

# Term Structure of Debt and Entrepreneurial Behavior: Experimental Evidence from Microfinance

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## Abstract

Financiers across the world structure debt contracts to limit the risk of entrepreneurial lending. However, certain debt structures that reduce risk may inhibit enterprise growth, especially among the poor. We use a field experiment to estimate the short- and long-run impacts of varying the term structure of the classic microfinance loan product. While the classic microfinance loan contract requires clients to make small and frequent repayment installments beginning immediately after loan disbursement, clients in our treatment group instead received a two-month grace period before repayment began. The shift to a grace period contract increased clients' business investments in the short run and profits and income in the long run, but also their rate of default, indicating a shift towards investments with higher average but also more variable returns. In this manner, the absence of a grace period reduces risk but also the potential impact of microfinance on microenterprise growth and household poverty.

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# 1 Introduction

Micro-entrepreneurs across the world rely on short-term debt to finance investments. Increasingly, a key source of such debt is lending by microfinance institutions (MFIs). There are currently an estimated 130-190 million borrowers worldwide and outstanding microfinance loans stood at more than \$43 billion in 2008 (Gonzalez, 2010). Yet emerging empirical evidence suggests limited impact of MFI activity on the average income growth of micro-entrepreneurs (Banerjee et al., 2009; Karlan and Zinman, 2009), despite concurrent evidence of relatively high returns to capital in small-scale enterprises in developing countries.<sup>1</sup>

This paper studies whether the immediate repayment obligations of the classic microcredit contract – widely held to be important for reducing default – inhibit investment in microenterprises by making relatively illiquid entrepreneurial investments too risky for small business owners in the short run. In doing so we directly demonstrate the trade-offs inherent in designing debt contracts for the poor that both protect them from default and help them out of poverty.

We study these tradeoffs through a field experiment with a large MFI in Kolkata, India, in which we evaluate the effect of relaxing the liquidity demands imposed by the classic “Grameen Bank” microfinance contract early in the loan cycle. Clients in the control group initiate repayment within two weeks of receiving their loan, as is standard practice in microfinance, while the set of clients randomly assigned to treatment receive a two-month grace period before repayment begins, more in line with small business loans in a developing country context. Once repayment begins, all clients repay at an identical frequency. We examine the impact of this difference in debt structure by tracking clients’ business investments shortly after receiving the loan and long-run profits, income and repayment behavior three years after loan disbursement.

Overall, the clients we study match the typical economic profile of the urban poor in developing countries.<sup>2</sup> Households in our sample report average per capita earnings of under

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<sup>1</sup>de Mel et al. (2008), for instance, estimate returns to capital in Sri Lanka micro-enterprises at 5% per month.

<sup>2</sup>For instance, Banerjee et al. (2009) report that in Peru, 69% of urban households who live under \$2 a

two dollars a day and the majority engage in microenterprise activity in the informal service sector.<sup>3</sup> MFI debt is a key mechanism through which these households finance working capital needs and make business investments.

A simple model of financial contracting demonstrates that introduction of a grace period in a debt contract should increase the portfolio of investment available to a household by making illiquid investments more viable early on in the loan cycle. This, in turn, should increase the average return on available investments and therefore expected business profits. The effect of changes in investment choices on default and delinquency is less straight forward and depends on the variability of returns and households' short-term liquidity needs. If relatively illiquid investments also have more variable returns (or, more generally, increase expected variance of household income by reducing short run ability to deal with shocks), then we may observe higher default even as average returns on business investments increase. Put differently, by distorting investment towards less risky choices, immediate repayment obligations may simultaneously limit default *and* income growth.<sup>4</sup>

Our field experiment provides rigorous evidence that both business investment and repayment behavior are sensitive to the introduction of a grace period: Microenterprise investment is approximately 10% higher and the likelihood of starting a new business is twice as high among clients who receive a two-month grace period. Furthermore, business profits and household income are on average 31% and 17% higher nearly three years after receiving the loan, indicating that investments shift towards higher-return ventures.

At the same time, grace period contracts appear to be associated with riskier investments and hence higher levels of default: The variability of profits after three years is 63% higher for clients who were given a grace period. Strikingly, these clients are also more than twice as likely to default on their loan, suggesting that illiquid investments imply greater

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day operate a non-agricultural business. In Indonesia, Pakistan, and Nicaragua, they report numbers that are between 47-52%

<sup>3</sup>The two most common activities are running a convenience store and selling clothes.

<sup>4</sup>In theory, early repayment may also discourage risky investments by improving loan officers' ability to monitor borrower activities early on in the loan cycle. We ignore this channel in the analysis since loan officers in our study (hired, trained and supervised by our research team) do not undertake any monitoring activities during loan meetings.

risk in ability to repay, as is likely to be the case with new business ventures.

While there is a growing empirical literature on the impact of microfinance on income and consumption of the poor, to the best of our knowledge, this is the first paper to demonstrate how immediate repayment obligations distort investment in microenterprises financed through microcredit. The lack of even observational evidence on this question reflects the fact that MFIs almost universally follow this practice. A small, largely theoretical, literature examines the role of repayment frequency in reducing default in MFIs, but this is tangential to our analysis since our experiment delayed when repayment starts and not the frequency of repayment over the loan cycle.<sup>5</sup>

Our paper is also related to the corporate finance and financial contracting literatures that seek to understand optimal debt structures. Indeed, the contractual form underlying lending to very small businesses in rich countries provides a good benchmark for comparison with the standard MFI contract. While the pool of small business loan applicants is also perceived to be risky, the typical small business loan contract in developed countries is significantly more flexible than a typical MFI contract.<sup>6</sup> Meanwhile, Glennon and Nigro (2005) document that default rates on SBA loans are between 13-15% for SBA loans compared to 2-5% on typical MFI loans, consistent with the tradeoffs we model in this paper.

Section 2 describes the MFI setting and client characteristics, the experimental intervention and the basic analytical framework. Section 3 describes the data and empirical strategy and Section 4.1 our findings. Section 5 concludes.

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<sup>5</sup>In particular, ? provide a theoretical analysis of how present biased borrowers will be more willing to repay smaller but more frequent repayments. They argue that more frequent repayment, therefore, sustains larger loan size. Similarly, ? demonstrate that more frequent meeting can improve clients' informal risk-sharing arrangements and, therefore, long-run ability to repay. However, neither analysis speaks directly to the implications of a grace period. Selection issues inhibit causal interpretations of existing non-experimental studies of how greater repayment flexibility affects default, and may explain the mixed findings: Armendariz and Morduch (2005) reports that more flexible repayment is associated with higher default in Bangladesh, while McIntosh (2008) finds that Ugandan MFI clients who choose more flexible repayment schedules are less likely to be delinquent.

<sup>6</sup>For instance, flexible repayment options are available on Small Business Administration (SBA) loans in the U.S., and typically negotiated on a loan-by-loan basis. Payments are typically via monthly installments of principal and interest. There are no balloon payments, and borrowers may delay their first payment up to three months with prior arrangement. For details, see for instance <https://www.key.com/html/spotlight-quantum-health.html>.

## 2 Background

Our study was conducted with a large MFI, Village Welfare Society (VWS), based in Kolkata, India. VWS has made individual liability loans to women in low-income neighborhoods of Kolkata since 1982. The VWS debt contract requires repayment through fixed installments starting two weeks after the loan has been disbursed. Although there is no group liability, repayment occurs in a group setting at a neighborhood meeting conducted every two weeks by a loan officer in one group member's home. In 2006, when we initiated work with VWS, their end-year financial statement reported a repayment rate of 99%.

We implemented the experimental intervention during 2007-08 and returned in 2010 to collect survey data on long-run economic outcomes of subjects in our experiment. Below we describe the experimental design of our study and then develop a simple model of financial contracting that derives testable predictions we take to the data.

### 2.1 Experimental Design

Between March and December 2007 we formed 169 five-member groups comprising 845 clients. Loan sizes varied from Rs. 4000 ( $\sim$ \$90) to Rs. 10,000 ( $\sim$ \$225), with a modal loan amount of Rs. 8000. After group formation and prior to loan disbursement, repayment schedules were randomly assigned in a public lottery. Randomization occurred at the group level after groups had been approved for loans. Treatment status was assigned to batches of 20 groups at a time based on the timing of group formation. No clients dropped out of the experiment between randomization and loan disbursement.

In total, 84 groups were assigned the contract with a grace period and 85 groups were assigned to the standard contract with immediate repayment. Other features of the loan contract were held constant across the two groups, including interest charges. Once repayment began, both groups of clients were required to repay fortnightly over the course of 44 weeks. However, since clients with a grace period had longer debt maturity (a total of 55 as opposed to 44 weeks before their full loan amount was due) and faced the same total

interest charges, they also faced a slightly lower effective interest rate on the loan, although the potential income effect of this difference is minimal given that interest rates are relatively low (12% annually for the control group) and loan sizes are small.<sup>7</sup>

## 2.2 Should Debt Structure Matter? Some Predictions

Introducing a grace period and thereby a longer total period over which to repay the same absolute amount of debt should make it easier for clients to accumulate the income needed to repay their loan. This is essentially the income effect implied by the lower interest rate in the grace period credit contract.<sup>8</sup> Furthermore, by reducing liquidity needs in the early phase of a client's loan cycle, the introduction of a grace period improved clients' ability to take on less liquid investments, and thereby expanded the set of investment opportunities available to them. Both factors imply that clients assigned to the grace period contract should differ in the level and nature of their business investments, earn higher average business profits and repay their loans at a higher rate. However, the last prediction presumes that investing in an illiquid project does not affect client risk. In reality, illiquid investments carry significant risk. For instance, if clients have a sudden need for money they may be forced to sell their investment at a loss. In this case, the grace period will both increase investment and worsen repayment outcomes.

Here we formalize the above intuition with a simple model. There are three periods  $t = 0, 1, 2$ . Clients are risk-neutral with utility function  $u(c_0, c_1, c_2) = c_0 + c_1 + c_2$ . Clients have access to a liquid investment which pays off  $R_L$  in the following period for each unit invested. They also have access to an illiquid investment which pays off  $R_I$  after two periods for each unit invested. The illiquid nature of the investment is such that selling it before period two yields very low returns. In period zero clients receive a loan amount  $X$  which they must repay in two installments,  $P_1$  in period one and  $P_2$  in period two. Assume for

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<sup>7</sup>Holding the interest rate constant across treatment arms would have implied  $\sim$ \\$21 in interest charges as opposed to the  $\sim$ \\$18 all clients are charged.

<sup>8</sup>Differences in implicit interest rates across treatment arms have no direct implication for repayment timing since clients must pay a fixed interest amount regardless of when they repay. Hence, clients offered the standard contract have no added incentive to repay early to avoid higher interest charges.

simplicity that investments are lumpy such that clients must invest the entire loan amount  $X$  in either the liquid or illiquid investment.

There is a probability  $\pi_S$  that in period one the client will face an urgent need for money such as sudden sickness and have to pay a cost  $S$ . For simplicity, we consider the extreme case in which liquidation net of the liquidity demand ( $S$ ) is zero. However, it is possible that the client has enough money on hand or emergency sources from which to borrow from that she will not have to liquidate her investment in the face of the shock.<sup>9</sup> We denote the probability that a client will be forced to liquidate her investment given she must pay  $S$  to be  $\pi_L$ .  $\pi_L$  is a decreasing function of cash on hand in period one and therefore is increasing in the period one loan payment ( $\pi'_L(P_1) > 0$ ). Figure 2 summarizes the model setup. Although we have assumed utility is linear in consumption, the fact that  $\pi_L(\cdot)$  is increasing in the first payment amount can be interpreted as concavity of the utility function. A client would prefer to smooth consumption across periods, but if the required loan payment combined with a bad shock causes consumption to fall too far in period one, she may prefer to sell her investment at a loss rather than waiting for it to pay off in the next period.

Clients will invest in the illiquid asset if and only if:

$$(1 - \pi_S)R_I X + \pi_S(1 - \pi_L(P_1))(R_I X - R_L S) - R_L P_1 - P_2 \geq R_L^2 X - \pi_S H R_L - R_L P_1 - P_2 \quad (1)$$

where the left hand side denotes the payoff from investing in the illiquid asset and the right hand side denotes the payoff from investing in the liquid asset. Since a risk-averse client would only consider an investment with greater risk if expected payoffs were higher, we assume that, if successful, any illiquid investment she is considering pays off more than the liquid investment ( $R_I > R_L^2$ ) and that the return from liquidation of the liquid project is less than the return from successfully completing the illiquid project ( $R_I X > S R_L$ ). Consider what happens when the probability of a shock approaches 1 ( $\pi_S = 1$ ). Then equation (1)

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<sup>9</sup>For simplicity, we assume that borrowing to pay  $S$  is at rate  $R_L$ .

will be satisfied as long as:

$$\pi_L(P_1) \leq \min\left\{\frac{(R_I - R_L^2)}{R_I - (S/X)R_L}, 1\right\} \quad (2)$$

Equation (2) shows that, in deciding between the illiquid and the liquid investment, clients weigh the risk that they will be forced to sell off their investment before it pays off (higher  $\pi_L$ ) with the higher return from the illiquid investment ( $R_I$ ). In the present context, grace period clients will have a lower  $P_1$  and therefore a lower  $\pi_L$  than clients without a grace period. The model predicts that grace period clients will be more likely to invest in the illiquid investment when the probability of a shock in period 1 ( $\pi_S$ ) is sufficiently high. Although the illiquid investment affords higher returns on average, the risk of forced liquidation means that grace period clients will also be more likely to enter period two with no cash on hand, which implies they must default on their loan.

In the example above, the risk of liquidation acts as the disincentive to take on the illiquid project. However, an alternative possibility is that clients face an uncertain demand for their product and therefore are reluctant to make large inventory investments. This fear is especially relevant for clients that have to make early repayments on their loan since a grace period allows clients to invest in inventory with less concern over not being able to sell it quickly. In this case,  $S$  is zero since clients who invest in the liquid asset do not face any shocks. For clients with a grace period, we can think of  $\pi_L$  as the probability that a client faces low demand in both period one and period two, in which case she would have to sell at a loss. Clients without a grace period face a higher  $\pi_L$  because they do not have the luxury of waiting until period two to sell their product.

### 3 Data and Background Information

The data used in this paper come from multiple sources, which we describe below (the data appendix describes the construction of specific variables more detail). We then use our survey data and a handful of in-depth case studies to describe the economic lives of the households



in our sample before presenting the empirical results.

### 3.1 Data

We conducted baseline surveys with clients as they entered the study between April and August 2007. The baseline survey gathered background information on household business activities, socio-economic status and demographic characteristics.

A comparison of baseline characteristics across treatment arms provides a check on random assignment. One shortcoming of the baseline data is that 78% of baseline surveys were conducted after loan disbursement, although on average only 2.8 weeks later.<sup>10</sup> Hence, in the randomization check we exclude variables that are potentially endogenous to contract type such as household savings and employment, and include only those listed in Panel A. To construct an indicator of whether the household had any microenterprise activity at the time of entering our study (“Has business”), we use information from the baseline on the duration of existing household business activities.<sup>11</sup> Column 3 shows mean differences between treatment groups. Although the difference across treatment groups in one out of twelve of the baseline characteristics (literacy) is statistically significant at the 10% level, the point estimates of the difference is small and a joint test of significance (chi-squared) of mean differences across all variables indicates that our randomization produced a balanced sample.<sup>12</sup> To confirm that small differences in treatment arm balance are not biasing the experimental results, we estimate all regressions with and without the controls listed in Panel A of Table 1.<sup>13</sup>

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<sup>10</sup>The reason for this delay is that baseline surveying had to take place between group formation and loan disbursement, and because new groups were formed on a rolling basis that was not spread evenly over time, during periods of peak formation, it was difficult to reach all clients within this short interval.

<sup>11</sup>As a result, there is some chance that we miss business activities that died between loan disbursement and administration of the baseline survey, which we expect to be minimal since this is on average only a two-week period.

<sup>12</sup>For the randomization check, the  $p$  value of joint significance is computed by jointly estimating a system of seemingly unrelated regressions consisting of a dummy variable indicating assignment to the grace period treatment, with standard errors adjusted for correlation within loan groups. The joint test also includes loan officer dummies.

<sup>13</sup>We exclude this variable from the set of controls due to multicollinearity with the narrow definition and

Outcome variables were collected from several different data sources. The first endline survey was completed between January and November 2008 by 93% of clients, on average 12 months after loan disbursement.<sup>14</sup> This survey, which contained a detailed loan use module that included business expenditure amounts and types, was used to study differences in short-run investment behavior. Clients were asked how much of their VWS loan they spent on five broad categories of expenditures: business, health, school, housing, savings, and other.

To evaluate the long run impacts of the intervention we conducted a detailed business survey between April and July 2010, almost three years after loan disbursement.<sup>15</sup> The primary purpose of this round of surveying was to gather long-run data on microenterprise profits and scale, and household income. We also used information from this survey combined with information from the baseline survey to measure new business formation in conjunction with receiving a loan through our study. In particular, we constructed an indicator of whether a household started a new business in the month prior to and after loan disbursement based on reports of new business activity in the baseline survey supplemented with reports of new business activity in the second endline survey for households who took the baseline less than one month after loan disbursement (26%) of households.<sup>16</sup> Of the 845 clients entering our intervention we administered long-run endline surveys to 761 clients, or 90% of the sample. We observe no significant difference in survey response between treatment and control groups and, as observed in Column 4 of Table 1, the sample remains balanced even after accounting for attrition at the follow-up survey stage.

Finally, to study delinquency and default, we tracked client repayment behavior using

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the minimal amount of variation in this measure.

<sup>14</sup>This is slightly longer than the duration of the baseline due to delays in tracking clients. The minimum time between baseline and follow-up was 10 months – the duration of the loan cycle – and the maximum time was 16 months, with a mean time between baseline and follow-up of 12 months.

<sup>15</sup>Ten percent of clients were interviewed in November 2010 because they could not be tracked during this initial stage.

<sup>16</sup>We prefer not to rely exclusively on the second endline survey in constructing this measure since three years is a long recall period over which to report exact dates of business formation and destruction, and would make us particularly likely to miss business ventures that died quickly, which could lead to a bias if the rate differs by treatment status.

two sources. First, we used VWS administrative data in which repayment date and amount paid were recorded by loan officers on a continuous basis in clients' passbooks and then compiled into a centralized bank database. We have data on all clients through June 21, 2009, by which date at least 30 weeks had passed since the loan due date for all loan groups.

As a check on the VWS administrative data, we also collected repayment data from loan officers. In particular, all loan officers were required to keep log books on meeting activities for the purpose of our experiment that recorded date of meeting, number of clients present, and names of clients who repaid at the meeting. Although the measures differ slightly, this alternative measure gives the same approximate default rate in the full sample as the VWS administrative data (5.2% compared with 5.4%).

Since some clients repay their loans long after the due date, we present results for different lengths of delinquency. Our preferred measure is 30 weeks overdue, the longest period for which we observe all clients in the sample, since it comes the closest to approximating permanent differences in default. We also run regressions of 52-week default for the censored sample of clients whose due date fell before June 2008, and verify that default changes little after the 30-week mark.<sup>17</sup>

## 3.2 Entrepreneurship in Kolkata

The summary statistics in Table 1 provide a portrait of subjects in our study. The majority of clients are literate and married, and the average client has two children living at home. Consistent with the type of clients targeted by many MFIs, over three-quarters of households in the sample claim to run some kind of microenterprise at the time of the baseline survey and roughly 80% of these households (60% of the sample) report that the female client closely manages and can answer detailed questions about at least one household business. Based on more the more detailed survey on household business activities that we conducted in 2010, virtually all households in the sample (97%) are engaged in some type of business

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<sup>17</sup>VWS does not make explicit the schedule of penalties according to duration of delinquency though there is implicit understanding that the degree of delinquency will influence approval rates and amounts of future loans.

activity around the time they were given a loan through our study (“Has Business (broad measure)”).<sup>18</sup>

As illustrated in Figure 1, the majority of households with businesses are vendors (62%), while 22% provide skilled service (e.g. tailors) and 17% provide unskilled service (e.g. piece rate work). While the group is relatively educated, the rate of shocks experienced by households is high, as is typical in this setting: 44% of households report experiencing a shock to household income over the past month, and 40% of clients report a household event in which they missed days of work within the last 30 days.<sup>19</sup> Such events are likely to adversely affect the functioning of household businesses by reducing available labor and credit.

In terms of financial access, clients enjoy reasonable access to banking services but undertake limited borrowing from other banks or MFIs. Thirty-two percent of clients have a household savings account, and 89% have some form of formal insurance (83% have life insurance, 15% have health insurance), which is mainly provided through VWS. All clients report taking out at least one loan within the year prior to the experiment, the bulk of which were taken out through VWS, and very few report loans from sources other than VWS.

## 4 Repayment Flexibility and Client Behavior

### 4.1 Empirical Strategy

Randomization of repayment schedule implies that a simple comparison of the average outcomes across clients assigned to the grace period versus no grace period treatments has a causal interpretation. Hence, for all outcome variables we estimate simple ordinary least

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<sup>18</sup>The difference in reported rates of business activity as measured in the baseline versus follow-up surveys is due to additional effort we put into capturing all possible forms of microenterprise ventures and self-employment in the follow-up, which we believe had been underestimated at baseline.

<sup>19</sup>Household events include illness, birth, death, and weather (flood).

squares regressions of the following form:

$$y_{ig} = \beta D_g + B_g + \delta X_{ig} + \epsilon_{ig} \quad (3)$$

where  $y_{ig}$  is the outcome of interest for client  $i$  in group  $g$ , and  $D_g$  is an indicator variable that equals one if the group was assigned to the delay intervention. All regressions include dummies for stratification batch ( $B_g$ ). Throughout, we report regressions with and without the twelve controls ( $X_{ig}$ ) listed in the top panel of Table 1 and loan officer fixed effects. In all regressions, standard errors are corrected for clustering within loan groups.

## 4.2 Grace Period and Repayment Pattern

Table 2 summarizes the first stage results of our experiment in a regression framework. The odd columns report regressions without controls, and even columns report regressions with controls. Our treatment mandated that groups assigned to the treatment postpone their first meeting by 8 weeks. Since there was some variation across loan groups in the exact schedule of meetings, the number of days between loan disbursement and first loan payment varies somewhat within treatment groups, however columns (1) and (2) show that clients assigned to the treatment arm that included a grace period made their first loan installment an average of 54.4 days after clients in the control group, or approximately 2 months later. This is reflected in an equivalent delay in time lapsed between disbursement and final loan due date (columns (3) and (4)).<sup>20</sup>

## 4.3 Loan Use and New Business Formation

Our analysis encompasses both short- and long-run sets of outcomes on microenterprise activity and default. In the short run, we study loan use and new business formation in the two-month period surrounding loan disbursement, and default up to seven months past the

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<sup>20</sup>In practice, clients often choose to repay the loan before it is actually due, although they are prohibited from repaying full before 5 months after loan disbursement. Separate estimates (unreported) show that clients do not choose to repay early at a significantly higher rate when offered the grace period, as one might expect.

loan due date. In the long run we examine the effect of a grace period on business profits, scale, household income, and business turnover almost three years after loan disbursement.

We start by presenting the evidence on loan use. Figure 3 shows average spending in five broad categories, the most important of which is business spending: 75% of clients spent part of their loan on business expenses and, on average, a client spent 80% of her loan on business-related activities. The second largest category is house repairs. Within the category of business expenditure, they were asked to describe the type of expense. The three most common types of business expenses are saris, wood, and sewing materials. Figure 4 presents the same bar graph divided between clients with and without a grace period, which suggests a significant difference in spending in business and home repairs across clients on different loan cycles.

In Table 3 we investigate these differences by estimating equation (3). All clients are included in these regressions regardless of whether they owned a business at baseline since loans could have been put towards new business formation. Columns (1) and (2) show a significant increase in business spending. The average client on the grace period contract spends roughly 9.5% (Rs. 580) more on business items. Meanwhile, they spend less on house repairs (columns (7) and (8)), although this point estimate (statistically significant at the 10% level) only accounts for about half of the difference in business expenditures between treatment arms. Since we observe no difference between treatment arms across other categories of expenditure, we can assume that control clients put aside more of their loan towards immediate repayment obligations, for instance, meeting the first installment obligation of  $\sim$ Rs. 400.

Given the difference in business expenditure and the fact that most loan money is spent on business expenditures, in Figure 5 we further break down business spending into inputs, equipment and other business spending. The difference in business spending appears to be driven by differences in spending on inputs, made up of inventory purchases and raw materials. Table 4 presents results for the corresponding regressions, in which we observe a significant difference in spending on inputs. These results are consistent with the prediction

that grace period clients increase their spending on illiquid investments. Raw materials are valuable if clients can find a market for the finished product, but if demand is uncertain, it may take several months to realize the returns from the investment and raw materials cannot be liquidated at cost once they have been transformed, which makes them a riskier investment. Consistent with the uncertain demand story, small vendors and those involved in service work are the most likely to purchase raw materials.

One important limitation of the data on business expenditures is that they only include information on business expenditures that were financed out of the VWS loan. Hence, it is possible that the grace period changed mental accounting but not actual expenditures such that clients report more of their loan being spent on investments without having made significantly more investments. Hence, we next examine client propensity to start new businesses, which was measured independently of how their loan was spent so is not subject to the same criticism. Our measure for whether a client started a new business is a dummy that equals one if a client reported starting a new business within a month of receiving her loan.<sup>21</sup>

Overall, the rate of new business formation is low - in the control sample only 2.5% of clients start new businesses within the one-year period. However, Table 5 shows that the likelihood of starting a new business is doubled among the treatment group, in which close to 5% of households start new microenterprises and the difference in rates of business formation is statistically significant. Figure 8 shows the breakdown of new business types. All new businesses in this sample were clothing sellers or some other type of vendor.

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<sup>21</sup>For about two-thirds of clients who were given the baseline survey 4-6 weeks after receiving the loan, this variable is measured very close to the time of new business formation so is not subject to significant recall error. For the remainder of clients who were administered baseline surveys within a month of receiving the loan, we measure new business activity around the time of the loan using the baseline survey combined with the follow-up data collected three years after loan disbursement. The timing of the baseline survey was balanced across treatment arms. See data appendix for an exact description of how this variable was constructed.

## 4.4 Long-run business profits and household income

The next section uses the three-year follow-up data to study long-run differences in microenterprise profits and household income. The results are presented in Table 6.<sup>22</sup> Household income is an estimated 17% higher for grace period clients 3 years after loan disbursement (~2 years after the loan was due). As shown in columns 5-8, this appears to be driven for the most part by a change in household business profits as we would expect. Households that were on a grace period report 29-50% higher weekly profits, which amounts in magnitude to an 11-19% increase in household income.

Not only is the level of profits higher for grace period clients in the long-run, but so is the variance: when one excludes the three outlier observations that differ by more than three standard deviations, the average variance in profits is almost twice as high for grace period clients as it is for those on the typical MFI contract with immediate repayment. Estimates that include the three outliers indicate a variability that is nearly *eight* times as high, but the point estimate is too noisy to be significant. Figure 9 shows the distribution of profits for delay and no-delay clients, which reveals substantially more households with both zero and very high weekly profits.

Table 7 looks at corresponding measures of business scale two years after the experiment. Consistent with the profits results, we observe that microenterprise activities in grace period households are around 50% larger in terms of assets and inventory (almost twice as large if we include the four outliers that are more than three standard deviations above the mean). Additionally, while the average household in the control group has only 2.75 workers employed in household businesses, the average grace period household has 3.03 workers, although the difference is not statistically significant. The fact that scale of business operations adjusts more rapidly than size of the microenterprise workforce is consistent with the fact that informal enterprises are likely unable to perfectly substitute outside for in-family labor, and are thus constrained in terms of increasing number of workers.

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<sup>22</sup>Both profits and income were measured with single survey questions: “Can you please tell us the average weekly profit you have now or when your business was last operational?” and “During the past 30 days, how much total income did your household earn?”.



Finally, we also see the differences in business activity at three years post-loan disbursement reflected in differential rates of business closure over the period. Changes were measured using retrospective data collected at the 3-year follow-up on any business closures experienced between loan disbursement and the survey date. Grace period clients are 18% less likely to have closed a business over the period, despite the fact that they have higher variance in profits. This result is consistent with a story in which clients on a grace period either feel less need to liquidate inventories when faced with a shock to household income in order to meet repayment obligations early on in the loan cycle, or are more reluctant to do so because they have greater difficulty liquidating business assets at cost.

## 4.5 Loan Repayment

Having established a link between the more flexible loan contract and business investment, we next investigate client delinquency and default. Recall that our analytical framework suggests that increased investment may come at the cost of increased default. If we find that a grace period is associated with both higher business investment and higher default, it implies that, in this setting, relatively illiquid investments carry greater risk.

We start by providing a graphical illustration of the impact of providing a grace period on client repayment behavior. In Figure 6 we show the densities of days from first meeting in which the client made a payment to when the client finished repaying for clients who repaid in full as of July 1, 2009. The vertical bars indicate the average loan due date and 16 weeks after the loan was due. The figure indicates that, although a significant fraction of clients were late, the vast majority of loans were repaid within 16 weeks of being due. We also observe a significant difference in the repayment patterns of clients who received a grace period versus those who did not. While repayment by clients without a grace period is heavily concentrated around the loan date, there is significantly more dispersion in time to repayment among clients who received a grace period. Given that the delay clients, in effect, had a longer period over which to repay the same size loan, it is not surprising that many of them were able to repay early relative to the no delay clients.

To see default more clearly, Figure 7 graphs the fraction of clients who have not repaid in full relative to the date of first installment. As in the previous Figure, the vertical bars indicate the loan due date and 16 weeks after the loan was due. Here we observe a clear difference in the fraction of grace period clients who have repaid in full four months past the due date.

To test for the statistical significance of these patterns, in Table 8 we estimate regressions of experimental assignment on default using three measures of default available for all clients: whether the client repaid within 8, 16 and 30 weeks of the loan due date (defined as the date when the final installment was due). We also estimate the impact of the grace period for default within a year of the loan due date (52 weeks) for the 64% of clients for whom we have repayment data for at least that length of time. In all cases we see a robust difference in default patterns between the delay and no-delay clients. Delay clients are, on average, between 6 to 8 percentage points more likely to default than non-delay clients. Sixteen weeks after the loan was due, 3% of the non-delay clients and 11% of the delay clients have failed to repay. Including controls in the regressions has very little impact on the point estimates, providing evidence that the results are not contaminated by treatment imbalance. Even after one year, the experimental difference is roughly the same (columns 7-8).

## 5 Conclusion

Our findings suggest that introducing flexibility into microfinance contracts in the form of a grace period presents a trade-off for banks and clients. On the one hand, we find evidence that average levels of default and delinquency rise when clients are offered a grace period before repayment begins. This basic finding supports the predominant view among micro-lenders that rigid repayment schedules are critical to maintaining low rates of default among poor borrowers. On the other hand, our findings are consistent with a model in which delayed repayment encourages more profitable, though riskier, investment.

The pattern of long-run default we observe in the data also sheds light on the in-

vestment opportunity set clients face. The fact that a substantial number of grace period clients still have not repaid more than a year after the loan due date suggests that the available higher return, less liquid investments also carry higher risk that leads to more variable business outcomes. In ongoing work we will look for direct evidence of this by examining differences across experimental groups in long-run business profits.

Assuming for now that the illiquid investments clients undertook were in fact socially desirable, we perform a back-of-the-envelope calculation to compute the interest rate required to compensate VWS for the additional default. Given a baseline default rate of 3% for clients without a grace period and 11% for clients with a grace period, VWS would have to increase its annualized interest rate from 22% to 33% to cover the additional default. Of course, a higher interest rate may itself cause a yet higher default rate if moral hazard or adverse selection are significant, so the new interest rate should be taken as a minimum.

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## 6 Data Appendix

### 6.1 Baseline Survey

Clients were given three different versions of the baseline survey. The breakdown of number of new and existing clients by survey is provided in Panel A of Table A1. Existing clients had already taken out a previous loan with VWS and had taken part in a previous study conducted by the authors. New clients were both new to VWS and had not taken part in any previous studies. We were unable to survey 15 clients (1.7%) at the baseline.

**Household Shock** Defined as whether households had experienced any of the following events in the last 30 days: birth, death, Heavy rain or flood, guest visit, travel.

**Household Savings** Defined as whether any member in the household has a savings account.

**Employment** The borrower is classified as self-employed, wage-employed, or housewife. A self-employed woman is defined as one who owns and works on her own business, a wage-employed woman as one who is either paid a salary or a daily wage by an employer outside of the home, and a housewife as any woman who does not work.

**First Time Borrower** Defined as someone who is a new client to our partner MFI

**Discount Rate** To estimate the discount rate, clients were asked to pick between receiving a fixed amount of money now or a larger amount a month later. For example, they were asked if they would prefer receiving 200 rupees now or 250 in a month. In this case, the implied discount rate for a client that decided to choose 250 rupees now in a month is between 0 and 25 percent. To generate a more balanced estimate, we took the average of the implied discount rate at the point at which the client chose to wait (in the previous example this is 25 percent) and the previous lower discount rate which the client did not choose. So, if the previous example had been the first question in the game series, we wouldve estimated the clients discount rate to be 12.5 percent. The higher the discount rate, the more impatient a client is.

**Risk Aversion Index** Clients were asked a series of question about whether they

would prefer to receive a certain amount of money with certainty or a higher amount with some degree of uncertainty. Based on these questions, we generated and normalized an index of how risk averse a person was. The higher a persons score in the index, the more risk loving they are.

## 6.2 Endline Survey

Panel B of Table A1 shows the breakdown of clients who were surveyed and who we were unable to survey at the endline. We were unable to survey 45 clients (5.3%).

**Loan Use** In order to ascertain how the loan was spent, we asked clients to list the purposes for which they had used the loan money. We provided a rubric with six broad categories: Business Expenditures, Health, Schooling, Housing Expenditures, Savings, and Miscellaneous, which were then further subdivided into more narrow sections. For example, business expenditures were divided into different types of inputs (saris, fish, etc) and equipment (sewing machine, rickshaw, etc). Surveyors were instructed to prompt clients if the total expenditure reported differed from the total loan amount. Still, in 93 cases the reported amount differed from the total loan amount. In 59 of these cases, the reported amount matched the amount of a subsequent loan taken by the client and so it is assumed that the client reported loan use for that loan. For these clients we include a dummy in the specification. Misreporting is balanced between grace period and no grace period clients. Since we are unlikely to see differences in loan use between grace period and no grace period clients in spending of subsequent loans (under which their contract did not differ), this misreporting will bias our estimates towards zero. In the remaining 34 cases in which the reported expenditure amount differed from the loan amount, the difference is less than 40% of the loan in all case.

**Inputs** This is constructed as the sum of Raw Materials and Inventory from the loan use section.

### 6.3 Variables from Multiple Surveys or Sources

The following variables were constructed using information from more than one survey instrument or data source.

**Delinquency and Default** The measure of default reported in the paper comes from the VWS administrative records. Matching between VWS records and study clients was conducted based on branch name, date of loan disbursement, loan disbursement amount, group name, and client name. All 845 clients were matched. We present three measures of default in the paper defined as those clients who have not repaid their loan amount  $X$  weeks after the full loan was due, or  $42 + X$  weeks after the first payment where  $X$  is 8, 12, and 16. Due to holidays and issues outlined below 42 weeks after the first meeting may not correspond to the exact due date. As a check on the VWS administrative records, loan officers were required to keep a record of payments at each group meeting. Based on consulting with loan officers, we also computed a separate measure of default. This measure differs slightly but it is not biased towards more or fewer reported defaults.<sup>23</sup> The results presented in Table 6 are quantitatively similar and remain statistically significant when using the alternative measure.

We are currently using the actual records kept by loan officers as a third check on the default measure and checking the reason for the few discrepancies between the default measure reported by loan officers and the default measure in the VWS administrative records.

VWS changed the interest rate that new clients were charged during the study implying that while some clients may repay 8800 Rs on an 8000 Rs loan, others may have to repay a higher amount. Although the total amount that a client has to repay differs by interest rate, VWS still requires that each client with a certain size loan repay the same fixed amount. In other words, regardless of a clients interest rate on the loan, she repays the same amount at each meeting. This means that, by definition, some clients had more meetings to repay the same sized loan. Defining the horizon for loan repayment too narrowly would

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<sup>23</sup>The full sample default rate using the administrative records is 5.2% compared with 5.4% for the measure reported by loan officers.

capture clients who simply needed longer to repay their loans due to their interest rate and not because they were defaulting. The maximum amount of time that any one client was given to repay their full loan was 45 weeks. The measures reported in the paper all fall after this cut-off.

**Household Business and New Business** All 208 new clients to our study were asked about the businesses that the household owns. They were also asked how long the business had been operating for. Based on the answers to these questions, we were able to determine if a household had started a new business with the loan, where new business is defined as one that was created after the repayment group was formed, or if the household had an existing business before becoming a participant in our study. The 276 clients who took version two of the survey were asked about existing and about new household businesses that were started in the past year. Using the same method as for new clients, we were able to categorize businesses as either existing at the time of the baseline or newly formed after disbursement of the new loan. The remaining 346 clients, who took version one and were existing clients, were only asked about whether they had started a new business in the last year but not about an existing business. Because they had been in a previous study, we used their responses from a previous baseline and endline to obtain information about businesses that existed at the beginning of the second intervention. For all clients, we used the endline to determine if a new business had been started between the baseline and endline.



Table 1: Grace Period vs. No Grace Period Randomization Check

Client-level variable	No Grace Period	Grace Period	Diff (2)-(1) full sample	Diff (2)-(1) surveyed sample	N of full sample No Grace/ Grace	N of surveyed sample No Grace/ Grace
	(1)	(2)	(3)	(4)	(5)	(6)
<b>Panel A</b>						
1 Age	34.2280 (0.408)	33.3940 (0.414)	-0.8766 (0.5675)	-0.7496 (0.5878)	425/416	387/380
2 Married	0.9010 (0.015)	0.8750 (0.016)	-0.0269 (0.0213)	-0.0361* (0.0217)	425/416	387/380
3 Literate	0.8490 (0.017)	0.7920 (0.02)	-0.0561* (0.0326)	-0.0646* (0.0346)	425/418	387/381
4 Muslim	0.0070 (0.004)	0.0190 (0.007)	0.0108 (0.0106)	0.0118 (0.0116)	425/418	387/381
5 Years of Education	6.9560 (0.159)	6.9610 (0.176)	-0.0030 (0.3046)	-0.1263 (0.3141)	413/409	376/375
6 Household Size	3.6850 (0.08)	3.7970 (0.078)	0.1088 (0.1303)	0.1037 (0.1341)	425/418	387/381
7 Household Shock	0.6070 (0.024)	0.6340 (0.024)	0.0237 (0.0618)	0.0121 (0.0623)	420/410	384/376
8 Has a Business (Narrow definition)	0.7660 (0.021)	0.7660 (0.021)	0.0000 (0.0415)	0.0102 (0.0425)	423/415	386/380
9 Owns Home	0.8460 (0.018)	0.8310 (0.019)	-0.0121 (0.0323)	-0.0018 (0.0336)	408/403	374/370
10 Has Financial Control	0.9020 (0.015)	0.8730 (0.017)	-0.0204 (0.0319)	-0.0127 (0.0339)	399/394	364/359
11 Loan Amt 4000 RPS	0.0120 (0.005)	0.0140 (0.006)	0.0031 (0.01)	0.0036 (0.011)	425/420	387/382
12 Loan Amt 5000 RPS	0.0470 (0.01)	0.0380 (0.009)	-0.0093 (0.0189)	-0.0048 (0.0202)	425/420	387/382
13 Loan Amt 6000 RPS	0.2890 (0.022)	0.2310 (0.021)	-0.0538 (0.0432)	-0.0570 (0.0423)	425/420	387/382
14 Loan Amt 8000 RPS	0.5670 (0.024)	0.5810 (0.024)	0.0143 (0.0502)	0.0079 (0.0506)	425/420	387/382
15 Loan Amt 9000 RPS	0.0000 (0)	0.0050 (0.003)	0.0046 (0.0046)	0.0051 (0.0051)	425/420	387/382
16 Loan Amount 10000	0.0820 (0.013)	0.1310 (0.017)	0.0432 (0.0361)	0.0476 (0.0363)	425/420	387/382
Joint Test p-value			0.1796	0.2199		
<b>Panel B</b>						
17 Has a Business (Broad definition)	0.9680 (0.010)	0.9730 (0.009)	0.0034 (0.014)	0.0034 (0.014)	343/328	343/328
18 Waged work	0.200 (0.400)	0.2040 (0.403)	0.0122 (0.027)	0.037 (0.028)	425/416	387/380
19 Has Savings	0.3200 (0.467)	0.3300 (0.473)	0.0280 (0.0316)	0.0306 (0.033)	425/418	387/381
20 Has Insurance	0.900 (0.295)	0.8800 (0.318)	-0.0131 (0.0196)	-0.0159 (0.0201)	425/418	387/381
21 Lost work days due to shock (broad measure of shock)	0.419 (0.494)	0.3900 (0.488)	-0.0330 (0.050)	-0.0564 (0.0531)	255/200	229/182
22 Spent money due to shock (broad measure of shock)	0.443 (0.497)	0.4300 (0.496)	-0.0560 (0.0501)	-0.074 (0.0531)	255/200	229/182
23 Total number of loans in last year	1.129 (0.882)	1.0600 (0.733)	-0.038 (0.0550)	-0.0386 (0.0578)	425/418	388/384
24 Manages HH business	0.784 (0.411)	0.7980 (0.401)	0.0007 (0.0318)	0.0007 (0.0318)	344/328	344/328

**Notes:**

- \* significant at 5% level \*\* significant at 1% level \*\*\* significant at .1% level
- (1) Standard errors adjusted for within loan group correlation in parenthesis.
  - (2) Column (3) is the coefficient on a dummy for grace period in a regression of the client-level variable on stratification of group formation and loan officer fixed effects.
  - (3) Column (4) is the coefficient on a dummy for grace period in a regression of the client-level variable on stratification of group formation and loan officer fixed effects, run on only the respondents who took the business income survey.
  - (4) Columns (5) and (6) report the number of non-missing observations for each variable.
  - (5) Overall Effect: Joint Test is Chi-Sq. Statistic, which is computed by jointly estimating a system of seemingly unrelated regressions consisting of a dummy for no delay/delay with standard errors adjusted for within loan group correlation. The Joint Test includes loan officer dummies, which are not shown here and excludes Has Business (Broad definition). Joint-test results reported at bottom of Column (3) is for the entire sample while those reported at the bottom of Column (4) is for the surveyed sample only.
  - (6) Household shock in row 7 is a dummy for whether household has experienced any of the following events in the last 30 days: birth, death, heavy rain or flood.
  - (7) Has a Business (Narrow definition) in row 8 is a dummy for whether household reported having at least one business in operation, excluding businesses formed during the 30 days prior to loan group formation and businesses formed after loan group formation.
  - (8) Has a Business (Broad definition) in row 9 is a dummy for whether according to the business start and end dates reported by clients in the Business Income survey, the client would have had at least once business open at the time of the loan disbursement. In the Business Income survey, surveyors were given extra training and instructions to probe for any non-salaried activities for which a household member was compensated in order to get the broadest measure of business activity.
  - (9) Financial Control in row 11 is a dummy for whether client answered "yes" to the following question: "If a close relative like your parents or siblings fell sick and needed money would you be able to lend money to that relative, if you had the extra money?"
  - (10) Table 1 omits the residual category of loan size 7000 RPS.
  - (11) Rows 21 and 22 reference any negative shocks the household reports in the last 30 days including birth, death, heavy rain/flood, or illness. Since not all of the baseline survey versions asked about illness, we only include the clients who took the survey which included illness in the section about shocks for these rows.
  - (12) All variables listed in Panel A are included in each regression in Tables 2-9 specified as including controls. Variables listed in Panel B are not used as controls.

Table 2: First Stage between Grace Period and No Grace Period

	Disbursement to first meeting		Disbursement to due date	
	(1)	(2)	(3)	(4)
Grace Period	54.16*** (1.521)	53.50*** (1.450)	54.16*** (1.521)	53.50*** (1.450)
Controls Used	No	Yes	No	Yes
Observations	845	845	845	845
Mean for No Delay	14.57 (0.637)	14.57 (0.637)	308.6 (0.637)	308.6 (0.637)

*Notes:*

\* significant at 5% level \*\* significant at 1% level \*\*\* significant at .1% level

- (1) Standard errors adjusted for within loan group correlation in parenthesis.
- (2) Each regression marked as including controls used all the variables found in Table 1 (with the exception of Has Business broad definition).
- (3) All regressions include stratification of group formation fixed effects. Control equations also include loan officer fixed effects.
- (4) In cases when a control variable is missing, its value is set to zero and a dummy is included for whether the variable is missing.

Table 3: Loan Use-All Categories

	Business		Health		Education		Home Repairs		Savings		Other	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Grace Period	579.8*** (208.3)	421.3** (198.6)	31.35 (65.22)	36.90 (59.35)	-59.42 (49.94)	-69.10 (52.83)	-238.9* (140.1)	-259.6* (156.2)	1.057 (47.07)	22.30 (48.11)	-59.82 (115.8)	-65.80 (115.8)
Controls Used	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	784	784	784	784	784	784	784	784	784	784	784	784
Mean for No Delay and Matches	6134.4 (165.3)	6134.4 (165.3)	96.58 (42.36)	96.58 (42.36)	132.9 (57.54)	132.9 (57.54)	531.4 (118.2)	531.4 (118.2)	117.6 (33.22)	117.6 (33.22)	430.3 (94.74)	430.3 (94.74)

*Notes:*

\* significant at 5% level \*\* significant at 1% level \*\*\* significant at .1% level

(1) Footnotes (1)-(4) in Table 2 also apply to each regression in this table

(2) Clients were asked about the loan they received in this intervention. Some of the clients who went on to the next intervention answered about the next loan. So all regressions include a dummy for whether the sum of loan use expenditures matched the 3rd intervention loan instead of the 2nd intervention loan.

Table 4: Loan Use-Business Expenditures Break Down

	Inventory		Raw Materials		Inputs		Equipment		Other Business Expenditures	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Grace Period	214.0 (307.1)	157.7 (303.3)	394.1* (233.1)	352.1 (235.8)	608.1** (293.0)	509.8* (282.8)	-60.02 (246.0)	-122.4 (234.2)	31.73 (48.46)	33.85 (50.00)
Controls Used	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Observations	784	784	784	784	784	784	784	784	784	784
Mean for No Delay and Matches	3251.1 (240.5)	3251.1 (240.5)	1307.1 (157.0)	1307.1 (157.0)	4558.2 (234.2)	4558.2 (234.2)	1492.3 (167.7)	1492.3 (167.7)	83.86 (37.05)	83.86 (37.05)

*Notes:*

\* significant at 5% level \*\* significant at 1% level \*\*\* significant at .1% level

(1) Footnotes (1)-(4) in Table 2 also apply to each regression in this table.

(2) Clients were asked about the loan they received in this intervention. Some of the clients who went on to the next intervention answered about the next loan. So all regressions include a dummy for whether the sum of loan use expenditures matched the 3rd intervention loan instead of the 2nd intervention loan.

Table 5: Default between Grace Period and No Grace Period

	Full loan not repaid within 8 weeks of due date		Full loan not repaid within 16 weeks of due date		Full loan not repaid within 30 weeks of due date		Full loan not repaid within 52 weeks of due date	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Grace Period	0.0784** (0.0370)	0.0760** (0.0356)	0.0903*** (0.0343)	0.0872** (0.0340)	0.0582** (0.0285)	0.0617** (0.0290)	0.0769** (0.0386)	0.0679** (0.0320)
Controls Used	No	Yes	No	Yes	No	Yes	No	Yes
Observations	845	845	845	845	845	845	545	545
Mean for No Delay	0.0659 (0.0190)	0.0659 (0.0190)	0.0376 (0.0132)	0.0376 (0.0132)	0.0306 (0.0123)	0.0306 (0.0123)	0.0197 (0.0112)	0.0197 (0.0112)

*Notes:*

\* significant at 5% level \*\* significant at 1% level \*\*\* significant at .1% level

(1) Footnotes (1)-(4) in Table 2 also apply to each regression in this table.

Table 6: Income and Profits

	Log of Average monthly HH income				Average Weekly Profits				Variability of Average Weekly Profits (Tens of Thousands)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Grace Period	0.192** (0.0801)	0.169** (0.0789)	0.180** (0.0800)	0.162** (0.0773)	893.8** (372.0)	815.8** (316.9)	493.8*** (182.2)	476.9*** (178.5)	4371 (3639)	3508 (2829)	470*** (168)	425*** (143)
Controls Used	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Trimmed	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
Observations	752	752	748	748	756	756	752	752	756	756	752	752
Mean for No Delay	20,478	20,478	20,478	20,478	1592	1592	1592	1592	539	539	539	539

*Notes:*

\* significant at 5% level \*\* significant at 1% level \*\*\* significant at .1% level

(1) Footnotes (1)-(4) in Table 2 also apply to each regression in this table.

(2) Trimmed samples exclude the top 0.5% of values.

(3) Variability is measured by square of deviation from treatment or control mean.

Table 7: Business results

	Inventory and Assets				Number of Employees	
	(1)	(2)	(3)	(4)	(5)	(6)
Grace Period	28,584** (11,234)	30,807*** (10,787)	17,536** (7,029)	19,552*** (7,164)	0.351 (0.310)	0.251 (0.294)
Controls Used	No	Yes	No	Yes	No	Yes
Trimmed	No	No	Yes	Yes	No	No
Observations	770	770	766	766	755	755
Mean for No Delay	35,661	35,661	35,661	35,661	2.54	2.54

*Notes:*

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

(1) Footnotes (1)-(4) in Table 2 also apply to each regression in this table.

(2) Trimmed samples exclude the top 0.5% of values.

Table 8: Business creation and destruction

	Whether new business created 30 days prior or 6 months after loan group formation		Whether at least one business reported as closed	
	(1)	(2)	(3)	(4)
Grace Period	0.0282* (0.0150)	0.0302** (0.0147)	-0.0707** (0.0323)	-0.0634* (0.0333)
Controls Used	No	Yes	No	Yes
Observations	771	771	770	770
Mean for No Delay	0.028	0.028	0.386	0.386

*Notes:*

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

(1) Footnotes (1)-(4) in Table 2 also apply to each regression in this table.



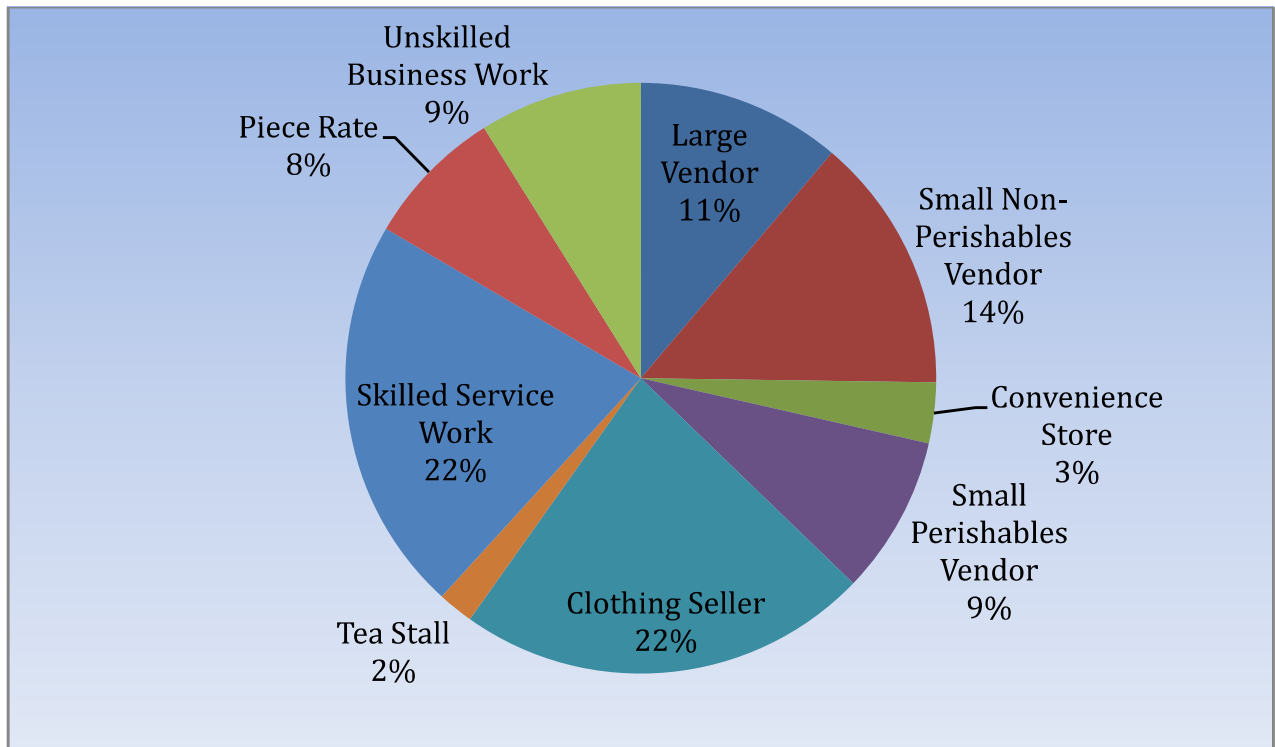


Figure 1: Distribution of Household Business Types

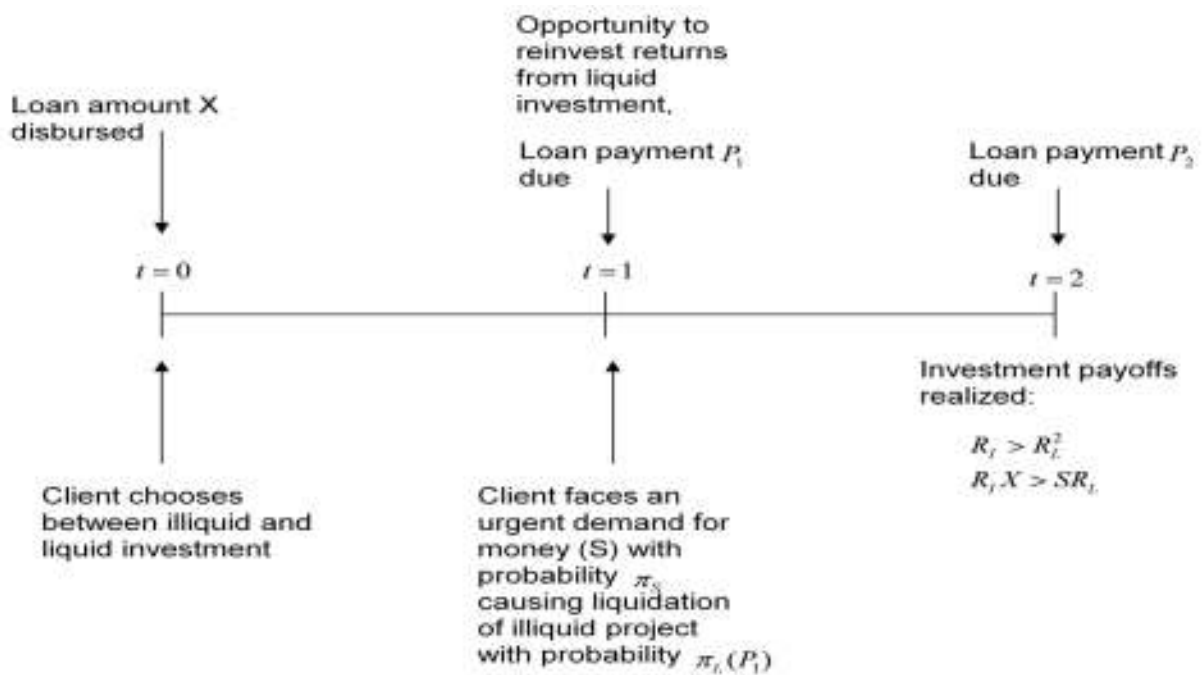


Figure 2: Model Timing

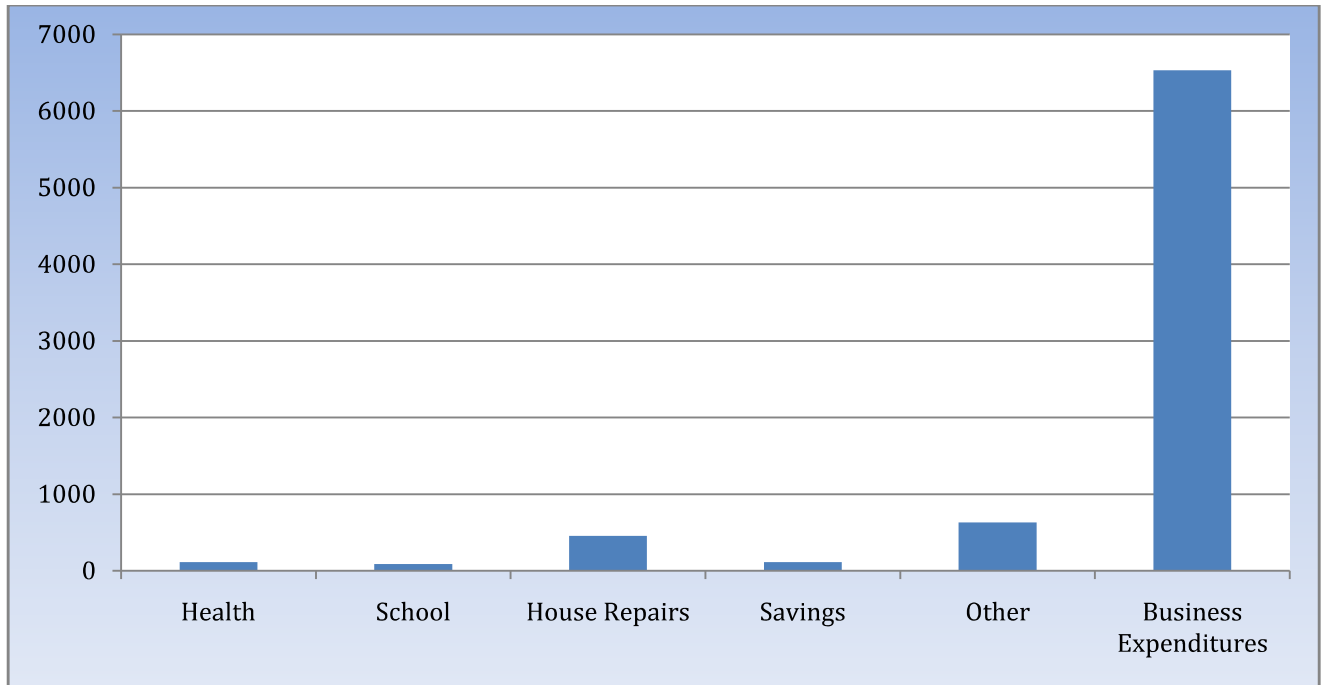


Figure 3: Loan Expenditure Categories

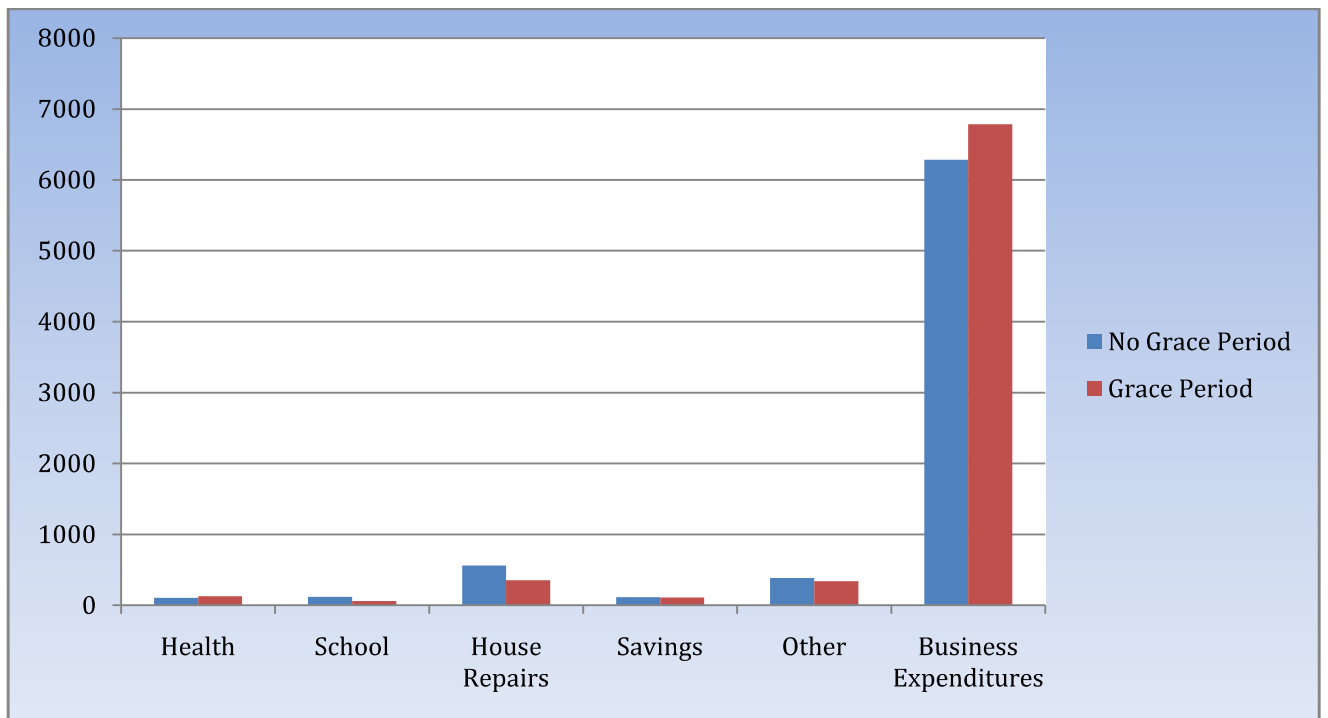


Figure 4: Loan Expenditure Categories by Grace Period and No Grace Period Clients

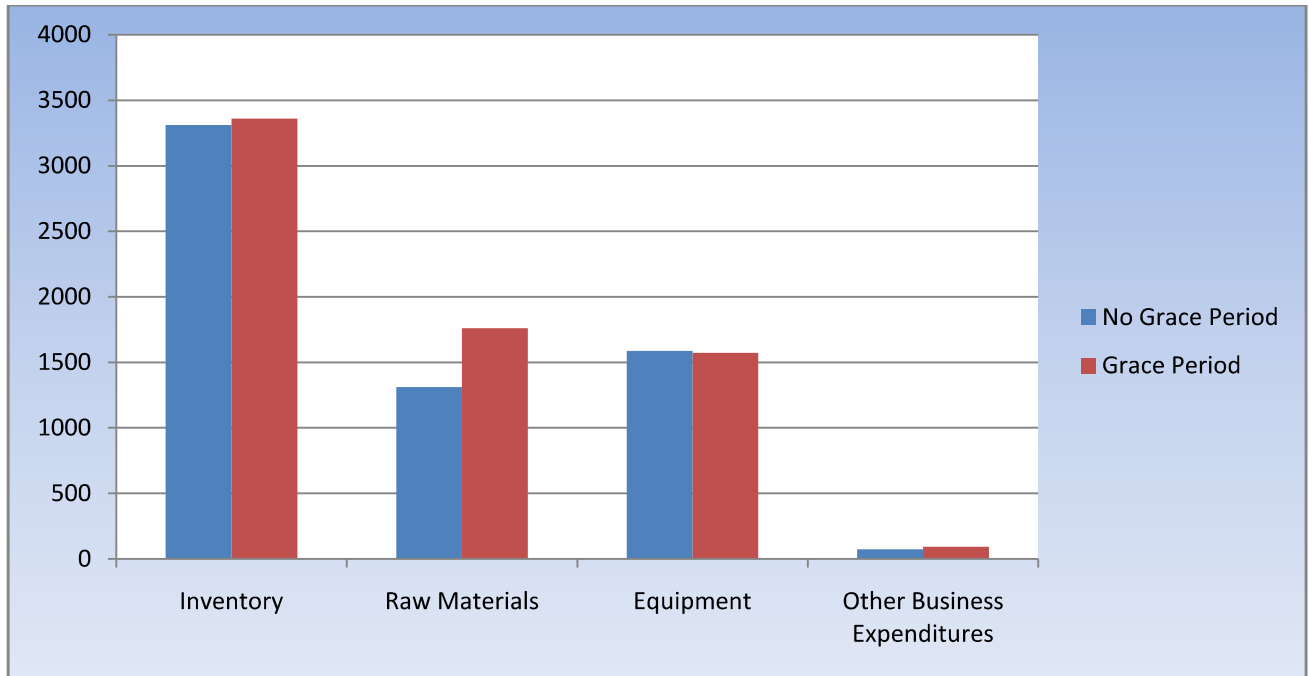


Figure 5: Business Expenditure Categories by Grace Period and No Grace Period Clients

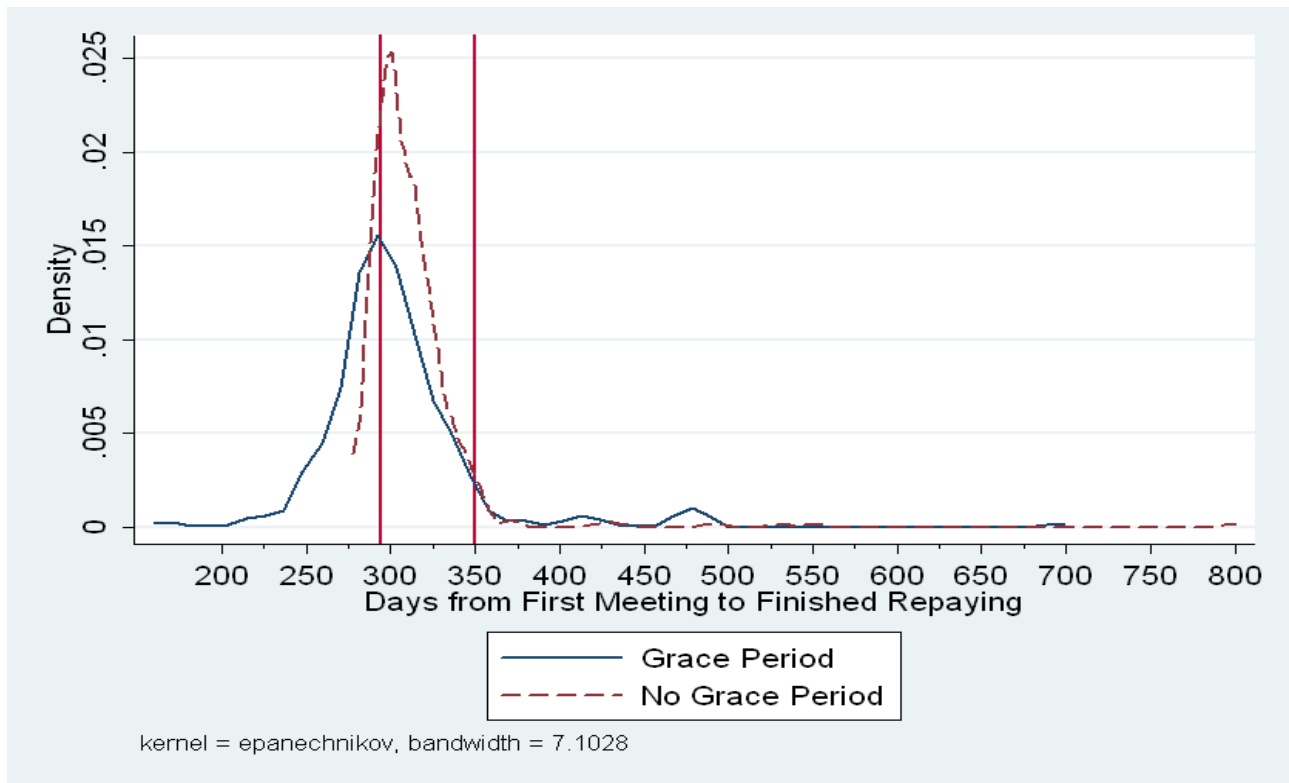


Figure 6: Kernel Density of Days Taken to Repay

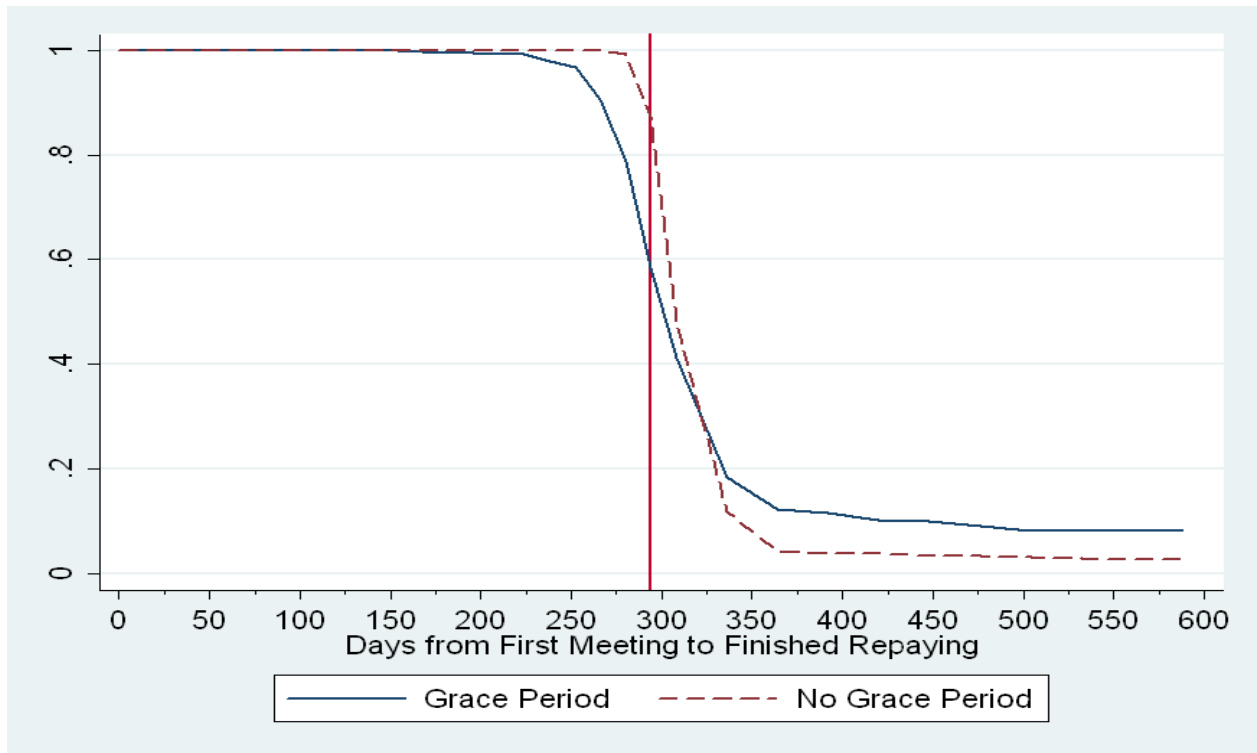


Figure 7: Fraction of Clients Who Have Not Repaid

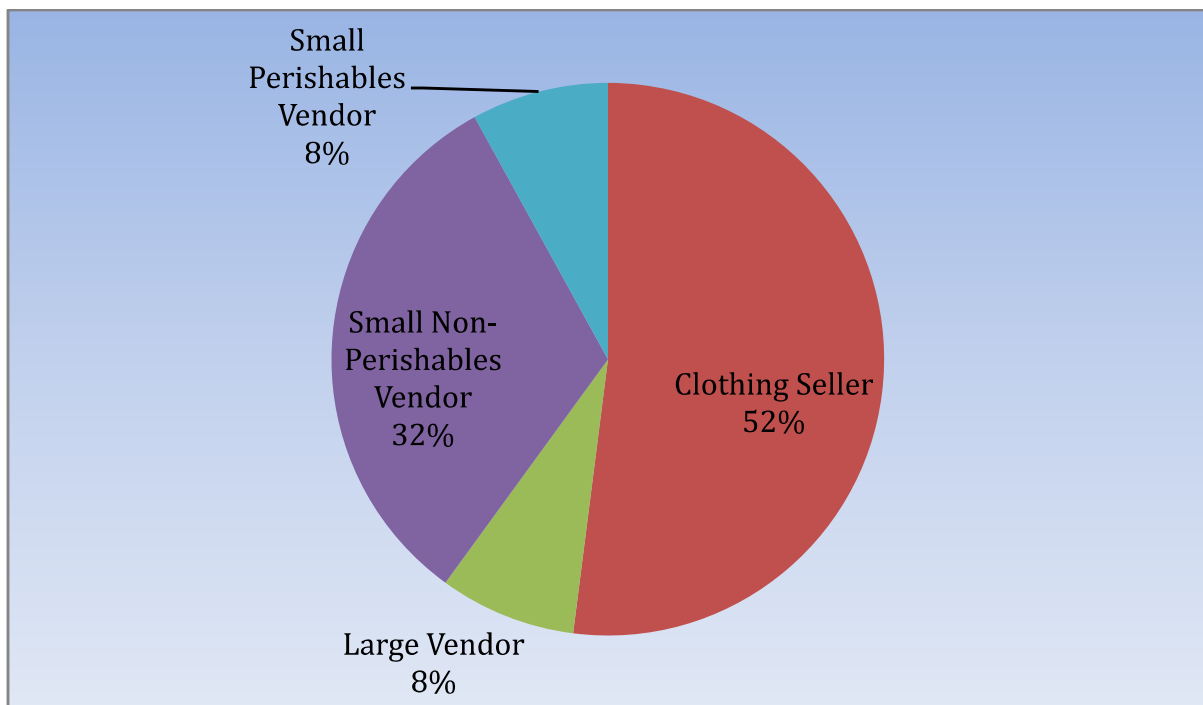


Figure 8: Distribution of New Household Business Types

Table A1: Baseline and Endline Taken by First Time and Existing Clients and by Grace and No Grace Period

	First Time Client		Existing Client		<b>Total</b>	Grace Period		No Grace Period		<b>Total</b>
<b>Panel A: Baseline Survey</b>										
Version 1	109		346		455	200		255		455
Version 2	0		276		276	162		114		276
Version 3	99		0		99	48		51		99
Not Surveyed	2		13		15	10		5		15
<b>Panel B: Endline Survey</b>										
Surveyed	196		604		800	392		408		800
Not Surveyed	14		31		45	28		17		45
<b>Total</b>	<b>210</b>		<b>635</b>		<b>845</b>	<b>420</b>		<b>425</b>		<b>845</b>