

Financial Analysis of VWS Interventions

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October 20, 2011

Introduction

This note highlights recent results from two randomized evaluations undertaken by the Centre for Microfinance (CMF) in West Bengal. The first intervention involved giving a grace period subsequent to loan disbursement to randomly selected clients, while the second compared weekly v. monthly repayment structures. Initial analyses of the two interventions had focused primarily on the impact of these experiments on the client. This note conducts additional analysis using the original study data, combined with recently posted publicly available financial data from the concerned Microfinance Institution (MFI) to assess the impact of the interventions on the finances and profitability measures of MFIs.

I. Grace Period Intervention

Study Methodology

A CMF study, *Does Microfinance Repayment Flexibility Affect Entrepreneurial Behavior and Loan Default?* evaluated the effect of relaxing liquidity demands imposed on households early in the loan cycle by offering a randomly selected group of clients a two-month grace period before starting repayment of loans. Business investment behavior and repayment rates were compared between clients provided the two-month grace period and those required to begin repaying within two weeks of receiving their loans. The study was conducted with 845 participating clients of the Village Welfare Society (VWS) in West Bengal. Payments were made at fortnightly intervals for all clients, and other features of the loan contract were held constant. Loan sizes ranged from Rs. 4,000 to Rs. 10,000. The interest rate was not adjusted for the delay in repayment, thus those who were offered the two-month grace period paid a lower effective interest rate. Baseline and endline surveys were used to gather data from clients regarding business investments. Delinquency and default rates were calculated using VWS administrative data on repayment dates and amounts, which were recorded by loan officers in a centralized database.

Summary of Findings

- Analysis thus far (Field, Pande, & Papp, 2009) has concluded that on average, a client given a grace period contract spends 8% (Rs. 421) more on business items than those not given the grace period contract. The difference in business spending appears to be driven by differences in spending on inputs, primarily inventory purchases and raw materials, with the grace period allowing clients greater flexibility in making these purchases.
- The study also found that the likelihood of starting a new business was twice as high among clients who had a two-month grace period than clients on the normal repayment schedule.
- The average level of delinquency and default increased when the client was provided a grace period. Clients exercising the option of this two-month grace period were 8% more likely to default on their loan than clients with a normal repayment schedule.
- Repayment by clients without a grace period is heavily concentrated around loan due date, while there is more dispersion for clients who received a grace period. This suggests that since clients with a grace period had a greater time span over which to repay, some were able to repay early when compared to those not under the grace period contract.

The study concluded that providing an initial grace period during loan repayment increases levels of investment, particularly in illiquid assets, but there is simultaneously a rise in levels of default as well as delinquency.

MFI-Level Financial Analysis

The following financial analysis aims to identify the impact the intervention would have for the profitability of the Microfinance Institution (MFI). To gauge profitability, we calculated the expected credit risk per loan at three observation points, 8 weeks, 10 weeks, and 12 weeks following the due date of each loan. As loans in the sample were disbursed at different times, it was thus necessary to observe each loan at points relative to due date (for instance, 10 weeks after the due date), rather than observe all loans at a given date.

At each observation point, the loan data from the study was used to determine the *probability of default* (PD) and *exposure at default* (EAD).

Probability of default (PD) is calculated as the percentage of number of loans that have not been completely repaid at any given observation point.

Exposure at default (EAD) is calculated as the percentage of the original loan amount that has not been repaid at any observation point, if the total loan has not been repaid.

We estimated an average loan size of Rs. 8000 and calculated the expected credit loss at each observation, using the following equation:

$$\text{Expected Credit Loss (Rs.)} = \text{PD} \times \text{EAD} \times \text{Loan Amount (Rs.)}$$

The expected credit loss is the Rupee amount of each loan that we expect not to be repaid. From a profitability perspective, the lower the expected credit losses, the higher the profitability, assuming all other factors are equal.

Table 1: Expected credit loss at 3 observation points (weeks after loan repayment completion date) showing grace period implications for the MFI *

Time after Due Date	8 weeks		10 weeks		12 weeks	
	Standard	Grace Period	Standard	Grace Period	Standard	Grace Period
Probability of Default (PD)	7.0%	8.4%	3.1%	4.2%	2.7%	3.7%
Exposure at Default (EAD)	19.7%	10.7%	37.0%	18.1%	43.3%	20.5%
Loan Size	Rs. 8000	Rs. 8000	Rs. 8000	Rs. 8000	Rs. 8000	Rs. 8000
Expected Credit Loss	Rs. 110 (1.4%)	Rs. 72 (0.9%)	Rs. 93 (1.2%)	Rs. 61 (0.8%)	Rs. 92 (1.2%)	Rs. 61 (0.8%)

As pointed out in the results from the original study, the *Probability of Default* (PD) is higher for the grace period intervention than the standard intervention at all observation points. This is presumably because when given a grace period, the customer will be more likely to engage in riskier activities. However, further analysis shows that that *Exposure at Default* (EAD) is significantly lower for the grace period intervention. This means that when a customer is provided a grace period and does not completely repay the loan, he will repay much more when compared to a standard customer who does not completely repay the loan. This suggests that a customer will be able to manage his finances better when given more flexibility in repayment, and thus will repay a much greater amount of the loan, even if he cannot manage to repay the entire amount

When the PD and EAD are combined to calculate expected credit loss, we see that the non-grace period clients are expected to repay significantly less of the loan than grace period intervention clients at all observation points. For example, 12 weeks after the loan due date observation point, expected credit loss for the non-grace period loan is 1.2% of the loan (Rs. 92 on a loan of Rs. 8000) and for the grace period loan is 0.8% of the loan (Rs. 61 on a loan of Rs. 8000). When thinking from the perspective of the MFI, this expected credit loss is the number that is most relevant for balance sheet profitability.

It is assumed that providing customers a 1-month grace period will not significantly affect operating costs, making expected credit loss the sole determinant for profitability. From this study, we thus conclude that allowing microfinance clients repayment flexibility in the form of an initial grace period will significantly reduce the loss per loan (0.4% - 0.5%) for institutions when compared to not giving the grace period.

II. Weekly vs. Monthly Repayments Intervention

Study Methodology

A second CMF study, *The Economic Returns to Social Interaction: Experimental Evidence from Microfinance* aimed to evaluate the effect of variations in meeting frequency of microfinance groups during the first loan cycle on long-run social interactions between group members and rates of default on future loans. For this study, 100 ten-member groups of first-time clients of Village Welfare Society (VWS) were chosen to participate in the experiment, and each client was given a Rs. 4,000 loan. Thirty groups were randomly assigned a weekly repayment schedule and the remaining seventy groups were assigned a monthly repayment schedule. Clients with a weekly repayment schedule had 44 weekly installments of Rs. 100 beginning two weeks after loan dispersal, while clients with a monthly repayment schedule have eleven monthly installments of Rs. 400 starting one month after dispersal. Clients were tracked for two and a half loan cycles (100 weeks), beginning in April of 2006. Data was collected at regular intervals since the beginning of the experiment for all these groups to assess the level of continued social interaction.

Summary of Findings

- The study found that clients who met most frequently are associated with long-run increases in social interaction and lower rates of default on future loans. Clients who have been assigned to the weekly repayment schedule had increased social contact with other group members outside of group meetings for more than a year after the end date of the experiment. Members who participated in the weekly repayment schedule saw each other 26% more often than members on the monthly schedule.
- Furthermore, such gains were particularly concentrated among members who did not know each other well before the beginning of the experiment but had close family networks or geographic proximity.
- Additionally, those who participated in weekly meetings during their first loan cycle were 3.5 times less likely to default on their subsequent loan cycle than members who met monthly, even after both groups had returned to the same repayment schedule. Such reduction in default was concentrated among the clients on the weekly schedule who shared geographic proximity or family networks with fellow group members.

- However, frequent meetings did not result in a significant reduction in default during the first loan cycle. As Village Welfare Society (VWS) uses an individual lending, rather than a joint liability group (JLG) lending model, there is an absence of direct incentives for clients to police loan repayments of other group members.

This study's findings thus suggest that frequent group meetings reduce future lending risk through increased social interaction and risk sharing, as a result of these strengthened social networks.

MFI-Level Financial Analysis

The financial analysis compares the impact of weekly vs. monthly collections from a profitability perspective. We again calculated the expected credit risk per loan at three observation points, 8 weeks, 10 weeks, and 12 weeks following the due date of each loan, the methodology being exactly the same as used in the previous analysis.

Table 2: Expected Credit Loss for Monthly v. Weekly repayments at 3 observation points*

	8 weeks		10 weeks		12 weeks	
	Weekly	Monthly	Weekly	Monthly	Weekly	Monthly
Probability of Default (PD)	9.0%	6.5%	6.5%	6.5%	6.5%	6.0%
Exposure at Default (EAD)	32.0%	37.5%	41.2%	37.5%	38.1%	41.2%
Loan Size	Rs. 8000	Rs. 8000	Rs. 8000	Rs. 8000	Rs. 8000	Rs. 8000
Expected Credit Loss	Rs. 229 (2.9%)	Rs. 195 (2.4%)	Rs. 215 (2.7%)	Rs. 195 (2.4%)	Rs. 199 (2.5%)	Rs. 197 (2.5%)

The *Probability of Default* (PD) was significantly lower for monthly collections at the 8 week observation point, but very similar to the weekly collections at the 10-week and 12- week observation points. *Exposure at Default* (EAD) varied as well, with no consistent differences across the three observation points. At the 8 week and 10 week observation points, the expected credit loss for the monthly collections was lower than the weekly collections, however at the 12 week observation point.

Thus, we conclude that monthly collections result in expected credit loss slightly lower or equal to that of weekly collections.

If monthly collections at worst result in expected credit loss equivalent to weekly collections, we can draw profitability conclusions based on the differences in operational costs and collection efficiency between the two frequencies of collection. Assuming that monthly collections require lesser resources in terms of loan officer time and travel costs, as well as administrative costs, the operational costs should be lower when compared to weekly collections. From the most recent VWS balance sheet posted on their website¹, we estimated a total close to Rs. 7.50 crores for the year 2010-2011, or approximately Rs. 330 per loan, of expenses that is pertinent to repayment collections (Included in Schedule 16 of Balance Sheet as well as Profit and Loss Account, March 31, 2011). If this number can be reduced by even as less as 10% by opting for monthly collection, the savings for the MFI will be significant enough to make the switch in terms of repayment frequency, as well as potentially reducing the annual provision for loan loss (Schedule 17 of Balance Sheet)

¹ The VWS Balance sheet is publicly available at http://www.village.net.in/upload/pdf/VFS-BS-2011_1305962094.pdf

*Calculations used to generate Tables 1 and 2 can be seen in the excel simulation provided along with this analysis document. The simulation can be used to see the effect of loan sizes, operational costs, and efficiency of loan officers when switching from a weekly to a monthly collection cycles.