Microfinance

1. INTRODUCTION

- Because of transactions costs (screening, monitoring and enforcement) credit markets are imperfect, and these are more severe in developing countries.
- Standard solution (in the absence of non-monetary punishments) is to use collateral.
- Two problems
    - A large fraction of the population in developing countries is poor & do not own *any* assets - poverty trap
        - Policy Implication: Credit subsidy, redistribution
    - Even those who own assets, do not necessarily have formal titles, and also foreclosing on collateral is costly because of inefficient judicial system
        - Policy Implication: Titling, rewriting bankruptcy codes, legal reform
- The evidence on subsidized lending is not very encouraging
        - Low repayment rates: 30% in Pakistan, 41% in India (IRDP), 51% in Bangladesh
        - Debts expected to be written off due to political reasons & also, captured by the rich

- The evidence on titling is mixed: some find large effects on credit supply (see Feder and Feeny, World Bank Economic Review 1991 for land titling programme in Thailand) while Fields and Torrero (2005) find moderate effects in urban housing titles in Peru
- More generally, like asset redistribution (we will look at land reform in the next lecture) titling involves significant political and administrative costs
- Easier way out – convert "social capital" that exists in social networks in close-knit societies into "invisible" collateral
- Members of a community know more about one another than an outside institution such as a bank.
- While a bank cannot apply financial or non-financial sanctions against poor people who default on a loan, their neighbors may be able to impose powerful non-financial sanctions at low cost.
- An institution that gives poor people the proper incentives to use information on their neighbors & to apply non-financial sanctions to delinquent borrowers can out-perform a conventional bank.
- Achieve goals of both efficiency & equity (conventional lending programs being merely redistributive)

2. MICROFINANCE

- The Grameen Bank of Bangladesh Lends to about two million people, most of whom are rural, landless women, operates in 36,000 villages, or about half of all villages in the country.

- Worldwide, 13 ml clients were served in 2000 with other major MF organizations being FINCA, BANCOSOL, BRI, BKD, ACCION, and BRAC

- Small loans for self-employment projects (e.g., poultry, paddy husking, handloom weaving, grocery or tea shops, dairy farming)

- No collateral is charged, interest rates though high are less than those charged by moneylenders

- Borrowers organize themselves into self-selected groups of five people from the same village

- Loans are given for individual project, but group is jointly liable for each other's loans - if any member of a group defaults, all members are ineligible for credit in the future

- Stands out compared to conventional lending approaches in terms of (a) Reaching Target Groups and (b) Loan Repayment
  - The IRDP in India : on average, percentage of ineligible beneficiaries 15-26%, the highest reported being 50%. In contrast, for the Grameen Bank, only 5% borrowers were outside the target group
  - IRDP repayment rates 41% for India as a whole (Pulley, 1989). For the Grameen Bank, even according conservative estimates (Morduch, 1999) it is 92%.

- A role model for other micro-credit programs.

- Economists argue that joint liability induces borrowers to monitor each other ("peer monitoring"), put pressure on delinquent group members ("peer pressure") and induce better group selection ("peer selection")

Theoretical Models

(based on Ghatak-Guinnane 1999)

All parties are risk-neutral.

Need 1 unit of capital to start a project, but have no money

Opportunity cost of capital **ρ** & opportunity cost of borrower's labor, **u**

The bank can only collect money from you when output is high (limited liability)

Project returns of borrowers are uncorrelated

Focus on groups of size 2

Standard debt contract: If you are able to repay, pay **r**

Joint liability Contract **:** If you are able to repay, pay **r** for yourself **AND** in addition

c if your partner fails

0 if your partner succeeds

Adverse Selection (Ghatak, Van Tassel, Armendariz-Gollier)

2 types of borrowers in the population, safe & risky

Differ only in their probabilities of getting high output, $\mathbf{p_s}$ & $\mathbf{p_r}$

Output can be high ($\mathbf{R_i}$) or low (**0**) with probabilities $\mathbf{p_i}$ & $\mathbf{1-p_i}$

Projects have same mean return $\mathbf{p_i R_i = R}$

Assumption: Projects are socially profitable $\mathbf{R > \rho + u}$

Bank can't tell who is who, but borrowers know each other's types

If you charge the same interest **r** then risky borrowers could borrow, raising the interest rate & reducing the surplus of safe borrowers

Joint Liability: Ask borrowers to select own partner

Expected payoff of borrower of type i when partner is type j

$$EU_{ij}(r,c) = p_i p_j (R_i - r) + p_i (1 - p_j)(R_i - r - c)$$

Naturally, everyone would like to have a safe borrower as partner

If I fail, I don't care what my partner's type is, but if I succeed, my expected gain from having a safe partner is $(\mathbf{p_s - p_r) * c}$ whatever is my type

But before I know whether I am successful or not, my *expected* gain from having a safe partner is $EU_{ss} - EU_{sr} = \mathbf{p_s}*(\mathbf{p_s - p_r) * c}$ if I am safe & $EU_{rs} - EU_{rr} = \mathbf{p_r}*(\mathbf{p_s - p_r)* c}$ if I am risky

Safe borrowers value safe partners more than risky borrowers do

Given that they have risky partners, risky borrowers dislike joint liability more than safe borrowers

Offer two contracts one individual liability & the other joint liability

Safe borrowers will select the latter & risky ones the former

Repayment rates would improve, & welfare go up

Moral Hazard (Stiglitz; Banerjee-Besley-Guinnane)

Borrower can take actions that are costly for the bank to monitor, which affect the probability of success **p**

The harder you work, the more you are likely to succeed but working hard is costly for you, say, $\mathbf{1/2*\gamma p^2}$

If you used your own money, you would choose the efficient level of effort

Maximize $\mathbf{pR - 1/2*\gamma p^2}$ with respect to **p** which yields $\mathbf{p^*}$ $\mathbf{= R/\gamma}$ (Assume $\mathbf{R < \gamma}$)

The reasons why you would choose an effort level that is less than the efficient level are (a) unobservability of **p** and (b) the fact that you cannot pay anything when output is low.

The interest rate needs to be paid only when you succeed, not when you fail, & so this reduces the attractiveness of success:

Maximize $\mathbf{p(R-r) - 1/2*\gamma p^2}$ with respect to **p**, which yields

$\mathbf{p = (R-r)/\gamma < p^*}$

Since repayment rates are low, interest rates will be high

Under joint-liability suppose your partner chooses an effort level $\mathbf{p'}$

Maximize $p(R-r) - cp(1-p') - 1/2*\gamma p^2$ with respect to p, which yields $p = (R- r - c) /\gamma + c/\gamma * p'$

The higher is the partner's effort level, the more you want to choose a higher effort level, since the expected "tax'' on your success output is less

If borrowers don't recognize this externality & behave non-cooperatively, then in a symmetric Nash-equilibrium

$\mathbf{p = (R- r - c) / (\gamma - c)}$

If borrowers recognize this externality & cooperatively choose their effort levels to solve

$Max_p\ p(R-r) - cp(1-p) - 1/2*\gamma p^2$

We get $\mathbf{p = (R- r - c) /(\gamma - 2c),}$ i.e., a higher effort level

In the paper by Ghatak-Guinnane (1999) there is a proof that if the borrowers don't recognize the externality then the repayment rate will be the same as in a standard IL loan. Basically, you have to use to bank's zero profit condition.

Enforcement (Besley-Coate)

Alter the above framework in the following ways:

There are no screening or monitoring problems

Output **R** is continuous

Borrowers risk-averse - concave utility function **u(.)**

Legal enforcement is very costly & banks need to use threats of denying loans in the future

B is the PDV of the benefits of receiving future loans

Consider first a regular loan contract

A borrower will repay if & only if

$u(R) - u(R - r) < \text{or} = B$

We can solve **R(r)** when the above holds with equality.

The greater is **r**, the higher will be **R(r)**

Borrowers repay only when **R>R(r).**

Consider joint-liability lending such that **r=c**

Then a borrower repays her own & her partner's loan if & only if

u(R) – u (R – 2r) < or = B

That is, if R>R(2r).

Two cases:

If one member is unwilling or unable to repay & the other is willing to repay both loans (i.e., **R>R(2r)**) , then JL is better than standard loans

If one member is unwilling or unable to repay & the other is willing to repay her own loan but not both loans (i.e., **R(r)<R<R(2r)** then JL is worse than standard loans

Depending on which states are more likely, which depends on the probability distribution of output, JL could have higher or lower repayment rates than standard loans

However, default by one borrower when she was able but unwilling to repay her loan (**r < R < R(r)**) hurts her partner who is willing to repay her own loan, the community might punish the former – Social Capital.

A Simple Model of Sequential Lending (based on Roy Choudhury, 2005[1])

- Group lending sometimes involves sequential lending

- In Grameen, loans are initially given to two borrowers, and if they pay their initial monthly installment then other borrowers receive loans

- Roy Chowdhury (JDE 2005) and Aniket (2005) show that this induces "extra" monitoring on the part of those whose turn come later (even if there is no joint liability)

First we present a simplified version of Roy Choudhury, JDE 2005

Suppose a borrower can choose an action $x \in \{0,1\}$ which is subject to moral hazard.

[1] Not required reading. We will also not cover the paper by Drugov-Macchiavello which is listed as required in the syllabus due to time constraints, and so this reading is not required anymore.

$x = 1$ is the good action which yields an output of H

x=0 is the bad action that yields a benefit b to the borrower (say, blowing it on drinks)

No uncertainty.

The opportunity cost of capital is r (exogenously given)

Borrowers have no wealth, and there is limited liability

Borrowers can perfectly monitor each other and can "induce" the other person to do the right thing at cost φ
Suppose the moral hazard problem is severe, so that under a standard IL contract borrowers will always default

$$H - r < b$$

As a result, banks will not lend unless banks can directly monitor

Under JL, the borrower has to pay H-2r

Suppose they choose monitoring decision simultaneously with M denoting they monitor, and D denotes they don't

1 \ 2	M	D
M	H-r-φ, H-r- φ	b- φ, H-2r
D	H-2r, b- φ	b,b

The payoffs from (M,M) and (D,D) are self-evident

Consider (D,M): switching from M to D, 1 knows that 2 will default but he will not as 2 continues to monitor (admittedly, not realistic)

So he is going to have to pay H-2r to the bank while 2 will get b- φ

If $r > \varphi$ then game has two Nash equilbria (M,M) and (D,D)

(If $r < \varphi$ then monitoring is so costly, it is easier paying back the partner's loan - not plausible)

Strategic complementarities in monitoring effort.

If you know the other guy is shirking, no point putting in the monitoring effort.

1 \ 2	M	D
M	$H-r-\varphi$, $H-r-\varphi$	$b-\varphi$, $H-2r$
D	$H-2r$, $b-\varphi$	b,b

Notice that (D,D) Pareto-dominates (M,M)

So assuming borrowers can coordinate, there is no monitoring

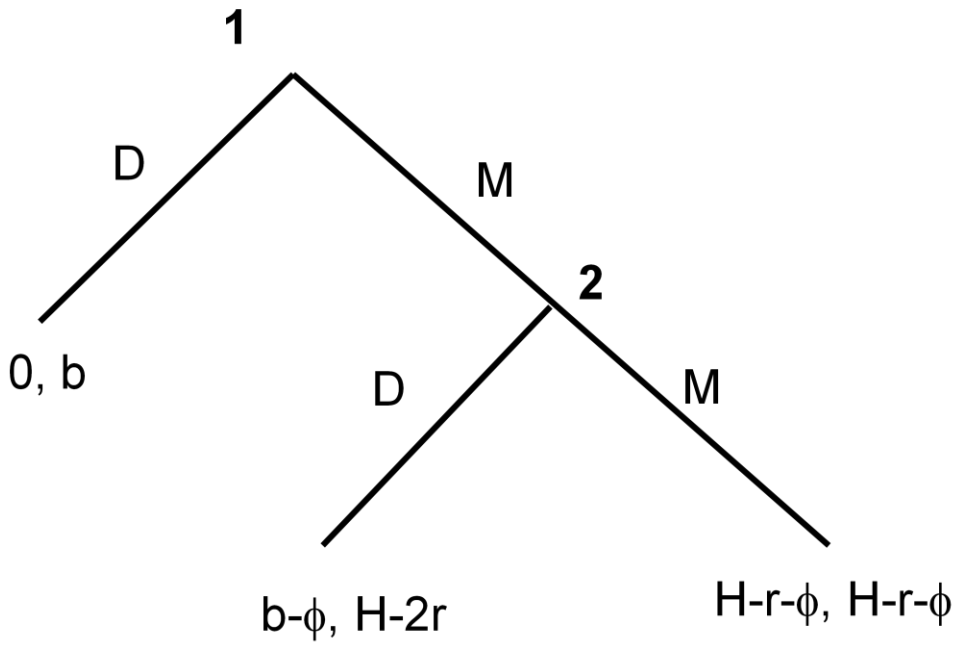
Now convert this to a sequential game

Borrower 2 gets a loan first, and 1 can choose to monitor or not

If 2 chooses the good project then the success revenue is held in an escrow account (e.g., “group fund”)

(Otherwise lender might have a temptation to take it using some excuse)

Then 1 gets his loan, and 2 decides to monitor or not



2 will choose M as $r > \varphi$

Knowing this, 1 will choose M as well.

Actually, M is a dominant strategy for 1 as $b - \varphi > H - r - \varphi > 0$

The problem of being stuck in the bad equilibrium is gone

Roy Choudhury's conclusion is this shows sequential lending induces monitoring

Other Arguments

- Women are better borrowers
- Direct monitoring by MFOs (Micro Finance Organizations)
- Also, there is a regular repayment schedule: every week you have to repay a bit. According to Yunus, having to repay a big amount at one go tempts borrowers to default. Jain and Mansuri (JDE 2003) and Fischer and Ghatak (2009) are some theoretical papers that examine this argument.

Empirical Questions

- What enables MFOs to achieve high repayment rates?
- What is the impact on the poor?

Studies have compared the performance of microfinance programs that use individual liability with those that use joint liability & found that the latter in general have better repayment rates

Problem: If borrowers can choose whether to join a joint liability program & a standard loan program, better risks will join the former. So comparing the repayment rates of the two programs leads to biased estimates. Still, selection is a socially valuable role. Mckernan (1998) finds evidence of strong selection effects using Bangladesh data.

Other studies have focused on microfinance programs that use joint liability

They use variables that proxy for social cohesion & better information flows among group members and find positive correlation with repayment rates

Problems:

Given the opportunity of selecting one's own partners, if a person still ends up in a group with little social capital, then the group members must be relatively unreliable & unattractive.

If groups are formed by villages or neighborhoods, then areas that have greater social capital may have better repayment, but they may also have better economic opportunities (e.g., better infrastructure, less crime).

Dean Karlan's (2006) study based on FINCA, Peru uses a quasi-randomized experiment

When lending groups are formed, borrowers are not asked to self select their group members, nor are they assigned by the lender. Individuals come from different parts of the city to the office of the lender at the city centre and sign up for loans.

Groups are formed on a first come first served basis. You sign up on a list. Every time 30 names are completed, a group is formed. (Goal is to "create social capital")

The process is fast enough that you don't feel compelled to find your own peers. So their composition is random.

Individuals do not come in groups. Sometimes, they are invited by a friend or relative. These individuals are deleted from the sample.

Exogenous variation in how connected the borrowers are in terms of social networks (geographic distance & cultural distance).

These are correlated with indices such as if these borrowers have traded with one another, know each others homes, borrowed from each other and sit next to each other in group meetings.

1694 individuals, over 4804 loan cycles, or 2.8 loans per person. 21% of the (uninvited) individuals defaulted

Runs regression of the form:

$Y_i = \alpha + \beta_1 X_i + \beta_2 Z_i + \varepsilon_i$ where Y is a financial outcome (e.g., default as a percentage of loan amount), X is one of the social capital measures (geographic proximity or cultural similarity) and Z includes neighborhood dummies, year and age of group, age, marital status, distance to FINCA etc.

Groups with that are more connected are significantly more likely to repay their loans.

Also, better connected individuals are more likely to be forgiven by their peers suggesting the latter can distinguish between default due to moral hazard and default due to bad luck

Karlan and Gine (2007)

- Question: can we try to directly estimate the impact the effect of joint liability?
- Worked with the Green Bank of Caraga in the Philippines to conduct a field experiment to address this question.

Took 169 previously formed group liability centres of approximately twenty women

Within each center, members divide into groups of five. Under the normal group liability system, those in the group of five are the first layer of liability for any default. Only if those five fail to pay the arrearage of an individual is the center as a whole responsible for an individual.

The researchers converted 80 to individual-liability centres (treatment) and kept 89 as-is with group liability (control) in three waves between August 2004 and May 2005.

The weekly group meetings still occurred; only the group liability was removed.

Group payments were still done at the weekly meeting. Although after the conversion group meetings did not include a discussion or review of who was in default, the fact that all were at the meeting provided ample opportunity for people to learn of each

other's status. Thus, many clients may still repay not out of social pressure, but rather out of concern for their social reputation.

Estimate a difference-in-difference (using pre-post and treatment-control data) model using OLS:

$$y_{igt} = \alpha + \beta T_{gt} + \delta_t + \theta_g + \varepsilon_{igt}$$

where the subscript *i* refers to the individual, *g* the group, and *t* the time period, *T* is an indicator variable if center *g* is under an individual liability regime at time *t*, δt are time fixed effects and θg are center fixed effects.

Thus, β is the coefficient of interest.

After one year, we find no increase in default and we find higher outreach due to more new clients joining the treatment groups.

Table 2 Columns 1, 2 and 3 show that the conversion to individual liability had no adverse effect on client repayment.

Given that the default rate is very low, the impact of conversion can be seen as a one-sided test, where at best there is no increase in default.

Not only is the point estimate close to zero, but most economically significant effects can be ruled out

Thus, they do not find strong enough evidence to support the "social collateral" story of Besley and Coate (1995) that predicts higher repayment for group liability loans

However, cannot rule out screening story as the borrowers were pre-selected in both control and treatment effects.

At best, finds moral hazard/enforcement were not important determinants of repayment via group liability.

Different Issue: Does Micro-credit actually help the borrowers?

Compare average consumption levels of villages where Grameen operated with villages where it didn't

Problems (Morduch 1998):

Grameen could choose to operate in poorer villages.

Within a village, Grameen lends to poorer groups (rule out individuals who have more than 0.5 acres of land)

Use difference-in-difference approach.

The effect of having access to Grameen: compare the difference in consumption levels of eligible groups in villages with and without Grameen.

Still not much effect.

What is wrong?

Other programs could use the same criterion.

Also, eligibility rule not strictly followed.

Not Required

Other credit institutions that use social networks: Rotating Saving and Credit Associations (ROSCAs)

A group of n individuals commit to put in £x into a pot each period over a given number of periods, m.

Each period the pot is allocated to one member of the group by convention, drawing lots, or bidding

Each period the process is repeated with past winners excluded until the last member has received the pot.

Not gambling nor a conventional bank
Besley-Coate-Loury: Overcomes indivisibilities in the presence of credit market imperfections

Suppose all individuals live for five periods. They can buy a machine that costs £1000 to produce a revenue of £1300 per period. Machine depreciates by £100 per period.

If you have the money, then your net surplus is £5*(1300-100)=£6000

Suppose not, and you can save upto £250 per period. Then will take 4 periods to save. Then you can use the machine for two periods only, earning £2*(1300-100)=£2400.

Suppose four of you pull your resources together and by lottery decide who gets the pot first. Then the first person will have a surplus of £6000 and the very last one will have a surplus of £2400, the same as before. Pareto improvement.

Social commitment device to save

Requires strong social networks – otherwise why bother to show up after getting your turn?

Table 4: Individual Default
OLS, Tobit and Probit

	Dependent variable: Percent of loan in default at end of cycle					
	1st Loan Only			All Loans		
	OLS	Tobit	Probit	OLS	Tobit	Probit
	(1)	(2)	(3)	(4)	(5)	(6)
Distance from individual's home to original members of group	0.014	0.316	0.017	0.043	0.297	0.040
	(0.078)	(0.353)	(0.020)	(0.069)	(0.248)	(0.027)
	n=616	n=616	n=616	n=1801	n=1801	n=1801
Percent of original members within 10 minute walk of individual's home	-1.506 ***	-5.835 ***	-0.269 ***	-1.518 ***	-3.664 ***	-0.353 ***
	(0.391)	(1.768)	(0.080)	(0.374)	(1.070)	(0.134)
	n=616	n=616	n=616	n=1801	n=1801	n=1801
Percent of original members with same culture as individual	-0.511 *	-3.776 **	-0.178 ***	-0.364	-1.254	-0.153
	(0.297)	(1.700)	(0.065)	(0.295)	(1.058)	(0.109)
	n=616	n=616	n=616	n=1801	n=1801	n=1801

*** 99% significance; ** 95% significance; * 90% significance

Each cell is a separate specification.

Standard errors corrected for clustering at the group level in all specifications.

Individuals weighted evenly "all loans" specifications.

Individual level specifications include the following control variables (See Appendix Table 2 for results on control variables):
Distance to FINCA (town center), town dummy, neighborhood dummies, age, education, marital status, siblings, children, # in household, year, and age of group when individual joined.

Loan size estimated using approved loan amount, which is savings balance at end of prior cycle.

DONE 3/25

Khandker "Does micro finance really help the poor"

Table 6

Average logarithm of consumption per capita, Difference-in-difference using *de facto* classifications (n = 1798)

	Grameen	BRAC	BRDB		Difference		
	(1)	(2)	(3)	Control	(1)	(2)	(3)
"Eligible"	4.23	4.24	4.18	4.24	-.01 (.33)	0 (.16)	-.06** (1.98)
"Not eligible"	4.50	4.53	4.60	4.51	-.01	.02	.08
Difference	-.27	-.29	-.42	-.27	0 (.05)	-.02 (.12)	-.14 (1.54)

Absolute values of t-statistics of differences in parentheses; ** (*) significant with 95% (90%) confidence.

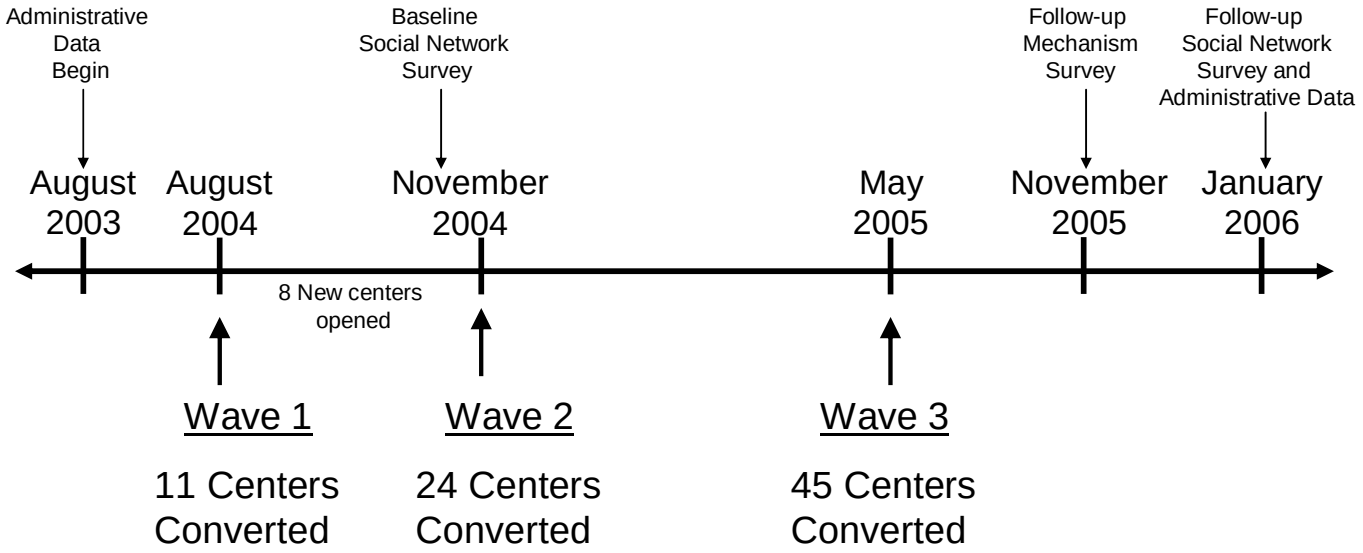
Table 7

Average logarithm of consumption per capita, Difference-in-difference using *de jure* classifications (n = 1562)

	Grameen	BRAC	BRDB		Difference		
	(1)	(2)	(3)	Control	(1)	(2)	(3)
Under 0.5 acre	4.17	4.21	4.17	4.24	-.07** (2.12)	-.03 (1.08)	-.07** (2.33)
Over 0.5 acre	4.51	4.54	4.61	4.51	0	.03	.10
Difference	-.34	-.33	-.44	-.27	-.07 (.75)	-.06 (.65)	-.17* (1.91)

Absolute values of t-statistics of differences in parentheses; ** (*) significant with 95% (90%) confidence.

Figure 1: Experimental Design



Total 169 Centers

80 Treatment

89 Control

Table 1: Summary Statistics

	All	Control	Treatment				F-stat Control vs Treatment
			All Waves	Wave 1	Wave 2	Wave 3	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
A. Center Performance, pre-intervention (Aug 2004)							
Total number of accounts	20.512	20.276	20.253	23.600	18.333	21.218	0.774
	(0.925)	(1.261)	(1.367)	(4.017)	(2.653)	(1.742)	
Average Loan size	6078.750	6135.264	6009.355	4758.583	5997.003	6306.050	0.689
	(159.833)	(227.906)	(223.152)	(348.283)	(413.538)	(303.972)	
Proportion of missed weeks over cycle	0.070	0.065	0.083	0.039	0.042	0.099	0.926
(May-Aug 2004)	(0.011)	(0.011)	(0.019)	(0.024)	(0.018)	(0.031)	
Retention	0.904	0.901	0.906	0.933	0.930	0.892	0.758
(May-Aug 2004)	(0.011)	(0.016)	(0.015)	(0.020)	(0.022)	(0.022)	
Number of active centers, August 2004	169	89	80	11	24	45	
B. Individual-level Performance, pre-intervention (Aug 2004)							
Proportion of missed weeks over cycle	0.062	0.058	0.066	0.090	0.065	0.059	0.241
	(0.003)	(0.004)	(0.005)	(0.020)	(0.008)	(0.005)	
Loan amount	6082.074	6123.237	6036.125	5165.354	5778.497	6399.568	0.503
	(64.944)	(90.359)	(93.072)	(180.301)	(193.300)	(125.040)	
Number of active clients, August 2004	3,308	1,744	1564	231	399	972	

Standard errors in parentheses. 52 pesos = US$1. t-statistics reported in column (7) is the probability of (column (2) - column (3)) being zero. F-stat in Column 7 is from a regression of the outcome variable of interest on a set of indicator variables for each of the treatment waves.

Table 2: Cycle-level Impact on Default, Savings, and Loan Size by Conversion Waves

OLS

Sample frame: Baseline clients only

Dependent Variable:	Proportion of missed weeks	Proportion of past due balance, at maturity date	Past due balance, 30 days past maturity date (binary)	Total excess savings	Loan Size
	(1)	(2)	(3)	(4)	(5)
Panel A: Wave 1 Conversion (Aug 2004)					
Treatment	-0.017	0.051	0.004	9.679	-853.041
	(0.040)	(0.077)	(0.003)	(69.493)	(726.291)
Constant	0.916***	0.131***	0.000	44.712***	2,490.513***
	(0.006)	(0.021)	(0.000)	(16.487)	(84.169)
Mean of dependent variable	0.078	0.133	0.001	272.561	6395.923
Observations	9027	9027	9027	8097	9027
Number of group(branch center)	97	97	97	97	97
R-squared	0.07	0.01	0.01	0.01	0.17
Panel B: Wave 2 Conversion (Nov 2004)					
Treatment	0.017	0.070	0.002	-32.080	-962.557**
	(0.014)	(0.113)	(0.003)	(29.751)	(418.074)
Constant	0.831***	0.188***	0.002***	111.848***	354.202*
	(0.016)	(0.042)	(0.001)	(12.333)	(206.981)
Mean of dependent variable	0.075	0.179	0.002	271.560	6314.152
Observations	10557	10557	10557	9434	10557
Number of group(branch center)	112	112	112	112	112
R-squared	0.08	0.01	0.01	0.01	0.14
Panel C: Wave 3 Conversion (May 2005)					
Treatment	-0.029	0.029	0.003	-21.806	-407.574
	(0.022)	(0.091)	(0.003)	(32.542)	(343.917)
Constant	0.008	0.094*	0.002***	338.2863	2,724.253***
	(0.007)	(0.051)	(0.000)	(7.981)	(88.509)
Mean of dependent variable	0.076	0.131	0.001	279.803	6345.303
Observations	14189	14189	14189	12497	14189
Number of group(branch center)	134	134	134	134	134
R-squared	0.08	0.01	0.01	0.01	0.12

Robust standard errors clustered by lending centers in parentheses, * significant at 10%; ** significant at 5%; *** significant at 1%. All regressions use fixed effect for lending centers and time. Proportion of missed weeks is calculated by the number of weeks in which the client did not make the full installment divided by the number of installments. Treatment variable is one if the loan cycle ends after the conversion in treatment centers; zero otherwise.