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**Working Paper**

## Microfinance in Northeast Thailand: Who Benefits and How Much

ERD Working Paper Series, No. 9

**Provided in Cooperation with:**

Asian Development Bank (ADB), Manila

*Suggested Citation:* Coleman, Brett E. (2002) : Microfinance in Northeast Thailand: Who Benefits and How Much, ERD Working Paper Series, No. 9, Asian Development Bank (ADB), Manila, <https://hdl.handle.net/11540/1926>

This Version is available at:

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# **Microfinance in Northeast Thailand: Who Benefits and How Much?**

**Brett E. Coleman**

April 2002

ERD Working Paper No. 9

# **MICROFINANCE IN NORTHEAST THAILAND: WHO BENEFITS AND HOW MUCH?**

**Brett E. Coleman**

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Brett E. Coleman is a Project Economist with the Mekong Department of the Asian Development Bank. The author would like to thank George Akerlof, Pranab Bardhan, David Dole, Paul Gertler, Alain de Janvry, Elisabeth Sadoulet, Ken Train, Ploenpit Satsanguan, and seminar participants at UC Berkeley, McGill University, Bard College, Franklin and Marshall College, San Diego State University, the University of Arkansas, and St. Mary's College of California for their helpful comments; the staff of CRS/Thailand, especially Yupaporn Boontid and Ruth Ellison, for their advice and support throughout the surveys; the staff of RFA/Surin and FIAM/Roi-Et for the excellent enumeration services of their field staff and for other data on their village banks; the staff of BAAC in Surin and Roi-Et for data on their members; and the villagers surveyed. Special thanks are due to Thanorm Charoensiri for her outstanding and dedicated research assistance. The author gratefully acknowledges financial support from the Social Science Research Council and the Fulbright Scholarship Program.

Asian Development Bank  
P.O. Box 789  
0980 Manila  
Philippines

©2002 by Asian Development Bank  
April 2002  
ISSN 1655-5252

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## **Foreword**

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## **Abstract**

This paper evaluates the outreach and impact of two microfinance “village bank” programs that target the poor in Northeast Thailand. It controls for endogenous self-selection and program placement, using data from a unique survey conducted in 1995-1996. Results indicate that even prior to program intervention, participants tend to be significantly wealthier than nonparticipants, and the wealthiest villagers are almost twice as likely to participate in the program as the poorer villagers. Moreover, the wealthiest in the village often become program committee members and use their positions to borrow substantially more than rank and file members. However, local information on individual creditworthiness is also used in member selection. Results demonstrate that microfinance loans positively affect many measures of household welfare for the wealthy committee members, but the impact is largely insignificant for poorer rank and file members. Policy recommendations include increased vigilance in targeting the poor, greater efforts to publicly disseminate the rules and purpose of the village bank program, and introduction and enforcement of eligibility criteria based on wealth while continuing to allow villagers to self-select.

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## I. INTRODUCTION

**H**istorically, efforts to deliver formal credit and financial services to the rural poor in developing countries have failed. Commercial banks generally do not serve the needs of the rural poor because of the perceived high risk and the high transaction costs associated with small loans and savings deposits. To fill the void, many governments have tried to deliver formal credit to rural areas by setting up special agricultural banks or directing commercial banks to loan to rural borrowers. However, these programs have almost all failed because of the political difficulty for governments to enforce loan repayment, and because the relatively wealthy and powerful, rather than the poor, received most of the loans (Adams et al. 1984, Adams and Vogel 1986, World Bank 1989).

The recent proliferation of innovative microfinance programs, often based on a group-lending methodology, has been largely inspired by the belief that such programs reach the poor and have a positive impact on various measures of their welfare, including economic measures (e.g., wealth and income), social measures (e.g., educational attainment and health status), and less tangible measures such as “empowerment”. The popular press has waved the banner of microfinance as perhaps the most important recent tool to reduce poverty (see for example, *San Francisco Examiner* 1990, 1999; *The Economist* 1993; Malveaux 1997; and *New York Times* 1997). The 1997 Microcredit Summit called for the mobilization of \$20 billion over a 10-year period to support microfinance (Microcredit Summit Report 1997). Much of this faith in microfinance is based on the highly selective anecdotal evidence of individuals who are reported to have pulled themselves and their families out of poverty with the benefit of microcredit.<sup>1</sup> Yet, despite the proliferation of these programs and the outpouring of support by donors, there has been precious little sound empirical research that tests the hypotheses that they are reaching and benefiting the poor.<sup>2</sup>

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<sup>1</sup> There remain dissenters to the popular view of microfinance. For example, Adams and von Pischke (1992, 1468) have written that “debt is not an effective tool for helping most poor people enhance their economic condition, be they operators of small farms or micro entrepreneurs, or poor women.” They argue that access to credit is not a significant problem faced by small agricultural households and that factor and product prices, land tenure, technology, and risk are the factors limiting small farmer development.

<sup>2</sup> For discussions on theoretical aspects of group lending, see Stiglitz (1990), Varian (1990), Besley and Coate (1995), Van Tassel (1999), Ghatak (1999), Conning (1999), Armendariz de Aghion (1999), Ghatak and Guinnane (1999), and Coleman (2000).



To form the basis of such a significant investment to reduce poverty compared to alternative investments in other poverty alleviation programs, the proposition that microfinance reaches the poor and positively affects their welfare should be proven and not just assumed. This paper attempts to address this shortcoming in the literature by examining the results of a survey of two Northeast Thailand “village bank” programs that target the poor. The survey was designed and conducted in 1995-1996 to measure outreach and impact on the poor, while controlling for the endogeneity biases that have plagued other studies.

The nongovernment organization (NGO) programs studied in this paper, as do many microfinance programs, target “the poorest of the poor” according to project documents and donor policy. The ability of any program to achieve this goal depends on the institutional context in which it is implemented, and the main premise on which microfinance programs are based is that the poor are credit-constrained and have limited access to formal sector credit. In Thailand, however, the Bank for Agriculture and Agricultural Cooperatives (BAAC) claims to serve over 80 percent of rural households. Hence, it is possible that the rural poor in Thailand are not credit-constrained. However, the BAAC’s outreach in the northeast, the country’s poorest region, is smaller than the rest of the country. In the 14 villages surveyed for this study, 63 percent of village households were BAAC members. Moreover, as is often the case in government-led credit programs, the BAAC’s clientele is largely male; only 29.5 percent of surveyed BAAC members were women. Hence, only 18.6 percent of surveyed households included women who had access to BAAC loans. On the other hand, 25.8 percent of surveyed households included women who were in debt to moneylenders. At the time of the surveys, BAAC’s annual interest rate varied from 3 to 12 percent, whereas moneylenders charged between 60 and 120 percent per year, and the NGO programs evaluated in this paper charged 24 percent per year. Hence, there is evidence that women in Northeast Thailand may be credit-constrained and may benefit from access to lower-cost institutional credit.

The main problems plaguing attempts to evaluate the targeting and impact of microfinance programs are that participants self-select and program placement might be endogenous.<sup>3</sup> It is, therefore, likely that there are significant unobservable differences between participants and nonparticipants (e.g., entrepreneurship, risk preferences, attitudes regarding the role of women in the household, attitudes toward belonging to a poverty lending group), which make direct comparison of participants and nonparticipants biased. Similarly, endogenous program placement will bias attempts to compare program and nonprogram villages. Coleman (1999), using the same data set examined in this paper, demonstrates the extent to which uncorrected estimates significantly overestimate average program impact.

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<sup>3</sup> For a thorough econometric discussion of the issues involved, see Pitt and Khandker (1998) and Coleman (1999).

This paper extends and refines the methodology used in Coleman (1999) to evaluate targeting and differential impact on different classes of participants. Results indicate that self-selected program participants are significantly wealthier than nonparticipants even prior to program intervention, and the wealthiest villagers are almost twice as likely to participate in the program than the poorer villagers. Moreover, some of the wealthiest villagers obtain a disproportionate share of program loan volume by virtue of holding influential positions as village bank committee members. Positive impact is seen largely in this wealthier group. Impact on rank and file members is significantly smaller than impact on the wealthy, and is largely insignificant. Hence, similar to previous attempts to deliver low-cost credit to the poor, most of the benefits in the village banks studied are going to the wealthiest villagers.

The remainder of the paper is organized as follows. Sections II to IV describe the design of the programs studied, survey design and data, and survey area. Section V presents results relating to participation, including member selection and borrowing, while Section VI presents results on program impact. Section VII concludes and discusses policy implications.

## II. THE NGO PROGRAMS STUDIED

The two microfinance programs studied are run by Thai NGOs: the Rural Friends Association (RFA), located in the northeast province of Surin, and the Foundation for Integrated Agricultural Management (FIAM), located in the adjacent province of Roi-Et. RFA and FIAM have promoted microfinance since 1988 and receive financial and technical assistance from the American NGO Catholic Relief Services (CRS). Both Thai NGOs follow the “village bank” group lending methodology of the Foundation for International Community Assistance (see FINCA 1990 and Hatch 1989), in which borrowers (all women) form their own peer groups of 20 to 60 members. Smaller solidarity groups are generally not used, although some of the sampled village banks independently formed such groups. The NGO grants a loan simultaneously to each member, but group members co-guarantee each other’s loans. If the group does not meet its collective responsibility to repay all of its members’ loans, then all group members are denied future credit.

The first loan is the same amount for all members (1500 baht).<sup>4</sup> For each subsequent loan cycle, the member is entitled to borrow an amount equal to her previous loan plus her accumulated savings in the village bank, up to a fixed maximum (7500 baht). Moreover, the group also makes loans to its members (and sometimes to nonmembers) from its members’ savings. Loans from the NGO lender are “external account” loans, and loans from members’ savings are “internal account” loans. External account loans must be repaid in 6 months.<sup>5</sup> External account loans are

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<sup>4</sup> In 1995-1996, US\$1 = 25 baht.

<sup>5</sup> In three of the older village banks surveyed, 4-month loan cycles were used for the first year. Subsequently, the NGOs switched to 6-month loan cycles in response to member demand.

made for 5 years, after which time the funds used for external account lending are used to finance new village banks, and the internal account built up is supposed to continue to finance the village bank members' needs.<sup>6</sup> The interest rate charged on external account loans is 2 percent per month, with both principal and interest due at term.<sup>7</sup> The interest rate on internal account loans is determined by each village bank, but is generally also set at 2 percent per month, although some village banks set it at 3 percent per month. At the time of the surveys, RFA had a 97 percent on-time repayment rate on its external account loans, and FIAM had a 100 percent on-time repayment rate. Savings are not mandatory, but are encouraged in two ways. First, external account borrowing rights grow with increasing savings; and second, the profits from internal account lending are allocated among members according to the amount of their savings.

Group formation and membership was generally determined as follows. The initial contact between NGO and village could be initiated either by the NGO or by the village, but almost always involved contacts between the NGO and "leading members" of the village. As is customary and necessary in Thailand, the NGO fieldworker's first visit to the village would include a visit to the village chief to introduce the purpose of the visit. Frequently, the task of assembling and organizing the village women into a village bank group would be delegated to the village leadership—either the village chief or a female leader designated by him. The role of the field worker was, therefore, frequently reduced to explaining the program to the group thus formed, and to administering the delivery of loans and collection of repayments. In three of the villages surveyed, however, the other extreme was observed—namely that the field workers, who were resident in the villages, handpicked the women to join the program.

Each village bank was managed by a committee comprised of a president, vice president, treasurer, and other officers. These committee members make most of the day-to-day decisions, including (importantly) decisions on membership, borrowing eligibility, and allocation of loans. In principle, the committee membership was elected annually, but in practice the leading women designated to organize the village bank became committee members and remained in their positions from year to year.<sup>8</sup>

### III. SURVEY DESIGN AND DATA

A total of 445 households in 14 villages in Northeast Thailand were surveyed in 1995-1996. Eight of the villages were supported by RFA, and the other six were supported by FIAM.

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<sup>6</sup> Interestingly, final-period external account loans were always paid back in full, contradicting the economic theory that finite-period games would lead to default. Clearly, the villagers either feel a moral obligation to repay, are concerned with their long-term reputations with the NGOs, or have not been properly educated on the subject of finite-period games!

<sup>7</sup> Originally, interest payments were made at weekly meetings, but were eliminated due to member demand. Meeting frequency was also reduced from weekly to monthly. However, with all payments due every six months, there is often little business to conduct at the monthly meetings, which are therefore poorly attended.

<sup>8</sup> There was occasionally some shifting within the committee—e.g., the president and treasurer swapping positions.

Of the 14 villages surveyed, six had never benefited from village bank support, and did not receive any village bank loans during the survey period. These “control” villages were identified as follows. Based on their expansion plans, RFA pre-identified four villages and FIAM pre-identified two that they would begin supporting in 1996. In February and March 1995, RFA and FIAM field staff organized the villagers into the new village banks, allowing them to self-select according to standard procedures, the only difference being that the villagers were told that loans would not begin for approximately one year.

A random sample of eight “treatment” villages (four each from RFA and FIAM) was also chosen from a list of their village banks (32 for RFA and 26 for FIAM). One other village that was just due to begin receiving loans was also included to serve as a control village for certain purposes<sup>9</sup> and to observe the initial development of a new village bank.

A stratified random sample based on participant status of 505 households was obtained from all 14 villages. Of these, 455 were located by the enumerators and agreed to be interviewed during the first survey, and 445 (including 294 program participants and 151 nonparticipants) finished the surveys.

Each village was surveyed four times over a year. The first survey was conducted in April 1995 and collected data on household demographics, assets, and debts. The second, third, and fourth surveys were conducted in August 1995, October 1995, and February-March 1996, respectively. They collected data on income, expenditures, and credit transactions during the dry season (February to May), the rainy season (June to September), and the harvest season (October to January). In addition to the household surveys, village surveys were also conducted to collect data on village infrastructure, prices, and other characteristics. The household surveys were administered by the staff of RFA in Surin and FIAM in Roi-Et, under the author’s supervision.<sup>10</sup> The author conducted the village surveys as well as in-depth informal interviews with numerous villagers.

#### IV. SURVEY AREA

The provinces of Surin and Roi-Et are adjacent to each other and are located in Northeast Thailand, the country’s poorest region. Most village households engage in small-scale agriculture: 90.4 percent of men and 91.3 percent of women in the households surveyed listed farming as their primary or secondary occupation. In Surin, rainfed rice is the primary crop, with planting in June

<sup>9</sup> This village bank opened in April 1995 and is, depending on the empirical test being conducted, sometimes a treatment village and sometimes a control village. For example, when estimating the impact of village bank loans on various assets, as measured by the first survey, it is a control village since it had not yet benefited from village bank loans. But when estimating the impact on income or expenditures over the 12-month survey period, it is a treatment village since its first two 6-month loans would have impacted income during this period.

<sup>10</sup> Questionnaires were checked for internal consistency in the villages immediately upon completion of an interview. Approximately 20 percent were subsequently checked for content in follow-up interviews.

and harvesting from November to January. During the off-season, a few households engage in small-scale irrigated gardening, but most either engage in nonagricultural income-generating activities or remain idle. The more common activities include pig raising; itinerant wage labor (especially construction) in the provincial capital or Bangkok; and small business activities such as petty trading, driving a motorcycle taxi, spinning and weaving silk and cotton, and operating small food stands. Some of the wealthier households buy and sell cattle and water buffalo. Agricultural and nonagricultural activities in Roi-Et are similar to those in Surin, with two differences. First, another important crop cultivated during the main growing season is sticky rice. Second, because of different soil quality, tobacco is commonly grown as a cash crop during the off season from November to April, leading to less migrant labor compared to Surin.

Most people in Surin, which borders Cambodia, are ethnically Khmer (98 percent) and primarily Khmer-speaking. The people of Roi-Et, like those in most of Northeast Thailand, are ethnically Lao (98 percent) and the language spoken is a dialect of Lao. In both provinces, however, Thai is understood and spoken by all but the oldest villagers.

## V. PARTICIPATION

### A. Selection of Members

The *raison d'être* of most microfinance programs is to correct market failure in delivering credit to the rural poor. Most microfinance programs state that their primary goal is to alleviate rural poverty by delivering credit and other financial services to the poorest households, especially to the women in those households. This is certainly the case for the programs studied in this paper. For example, Catholic Relief Services publishes “Eight Principles of Village Banking”, the first of which is to loan to “the poorest of the poor.” FINCA (1989) lists several “criteria for membership selection,” one of which is that membership should be “open to poorest-of-the-poor, but not exclusively for poor” although “ultimately, membership is self-selecting and not responsibility of sponsoring agency.”

The poor are generally targeted by group lending programs in one of two ways. In a minority of programs, such as the Grameen Bank in Bangladesh, households owning assets valued at more than a certain amount are in principle excluded from participating in the program.<sup>11</sup> The majority of group lending programs, however, do not set strict eligibility criteria. Instead, they seek to target the poor and screen out the wealthy indirectly (i) by setting small loan sizes (e.g., \$50 to \$300)

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<sup>11</sup> For example, households owning assets that are worth more than the value of one acre of land are theoretically ineligible to join the Grameen Bank. Two other Bangladeshi group lending programs, the Bangladesh Rural Advancement Committee (BRAC) and the Bangladesh Rural Development Board (BRDB), deem ineligible households that own more than 0.5 acres of land. Morduch (1999), however, shows that these eligibility criteria are not perfectly enforced, and some 18 to 32 percent of participants do not meet the eligibility criteria.

that would presumably be of little interest to the wealthy; (ii) by requiring frequent group meetings (usually weekly or monthly) that would impose a cost on the wealthy in excess of any benefit they might derive from the small loans; and (iii) by the stigma of participating in a “poverty lending” program. This second, indirect, screening method is part of the “village bank” model of group lending pioneered by FINCA and adopted by most international NGOs such as Catholic Relief Services, CARE, Save the Children, and Freedom From Hunger. It is therefore important to determine whether or not the self-selection process allows NGOs to reach their target group of “the poorest of the poor”.

Most existing studies on program impact have ignored the issue of program targeting. These include, for example, the 32 studies reviewed in Sebstad and Chen (1996) (with the exception of MkNelly and Watetip 1993 discussed in greater detail below), the 11 studies reviewed in Chen (1992), and the studies by Wydick (1995a and 1995c), Pitt and Khandker (1998), and Khandker (2001).

Exceptions to this neglect include MkNelly and Watetip’s (1993) study of village banks in Northeast Thailand (not far from where the current study was conducted), Perry’s (1995) anthropological study of village banks in Senegal, Park and Ren’s (2001) study of microfinance in the People’s Republic of China (PRC), and Amin et al.’s (1999) Bangladesh study. MkNelly and Watetip find that village bank members closely match a general cross section of the village. They use an innovative survey of village chiefs regarding the wealth level of member and nonmember households in the village. However, they conduct their study three years *after* the establishment of the village banks. Hence, differences in wealth would have been influenced by the village bank itself. Moreover, politically savvy village chiefs might have deduced that the “correct” response is that village bank members are poorer than nonmembers (or, if the chiefs are concerned about impact, they might respond that participants are the wealthier villagers). The shortcomings of this method are underscored by Perry’s (1995) study in Senegal. She found that, in response to open-ended questions, focus groups of village bank members asserted that the wealthy do not dominate village bank membership. However, her more objective measurements of wealth demonstrated that the wealthy in fact did have more access to membership and to borrowing. The studies by Park and Ren (2001) and Amin et al. (1999) also evaluate targeting by comparing participants and nonparticipants after program effects have been realized, potentially biasing the results.

As these studies demonstrate, the main problem plaguing attempts to evaluate program targeting is that most empirical studies have focused on impact; therefore, data have been collected after the programs have been operating for some time. Differences between participants and nonparticipants are therefore corrupted by the effects of the program.

The Thai data set collected for the present study, however, provides an ideal setting to study issues of self-selection and targeting because the sample includes seven villages where villagers are self-selected but had not received village bank loans at the time of the first survey. Differences in wealth of members and nonmembers can be directly compared in these villages. In addition, data for *all* households surveyed was collected on land owned 5 years before the surveys,

i.e., land owned before any of the 14 villages had a village bank.<sup>12</sup> Because land value makes up 73.7 percent of the value of household assets in the sample, the value of land owned 5 years before the surveys is an excellent proxy for prior household wealth.<sup>13</sup>

It should be kept in mind in what follows that a villager can become a member only if she self-selects *and* is selected by her peers. Hence, to refer to the selection process as “self-selection” can be misleading; selection by peers may be the more important process. Table 1 below presents weighted<sup>14</sup> t-tests on total wealth, land value, and the value of nonland assets (total and by gender of the owner) for households in the seven villages that had not received village bank support at the time of the first survey. Table 2 presents weighted t-tests on land value (total and by gender) for all 14 villages 5 years before our surveys.

**Table 1: Weighted t-tests on Wealth of Members and Nonmembers in Control Villages**

Variable (in baht)	Village Bank Members (n=140)	Nonmembers (n=70)	P-value of Difference
Household wealth (assets less debt)	574,738	434,154	.157
Female-owned wealth (assets less debt)	303,482	191,327	.055
Male-owned wealth (assets less debt)	264,810	237,635	.740
Value of household land	442,814	271,370	.028
Value of female-owned land	254,089	128,560	.019
Value of male-owned land	187,413	142,810	.455
Value of household nonland assets	172,114	201,354	.476
Value of female-owned nonland assets	61,604	76,252	.376
Value of male-owned nonland assets	104,548	119,910	.670

**Table 2: Weighted t-tests on Land Value of Members and Nonmembers in All Villages 5 Years before Surveys**

Variable (in baht)	Village Bank members (n=294)	Nonmembers (n=151)	P-value of difference
Value of household land	480,745	249,604	.001
Value of female-owned land	301,816	109,774	.001
Value of male-owned land	176,624	137,851	.382

<sup>12</sup> Collecting data on land owned 5 years earlier is relatively easy. Because land transactions tend to be large and important yet relatively infrequent for a household, a household can easily recall land transactions made in the previous 5 years, and land owned (and its value) 5 years earlier can be deduced.

<sup>13</sup> Land value 5 years before our surveys is also an important regressor in estimating village bank impact on various outcomes as it controls for initial wealth in all households (see Section 6 below).

<sup>14</sup> Observations from each of 28 strata (determined by village and village bank membership status) were weighted by the inverse of their sampling probabilities.

Tables 1 and 2 show that village bank members, prior to any village bank support, tend to be wealthier than nonmembers. Furthermore, the wealth difference comes primarily through the value of land owned by women in the household.<sup>15</sup>

An alternative, and perhaps better, way to examine targeting is to examine the probability of selection by different wealth groups. Examining the selection process in this way with the current data set is complicated by the stratification process used. Because stratification was based on participation status, the probability of selecting into the program has to be calculated using the probability that a member (or nonmember) belongs to a certain wealth category, adjusted by the probability of being sampled. Table 3 below presents the results.

Table 3. **Probability of Members of Different Wealth Groups  
Gaining Access to Program**

Wealth Group (value of household land owned 5 years earlier, baht)	Total Number of Households	Total Participating in Sample Villages	Total Non-participating Households	Percent of Wealth Group Participating in Program
0 (landless)	143	65	78	45
0 to 99,999	257	108	149	42
100,000 to 199,999	264	111	153	42
200,000 to 399,999	351	137	214	39
400,000 to 999,999	282	153	129	54
Greater than or equal to 1,000,000	72	58	14	81

As this table shows, the probability of selecting into the program is much higher for the two wealthiest groups of villagers, and the probability of the wealthiest group selecting into the program is nearly twice that of the four poorer groups.

It is still possible, however, that wealth per se (and female land wealth in particular) is not a significant *determinant* of member selection. For example, it is conceivable that the primary criteria for membership are personal responsibility, trustworthiness, entrepreneurship, and an assortment of other unobservable characteristics that lead to the selection bias discussed earlier, and which are correlated with wealth. Therefore, as part of the field research, two knowledgeable informants in every village (the village chief and village bank president) were interviewed about the creditworthiness of each household surveyed. Specifically they were asked, "If the adult women in this household borrowed money from any source (private bank, BAAC, friend, relative, moneylender, or any other source) how sure would you be that they would repay the amount due on time? Very sure=3, fairly sure=2, or not very sure=1." By this question, a measure of each

<sup>15</sup> Whereas households sometimes had trouble designating an individual owner of nonland assets, they rarely had trouble designating an individual owner of each plot of land. Moreover, since Thailand is traditionally a matrilineal society, with land being passed down through the woman's side of the family, it should not be surprising that women own more land than men.



household's reputation for creditworthiness was obtained, which would presumably be a major criterion in determining which women in the village would be allowed to join the village bank. It is intended to be a proxy for many of the unobservable characteristics discussed above. A creditworthiness score was then calculated as the average of the informants' responses for each household.

Results of weighted<sup>16</sup> logit regressions on member selection using this and other household characteristics are presented in Annex Table 2. Estimates in the left-hand portion of the table use data only from the control villages and include the value of land and nonland assets owned when the first survey began. Similar estimates using the entire sample but slightly different regressors (namely, land owned 5 years before our survey, i.e., the initial wealth measure exogenous for all households) are presented in the right-hand portion of the table.<sup>17</sup> Both regressions yield similar results, showing that creditworthiness is a significant determinant of member selection (in control villages: coef=.709 and p=.046; in all villages: coef=.384 and p=.097), so local information apparently is being used in the selection process. At the same time, however, even controlling for this use of local information, the value of land owned by women is still highly significant (in control villages: coef= $2.73 \times 10^{-6}$  and p=.025; in all villages: coef= $2.44 \times 10^{-6}$  and p=.001).

This evidence that the village banks are failing to reach the poor is also supported by informal interviews with villagers. For example, when asked what kind of person joined the village bank, many nonmembers in two treatment villages identified the village bank as a "group for the rich" and that they would "not be qualified to join" although they would be interested in joining such a group for poor people. In five other villages (two control and three treatment), nonmembers made similar remarks that suggested that the program was open primarily to the richer households in the village. None of the villagers interviewed identified the village bank as a program that targeted the poor.<sup>18</sup>

As mentioned in Section II above, in most villages the NGO field worker's first contact was with the village chief, and after this contact, the NGO field worker usually was uninvolved in member selection, leaving it up to the village chief to organize the villagers. The village chief would normally then contact "leading women" in the village to assist in the organization of the village bank. The village chiefs and leading women were generally among the wealthiest and most

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<sup>16</sup> Sampling weights (the inverse of the probability of being sampled) were applied to the data for these logit regressions because stratification was done on the dependent variable (member status). Weighting is not required in the impact regressions (see below) because stratification was done on the exogenous variables (Maddala 1983, 170).

<sup>17</sup> The estimates on the right-hand side of Annex Table 2, however, are possibly biased because "creditworthiness" is likely to be endogenous for the village bank members in treatment villages: the village chief's and village bank president's assessment of their creditworthiness would be influenced by their performance in the village bank.

<sup>18</sup> This result is interesting, especially when compared with the methodology of Park and Ren (2001), who evaluate targeting and impact in the PRC using respondents' own subjective determination of their "eligibility" in programs that do not have explicit eligibility criteria.

influential residents of the village (and the women were often relatives of the village chief), and the other women they asked to join were also richer than average.

Frequently, the village chief's wife was the village bank president or held another influential committee position, and other wealthy leading women in the village also usually became committee members. Their influence continued beyond the selection of members to the determination of the amounts of money that they and other members borrowed. We now turn to this process.

#### A. Borrowing by Members

One of the more fascinating phenomena discovered during the course of the surveys is the extent to which village bank members use other names, in addition to their own, to borrow from the village bank. For example, sometimes when a member does not want to borrow, she will let another member use her name to borrow from the village bank. Of more importance, however, is the use of multiple names to borrow. For instance, some members also enroll as “members” a relative who may or may not live with the borrower. In other instances, a member will take over the account of a member who leaves the village bank. Virtually all of the members who used multiple names to borrow from the village bank on a more or less *permanent* basis were also influential committee members (president, vice president, or treasurer of the village bank), who set village bank policy (especially regarding management and lending of the internal account funds), and managed daily operations. Committee members in six of the eight treatment villages engaged in this practice. The use of multiple names has a large impact on the amount that a member can borrow, effectively multiplying the maximum loan size by the number of names used. In the most extreme case, one village bank president (who was also the village chief's business partner and a moneylender for several villages in the area) used nine names to borrow. Households reported that 35 percent of loan volume in the eight treatment villages was borrowed by someone other than the person recorded in the village bank records. Even this estimate is probably low because some villagers reported that they had been instructed not to report the use of multiple names.

In principle, the most important determinant of a member's cumulative borrowing is the length of time she has been a member. Borrowing by members is estimated in Annex Tables 3 through 5, using as regressors various household characteristics, the number of months of membership as a rank and file member, and the number of months as a committee member. Annex Table 3 presents results for external account borrowing; Annex Table 4 presents results for internal account borrowing; and Annex Table 5 presents results for total borrowing (external plus internal account). The left-hand portion of each table presents results when the dependent variable is borrowing according to official records. The right-hand portion adjusts the dependent variable for use of multiple names to borrow. F-tests of the hypothesis that “months as a rank and file member” and “months as a committee member” are equal determinants of borrowing are presented at the end of each table.

The results show the extent to which committee members borrow more than rank and file members and the extent to which this difference is magnified when adjusting for the use of

multiple names. In the adjusted (right column) borrowing equations, committee members borrow more than twice as much as rank and file members: real external account borrowing increases by 4953 baht per month for a committee member, and by 2359 baht for a rank and file member. Internal account borrowing increases by 8704 baht per month for a committee member, and by 4236 baht for a rank and file member. Combined borrowing increases by 5960 baht per month for a rank and file member, and by 12,982 baht per month for a committee member.<sup>19</sup> For both external and internal account borrowing, the p-value on the difference between the coefficients is 0.0. Overall, committee members, who make up 15.6 percent of the treatment village bank members (and 3 percent of all households in treatment villages), borrowed 27.0 percent of total loan volume.

Given the large and significant difference in borrowing by rank and file members and committee members, combined with the goal of targeting the poor, the question naturally arises as to whether committee members are richer or poorer than rank and file members *prior* to village bank intervention. Tables 4 and 5 present t-tests on the same wealth measures used in Tables 1 and 2 above, but now test for differences between committee members and rank and file members.

**Table 4: Weighted t-tests on Wealth of Committee and Rank and File Members in Control Villages**

Variable (in baht)	Committee Members (n=16)	Rank and File Members (n=124)	P-value of Difference
Household wealth (assets less debt)	859,747	554,180	.145
Female-owned wealth (assets less debt)	546,426	302,851	.196
Male-owned wealth (assets less debt)	312,977	244,190	.575
Value of household land	722,225	422,115	.141
Value of female-owned land	495,413	253,480	.189
Value of male-owned land	226,813	166,619	.602
Value of household nonland assets	224,630	171,554	.207
Value of female-owned nonland assets	59,686	64,143	.864
Value of male-owned nonland assets	164,601	101,016	.061

**Table 5: Weighted t-tests on Land Value of Committee and Rank and File Members in All Villages 5 Years before Surveys**

Variable (in baht)	Committee Members (n=40)	Rank and File Members (n=254)	P-value of Difference
Value of household land	729,190	409,354	.033
Value of female-owned land	481,140	264,144	.093
Value of male-owned land	248,050	141,392	.208

<sup>19</sup> Borrowing is actually measured in baht-months to account for the different lengths of time that money is borrowed. For example, 1000 baht borrowed for 6 months is 6000 baht-months. This measure is necessary because early external account loan cycles lasted 4 months but were subsequently adjusted to 6 months in response to client demand. However, the results are robust to other measures of borrowing (e.g., average loan size outstanding).

On virtually all measures, committee members are wealthier before village bank intervention. When examining differences only in the control villages (Table 3), however, only one difference is significant beyond the .14 level—almost certainly because of the small number of committee members (n=16) from those villages in the sample. When using land value 5 years before our surveys, however, and expanding the sample to include treatment villages, the difference in total land value is significant at the .03 level, and the difference in female-owned land value is significant at the .09 level.

Hence, there is evidence that the wealthiest households in the villages play a dominant role in the village banks, and use their positions to borrow significantly more than rank and file members. In some villages, this phenomenon caused serious problems between committee members and rank and file members. For example, one of the oldest village banks in the sample originally had over 70 members, but at the time of our surveys, the number was 40. Many of the original members resigned because they were angry that the president (who was also the village chief's wife) and treasurer were borrowing much more than they.<sup>20</sup> In another village, some rank and file members resented the fact that committee members “rounded down” members’ external account loan amounts (e.g., from 2230 baht to 2000 baht), ostensibly because it was easier to calculate interest payments. The surplus, which could be large when all members’ loans were considered, was then loaned out by the committee members to themselves, the village chief, or others of their choosing. A small number of members had resigned as a result. In several villages, some members who had resigned were surprised and angered to learn during the interviews that their names were still being used to borrow without their knowledge or permission.

## VI. IMPACT

Coleman (1999) demonstrates that the unique survey design of this study can be exploited to obtain unbiased (in the case of uncensored dependent variables) or consistent (in the case of censored dependent variables) estimates of average program impact with the following specification:

$$Y_{ij} = X_{ij}\alpha + V_j\beta + M_{ij}\gamma + VBMOS_{ij}\delta + \eta_{ij} \quad (1)$$

where  $Y_{ij}$  is an outcome of household  $i$  in village  $j$  on which we want to measure program impact;  $X_{ij}$  is a vector of household characteristics;  $V_j$  is a vector of village fixed effects (village dummy

<sup>20</sup> Members in this and other villages were primarily angry over internal account borrowing since the NGO still provided the rank-and-file members with the external account loans they were entitled to. Internal account lending policy is determined in principle by the village bank membership, but in practice by the committee members. An examination of Annex Table 4 shows that in fact no household characteristics other than “months as a rank and file member” and “months as a committee member” have a significant impact on credit demand from the internal account, demonstrating the dominant role of committee members in allocating internal account funds.

variables);  $M_{ij}$  is a membership dummy variable equal to 1 if household  $ij$  selects into the microfinance program, and 0 otherwise; and  $VB MOS_{ij}$  is the number of months village bank credit has been available to members. The membership dummy variable  $M_{ij}$  is a proxy for the unobservable characteristics that lead a household to self-select into the village bank and that might affect outcomes. It is important to recognize that it equals 1 for both “treatment” members (who have received program support) and “control” members (who have not yet received program support). The variable  $VB MOS_{ij}$  measures the extent of program availability to members who have self-selected. Unlike the amount borrowed, it is exogenous to the household (positive in varying amounts for treatment members, and 0 for control members). Inclusion of nonparticipants in the sample, combined with the use of village fixed effects, controls for possible endogenous program placement. In this specification,  $d$  is an unbiased or consistent measure of impact per month of program availability.

Coleman (1999) found that, when controlling for endogenous member selection and program placement, average program impact was not significant. Final impact estimation, however, must account for the apparent difference in access to loans by rank and file members and committee members, who may therefore experience different levels of impact. Because of this difference, the empirical specification of equation (1) will be modified as follows. First, the dummy variable  $M_{ij}$  will be replaced by two dummy variables: a rank and file member dummy variable to capture unobservable differences between rank and file members and nonmembers, and a committee member dummy variable to capture similar unobservable differences between rank and file and committee members.<sup>21</sup> Second, the regressor  $VB MOS_{ij}$  will be replaced by two regressors: months of rank and file membership and months of committee membership, which will allow for differential impact to be measured on rank and file members and committee members. Hence, the empirical specification to be estimated in this paper is as follows:

$$Y_{ij} = X_{ij}\alpha + V_j\beta + MR_{ij}\gamma_R + MC_{ij}\gamma_C + RMOS_{ij}\delta_R + CMOS_{ij}\delta_C + \mu_{ij} \quad (2)$$

where  $MR_{ij}$  is a dummy variable equal to 1 if the household has a rank and file member and 0 otherwise;  $MC_{ij}$  is a dummy variable equal to 1 if the household has a village bank committee member and 0 otherwise;  $RMOS_{ij}$  is the number of months of rank and file membership;  $CMOS_{ij}$  is the number of months of committee membership; and the other variables are defined as before. Again,  $MR_{ij}$  and  $MC_{ij}$  equal 1 for treatment and control participants, and equal 0 for nonparticipants in all villages.  $RMOS_{ij}$  and  $CMOS_{ij}$  measure the different access to program loans by rank and file and committee members, respectively, and are exogenous to the household (equal to 0 for

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<sup>21</sup> As mentioned in Section II, committee members are chosen every year, which in theory could bias the results because in the control villages, we know the committee members only for the first year. In practice, however, the committee members rarely change. In six of the treatment villages, the committee has not changed at all; in the two other treatment villages, there have been only minor changes, with many of the core committee members only shifting committee positions (e.g., president to vice president).

nonparticipants and treatment participants, but positive and varying for treatment participants). Inclusion of nonparticipants in the sample, combined with the use of village fixed effects, again controls for possible endogenous program placement. In this specification, dR measures the impact of an additional month's program availability to a rank and file member; and dC measures the impact of an additional month's program availability to a committee member. F-tests can be conducted to determine if  $dR = dC$ , i.e., if the impact of the village bank on rank and file members and committee members is equal.

Annex Table 6 presents the complete output of a typical regression (for household nonland assets), and Annex Table 7 presents the coefficients and associated p-values for the regressors of interest (months of rank and file membership and months of committee membership) in all the regressions.<sup>22</sup>

### A. Impact on Rank and File Members

The results presented in Annex Table 7 for rank and file members are consistent with the average impacts found in Coleman (1999), i.e., the impact estimates are largely insignificantly different from 0. In fact, the only measures that are significantly different from 0 indicate a negative impact. It is remarkable to note that men's overall self-employment expenses (coef=-9986; p=.077) are negative and statistically significant, and men's overall self-employment sales (coef=-11,023; p=.106) are negative and nearly significant at the 10 percent level. Estimated impact on men's agricultural expenses and business sales and expenses, including labor time are all negative and statistically significant, and estimated impact on all other measures of men's economic activity is also negative though not statistically significant. Assuming that men's leisure is a normal good, these results may represent (expected) income effects of providing low-cost credit to women: essentially, women's increased income generated by access to program credit could provide men with economic rents taken in the form of increased leisure. Unfortunately, however, these rents appear to be perceived rather than realized, as the measured impact on women's outcomes in rank and file households is not significant.

Another important, and potentially ominous, result is the lack of impact on savings for rank and file members. In fact, measured impact is negative, though insignificantly different from zero. One possible explanation for this result is that, especially after the third year, members have reduced incentive to save. Recall that external account loan size grows according to a member's savings, up to a maximum of 7500 baht. In practice, however, although external account loans are made for 5 years, the NGOs start reducing loan size after the third year, so as to gradually wean members from external account loans. Hence, members have little incentive (in term of access

<sup>22</sup> Variables were entered in linear form. In the vast majority of regressions, no additional explanatory value was gained by introducing nonlinearities. Note also that the dependent variables presented in Annex Table 7 are not independent of each other. Most aggregate variables (e.g., total household wealth) are broken down into more refined measures (e.g., women's wealth, total household productive assets, men's business assets, etc.) in order to identify exactly where the impacts occur.

to external account loans) to continue to save after a certain point.<sup>23</sup> Moreover, because member savings make up the internal account fund, and because this fund is often monopolized by the committee members, rank and file members may be further inclined to reduce their village bank savings.<sup>24</sup> This lack of impact on mobilizing savings from rank and file members could have major consequences because the long-term sustainability of village banks depends on the sustainability of their internal account funds.

## **B. Impact on Committee Members**

Estimated impact on committee members, however, is significant and positive on a range of dependent variables. Impact results are presented below under the headings of physical assets; savings, debt, and lending; production, sales, expenses, and labor time; and health care and education.

### **1. Physical Assets**

The village banks appear to have had a large and positive impact on the value of committee members' household wealth (coef=3010; p=.043), and this impact is seen primarily on women's wealth (coef=1705; p=.076). Broken down further into landed wealth and nonland assets, there is a positive and significant impact on total household nonland assets (coef=3187; p=.018). Interestingly, this effect is most pronounced for men's nonland assets (coef=2122; p=.071), although further refinements indicate positive and significant effects on women's productive assets (coef=870; p=.014), including nonland farm assets (coef=329; p=.100) and consumer durables (coef=755; p=.026). F-tests shown in the last two columns of Annex Table 7 indicate that the impact on committee members is significantly greater than that on rank and file on many of these wealth measures (household and women's wealth, household and women's nonland assets, household and women's productive assets, household and men's livestock, and women's consumer durables).

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<sup>23</sup> Nonlinear specifications, however, did not add any explanatory value.

<sup>24</sup> The advantage of having a saving facility in the village was also virtually eliminated in two village banks surveyed, largely because of policies set by the committee. In one village, members were not allowed to save only—all members were required to borrow from the NGO, even if they did not want to. The reason given by the committee members was that it would be "impolite" for members to refuse the assistance offered. Twenty of this village bank's 30 members regularly had to borrow from moneylenders to repay their village bank loans. In another village bank, the president decided to pay members their end-of-year interest income, not based on average yearly savings, but (ostensibly for ease of calculation) on savings on 31 December. She then greatly increased her own savings on 28 December so as to increase her share of interest income.

## 2. Savings, Debt, and Lending

The impact of the village banks on household savings is positive and significant for committee households (551;  $p=.073$ ). This effect appears to come not only from the impact on women's savings (217;  $p=.118$ ), but also on men's savings (425;  $p=.161$ ), although neither gender's individual coefficients are significantly different from zero. F-tests show that the impact on committee household savings is significantly greater than the impact on rank and file household savings.

According to NGO staff, a primary goal of these village bank programs is to allow members to reduce their high-interest debt to moneylenders. Hence, the village bank's impact was estimated on "high-interest" debt, defined as debt with an interest rate greater than 2 percent per month, the rate charged on external account loans. However, no coefficients were significantly different from 0, indicating that village bank credit is not substituting for high-interest credit.<sup>25</sup> Also estimated was the impact on "low-interest" debt (debt with an interest rate less than or equal to 2 percent per month) to determine if village bank credit is merely substituting for existing sources of low-interest credit, or if it was allowing (or encouraging) households to mobilize additional institutional credit. Results indicate that committee member households are also increasing their low-interest debt from other sources available to men in the household. This is an interesting and useful result for the following reason. The differential impacts measured between committee members and rank and file members could be the result of two different factors. One, it may be the result of the differential access to funds as discussed above, and this differential impact allows committee members to invest in different types of projects, perhaps with different scale economies. Two, it may be the result of different unobservable characteristics (e.g., entrepreneurship) that can be harnessed or realized only by access to credit. The fact that access to village bank funds appears to be allowing or encouraging additional borrowing is one indication that committee members are investing in different types of projects, perhaps with larger fixed assets, which require larger capital. This is also consistent with the result discussed above that women's productive assets are positively affected by the village bank. Hence, differential access to program loans does appear to matter.

In four of eight treatment villages and three of six control villages, at least one (and often two) committee member(s) engaged in money lending to some degree, and some nonmembers and rank and file members complained that committee members borrowed from the village bank, then lent the money at higher interest rates. Therefore, the impact of village bank loans on money lending was also estimated. As expected, there is evidence of positive impact on committee members' money lending. The coefficient on the impact of committee months on household money lending is positive and highly significant (2653;  $p=.005$ ), and this effect comes entirely through the women in the household (2093;  $p=.054$ ).<sup>26</sup> The difference between coefficients on committee and rank and file months for household lending with interest is also significant ( $p=.035$ ).

<sup>25</sup> Estimation of impact on male high-interest debt in committee households was not possible because only four such households had men with high-interest debt.

<sup>26</sup> Estimation of impact on men's money lending was impossible because of the small number of households reporting nonzero values.



### 3. Production, Sales, Expenses, and Labor Time

As Annex Table 7 indicates, the village banks have also exerted a positive and significant impact on women's self-employment sales (2245;  $p=.023$ ) and expenses (1520;  $p=.058$ ) in committee households. F-tests indicate that the impact on sales and expenses of women in committee households is significantly greater than the corresponding measures for rank and file households ( $p=.058$  for sales, and  $p=.051$  for expenses). Refined impact estimates indicate a positive effect on household agricultural production, household livestock production, women's livestock sales, and women's business sales and expenses in committee member households. All impact measures are significantly greater for committee members than rank and file members.

The impact on total household self-employment labor time in committee households is also positive and significant (coef=26.9;  $p=.058$ ), apparently impacting both women's labor time (14.0;  $p=.112$ ) and men's time (12.9;  $p=.156$ ), though the estimates by gender are not individually statistically significant.

### 4. Health Care and Education

Most estimates of village bank impact on medical and school expenses (totals, by gender, and for children, by gender)<sup>27</sup> in both committee households and rank and file households are insignificantly different from zero. The one exception to this was educational expenses for boys in committee member households (coef=86.6;  $p=.035$ ), perhaps indicative of the privileged status of boys in Northeastern Thai households.

## VII. SUMMARY AND POLICY CONCLUSIONS

This paper has evaluated the targeting and impact of a women's group-lending program in Northeast Thailand. To do so, it exploited a unique survey sample that included program participants from "treatment" villages that had already received program support, participants from control villages that had not yet received program support, and nonparticipants from both types of villages. Results were presented in terms of targeting (i.e., the processes of member selection and borrowing) to determine if the program has succeeded in reaching its target group of the "poorest of the poor", and in terms of impact on member households.

There is strong evidence that, similar to previous efforts to deliver financial services to the rural poor in developing countries, the programs surveyed are not reaching the poor as much as the relatively wealthy. Weighted t-tests indicate that prior to program intervention, participant households are significantly wealthier than those of nonparticipants, and that the wealth difference

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<sup>27</sup> "Female medical expenses" are expenses for women, but not necessarily paid by women. No attempt was made to learn which household members paid for the medical care. The same is true for school expenses.

is explained primarily by the value of female-owned land in the households. Moreover, the probability of wealthiest villagers selecting into the program is nearly twice that of the poorer villagers. Weighted logit estimates confirm that the value of female-owned land is a significant determinant of member selection. The same logit estimates, however, indicate that “creditworthiness” of female household members, as measured by a special survey of village informants, is also a significant determinant of member selection. Hence, there is evidence that both relatively public information on land holdings (the same information most commonly used by commercial lending institutions in Thailand to select its rural customers) and local information on creditworthiness are being used to select village bank members.

There is also strong evidence that the richest village bank members become committee members (president, vice president, treasurer) and use their position to borrow significantly more from the village bank (both from the external account and the internal account) than rank and file members. One method commonly employed by committee members to circumvent village bank external account borrowing limits is to use multiple village bank accounts, each under a different name.

Hence, it is clear that, within the context of Northeast Thailand, village banks’ small loan size and frequent meetings, as well as the stigma of belonging to a poverty lending program, do not discourage the relatively rich villagers from participating in the village bank. Furthermore, although some of the poorer nonmembers reported choosing not to join the village bank, many others were excluded against their wishes. Some never knew of the village bank before the surveys, while others felt intimidated to join because they considered the village bank to be a program for the relatively wealthy in the village. Moreover, the process by which NGOs first contact the village political structure, represented by the village chief, and then allow him to organize the selection process likely contributes to the richest women in the village becoming committee members, who then borrow the lion’s share of village bank loans.

Results indicate a positive impact of the village bank program on several measures of household welfare. Given the difference in access to loans by committee members and rank and file members, however, it is not surprising that estimated impact on committee members is significantly larger than impact on rank and file members. For example, positive and significant impact is observed in committee member households on many important measures of wealth, savings, income, productive expenses, and labor time. Impact is also positive on committee members’ moneylending activities, as they apparently borrowed from the program at lower interest rates and relent at higher rates. Impact on outcomes for rank and file members was largely insignificant, although men’s economic activity appears to have decreased as a result of the program, possibly the result of increased leisure consumption allowed by their perception of their wives’ increased economic activity.

The differential impact measured between committee members and rank and file members could be the result of the differential access to loans, with committee members’ increased access allowing them to invest in different types of projects, perhaps with greater returns to scale. Or it could be the result of different unobservable characteristics (e.g., entrepreneurship) that can

be harnessed or realized only by access to credit. However, the fact that access to village bank loans appears to also encourage additional borrowing from other institutional sources is consistent with the first possibility, namely that committee members are investing in different types of projects, perhaps with larger fixed assets, which require larger capital. Differential access to loans does matter.

There are several policy implications of these research findings. First, these and perhaps other programs should seriously consider imposing (and enforcing) membership eligibility criteria similar to that used by the Grameen Bank (e.g., maximum allowable land holdings or other measures of wealth) in order to more actively target the poor. Beyond this type of restriction, however, villagers should still self-select for membership since evidence presented here indicates that local information about each household's creditworthiness is used to screen members. NGOs should also enforce the rule that village banks are to select new committee members annually so that committee members do not become entrenched in their positions,<sup>28</sup> which only encourages abuses. In the two villages where some committee turnover was observed, the use of multiple names was greatly diminished, and borrowing was much more equitable between committee and rank and file members. Clearer and more frequent public pronouncements of the village bank's goals and target group by the NGO fieldworkers, as well as stricter enforcement of existing rules against the use of multiple names, would go a long way toward reaching the target group of the poor. One goal of village banks is to "empower" the poor, especially poor women. But it is naive to think that existing village power structures will not pursue their own self-interest and use the village bank to enhance their own power if given the opportunity. It is equally naive to think that the relatively poor and powerless can be empowered without more active involvement of program administrators to ensure that they are the beneficiaries of these poverty lending programs. Along these lines, village bank rules regarding eligibility, limits on borrowing, and election of committee members could be printed on each member's passbook, or posted in the village,<sup>29</sup> thus helping to eliminate some of the information asymmetries that currently exist within the village regarding what is and is not acceptable within the village bank. Informal interviews indicated that the lack of such commonly recognized rules restricts efforts of the poor to gain access to the program and restricts efforts by the rank and file to equalize their access to loans.

Caution should be exercised before extrapolating these results to other contexts. Thailand is a relatively wealthy developing country, and many villagers already have access to low-interest credit from financial institutions such as the BAAC. The average wealth of survey households was over 500,000 baht, and average household low-interest debt, excluding village bank debt, was over 30,000 baht. In this context, loans of 1500 to 7500 baht may have a limited impact. Many women surveyed stated that the size of village bank loans was too small, and some women left

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<sup>28</sup> At least in Thailand, literacy is not an issue in choosing committee members: approximately 80 percent of the women surveyed reported being able to read and write.

<sup>29</sup> All surveyed villages had a village meeting place where other information on rice banks, buffalo banks, or general village information was posted or could be posted.

the program for that reason. It may not be surprising, then, that the largest impact was seen on committee members, who were able to circumvent the loan ceilings. In fact, given the inappropriately small loan size, it is understandable that the influential villagers would manipulate the system to obtain larger loans. It is arguable that this sort of manipulation would be reduced if program loan sizes increased.

Further research should be conducted on microfinance programs in other parts of the world to determine if these results are unique to Northeast Thailand or are typical of microfinance programs in general. The research methods and survey design used here could be easily implemented elsewhere. Since most microfinance programs regularly expand to new villages, which could be used as controls, this type of survey could be widely undertaken.

## APPENDIX

Appendix Table 1: **List of Variables**

<b>Variables</b>	<b>Weighted Mean (n=445)</b>	<b>Standard Deviation</b>
<b>Independent Variables</b>		
Months as village bank rank and file member	35.9	21.2
Months as village bank committee member	4.2	12.6
Male-owned land value 5 years ago (baht)	169,763	340,890
Female-owned land value 5 years ago (baht)	217,333	628,873
Sex of household head (F=1)	.2	.4
Education of male (years)	5.2	3.3
Education of female (years)	4.8	2.6
Family generations in village	3.4	1.1
Number of relatives in village	8.0	6.8
Village chief or assistant? (0/1)	.03	.2
Is female a civil servant? (0/1)	.02	.2
Is male a civil servant? (0/1)	.04	.2
Does household have village bank member? (0/1)	.5	.5
Number of females aged 22-39	.6	.6
Number of females aged 40-59	.5	.5
Number females age 60 and over	.3	.5
Number of males aged 22-39	.6	.6
Number of males aged 40-59	.4	.5
Number of males aged 60 and over	.2	.4

Appendix Table 1. continued.

<b>Variables</b>	<b>Weighted Mean (n=445)</b>	<b>Standard Deviation</b>
<b>Dependent Variables (in baht unless stated otherwise)</b>		
Household wealth	529,586	742,452
Female-owned wealth	267,272	654,629
Male-owned wealth	256,640	389,261
Household land value	390,330	686,081
Female-owned land value	218,379	628,373
Male-owned land value	171,951	338,945
Household nonland assets	172,819	199,889
Female nonland assets	58,050	123,455
Male nonland assets	107,713	159,159
Household productive assets	43,052	56,071
Female productive assets	10,459	27,582
Male productive assets	31,064	50,504
Household nonland farm assets	15,934	20,749
Female nonland farm assets	3485	10,509
Male nonland farm assets	11,676	18,735
Household livestock	15,205	14,366
Female-owned livestock	4391	10,147
Male-owned livestock	10,068	13,693
Household business assets	11,913	45,793
Female business assets	2583	20,890
Male business assets	9320	40,735
Household consumer durables	32,340	83,611
Female-owned consumer durables	14,584	56,455
Male-owned consumer durables	15,585	60,394
Value of house	82,551	109,238
Household cash savings	13,574	37,730
Female cash savings	6383	16,369
Male cash savings	7191	29,499
Household low-interest debt ( $\leq 2$ percent/month)	31,330	103,351

Appendix Table 1. continued.

<b>Variables</b>	<b>Weighted Mean (n=445)</b>	<b>Standard Deviation</b>
Female low-interest debt ( $\leq 2$ percent/month)	9342	46,252
Male low-interest debt ( $\leq 2$ percent/month)	21,775	73,630
Household high-interest debt ( $> 2$ percent/month)	7386	22,842
Female high-interest debt ( $> 2$ percent/month)	3928	14,810
Male high-interest debt ( $> 2$ percent/month)	3458	16,577
Household loaning out at interest	3823	27,027
Female loaning out at interest	3104	25,950
External account borrowing, according to records (baht-months)	85,722	57,587
Internal account borrowing, according to records (baht-months)	88,250	102,275
Total village bank borrowing (external + internal account), according to records (baht-months)	173,972	144,898
Household self-employment production	135,215	1,273,136
Female self-employment sales	29,852	101,596
Male self-employment sales	93,825	1,269,232
Household agricultural production	24,254	21,974
Female agricultural sales	6160	13,145
Male agricultural sales	8163	14,513
Household livestock production	5035	9974
Female animal sales	2839	7332
Male animal sales	2195	6602
Household business sales	104,791	1,271,791
Female business sales	20,853	100,446
Male business sales	83,466	1,267,907
Household self-employment expenses	108,963	1,200,117
Female self-employment expenses	23,540	90,119

Appendix Table 1. continued.

<b>Variables</b>	<b>Weighted Mean (n=445)</b>	<b>Standard Deviation</b>
Male self-employment expenses	84,182	1,195,831
Household agricultural expenses	12,044	10,974
Female agricultural expenses	4634	7026
Male agricultural expenses	7408	9780
Household animal-raising expenses	3401	8783
Female animal-raising expenses	1627	6131
Male animal-raising expenses	1653	5531
Household business expenses	92,715	1,196,996
Female business expenses	17,279	88,911
Male business expenses	75,121	1,194,188
Household self-employed labor (hours)	3488	2122
Female self-employed labor (hours)	1695	1221
Male self-employed labor (hours)	1792	1352
Household medical expenses	2606	6100
Medical expenses for females	1281	3137
Medical expenses for males	1325	5303
Medical expenses for children	573	1478
Medical expenses for girls	284	1015
Medical expenses for boys	289	1111
School expenses for children	2430	3918
School expenses for girls	1079	2250
School expenses for boys	1351	3014
External account borrowing, adjusted (baht-months)	87,203	82,837
Internal account borrowing, adjusted (baht-months)	101,910	157,371
Total village bank borrowing (external + internal account), adjusted (baht-months)	189,112	226,822



**Appendix Table 2: Logit Estimates of the Determinants  
of Village Bank Member Selection**

Independent Variables	Control Villages <sup>a</sup>		All Villages <sup>b</sup>	
	Coefficient	P-value	Coefficient	P-value
Creditworthiness score	.71	0.05	.384	0.10
Female-owned land value	2.73 x 10 <sup>-6</sup>	0.02		
Male-owned land value	1.01 x 10 <sup>-6</sup>	0.16		
Female-owned nonland asset value	-1.96 x 10 <sup>-6</sup>	0.50		
Male-owned nonland asset value	-2.03 x 10 <sup>-6</sup>	0.24		
Female-owned land value 5 years ago			2.44 x 10 <sup>-6</sup>	0.00
Male-owned land value 5 years ago			2.40 x 10 <sup>-6</sup>	0.51
Number of males aged 22-39	-.08	0.84	-.26	0.31
Number of males aged 40-59	-.38	0.52	-.080	0.82
Number of males aged 60 and over	-1.20	0.07	-.78	0.05
Number of females aged 22-39	.32	0.52	.044	0.87
Number of females aged 40-59	.54	0.38	-.011	0.98
Number of females aged 60 and over	.20	0.74	-.36	0.29
Household head female? (0/1)	-1.91	0.01	-.95	0.03
Highest female education level	.002	0.99	.07	0.25
Highest male education level	-.017	0.81	-.04	0.42
Family generations in village	.12	0.58	.02	0.85
Number of blood relatives in village	-.04	0.38	.02	0.31
Household member chief or assistant? (0/1)	.01	0.99	1.90	0.07
Female with civil servant job (0/1)	-1.01	0.61	-1.09	0.38
Male with civil servant job (0/1)	-.17	0.86	.89	0.24
Constant	-1.35	0.28	-1.19	0.09

<sup>a</sup> Number of obs = 167; F(19, 148) = 1.16; Prob > F = 0.2992

<sup>b</sup> Number of obs = 444; F(17, 427) = 2.32; Prob > F = 0.0022

Appendix Table 3: **Cumulative Borrowing from Village Bank External Account**  
(in baht-months)

Independent Variables	Dependent Variable: <sup>a</sup> External Account Borrowing according to Records		Dependent Variable: <sup>b</sup> External Account Borrowing Adjusted for Use of Multiple Names	
	Coefficient	P-value	Coefficient	P-value
Months as rank and file member	2064	0.00	2359	0.00
Months as committee member	3001	0.00	4953	0.00
Female-owned land value 5 years ago	-.0014	0.74	-.007	0.30
Male-owned land value 5 years ago	.0112	0.40	.021	0.31
Sex of household head (female=1)	5669	0.60	4733	0.77
Education of most highly educated woman	1461	0.37	4021	0.12
Education of most highly educated man	-759	0.53	-2383	0.20
Family generations in village	-9270	0.00	-6434	0.15
Number of blood relatives in village	724	0.08	1512	0.02
Is household member village chief or assistant? (0/1)	16,151	0.22	38,816	0.06
Are any females civil servants? (0/1)	-11,055	0.64	-58,571	0.15
Are any males civil servants? (0/1)	-1509	0.93	15,146	0.55
Number of females aged 22 to 39	31,970	0.00	27,311	0.03
Number of females aged 40 to 59	13,855	0.09	21,354	0.09
Number of females aged 60 and over	-14,731	0.13	-18,903	0.21
Number of males aged 22 to 39	-1538	0.84	10,760	0.35
Number of males aged 40 to 59	-943	0.91	-5671	0.67
Number of males aged 60 and over	9727	0.39	894	0.96
Constant	-7972	0.58	-54,363	0.02

<sup>a</sup> Number of obs = 181;  $\chi^2(18) = 160.59$ ; Prob >  $\chi^2 = 0.0000$ ; Pseudo R<sup>2</sup> = 0.0387; Test rank and file = comm.;  $F(1, 163) = 13.64$ ; Prob > F = 0.0003

<sup>b</sup> Number of obs = 181;  $\chi^2(18) = 149.21$ ; Prob >  $\chi^2 = 0.0000$ ; Pseudo R<sup>2</sup> = 0.0359; Test rank and file = comm.;  $F(1, 163) = 44.63$ ; Prob > F = 0.0000

Appendix Table 4: **Cumulative Borrowing from Village Bank Internal Account**  
(in baht-months)

Independent Variables	Dependent Variable: <sup>a</sup> Internal Account Borrowing according to Records		Dependent Variable: <sup>b</sup> Internal Account Borrowing Adjusted for Use of Multiple Names	
	Coefficient	P-value	Coefficient	P-value
Months as rank and file member	3397	0.00	4236	0.00
Months as committee member	5294	0.00	8704	0.00
Female-owned land value 5 years ago	-.00	0.97	-.013	0.39
Male-owned land value 5 years ago	.01	0.80	-.013	0.79
Sex of household head (female=1)	-10,497	0.65	-9450	0.80
Education of most highly educated woman	-4230	0.24	-998	0.86
Education of most highly educated man	2355	0.37	2427	0.57
Family generations in village	-820	0.90	-4236	0.67
Number of blood relatives in village	585	0.51	1918	0.18
Is household member village chief or assistant?(0/1)	-46,852	0.10	-16,142	0.73
Are any females civil servants? (0/1)	102,730	0.05	15,516	0.86
Are any males civil servants? (0/1)	-27,295	0.44	-19,705	0.73
Number of females aged 22 to 39	13,811	0.43	18,333	0.52
Number of females aged 40 to 59	9892	0.58	21,287	0.45
Number of females aged 60 and over	-11,929	0.58	2394	0.94
Number of males aged 22 to 39	-17,856	0.28	909	0.97
Number of males aged 40 to 59	-7635	0.69	-6403	0.84
Number of males aged 60 and over	-2471	0.92	-12,858	0.75
Constant	-58,189	0.07	-128,615	0.01

<sup>a</sup> Number of obs = 181; chi2(18) = 105.84; Prob > chi2 = 0.0000; Pseudo R2 = 0.0255; Test rank and file = comm.; F(1, 163) = 12.11; Prob > F = 0.0006

<sup>b</sup> Number of obs = 181; chi2(18) = 89.93; Prob > chi2 = 0.0000; Pseudo R2 = 0.0209; Test rank and file = comm.; F(1, 163) = 25.77; Prob > F = 0.0000

Appendix Table 5: **Cumulative Borrowing from Village Bank External and Internal Accounts Combined**  
(in baht-months)

Independent Variables	Dependent Variable: <sup>a</sup> External and Internal Account Borrowing According to Records		Dependent Variable: <sup>b</sup> External and Internal Account Borrowing Adjusted for Use of Multiple Names	
	Coefficient	P-value	Coefficient	P-value
Months as rank and file member	5063	0.00	5960	0.00
Months as committee member	7814	0.00	12,982	0.00
Female-owned land value 5 years ago	-.00	0.96	-.02	0.30
Male-owned land value 5 years ago	.03	0.40	.02	0.74
Sex of household head (female=1)	-4847	0.86	-11,274	0.81
Education of most highly educated woman	-3626	0.39	2829	0.70
Education of most highly educated man	1538	0.62	-15.9	0.99
Family generations in village	-9420	0.20	-9209	0.47
Number of blood relatives in village	1196	0.26	3498	0.06
Is household member village chief or assistant?(0/1)	-26,790	0.42	18,052	0.76
Are any females civil servants? (0/1)	105,358	0.08	-38,958	0.73
Are any males civil servants? (0/1)	-28,641	0.49	-6312	0.93
Number of females aged 22 to 39	38,282	0.07	44,018	0.22
Number of females aged 40 to 59	18,433	0.38	40,069	0.27
Number of females aged 60 and over	-27,297	0.28	-18,338	0.67
Number of males aged 22 to 39	-16,274	0.40	14,132	0.67
Number of males aged 40 to 59	-10,425	0.64	-19,048	0.62
Number of males aged 60 and over	4423	0.88	-25,733	0.61
Constant	-34,634	0.34	-144,079	0.03

<sup>a</sup> Number of obs = 181; chi2(18) = 146.51; Prob > chi2 = 0.0000; Pseudo R2 = 0.0321; Test rank and file = comm.; F(1, 163) = 18.03; Prob > F = 0.0000

<sup>b</sup> Number of obs = 181; chi2(18) = 119.10; Prob > chi2 = 0.0000; Pseudo R2 = 0.0254; Test rank and file = comm.; F(1, 163) = 39.32; Prob > F = 0.0000

Appendix Table 6: **Sample Regression: Impact of Village Bank on Household Nonland Asset Value**

Independent Variables	Coefficient	P-value
Months as rank and file member	-367	0.56
Months as committee member	3187	0.02
Does household have a village bank member?(0/1)	-5885	0.76
Does household have a village bank committee member?(0/1)	12,987	0.67
Female-owned land value 5 years ago (baht)	.0439	0.00
Male-owned land value 5 years ago (baht)	.0921	0.00
Sex of household head (female=1)	349	0.99
Education of highest educated female (yrs)	3437	0.31
Education of highest educated male (yrs)	4127	0.12
Family generations in village	-7678	0.25
Number of relatives in village	1868	0.07
Is household member village chief or assistant?(0/1)	77,053	0.02
Is female in household a civil servant?(0/1)	471,308	0.00
Is male in household a civil servant?(0/1)	260,787	0.00
Number of females aged 22-39	8372	0.59
Number of females aged 40-59	15,275	0.42
Number of females aged 60 and over	17,968	0.36
Number of males aged 22-39	-10,379	0.49
Number of males aged 40-59	23,382	0.24
Number of males aged 60 and over	19,040	0.42
Village FA	1896	0.96
Village FB	-26,836	0.48
Village FC	-20,317	0.56
Village FD	-53,542	0.14
Village FE	-20,083	0.58
Village FF	-9731	0.78
Village RA	-12,073	0.78
Village RB	-30,246	0.44
Village RC	-87,836	0.03
Village RD	17,076	0.65
Village RF	-49,209	0.19
Village RG	-25,185	0.48
Village RH	-11,448	0.76
Constant	97,358	0.01

Number of obs = 444; F( 33, 410) = 14.25; Prob > F = 0.0000; R-squared = 0.5342;

Adj R-squared = 0.4967

Appendix Table 7: **Impact of Village Bank on Household Outcomes**

Dependent Variables <sup>a</sup>	Independent Variables					
	Coefficient on Months as Rank and File Member ( $\delta_1$ )	P-value	Coefficient on Months as Committee Member ( $\delta_2$ )	P-value	F-test that $\delta_1$ = $\delta_2$	P-value
<b>Physical Assets</b>						
Household wealth	-432	.53	3010	.04	5.73	.02
Women's wealth	-494	.26	1705	.08	5.58	.02
Men's wealth	212	.68	1382	.22	1.15	.28
Household land value	-96.1	.32	-20.8	.92	0.14	.71
Women's land value (T)	31.1	.72	263	.17	1.61	.20
Men's land value (T)	-68.1	.53	-170	.45	0.21	.65
Household nonland assets	-367	.55	3187	.02	7.44	.01
Women's nonland assets	-535	.18	1300	.14	4.74	.03
Men's nonland assets	362	.50	2122	.07	2.40	.12
Household productive assets	-20.2	.94	981	.07	3.74	.05
Women's productive assets (T)	171	.33	870	.01	4.26	.04
Men's productive assets (T)	-153	.58	351	.54	0.82	.37
Household nonland farm assets	52.9	.54	307	.10	1.93	.16
Women's nonland farm assets (T)	88.9	.35	329	.10	1.58	.21
Men's nonland farm assets (T)	-7.22	.94	142	.51	0.50	.48
Household livestock	56.4	.36	514	.00	12.7	.00
Women's livestock (T)	111	.15	187	.24	0.25	.62
Men's livestock (T)	-5.31	.95	355	.06	3.88	.05
Household business assets (T)	-506	.32	872	.37	2.14	.14
Women's business assets (T)	50.0	.90	724	.23	1.46	.23
Men's business assets (T)	-1045	.24	1044	.57	1.32	.25
Household consumer durables	-232	.34	437	.41	1.71	.19
Women's consumer durables (T)	-114	.48	755	.03	7.05	.01
Men's consumer durables (T)	-6.04	.98	-356	.60	0.28	.60
House value	58.4	.88	1220	.15	1.98	.16
<b>Savings, Debt, Lending</b>						
Household savings (cash, bank deposits, etc.)	-172	.22	551	.07	5.91	.02
Women's savings (T)	-80.8	.22	217	.12	4.93	.03
Men's savings (T)	-79.2	.59	425	.16	2.96	.08
Household low-interest debt (interest rate $\leq$ 2 percent/month) (T)	244	.56	1782	.04	3.54	.06
Women's low-interest debt (T)	-290	.44	256	.74	0.57	.45
Men's low-interest debt (T)	461	.30	2012	.02	3.34	.07
Household high-interest debt (interest rate $>$ 2 percent/month) (T)	218	.39	-254	.64	0.77	.38
Women's high-interest debt (T)	373	.14	402	.44	0.00	.96
Men's high-interest debt (T)	-91.3	.80	NA	NA	NA	NA
Household lending out at positive interest (T)	756	.17	2653	.00	4.49	.04
Women's lending out at positive interest (T)	831	.20	2093	.05	1.54	.22
<b>Production, Sales, Expenses, Labor</b>						
Household self-employment production (sales and own consumption)	-6319	.22	-3495	.75	0.07	.80

Appendix Table 7. continued.

Dependent Variables <sup>a</sup>	Independent Variables					
	Coefficient on Months as Rank and File Member ( $\delta_1$ )	P-value	Coefficient on Months as Committee Member ( $\delta_2$ )	P-value	F-test that $\delta_1$ = $\delta_2$	P-value
Women's self-employment sales (T)	-380	.42	2245	.02	7.51	.01
Men's self-employment sales (T)	-11,023	.11	2109	.89	0.83	.36
Household agricultural production	24.2	.75	304	.06	3.15	.08
Women's agricultural sales (T)	104	.28	206	.28	0.30	.59
Men's agricultural sales (T)	-153	.14	200	.35	2.81	.09
Household animal production (sales and own consumption)	-65.2	.11	156	.07	6.84	.01
Women's animal sales (T)	-58.8	.26	229	.03	7.97	.00
Men's animal sales (T)	-17.2	.83	30.2	.88	0.06	.81
Household business sales (T)	-16,841	.06	4101	.82	1.46	.23
Women's business sales (T)	-640	.57	3691	.08	4.73	.03
Men's business sales (T)	-20,886	.12	2635	.92	0.77	.38
Household self-employment expenses (purchase of inputs)	-5813	.23	-4709	.66	0.01	.91
Women's self-employment expenses (T)	-562	.14	1520	.06	7.23	.01
Men's self-employment expenses (T)	-9986	.08	-9368	.44	0.00	.96
Household farming expenses (purchase of inputs)	-41.3	.31	92.7	.30	2.42	.12
Women's farming expenses (T)	9.86	.79	106	.17	1.70	.19
Men's farming expenses (T)	-84.9	.09	5.78	.96	0.77	.38
Household animal-raising expenses (purchase of inputs)	-26.1	.46	56.7	.45	1.27	.26
Women's animal-raising expenses (T)	-12.5	.70	-48.4	.48	0.30	.58
Men's animal-raising expenses (T)	-42.7	.31	106	.22	3.09	.08
Household business expenses (purchase of inputs) (T)	-15,030	.08	4191	.81	1.34	.25
Women's business expenses (T)	-655	.52	3209	.08	4.89	.03
Men's business expenses (T)	-19,797	.13	3631	.89	0.81	.37
Household self-employment labor hours	-4.60	.48	26.9	.06	5.25	.02
Women's self-employment labor hours	-1.94	.63	14.0	.11	3.47	.06
Men's self-employment labor hours	-2.67	.53	12.9	.16	3.11	.08
<b>Health Care and Education</b>						
Household medical expenses (T)	-43.7	.11	-47.6	.42	0.00	.95
Medical expenses for women (T)	-13.3	.44	-46.0	.23	0.77	.38
Medical expenses for men (T)	-23.5	.46	-66.9	.36	0.38	.54
Medical expenses for children (T)	6.09	.53	-10.7	.64	0.58	.44
Medical expenses for girls (T)	-1.08	.92	8.38	.74	0.15	.69
Medical expenses for boys (T)	12.2	.27	-26.7	.35	1.88	.17
School expenses for children in household	5.39	.77	86.6	.04	4.29	.04
School expenses for girls	-1.47	.93	2.79	.93	0.02	.89
School expenses for boys	6.80	.69	127	.00	10.14	.00

<sup>a</sup> Measured in baht unless stated otherwise.  
 NA means not applicable.  
 (T) means that Tobit regression is used.

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