Repayment Frequency and Default in Micro-Finance: Evidence from India

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Abstract

In stark contrast to bank debt contracts, most micro-finance contracts require that repayments start nearly immediately after loan disbursement and occur weekly thereafter. Even though economic theory suggests that a more flexible repayment schedule would benefit clients and potentially improve their repayment capacity, micro-finance practitioners argue that the fiscal discipline imposed by frequent repayment is critical to preventing loan default. In this paper we use data from a field experiment which randomized client assignment to a weekly or monthly repayment schedule and find no significant effect of type of repayment schedule on client delinquency or default. Our findings suggest that, among micro-finance clients who are willing to borrow at either weekly or monthly repayment schedules, a more flexible schedule can significantly lower transaction costs without increasing client default.

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1 Introduction

A large literature in development economics examines the optimal design of credit contracts when clients are unable to provide collateral and there is limited liability (for an overview see Ray (1998)). However, this literature has paid scant attention to a central feature of the typical credit contract offered by micro-finance institutions (now on, MFI) – frequent repayment in a group setting (Armendariz and Morduch 2005).

MFIs are increasingly a central source of credit for the poor in many countries.[1] The typical repayment schedule offered by a MFI consists of weekly repayment starting 1-2 weeks after loan disbursement. The weekly repayment amount is usually calculated as the principal and interest due divided by the number of weeks until the end of term and payments are generally collected in a group meeting led by the MFI loan officer. Weekly collection of repayment installments by bank personnel is one of the key features of micro-finance that is believed to reduce default risk in the absence of collateral and make lending to the poor viable. On the other hand, it also dramatically increases MFI transactions costs, thereby limiting the set of loan sizes and client types that are profitable under this model.

Given this tradeoff, an important question is whether reduced repayment flexibility, as exemplified by high frequency of repayment, actually reduces the likelihood that a client defaults on her loan. If individuals are rational, and function in a full information environment, then a less rigid repayment schedule should never increase default or client delinquency. Rather, by encouraging longer term investments it may improve clients' long run repayment capacity. However, micro-finance practitioners frequently suggest that a more realistic model is one in which clients benefit from the fiscal discipline afforded by a more rigid payment schedule. More frequent repayment, by providing clients a credible commitment device, enables them to form the habit of saving regularly. It also serves as a savings mechanism for clients without access to banking services. In addition, frequent meetings with a loan officer may improve client trust in loan officers and their willingness to stay on track with repayments. For all of these reasons, micro-finance practitioners believe that more frequent repayment schedules improve client repayment rates, as is evidenced by the almost universal practice of weekly repayment among MFIs .[2]

[1] According to Daley-Harris (2006) as of December 31, 2005 3,133 micro-credit institutions had reported reaching over 80 million poor households worldwide.

[2] A different explanation for frequent repayment is offered by Jain and Mansuri (2003). They suggest that the need to raise funds for frequent repayment makes clients take

Despite the sharp disjunction in the predictions afforded by the rational economics model and the behavioral model, evidence on whether repayment frequency influences default rates in micro-finance remains limited. Armendariz and Morduch (2005) report anecdotal evidence from Bangladeshi micro-finance providers suggesting that micro-finance contracts with less frequent repayment saw higher client default. Mcintosh (2007) exploits spatial variation in the repayment schedule associated with micro-finance contracts offered by FINCA in Uganda to provide a more formal analysis. In 2000, FINCA offered clients in the east and north of the country the option to elect (by a unanimous vote) to change from the standard weekly repayment practice to repaying the loan every other week. Relative to weekly repayment schedule, groups which opted for the fortnightly weekly schedule saw lower drop-out and increased repayment. While supportive of the predictions from economic theory, the fact that clients chose their repayment schedule makes it possible that "better" clients self-selected into the fortnightly repayment schedule.

In this paper we use data from a field experiment on repayment schedules conducted in urban India to examine whether repayment frequency affects loan default and delinquency. One hundred micro-finance groups, each consisting of ten first-time borrowers, were randomly assigned to either a weekly or a monthly repayment schedule after group formation had been completed and clients approved for the loan. Since treatment assignment occurred after loan approval, no clients dropped out of the assigned group at this stage. Therefore, we can be confident that any observed differences in default patterns across clients on the weekly and monthly repayment schedule are attributable to features of the repayment schedule.

We find that switching from weekly to monthly installments did not affect client repayment capacity. Consistent with the patterns observed among the bank's clients outside of our experiment, there was no default among either the weekly or monthly clients. Likewise, delinquency rates were low and not statistically different across clients on weekly and monthly repayment schedules.

These results suggest that switching to lower frequency repayment schedules could allow MFIs operating in comparable settings to save dramatically on the transaction costs of installment collection while facing virtually no added risk of default. It is often held that high MFI transaction costs, in a large part driven by the cost of frequent payment collection

out informal sector loans. The MFI, in turn, benefits from the superior monitoring technology of moneylenders and therefore prefers a repayment schedule which makes it more likely that the client also takes out informal sector loans.

(Shankar 2006), keep MFI interest rates high and limit their ability to scale up operations and reach new clients in more remote locations (Armendariz and Morduch 2004). Our findings suggest that a slight variation of the traditional micro-finance model could allow MFIs to reach up to four times as many clients without hiring additional collection officers, and thereby significantly expand operations without incurring a loss. It is, however, important to note that this policy implication rests on the assumption that the risk composition of borrowers is not negatively influenced by a more flexible repayment schedule.

Section 2 describes the field experiment. Section 3 reports our findings and Section 4 concludes.

2 Context

In April 2006 we began a field experiment on repayment schedules in collaboration with a leading micro-finance institution in Kolkata, 'Village Welfare Society' (now on, VWS). The loan product we study is the classic joint liability loan made by VWS to groups of 10 women living in the same neighborhood. VWS offers uniform loan amounts, interest rates and repayment schedules to every first-time borrower – a Rs. 4000 (˜$100) loan to be repaid, together with an interest fee of Rs. 400, over 44 weeks starting two weeks after loan disbursement. At any point after 20 weeks, clients have the option of repaying the remaining balance on the loan in one installment and graduating to a larger loan.

The relatively low initial loan size, combined with VWS policy of targeting self-employed women with household income of less that two dollars a day, implies that the VWS client base is largely drawn from low- to low-middle income households who are recruited from peri-urban neighborhoods of Kolkata. The majority of the VWS clients are self-employed, and common business enterprises include garment retail and servicing.

Client groups that participated in our experiment were formed through the normal VWS process by five loan officers recruited specifically for this project. To form a group the loan officer first visited a potential neighborhood and conducted an "Eye Survey" to identify whether the neighborhood had a sufficient number of potential clients. This was followed by a large meeting in which the loan officer provided potential clients information about VWS loan products. Interested individuals were invited to a five-day intensive Continuous Group Training program. These women met for an hour each day during which the loan officer described the benefits and responsibilities associated with the loan product. At the end of the five-

day training, women participated in a Group Recognition Test and women who were considered sufficiently informed and interested to be eligible for a VWS loan were formed into a group by the loan officer.

Between April and September 2006, the loan officers working on this experiment formed one hundred groups consisting of 1026 first time borrowers. While group size ranged from 8 to 13 members, 80% of the groups had 10 clients.[3] After group formation was finalized, the repayment schedule for the group was randomly assigned in a public lottery. The experimental arms included one control group and two treatment arms. The thirty control groups were assigned the normal VWS repayment schedule of weekly repayment at a weekly meeting. Thirty-eight groups who were assigned to the first treatment arm followed a repayment schedule of monthly repayment at a monthly meeting. The thirty groups in the second treatment arm were also assigned a monthly repayment schedule. However, they were required to attend weekly meetings for (on average) the first three months after loan disbursement, after which point they graduated to a monthly meeting schedule.

As with all first-time VWS borrowers, clients in our experiment received a Rs. 4000 loan with a fixed Rs. 400 interest payment. Clients on the weekly repayment schedule repaid Rs. 100 every week for 44 weeks starting 2 weeks after loan disbursal. In contrast, clients on the monthly repayment schedule repaid 11 Rs. 400 installments starting the second month after the loan was disbursed. In all cases, repayment occurred in a group meeting led by the loan officer and held at one of the client's homes. During each meeting, which lasted between 15 and 30 minutes, clients took an oath (in which they promise to repay regularly and observe joint liability), the loan officer collected members' repayment and marked their passbooks and collected basic data from each client.

There are no "late fees" for delayed installments, so clients' incentives to repay according to the assigned schedule is driven entirely by fear of losing access to future loans from this provider. VWS is the main MFI in the neighborhoods where our experiment was located, and faces almost no competition in these locations from other lenders. Correspondingly, the majority of clients in our experiment had not borrowed from a MFI before and very few reported borrowing from alternative formal or informal sources during the course of the experiment. Although the penalty for default is not made explicit to clients (this appears to be typical of Indian MFIs), discussions with clients suggest that they consider VWS as the

[3]There were eighty 10-member groups, two 9-member groups, eight 11-member groups, nine 12-member groups, and one 13 member-group.

main potential source of credit available to them and recognized that their access to future loans would be compromised if they defaulted on loan repayment or were sufficiently delinquent.

3 Data and Results

We administered a baseline survey to clients as soon as group formation was completed.[4] A randomization check using these data indicate that our experimental groups are balanced across a wide set of observable household and group characteristics, including month of group formation, and client income, education, occupation, age and family size.[5] We tracked clients' repayment behavior using two data sources: repayment date and amount recorded on a continuous basis in clients' passbooks and compiled into a bank database by VWS, and client-wise data collected by loan officers at each group meeting. The group meeting data include whether a client attended a meeting, whether she repaid the full amount at that meeting herself and whether another group member repaid for her.

We first examine the influence of repayment schedule on default. As MFI loans are not backed by collateral, clients' main motivation for repaying is their expectation of future loans from the MFI if they repay promptly. It is therefore appropriate to measure loan delinquency as non-repayment by the date beyond which the client is barred from future loans. From the bank's perspective the cut-off date after which they would favor strict client penalties is the date after which the Indian central bank deems the loan as part of the MFIs Non-performing Assets. During 2006-2007, this was 15 months after loan disbursement for the standard MFI loan product. Therefore, for our study clients, our first measure of loan default is whether the client has made full repayment by week 60 of the loan cycle. At the point of data analysis (August 2007), only 1% (11 clients) of our analysis sample were not 60 weeks past their loan disbursement. Since their outcomes are right-censored, we excluded these clients from the regression. To make use of a larger set of clients, we define as an alternative measures of default as full repayment within 56 weeks, and 54 weeks, of loan disbursement. The 54 week cut-off has the advantage of including all clients in the study. All three cutoff points are beyond the official maturation date for weekly and monthly clients, although it is important to keep in mind in interpreting differences across experimental arms that, due to

[4] 1016 of the 1028 clients completed this survey.

[5] The randomization check statistics are available from the authors, also see Field and Pande (2007).

their longer loan cycle, monthly clients may presume that the penalty for repaying at, for example, week 53, is lower than it is for weekly clients.

Client delinquency is considered to be an important correlate of MFI loan default (Rosenberg 1999), and for internal accounting purposes VWS considers any late payment as a measure of default. We, therefore, use group meetings data to examine the rate of late payments by clients over the course of the loan cycle. We aggregate late repayments reported in the group meeting data into two summary measures for each client: whether the client ever repaid late and - to better account for fact that weekly repayment clients have more opportunities for tardiness - mean number of days past due. Since there is only one case in which a client repaid less than the full amount, we ignore amount repaid.

Consistent with the repayment patterns observed in the full VWS client population we observe very few cases of default in our data. In 2006, VWS reported an "on-time repayment rate" of 99.1%.[6] In our analysis sample, only 16 clients have not repaid at week 60, 21 clients have not repaid by week 56, and 48 clients have not repaid by week 54. In terms of late payments within the year, 1.4% of weekly repayment clients, 2.9% of monthly repayment-weekly meeting clients and 0.8% of monthly repayment-monthly meeting clients ever make a payment late. Meanwhile, the average number of days late is 0.006% among weekly repayment clients, 0.034% among monthly repayment-weekly meeting clients, and 0.009% among monthly repayment-monthly meeting clients. To test for statistically significant differences in repayment behavior between experimental arms, we run ordinary least squares regressions of the form

$$Y_{iglt} = \alpha_l + \nu_t + \beta_1 W_g + \beta_2 M_g + \delta S_g + \gamma X_i + \epsilon_{iglt}$$

i denotes client, g the group she belongs to, l the loan officer in charge of the group and t the month of group formation. The main coefficient of interest are β_1 and β_2 which capture whether the default and delinquency behavior of clients on a weekly repayment schedule and a monthly repayment schedule which met weekly for the first three months differs significantly from those on a monthly schedule. The regressions include fixed effects for loan officers (α_l) and controls for month of group formation (ν_t) and group size (δ_g). Finally, we include a vector of client demographic controls X_i consisting of dummy variables for whether the client is literate, married, had a savings account at baseline, had assets separate from

[6]Performance status calculated as of November 30, 2006. Report available at: http://www.villagewelfare.com/financials.php.

her husband, kept emergency savings, whether she or her husband were a salaried worker, whether she is in the clothing retail business, or is a tailor. We also control for family size and client age. We always cluster standard errors by group.

Table 1 presents the regression results for default. The odd columns report results without controls and even columns with controls. Across our three measures of default we observe no difference in default rates of the monthly clients relative to weekly clients. Table 2 presents analogous regression results for the two measures of delinquency and rate of absence at group meetings. Once again, we find no evidence that reducing repayment frequency has an adverse effect on repayment behavior. Further, we do not find evidence that loan officers exert greater effort to extract payments from monthly clients: Although monthly meetings are on average 3 minutes longer (and the difference is statistically significant), loan officers do not rank monthly clients' ability to repay at the group meeting as worse than weekly clients. Taken together, this suggests that less frequent repayment schedules do not increase the per meeting transaction cost of collection.

4 Conclusion

In contrast to the general opinion of micro-finance practitioners, a large scale randomized field experiment with a typical urban MFI provides no evidence that lower frequency repayment schedules encourage irresponsible repayment behavior among first-time borrowers receiving small loans.

There are, however, some important caveats. First, it may be that repayment frequency is more important for fiscal discipline when clients graduate to larger loans, and this potential threshold level relative to clients' income is difficult to predict. That said, if the purpose of weekly installments is habit formation, fiscal discipline may become less important as clients graduate to second and third loans, balancing out the heightened risk associated with larger loans.

Another important caveat is that client behavior may be sensitive to the number of alternative credit sources available to them, a factor of increasing importance as the number of and level of competition among MFIs in urban areas rises. Unlike many other settings, over 80% of the VWS clients in our sample report no other outside loans from either formal or informal sources. If the primary penalty for default or delinquency is denial of future loans, clients will presumably be more willing to risk bad behavior as their outside options expand. In such cases, factors such

as repayment schedule may have a marginal impact on delinquency and default.

Finally, since participants in our experiment were pre-selected on willingness to borrow at either schedule, our experiment abstracted from selection issues. However, in practice, borrower composition may be sensitive to the flexibility of the repayment schedule, which could either reduce or increase an MFI's financial gains from switching from a weekly to a monthly schedule. While this selection effect appears to be minmal based on client recruiting and drop-out rates in our experiment, more work needs to be done in order to carefully assess the role of repayment frequency in screening out risky clients. 0.8

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Table 1: Repayment Schedule and Loan Default

	Full loan repaid					
	within 60 weeks		within fifty six weeks		within fifty four weeks	
	(1)	(2)	(3)	(4)	(5)	(6)
Weekly payment	-0.012	-0.016	-0.009	-0.013	0.011	0.010
	(0.022)	(0.022)	(0.022)	(0.023)	(0.028)	(0.029)
Monthly payment, weekly meeting	-0.005	-0.005	-0.012	-0.012	-0.042	-0.038
	(0.014)	(0.014)	(0.017)	(0.017)	(0.040)	(0.040)
Control variables	No	Yes	No	Yes	No	Yes
Observations	1017	1005	1018	1006	1028	1016
Mean value, monthly payment, monthly meeting	0.987 (0.112)		0.985 (0.122)		0.964 (0.185)	

Notes

1. All regressions include group size, month-year of loan disbursement and loanofficer fixed effects as controls. The regressions in the even columns include as additional controls dummy variables for whether the client is illiterate, married, has a sari/cloth business, is a tailor, earns a fixed salary, her husband earns a fixed salary, has a savings account, has separate assets from husband and whether keeps money for emergencies. We also include controls for client age and family size.

2. The dependent variable is a dummy variable which equals one if client has repaid within 60 weeks (columns 1 and 2), 56 weeks (columns 3 and 4) and 54 weeks (columns 5 and 6). The sample consists of clients whose loan was disbursed at or before the number of weeks at which we measure repayment. Weekly payment =1 if the client was on a weekly repayment schedue and Monthly payment weekly meeting=1 if client was on a monthly repayment schedule but met weekly for first three months after loan was disbursed.

3. Standard errors clustered by loan group are in parenthesis.

Table 2: Repayment Schedule and Client Delinquency

	Ever late payment		Average number of days past due		Rate of absence at meetings	
	(1)	(2)	(3)	(4)	(5)	(6)
Weekly payment	0.017	0.016	0.012	0.011	-0.0003	-0.0003
	(0.013)	(0.012)	(0.011)	(0.011)	(0.0003)	(0.0003)
Monthly payment, weekly meeting	0.010	0.010	0.011	0.013	-0.0006	-0.0007
	(0.011)	(0.011)	(0.018)	(0.021)	(0.0006)	(0.0007)
Control variables	No	Yes	No	Yes	No	Yes
Observations	966	966	966	966	966	966
Mean value, monthly payment, monthly meeting	0.0081 (0.0045)		0.009 (0.0070)		0.0005 (0.0005)	

Notes

1. All regressions include group size, month-year of loan disbursement, time between first and last meeting and loan officer fixed effects as controls. The regressions in the even columns include the additional controls listed in notes to Table 1.

2. The dependent variable is a dummy variable which equals one if the client ever made a late payment (columns 1 and 2), the average number of days past due (columns 3 and 4) and the fraction of meetings at which the client came late (columns 5 and 6). The sample consists of 966 clients for whom we have group meeting data. Weekly and monthly payment variables are as defined in Table 1 notes.

3. Standard errors clustered by loan group are in parenthesis.