	3.51	.75	5.97
Money gambling				
Unable to repay debts		.88		

Other	1.16	7.90	1.50	5.97
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Table 5: Response to Bad Year - Unsolicited Responses (from household resurvey)

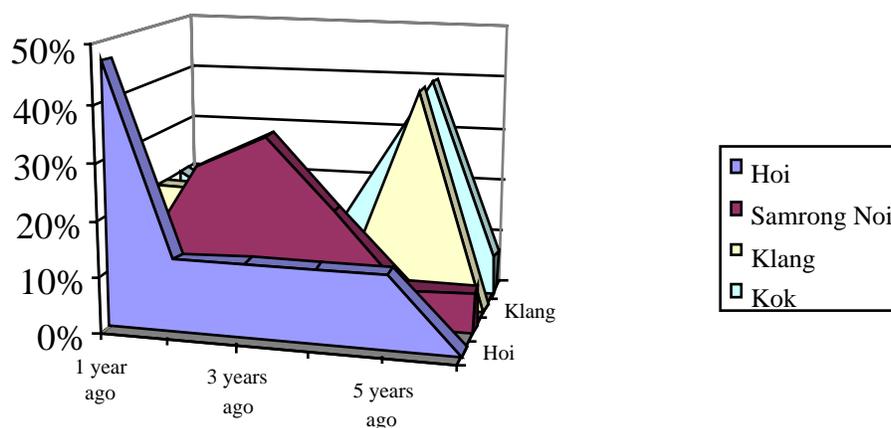
Provinces:	Chachoengsa	Lopburi	Buriram	Srisaket
Direct Impact:				
Reduce consumption	25(22.5)	46(32.8)	14(12.5)	5(7.3)
Reduce productive inputs	11(9.9)	3(2.1)	5(4.5)	1(1.3)
Work harder	16(14.4)	28(20.0)	13(11.6)	9(13.0)
Migrate	8(7.2)	0	1(0.9)	3(4.3)
Do additional job	12(10.8)	6(4.3)	22(19.6)	9(13.0)
Self-Insurance:				
Use/sell rice in storage	1(0.9)	0	11(9.8)	10(14.5)
Use savings	2(1.8)	6(4.3)	7(6.3)	2(2.9)
Sell jewelry/land/ livestock	10(9.0)	10(7.1)	4(3.6)	5(7.2)
Formal Organization:				
Borrow from BAAC	9(8.1)	1(0.7)	11(9.8)	8(11.6)
Borrow from Agri.Coop.	2(1.8)	2(1.4)	0	0
Borrow from Commercial Bank	0	0	0	0
Borrow from village organization	1(0.9)	3(2.1)	1(0.9)	2(2.9)
Informal Mechanism:				
Borrow/help from relatives	6(5.4)	16(11.4)	12(10.7)	5(7.2)
Borrow/help from non-relatives	2(1.8)	7(5)	1(0.9)	0
Borrow from supplier	3(2.7)	4(2.9)	0	1(1.4)
Borrow from moneylender	1(0.9)	7(5)	10(8.9)	7(10.1)
Special:				
Help from government	2(1.8)	1(0.7)	0	2(2.9)
Help from temple	0	0	0	0
Number of Households	111	140	112	69

Note: Number in parenthesis is percent

Table 6: Rank-Ordered Responses

Province	Most Important Response				
Chachoengsao 86 Households	Reduce consumption (65%)	Work harder (33.7%)	Use savings (32.5%)	Reduce productive inputs (18.6%)	Borrow from BAAC (16.3%)
Lopburi 114 Households	Reduce consumption (65%)	Work harder (45.6%)	Use savings (29.82%)	Help from relatives (21%)	Sell jewelry (15.8%)
Buriram 133 Households	Reduce consumption (36.8%)	Use/sell rice in storage (36%)	Work harder (31.5%)	Sell livestock/equipment (26.3%)	Borrow from moneylender (21.8%)
Srisaket 67 Households	Use/sell rice in storage (44.7%)	Borrow from BAAC (28.3%)	Sell livestock (28.3%)	Use savings (26.8%)	Work harder (23.8%)

Figure 1: Distribution of worst income years across villages in Tambon Hua Chang (Sisaket)



	1 year ago	2 years ago	3 years ago	4 years ago	5 years ago	no changes
Hoi	47%	13%	13%	13%	13%	0%
Samrong Noi	7%	27%	33%	20%	7%	7%
Klang	20%	20%	13%	7%	40%	0%
Kok	20%	13%	0%	20%	40%	7%

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