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Do flexible repayment schedules improve the impact of microcredit? Evidence from a randomized evaluation in rural India*

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Microcredit institutions typically apply rigid and fixed repayment schedules when disbursing loans in order to reduce transaction costs, simplify procedures, and inculcate fiscal discipline for better repayment behavior. Microcredit clients, however, often have neither smooth income nor singular moments in which to make lumpy investments throughout the year. This mismatch generates a cash flow disconnect and, given the presumed liquidity constraints of the typical microcredit client, a potential welfare loss. Using data from a randomized evaluation with dairy farmers in rural India, we test the impact of flexible microcredit repayment schedules relative to “normal” inflexible, fixed repayment schedules. Although we are only able to track those who borrow, which introduces potential selection effects, we find amongst those in flexible lending groups some evidence for higher ability to absorb shocks and higher income, which seems to be driven by limited improvements in investment and higher production from milk. On the cost-side, defaults do increase for the lender. Towards the end of the study, the microcredit market encountered crisis, with mass defaults, thus it is hard to generalize with respect to the default results. We conclude with caution, that we have shown suggestive evidence that a more flexible product design, one tailored to the needs of a dairy farmer, may be welfare enhancing for the dairy farmer. Further work is needed to both validate these results, and explore how to balance any trade-off with default.

Keywords: Flexible repayment schedules, microfinance, microcredit, consumption smoothing
JEL categories: O16, Q14

1 Introduction

Microcredit institutions typically use standardized products for several reasons. First, these products help lower the costs of credit disbursement by streamlining loan administration, simplifying decision making for field staff, reducing the information required from clients, and standardizing the calculation of repayment obligations and the explanation of these obligations to uneducated

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borrowers (Armendáriz and Morduch (2010), Meyer (2002)). Second, standardized loan products with high frequency repayment installments of fixed amounts may help inculcate fiscal discipline (Armendáriz and Morduch (2010), Meyer (2002), Jain and Mansuri (2003)).

However, fixed payments may not be optimal for the client. Microcredit borrowers do not typically have a smooth income throughout the year and may face cash flow disconnects when loan payments come due at periods of ebbing income. This disconnect is likely to be even more pronounced with adverse income shocks (Karlan and Mullainathan (2007)).

Given the liquidity constraints of a typical microcredit client, fluctuating income and income shocks have several possible implications: failure to smooth consumption (Sawada and Shimizutani (2007), Shoji (2007), Sawada (2008), Shoji (2010)), over-indebtedness by cross-financing of repayments from informal sources (Jain and Mansuri (2003)), and higher than efficient levels of default. Wright (2000) and Meyer (2002) even claim that fixed repayment schedules deter potential borrowers from joining microcredit programs and discourage existing clients from repeated borrowing.

Field *et al.* (2013) argue that the typical microcredit contracts with the immediate start of repayments after loan disbursement stipulate *ex ante* underinvestment, especially in long gestation projects with illiquid investments. Studying the effects of a two-month grace period on business and loan repayment performance of micro entrepreneurs, they find that postponing repayment benefits borrowers by increasing short-run business investments and long-run profits, but also harms the financier by increasing the variance of profits and subsequently default.

Considering this, clients could potentially benefit substantially from loan repayment schedules that allow them to align repayment outflows and income inflows (Karlan and Mullainathan (2007)). Whether flexibility is beneficial for clients in practice remains to be answered, however. Based on a randomized evaluation in rural India, we compare structured flexible loans, i.e. loans with regular repayments and predefined ways to exercise flexibility, with regular fixed repayment schedule loans.¹ The sample frame consists of over 3,000 existing microcredit clients in a district with high dairy farming density. Dairy farming is a natural field to test a flexible loan product since milk production by dairy cattle follows the same cycle punctuated by individual dry periods with no milk to sell.

The randomized evaluation tests two types of flexible loan products. The first flexible repayment schedule is tailored specifically to the cash flow cycles of dairy farming. Loan repayments are required when dairy cattle are producing milk and may be paused when dairy cattle are not lactating, i.e. in the dry period. The second flexible repayment schedule addresses general short-term idiosyncratic and unexpected shocks by permitting occasional skips in repayment. Specifically, it allows borrowers to lag behind in repayment for up to two months.

We study the effects of these structured flexible repayment schemes on borrowers' income, consumption smoothing, borrowing behavior, and dairy investments. We find some evidence of reduced outside borrowing and only suggestive evidence of consumption smoothing. There is, however, evidence on increased income for clients with the dairy-specific flexible lending product and investments in dairy cattle seems to be the potential impact channel. Although we do not find any effect on the likelihood of purchasing a cow, we find evidence of the dairy-specific flexible lending product

¹The evaluation was designed by Dean Karlan and Sendhil Mullainathan and implemented in collaboration with the Centre for Microfinance in Chennai.

leading to higher investments in dairy cattle: milk production increases, and amongst those who buy a cow (caveat, an endogenous sample filter), the average cow purchase price is higher. Nevertheless, this increase in income did not yet translate to higher average consumption. Both this loan and the second flexible lending product, that is the loan that allows for occasional skips in repayment, did lead to better ability to cope with shocks (consumption is less affected by the death of a cow for those in this treatment group).

The data come with a critical flaw: outcomes for a substantial portion of individuals that did not take-up the assigned loan product are not observed which introduces potential selection effects. Although the research design still answers the policy questions from the lender’s perspective, from a research perspective we cannot distinguish whether the observed effects are driven by incentive changes in the product design or shifts in the composition of the borrower pool. We examine the evidence for selection on observables, and also conduct analysis on a restricted sample frame, to help understand how much selection may be influencing the results.

For the lending institution, the change in repayment structure was costly: both the incidence and the level of default increased. However, in contrast to e.g. Field *et al.* (2013) which also found an increase in default from a product with delayed start for repayment, here the underlying market environment was unique, i.e., a massive market collapse due to political and societal pressure. Thus the repayment results we find here are potentially not particularly generalizable, and with the collapse of the partner institution the data are incomplete.

2 Experiment and data

This study is based on a randomized evaluation conducted from mid-2006 to early 2009 in the Puri district of Orissa, India, where dairy farming is a major income generating activity aside from agricultural production.² The sample frame consists of 3,648 clients of the KAS Foundation, a local microcredit institution that provided loans for agriculture, dairy farming, microenterprises, and other livelihoods. Most of the microfinance clients participating in the study are already clients of KAS Foundation.

PARTNER MICROCREDIT INSTITUTION

KAS Foundation was established in 2003, and by 2006 had expanded rapidly to 394,462 active borrowers and US \$27,753,071 in outstanding loans.³ The KAS Foundation’s microcredit clients are organized in self-help groups (SHGs) of 15 to 20 women. KAS Foundation mostly relies on pre-existing SHGs formed by NGOs for its microcredit activities, but new groups are also formed in which clients can borrow. After a probation period in which the group members accumulate funds with their own savings and give credit to group members from these accumulated funds, SHGs are linked to formal banks for savings and credit transactions. Throughout India, the National Bank for

²Dean Karlan and Sendhil Mullainathan who designed the randomized evaluation and implemented it in collaboration with the Centre for Microfinance in Chennai, graciously provided the data for this study.

³Detailed information on KAS Foundation is listed on the Mix Market homepage (<http://reports.mixmarket.org/mfi/jfsl>) where KAS Foundation is registered under JFSL - Jagannath Financial Services Limited.

Agriculture and Rural Development has promoted this in its SHG-bank linkage program (NABARD (1992), Reserve Bank of India (2005), NABARD (2008)).⁴

Loans of KAS Foundation are secured by joint liability at the group level, as well as by some regular savings from the group members in a savings account at the nearest branch. KAS usually offers loans of Rs. 3,000 to Rs. 4,000 per client which are repaid in equated monthly installments over a two-year time period with an annual interest rate of 10.75 percent.⁵

In 2010, KAS Foundation collapsed and withdrew all its micro lending activities. We will discuss possible implications of this in section 4 with the loan repayment analysis.

DAIRY FARMING AND PRODUCTION CYCLES IN DAIRY FARMING

Dairy farmers are a particularly vulnerable group due to the inherent milk production cycle of dairy cattle which leads to irregular income. Although the timing of the phases in the dairy cycle differs across dairy farmers, the structure of the dairy cycle is the same for all dairy cattle. This cycle is characterized by two phases: a lactation phase with milk production and a dry period before calving when cows do not produce any milk. This dry period at minimum lasts two months, but for smallholder dairy farmers in India, the dry period usually lasts anywhere from four to ten months (Saha *et al.* (2004)).

[Figure 1 about here]

As a result, income generated from dairy farming is highly seasonal; farmers receive high income from milk production in the lactation phase and no income during the dry period. This is illustrated graphically in Figure 1. Under a fixed loan repayment schedule, this production cycle would result in a period in which a dairy farmer client would have to continue making loan payments while their dairy cattle are not earning income. Flexible repayment schedules may help to manage this cash flow disconnect.

EXPERIMENTAL DESIGN

Loans were disbursed by the KAS Foundation for the purpose of purchasing cattle. In order to design the loan products qualitative interviews and focus group discussions have been conducted with clients and staff of KAS Foundation to identify the exact nature of the need for flexibility and to test the feasibility of implementing flexible repayment schedules.

[Table 1 about here]

Table 1 gives an overview of the loan products in the study. The *larger fixed loan* in the study is a Rs. 6,000 loan with a fixed and equal monthly repayment schedule, 10.75 per year interest rate, and 24 month duration. In the econometric specifications below, this is the control group (or constant). Repayment of the loan is secured by joint liability of the borrowing group. This loan amount allows

⁴As of the end of March 2005 over 1.4 million SHGs were linked to formal banks (Reserve Bank of India (2005)).

⁵Exchange rate at time of study was Rs. 40 to US \$1.

for the purchase of a high quality dairy cow.⁶ In comparison, the regular KAS Foundation loan has a loan size of Rs. 4,000. It is included in the evaluation as the *smaller fixed loan* allowing us to analyze effects of changes in loan size.

Two flexible loan products are designed for this study. Both flexible loan products have a loan amount of Rs. 6,000, with loan repayment scheduled in monthly installments. In contrast to the fixed repayment loans, the flexible loans have strictly identified rules when clients can pause repayment of the principal installment but continue paying the interest installment. This way all clients, even if they exercise their flexibility and systematically skip repayments, have to continue attending the monthly meetings. This structured flexibility maintains the group structure and regular repayment meetings which help to promote social capital creation and to keeping clients' repayment morale and fiscal discipline high. Additionally, the implementation of flexibility does not demand too much extra work from KAS Foundation's field officers who collect the repayment.

The first flexible loan is tailored both to support the purchase of dairy cattle and to assist the farmer to meet obligations throughout the milk production cycle. This loan, called the *dairy specific flexible loan*, allows the farmer to align the repayment burden with the dairy production flow. In the first six months, farmers are required to make two principal repayment installments at each monthly meeting. In return for the prepayment of six installments, it allows clients to skip the principal installments for any consecutive six-month period thereafter as illustrated in Figure 2 (a). Throughout the repayment duration, interest payments have to be made. The underlying idea is to carry a high repayment burden when milk production is high directly after purchase and to reduce loan repayment drastically as soon as the dairy cow goes dry.

[Figure 2 about here]

The second flexible loan product, called the *coupon flexible loan*, is tailored to help microcredit clients adjust to unexpected idiosyncratic shocks in a less rigid way than the first flexible loan. It allows the borrower to systematically skip repayments and to lag behind in the repayment of the principal installment at any point in time after the third month of the loan cycle for up to a total of two installment payments. Repayment is tracked and made transparent via a coupon booklet. The booklet consists of two identical parts which contain information on the month and the amount of repayment. For each installment the borrower pays, one part of the coupon is handed to the loan officer while the other part remains in the coupon booklet. This way, both borrowers and credit officers know exactly for which month the repayment has been made, when the borrower has skipped a repayment, and how many installments she is lagging behind. As with the first flexible loan, interest payments have to be made throughout the total loan duration. One possible realization of the repayment trajectory is illustrated in Figure 2 (b).

Our three treatment groups, i.e. both flexible loan products and the smaller fixed loan, are compared to the larger fixed loan, our control group. The four loan products are randomly assigned to 202 borrowing groups with 3,648 clients in total (Table 2, Panel A). After the random assignment

⁶During the preparations for designing the loan products, participants stated the inappropriate loan size for the purchase of cattle as a main criticism of the regular existing loan of KAS Foundation.

of the four loan products to borrowing groups, the assigned loan was offered to each SHG group of 15 to 20.⁷

Approximately half the groups and consequently half of the clients were offered a loan product with a fixed repayment schedule (Table 2, Panel A, columns (1) and (4)) and the other half were offered a loan product with a flexible repayment schedule (Table 2, Panel A, columns (2) and (3)). The vast majority of the groups is formed by female only borrowing groups, that is borrowing groups with only female borrowers.

[Table 2 about here]

Take-up of treatment

After the offer of the randomly assigned loan product to the borrowing groups, each group member could choose to take-up the offered loan product (i.e. the dairy specific flexible loan, the coupon flexible loan, the larger fixed loan or the smaller fixed loan, based on their random assignment). If clients did not want to take-up the assigned loan product when assigned a loan size of Rs. 6,000, they could opt out and take-up the smaller fixed loan instead.⁸ Additionally, clients could choose to not take-up any loan.

In total, 2,766 clients (75.82 percent) took-up the assigned loan, 210 clients (5.76 percent) offered either one of the flexible loans or the larger fixed loan opted for the default loan, the smaller fixed loan, and 672 clients (18.42 percent) did not take-up any loan. Unfortunately, we do not have any detailed information as to why clients did take-up.

Table 2, Panel B, sets out the compliance levels for all assigned treatment loans. Take-up rates of the assigned loan are highest (86.7 percent) for the smaller fixed loan (the regular loan of KAS Foundation) and lowest (69.1 percent) for the dairy specific flexible loan. Eight groups broke down during the group formation period. All of these borrowers are included in the analyses as non-borrowers, e.g. in the 672 clients that did not take-up any loan.

Since take-up of the treatments in form of different loan products cannot be enforced, we use the intent-to-treat (ITT) framework for our analysis, thus including both the non-compliers and non-borrowers with their assigned treatment for all specifications. We discuss potential composition effects of the borrower pool below at the end of this section.

DATA

Data collection and survey participation

Household data were collected in seven survey rounds. The first survey was conducted immediately after loan disbursement in 2006. Due to organizational challenges, the first survey was not conducted before the loan disbursement as hoped for but rather shortly thereafter.

⁷KAS Foundation's field collectors, who manage a group's formation and monthly repayment, were responsible for marketing the prescribed loan. This involved explaining the features of the offered loan product and the repayment schemes to the clients.

⁸The smaller fixed loan corresponds to the regular loan that KAS Foundation offers.

Our data come with a critical flaw: we do not observe outcomes for all individuals that did not take-up. Thus, if there are important compositional differences in who takes-up each product, the analysis is no longer adhering to the experimental design per se, and conflates selection with incentive effects from the product. From the microfinance institution’s perspective, this still answers the policy question at hand; however, from a research perspective, this conflates mechanisms. We will examine the evidence for selection on observables, present weighted results to reflect the compliance with treatment assignment, and conduct analysis on a restricted sample frame, to help understand how much selection may be influencing the results.

Midline surveys were conducted approximately every three to five months, yielding five midline surveys during the loan cycle. An endline survey was conducted after the completion of the loan cycle in late 2008 and early 2009. The total data set contains information on household demographics, household conditions, income details, assets and expenditure details, indebtedness, savings and insurance details, as well as detailed information on cattle owned by the household.⁹

Survey rates, i.e. the number of completed surveys as a share of all seven survey rounds, is 68 percent on average for all clients, but varies substantially across compliance levels: for borrowers who took-up the assigned loan survey rates vary from 76 to 87 percent; for borrowers who did not take-up any loan survey rates vary between 18 and 31 percent; for borrowers who were assigned a flexible or the larger fixed loan and took-up the smaller fixed loan instead survey rates are around 14 percent (Table 2, Panel B). Except for the lower likelihood of being surveyed for borrowers who took-up the assigned loan and were assigned the smaller fixed loan, there are no statistically significant differences across survey rates (Appendix Table A.1, Panel A, columns 1 to 3).

In total, 31 percent of all clients completed all seven survey rounds with an average of 4.8 completed surveys (Appendix Table A.1, Panel A). There are no differences in survey completion (31 percent completed all surveys), number of surveys completed (4.8 surveys completed) and attrition (9.9 percent did not participate in the last survey although they participated in a previous survey) across treatments. Clients offered the smaller fixed loan were, however, more likely to participate in at least one survey (Appendix Table A.1, Panel A, column 6). Survey participation was highest in the final survey round (Appendix Table A.1, Panel B).¹⁰

The differences in survey participation across compliance levels leave us with the following data: of the 2,976 clients who actually took a loan, all but 17 were surveyed in at least one out of the seven survey rounds. The 672 clients that did not take any loan were unfortunately interviewed erratically. 413 of them were interviewed at least once, but only 242 were interviewed at the first survey round and 185 at the last survey. Since household demographics and client characteristics were only collected at the first and last survey, our take-up analysis is limited to the subset of borrowers that were interviewed in one of these surveys.

The differences in survey participation create an unbalanced panel and the differences across

⁹Detailed household demographic information was only collected in the first survey (round 1) and the last survey (round 7), midline surveys (rounds 2 to 6) focus on outcome variables such as consumption, milk production and income. We indicate whenever our data is only available for a subset of survey rounds.

¹⁰In the first survey round, clients offered a smaller fixed loan were less likely to be surveyed (-14.0 percent). In survey round two and three, clients offered a dairy specific flexible loan were less likely to be surveyed (-10.7 and -13.2 percent). The joint F-test confirms a significant difference in survey participation across treatments for the first three survey rounds.

compliance levels may bias our results if there is systematic self-selection into survey participation by compliance with treatment. We lack a good instrument for survey participation. As a robustness check we include sample weights for survey participation in each survey round conditioned on compliance with treatment (Appendix B).

Summary statistics and orthogonality

Measures of household income, consumption, or household assets are potentially endogenous to loan disbursement, so we restrict the orthogonality test to household characteristics that are unlikely to change due to the loan disbursement.¹¹ These include individual characteristics of the household head or the client, such as age, gender, literacy and level of education, household characteristics such as the household size and the number of children, or household landholding characteristics such as the incidence of owning land, the land area and its value.

[Table 3 about here]

Table 3 presents descriptive statistics for characteristics of the client, the household head, and household and landholding characteristics by treatment assignment. The average household in the control group assigned the larger fixed loan consists of 6.5 members, of which 1.5 are children below the age of 13. Most household heads are male (94 percent) and literate (81 percent), with an average age of 48 years and 8.4 years of education. The majority of clients is female (1 percent male borrowers), the average age is 40 years, 69 percent is literate with an average of 9.5 years of education. With regard to landholding, 77 percent of the households own land, with on average a land area of 3 acres and a land value of Rs. 137,914.

Column 5 sets out the p-values of the joint significance F-test that tests whether each characteristic's average is the same across the binary variables for assigned treatments (columns 2 to 4) and the control group (column 1) who received the larger fixed loan. In terms of household and landholding characteristics, and mainly in terms of household head characteristics, the sample seems to be well-balanced with no p-values under 10 percent for all controlled characteristics with the exception of the literacy level of the household head. For client characteristics however, client age, and the proportion of male borrowers do indicate statistically significant differences across treatments.

The difference in the proportion of male borrowers may be a result of the random treatment assignment at the group level. Table 2, Panel A, shows the distribution of loan products across borrowing groups and clients. While most of the borrowing groups (185 groups) consist of only female borrowers, 17 groups consist of only male borrowers. The randomization was not stratified on the gender of the borrowing group and with some bad luck the distribution of male only borrowing groups is uneven across treatments explaining the significant client gender differences across treatments.

Nevertheless, the significant differences in client and household head characteristics may indicate different compositions of borrowers across treatments as discussed below. As robustness checks, we first repeat all analyses including client characteristics controlling for differences in client age,

¹¹This is necessary since the first survey was conducted after loan disbursement.

gender, literacy and education (Appendix C). Second, we repeat all analysis including all covariates of client characteristics, household head characteristics, household size and household land holding (Appendix D).

Composition of the borrower pool

Since we use the intent-to-treat (ITT) framework for our analysis, we include both the non-compliers (i.e. the non-borrowers) and the borrowers who took-up the smaller fixed loan instead of the assigned loan by their assigned treatments in our analyses. Unfortunately, we only have client characteristic data of 185 clients who did not take-up any loan which severely limits our analysis of take-up and the composition of the borrower pool. In terms of interpreting our results, we cannot distinguish the effects of changes in borrower composition due to take-up differences from the effects of the flexible repayment mechanism.

First, we look at the summary statistics and the orthogonality tests for the subsample of households who actually took the loan they were assigned to. Appendix Table A.2 repeats the orthogonality checks by assigned treatment for all borrowers who took-up the assigned loan. There are only two changes in the balance checks on the take-up sample compared to the total sample: first, client literacy is now statistically significantly different across the four treatment groups, and second, land area owned is now statistically significantly different at the five percent level. This slightly strengthens the concern for composition effects with respect to client gender and literacy, and unfortunately, with our data, we cannot separate changes in the borrower composition from loan incentive effects. Although no guarantee for unbiased results, the concern of composition effects is mitigated if results are robust to restricting the sample to only female borrowing groups (Appendix E) and only literate borrowers (Appendix F). We report whenever results from the analyses are not robust to any of these checks.

In Table 4 we analyze whether the composition of the borrower pool in the three treatments and in the control group significantly influences the take-up decision of the assigned loan. For the larger fixed loan, client age is positively and land ownership is negatively significantly correlated with take-up of the assigned loan. For the dairy specific flexible loan, land area is positively correlated with take-up of the assigned loan. For the coupon flexible loan, client gender is positively significantly correlated with take-up. For the smaller fixed loan, there are no significant correlations. Across treatments there is no clear pattern of covariates that influence take-up which alleviates the concern of composition effects of the borrower pool slightly.

[Table 4 about here]

3 Empirical strategy

Given the nature of our data we follow two different estimation strategies. First, in cases where we report results from a single time period, we use the single difference estimation strategy that relies on the randomization of treatments for identification in an OLS framework. The estimation

equation is

$$y_{ig} = \alpha + \beta_1 * flex_dairy_g + \beta_2 * flex_coupon_g + \gamma * fixed_small_g + u_{ig} \quad (1)$$

where y_{ig} is the outcome variable of interest for household i in group g . $flex_dairy_g$, $flex_coupon_g$ and $fixed_small_g$ are binary indicator variables for the treatment of the assigned loan product for the borrowing group g . In this ITT-framework, the coefficients of interest β_1 and β_2 measure the average causal effect of being offered a flexible loan product. γ measures the average causal effect of the difference in loan size for both fixed repayment loans. We cluster the standard errors at the group level since the treatment was randomized at the borrowing group level.

To also consider effects over the total loan cycle period, we consider information from all survey rounds in a pooled OLS framework as a second estimation strategy. We stack all observations by household i and control for survey round fixed effects δ_t as described in

$$y_{igt} = \alpha + \beta_1 * flex_dairy_g + \beta_2 * flex_coupon_g + \gamma * fixed_small_g + \sum_t \delta_t + u_{igt}, \quad (2)$$

with $t = 1, \dots, 7$.

We cluster the standard errors at the group level since our randomization was implemented at the group level. This is the conservative way of clustering standard errors accounting both for intra-group correlation and autocorrelation of individuals over time. To better understand which correlation is driving some results, we cluster standard errors at the individual level, i.e. only accounting for autocorrelation over time, as a robustness check (Appendix G).

4 Empirical results

HOUSEHOLD WELFARE AND VULNERABILITY TO INCOME SHOCKS

Rigid and fixed repayment schedules may induce an increase in vulnerability to income shocks, failure to smooth consumption and over-indebtedness. These issues are especially burdensome when client households face an adverse income shock since these households are obliged to continue making loan payments against limited income. In response, households can apply various coping mechanisms to deal with idiosyncratic and unexpected shocks. In the following analyses we look at income and consumption as measures for household welfare and at consumption smoothing and outside borrowing from formal and informal sources as measures of risk vulnerability and coping.

Income sources and income level

The general basket of income earning activities of a household and its level of income are the main determinants of households' welfare. In our study, households stated on average 3.96 income sources with 82 percent of households engaged in agricultural activities, 76 percent earning income from

livestock activities, and 28 percent running a microenterprise across all survey rounds (Table 5). The total self-reported annual income earned is Rs. 24,546 – about US \$610 at the time of study.

Even though self-reported income usually suffers from many biases regarding the absolute income size, we still can use this data for comparing households, since biases are unlikely to be systematically different between households. When comparing income levels, we examine binary variables for the source of income received and total income in Rs. To reduce the effect of outliers we winsorize our data at the top one percent.

[Table 5 about here]

In the pooled OLS framework of equation (2) we study differences in the number of income sources including: the likelihood of being engaged in agriculture, livestock, microenterprise, salary and wage income activities, and the total self-reported income earned last year. We find a significant higher number of income sources for the dairy specific flexible loan treatment group of 0.23 (se = 0.08). Evaluated at the sample mean of 3.96 income sources, this corresponds to an increase of seven percent, resulting in higher income generation at the extensive margin, i.e. more diverse income sources (Table 5, column 1). Households in this group are also 6.7 percentage points (se = 0.04) more likely to engage in agricultural income generation activities compared to the control group (Table 5, column 2) although this result is not robust to including all covariates in the regression and the restricted sample of only literate female borrowers.

The income diversification results in Rs. 2,489 percent (se = 1351) higher self-reported income for the dairy specific flexible loan treatment group households (Table 5, column 7). Results are robust in magnitude to all robustness checks and in significance to the sample restriction to only literate borrowers. Evaluated at the sample mean, this corresponds to an increase of 10.1 percent. In the smaller fixed loan treatment group, we find a lower likelihood of being engaged in livestock activities (-7.0 percentage points, se = 3.3) (Table 5, column 3).

Consumption levels and variation

Any households that accepted the offer of a loan are required to repay equated monthly installments with fixed repayment schedules. They therefore have to find ways of compensating irregular income in order to comply with their repayment schedules. Reducing consumption expenditures is one way to cope with adverse income shocks, making consumption expenditures an important measure for the vulnerability of households and their ability to deal with shocks. Detailed information on household consumption expenditures in the last month prior to each survey has been collected. The total consumption expenditures contain spending on food items, meals outside the home, leisure activities, school fees, medical expenses, clothing, travel expenses, and religious expenses.

We calculate consumption expenditures per household for rice, pulses, vegetables, egg, fish, meat, cinema, theatre, video shows, CD renting, school fees, medical expenses, commuting and other journeys, and religious expenses in the last month, and also report per capita values for each household. Expenditures for household consumption in the previous month averaged Rs. 1,831 per

household and Rs. 334 per household member across all surveys (Table 6)¹².

We measure the standard deviation of consumption expenditures over the whole survey period to gauge the level of household consumption smoothing. Using households with a minimum of two observations, we calculate the standard deviation of consumption expenditures per household across the seven survey rounds using all available observations per individual. The average standard deviation of consumption expenditures over time is Rs. 1,300 per household and Rs. 235 per household member.

The standard deviation is similar to the mean consumption expenditures, indicative of highly variable levels of consumption over the duration of the study. These fluctuations can be partly explained by standard deviations in household income.

[Table 6 about here]

In an analysis based on the pooled estimation of equation (2) we analyze differences in the level of consumption expenditures. We winsorize the consumption expenditure data at the top one percent level to reduce the effect of outliers. We find no robust effect of any flexible loan (Table 6, columns 1 and 2).

The standard deviation of consumption expenditures is already an aggregate measure, so we apply the single difference estimation of equation (1) for this analysis. Since the standard deviation of consumption most likely depends on the general consumption level of the household, we control for consumption expenditures in the first survey. Although we expected flexible repayment schedules to have a positive effect on households' consumption smoothing abilities, we do not find significant differences in the standard deviation of consumption expenditures for the coupon flexible loan (Table 6, columns 3 and 4). For the dairy specific flexible loan, we find a significant reduction in the standard deviation of consumption expenditures but this is only robust in significance to including all covariates and not in magnitude to the other robustness checks (Table 6, columns 3 and 4). The better diversified income portfolio of households in the dairy specific flexible loan treatment group does not result in smoother consumption.

The flexible repayment loans, especially the coupon flexible loan, were designed to help clients reduce their vulnerability to and to cope better with income shocks. With respect to dairy farming, cattle illness and cattle death pose negative income shocks. In our sample, 19.1 percent of clients report the incidence of cattle illness and 1.3 percent the incidence of cattle death. Both incidences are a self-reported measure for income shocks to dairy farming and are prone to self-reporting biases which is more pronounced for cattle illness than for cattle death. Table 7 shows that there are no difference in self-reported cattle illness and cattle death across treatment groups (Table 7, columns 1 and 2). Interacting the incidence of cattle illness with the assigned treatment, does not have any effect on consumption expenditures per household and per household member (Table 7, columns 3 and 4). However, we do observe that in cases where cattle died, households reduce their consumption significantly. The households offered the coupon flexible product are able to maintain significantly higher consumption expenditures than those with fixed loans, i.e. the coupon flexible product leads

¹²Given the monthly consumption-based, state-specific poverty line in rural Orissa in 2004 of Rs. 326, most households in the study are very close to the poverty line.

to Rs. 1,552 (se = 580) higher consumption expenditures per household and Rs. 297 (se = 102) per household member when suffering cattle death (Table 7, columns 5 and 6). Households with the dairy specific flexible loan could also maintain higher consumption expenditures of Rs. 520 (se = 310) per household and Rs. 141 (se = 65). In contrast to the coupon flexible loan, the effect of the dairy specific flexible loan is only robust for consumption expenditures per household; for total consumption expenditures coefficients are not robust to the sample restriction to only literate borrowers and to including sample weights for survey participation in each survey round conditioned on compliance with treatment. Nevertheless, the results offer suggestive evidence for reduced risk vulnerability to shocks and improved ability to absorb these for flexible loans.

[Table 7 about here]

Households could be using alternative coping strategies that we have not considered so far in the analysis. Unfortunately, we do not have detailed data on social networks and mutual informal insurance to explore these options. We do have, however, data on borrowing behavior of the households, which can be used as an indicator for social networks if informal loans from family and friends are considered.

Outside borrowing

Households can apply credit as a coping mechanism to smooth consumption against income shocks. Perhaps the impacts on consumption and investment are small because the impact of the flexible loans was merely about shifts in one's borrowing portfolio. To examine this, we turn to Table 8 for an analysis of outside borrowing. We find that the lower loan size does not, for the most part, lead to higher borrowing elsewhere. However, both the dairy specific flexible and the coupon flexible loan indicate lower borrowing elsewhere. The dairy specific flexible loan crowds out other borrowing (Table 8, column 3), in particular formal borrowing, although the aggregate borrowing (which is noisier to measure, thus we have lower power) does not change.¹³ The effect is robust in magnitude to all robustness checks and in significance levels to all but including all covariates and restricting the sample to only female borrowers.

[Table 8 about here]

Discussion

For the dairy specific flexible loan, we find some positive effects on income generation that did not yet translate into higher consumption levels or smoother consumption patterns. For both flexible loans we do not find significant and robust positive effects on the use of ex post coping strategies. The exception is suggestive evidence of reduced risk vulnerability and higher consumption expenditure

¹³We observe high shares of lending from SHGs and microcredit institutions. Although the survey explicitly asked for other loans than the KAS loan, we feel that some of these loans were incorrectly labeled as outside borrowing, especially since 21 percent of households stated that they borrowed money for the purchase of livestock (compare Appendix Figure A.1).

for both flexible loans, in particular the coupon flexible loan, in the presence of self-reported cattle death.

It is usually argued that within borrowing groups with joint liability, group members mutually insure each other and cover repayment obligations for fellow group members in need after a shock occurs.¹⁴ This may allow joint liability borrowers to cope with adverse income shocks without reducing their consumption or borrowing money. The present study relies on such joint liability groups in the form of SHGs with 15 to 20 members. Perhaps clients support and mutually insure each other in times of need, thus the treatments in this context did not provide any added value in terms of risk coping. This can explain why we do not observe significant difference between the coupon flexible loan and the larger fixed loan in the study. If repayment flexibility gives the individual borrower more leeway to cope with shocks before relying on mutual insurance from her borrowing group, it could help ease group problems related to extensive peer pressure. However, we only have limited data on risk-sharing within borrowing groups, and the information we actually have indicates only little mutual insurance as discussed in the repayment section below.

INVESTMENT DECISIONS IN DAIRY FARMING

The previous section showed positive income effects of the dairy specific flexible loan and we study possible channels of repayment flexibility in this section. As outlined in section 2, dairy farming yields particularly seasonal income streams. A flexible repayment scheme could help dairy farmers cope with the seasonal production in dairy farming leaving them less constrained by their repayment obligations in cattle dry periods. Anticipating this, dairy farmers might ex ante increase their investments in dairy farming when loan repayments are more flexible. In this section, we investigate these claims by looking at ownership of dairy cattle, purchase of dairy cattle, and milk production as quality of investment in each loan group.

Purchase of dairy cattle

First, we analyze the likelihood of owning and purchasing cattle in the second survey round using a linear probability analysis based on equation (1). In the control group which was assigned the larger fixed loan, 75.9 percent of households own cattle at the time of the second survey round with on average 1.1 cows. While we do find that households with the smaller fixed loan are significantly less likely to own (-16 percentage points, se = 4.6), we do not find any positive effect for the two flexible loan products on owning cattle (Table 9, column 1). The number of cattle owned in the second survey and in all surveys, however, does not differ statistically significantly across any of the four loan products (Table 9, columns 2 and 3).

Second, we look at investment in cattle by incidence and magnitude. For the larger fixed loan treatment group, 50.5 percent of the households purchased cattle between the first and second survey (Table 9, column 4). While we do find that households with the smaller fixed loan are significantly less likely to purchase cattle (-23.0 percentage points, se = 6.0, for the incidence, Rs. -1,576, se

¹⁴See Ghatak and Guinnane (1999) for a theoretical analysis of the functioning of joint liability lending.

= 412, for the magnitude of purchasing) compared to the larger fixed loan, we do not find any positive effect for the two flexible loan products on the incidence and the magnitude of purchasing cattle (Table 9, columns 4 and 5). Although the result is robust to a tobit estimation accounting for the censored observation of cattle investment (Appendix Table A.3), we do find that for those who do buy a cow, the dairy specific flexible loan leads to more expensive cows (Table 9, column 6). Although this finding is prone to selection into purchasing cattle in the first place, it gives suggestive evidence of higher investment for those who do invest anything. A flexible repayment schedule does not seem to influence the propensity to purchase cattle; however, the higher loan size in the treatment loans has a positive effect on the purchase decision which increases investments by around 45 percent (23 percentage points evaluated at the sample mean of 50.5 percent for the larger fixed loan).

[Table 9 about here]

Milk production and quality of dairy cattle

Since a higher price for dairy cattle is usually associated with better quality cattle that produces more milk and also because individuals may invest more in the cow via feed, e.g. that increases milk production, we look at differences in milk production across the treatments. To do so, milk production is measured both on the day before and as the average per day in the week before a survey in each of the second to sixth round. We also have information on how many liters of milk are sold on average per day and what share of the milk production in the past five months was sold.

On average, milk production was 1.7 liters per day, both when respondents were asked about how much they produced in the past day, and when asked how much they produced on average in the past week. These averages are very low, confirming Saha *et al.* (2004)'s finding of very low productivity in dairy farming in Orissa.

In our sample, 36.6 percent of the households state that they have had one cow not lactating (i.e. in dry period) in the past five months, with 0.4 cows in the dry period on average (Table 10, columns 5 and 6).

Households sell on average 40.2 percent of their produced milk and consume the rest themselves. However, 1.7 liters are sold per day on average, which is the same as the amount produced. Since the median share of produced milk sold is 80 percent, many households are either selling all produced milk or keeping the entire production for their own consumption.

We use the pooled OLS framework of equation (2) to compare differences in milk production across treatments. We treat milk production as return to investment in cattle. Therefore we set the milk production to zero if the household reports no milk production.

The lower incidence of investment in cattle for the smaller fixed loan is confirmed in very low and statistically insignificant coefficients for milk production the last day and on average per day in the last week (Table 10, columns 1 and 2).

Although investment levels in dairy cattle for the dairy specific flexible loan were only higher conditional on purchasing dairy cattle, we find higher milk production over the duration of the loan cycle. Households with the dairy specific flexible loan have 0.23 liters (se = 0.19) higher milk

production on the day prior to the surveys and 0.24 liters (se=0.20) on average per day in the last week before the survey (Table 10, columns 1 and 2). The estimated increase of around 0.23 liters corresponds to approximately 14 percent higher milk production for the dairy specific flexible loan treatment households. The observed increases in milk production for the coupon flexible loan are 0.17 liters and 0.18 liters per day, respectively. These results for the dairy specific flexible loan are robust in magnitude to all robustness checks. In some robustness checks, however, the magnitude of coefficients for the coupon flexible loan drops substantially. Unfortunately, due to high intra-cluster correlation, we lack power to detect a significant effect, but we cautiously consider the improvements in milk production for the dairy specific flexible loan as sufficiently robust in terms of magnitude. This becomes evident when clustering the standard errors at a lower level of aggregation, i.e. at the individual borrower level.

We observe a difference for both flexible loan products (Table 10, columns 3 and 4) in the quantity or share of milk sold. But these are not robust in magnitude to the robustness checks.

As the typical small scale dairy farm only has a few cows, they are only expected to have higher milk production in times when at least one of their cows is lactating. We do not find any significant differences in the incidence or the extent of cows being in dry period across the treatment variables ruling this out as an explanation for the higher milk production observed for the dairy specific flexible loan borrowers (Table 10, columns 5 and 6).

[Table 10 about here]

Discussion

For the investment analyses, we find positive effects due to the higher loan amount of the larger fixed loan compared to the smaller fixed loan. This is simple evidence of binding credit constraints. There is suggestive evidence that the dairy specific flexible loan increased investments in dairy cattle for those who purchased dairy cattle, although we carefully note that an endogenous sample filter, i.e. the selection into purchasing cattle, may be influencing this result. This is reflected in higher milk production although we lack the power to detect a significant difference when intra-group correlations are accounted for. The results suggest that limited improvements in investment and higher production from milk may be the impact channel through which flexible repayment schedules lead to higher income.

REPAYMENT AND DEFAULT

Repayment behavior and default

To estimate the costs of flexible repayment schedules for borrowers and lenders, we study repayment problems and default. Table 11 shows self-reported repayment behavior stated from the second survey round onwards. On average, 61.3 percent noted repayment problems since the last survey round. Of these, 52.5 percent on average state that they did not pay a monthly scheduled installment. While this second statistic may include borrowers with the dairy specific flexible loan or the coupon

flexible loan exercising their flexibility, both fixed repayment schedules have a 37 to 48 percent base of clients not making regular payments. Despite high self-reported repayment problems and default on loan repayment, only 1.2 percent of borrowers state that another group member covered their repayment obligation and only 0.5 percent of respondents reported covering a repayment for a defaulting fellow group borrower. This indicates little mutual insurance within the borrowing group. However, we cannot infer from this to general risk-sharing as we do not observe possible risk-sharing networks other than the borrowing group.

Clients' knowledge and understanding of the flexible repayment loan as self-reported in the survey and checked by the enumerators shows that over 90 percent of clients with both assigned flexible loans know and understand the product.

[Table 11 about here]

[Table 12 about here]

The self-reported default data is confirmed in the available loan repayment data for 1,550 borrowers collected by KAS Foundation, presented in Table 12.¹⁵ On average, borrowers made 21.1 of 24 total scheduled loan repayments. Borrowers with both flexible loans and the lower sized fixed loans made even fewer payments. Nevertheless, the lower number of collected repayments for both fixed loans indicates general problems of KAS Foundation in collecting loan repayments and documenting it properly.

The low number of repayments translates to a substantial average default rate of 57.1 percent of borrowers with the larger fixed loan being in default and 88.5 percent of borrowers with the dairy specific flexible loan (Table 12, column 2) in default. The share of borrowers in default with the coupon flexible loan and the smaller fixed loan does not differ significantly from the control group (Table 12, column 2).

The high binary default measure translates to an equally high default measured by the amount with which borrowers are in default as a percentage share of the loan size. On average, borrowers with the larger fixed loan are with 20.3 percent of their loan in default at the end of the loan cycle, borrowers with the dairy specific flexible loan with 45.5 percent, borrowers with the coupon flexible loan with 50.7 percent, and borrowers with the smaller fixed loan with 31.5 percent, although the latter is not robust to the inclusion of client characteristics or the concentration on female only groups (Table 12, column 4).

Default differences across both fixed loans are less pronounced when we only consider the reduced sample frame to only female borrowing groups. This could suggest some borrower composition effects on default, e.g. the share of male borrowers is higher for both flexible loans which could partially explain the slightly higher default measures, although in this interpretation we neglect the similar difference in male borrowers across both fixed loans.

We can conclude that for borrowers with both fixed and flexible repayment loans, the incident as well as the dimension of default up to the scheduled end of the loan cycle is massive. For a

¹⁵Institutional repayment data was available only for these clients because not all branches tracked the individual repayment collections properly in a management information system (MIS). Since KAS Foundation collapsed in 2010 it was impossible to recover any additional repayment information at the time of writing this paper.

more nuanced picture, we cumulate the loan repayments and calculate the incidence of default up to each scheduled installment (Table 13). We classify a borrower as being in default at installment X , ($X = 1, \dots, 24$), if all repayments made up to installment X are less than the cumulated scheduled repayment up to installment X . For both flexible loan products, we account for borrowers exercising their flexibility option by making a repayment only of the interest amount. Additionally, for the coupon flexible loan we have to consider that repayments are lagging behind for a maximum of two months if the flexibility has been exercised.

Even though 93.5 percent of borrowers reported that they understood the repayment schedule of their flexible loan product, we observed that around 30 percent of the borrowers did not follow the protocol of the loan product with a repayment of two principal repayments and one interest payment correctly in the first month of the dairy specific flexible loan. Therefore, we introduce a lenient and a strict default measure for the dairy specific flexible loan borrowers. The strict default measure counts any deviation from the protocol as default. The lenient measure considers default based on the scheduled repayments of the larger fixed loan. Consequently, these two measures differ only in the first six months of the loan cycle where two principal repayments are scheduled. Default starts to differ significantly from zero at the third installment for all loans with 25.6 percent of borrowers in default for the control group and then stabilizes at above 40 percent in the 12th installment before it increases to above 60 to 80 percent in the last three installments (Table 13, column 4).

[Table 13 about here]

[Table 14 about here]

One explanation for the substantially high default rates is that the microcredit institution did not start the collection of repayments as scheduled but in many cases with a time lag of several weeks. To account for this unintended grace period, we lag the cumulated default measure by two months, meaning that we classify a borrower as being in default at installment X , ($X = 1, \dots, 24$), if all repayments made up to installment X are less than the cumulated scheduled repayment up to installment $X-2$.

In the first four months there is hardly any default, except with the strict measure for the dairy specific flexible loan borrowers (Table 14). However, a significant base level of default exists from the tenth installment onwards. Here, we also observe that the incidence of default is higher for the two flexible loans in almost all installments after the fourth installment. In both analyses of monthly cumulated default we find a manifested incidence of default that cannot be fully explained by borrowers exercising their flexibility or by a delayed start of repayment.

Repayment problems

Another possible explanation for the high default rates may be the collapse of KAS Foundation in 2010. Figure 3 (a) shows that financial indicators of KAS Foundation already deteriorated substantially from 2007 to 2008. Figure 3 (b) also confirms this collapse in terms of organizational indicators from 2007 to 2009.¹⁶ For instance, while KAS Foundation was operating 168 offices in 2007, this

¹⁶Data is taken from KAS Foundation reports on MixMarket (<http://reports.mixmarket.org/mfi/jfsl>) where it is registered under JFSL - Jagannath Financial Services Limited. Observations for 2008 are missing in the MixMarket

number had shrunk to 42 in 2009.

Since our study started with loan disbursement in mid to late 2006, more than half of the loan repayments in the study fall in the same period as the slump in KAS Foundation's financial health. This timing could be related to our repayment data in two ways. First, repayment collection by KAS Foundation's field staff in general deteriorated and loan repayments were not collected properly in the present study. Second, borrowers may have anticipated the collapse of KAS Foundation and stopped repaying their loan in a sort of borrower run.

[Figure 3 about here]

The specification of stated repayment problems in Table 15 may yield some insights into the high rates of default. Only around one percent of borrowers experiencing repayment problems specified problems with the credit officer, such as credit officer not showing up at the repayment meeting, as the primary reason for their repayment problems. If repayment collection by KAS Foundation had deteriorated systematically during the slump of its financial health, more clients would have stated this as a reason for their repayment problems. When this statistic is combined with the cumulated default starting later in the loan cycle, a possible explanation is borrowers anticipated the collapse of the lender and repaid less. However, we cannot verify this with the data at hand.

Around 8 to 18 percent of clients stated group problems as a reason for repayment problems. This statistic is also reflected in low mutual insurance mentioned above which may indicate that joint liability was not actually enforced in this study, leading to such high default incidence.

Both these findings indicate that informal risk sharing was limited, which consequently cannot explain the low effects of the coupon flexible loan on household's use of coping strategies as argued above. It may indicate, however, that the joint liability groups in this study were not necessarily prior risk-sharing groups but may have formed recently to gain access to credit. The recent formation of these groups could explain group breakdowns before the study, stated group problems, and repayment problems. Due to limited data on borrowing group history and whether and for how long the groups existed before participating in the study, though, we cannot support this hypothesis.

[Table 15 about here]

Less income (26.2 percent), high medical expenditures (18 percent) and less income from dairy cattle (17.7 percent) were cited by the control group as the primary reasons for repayment problems (Table 15, columns 3, 4 and 8). For the dairy specific flexible loan products, less income from dairy cattle, poses a significantly smaller problem (-6.3 percentage points, $se = 1.3$, corresponding to 35.6 percent).¹⁷ For the coupon flexible loan, higher expenditures pose a significantly smaller problem (-2.5 percentage points, $se=1.2$, corresponding to 18.7 percent).

This analysis gives some confidence that both flexible products eased the repayment burden for dairy farmers with fluctuating income despite the high default level. This confidence is supported

data. We calculate the 2008 indicators as the average value of indicators from 2007 and 2009.

¹⁷The significantly lower share for the smaller fixed loan borrowers is most likely driven by the lower number of dairy cattle owned and purchased by this group.

by the fact that these borrowers did not consider the interest rates as a too high burden, instead citing other reasons for repayment problems.

While there were some reductions in repayment problems for borrowers with flexible repayment schedules, the incidence and extent of default was higher for both groups of flexible loan borrowers, indicating that there might be broader reasons for the high default observed in all groups in this study. A proper cost-benefit analysis of the flexible repayment loans is therefore impossible.

5 Conclusion

We find evidence that products with flexible repayments can lead to welfare improvements for borrowers, specifically to higher household income, and more diversified income as well as suggestive evidence of reduced vulnerability to shocks to dairy farming. Our results suggest that the main channel through which flexible repayments affect income is higher returns to investment, i.e. more milk production for dairy farmers. But these benefits may come at the expense of the lender, as defaults were considerable. The implementation of this experiment occurred just before the onset of the microcredit crisis in India, and thus we have difficulty ascertaining the full extent of the trade-offs, and the long term consequences, as the microlender ceased its operations.

The pattern of our findings is comparable to the findings of Field *et al.* (2013) who study the effects of a two-month grace period between loan disbursement at the start of repayment. A grace period may allow borrowers to invest in longer gestation projects since loan repayment does not start immediately after disbursement. Field *et al.* (2013) find an increase in investment returns at the expense of higher default which is similar in structure to our finding of improved investment returns with higher default, although in an already high-default environment, in our study. Both their and our study point to potential benefits of tailoring financial products to clients' needs at the possible expense of reduced repayment performance. Future research has to consider this also in light of recent studies claiming that there is too little risky but profitable investment of microfinance borrowers (Fischer (2013)).

Aside from the flexible repayment treatments, we also tested the impact of loan size on investment. The results yield two important insights: first, these individuals were credit constrained, and tightening the credit constraint led to lower investment (effectively, this is then a reverse impact evaluation of credit on the extensive margin). This is similar to results found by recent studies of the impact of microcredit (Karlan and Zinman (2010), Karlan and Zinman (2011), Banerjee *et al.* (2015b); Crépon *et al.* (2015), Attanasio *et al.* (2015), Augsburg *et al.* (2015), Angelucci *et al.* (2015), Banerjee *et al.* (2015a); Tarozzi *et al.* (2015)).

We thus see these results as promising, but by no means conclusive. The basic idea of matching revenues to financing is core to project finance, yet not the standard for microcredit. Yet, matching repayments to fluctuating income streams could be of tremendous importance for microcredit clients whose income is usually characterized by high volatility from seasonal production, production cycles or general high-risk environments, like for the dairy farmers in this study. There may be risks, risks of discipline, risks of confusion, risks of mixed messages by the lender, and risks of mismanagement from non-standardized repayment schedules. We see this experiment as establishing strong but

suggestive evidence that there are welfare improvements to be made if this problem can be solved better.

While our design answers these question from the lender's perspective for whom borrower compositions does not matter, it does not allow us to ask questions of household risk and liquidity management. Although there seem to be limited selection effects based on observables and restricted sample frame robustness checks, we cannot disentangle possible borrower composition effects from the incentive effects of flexible repayment schedules that could improve households risk and liquidity management substantially. Future experimentation, we hope, will help shed insight on how exactly the flexibility leads to higher default, and then when there is a better understanding of the underlying mechanism, alternative approaches can be tested that allow for the flexibility without taking on the additional costs and risks for the lender.

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6 Figures

FIGURE 1: Dairy production cycle - milk production flow

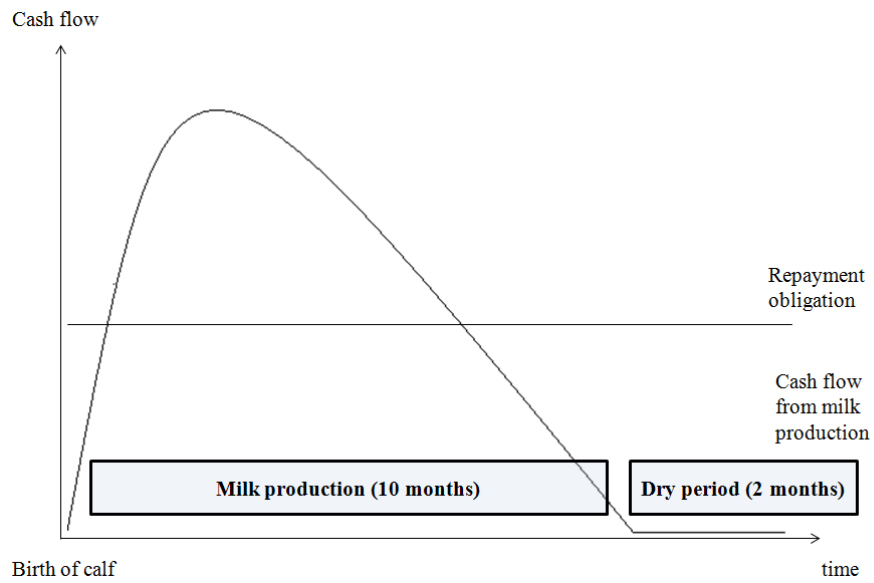


FIGURE 2: Flexible repayment schedules

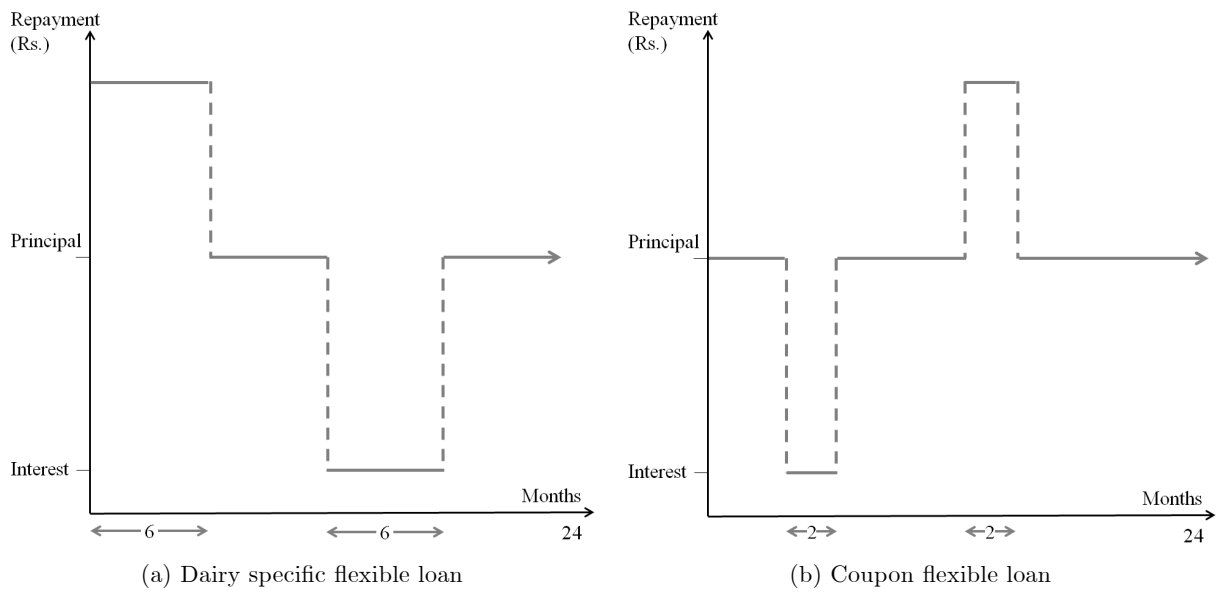
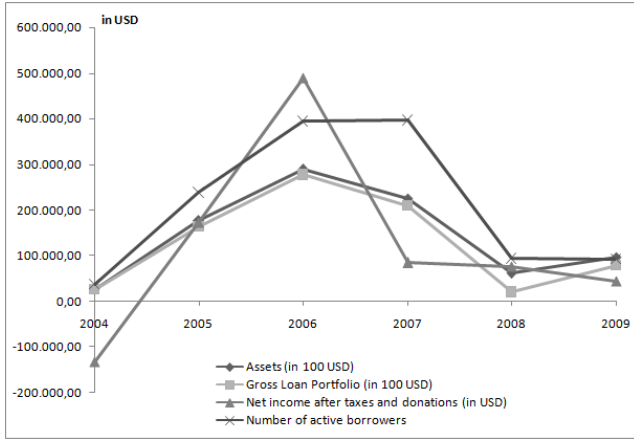
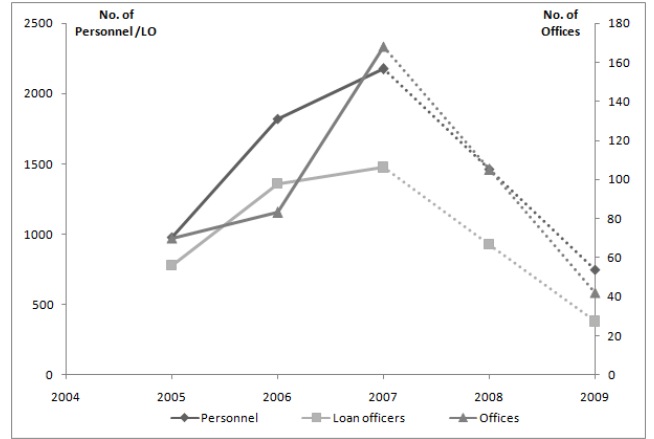


FIGURE 3: Financial and institutional indicators of KAS Foundation from 2005 to 2009



(a) Financial indicators



(b) Institutional indicators

7 Tables

TABLE 1: Fixed and flexible loan products

| | Larger fixed loan (1) | Dairy specific flexible loan (2) | Coupon flexible loan (3) | Smaller fixed loan (4) |
|--------------------------------------|-----------------------------|--|--|------------------------------|
| Loan amount (in Rs.) | 6,000 | 6,000 | 6,000 | 4,000 |
| Duration in months | 24 | 24 | 24 | 24 |
| Interest rate per annum | 10.75% | 10.75% | 10.75% | 10.75% |
| Joint liability of loan repayment | Yes | Yes | Yes | Yes |
| <i>Monthly installments (in Rs.)</i> | | | | |
| Principal + interest payment | 255 + 55 | 255 + 55 | 255 + 55 | 175 + 38 |
| Flexibility in repayment | none | 1. to 6. months: 2 principal repayments at each installment. After 6. month: pause principal repayment for any consecutive 6-month period. | Postpone principal repayment for up to 2 installments. | none |

TABLE 2: Treatment assignment and compliance

Panel A: Assigned treatment to borrowing groups

| | Larger fixed loan | Dairy specific flexible loan | Coupon flexible loan | Smaller fixed loan | Total |
|-------------------------|----------------------|---------------------------------|-------------------------|-----------------------|-------|
| | (1) | (2) | (3) | (4) | (5) |
| # of groups | 52 | 53 | 52 | 45 | 202 |
| # of female only groups | 51 | 45 | 47 | 42 | 185 |
| # of male only groups | 1 | 8 | 5 | 3 | 17 |
| # of borrowers | 932 | 967 | 935 | 814 | 3648 |

Panel B: Compliance with assigned treatment and survey rates

| Assigned loan | Actually received loan | | | | No loan | Total |
|-------------------------------------|------------------------|---------------------------------|-------------------------|-----------------------|---------|-------|
| | Larger fixed loan | Dairy specific flexible loan | Coupon flexible loan | Smaller fixed loan | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Smaller fixed loan | | | | | | |
| borrowers (#) | 0 | 0 | 0 | 706 | 108 | 814 |
| borrowers (%) | | | | 86.73 | 13.27 | 100 |
| survey rate (%) | | | | 76.10 | 29.10 | 69.87 |
| Dairy specific flexible loan | | | | | | |
| borrowers (#) | 0 | 668 | 0 | 69 | 230 | 967 |
| borrowers (%) | | 69.08 | | 7.14 | 23.78 | 100 |
| survey rate (%) | | 83.15 | | 14.29 | 17.95 | 62.73 |
| Coupon flexible loan | | | | | | |
| borrowers (#) | 0 | 0 | 725 | 64 | 146 | 935 |
| borrowers (%) | | | 77.54 | 6.84 | 15.61 | 100 |
| survey rate (%) | | | 86.74 | 14.06 | 30.72 | 73.02 |
| Larger fixed loan | | | | | | |
| borrowers (#) | 667 | 0 | 0 | 77 | 188 | 932 |
| borrowers (%) | 71.57 | | | 8.26 | 20.17 | 100 |
| survey rate (%) | 87.00 | | | 13.91 | 22.04 | 67.86 |
| Total | | | | | | |
| borrowers (#) | 667 | 668 | 725 | 916 | 672 | 3648 |
| borrowers (%) | 18.28 | 18.31 | 19.87 | 25.11 | 18.42 | 100 |
| survey rate (%) | 87.00 | 83.15 | 86.74 | 61.88 | 23.66 | 68.27 |

Notes: Panel A: Number of borrowing groups and borrowers per assigned treatment. Panel B: Compliance with assigned loan: Table shows actually received loan (number of borrowers, share of borrowers who received loan stated in column of those who were assigned loan in row, survey rate) by assigned loan. Borrowers could either take-up the assigned loan, take-up the smaller fixed loan instead of the assigned loan, or not take-up any loan. Survey rate (in %) refers to the number of completed surveys as a share of all seven survey rounds.

TABLE 3: Summary statistics and orthogonality by assigned treatment

| | Larger fixed loan (1a) | Dairy specific flexible loan (2a) | Coupon flexible loan (3a) | Smaller fixed loan (4a) | F-stat P-value (5a) |
|---|------------------------------|---|---------------------------------|-------------------------------|---------------------------|
| <i>Client characteristics (last survey) - 2966 observations</i> | | | | | |
| Age (years) | 39.57 (11.47) | 41.00 (11.43) | 40.43 (11.77) | 38.79 (10.96) | 0.017 |
| Male | 0.01 (0.12) | 0.17 (0.38) | 0.12 (0.33) | 0.07 (0.25) | 0.008 |
| Literate | 0.69 (0.46) | 0.74 (0.44) | 0.74 (0.44) | 0.68 (0.47) | 0.170 |
| Education (years) | 9.46 (5.00) | 9.31 (4.66) | 9.16 (4.70) | 9.80 (4.87) | 0.150 |
| <i>Household head (last survey) - 3004 observations</i> | | | | | |
| Age (years) | 47.97 (12.92) | 47.74 (11.69) | 47.82 (12.08) | 47.59 (12.58) | 0.974 |
| Male | 0.94 (0.24) | 0.96 (0.20) | 0.93 (0.26) | 0.93 (0.25) | 0.143 |
| Literate | 0.81 (0.39) | 0.85 (0.36) | 0.84 (0.36) | 0.79 (0.40) | 0.082 |
| Education (years) | 8.44 (4.48) | 8.39 (4.21) | 8.54 (4.20) | 8.96 (4.39) | 0.221 |
| <i>Household size (last survey) - 3007 observations</i> | | | | | |
| No.household members | 6.54 (3.27) | 6.37 (3.12) | 6.42 (2.97) | 6.61 (3.33) | 0.767 |
| No. children | 1.53 (1.44) | 1.33 (1.37) | 1.44 (1.42) | 1.46 (1.38) | 0.161 |
| <i>Household landholdings (last survey) - 3003 observations</i> | | | | | |
| Land ownership (dummy) | 0.77 (0.42) | 0.81 (0.39) | 0.77 (0.42) | 0.79 (0.41) | 0.640 |
| Land area (in acres) | 3.08 (4.48) | 3.85 (4.89) | 3.15 (4.97) | 3.19 (4.91) | 0.205 |
| Land value (in Rs.) | 137914.40 (318482.86) | 180855.19 (546901.79) | 143711.89 (409162.21) | 150556.73 (549820.51) | 0.564 |

Notes: Table lists means and standard deviations in parentheses below the means by assigned treatment. Loan products are assigned randomly by borrowing group. Characteristics of client, household head, household size and household landholding are from the last survey round. Literate is a binary variable equal to 1 if person is literate, 0 otherwise. Number of children counts all household members below age 13. F-stat p-value from test that all coefficients are equal is reported in column (5). For the F-test in column 5: Standard errors clustered at the group level.

TABLE 4: Take-up of assigned loan

| | Binary dependent variable=1 if individual took-up the assigned loan, i.e. | | | |
|----------------------------------|---|--|--------------------------------|------------------------------|
| | Larger fixed loan (1) | Dairy specific flexible loan (2) | Coupon flexible loan (3) | Smaller fixed loan (4) |
| <i>Client characteristics</i> | | | | |
| Age (years) | 0.002* (0.001) | 0.000 (0.002) | -0.000 (0.001) | -0.001 (0.001) |
| Male | 0.043 (0.030) | 0.113 (0.115) | 0.090** (0.042) | 0.041 (0.029) |
| Literate | 0.081 (0.075) | -0.079 (0.093) | -0.048 (0.084) | -0.019 (0.028) |
| Education (years) | 0.004 (0.006) | -0.010 (0.006) | -0.002 (0.007) | -0.001 (0.002) |
| <i>Household head</i> | | | | |
| Age (years) | -0.001 (0.001) | 0.000 (0.002) | -0.001 (0.001) | -0.000 (0.001) |
| Male | -0.070 (0.043) | -0.036 (0.089) | -0.010 (0.041) | -0.040 (0.027) |
| Literate | 0.049 (0.081) | 0.051 (0.084) | 0.101 (0.063) | -0.005 (0.030) |
| Education (years) | 0.003 (0.006) | 0.009 (0.006) | 0.004 (0.005) | -0.000 (0.003) |
| <i>Household characteristics</i> | | | | |
| No.household members | 0.001 (0.007) | 0.012 (0.008) | 0.002 (0.008) | 0.008 (0.008) |
| No. children | -0.005 (0.014) | -0.016 (0.016) | -0.004 (0.019) | -0.007 (0.008) |
| Land ownership (dummy) | -0.072* (0.037) | 0.070 (0.068) | 0.057 (0.052) | -0.008 (0.009) |
| Land area (in acres) | 0.000 (0.003) | 0.006* (0.004) | 0.004 (0.003) | -0.004 (0.004) |
| Land value (in Rs.) | 0.000*** (0.000) | 0.000 (0.000) | -0.000 (0.000) | 0.000 (0.000) |
| Constant | 0.791*** (0.173) | 0.666** (0.254) | 0.806*** (0.172) | 1.049*** (0.086) |
| R-squared | 0.021 | 0.038 | 0.029 | 0.021 |
| Observations | 728 | 753 | 755 | 672 |

Notes: Dependent variables: Took-out assigned loan; binary variable equal 1 if household took-out assigned loan, 0 otherwise. Data: Only one survey round; independent variables are based on last survey round. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE 5: ITT Treatment effects on income sources and income last year

| | Number of | | Binary variable = 1 if household earned income from | | | | Total income (in Rs.) |
|--------------------------------|-----------------------|--------------------|---|------------------------|-------------------|-------------------|--------------------------|
| | income sources (1) | Agriculture (2) | Livestock (3) | Microenterprise (4) | Salary (5) | Wage (6) | |
| Smaller fixed loan | -0.092 (0.095) | 0.037 (0.034) | -0.070** (0.033) | -0.020 (0.035) | -0.006 (0.028) | 0.034 (0.030) | 270.688 (1502.071) |
| Dairy specific flexible loan | 0.230*** (0.081) | 0.067* (0.035) | -0.004 (0.030) | 0.042 (0.032) | -0.011 (0.025) | 0.004 (0.028) | 2489.249* (1351.816) |
| Coupon flexible loan | -0.042 (0.086) | -0.012 (0.040) | 0.010 (0.029) | 0.013 (0.032) | -0.019 (0.026) | -0.001 (0.030) | 769.652 (1468.546) |
| R-squared | 0.624 | 0.016 | 0.050 | 0.111 | 0.010 | 0.043 | 0.430 |
| Joint F-test of flexible loans | 0.001 | 0.044 | 0.620 | 0.364 | 0.685 | 0.878 | 0.171 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Larger fixed loan (mean) | 3.963 | 0.819 | 0.758 | 0.279 | 0.211 | 0.234 | 24546.182 |
| Observations | 17433 | 17430 | 17426 | 17414 | 17418 | 17414 | 17293 |
| Number of households | 3372 | 3372 | 3372 | 3372 | 3372 | 3372 | 3372 |

Notes: Dependent variables: (1) Number of income sources from which household generated income in the last year. (2) Agricultural income - binary indicator, 1 if household earned income from agriculture, 0 otherwise. (3) Livestock income - binary indicator, 1 if household earned income from livestock activities, 0 otherwise. (4) Microenterprise income - binary indicator, 1 if household earned income from microenterprise, 0 otherwise. (5) Salary income - binary indicator, 1 if household earned income from regular fixed salary employment, 0 otherwise. (6) Wage income - binary indicator, 1 if household earned income from wage labor, 0 otherwise. (7) Total household income earned in the last year (in Rs.), data is winsorized and censored at the top 1% to reduce effect of outliers. Data: All seven survey rounds. Survey round fixed effects included in all regressions. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE 6: ITT Treatment effects on consumption expenditures per household and per household member - levels and standard deviations

| | Consumption expenditures (in Rs.) | | Standard deviation of consumption expenditures (in Rs.) | |
|--|-----------------------------------|-----------------------------|---|-----------------------------|
| | per household (1) | per household member (2) | per household (3) | per household member (4) |
| Smaller fixed loan | -18.280 (92.172) | -16.720 (16.414) | 26.550 (110.868) | -7.305 (20.388) |
| Dairy specific flexible loan | -75.071 (74.440) | -19.390 (14.071) | -176.173* (98.492) | -33.396* (17.765) |
| Coupon flexible loan | 36.153 (77.061) | 5.909 (13.556) | 65.910 (100.804) | 4.825 (18.112) |
| Consumption expenditures (first survey) | | | 0.266*** (0.016) | 0.040*** (0.004) |
| R-squared | 0.048 | 0.037 | 0.005 | 0.004 |
| Joint F-test of flexible loans | 0.092 | 0.026 | 0.011 | 0.019 |
| Survey round fixed effects | Yes | Yes | No | No |
| Larger fixed loan (mean) | 1831.639 | 334.232 | 1300.894 | 235.587 |
| Observations | 17398 | 17139 | 2961 | 2896 |
| Number of households | 3372 | 3297 | 2961 | 2896 |

Notes: Dependent variables: (1) Consumption expenditures per household. (2) Consumption expenditures per household member. Consumption measures include only items that were measured in all surveys. Consumption per household member calculated as: first and last survey round consumption divided by number of household members in these surveys respectively, midline consumption divided by average number of household members. Consumption data is winsorized and censored at the top 1% to reduce effect of outliers. (3) Standard deviation of household consumption expenditures per household. (4) Standard deviation of household consumption expenditures per household member. Standard deviation of winsorized consumption expenditures calculated per household across all available survey rounds if at least two observations per household are available. Consumption expenditures in the first survey round are also winsorized. Data: All seven survey rounds. Survey round fixed effects as indicated. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 7: ITT treatments effects on consumption expenditures and shocks to dairy farming income

| | Cattle ill | | Cattle death | | Consumption expenditures (in Rs.) | | Consumption expenditures (in Rs.) | |
|---|-------------------|-------------------|----------------------|----------------------|-----------------------------------|-----------------------------|-----------------------------------|--|
| | (dummy) (1) | (dummy) (2) | per household (3) | per household (4) | per household (5) | per household member (6) | | |
| Smaller fixed loan | -0.025 (0.023) | -0.005 (0.004) | 5.897 (120.628) | -11.945 (21.242) | -10.621 (118.960) | -16.234 (21.338) | | |
| Dairy specific flexible loan | 0.001 (0.023) | -0.002 (0.004) | -98.440 (100.745) | -25.395 (19.057) | -112.624 (93.327) | -26.457 (18.323) | | |
| Coupon flexible loan | 0.029 (0.024) | 0.002 (0.004) | 23.370 (104.693) | 3.352 (18.338) | 29.889 (101.414) | 5.839 (17.800) | | |
| Cattle ill (dummy) | | | 185.364* | 17.346 | | | | |
| Smaller fixed loan x Cattle ill | | | (98.748) | (19.707) | | | | |
| Dairy specific flexible loan x Cattle ill | | | -24.016 (136.291) | -13.546 (27.950) | | | | |
| Coupon flexible loan x Cattle ill | | | -37.010 (125.137) | 4.008 (25.352) | | | | |
| Cattle death (dummy) | | | 110.768 (167.926) | 29.036 (30.818) | | | | |
| Smaller fixed loan x Cattle death | | | | | -483.828*** (174.665) | -113.055*** (31.108) | | |
| Dairy specific flexible loan x Cattle death | | | | | 633.047 (476.097) | 113.566 (76.480) | | |
| Coupon flexible loan x Cattle death | | | | | 520.950* (310.784) | 141.333** (65.376) | | |
| R-squared | 0.049 | 0.010 | 0.053 | 0.043 | 1552.881*** (580.113) | 297.062*** (102.957) | | |
| Joint F-test of flexible loans | 0.337 | 0.248 | 0.233 | 0.156 | 0.052 | 0.043 | | |
| Survey round fixed effects | Yes | Yes | Yes | Yes | 0.007 | 0.001 | | |
| Observations | 11827 | 11827 | 11808 | 11549 | Yes | Yes | | |
| Number of households | 2898 | 2898 | 2898 | 2823 | 11808 | 11549 | | |

Notes: Dependent variables: (1) Cattle ill - binary indicator, 1 if cattle has been ill, 0 otherwise. (2) Cattle death - binary indicator, 1 if there has been a cattle death, 0 otherwise. Consumption expenditures as defined in Table 6. Data: Only survey rounds 2 - 6 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until 3 months before loan repayment (round 6)). The joint F-test includes both flexible loans and their interaction with the cattle ill and cattle death dummy, respectively. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE 8: ITT Treatment effects on outside borrowing

| | Any loan outstanding (1) | Any informal loan outstanding (2) | Any formal loan outstanding (3) | Number of loans outstanding (4) | Total amount outstanding (in Rs.) (5) | Average amount outstanding (in Rs.) (6) |
|--------------------------------|--------------------------------|---|---------------------------------------|---------------------------------------|---|---|
| Smaller fixed loan | -0.009 (0.024) | -0.003 (0.024) | -0.014 (0.021) | -0.024 (0.056) | 545.183 (499.285) | 90.748 (226.748) |
| Dairy specific flexible loan | -0.025 (0.024) | 0.006 (0.025) | -0.044** (0.021) | 0.025 (0.060) | 769.215 (485.846) | 84.698 (208.430) |
| Coupon flexible loan | -0.021 (0.024) | -0.009 (0.024) | -0.020 (0.021) | -0.056 (0.053) | 3.672 (435.603) | 4.803 (208.048) |
| R-squared | 0.193 | 0.119 | 0.153 | 0.261 | 0.194 | 0.163 |
| Joint F-test of flexible loans | 0.863 | 0.539 | 0.234 | 0.154 | 0.104 | 0.702 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Larger fixed loan (mean) | 0.641 | 0.403 | 0.245 | 1.184 | 6777.027 | 3495.426 |
| Observations | 17354 | 14755 | 14755 | 17354 | 17354 | 17354 |
| Number of households | 3372 | 3323 | 3323 | 3372 | 3372 | 3372 |
| Survey rounds | All 7 rounds | Rounds 2 -7 | Rounds 2 -7 | All 7 rounds | All 7 rounds | All 7 rounds |

Notes: Dependent variables: (1) Any loan outstanding from outside borrowing sources - binary indicator equal 1 if any outstanding loan, 0 otherwise. (2) Any loan outstanding from informal sources - binary indicator equal 1 if loan outstanding from any informal source (family member, neighbor, friend, moneylender, shopkeeper, pawn broker, or Rosca), 0 if only formal loans outstanding or no outside borrowing - only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). (3) Any loan outstanding from formal outside sources - binary indicator equal 1 if loan outstanding from a formal source (SHG, commercial bank, microfinance institution, cooperative, provident fund, or finance company), 0 if only informal loans outstanding or no outside borrowing - only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). (4) Number of loans outstanding from outside financing sources. (5) Total loan amount outstanding in Rs., data winsorized and censored at the top 1% to reduce effect of outliers. (6) Average loan amount outstanding in Rs. (total loan amount/ number of loans), data winsorized and censored at the top 1%. The loan amount outstanding refers to loans other than the loan in the study. Problems of wrong labeling of these loans as outside loans are discussed in footnote 8 on page 13. Data: All seven survey rounds, except for columns (2) and (3). Survey round fixed effects included in all regressions. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 9: ITT Treatment effects on cattle herd and investment in cattle

| | Investment in cattle | | | | | |
|--------------------------------|-----------------------|-------------------|-------------------|--------------------------------|-----------------------------------|--|
| | Household owns cattle | Number of cattle | Number of cattle | Household has purchased cattle | Amount spent on purchasing cattle | Amount spent on purchasing cattle - restricted sample to those who actually purchased cattle |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Smaller fixed loan | -0.160*** (0.046) | -0.075 (0.129) | -0.050 (0.099) | -0.230*** (0.060) | -1567.881*** (412.374) | -279.728 (346.092) |
| Dairy specific flexible loan | -0.026 (0.045) | 0.078 (0.090) | 0.011 (0.076) | -0.071 (0.071) | -178.570 (526.029) | 627.823* (319.418) |
| Coupon flexible loan | -0.010 (0.044) | 0.066 (0.080) | 0.075 (0.079) | -0.068 (0.065) | -200.585 (471.664) | 424.045 (303.260) |
| R-squared | 0.023 | 0.003 | 0.042 | 0.473 | 0.898 | 0.129 |
| Joint F-test of flexible loans | 0.851 | 0.576 | 0.620 | 0.028 | 0.031 | 0.018 |
| Survey round fixed effects | No | No | Yes | No | No | No |
| Larger fixed loan (mean) | 0.759 | 1.126 | 1.256 | 0.505 | 3081.872 | 6396.018 |
| Observations | 2503 | 2503 | 17431 | 2503 | 2415 | 1175 |
| Number of households | 2503 | 2503 | 3372 | 2503 | 2415 | 1175 |
| Survey rounds | Round 2 | Round 2 | All 7 rounds | Round 2 | Round 2 | Round 2 |

Notes: Dependent variables: (1) Own cattle - binary variable equal 1 if household owns cattle, 0 otherwise. (2) Number of cattle owned. (3) Number of cattle owned. Pooled regression with survey round fixed effects. (4) Purchase cattle - binary variable equal 1 if household purchased cattle between loan disbursement and second survey round, 0 otherwise. (5) Purchase price of cattle (in Rs.) purchased between loan disbursement and second survey round. If no cattle were purchased, cattle price is set to 0. OLS results robust to a Tobit estimation specification (compare Appendix Table A.3). (6) Purchase price of cattle (in Rs.) purchased between loan disbursement and second survey round. If no cattle were purchased, cattle price is set to missing. Price data is winsorized at the 1% level to reduce effect of outliers. Data: Only second survey round (i.e. 6 months after treatment assignment and loan disbursement) (except for column 3)). Survey round fixed effects are included as indicated. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE 10: ITT Treatment effects on milk production - Quantity (in liters) produced and sold per day, and cattle in lean phase

| | Milk produced per day (liters) | | Milk sold | | Cattle in lean phase | |
|--------------------------------|--------------------------------|-------------------|-------------------|-------------------|----------------------|-------------------|
| | Last day | Last week | Liters | Share (%) | Dummy | Number |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Smaller fixed loan | -0.114 (0.212) | -0.110 (0.219) | -0.196 (0.218) | -4.984 (3.694) | -0.043 (0.028) | -0.037 (0.042) |
| Dairy specific flexible loan | 0.232 (0.191) | 0.236 (0.195) | 0.120 (0.189) | 1.004 (3.814) | -0.013 (0.028) | -0.021 (0.037) |
| Coupon flexible loan | 0.171 (0.186) | 0.180 (0.188) | 0.115 (0.183) | 1.047 (3.233) | -0.006 (0.026) | 0.004 (0.037) |
| R-squared | 0.012 | 0.012 | 0.020 | 0.019 | 0.008 | 0.005 |
| Joint F-test of flexible loans | 0.429 | 0.420 | 0.454 | 0.665 | 0.710 | 0.742 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Larger fixed loan (mean) | 1.697 | 1.734 | 1.716 | 40.214 | 0.366 | 0.443 |
| Observations | 11475 | 11707 | 11512 | 11489 | 11827 | 11827 |
| Number of households | 2895 | 2898 | 2898 | 2898 | 2898 | 2898 |

Notes: Dependent variables: (1) Milk production in liters last day. (2) Average milk production in liters per day last week. (3) Average liters of milk sold per day. (4) Share (in %) of last 5 months' milk production sold. For all milk production data, milk production is set to 0 when household does not own cattle. Appendix Table A.4 confirms the results when only looking at cattle owners. (5) Cattle in lean phase - binary variable equal 1 if any cattle are in lean phase, 0 otherwise. (6) Number of cattle in lean phase, 0 if no cattle in lean phase. Milk production data winsorized at the top 1% level to reduce effect of outliers. Data: Only survey rounds 2 - 6 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until 3 month before loan repayment (round 6)). Survey round fixed effects included in all regressions. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE 11: ITT Treatment effects on self-reported repayment behavior

| Binary variable = 1 if | Any repayment problems (1) | Repaid every month at group meeting (2) | Not paid in a month (3) | Another group member paid for self (4) | Paid for a defaulting peer (5) | Know flexible repayment schedule (6) | Understood flexible repayment schedule (7) |
|--------------------------------|----------------------------|---|-------------------------|--|--------------------------------|--------------------------------------|--|
| Smaller fixed loan | 0.016 (0.037) | -0.005 (0.050) | -0.044 (0.065) | -0.001 (0.004) | -0.001 (0.002) | | |
| Dairy specific flexible loan | 0.088** (0.037) | -0.166*** (0.049) | 0.127** (0.061) | -0.001 (0.004) | 0.003 (0.003) | 0.926*** (0.027) | 0.910*** (0.028) |
| Coupon flexible loan | 0.049 (0.037) | -0.054 (0.047) | 0.106* (0.061) | 0.001 (0.004) | 0.005 (0.003) | 0.954*** (0.013) | 0.947*** (0.013) |
| R-squared | 0.012 | 0.072 | 0.052 | 0.006 | 0.007 | 0.907 | 0.939 |
| Joint F-test of flexible loans | 0.280 | 0.025 | 0.722 | 0.667 | 0.565 | 0.240 | 0.119 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Larger fixed loan (mean) | 0.613 | 0.525 | 0.480 | 0.012 | 0.005 | | |
| Observations | 14413 | 14371 | 14361 | 14398 | 14403 | 7299 | 6994 |
| Number of households | 2968 | 2968 | 2967 | 2968 | 2968 | 1489 | 1482 |
| Survey rounds | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 |

Notes: Dependent variables are binary indicators equal 1 if household agreed to the statement in the survey, 0 otherwise. (1) Any repayment problems: faced any difficulty in repaying the monthly installments in the last 5 months. (2) Paid the monthly installment at every group meeting. (3) Did not repay at least one monthly installment. (4) Another group member paid the installment when respondent could not pay herself. (5) Respondent paid the installment for a peer who could not repay the installment herself. (6) The borrower knows (self-reported) the repayment schedule. (7) The borrower can explain the loan schedule to the enumerator during the household survey, 0 otherwise. Both columns (6) and (7) are estimated without the constant. Data: Only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). Survey round fixed effects included in all regressions. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 12: ITT Treatment effects on loan repayment

| | No. of repayments made (1) | Default (dummy) (2) | Amount (in Rs.) (3) | Amount (% of loan size) (4) |
|------------------------------|-------------------------------|------------------------|--------------------------|--------------------------------|
| Smaller fixed loan | -2.443** (1.191) | 0.148 (0.116) | 52.694 (335.811) | 0.114* (0.066) |
| Dairy specific flexible loan | -4.716*** (1.617) | 0.314*** (0.112) | 1513.129*** (424.960) | 0.252*** (0.070) |
| Coupon flexible loan | -4.570** (1.805) | 0.197 (0.133) | 1835.451*** (563.872) | 0.304*** (0.093) |
| R-squared | 0.090 | 0.066 | 0.195 | 0.124 |
| Larger fixed loan (mean) | 21.149 | 0.571 | 1236.045 | 0.203 |
| Observations | 1550 | 1550 | 1550 | 1550 |
| Number of households | 1550 | 1550 | 1550 | 1550 |
| Survey rounds | Round 7 | Round 7 | Round 7 | Round 7 |

Notes: Default at end of loan cycle - binary variable equal 1 if outstanding loan repayment at end of loan cycle, 0 otherwise. Data: Only last survey round after loan repayment (round 7). Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE 13: ITT Treatment effect on default in loan repayment cumulated up to each installments due

| Default in repayment up to installment X (dummy) | Smaller fixed loan | | Dairy specific flexible loan | | Coupon flexible loan (3) | Larger fixed loan (Constant) (4) | R-squared | | Observations |
|--|--------------------|---------------------|------------------------------|---------------------|--------------------------|----------------------------------|------------------|------|--------------|
| | (1) | (2a) | (2b) | (for 2a) (5a) | | | (for 2b) (5b) | (6) | |
| Installment 1 | 0.046 (0.080) | -0.007 (0.075) | -0.007 (0.075) | 0.045 (0.099) | 0.081 (0.055) | 0.007 (0.007) | 0.007 (0.007) | 1560 | |
| Installment 2 | 0.068 (0.072) | 0.192** (0.096) | 0.489** (0.106) | 0.147 (0.103) | 0.046 (0.045) | 0.042 (0.042) | 0.213 (0.213) | 1560 | |
| Installment 3 | 0.045 (0.114) | -0.198** (0.099) | 0.481*** (0.125) | 0.171 (0.144) | 0.256*** (0.090) | 0.094 (0.094) | 0.155 (0.155) | 1560 | |
| Installment 4 | 0.067 (0.110) | 0.125 (0.119) | 0.487*** (0.123) | 0.016 (0.120) | 0.167** (0.083) | 0.014 (0.014) | 0.180 (0.180) | 1560 | |
| Installment 5 | 0.083 (0.126) | -0.162 (0.122) | 0.236* (0.137) | 0.287** (0.143) | 0.337*** (0.100) | 0.105 (0.105) | 0.053 (0.053) | 1560 | |
| Installment 6 | 0.244** (0.122) | -0.067 (0.127) | 0.176 (0.138) | 0.059 (0.142) | 0.314*** (0.098) | 0.065 (0.065) | 0.033 (0.033) | 1560 | |
| Installment 7 | 0.073 (0.108) | 0.056 (0.121) | 0.056 (0.121) | 0.214 (0.140) | 0.233*** (0.087) | 0.024 (0.024) | 0.024 (0.024) | 1560 | |
| Installment 8 | -0.099 (0.124) | -0.299** (0.132) | -0.299** (0.132) | -0.061 (0.146) | 0.582*** (0.101) | 0.053 (0.053) | 0.065 (0.065) | 1560 | |
| Installment 9 | 0.149 (0.106) | 0.187 (0.117) | 0.187 (0.117) | 0.348*** (0.129) | 0.173** (0.079) | 0.058 (0.058) | 0.060 (0.060) | 1560 | |
| Installment 10 | -0.003 (0.122) | -0.044 (0.127) | -0.044 (0.127) | 0.113 (0.135) | 0.559*** (0.097) | 0.012 (0.012) | 0.027 (0.027) | 1560 | |
| Installment 11 | 0.254** (0.104) | 0.260** (0.116) | 0.260** (0.116) | 0.312** (0.130) | 0.164** (0.071) | 0.056 (0.056) | 0.057 (0.057) | 1560 | |
| Installment 12 | -0.135 (0.119) | 0.076 (0.123) | 0.076 (0.123) | 0.083 (0.137) | 0.605*** (0.096) | 0.035 (0.035) | 0.038 (0.038) | 1560 | |
| Installment 13 | 0.191 (0.120) | 0.204 (0.132) | 0.204 (0.132) | 0.264* (0.139) | 0.389*** (0.098) | 0.035 (0.035) | 0.038 (0.038) | 1560 | |

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| Default in repayment up to installment X (dummy) | Smaller fixed loan | | Dairy specific flexible loan | | Coupon flexible loan (3) | Larger fixed loan (Constant) (4) | R-squared | | Observations |
|--|--------------------|---------------------|------------------------------|---------------------|--------------------------|----------------------------------|------------------|---------------|--------------|
| | (1) | (2a) | lenient measure (2a) | strict measure (2b) | | | (for 2a) (5a) | (for 2b) (5b) | |
| Installment 14 | 0.076 (0.119) | 0.241* (0.127) | 0.241* (0.127) | 0.269* (0.141) | 0.438*** (0.098) | 0.048 (0.001) | 0.050 (0.005) | 1560 | |
| Installment 15 | -0.004 (0.105) | 0.032 (0.119) | 0.032 (0.119) | 0.027 (0.126) | 0.680*** (0.088) | 0.001 (0.065) | 0.005 (0.071) | 1560 | |
| Installment 16 | 0.214* (0.113) | 0.338*** (0.114) | 0.338*** (0.114) | 0.236* (0.136) | 0.455*** (0.096) | 0.065 (0.024) | 0.071 (0.024) | 1560 | |
| Installment 17 | -0.034 (0.108) | 0.137 (0.111) | 0.137 (0.111) | 0.082 (0.130) | 0.651*** (0.088) | 0.024 (0.025) | 0.024 (0.025) | 1560 | |
| Installment 18 | 0.175* (0.097) | 0.163 (0.109) | 0.163 (0.109) | 0.096 (0.129) | 0.637*** (0.089) | 0.025 (0.092) | 0.025 (0.092) | 1560 | |
| Installment 19 | 0.115 (0.124) | 0.333*** (0.114) | 0.333*** (0.114) | 0.312*** (0.128) | 0.530*** (0.102) | 0.092 (0.022) | 0.092 (0.029) | 1560 | |
| Installment 20 | 0.021 (0.109) | 0.156 (0.112) | 0.156 (0.112) | 0.107 (0.125) | 0.677*** (0.092) | 0.022 (0.075) | 0.029 (0.076) | 1560 | |
| Installment 21 | 0.126 (0.118) | 0.328*** (0.107) | 0.328*** (0.107) | 0.251* (0.130) | 0.530*** (0.095) | 0.075 (0.009) | 0.076 (0.009) | 1560 | |
| Installment 22 | 0.013 (0.086) | 0.085 (0.091) | 0.085 (0.091) | 0.026 (0.112) | 0.810*** (0.078) | 0.009 (0.052) | 0.009 (0.056) | 1560 | |
| Installment 23 | 0.102 (0.115) | 0.272** (0.111) | 0.272** (0.111) | 0.139 (0.128) | 0.614*** (0.096) | 0.052 (0.022) | 0.056 (0.022) | 1560 | |
| Installment 24 | 0.010 (0.106) | 0.114 (0.099) | 0.114 (0.099) | 0.116 (0.107) | 0.778*** (0.087) | 0.022 (0.087) | 0.022 (0.087) | 1560 | |

Notes: Dependent variable is default in repayment up to installment X - binary variable per installment equal to 1 if cumulated amount due at installment X (end of month X) - cumulated amount repaid until installment X (end of month X) is positive AND flexibility (repayment = interest) has not been exercised, 0 otherwise. Two versions of each regression are reported for the dairy specific flexible loan: version (a) includes a lenient default measure (column 2a), version (b) contains a strict measure (column 2b). The lenient measure considers default based on the scheduled repayments of the larger fixed loan. The strict default measure counts any deviation from the protocol as default. Treatment by actual credit product taken, e.g. assigned research product or default option of regular loan=smaller fixed loan amount. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE 14: ITT Treatment effects on default in loan repayment cumulated up to installments due and lagged by two months

| Default in repayment (lagged by 2 month) up to installment X (dummy) | Smaller fixed loan | | Dairy specific flexible loan | | Coupon flexible loan | | Larger fixed loan (Constant) | | R-squared | | Observations |
|--|--------------------|--------------------|------------------------------|---------------------|----------------------|-------|------------------------------|---------------------|-----------|-------|--------------|
| | (1) | (2a) | strict measure (2b) | flexible loan (3) | loan (4) | (5a) | (for 2a) (5b) | (6) | | | |
| Installment 1 | 0.000 (.) | 0.000 (.) | 0.034 (0.033) | 0.000 (.) | 0.000 (.) | 0.024 | | 0.000 (.) | | 0.024 | 1560 |
| Installment 2 | 0.009 (0.007) | 0.117* (0.062) | 0.742*** (0.085) | 0.051 (0.050) | -0.000 (0.000) | 0.053 | 0.615 | 0.053 | 0.053 | 0.615 | 1560 |
| Installment 3 | -0.038 (0.040) | 0.011 (0.058) | 0.616*** (0.098) | 0.046 (0.067) | 0.040 (0.040) | 0.022 | 0.469 | 0.040 (0.040) | 0.022 | 0.469 | 1560 |
| Installment 4 | 0.077 (0.068) | 0.029 (0.063) | 0.373*** (0.104) | 0.212* (0.112) | 0.052 (0.040) | 0.051 | 0.121 | 0.052 (0.040) | 0.051 | 0.121 | 1560 |
| Installment 5 | 0.012 (0.010) | 0.118** (0.056) | 0.507*** (0.094) | 0.187** (0.085) | 0.003 (0.003) | 0.076 | 0.300 | 0.003 (0.003) | 0.076 | 0.300 | 1560 |
| Installment 6 | 0.073 (0.076) | 0.048 (0.081) | 0.279*** (0.100) | 0.158 (0.105) | 0.089* (0.047) | 0.021 | 0.065 | 0.089* (0.047) | 0.021 | 0.065 | 1560 |
| Installment 7 | 0.071 (0.063) | 0.143* (0.082) | 0.143* (0.082) | 0.317*** (0.113) | 0.043 (0.043) | 0.084 | 0.084 | 0.043 (0.043) | 0.084 | 0.084 | 1560 |
| Installment 8 | 0.192* (0.099) | 0.084 (0.102) | 0.084 (0.102) | 0.420*** (0.119) | 0.159** (0.068) | 0.097 | 0.097 | 0.159** (0.068) | 0.097 | 0.097 | 1560 |
| Installment 9 | 0.149** (0.074) | 0.217** (0.092) | 0.217** (0.092) | 0.284** (0.109) | 0.063 (0.042) | 0.056 | 0.056 | 0.063 (0.042) | 0.056 | 0.056 | 1560 |
| Installment 10 | 0.140 (0.098) | 0.068 (0.103) | 0.068 (0.103) | 0.437*** (0.120) | 0.190** (0.074) | 0.104 | 0.104 | 0.190** (0.074) | 0.104 | 0.104 | 1560 |
| Installment 11 | 0.194* (0.101) | 0.234** (0.116) | 0.234** (0.116) | 0.334** (0.133) | 0.193** (0.074) | 0.054 | 0.054 | 0.193** (0.074) | 0.054 | 0.054 | 1560 |
| Installment 12 | 0.135 (0.103) | 0.280** (0.113) | 0.280** (0.113) | 0.390*** (0.131) | 0.231*** (0.077) | 0.078 | 0.078 | 0.231*** (0.077) | 0.078 | 0.078 | 1560 |
| Installment 13 | 0.157 (0.111) | 0.293** (0.118) | 0.293** (0.118) | 0.382*** (0.129) | 0.274*** (0.084) | 0.074 | 0.074 | 0.274*** (0.084) | 0.074 | 0.074 | 1560 |

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| Default in repayment (lagged by 2 month) up to installment X (dummy) | Smaller fixed loan | | Dairy specific flexible loan | | Coupon flexible loan (3) | Larger fixed loan (Constant) (4) | R-squared | | Observations |
|--|---------------------|---------------------|------------------------------|---------------------|--------------------------|----------------------------------|---------------|---------------|--------------|
| | (1) | (2a) | lenient measure (2b) | strict measure | | | (for 2a) (5a) | (for 2b) (5b) | |
| Installment 14 | 0.204* (0.108) | 0.296** (0.118) | 0.296** (0.118) | 0.365*** (0.136) | 0.288*** (0.087) | 0.067 (0.067) | 0.067 | 1560 | |
| Installment 15 | 0.084 (0.107) | 0.314*** (0.114) | 0.314*** (0.114) | 0.359*** (0.130) | 0.352*** (0.082) | 0.086 | 0.086 | 1560 | |
| Installment 16 | 0.305*** (0.107) | 0.321*** (0.115) | 0.321*** (0.115) | 0.371*** (0.127) | 0.340*** (0.086) | 0.079 | 0.079 | 1560 | |
| Installment 17 | 0.113 (0.108) | 0.344*** (0.105) | 0.344*** (0.105) | 0.262* (0.136) | 0.429*** (0.086) | 0.074 | 0.074 | 1560 | |
| Installment 18 | 0.160 (0.115) | 0.371*** (0.116) | 0.371*** (0.116) | 0.285** (0.135) | 0.409*** (0.092) | 0.081 | 0.081 | 1560 | |
| Installment 19 | 0.185 (0.118) | 0.390*** (0.109) | 0.390*** (0.109) | 0.309** (0.132) | 0.424*** (0.094) | 0.092 | 0.092 | 1560 | |
| Installment 20 | 0.119 (0.115) | 0.303*** (0.114) | 0.303*** (0.114) | 0.178 (0.139) | 0.562*** (0.100) | 0.060 | 0.060 | 1560 | |
| Installment 21 | 0.157 (0.116) | 0.368*** (0.110) | 0.368*** (0.110) | 0.253* (0.130) | 0.493*** (0.094) | 0.085 | 0.085 | 1560 | |
| Installment 22 | 0.072 (0.116) | 0.251** (0.111) | 0.251** (0.111) | 0.268** (0.119) | 0.594*** (0.098) | 0.065 | 0.065 | 1560 | |

Notes: Dependent variables is default in repayment (lagged by 2 months) up to installment X - binary variable per installment equal to 1 if cumulated amount due at installment X (end of month X) - cumulated amount repaid until installment X+2 (end of month X+2) is positive AND flexibility (repayment = interest) has not been exercised, 0 otherwise. Two version of each regression are reported for the dairy specific flexible loan: version (a) includes a lenient default measure (column 2a), version (b) contains a strict measure (column 2b). The lenient measure considers default based on the scheduled repayments of the larger fixed loan. The strict default measure counts any deviation from the protocol as default. Treatment by actual credit product taken, e.g. assigned research product or default option of regular loan=smaller fixed loan amount. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

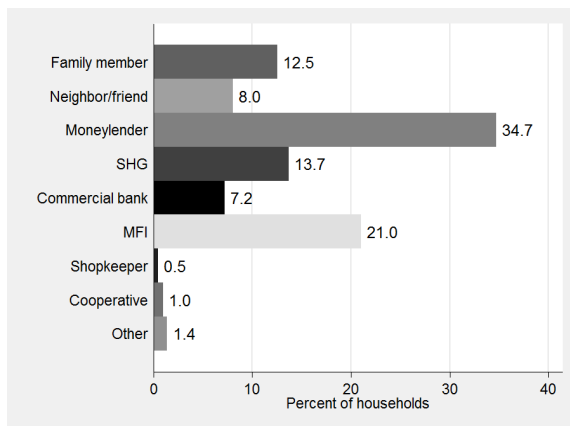
TABLE 15: ITT Treatment effects on self-reported repayment problem

| | Group problems (1) | Problems with officer (2) | Less income than usual (3) | Less income from cow (4) | Less income but higher expenditures (5) | Irregular/insecure income (6) | Higher expenditures (7) | High expenditures for health (8) | Flood (9) | Interest rate too high (10) | Repay other loan (11) |
|------------------------------|---------------------|---------------------------|----------------------------|--------------------------|---|-------------------------------|-------------------------|----------------------------------|-------------------|-----------------------------|-----------------------|
| Smaller fixed loan | 0.016 (0.028) | -0.011 (0.008) | 0.035 (0.023) | -0.073*** (0.022) | 0.007 (0.009) | 0.010 (0.013) | 0.009 (0.025) | -0.013 (0.025) | -0.002 (0.006) | 0.008 (0.013) | 0.008 (0.006) |
| Dairy specific flexible loan | 0.088*** (0.030) | -0.008 (0.007) | -0.010 (0.024) | -0.068*** (0.022) | 0.004 (0.008) | -0.000 (0.013) | -0.009 (0.021) | 0.009 (0.026) | 0.012* (0.007) | -0.017*** (0.008) | 0.001 (0.006) |
| Coupon flexible loan | 0.027 (0.026) | -0.000 (0.008) | 0.007 (0.021) | -0.029 (0.022) | 0.008 (0.009) | 0.015 (0.012) | -0.023 (0.020) | -0.011 (0.026) | 0.009 (0.007) | -0.009 (0.009) | 0.006 (0.006) |
| R-squared | 0.055 | 0.029 | 0.006 | 0.042 | 0.016 | 0.009 | 0.016 | 0.010 | 0.041 | 0.009 | 0.001 |
| Survey round FE | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Larger fixed loan (mean) | 0.084 | 0.022 | 0.262 | 0.177 | 0.038 | 0.042 | 0.134 | 0.180 | 0.008 | 0.028 | 0.012 |
| Observations | 14413 | 7913 | 7913 | 7913 | 7913 | 7913 | 7913 | 7913 | 7913 | 7913 | 7913 |
| Number of households | 2968 | 2785 | 2785 | 2785 | 2785 | 2785 | 2785 | 2785 | 2785 | 2785 | 2785 |
| Survey rounds | 3-7 | 3-7 | 3-7 | 3-7 | 3-7 | 3-7 | 3-7 | 3-7 | 3-7 | 3-7 | 3-7 |

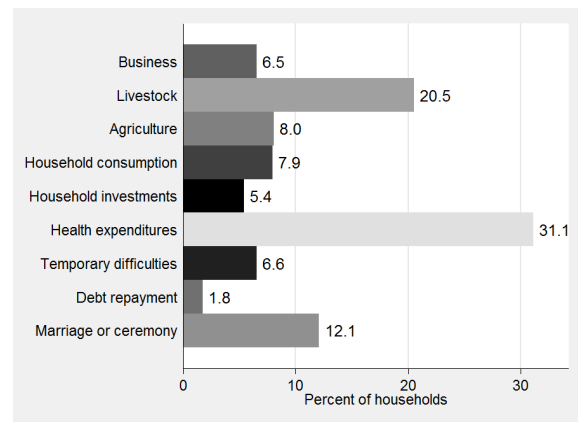
Notes: Dependent variables are binary indicators equal 1 if the statement applies, 0 otherwise. The statements regarding repayment problems have been reported during the household survey. Data: Only survey rounds 3 - 7 (i.e. 9 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

Appendix A Appendix Tables

FIGURE A.1: First loan outstanding from outside borrowing sources



(a) Loan source



(b) Loan purpose

TABLE A.1: Survey participation and completion rates

Panel A: Survey completion and attrition

| | Survey rate if | | | Completed all surveys | Number of surveys completed | Not completed any survey | Attrition - not completed last survey |
|--------------------------------|-----------------------|--------------------------|------------------------------------|-----------------------|-----------------------------|--------------------------|---------------------------------------|
| | took-up assigned loan | did not take-up any loan | took-up smaller fixed loan instead | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Smaller fixed loan | -0.109*** (0.032) | 0.071 (0.073) | | -0.066 (0.061) | 0.141 (0.288) | -0.076*** (0.027) | 0.017 (0.028) |
| Dairy specific flexible loan | -0.039 (0.029) | -0.041 (0.055) | 0.004 (0.019) | -0.046 (0.064) | -0.359 (0.312) | -0.026 (0.033) | 0.024 (0.029) |
| Coupon flexible loan | -0.003 (0.023) | 0.087 (0.078) | 0.001 (0.021) | -0.002 (0.065) | 0.361 (0.250) | -0.039 (0.031) | -0.003 (0.027) |
| Larger fixed loan (mean) | 0.870 | 0.220 | 0.139 | 0.307 | 4.750 | 0.109 | 0.099 |
| Joint F-test of flexible loans | 0.003 | 0.123 | 0.956 | 0.638 | 0.093 | 0.010 | 0.743 |
| R-squared | 0.056 | 0.034 | 0.001 | 0.004 | 0.013 | 0.010 | 0.001 |
| Observations | 2766 | 672 | 210 | 3648 | 3648 | 3648 | 3372 |

Panel B: Survey participation by survey round

| | Binary variable = 1 if participated in survey | | | | | | |
|--------------------------------|---|----------------------|----------------------|-------------------|-------------------|-------------------|------------------|
| | Round 1 | Round 2 | Round 3 | Round 4 | Round 5 | Round 6 | Round 7 |
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Smaller fixed loan | -0.140*** (0.053) | 0.049 (0.045) | -0.009 (0.056) | 0.065 (0.059) | -0.005 (0.077) | 0.127 (0.081) | 0.052 (0.037) |
| Dairy specific flexible loan | -0.058 (0.048) | -0.107*** (0.053) | -0.132*** (0.060) | -0.054 (0.062) | -0.000 (0.071) | -0.010 (0.079) | 0.001 (0.044) |
| Coupon flexible loan | 0.048 (0.042) | 0.069* (0.038) | 0.044 (0.041) | 0.073 (0.049) | 0.030 (0.067) | 0.059 (0.077) | 0.038 (0.038) |
| Larger fixed loan (mean) | 0.747 | 0.686 | 0.729 | 0.679 | 0.635 | 0.472 | 0.803 |
| Joint F-test of flexible loans | 0.003 | 0.009 | 0.036 | 0.131 | 0.958 | 0.323 | 0.392 |
| R-squared | 0.023 | 0.022 | 0.021 | 0.013 | 0.001 | 0.011 | 0.004 |
| Observations | 3648 | 3648 | 3648 | 3648 | 3648 | 3648 | 3648 |

Notes: Panel A: Dependent variables: Survey rate (in %) refers to the number of completed surveys as a share of all seven survey rounds. It is analyzed by compliance level, e.g. for borrowers who (1) took-up the assigned loan, (2) did not take-up any loan, and (3) took-up the smaller fixed loan instead of the assigned loan. Binary variables (columns (4), (6), and (7) equal 1 if this applies to the household, 0 otherwise. Attrition is defined as 1 if household did not participate in last survey round but at least in one other survey round before, 0 otherwise. Panel B: Dependent variables: Binary variables equal to 1 if household participated in the survey round, 0 otherwise. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE A.2: Summary stats and orthogonality by assigned treatment - Only borrowers who took-up the assigned loan

| | Larger fixed loan (1) | Dairy specific flexible loan (2) | Coupon flexible loan (3) | Smaller fixed loan (4) | F-stat P-value (5) |
|---|-----------------------------|--|--------------------------------|------------------------------|--------------------------|
| <i>Client characteristics (last survey) - 2592 observations</i> | | | | | |
| Age (years) | 39.70 (11.49) | 41.17 (11.46) | 40.41 (11.48) | 38.71 (10.93) | 0.011 |
| Male | 0.01 (0.12) | 0.19 (0.39) | 0.13 (0.34) | 0.07 (0.25) | 0.008 |
| Literate | 0.70 (0.46) | 0.75 (0.43) | 0.74 (0.44) | 0.68 (0.47) | 0.054 |
| Education (years) | 9.43 (4.97) | 9.22 (4.60) | 9.17 (4.68) | 9.82 (4.89) | 0.101 |
| <i>Household head (last survey) - 2628 observations</i> | | | | | |
| Age (years) | 47.77 (12.94) | 47.86 (11.42) | 47.68 (11.97) | 47.54 (12.65) | 0.995 |
| Male | 0.93 (0.25) | 0.96 (0.21) | 0.93 (0.26) | 0.93 (0.25) | 0.268 |
| Literate | 0.82 (0.38) | 0.85 (0.36) | 0.85 (0.35) | 0.79 (0.41) | 0.014 |
| Education (years) | 8.40 (4.45) | 8.45 (4.19) | 8.47 (4.16) | 8.97 (4.41) | 0.200 |
| <i>Household size (last survey) - 2822 observations</i> | | | | | |
| No.household members | 6.55 (3.16) | 6.52 (3.21) | 6.45 (2.99) | 6.63 (3.36) | 0.979 |
| No. children | 1.53 (1.44) | 1.34 (1.39) | 1.43 (1.42) | 1.47 (1.39) | 0.279 |
| <i>Household landholdings (last survey) - 2627 observations</i> | | | | | |
| Land ownership (dummy) | 0.76 (0.43) | 0.83 (0.37) | 0.78 (0.41) | 0.79 (0.41) | 0.289 |
| Land area (in acres) | 3.15 (4.69) | 4.18 (5.13) | 3.30 (5.13) | 3.13 (4.90) | 0.008 |
| Land value (in Rs.) | 146809.22 (341330.72) | 197849.33 (597923.59) | 152339.60 (430344.39) | 148098.71 (551165.63) | 0.390 |

Notes: Table lists means and standard deviations in parentheses below the means by assigned treatment for all borrowers who took-up the assigned loan. Loan products are assigned randomly by borrowing group. Characteristics of client, household head, household size and household landholding are from the last survey round. Literate is a binary variable equal to 1 if person is literate, 0 otherwise. Number of children counts all household members below age 13. F-stat p-value from test that all coefficients are equal is reported in column (5). For the F-test in column 5: Standard errors clustered at the group level for the F-test.

TABLE A.3: Tobit estimation of investment in cattle

| | Investment in cattle - purchase price | |
|------------------------------|---------------------------------------|---------------------------|
| | OLS (1) | Tobit (2) |
| Smaller fixed loan | -1567.881*** (412.374) | -3446.606*** (894.580) |
| Dairy specific flexible loan | -178.570 (526.029) | -633.830 (1006.616) |
| Coupon flexible loan | -134.987 (468.772) | -445.781 (884.387) |
| (Pseudo) R-squared | 0.032 | 0.003 |
| Observations | 2415 | 2415 |
| Number of households | 2415 | 2415 |

Notes: Purchase price of cattle (in Rs.) purchased between loan disbursement and second survey round. If no cattle were purchased, cattle price is set to 0. (1) OLS results from Table 33, (2) Tobit regression as a robustness check to OLS because of censored data. Data: Only second survey round. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE A.4: Milk production - Quantity (in liters) produced and sold per day, and cattle in lean phase - only cattle owner

| | Milk production (liters) | | Milk sold | | Cattle in lean phase | |
|--------------------------------|--------------------------|--------------------|------------------|------------------|----------------------|-------------------|
| | last day (1) | last week (2) | Liters (3) | Share (%) (4) | Dummy (5) | Number (6) |
| Smaller fixed loan | 0.237 (0.254) | 0.262 (0.262) | 0.134 (0.267) | 2.321 (3.143) | 0.014 (0.027) | 0.044 (0.049) |
| Dairy specific flexible loan | 0.378** (0.189) | 0.402** (0.193) | 0.242 (0.184) | 3.287 (2.992) | -0.001 (0.028) | -0.005 (0.039) |
| Coupon flexible loan | 0.196 (0.195) | 0.220 (0.197) | 0.142 (0.190) | 0.813 (2.469) | -0.015 (0.024) | -0.004 (0.039) |
| R-squared | 0.004 | 0.005 | 0.012 | 0.008 | 0.010 | 0.009 |
| Joint F-test of flexible loans | 0.134 | 0.111 | 0.411 | 0.546 | 0.804 | 0.989 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Larger fixed loan (mean) | 2.328 | 2.349 | 2.330 | 54.802 | 0.490 | 0.592 |
| Observations | 8034 | 8266 | 8073 | 8050 | 8386 | 8386 |
| Number of households | 2507 | 2512 | 2506 | 2504 | 2517 | 2517 |
| Survey rounds | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 |

Notes: Milk production of cattle owners. Dependent variables: (1) Milk production in liters last day. (2) Average milk production in liters per day last week. (3) Average liters of milk sold per day. (4) Share (in %) of last 5 months' milk production sold. For all milk production data, milk production is set to missing when household does not own cattle. (5) Cattle in lean phase - binary variable equal 1 if any cattle are in lean phase, 0 otherwise. (6) Number of cattle in lean phase, 0 if no cattle in lean phase. Milk production data winsorized at the top 1% level to reduce effect of outliers. Data: Only survey rounds 2 - 6 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until 3 month before loan repayment (round 6)). Observations are weighted by survey participation by compliance level in the considered survey rounds. Survey round fixed effects included in all regressions. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Appendix B Weighted regressions

TABLE B.1: ITT Treatment effects on income sources and income last year - weighted OLS
 OLS, weighted by inverse of the likelihood of being surveyed in each survey round conditional on compliance with treatment assignment

| | Binary variable = 1 if household earned income from | | | | | | |
|------------------------------|---|--------------------|-------------------|------------------------|-------------------|------------------|---------------------------------|
| | Number of income sources (1) | Agriculture (2) | Livestock (3) | Microenterprise (4) | Salary (5) | Wage (6) | Total income (in Rs.) (7) |
| Smaller fixed loan | -0.030 (0.099) | 0.033 (0.032) | -0.054 (0.033) | 0.004 (0.036) | 0.004 (0.034) | 0.023 (0.031) | 760.448 (1537.016) |
| Dairy specific flexible loan | 0.256*** (0.079) | 0.064* (0.033) | 0.008 (0.028) | 0.049 (0.033) | -0.016 (0.026) | 0.009 (0.028) | 2310.736* (1312.182) |
| Coupon flexible loan | -0.009 (0.090) | -0.018 (0.037) | 0.016 (0.028) | 0.025 (0.034) | -0.033 (0.027) | 0.017 (0.033) | 884.008 (1487.354) |
| R-squared | 0.624 | 0.019 | 0.052 | 0.108 | 0.008 | 0.043 | 0.158 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Sample weights | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 17433 | 17430 | 17426 | 17414 | 17418 | 17414 | 17293 |
| Number of households | 3372 | 3372 | 3372 | 3372 | 3372 | 3372 | 3372 |

Notes: Dependent variables: (1) Number of income sources from which household generated income in the last year. (2) Agricultural income - binary indicator, 1 if household earned income from agriculture, 0 otherwise. (3) Livestock income - binary indicator, 1 if household earned income from livestock activities, 0 otherwise. (4) Microenterprise income - binary indicator, 1 if household earned income from microenterprise, 0 otherwise. (5) Salary income - binary indicator, 1 if household earned income from regular fixed salary employment, 0 otherwise. (6) Wage income - binary indicator, 1 if household earned income from wage labor, 0 otherwise. (7) Total household income earned in the last year (in Rs.), data is winsorized and censored at the top 1% to reduce effect of outliers. Data: All seven survey rounds. Observations are weighted by the inverse of the likelihood of being surveyed in each survey round conditional on compliance with treatment assignment. Survey round fixed effects included in all regressions. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE B.2: ITT Treatment effects on consumption expenditures per household and per household member - levels and standard deviations - weighted OLS

| | Consumption expenditures (in Rs.) | | Standard deviation of consumption expenditures (in Rs.) | |
|---|-----------------------------------|-----------------------------|---|-----------------------------|
| | per household (1) | per household member (2) | per household (3) | per household member (4) |
| Smaller fixed loan | 113.761 (145.469) | -5.833 (26.055) | 175.667 (113.867) | 17.493 (20.496) |
| Dairy specific flexible loan | -18.018 (86.716) | -12.289 (18.573) | -80.149 (107.323) | -20.889 (20.813) |
| Coupon flexible loan | 125.152 (99.724) | 16.516 (19.787) | 175.667 (113.867) | 17.493 (20.496) |
| Consumption expenditures (first survey) | | | 0.281*** (0.017) | 0.040*** (0.004) |
| R-squared | 0.058 | 0.047 | 0.141 | 0.085 |
| Survey round fixed effects | Yes | Yes | No | No |
| Sample weights | Yes | Yes | Yes | Yes |
| Observations | 17398 | 17139 | 2535 | 2535 |
| Number of households | 3372 | 3297 | 2535 | 2535 |

Notes: Dependent variables: (1) Consumption expenditures per household. (2) Consumption expenditures per household member. Consumption measures include only items that were measured in all surveys. Consumption per household member calculated as: first and last survey round consumption divided by number of household members in these surveys respectively, midline consumption divided by average number of household members. Consumption data is winsorized and censored at the top 1% to reduce effect of outliers. (3) Standard deviation of household consumption expenditures per household. (4) Standard deviation of household consumption expenditures per household member. Standard deviation of winsorized consumption expenditures calculated per household across all available survey rounds if at least two observations per household are available. Consumption expenditures in the first survey round are also winsorized. Data: All seven survey rounds. Observations are weighted by the inverse of the likelihood of being surveyed in each survey round conditional on compliance with treatment assignment. Survey round fixed effects as indicated. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE B.3: ITT treatments effects on consumption expenditures and shocks to dairy farming income - weighted OLS OLS, weighted by inverse of the likelihood of being surveyed in each survey round conditional on compliance with treatment assignment

| | Cattle ill | | Cattle death | | Consumption expenditures (in Rs.) | | Consumption expenditures (in Rs.) | |
|---|-------------------|---------------------|----------------------|-----------------------------|-----------------------------------|-----------------------------|-----------------------------------|--|
| | (dummy) (1) | (dummy) (2) | per household (3) | per household member (4) | per household (5) | per household member (6) | | |
| Smaller fixed loan | 0.003 (0.028) | -0.007** (0.004) | 126.028 (189.722) | -8.960 (30.970) | 156.158 (196.183) | -4.278 (35.876) | | |
| Dairy specific flexible loan | 0.016 (0.024) | -0.004 (0.004) | -57.894 (123.631) | -24.957 (26.114) | -47.214 (112.678) | -21.885 (25.877) | | |
| Coupon flexible loan | 0.052* (0.030) | 0.002 (0.005) | 71.527 (135.181) | 2.145 (27.344) | 102.226 (131.102) | 10.215 (26.208) | | |
| Cattle ill (dummy) | | | 122.573 (112.466) | 9.691 (22.288) | | | | |
| Smaller fixed loan x Cattle ill | | | 180.574 (211.109) | 30.427 (51.853) | | | | |
| Dairy specific flexible loan x Cattle ill | | | 73.576 (142.022) | 22.604 (33.169) | | | | |
| Coupon flexible loan x Cattle ill | | | 190.172 (197.788) | 49.372 (35.175) | | | | |
| Cattle death (dummy) | | | | | -497.295** (207.151) | -114.687** (44.387) | | |
| Smaller fixed loan x Cattle death | | | | | 408.268 (489.128) | 81.292 (85.082) | | |
| Dairy specific flexible loan x Cattle death | | | | | 444.260 (348.071) | 125.165 (78.624) | | |
| Coupon flexible loan x Cattle death | | | | | 1391.479*** (516.254) | 281.675*** (97.704) | | |
| R-squared | 0.049 | 0.010 | 0.066 | 0.053 | 0.064 | 0.052 | | |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | | |
| Sample weights | Yes | Yes | Yes | Yes | Yes | Yes | | |
| Observations | 11827 | 11827 | 11808 | 11549 | 11808 | 11549 | | |
| Number of households | 2898 | 2898 | 2898 | 2823 | 2898 | 2823 | | |

Notes: Dependent variables: (1) Cattle ill - binary indicator, 1 if cattle has been ill, 0 otherwise. (2) Cattle death - binary indicator, 1 if there has been a cattle death, 0 otherwise. Consumption expenditures as defined in Table 6. Data: Only survey rounds 2 - 6 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until 3 month before loan repayment (round 6)). Observations are weighted by the inverse of the likelihood of being surveyed in each survey round conditional on compliance with treatment assignment. The joint F-test includes both flexible loans and their interaction with the cattle ill and cattle death dummy, respectively. Standard errors reported in parentheses and clustered at the group level. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE B.4: ITT Treatment effects on outside borrowing - weighted OLS

| | Any loan outstanding (1) | Any informal loan outstanding (2) | Any formal loan outstanding (3) | Number of loans outstanding (4) | Total amount outstanding (in Rs.) (5) | Average amount outstanding (in Rs.) (6) |
|------------------------------|--------------------------------|---|---------------------------------------|---------------------------------------|---|---|
| Smaller fixed loan | -0.029 (0.028) | -0.026 (0.029) | -0.015 (0.022) | -0.064 (0.058) | 278.624 (517.891) | -52.843 (242.512) |
| Dairy specific flexible loan | -0.026 (0.026) | 0.004 (0.028) | -0.038* (0.022) | 0.003 (0.061) | 602.710 (526.911) | 30.259 (229.626) |
| Coupon flexible loan | -0.043 (0.030) | -0.029 (0.028) | -0.026 (0.023) | -0.106* (0.059) | -379.743 (467.833) | -186.039 (225.029) |
| R-squared | 0.193 | 0.118 | 0.154 | 0.258 | 0.193 | 0.164 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Sample weights | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 17354 | 14755 | 14755 | 17354 | 17354 | 17354 |
| Number of households | 3372 | 3323 | 3323 | 3372 | 3372 | 3372 |
| Survey rounds | All 7 rounds | Rounds 2 -7 | Rounds 2 -7 | All 7 rounds | All 7 rounds | All 7 rounds |

Notes: Dependent variables: (1) Any loan outstanding from outside borrowing sources - binary indicator equal 1 if any outstanding loan, 0 otherwise. (2) Any loan outstanding from informal sources - binary indicator equal 1 if loan outstanding from any informal source (family member, neighbor, friend, moneylender, shopkeeper, pawn broker, or Rosca), 0 if only formal loans outstanding or no outside borrowing - only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). (3) Any loan outstanding from formal outside sources - binary indicator equal 1 if loan outstanding from a formal source (SHG, commercial bank, microfinance institution, cooperative, provident fund, or finance company), 0 if only informal loans outstanding or no outside borrowing - only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). (4) Number of loans outstanding from outside financing sources. (5) Total loan amount outstanding in Rs., data winsorized and censored at the top 1% to reduce effect of outliers. (6) Average loan amount outstanding in Rs. (total loan amount/ number of loans), data winsorized and censored at the top 1%. The loan amount outstanding refers to loans other than the loan in the study. Problems of wrong labeling of these loans as outside loans are discussed in footnote 8 on page 13. Data: All seven survey rounds, except for columns (2) and (3). Observations are weighted by the inverse of the likelihood of being surveyed in each survey round conditional on compliance with treatment assignment. Survey round fixed effects included in all regressions. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE B.5: ITT Treatment effects on cattle herd and investment in cattle - weighted OLS OLS, weighted by inverse of the likelihood of being surveyed in each survey round conditional on compliance with treatment assignment

| | Investment in cattle | | | | | |
|--------------------------------|-----------------------|-------------------|------------------|--------------------------------|--|--|
| | Household owns cattle | Number of cattle | Number of cattle | Household has purchased cattle | Amount spent on purchasing cattle - restricted sample to those who actually purchased cattle | Amount spent on purchasing cattle - restricted sample to those who actually purchased cattle |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Smaller fixed loan | -0.160*** (0.047) | -0.031 (0.167) | 0.035 (0.111) | -0.227*** (0.064) | -1576.848*** (482.884) | -167.086 (492.292) |
| Dairy specific flexible loan | -0.035 (0.045) | 0.040 (0.103) | 0.039 (0.075) | -0.082 (0.073) | -255.974 (576.275) | 634.554* (378.492) |
| Coupon flexible loan | -0.001 (0.042) | 0.071 (0.090) | 0.131 (0.087) | -0.077 (0.062) | -296.349 (483.166) | 348.014 (327.876) |
| Survey round fixed effects | No | No | Yes | No | No | No |
| Sample weights | Yes | Yes | Yes | Yes | Yes | Yes |
| R-squared | 0.024 | 0.001 | 0.025 | 0.027 | 0.029 | 0.014 |
| Joint F-test of flexible loans | 0.695 | 0.726 | 0.124 | 0.418 | 0.853 | 0.244 |
| Observations | 2503 | 2503 | 17431 | 2503 | 2415 | 1183 |
| Number of households | 2503 | 2503 | 3372 | 2503 | 2415 | 1183 |
| Survey rounds | Round 2 | Round 2 | All 7 rounds | Round 2 | Round 2 | Round 2 |

Notes: Dependent variables: (1) Own cattle - binary variable equal 1 if household owns cattle, 0 otherwise. (2) Number of cattle owned. (3) Number of cattle owned. Pooled regression with survey round fixed effects. (4) Purchase cattle - binary variable equal 1 if household purchased cattle between loan disbursement and second survey round, 0 otherwise. (5) Purchase price of cattle (in Rs.) purchased between loan disbursement and second survey round. If no cattle were purchased, cattle price is set to 0. OLS results robust to a Tobit estimation specification (compare Appendix Table A.3). (6) Purchase price of cattle (in Rs.) purchased between loan disbursement and second survey round. If no cattle were purchased, cattle price is set to missing. Price data is winsorized at the 1% level to reduce effect of outliers. Data: Only second survey round (i.e. 6 months after treatment assignment and loan disbursement) (except for column 3)). Observations are weighted by the inverse of the likelihood of being surveyed in each considered survey round conditional on compliance with treatment assignment. Survey round fixed effects are included as indicated. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE B.6: ITT Treatment effects on milk production - Quantity (in liters) produced and sold per day, and cattle in lean phase - weighted OLS, weighted by inverse of the likelihood of being surveyed in each survey round conditional on compliance with treatment assignment

| | Milk produced per day (liters) | | Milk sold | | Cattle in lean phase | |
|------------------------------|--------------------------------|------------------|------------------|-------------------|----------------------|-------------------|
| | Last day (1) | Last week (2) | Liters (3) | Share (%) (4) | Dummy (5) | Number (6) |
| Smaller fixed loan | 0.083 (0.268) | 0.133 (0.286) | 0.030 (0.290) | -2.050 (4.240) | -0.031 (0.033) | -0.002 (0.063) |
| Dairy specific flexible loan | 0.310 (0.202) | 0.322 (0.208) | 0.184 (0.199) | 3.211 (4.118) | -0.021 (0.030) | -0.028 (0.045) |
| Coupon flexible loan | 0.295 (0.206) | 0.330 (0.213) | 0.239 (0.210) | 2.357 (3.385) | -0.000 (0.031) | 0.001 (0.044) |
| R-squared | 0.011 | 0.010 | 0.017 | 0.016 | 0.008 | 0.005 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Sample weights | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 11475 | 11707 | 11514 | 11491 | 11827 | 11827 |
| Number of households | 2895 | 2898 | 2898 | 2898 | 2898 | 2898 |
| Survey rounds | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 |

Notes: Dependent variables: (1) Milk production in liters last day. (2) Average milk production in liters per day last week. (3) Average liters of milk sold per day. (4) Share (in %) of last 5 months' milk production sold. For all milk production data, milk production is set to 0 when household does not own cattle. Appendix Table A.4 confirms the results when only looking at cattle owners. (5) Cattle in lean phase - binary variable equal 1 if any cattle are in lean phase, 0 otherwise. (6) Number of cattle in lean phase, 0 if no cattle in lean phase. Milk production data winsorized at the top 1% level to reduce effect of outliers. Data: Only survey rounds 2 - 6 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until 3 month before loan repayment (round 6)). Observations are weighted by survey participation by compliance level in the considered survey rounds. Survey round fixed effects included in all regressions. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE B.7: ITT Treatment effects on self-reported repayment behavior - weighted OLS
 OLS, weighted by inverse of the likelihood of being surveyed in each survey round conditional on compliance with treatment assignment

| Binary variable =1 if | Any repayment problems | Repaid every month at group meeting | Not paid in a month | Another group member paid for self | Paid for a defaulting peer | Know flexible repayment schedule | Understood flexible repayment schedule |
|------------------------------|------------------------|-------------------------------------|---------------------|------------------------------------|----------------------------|----------------------------------|--|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Smaller fixed loan | -0.017 (0.045) | -0.003 (0.049) | -0.110 (0.072) | 0.002 (0.006) | -0.000 (0.002) | | |
| Dairy specific flexible loan | 0.074* (0.043) | -0.157*** (0.049) | 0.074 (0.067) | -0.001 (0.004) | 0.004 (0.003) | 0.911*** (0.030) | 0.890*** (0.033) |
| Coupon flexible loan | 0.026 (0.042) | -0.048 (0.045) | 0.054 (0.067) | 0.003 (0.005) | 0.007 (0.005) | 0.955*** (0.015) | 0.943*** (0.016) |
| R-squared | 0.014 | 0.088 | 0.049 | 0.007 | 0.007 | 0.907 | 0.929 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Sample weights | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 14413 | 14371 | 14361 | 14398 | 14403 | 7299 | 6994 |
| Number of households | 2968 | 2968 | 2967 | 2968 | 2968 | 1489 | 1482 |
| Survey rounds | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 |

Notes: Dependent variables are binary indicators equal 1 if household agreed to the statement in the survey, 0 otherwise. (1) Any repayment problems: faced any difficulty in repaying the monthly installments in the last 5 months. (2) Paid the monthly installment at every group meeting. (3) Did not repay at least one monthly installment. (4) Another group member paid the installment when respondent could not pay herself. (5) Respondent paid the installment for a peer who could not repay the installment herself. (6) The borrower knows (self-reported) the repayment schedule. (7) The borrower can explain the loan schedule to the enumerator during the household survey, 0 otherwise. Both columns (6) and (7) are estimated without the constant. Data: Only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). Observations are weighted by the inverse of the likelihood of being surveyed in each survey round conditional on compliance with treatment assignment. Survey round fixed effects included in all regressions. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE B.8: ITT Treatment effects on loan repayment - weighted OLS

| | No. of repayments made (1) | Default (dummy) (2) | Amount (in Rs.) (3) | Amount (% of loan size) (4) |
|------------------------------|-------------------------------|------------------------|--------------------------|--------------------------------|
| Smaller fixed loan | -2.443** (1.181) | 0.145 (0.115) | 47.726 (334.765) | 0.112* (0.065) |
| Dairy specific flexible loan | -4.716*** (1.617) | 0.314*** (0.112) | 1513.129*** (424.960) | 0.252*** (0.070) |
| Coupon flexible loan | -4.570** (1.805) | 0.197 (0.133) | 1835.451*** (563.872) | 0.304*** (0.093) |
| R-squared | 0.090 | 0.065 | 0.196 | 0.124 |
| Sample weights | Yes | Yes | Yes | Yes |
| Observations | 1550 | 1550 | 1550 | 1550 |
| Number of households | 1550 | 1550 | 1550 | 1550 |
| Survey rounds | Round 7 | Round 7 | Round 7 | Round 7 |

Notes: Default at end of loan cycle - binary variable equal 1 if outstanding loan repayment at end of loan cycle, 0 otherwise. Data: Only last survey round after loan repayment (round 7). Observations are weighted by the inverse of the likelihood of being surveyed in the last survey round conditional on compliance with treatment assignment. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

Appendix C Client characteristics as covariates

TABLE C.1: ITT Treatment effects on income sources and income last year - Client characteristics

| | Number of income sources | | | Binary variable = 1 if household earned income from | | | Total income (in Rs.) |
|------------------------------|--------------------------|--------------------|---------------------|---|-------------------|------------------|------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Smaller fixed loan | -0.100 (0.098) | 0.046 (0.036) | -0.069** (0.034) | -0.032 (0.036) | -0.003 (0.025) | 0.030 (0.028) | 129.122 (1389.603) |
| Dairy specific flexible loan | 0.229*** (0.083) | 0.075** (0.035) | 0.007 (0.030) | 0.027 (0.033) | -0.020 (0.023) | 0.010 (0.026) | 1455.512 (1383.666) |
| Coupon flexible loan | -0.062 (0.086) | -0.011 (0.044) | 0.013 (0.031) | 0.001 (0.034) | -0.015 (0.024) | 0.001 (0.028) | 333.106 (1437.857) |
| R-squared | 0.620 | 0.020 | 0.054 | 0.117 | 0.048 | 0.091 | 0.455 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Client characteristics | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 15702 | 15699 | 15696 | 15686 | 15690 | 15686 | 15578 |
| Number of households | 2963 | 2963 | 2963 | 2963 | 2963 | 2963 | 2963 |

Notes: Dependent variables: (1) Number of income sources from which household generated income in the last year. (2) Agricultural income - binary indicator, 1 if household earned income from agriculture, 0 otherwise. (3) Livestock income - binary indicator, 1 if household earned income from livestock activities, 0 otherwise. (4) Microenterprise income - binary indicator, 1 if household earned income from microenterprise, 0 otherwise. (5) Salary income - binary indicator, 1 if household earned income from regular fixed salary employment, 0 otherwise. (6) Wage income - binary indicator, 1 if household earned income from wage labor, 0 otherwise. (7) Total household income earned in the last year (in Rs.), data is winsorized and censored at the top 1% to reduce effect of outliers. Data: All seven survey rounds. Survey round fixed effects included in all regressions. Client characteristics (gender, age, literacy, and education) included in all regressions. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE C.2: ITT Treatment effects on consumption expenditures per household and per household member - levels and standard deviations - Client characteristics

| | Consumption expenditures (in Rs.) | | Standard deviation of consumption expenditures (in Rs.) | |
|---|-----------------------------------|-----------------------------|---|-----------------------------|
| | per household (1) | per household member (2) | per household (3) | per household member (4) |
| Smaller fixed loan | -61.082 (84.024) | -17.206 (15.079) | 34.710 (116.314) | -7.973 (21.874) |
| Dairy specific flexible loan | -109.723 (74.723) | -20.906 (13.354) | -87.772 (105.787) | -20.197 (18.787) |
| Coupon flexible loan | 4.773 (72.534) | 3.982 (12.602) | -87.772 (105.787) | -20.197 (18.787) |
| Consumption expenditures (first survey) | | | 0.254*** (0.017) | 0.040*** (0.004) |
| R-squared | 0.053 | 0.041 | 0.138 | 0.106 |
| Survey round fixed effects | Yes | Yes | No | No |
| Client characteristics | Yes | Yes | Yes | Yes |
| Observations | 15673 | 15673 | 2259 | 2259 |
| Number of households | 2963 | 2963 | 2259 | 2259 |

Notes: Dependent variables: (1) Consumption expenditures per household. (2) Consumption expenditures per household member. Consumption measures include only items that were measured in all surveys. Consumption per household member calculated as: first and last survey round consumption divided by number of household members in these surveys respectively, midline consumption divided by average number of household members. Consumption data is winsorized and censored at the top 1% to reduce effect of outliers. (3) Standard deviation of household consumption expenditures per household. (4) Standard deviation of household consumption expenditures per household member. Standard deviation of winsorized consumption expenditures calculated per household across all available survey rounds if at least two observations per household are available. Consumption expenditures in the first survey round are also winsorized. Data: All seven survey rounds. Survey round fixed effects as indicated. Client characteristics (gender, age, literacy, and education) included in all regressions. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE C.3: ITT Treatment effects on consumption expenditures and shocks to dairy farming income - Client characteristics

| | Cattle ill (dummy) (1) | Cattle death (dummy) (2) | Consumption expenditures (in Rs.) per household member (3) | Consumption expenditures (in Rs.) per household member (4) | Consumption expenditures (in Rs.) per household member (5) | Consumption expenditures (in Rs.) per household member (6) |
|---|------------------------------|--------------------------------|--|--|--|--|
| Smaller fixed loan | -0.030 (0.022) | -0.003 (0.004) | -43.643 (111.239) | -12.026 (19.626) | -76.058 (106.037) | -18.813 (18.945) |
| Dairy specific flexible loan | 0.012 (0.025) | -0.000 (0.004) | -141.704 (99.538) | -27.398 (17.738) | -154.648* (92.229) | -28.416* (17.161) |
| Coupon flexible loan | 0.025 (0.024) | 0.003 (0.005) | -10.627 (100.490) | 2.201 (16.564) | -9.143 (96.256) | 3.409 (16.636) |
| Cattle ill (dummy) | | | 178.059* (103.246) | 15.399 (20.863) | | |
| Smaller fixed loan x Cattle ill | | | -107.528 (138.128) | -27.721 (25.419) | | |
| Dairy specific flexible loan x Cattle ill | | | -32.219 (132.118) | 4.800 (26.996) | | |
| Coupon flexible loan x Cattle ill | | | 81.634 (174.620) | 20.936 (31.658) | | |
| Cattle death (dummy) | | | | | -495.352*** (175.054) | -117.224*** (28.078) |
| Smaller fixed loan x Cattle death | | | | | 718.810 (466.744) | 130.622* (73.947) |
| Dairy specific flexible loan x Cattle death | | | | | 606.726* (328.394) | 162.135** (68.765) |
| Coupon flexible loan x Cattle death | | | | | 1350.099** (598.664) | 249.331** (103.318) |
| R-squared | 0.054 | 0.011 | 0.057 | 0.047 | 0.057 | 0.048 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Client characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 10467 | 10467 | 10451 | 10451 | 10451 | 10451 |
| Number of households | 2539 | 2539 | 2539 | 2539 | 2539 | 2539 |

Notes: Dependent variables: (1) Cattle ill - binary indicator, 1 if cattle has been ill, 0 otherwise. (2) Cattle death - binary indicator, 1 if there has been a cattle death, 0 otherwise. Consumption expenditures as defined in Table 6. Data: Only survey rounds 2 - 6 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until 3 months before loan repayment (round 6)). The joint F-test includes both flexible loans and their interaction with the cattle ill and cattle death dummy, respectively. Client characteristics (gender, age, literacy, and education) included in all regressions. Standard errors reported in parentheses and clustered at the group level. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE C.4: ITT Treatment effects on outside borrowing - Client characteristics

| | Any loan outstanding (1) | Any informal loan outstanding (2) | Any formal loan outstanding (3) | Number of loans outstanding (4) | Total amount outstanding (in Rs.) (5) | Average amount outstanding (in Rs.) (6) |
|------------------------------|--------------------------------|---|---------------------------------------|---------------------------------------|---|---|
| Smaller fixed loan | -0.004 (0.023) | 0.000 (0.023) | -0.013 (0.021) | -0.017 (0.057) | 704.477 (505.375) | 155.740 (226.984) |
| Dairy specific flexible loan | -0.014 (0.024) | 0.007 (0.025) | -0.038* (0.022) | 0.037 (0.063) | 748.863 (530.991) | 83.941 (224.309) |
| Coupon flexible loan | -0.009 (0.023) | 0.001 (0.024) | -0.017 (0.021) | -0.043 (0.055) | 72.141 (442.476) | 55.734 (211.944) |
| R-squared | 0.194 | 0.123 | 0.150 | 0.262 | 0.198 | 0.162 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Client characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 15637 | 13365 | 13365 | 15637 | 15637 | 15637 |
| Number of households | 2963 | 2963 | 2963 | 2963 | 2963 | 2963 |
| Survey rounds | All 7 rounds | Rounds 2 -7 | Rounds 2 -7 | All 7 rounds | All 7 rounds | All 7 rounds |

Notes: Dependent variables: (1) Any loan outstanding from outside borrowing sources - binary indicator equal 1 if any outstanding loan, 0 otherwise. (2) Any loan outstanding from informal sources - binary indicator equal 1 if loan outstanding from any informal source (family member, neighbor, friend, moneylender, shopkeeper, pawn broker, or Rosca), 0 if only formal loans outstanding or no outside borrowing - only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). (3) Any loan outstanding from formal outside sources - binary indicator equal 1 if loan outstanding from a formal source (SHG, commercial bank, microfinance institution, cooperative, provident fund, or finance company), 0 if only informal loans outstanding or no outside borrowing - only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). (4) Number of loans outstanding from outside financing sources. (5) Total loan amount outstanding in Rs., data winsorized and censored at the top 1% to reduce effect of outliers. (6) Average loan amount outstanding in Rs. (total loan amount/ number of loans), data winsorized and censored at the top 1%. The loan amount outstanding refers to loans other than the loan in the study. Problems of wrong labeling of these loans as outside loans are discussed in footnote 8 on page 13. Data: All seven survey rounds, except for columns (2) and (3). Survey round fixed effects included in all regressions. Client characteristics (gender, age, literacy, and education) included in all regressions. Standard errors clustered at the group level and reported in parentheses.

* p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE C.5: ITT Treatment effects on cattle herd and investment in cattle - Client characteristics

| | Investment in cattle | | | | | |
|------------------------------|-----------------------|-------------------|-------------------|--------------------------------|-----------------------------------|--|
| | Household owns cattle | Number of cattle | Number of cattle | Household has purchased cattle | Amount spent on purchasing cattle | Amount spent on purchasing cattle - restricted sample to those who actually purchased cattle |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Smaller fixed loan | -0.157*** (0.048) | -0.085 (0.132) | -0.061 (0.104) | -0.222*** (0.058) | -1500.114*** (398.895) | -262.461 (339.058) |
| Dairy specific flexible loan | -0.022 (0.048) | 0.112 (0.096) | 0.024 (0.082) | -0.041 (0.071) | -7.548 (531.690) | 568.839 (346.881) |
| Coupon flexible loan | -0.017 (0.047) | 0.059 (0.084) | 0.046 (0.081) | -0.040 (0.066) | -75.321 (473.571) | 326.855 (305.150) |
| Survey round fixed effects | No | No | Yes | No | No | No |
| Client characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 2221 | 2221 | 15700 | 2221 | 2140 | 1022 |
| Number of households | 2221 | 2221 | 2963 | 2221 | 2140 | 1022 |
| Survey rounds | Round 2 | Round 2 | All 7 rounds | Round 2 | Round 2 | Round 2 |

Notes: Dependent variables: (1) Own cattle - binary variable equal 1 if household owns cattle, 0 otherwise. (2) Number of cattle owned. (3) Number of cattle owned. Pooled regression with survey round fixed effects. (4) Purchase cattle - binary variable equal 1 if household purchased cattle between loan disbursement and second survey round, 0 otherwise. (5) Purchase price of cattle (in Rs.) purchased between loan disbursement and second survey round. If no cattle were purchased, cattle price is set to 0. (6) Purchase price of cattle (in Rs.) purchased between loan disbursement and second survey round. If no cattle were purchased, cattle price is set to missing. Price data is winsorized at the 1% level to reduce effect of outliers. Data: Only second survey round (i.e. 6 months after treatment assignment and loan disbursement) (except for column 3)). Survey round fixed effects are included as indicated. Client characteristics (gender, age, literacy, and education) included in all regressions. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE C.6: ITT Treatment effects on milk production - Quantity (in liters) produced and sold per day, and cattle in lean phase - Client characteristics

| | Milk produced per day (liters) | | Milk sold | | Cattle in lean phase | |
|------------------------------|--------------------------------|-------------------|-------------------|-------------------|----------------------|-------------------|
| | Last day (1) | Last week (2) | Liters (3) | Share (%) (4) | Dummy (5) | Number (6) |
| Smaller fixed loan | -0.158 (0.216) | -0.172 (0.218) | -0.237 (0.219) | -4.566 (3.698) | -0.043 (0.028) | -0.047 (0.041) |
| Dairy specific flexible loan | 0.188 (0.200) | 0.198 (0.204) | 0.105 (0.198) | 1.767 (3.941) | 0.016 (0.029) | 0.012 (0.039) |
| Coupon flexible loan | 0.075 (0.181) | 0.076 (0.181) | 0.038 (0.178) | 1.203 (3.315) | -0.002 (0.026) | 0.008 (0.037) |
| R-squared | 0.012 | 0.012 | 0.021 | 0.021 | 0.015 | 0.011 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Client characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 10163 | 10368 | 10186 | 10168 | 10467 | 10467 |
| Number of households | 2538 | 2539 | 2539 | 2539 | 2539 | 2539 |
| Survey rounds | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 |

Notes: Dependent variables: (1) Milk production in liters last day. (2) Average milk production in liters per day last week. (3) Average liters of milk sold per day. (4) Share (in %) of last 5 months' milk production sold. For all milk production data, milk production is set to 0 when household does not own cattle. (5) Cattle in lean phase - binary variable equal 1 if any cattle are in lean phase, 0 otherwise. (6) Number of cattle in lean phase, 0 if no cattle in lean phase. Milk production data winsorized at the top 1% level to reduce effect of outliers. Data: Only survey rounds 2 - 6 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until 3 month before loan repayment (round 6)). Observations are weighted by survey participation by compliance level in the considered survey rounds. Survey round fixed effects included in all regressions. Client characteristics (gender, age, literacy, and education) included in all regressions. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE C.7: ITT Treatment effects on repayment problems and default on loan repayment - Client characteristics

| Binary variable = 1 if | Any repayment problems (1) | Repaid every month at group meeting (2) | Not paid in a month (3) | Another group member paid for self (4) | Paid for a defaulting peer (5) | Know flexible repayment schedule (6) | Understood flexible repayment schedule (7) |
|------------------------------|----------------------------|---|-------------------------|--|--------------------------------|--------------------------------------|--|
| Smaller fixed loan | 0.012 (0.036) | 0.017 (0.049) | -0.042 (0.063) | -0.002 (0.005) | -0.001 (0.002) | | |
| Dairy specific flexible loan | 0.070* (0.037) | -0.116** (0.048) | 0.103* (0.061) | 0.001 (0.004) | 0.004 (0.003) | 0.912*** (0.052) | 0.905*** (0.047) |
| Coupon flexible loan | 0.043 (0.035) | -0.028 (0.044) | 0.101* (0.060) | 0.001 (0.004) | 0.005* (0.003) | 0.942*** (0.048) | 0.946*** (0.043) |
| R-squared | 0.025 | 0.099 | 0.081 | 0.008 | 0.008 | 0.904 | 0.940 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Client characteristics | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 13015 | 12983 | 12973 | 13005 | 13007 | 6570 | 6263 |
| Number of households | 2609 | 2609 | 2609 | 2609 | 2609 | 1303 | 1296 |
| Survey rounds | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 |

Notes: Dependent variables are binary indicators equal 1 if household agreed to the statement in the survey, 0 otherwise. (1) Any repayment problems: faced any difficulty in repaying the monthly installments in the last 5 months. (2) Paid the monthly installment at every group meeting. (3) Did not repay at least one monthly installment. (4) Another group member paid the installment when respondent could not pay herself. (5) Respondent paid the installment for a peer who could not repay the installment herself. (6) The borrower knows (self-reported) the repayment schedule. (7) The borrower can explain the loan schedule to the enumerator during the household survey, 0 otherwise. Both columns (6) and (7) are estimated without the constant. Data: Only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). Survey round fixed effects included in all regressions. Client characteristics (gender, age, literacy, and education) included in all regressions. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01

TABLE C.8: ITT Treatment effects on repayment problems and default on loan repayment - Client characteristics

| | (1) | (2) | (3) | (4) |
|------------------------------|------------------------|--------------------|--------------------------|-------------------------|
| | No. of repayments made | Default (dummy) | Amount (in Rs.) | Amount (% of loan size) |
| <i>Panel A</i> | | | | |
| Smaller fixed loan | -1.629 (1.009) | 0.120 (0.118) | -198.714 (319.280) | 0.063 (0.060) |
| Dairy specific flexible loan | -2.798** (1.387) | 0.242** (0.120) | 868.297** (408.544) | 0.136** (0.068) |
| Coupon flexible loan | -2.953** (1.370) | 0.144 (0.138) | 1363.183*** (506.950) | 0.218** (0.083) |
| R-squared | 0.286 | 0.111 | 0.350 | 0.299 |
| Client characteristics | Yes | Yes | Yes | Yes |
| Observations | 1387 | 1387 | 1387 | 1387 |
| Number of households | 1387 | 1387 | 1387 | 1387 |
| Survey rounds | Round 7 | Round 7 | Round 7 | Round 7 |

Notes: Default at end of loan cycle - binary variable equal 1 if outstanding loan repayment at end of loan cycle, 0 otherwise. Data: Only last survey round after loan repayment (round 7). Client characteristics (gender, age, literacy, and education) included in all regressions. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

Appendix D All covariates

TABLE D.1: ITT Treatment effects on income sources and income last year - All covariates

| | Binary variable = 1 if household earned income from | | | | | | |
|------------------------------|---|-------------------|-------------------|---------------------|-------------------|------------------|---------------------------|
| | Number of income sources (1) | Agriculture (2) | Livestock (3) | Microenterprise (4) | Salary (5) | Wage (6) | Total income (in Rs.) (7) |
| Smaller fixed loan | -0.072 (0.097) | 0.012 (0.016) | -0.053 (0.034) | -0.017 (0.033) | -0.017 (0.026) | 0.040 (0.027) | -59,357 (1393,247) |
| Dairy specific flexible loan | 0.230*** (0.077) | 0.023 (0.015) | -0.004 (0.027) | 0.040 (0.031) | -0.024 (0.025) | 0.032 (0.025) | 1619,218 (1307,468) |
| Coupon flexible loan | -0.023 (0.080) | -0.002 (0.018) | 0.010 (0.028) | -0.001 (0.033) | -0.015 (0.025) | 0.026 (0.027) | 1313,851 (1490,649) |
| R-squared | 0.644 | 0.029 | 0.063 | 0.122 | 0.068 | 0.098 | 0.522 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Client characteristics | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Household characteristics | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 12030 | 12029 | 12026 | 12017 | 12021 | 12017 | 11972 |
| Number of households | 2275 | 2275 | 2275 | 2275 | 2275 | 2275 | 2275 |

Notes: Dependent variables: (1) Number of income sources from which household generated income in the last year. (2) Agricultural income - binary indicator, 1 if household earned income from agriculture, 0 otherwise. (3) Livestock income - binary indicator, 1 if household earned income from livestock activities, 0 otherwise. (4) Microenterprise income - binary indicator, 1 if household earned income from microenterprise, 0 otherwise. (5) Salary income - binary indicator, 1 if household earned income from regular fixed salary employment, 0 otherwise. (6) Wage income - binary indicator, 1 if household earned income from wage labor, 0 otherwise. (7) Total household income earned in the last year (in Rs.), data is winsorized and censored at the top 1% to reduce effect of outliers. Data: All seven survey rounds. Survey round fixed effects included in all regressions. Client characteristics (gender, age, literacy, and education) included in all regressions. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE D.2: ITT Treatment effects on consumption expenditures per household and per household member - levels and standard deviations - All covariates

| | Consumption expenditures (in Rs.) | | Standard deviation of consumption expenditures (in Rs.) | |
|---|-----------------------------------|-----------------------------|---|-----------------------------|
| | per household (1) | per household member (2) | per household (3) | per household member (4) |
| Smaller fixed loan | -132.155 (86.744) | -31.469** (15.613) | -40.273 (130.396) | -23.561 (24.086) |
| Dairy specific flexible loan | -196.630** (75.610) | -36.286*** (13.885) | -219.031** (110.658) | -44.133** (20.408) |
| Coupon flexible loan | -44.205 (74.929) | -9.272 (13.930) | 90.495 (112.517) | 5.677 (21.273) |
| Consumption expenditures (first survey) | | | 0.232*** | 0.039*** |
| R-squared | 0.088 | 0.068 | 0.181 | 0.134 |
| Survey round fixed effects | Yes | Yes | No | No |
| Client characteristics | Yes | Yes | Yes | Yes |
| Household characteristics | Yes | Yes | Yes | Yes |
| Observations | 12006 | 12006 | 1728 | 1728 |
| Number of households | 2275 | 2275 | 1728 | 1728 |

Notes: Dependent variables: (1) Consumption expenditures per household. (2) Consumption expenditures per household member. Consumption measures include only items that were measured in all surveys. Consumption per household member calculated as: first and last survey round consumption divided by number of household members in these surveys respectively, midline consumption divided by average number of household members. Consumption data is winsorized and censored at the top 1% to reduce effect of outliers. (3) Standard deviation of household consumption expenditures per household. (4) Standard deviation of household consumption expenditures per household member. Standard deviation of winsorized consumption expenditures calculated per household across all available survey rounds if at least two observations per household are available. Consumption expenditures in the first survey round are also winsorized. Data: All seven survey rounds. Survey round fixed effects as indicated. Client characteristics (gender, age, literacy, and education) included in all regressions. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE D.3: ITT Treatment effects on consumption expenditures and shocks to dairy farming income - All covariates

| | Cattle ill | | Cattle death | | Consumption expenditures (in Rs.) per household member | | Consumption expenditures (in Rs.) per household member | |
|---|-------------------|-------------------|-------------------------|-----------------------|--|-------------------------|--|--|
| | (1) | (2) | (3) | (4) | (5) | (6) | | |
| Smaller fixed loan | -0.034 (0.024) | -0.004 (0.005) | -150.814 (123.227) | -32.749 (21.827) | -183.114 (114.008) | -39.387* (21.066) | | |
| Dairy specific flexible loan | -0.003 (0.027) | -0.001 (0.005) | -279.166** (108.081) | -49.527** (19.674) | -287.243*** (98.747) | -49.518*** (18.506) | | |
| Coupon flexible loan | 0.024 (0.027) | -0.001 (0.005) | -100.000 (108.154) | -20.650 (19.156) | -99.484 (101.737) | -18.731 (18.876) | | |
| Cattle ill (dummy) | | | 131.162 (125.884) | 18.080 (23.957) | | | | |
| Smaller fixed loan x Cattle ill | | | -78.392 (161.141) | -21.020 (28.855) | | | | |
| Dairy specific flexible loan x Cattle ill | | | 9.127 (152.785) | 9.014 (28.930) | | | | |
| Coupon flexible loan x Cattle ill | | | 94.866 (205.486) | 23.880 (35.539) | | | | |
| Cattle death (dummy) | | | | | -650.734*** (189.000) | -112.123*** (34.271) | | |
| Smaller fixed loan x Cattle death | | | | | 891.932* (509.207) | 144.762* (76.158) | | |
| Dairy specific flexible loan x Cattle death | | | | | 613.792* (318.945) | 121.119* (62.067) | | |
| Coupon flexible loan x Cattle death | | | | | 1637.184*** (572.606) | 272.428*** (101.157) | | |
| R-squared | 0.056 | 0.013 | 0.079 | 0.074 | 0.079 | 0.074 | | |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | | |
| Client characteristics | Yes | Yes | Yes | Yes | Yes | Yes | | |
| Household characteristics | Yes | Yes | Yes | Yes | Yes | Yes | | |
| Observations | 8016 | 8016 | 8003 | 8003 | 8003 | 8003 | | |
| Number of households | 1954 | 1954 | 1954 | 1954 | 1954 | 1954 | | |

Notes: Dependent variables: (1) Cattle ill - binary indicator, 1 if cattle has been ill, 0 otherwise. (2) Cattle death - binary indicator, 1 if there has been a cattle death, 0 otherwise. Consumption expenditures as defined in Table 6. Data: Only survey rounds 2 - 6 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until 3 month before loan repayment (round 6)). The joint F-test includes both flexible loans and their interaction with the cattle ill and cattle death dummy, respectively. Client characteristics (gender, age, literacy, and education) included in all regressions. Standard errors reported in parentheses and clustered at the group level. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE D.4: ITT Treatment effects on outside borrowing - All covariates

| | Any loan outstanding (1) | Any informal loan outstanding (2) | Any formal loan outstanding (3) | Number of loans outstanding (4) | Total amount outstanding (in Rs.) (5) | Average amount outstanding (in Rs.) (6) |
|------------------------------|--------------------------------|---|---------------------------------------|---------------------------------------|---|---|
| Smaller fixed loan | 0.006 (0.025) | 0.005 (0.024) | -0.006 (0.021) | 0.012 (0.062) | 836.363 (535.640) | 209.267 (237.239) |
| Dairy specific flexible loan | -0.005 (0.025) | 0.007 (0.026) | -0.022 (0.022) | 0.067 (0.067) | 823.003 (543.211) | 58.941 (226.627) |
| Coupon flexible loan | -0.010 (0.025) | -0.003 (0.025) | -0.011 (0.021) | -0.029 (0.060) | 226.063 (455.173) | 46.689 (211.940) |
| -squared | 0.199 | 0.125 | 0.156 | 0.265 | 0.217 | 0.176 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Client characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Household characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 11980 | 10241 | 10241 | 11980 | 11980 | 11980 |
| Number of households | 2275 | 2275 | 2275 | 2275 | 2275 | 2275 |
| Survey rounds | All 7 rounds | Rounds 2 -7 | Rounds 2 -7 | All 7 rounds | All 7 rounds | All 7 rounds |

Notes: Dependent variables: (1) Any loan outstanding from outside borrowing sources - binary indicator equal 1 if any outstanding loan, 0 otherwise. (2) Any loan outstanding from informal sources - binary indicator equal 1 if loan outstanding from any informal source (family member, neighbor, friend, moneylender, shopkeeper, pawn broker, or Rosca), 0 if only formal loans outstanding or no outside borrowing - only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). (3) Any loan outstanding from formal outside sources - binary indicator equal 1 if loan outstanding from a formal source (SHC, commercial bank, microfinance institution, cooperative, provident fund, or finance company), 0 if only informal loans outstanding or no outside borrowing - only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). (4) Number of loans outstanding from outside financing sources. (5) Total loan amount outstanding in Rs., data winsorized and censored at the top 1% to reduce effect of outliers. (6) Average loan amount outstanding in Rs. (total loan amount/ number of loans), data winsorized and censored at the top 1%. The loan amount outstanding refers to loans other than the loan in the study. Problems of wrong labeling of these loans as outside loans are discussed in footnote 8 on page 13. Data: All seven survey rounds, except for columns (2) and (3). Survey round fixed effects included in all regressions. Client characteristics (gender, age, literacy, and education) included in all regressions. Standard errors clustered at the group level and reported in parentheses.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE D.5: ITT Treatment effects on cattle herd and investment in cattle - All covariates

| | Investment in cattle | | | | | |
|------------------------------|-----------------------|-------------------|-------------------|--------------------------------|-----------------------------------|--|
| | Household owns cattle | Number of cattle | Number of cattle | Household has purchased cattle | Amount spent on purchasing cattle | Amount spent on purchasing cattle - restricted sample to those who actually purchased cattle |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Smaller fixed loan | -0.152*** (0.051) | -0.053 (0.153) | -0.017 (0.110) | -0.229*** (0.059) | -1569.509*** (414.749) | -200.497 (373.117) |
| Dairy specific flexible loan | -0.054 (0.047) | 0.080 (0.105) | 0.006 (0.086) | -0.066 (0.071) | -207.050 (538.087) | 456.147 (385.785) |
| Coupon flexible loan | -0.041 (0.045) | -0.038 (0.081) | 0.025 (0.079) | -0.067 (0.065) | -238.942 (475.505) | 304.233 (335.388) |
| R-squared | 0.028 | 0.030 | 0.093 | 0.045 | 0.043 | 0.054 |
| Survey round fixed effects | No | No | Yes | No | No | No |
| Client characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Household characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 1712 | 1712 | 12028 | 1712 | 1651 | 817 |
| Number of households | 1712 | 1712 | 2275 | 1712 | 1651 | 817 |
| Survey rounds | Round 2 | Round 2 | All 7 rounds | Round 2 | Round 2 | Round 2 |

Notes: Dependent variables: (1) Own cattle - binary variable equal 1 if household owns cattle, 0 otherwise. (2) Number of cattle owned. (3) Number of cattle owned. Pooled regression with survey round fixed effects. (4) Purchase cattle - binary variable equal 1 if household purchased cattle between loan disbursement and second survey round, 0 otherwise. (5) Purchase price of cattle (in Rs.) purchased between loan disbursement and second survey round. If no cattle were purchased, cattle price is set to 0. (6) Purchase price of cattle (in Rs.) purchased between loan disbursement and second survey round. If no cattle were purchased, cattle price is set to missing. Price data is winsorized at the 1% level to reduce effect of outliers. Data: Only second survey round (i.e. 6 months after treatment assignment and loan disbursement) (except for column 3)). Survey round fixed effects are included as indicated. Client characteristics (gender, age, literacy, and education) included in all regressions. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE D.6: ITT Treatment effects on milk production - Quantity (in liters) produced and sold per day, and cattle in lean phase - All covariates

| | Milk produced per day (liters) | | Milk sold | | Cattle in lean phase | |
|------------------------------|--------------------------------|-------------------|-------------------|-------------------|----------------------|-------------------|
| | Last day (1) | Last week (2) | Liters (3) | Share (%) (4) | Dummy (5) | Number (6) |
| Smaller fixed loan | -0.157 (0.239) | -0.151 (0.240) | -0.263 (0.240) | -4.546 (3.723) | -0.026 (0.030) | -0.031 (0.045) |
| Dairy specific flexible loan | 0.136 (0.224) | 0.153 (0.228) | 0.020 (0.219) | -0.197 (4.103) | 0.003 (0.030) | -0.011 (0.042) |
| Coupon flexible loan | 0.031 (0.200) | 0.042 (0.197) | -0.022 (0.194) | -0.075 (3.304) | -0.006 (0.028) | -0.003 (0.042) |
| R-squared | 0.027 | 0.029 | 0.035 | 0.028 | 0.021 | 0.019 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Client characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Household characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 7788 | 7946 | 7794 | 7790 | 8016 | 8016 |
| Number of households | 1953 | 1954 | 1954 | 1954 | 1954 | 1954 |
| Survey rounds | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 |

Notes: Dependent variables: (1) Milk production in liters last day. (2) Milk production in liters per day last week. (3) Average liters of milk sold per day. (4) Share (in %) of last 5 months' milk production sold. For all milk production data, milk production is set to 0 when household does not own cattle. (5) Cattle in lean phase - binary variable equal 1 if any cattle are in lean phase, 0 otherwise. (6) Number of cattle in lean phase, 0 if no cattle in lean phase. Milk production data winsorized at the top 1% level to reduce effect of outliers. Data: Only survey rounds 2 - 6 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until 3 month before loan repayment (round 6)). Observations are weighted by survey participation by compliance level in the considered survey rounds. Survey round fixed effects included in all regressions. Client characteristics (gender, age, literacy, and education) included in all regressions. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE D.7: ITT Treatment effects on repayment problems and default on loan repayment - All covariates

| Binary variable = 1 if | Any repayment problems | Repaid every month at group meeting | Not paid in a month | Another group member paid for self | Paid for a peer defaulting | Know flexible repayment schedule | Understood flexible repayment schedule |
|------------------------------|------------------------|-------------------------------------|---------------------|------------------------------------|----------------------------|----------------------------------|--|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Smaller fixed loan | 0.023 (0.036) | 0.006 (0.049) | -0.037 (0.066) | -0.003 (0.005) | -0.001 (0.002) | | |
| Dairy specific flexible loan | 0.072* (0.040) | -0.115** (0.049) | 0.096 (0.065) | -0.000 (0.005) | 0.003 (0.003) | 0.920*** (0.068) | 0.911*** (0.062) |
| Coupon flexible loan | 0.055 (0.037) | -0.035 (0.044) | 0.096 (0.066) | -0.000 (0.005) | 0.005* (0.003) | 0.958*** (0.072) | 0.955*** (0.066) |
| R-squared | 0.028 | 0.096 | 0.078 | 0.010 | 0.010 | 0.901 | 0.937 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Client characteristics | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Household characteristics | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 9792 | 9768 | 9761 | 9782 | 9788 | 5030 | 4800 |
| Number of households | 1974 | 1974 | 1974 | 1974 | 1974 | 1004 | 1000 |
| Survey rounds | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 |

Notes: Dependent variables are binary indicators equal 1 if household agreed to the statement in the survey, 0 otherwise. (1) Any repayment problems: faced any difficulty in repaying the monthly installments in the last 5 months. (2) Paid the monthly installment at every group meeting. (3) Did not repay at least one monthly installment. (4) Another group member paid the installment when respondent could not pay herself. (5) Respondent paid the installment for a peer who could not repay the installment herself. (6) The borrower knows (self-reported) the repayment schedule. (7) The borrower can explain the loan schedule to the enumerator during the household survey, 0 otherwise. Both columns (6) and (7) are estimated without the constant. Data: Only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). Survey round fixed effects included in all regressions. Client characteristics (gender, age, literacy, and education) included in all regressions. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

TABLE D.8: ITT Treatment effects on repayment problems and default on loan repayment - All covariates

| | (1) | (2) | (3) | (4) |
|------------------------------|------------------------|------------------|-------------------------|-------------------------|
| | No. of repayments made | Default (dummy) | Amount (in Rs.) | Amount (% of loan size) |
| Smaller fixed loan | -1.377 (0.993) | 0.142 (0.115) | -209.780 (342.466) | 0.061 (0.063) |
| Dairy specific flexible loan | -2.286* (1.362) | 0.194 (0.127) | 755.848* (435.288) | 0.122* (0.072) |
| Coupon flexible loan | -3.329** (1.479) | 0.092 (0.145) | 1366.519** (567.104) | 0.223** (0.093) |
| R-squared | 0.275 | 0.105 | 0.355 | 0.296 |
| Client characteristics | Yes | Yes | Yes | Yes |
| Household characteristics | Yes | Yes | Yes | Yes |
| Observations | 1013 | 1013 | 1013 | 1013 |
| Number of households | 1013 | 1013 | 1013 | 1013 |
| Survey rounds | Round 7 | Round 7 | Round 7 | Round 7 |

Notes: Default at end of loan cycle - binary variable equal 1 if outstanding loan repayment at end of loan cycle, 0 otherwise. Data: Only last survey round after loan repayment (round 7). Client characteristics (gender, age, literacy, and education) included in all regressions. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Appendix E Female only borrowing groups

TABLE E.1: ITT Treatment effects on income sources and income last year - Female only borrowing groups

| | Binary variable = 1 if household earned income from | | | | | | | Total income (in Rs.) |
|------------------------------|---|---------------------|--------------------|---------------------|-------------------|-------------------|------------------------|-----------------------|
| | Number of income sources (1) | Agriculture (2) | Livestock (3) | Microenterprise (4) | Salary (5) | Wage (6) | | |
| Smaller fixed loan | -0.091 (0.098) | 0.048 (0.035) | -0.058* (0.033) | -0.036 (0.036) | -0.014 (0.027) | 0.042 (0.031) | -784.512 (1457.699) | |
| Dairy specific flexible loan | 0.244*** (0.083) | 0.092*** (0.032) | 0.010 (0.029) | 0.024 (0.034) | -0.000 (0.026) | -0.003 (0.028) | 2396.889 (1450.982) | |
| Coupon flexible loan | -0.033 (0.091) | -0.025 (0.043) | 0.010 (0.030) | 0.025 (0.034) | -0.008 (0.027) | 0.002 (0.032) | 1079.510 (1547.547) | |
| R-squared | 0.628 | 0.024 | 0.051 | 0.106 | 0.009 | 0.045 | 0.432 | |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Female only borrowing groups | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Observations | 15507 | 15505 | 15501 | 15491 | 15495 | 15491 | 15395 | |
| Number of households | 2984 | 2984 | 2984 | 2984 | 2984 | 2984 | 2984 | |

Notes: Dependent variables: (1) Number of income sources from which household generated income in the last year. (2) Agricultural income - binary indicator, 1 if household earned income from agriculture, 0 otherwise. (3) Livestock income - binary indicator, 1 if household earned income from livestock activities, 0 otherwise. (4) Microenterprise income - binary indicator, 1 if household earned income from microenterprise, 0 otherwise. (5) Salary income - binary indicator, 1 if household earned income from regular fixed salary employment, 0 otherwise. (6) Wage income - binary indicator, 1 if household earned income from wage labor, 0 otherwise. (7) Total household income earned in the last year (in Rs.), data is winsorized and censored at the top 1% to reduce effect of outliers. Data: All seven survey rounds. Survey round fixed effects included in all regressions. Only female only borrowing groups are considered. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE E.2: ITT Treatment effects on consumption expenditures per household and per household member - levels and standard deviations - Female only borrowing groups

| | Consumption expenditures (in Rs.) | | Standard deviation of consumption expenditures (in Rs.) | |
|---|-----------------------------------|-----------------------------|---|-----------------------------|
| | per household (1) | per household member (2) | per household (3) | per household member (4) |
| Smaller fixed loan | -56.772 (89.208) | -20.137 (16.896) | 50.627 (114.420) | -4.058 (21.853) |
| Dairy specific flexible loan | -58.860 (79.239) | -15.691 (14.858) | 0.025 (107.934) | -7.990 (19.709) |
| Coupon flexible loan | 59.867 (79.264) | 9.893 (13.909) | 155.851 (107.050) | 18.158 (19.327) |
| Consumption expenditures (first survey) | | | 0.257*** (0.017) | 0.038*** (0.004) |
| R-squared | 0.045 | 0.035 | 0.121 | 0.081 |
| Survey round fixed effects | Yes | Yes | No | No |
| Female only borrowing groups | Yes | Yes | Yes | Yes |
| Observations | 15477 | 15477 | 2291 | 2291 |
| Number of households | 2984 | 2984 | 2291 | 2291 |

Notes: Dependent variables: (1) Consumption expenditures per household. (2) Consumption expenditures per household member. Consumption measures include only items that were measured in all surveys. Consumption per household member calculated as: first and last survey round consumption divided by number of household members in these surveys respectively, midline consumption divided by average number of household members. Consumption data is winsorized and censored at the top 1% to reduce effect of outliers. (3) Standard deviation of household consumption expenditures per household. (4) Standard deviation of household consumption expenditures per household member. Standard deviation of winsorized consumption expenditures calculated per household across all available survey rounds if at least two observations per household are available. Consumption expenditures in the first survey round are also winsorized. Data: All seven survey rounds. Survey round fixed effects as indicated. Only female only borrowing groups are considered. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE E.3: ITT Treatment effects on consumption expenditures and shocks to dairy farming income - Female only borrowing groups

| | Cattle ill | | Cattle death | | Consumption expenditures (in Rs.) | | Consumption expenditures (in Rs.) | |
|---|-------------------|------------------------|---------------------|--------------------------|-----------------------------------|----------------------|-----------------------------------|----------------------|
| | (dummy) | (2) | (dummy) | (2) | per household | per household member | per household | per household member |
| | (1) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| Smaller fixed loan | -0.020 (0.023) | -33.092 (118.130) | -15.271 (22.032) | -52.578 (114.926) | -19.417 (22.151) | | | |
| Dairy specific flexible loan | 0.020 (0.026) | -67.374 (108.504) | -19.327 (20.647) | -87.912 (98.107) | -20.797 (19.501) | | | |
| Coupon flexible loan | 0.037 (0.026) | 65.212 (109.274) | 10.351 (18.916) | 56.092 (103.905) | 10.691 (18.263) | | | |
| Cattle ill (dummy) | | 205.482** (100.396) | 19.716 (20.163) | | | | | |
| Smaller fixed loan x Cattle ill | | -37.123 (138.350) | -12.081 (28.748) | | | | | |
| Dairy specific flexible loan x Cattle ill | | -75.078 (133.511) | 0.705 (27.180) | | | | | |
| Coupon flexible loan x Cattle ill | | 13.466 (172.907) | 14.357 (31.887) | | | | | |
| Cattle death (dummy) | | | | -495.462*** (176.421) | -114.770*** (31.258) | | | |
| Smaller fixed loan x Cattle death | | | | 674.436 (473.994) | 116.589 (76.560) | | | |
| Dairy specific flexible loan x Cattle death | | | | 600.785* (330.858) | 145.518** (69.021) | | | |
| Coupon flexible loan x Cattle death | | | | 1312.416*** (600.588) | 250.104** (104.781) | | | |
| R-squared | 0.054 | 0.047 | 0.039 | 0.047 | 0.039 | | | |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | | | |
| Female only borrowing groups | Yes | Yes | Yes | Yes | Yes | | | |
| Observations | 10429 | 10429 | 10413 | 10413 | 10413 | | | |
| Number of households | 2533 | 2533 | 2533 | 2533 | 2533 | | | |

Notes: Dependent variables: (1) Cattle ill - binary indicator, 1 if cattle has been ill, 0 otherwise. (2) Cattle death - binary indicator, 1 if there has been a cattle death, 0 otherwise. Consumption expenditures as defined in Table 6. Data: Only survey rounds 2 - 6 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until 3 months before loan repayment (round 6)). The joint F-test includes both flexible loans and their interaction with the cattle ill and cattle death dummy, respectively. Only female only borrowing groups are considered. Standard errors reported in parentheses and clustered at the group level. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE E.4: ITT Treatment effects on outside borrowing - Female only borrowing groups

| | Any loan outstanding (1) | Any informal loan outstanding (2) | Any formal loan outstanding (3) | Number of loans outstanding (4) | Total amount outstanding (in Rs.) (5) | Average amount outstanding (in Rs.) (6) |
|------------------------------|--------------------------------|---|---------------------------------------|---------------------------------------|---|---|
| Smaller fixed loan | 0.001 (0.024) | 0.010 (0.024) | -0.014 (0.022) | -0.015 (0.058) | 397.681 (513.307) | 30.553 (230.862) |
| Dairy specific flexible loan | -0.025 (0.025) | -0.002 (0.026) | -0.035 (0.023) | 0.014 (0.063) | 701.095 (526.265) | 46.323 (220.515) |
| Coupon flexible loan | -0.013 (0.025) | -0.008 (0.025) | -0.016 (0.022) | -0.054 (0.055) | 116.215 (445.717) | 83.333 (212.620) |
| R-squared | 0.192 | 0.118 | 0.150 | 0.259 | 0.186 | 0.159 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Female only borrowing groups | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 15432 | 13079 | 13079 | 15432 | 15432 | 15432 |
| Number of households | 2984 | 2935 | 2935 | 2984 | 2984 | 2984 |
| Survey rounds | All 7 rounds | Rounds 2 -7 | Rounds 2 -7 | All 7 rounds | All 7 rounds | All 7 rounds |

Notes: Dependent variables: (1) Any loan outstanding from outside borrowing sources - binary indicator equal 1 if any outstanding loan, 0 otherwise. (2) Any loan outstanding from informal sources - binary indicator equal 1 if loan outstanding from any informal source (family member, neighbor, friend, moneylender, shopkeeper, pawn broker, or Rosca), 0 if only formal loans outstanding or no outside borrowing - only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). (3) Any loan outstanding from formal outside sources - binary indicator equal 1 if loan outstanding from a formal source (SHG, commercial bank, microfinance institution, cooperative, provident fund, or finance company), 0 if only informal loans outstanding or no outside borrowing - only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). (4) Number of loans outstanding from outside financing sources. (5) Total loan amount outstanding in Rs., data winsorized and censored at the top 1% to reduce effect of outliers. (6) Average loan amount outstanding in Rs. (total loan amount/ number of loans), data winsorized and censored at the top 1%. The loan amount outstanding refers to loans other than the loan in the study. Problems of wrong labeling of these loans as outside loans are discussed in footnote 8 on page 13. Data: All seven survey rounds, except for columns (2) and (3). Survey round fixed effects included in all regressions. Only female only borrowing groups are considered. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE E.5: ITT Treatment effects on cattle herd and investment in cattle - Female only borrowing groups

| | Investment in cattle | | | | | |
|------------------------------|-----------------------|-------------------|-------------------|--------------------------------|-----------------------------------|--|
| | Household owns cattle | Number of cattle | Number of cattle | Household has purchased cattle | Amount spent on purchasing cattle | Amount spent on purchasing cattle - restricted sample to those who actually purchased cattle |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Smaller fixed loan | -0.145*** (0.048) | -0.058 (0.138) | -0.041 (0.105) | -0.203*** (0.061) | -1414.329*** (426.581) | -262.186 (359.645) |
| Dairy specific flexible loan | -0.022 (0.047) | 0.072 (0.097) | 0.026 (0.081) | -0.064 (0.076) | -151.365 (569.243) | 606.987* (350.052) |
| Coupon flexible loan | -0.000 (0.046) | 0.081 (0.083) | 0.086 (0.083) | -0.043 (0.067) | -93.029 (496.007) | 326.349 (319.312) |
| R-squared | 0.020 | 0.002 | 0.037 | 0.023 | 0.027 | 0.015 |
| R-squared | 0.020 | 0.002 | 0.037 | 0.023 | 0.026 | 0.013 |
| Survey round fixed effects | No | No | Yes | No | No | No |
| Female only borrowing groups | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 2237 | 2237 | 15507 | 2237 | 2151 | 1070 |
| Number of households | 2237 | 2237 | 2984 | 2237 | 2151 | 1070 |
| Survey rounds | Round 2 | Round 2 | All 7 rounds | Round 2 | Round 2 | Round 2 |

Notes: Dependent variables: (1) Own cattle - binary variable equal 1 if household owns cattle, 0 otherwise. (2) Number of cattle owned. (3) Number of cattle owned. Pooled regression with survey round fixed effects. (4) Purchase cattle - binary variable equal 1 if household purchased cattle between loan disbursement and second survey round, 0 otherwise. (5) Purchase price of cattle (in Rs.) purchased between loan disbursement and second survey round. If no cattle were purchased, cattle price is set to 0. (6) Purchase price of cattle (in Rs.) purchased between loan disbursement and second survey round. If no cattle were purchased, cattle price is set to missing. Price data is winsorized at the 1% level to reduce effect of outliers. Data: Only second survey round (i.e. 6 months after treatment assignment and loan disbursement) (except for column 3)). Survey round fixed effects are included as indicated. Only female only borrowing groups are considered. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE E.6: ITT Treatment effects on milk production - Quantity (in liters) produced and sold per day, and cattle in lean phase - Female only borrowing groups

| | Milk produced per day (liters) | | Milk sold | | Cattle in lean phase | |
|------------------------------|--------------------------------|-------------------|-------------------|-------------------|----------------------|-------------------|
| | Last day (1) | Last week (2) | Liters (3) | Share (%) (4) | Dummy (5) | Number (6) |
| Smaller fixed loan | -0.083 (0.226) | -0.081 (0.233) | -0.153 (0.231) | -4.037 (3.871) | -0.028 (0.028) | -0.031 (0.042) |
| Dairy specific flexible loan | 0.210 (0.201) | 0.222 (0.206) | 0.123 (0.200) | 2.579 (4.190) | -0.002 (0.029) | -0.006 (0.040) |
| Coupon flexible loan | 0.128 (0.187) | 0.139 (0.189) | 0.075 (0.185) | 1.458 (3.376) | 0.003 (0.026) | 0.015 (0.038) |
| R-squared | 0.009 | 0.009 | 0.017 | 0.016 | 0.010 | 0.006 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Female only borrowing groups | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 10096 | 10317 | 10139 | 10120 | 10429 | 10429 |
| Number of households | 2530 | 2533 | 2533 | 2533 | 2533 | 2533 |
| Survey rounds | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 |

Notes: Dependent variables: (1) Milk production in liters last day. (2) Average milk production in liters per day last week. (3) Average liters of milk sold per day. (4) Share (in %) of last 5 months' milk production sold. For all milk production data, milk production is set to 0 when household does not own cattle. (5) Cattle in lean phase - binary variable equal 1 if any cattle are in lean phase, 0 otherwise. (6) Number of cattle in lean phase. Milk production data winsorized at the top 1% level to reduce effect of outliers. Data: Only survey rounds 2 - 6 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until 3 month before loan repayment (round 6)). Observations are weighted by survey participation by compliance level in the considered survey rounds. Survey round fixed effects included in all regressions. Only female only borrowing groups are considered. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE E.7: ITT Treatment effects on repayment problems and default on loan repayment - Female only borrowing groups

| Binary variable = 1 if | Any repayment problems | Repaid every month at group meeting | Not paid in a month | Another group member paid for self | Paid for a defaulting peer | Know flexible repayment schedule | Understood flexible repayment schedule |
|------------------------------|------------------------|-------------------------------------|---------------------|------------------------------------|----------------------------|----------------------------------|--|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Smaller fixed loan | 0.011 (0.038) | 0.002 (0.050) | -0.058 (0.065) | -0.001 (0.005) | -0.001 (0.002) | | |
| Dairy specific flexible loan | 0.056 (0.040) | -0.123** (0.051) | 0.090 (0.066) | -0.001 (0.005) | 0.003 (0.003) | 0.922*** (0.027) | 0.906*** (0.029) |
| Coupon flexible loan | 0.031 (0.036) | -0.015 (0.046) | 0.067 (0.062) | 0.002 (0.004) | 0.005 (0.004) | 0.952*** (0.014) | 0.945*** (0.014) |
| R-squared | 0.009 | 0.068 | 0.041 | 0.006 | 0.007 | 0.907 | 0.938 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Female only borrowing groups | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 12757 | 12723 | 12707 | 12743 | 12748 | 6816 | 6528 |
| Number of households | 2601 | 2601 | 2600 | 2601 | 2601 | 1227 | 1222 |
| Survey rounds | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 |

Notes: Dependent variables are binary indicators equal 1 if household agreed to the statement in the survey, 0 otherwise. (1) Any repayment problems: faced any difficulty in repaying the monthly installments in the last 5 months. (2) Paid the monthly installment at every group meeting. (3) Did not repay at least one monthly installment. (4) Another group member paid the installment when respondent could not pay herself. (5) Respondent paid the installment for a peer who could not repay the installment herself. (6) The borrower knows (self-reported) the repayment schedule. (7) The borrower can explain the loan schedule to the enumerator during the household survey, 0 otherwise. Both columns (6) and (7) are estimated without the constant. Data: Only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). Survey round fixed effects included in all regressions. Only female only borrowing groups are considered. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

TABLE E.8: ITT Treatment effects on repayment problems and default on loan repayment - Female only borrowing groups

| | No. of repayments made (1) | Default (dummy) (2) | Amount (in Rs.) (3) | Amount (% of loan size) (4) |
|------------------------------|-------------------------------|------------------------|-------------------------|--------------------------------|
| Smaller fixed loan | -1.535 (1.072) | 0.122 (0.123) | -163.776 (331.016) | 0.055 (0.063) |
| Dairy specific flexible loan | -4.097*** (1.447) | 0.276** (0.125) | 1074.331** (426.537) | 0.179** (0.070) |
| Coupon flexible loan | -1.940 (1.418) | 0.137 (0.152) | 1118.701* (562.100) | 0.184** (0.092) |
| R-squared | 0.094 | 0.045 | 0.134 | 0.077 |
| Female only borrowing groups | Yes | Yes | Yes | Yes |
| Observations | 1226 | 1226 | 1226 | 1226 |
| Number of households | 1226 | 1226 | 1226 | 1226 |
| Survey rounds | Round 7 | Round 7 | Round 7 | Round 7 |

Notes: Default at end of loan cycle - binary variable equal 1 if outstanding loan repayment at end of loan cycle, 0 otherwise. Data: Only last survey round after loan repayment (round 7). Only female only borrowing groups are considered. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

Appendix F Literate borrowers

TABLE F.1: ITT Treatment effects on income sources and income last year - Literate borrowers

| | Number of income sources | | Binary variable = 1 if household earned income from | | | | Total income (in Rs.) |
|------------------------------|--------------------------|-------------------|---|-------------------|-------------------|-------------------|-------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Smaller fixed loan | -0.065 (0.101) | 0.037 (0.038) | -0.061 (0.039) | -0.030 (0.037) | -0.001 (0.033) | 0.018 (0.028) | 733.029 (1704.569) |
| Dairy specific flexible loan | 0.254*** (0.086) | 0.064 (0.039) | 0.007 (0.035) | 0.040 (0.034) | -0.032 (0.028) | 0.009 (0.030) | 2579.760* (1542.408) |
| Coupon flexible loan | -0.094 (0.085) | -0.020 (0.044) | 0.012 (0.035) | 0.003 (0.036) | -0.021 (0.031) | -0.010 (0.027) | 493.481 (1649.040) |
| R-squared | 0.623 | 0.019 | 0.048 | 0.120 | 0.011 | 0.033 | 0.453 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Only literate borrowers | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 11307 | 11304 | 11303 | 11293 | 11297 | 11293 | 11217 |
| Number of households | 2116 | 2116 | 2116 | 2116 | 2116 | 2116 | 2116 |

Notes: Dependent variables: (1) Number of income sources from which household generated income in the last year. (2) Agricultural income - binary indicator, 1 if household earned income from agriculture, 0 otherwise. (3) Livestock income - binary indicator, 1 if household earned income from livestock activities, 0 otherwise. (4) Microenterprise income - binary indicator, 1 if household earned income from microenterprise, 0 otherwise. (5) Salary income - binary indicator, 1 if household earned income from regular fixed salary employment, 0 otherwise. (6) Wage income - binary indicator, 1 if household earned income from wage labor, 0 otherwise. (7) Total household income earned in the last year (in Rs.), data is winsorized and censored at the top 1% to reduce effect of outliers. Data: All seven survey rounds. Survey round fixed effects included in all regressions. Only literate clients are considered. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE F.2: ITT Treatment effects on consumption expenditures per household and per household member - levels and standard deviations - Literate borrowers

| | Consumption expenditures (in Rs.) | | Standard deviation of consumption expenditures (in Rs.) | |
|---|-----------------------------------|-----------------------------|---|-----------------------------|
| | per household (1) | per household member (2) | per household (3) | per household member (4) |
| Smaller fixed loan | -104.371 (100.679) | -29.485 (18.026) | -4.272 (128.260) | -21.546 (23.772) |
| Dairy specific flexible loan | -172.794** (84.581) | -27.306 (16.527) | -131.888 (119.911) | -28.336 (21.402) |
| Coupon flexible loan | -42.002 (90.293) | -2.122 (16.453) | 112.958 (127.379) | 12.129 (22.876) |
| Consumption expenditures (first survey) | | | 0.264*** (0.018) | 0.042*** (0.004) |
| R-squared | 0.049 | 0.037 | 0.140 | 0.111 |
| Survey round fixed effects | Yes | Yes | No | No |
| Only literate borrowers | Yes | Yes | Yes | Yes |
| Observations | 11290 | 11290 | 1631 | 1631 |
| Number of households | 2116 | 2116 | 1631 | 1631 |

Notes: Dependent variables: (1) Consumption expenditures per household. (2) Consumption expenditures per household member. Consumption measures include only items that were measured in all surveys. Consumption per household member calculated as: first and last survey round consumption divided by number of household members in these surveys respectively, midline consumption divided by average number of household members. Consumption data is winsorized and censored at the top 1% to reduce effect of outliers. (3) Standard deviation of household consumption expenditures per household. (4) Standard deviation of household consumption expenditures per household member. Standard deviation of winsorized consumption expenditures calculated per household across all available survey rounds if at least two observations per household are available. Consumption expenditures in the first survey round are also winsorized. Data: All seven survey rounds. Survey round fixed effects as indicated. Only literate clients are considered. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE F.3: ITT Treatment effects on consumption expenditures and shocks to dairy farming income - Literate borrowers

| | Cattle ill | | Cattle death | | Consumption expenditures (in Rs.) | | Consumption expenditures (in Rs.) | |
|---|---------------------|-------------------|------------------------|----------------------|-----------------------------------|-------------------------|-----------------------------------|----------------------|
| | (dummy) | (dummy) | (dummy) | (dummy) | per household | per household member | per household | per household member |
| | (1) | (2) | (3) | (4) | (5) | (6) | (5) | (6) |
| Smaller fixed loan | -0.049** (0.025) | -0.004 (0.005) | -100.136 (138.883) | -25.431 (24.257) | -148.417 (131.864) | -33.012 (23.025) | | |
| Dairy specific flexible loan | -0.012 (0.028) | -0.001 (0.005) | -229.125* (119.637) | -37.951* (22.068) | -237.657** (109.988) | -37.053* (20.942) | | |
| Coupon flexible loan | 0.008 (0.027) | 0.001 (0.005) | -82.935 (125.973) | -8.501 (21.708) | -71.655 (121.558) | -4.772 (21.210) | | |
| Cattle ill (dummy) | | | 195.931 (127.723) | 11.887 (23.133) | | | | |
| Smaller fixed loan x Cattle ill | | | -147.021 (162.400) | -26.581 (27.210) | | | | |
| Dairy specific flexible loan x Cattle ill | | | 6.301 (165.412) | 14.396 (30.225) | | | | |
| Coupon flexible loan x Cattle ill | | | 129.513 (212.635) | 31.793 (36.273) | | | | |
| Cattle death (dummy) | | | | | -593.373*** (187.642) | -131.866*** (31.909) | | |
| Smaller fixed loan x Cattle death | | | | | 1245.833** (618.220) | 216.581** (96.865) | | |
| Dairy specific flexible loan x Cattle death | | | | | 499.778 (348.783) | 121.721* (67.518) | | |
| Coupon flexible loan x Cattle death | | | | | 1210.839** (548.025) | 215.479** (88.948) | | |
| R-squared | 0.053 | 0.011 | 0.056 | 0.046 | 0.055 | 0.046 | | |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Only literate borrowers | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 7551 | 7551 | 7543 | 7543 | 7543 | 7543 | 7543 | 7543 |
| Number of households | 1825 | 1825 | 1825 | 1825 | 1825 | 1825 | 1825 | 1825 |

Notes: Dependent variables: (1) Cattle ill - binary indicator, 1 if cattle has been ill, 0 otherwise. (2) Cattle death - binary indicator, 1 if there has been a cattle death, 0 otherwise. Consumption expenditures as defined in Table 6. Data: Only survey rounds 2 - 6 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until 3 months before loan repayment (round 6)). The joint F-test includes both flexible loans and their interaction with the cattle ill and cattle death dummy, respectively. Only literate clients are considered. Standard errors reported in parentheses and clustered at the group level. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE F.4: ITT Treatment effects on outside borrowing - Literate borrowers

| | Any loan outstanding (1) | Any informal loan outstanding (2) | Any formal loan outstanding (3) | Number of loans outstanding (4) | Total amount outstanding (in Rs.) (5) | Average amount outstanding (in Rs.) (6) |
|------------------------------|--------------------------------|---|---------------------------------------|---------------------------------------|---|---|
| Smaller fixed loan | -0.015 (0.015) | -0.014 (0.017) | -0.011 (0.013) | -0.017 (0.038) | 648.726 (443.364) | 53.067 (202.750) |
| Dairy specific flexible loan | -0.027** (0.014) | -0.008 (0.016) | -0.036*** (0.013) | 0.020 (0.038) | 835.560* (448.944) | 49.651 (201.553) |
| Coupon flexible loan | -0.018 (0.013) | -0.004 (0.016) | -0.017 (0.013) | -0.037 (0.035) | 114.760 (411.869) | 16.327 (190.784) |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Only literate borrowers | Yes | Yes | Yes | Yes | Yes | Yes |
| R-squared | 0.188 | 0.104 | 0.151 | 0.250 | 0.188 | 0.148 |
| Observations | 11264 | 9624 | 9624 | 11264 | 11264 | 11264 |
| Number of households | 2116 | 2116 | 2116 | 2116 | 2116 | 2116 |
| Survey rounds | All 7 rounds | Rounds 2 -7 | Rounds 2 -7 | All 7 rounds | All 7 rounds | All 7 rounds |

Notes: Dependent variables: (1) Any loan outstanding from outside borrowing sources - binary indicator equal 1 if any outstanding loan, 0 otherwise. (2) Any loan outstanding from informal sources - binary indicator equal 1 if loan outstanding from any informal source (family member, neighbor, friend, moneylender, shopkeeper, pawn broker, or Rosca), 0 if only formal loans outstanding or no outside borrowing - only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). (3) Any loan outstanding from formal outside sources - binary indicator equal 1 if loan outstanding from a formal source (SHG, commercial bank, microfinance institution, cooperative, provident fund, or finance company), 0 if only informal loans outstanding or no outside borrowing - only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). (4) Number of loans outstanding from outside financing sources. (5) Total loan amount outstanding in Rs., data winsorized and censored at the top 1% to reduce effect of outliers. (6) Average loan amount outstanding in Rs. (total loan amount/ number of loans), data winsorized and censored at the top 1%. The loan amount outstanding refers to loans other than the loan in the study. Problems of wrong labeling of these loans as outside loans are discussed in footnote 8 on page 13. Data: All seven survey rounds, except for columns (2) and (3). Survey round fixed effects included in all regressions. Only literate clients are considered. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE F.5: ITT Treatment effects on cattle herd and investment in cattle - Literate borrowers

| | Investment in cattle | | | | | |
|------------------------------|-----------------------|-------------------|-------------------|--------------------------------|-----------------------------------|--|
| | Household owns cattle | Number of cattle | Number of cattle | Household has purchased cattle | Amount spent on purchasing cattle | Amount spent on purchasing cattle - restricted sample to those who actually purchased cattle |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Smaller fixed loan | -0.144*** (0.052) | -0.165 (0.104) | -0.082 (0.101) | -0.219*** (0.061) | -1463.273*** (416.067) | -153.776 (424.288) |
| Dairy specific flexible loan | -0.012 (0.054) | 0.078 (0.108) | -0.020 (0.093) | -0.032 (0.073) | -14.344 (529.500) | 465.200 (325.029) |
| Coupon flexible loan | -0.009 (0.050) | 0.047 (0.099) | 0.007 (0.092) | -0.044 (0.068) | -99.821 (482.523) | 386.594 (332.108) |
| R-squared | 0.018 | 0.006 | 0.047 | 0.028 | 0.029 | 0.010 |
| Survey round fixed effects | No | No | Yes | No | No | No |
| Only literate clients | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 1595 | 1595 | 11305 | 1595 | 1540 | 724 |
| Number of households | 1595 | 1595 | 2116 | 1595 | 1540 | 724 |
| Survey rounds | Round 2 | Round 2 | All 7 rounds | Round 2 | Round 2 | Round 2 |

Notes: Dependent variables: (1) Own cattle - binary variable equal 1 if household owns cattle, 0 otherwise. (2) Number of cattle owned. (3) Number of cattle owned. Pooled regression with survey round fixed effects. (4) Purchase cattle - binary variable equal 1 if household purchased cattle between loan disbursement and second survey round, 0 otherwise. (5) Purchase price of cattle (in Rs.) purchased between loan disbursement and second survey round. If no cattle were purchased, cattle price is set to 0. (6) Purchase price of cattle (in Rs.) purchased between loan disbursement and second survey round. If no cattle were purchased, cattle price is set to missing. Price data is winsorized at the 1% level to reduce effect of outliers. Data: Only second survey round (i.e. 6 months after treatment assignment and loan disbursement) (except for column 3)). Survey round fixed effects are included as indicated. Only literate clients are considered. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE F.6: ITT Treatment effects on milk production - Quantity (in liters) produced and sold per day, and cattle in lean phase - Literate borrowers

| | Milk produced per day (liters) | | Milk sold | | Cattle in lean phase | |
|------------------------------|--------------------------------|-------------------|-------------------|-------------------|----------------------|--------------------|
| | Last day | Last week | Liters | Share (%) | Dummy | Number |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Smaller fixed loan | -0.118 (0.235) | -0.131 (0.239) | -0.214 (0.233) | -4.487 (3.960) | -0.070** (0.032) | -0.084* (0.045) |
| Dairy specific flexible loan | 0.141 (0.218) | 0.154 (0.223) | 0.075 (0.212) | 0.664 (4.065) | -0.006 (0.033) | -0.023 (0.045) |
| Coupon flexible loan | 0.053 (0.210) | 0.054 (0.212) | -0.008 (0.205) | -0.143 (3.598) | -0.020 (0.030) | -0.026 (0.042) |
| R-squared | 0.008 | 0.008 | 0.016 | 0.016 | 0.014 | 0.009 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Only literate borrowers | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 7333 | 7479 | 7348 | 7344 | 7551 | 7551 |
| Number of households | 1825 | 1825 | 1825 | 1825 | 1825 | 1825 |
| Survey rounds | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 |

Notes: Dependent variables: (1) Milk production in liters last day. (2) Average milk production in liters per day last week. (3) Average liters of milk sold per day. (4) Share (in %) of last 5 months' milk production sold. For all milk production data, milk production is set to 0 when household does not own cattle. (5) Cattle in lean phase - binary variable equal 1 if any cattle are in lean phase, 0 otherwise. (6) Number of cattle in lean phase, 0 if no cattle in lean phase. Milk production data winsorized at the top 1% level to reduce effect of outliers. Data: Only survey rounds 2 - 6 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until 3 month before loan repayment (round 6)). Observations are weighted by survey participation by compliance level in the considered survey rounds. Survey round fixed effects included in all regressions. Only literate clients are considered. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE F.7: ITT Treatment effects on repayment problems and default on loan repayment - Literate borrowers

| Binary variable = 1 if | Any repayment problems | Repaid every month at group meeting | Not paid in a month | Another group member paid for self | Paid for a defaulting peer | Know flexible repayment schedule | Understood flexible repayment schedule |
|------------------------------|------------------------|-------------------------------------|---------------------|------------------------------------|----------------------------|----------------------------------|--|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
| Smaller fixed loan | 0.016 (0.040) | -0.000 (0.052) | -0.010 (0.066) | -0.002 (0.005) | 0.000 (0.002) | | |
| Dairy specific flexible loan | 0.098** (0.041) | -0.160*** (0.051) | 0.139** (0.063) | 0.001 (0.005) | 0.006* (0.003) | 0.928*** (0.028) | 0.912*** (0.029) |
| Coupon flexible loan | 0.067 (0.041) | -0.064 (0.050) | 0.129** (0.062) | 0.001 (0.005) | 0.005* (0.003) | 0.960*** (0.013) | 0.954*** (0.013) |
| R-squared | 0.013 | 0.068 | 0.054 | 0.008 | 0.009 | 0.905 | 0.937 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Only literate borrowers | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 9384 | 9365 | 9355 | 9379 | 9382 | 5993 | 5737 |
| Number of households | 1872 | 1872 | 1872 | 1872 | 1872 | 970 | 966 |
| Survey rounds | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 |

Notes: Dependent variables are binary indicators equal 1 if household agreed to the statement in the survey, 0 otherwise. (1) Any repayment problems: faced any difficulty in repaying the monthly installments in the last 5 months. (2) Paid the monthly installment at every group meeting. (3) Did not repay at least one monthly installment. (4) Another group member paid the installment when respondent could not pay herself. (5) Respondent paid the installment for a peer who could not repay the installment herself. (6) The borrower knows (self-reported) the repayment schedule. (7) The borrower can explain the loan schedule to the enumerator during the household survey, 0 otherwise. Both columns (6) and (7) are estimated without the constant. Data: Only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). Survey round fixed effects included in all regressions. Only literate clients are considered. Standard errors clustered at the group level and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

TABLE F.8: ITT Treatment effects on repayment problems and default on loan repayment - Literate borrowers

| | No. of repayments made (1) | Default (dummy) (2) | Amount (in Rs.) (3) | Amount (% of loan size) (4) |
|------------------------------|-------------------------------|------------------------|--------------------------|--------------------------------|
| Smaller fixed loan | -1.629 (1.009) | 0.120 (0.118) | -198.714 (319.280) | 0.063 (0.060) |
| Dairy specific flexible loan | -2.798** (1.387) | 0.242** (0.120) | 868.297** (408.544) | 0.136** (0.068) |
| Coupon flexible loan | -2.953** (1.370) | 0.144 (0.138) | 1363.183*** (506.950) | 0.218** (0.083) |
| R-squared | 0.286 | 0.111 | 0.350 | 0.299 |
| Client characteristics | Yes | Yes | Yes | Yes |
| Observations | 1387 | 1387 | 1387 | 1387 |
| Number of households | 1387 | 1387 | 1387 | 1387 |
| Survey rounds | Round 7 | Round 7 | Round 7 | Round 7 |

Notes: Default at end of loan cycle - binary variable equal 1 if outstanding loan repayment at end of loan cycle, 0 otherwise. Data: Only last survey round after loan repayment (round 7). Only literate clients are considered. Standard errors clustered at the group level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

Appendix G Clustered standard errors at less aggregate level

TABLE G.1: ITT Treatment effects on income sources and income last year

| | Binary variable = 1 if household earned income from | | | | | | | Total income (in Rs.) (7) |
|--------------------------------|---|---------------------|----------------------|------------------------|-------------------|--------------------|--------------------------|---------------------------------|
| | Number of income sources (1) | Agriculture (2) | Livestock (3) | Microenterprise (4) | Salary (5) | Wage (6) | | |
| Smaller fixed loan | -0.092** (0.045) | 0.038** (0.015) | -0.070*** (0.017) | -0.020 (0.015) | -0.006 (0.016) | 0.034** (0.015) | 270.688 (819.282) | |
| Dairy specific flexible loan | 0.230*** (0.041) | 0.068*** (0.014) | -0.005 (0.016) | 0.042*** (0.015) | -0.011 (0.015) | 0.004 (0.015) | 2489.249*** (805.093) | |
| Coupon flexible loan | -0.042 (0.041) | -0.011 (0.016) | 0.009 (0.015) | 0.013 (0.015) | -0.019 (0.015) | -0.001 (0.014) | 769.652 (756.742) | |
| R-squared | 0.624 | 0.016 | 0.050 | 0.111 | 0.010 | 0.043 | 0.430 | |
| Joint F-test of flexible loans | 0.000 | 0.000 | 0.362 | 0.049 | 0.580 | 0.781 | 0.024 | |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes | |
| Observations | 17433 | 17430 | 17426 | 17414 | 17418 | 17414 | 17293 | |
| Number of households | 3372 | 3372 | 3372 | 3372 | 3372 | 3372 | 3372 | |

Notes: Dependent variables: (1) Number of income sources from which household generated income in the last year. (2) Agricultural income - binary indicator, 1 if household earned income from agriculture, 0 otherwise. (3) Livestock income - binary indicator, 1 if household earned income from livestock activities, 0 otherwise. (4) Microenterprise income - binary indicator, 1 if household earned income from microenterprise, 0 otherwise. (5) Salary income - binary indicator, 1 if household earned income from regular fixed salary employment, 0 otherwise. (6) Wage income - binary indicator, 1 if household earned income from wage labor, 0 otherwise. (7) Total household income earned in the last year (in Rs.), data is winsorized and censored at the top 1% to reduce effect of outliers. Data: All seven survey rounds. Survey round fixed effects included in all regressions. Standard errors clustered at the individual level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE G.2: ITT Treatment effects on consumption expenditures per household and per household member - levels and standard deviations

| | Consumption expenditures (in Rs.) | | Standard deviation of consumption expenditures (in Rs.) | |
|--|-----------------------------------|-----------------------------|---|-----------------------------|
| | per household (1) | per household member (2) | per household (3) | per household member (4) |
| Smaller fixed loan | -18.280 (49.924) | -16.720* (9.604) | 26.550 (110.868) | -7.305 (20.388) |
| Dairy specific flexible loan | -75.071* (45.384) | -19.390** (8.692) | -176.173* (98.492) | -33.396* (17.765) |
| Coupon flexible loan | 36.153 (46.414) | 5.909 (8.771) | 65.910 (100.804) | 4.825 (18.112) |
| Consumption expenditures (first survey) | | | 0.266*** (0.016) | 0.040*** (0.004) |
| R-squared | 0.048 | 0.037 | 0.005 | 0.004 |
| Joint F-test of flexible loans | 0.011 | 0.002 | 0.011 | 0.019 |
| Survey round fixed effects | Yes | Yes | No | No |
| Observations | 17398 | 17139 | 2961 | 2896 |
| Number of households | 3372 | 3297 | 2961 | 2896 |

Notes: Dependent variables: (1) Consumption expenditures per household. (2) Consumption expenditures per household member. Consumption measures include only items that were measured in all surveys. Consumption per household member calculated as: first and last survey round consumption divided by number of household members in these surveys respectively, midline consumption divided by average number of household members. Consumption data is winsorized and censored at the top 1% to reduce effect of outliers. (3) Standard deviation of household consumption expenditures per household. (4) Standard deviation of household consumption expenditures per household member. Standard deviation of winsorized consumption expenditures calculated per household across all available survey rounds if at least two observations per household are available. Consumption expenditures in the first survey round are also winsorized. Data: All seven survey rounds. Survey round fixed effects as indicated. Standard errors reported in parentheses and clustered at the individual level for consumption expenditures with several observations per borrower and at group level for the standard deviation. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE G.3: ITT treatments effects on consumption expenditures and shocks to dairy farming income

| | Cattle ill | | Cattle death | | Consumption expenditures (in Rs.) | | Consumption expenditures (in Rs.) | |
|---|---------------------|-------------------|-----------------------|-----------------------|-----------------------------------|-------------------------|-----------------------------------|----------------------|
| | (dummy) | (dummy) | (dummy) | (dummy) | per household | per household | per household | per household member |
| | (1) | (2) | (3) | (4) | (5) | (6) | (5) | (6) |
| Smaller fixed loan | -0.025** (0.012) | -0.005 (0.003) | 5.897 (65.837) | -11.945 (12.955) | -10.621 (61.565) | -16.234 (12.101) | | |
| Dairy specific flexible loan | 0.001 (0.012) | -0.002 (0.003) | -98.440* (59.808) | -25.395** (11.841) | -112.624** (54.867) | -26.457** (10.956) | | |
| Coupon flexible loan | 0.029** (0.012) | 0.002 (0.003) | 23.370 (61.382) | 3.352 (11.600) | 29.889 (56.743) | 5.839 (10.817) | | |
| Cattle ill (dummy) | | | 185.364** (89.316) | 17.346 (17.004) | | | | |
| Smaller fixed loan x Cattle ill | | | -24.016 (131.229) | -13.546 (24.581) | | | | |
| Dairy specific flexible loan x Cattle ill | | | -37.010 (116.771) | 4.008 (23.074) | | | | |
| Coupon flexible loan x Cattle ill | | | 110.768 (124.502) | 29.036 (23.470) | | | | |
| Cattle death (dummy) | | | | | -483.828*** (145.755) | -113.055*** (26.801) | | |
| Smaller fixed loan x Cattle death | | | | | 633.047 (487.428) | 113.566 (75.058) | | |
| Dairy specific flexible loan x Cattle death | | | | | 520.950 (329.667) | 141.333** (69.219) | | |
| Coupon flexible loan x Cattle death | | | | | 1552.881*** (514.292) | 297.062*** (94.217) | | |
| R-squared | 0.049 | 0.010 | 0.053 | 0.043 | 0.052 | 0.043 | | |
| Joint F-test of flexible loans | 0.024 | 0.123 | 0.026 | 0.012 | 0.001 | 0.000 | | |
| Observations | 11827 | 11827 | 11808 | 11549 | 11808 | 11549 | | |
| Number of households | 2898 | 2898 | 2898 | 2823 | 2898 | 2823 | | |

Notes: Dependent variables: (1) Cattle ill - binary indicator, 1 if cattle has been ill, 0 otherwise. (2) Cattle death - binary indicator, 1 if there has been a cattle death, 0 otherwise. Consumption expenditures as defined in Table 6. Data: Only survey rounds 2 - 6 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until 3 month before loan repayment (round 6)). The joint F-test includes both flexible loans and their interaction with the cattle ill and cattle death dummy, respectively. Standard errors reported in parentheses and clustered at the individual level. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE G.4: ITT Treatment effects on outside borrowing

| | Any loan outstanding (1) | Any informal loan outstanding (2) | Any formal loan outstanding (3) | Number of loans outstanding (4) | Total amount outstanding (in Rs.) (5) | Average amount outstanding (in Rs.) (6) |
|--------------------------------|--------------------------------|---|---------------------------------------|---------------------------------------|---|---|
| Smaller fixed loan | -0.009 (0.011) | -0.003 (0.013) | -0.014 (0.010) | -0.024 (0.028) | 545.183* (321.992) | 90.748 (144.147) |
| Dairy specific flexible loan | -0.025** (0.011) | 0.006 (0.012) | -0.044*** (0.010) | 0.025 (0.028) | 769.215** (305.443) | 84.698 (133.192) |
| Coupon flexible loan | -0.021* (0.011) | -0.009 (0.012) | -0.020** (0.010) | -0.056** (0.026) | 3.672 (286.337) | 4.803 (128.218) |
| R-squared | 0.193 | 0.119 | 0.153 | 0.261 | 0.194 | 0.163 |
| Joint F-test of flexible loans | 0.717 | 0.214 | 0.011 | 0.004 | 0.014 | 0.547 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 17354 | 14755 | 14755 | 17354 | 17354 | 17354 |
| Number of households | 3372 | 3323 | 3323 | 3372 | 3372 | 3372 |
| Survey rounds | All 7 rounds | Rounds 2 -7 | Rounds 2 -7 | All 7 rounds | All 7 rounds | All 7 rounds |

Notes: Dependent variables: (1) Any loan outstanding from outside borrowing sources - binary indicator equal 1 if any outstanding loan, 0 otherwise. (2) Any loan outstanding from informal sources - binary indicator equal 1 if loan outstanding from any informal source (family member, neighbor, friend, moneylender, shopkeeper, pawn broker, or Rosca), 0 if only formal loans outstanding or no outside borrowing - only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). (3) Any loan outstanding from formal outside sources - binary indicator equal 1 if loan outstanding from a formal source (SHG, commercial bank, microfinance institution, cooperative, provident fund, or finance company), 0 if only informal loans outstanding or no outside borrowing - only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). (4) Number of loans outstanding from outside financing sources. (5) Total loan amount outstanding in Rs., data winsorized and censored at the top 1% to reduce effect of outliers. (6) Average loan amount outstanding in Rs. (total loan amount/ number of loans), data winsorized and censored at the top 1%. The loan amount outstanding refers to loans other than the loan in the study. Problems of wrong labeling of these loans as outside loans are discussed in footnote 8 on page 13. Data: All seven survey rounds, except for columns (2) and (3). Survey round fixed effects included in all regressions. Standard errors clustered at the individual level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE G-5: ITT Treatment effects on cattle herd and investment in cattle

| | Investment in cattle | | | | | |
|--------------------------------|-----------------------|-------------------|-------------------|--------------------------------|-----------------------------------|--|
| | Household owns cattle | Number of cattle | Number of cattle | Household has purchased cattle | Amount spent on purchasing cattle | Amount spent on purchasing cattle - restricted sample to those who actually purchased cattle |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Smaller fixed loan | -0.160*** (0.046) | -0.075 (0.129) | -0.050 (0.051) | -0.230*** (0.060) | -1567.881*** (412.374) | -279.728 (346.092) |
| Dairy specific flexible loan | -0.026 (0.045) | 0.078 (0.090) | 0.011 (0.044) | -0.071 (0.071) | -178.570 (526.029) | 627.823* (319.418) |
| Coupon flexible loan | -0.010 (0.044) | 0.066 (0.080) | 0.075 (0.053) | -0.068 (0.065) | -200.585 (471.664) | 424.045 (303.260) |
| R-squared | 0.023 | 0.003 | 0.042 | 0.473 | 0.898 | 0.129 |
| Joint F-test of flexible loans | 0.851 | 0.576 | 0.360 | 0.028 | 0.031 | 0.018 |
| Survey round fixed effects | No | No | Yes | No | No | No |
| Client characteristics | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 2503 | 2503 | 17431 | 2503 | 2415 | 1175 |
| Number of households | 2503 | 2503 | 3372 | 2503 | 2415 | 1175 |
| Survey rounds | Round 2 | Round 2 | All 7 rounds | Round 2 | Round 2 | Round 2 |

Notes: Dependent variables: (1) Own cattle - binary variable equal 1 if household owns cattle, 0 otherwise. (2) Number of cattle owned. (3) Number of cattle owned. Pooled regression with survey round fixed effects. (4) Purchase cattle - binary variable equal 1 if household purchased cattle between loan disbursement and second survey round, 0 otherwise. (5) Purchase price of cattle (in Rs.) purchased between loan disbursement and second survey round. If no cattle were purchased, cattle price is set to 0. OLS results robust to a Tobit estimation specification (compare Appendix Table A.3). (6) Purchase price of cattle (in Rs.) purchased between loan disbursement and second survey round. If no cattle were purchased, cattle price is set to missing. Price data is winsorized at the 1% level to reduce effect of outliers. Data: Only second survey round (i.e. 6 months after treatment assignment and loan disbursement) (except for column 3)). Survey round fixed effects are included as indicated. Standard errors clustered at the group level if only one survey round is considered and at the individual level when several rounds are considered, and reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

TABLE G.6: ITT Treatment effects on milk production - Quantity (in liters) produced and sold per day, and cattle in lean phase

| | Milk produced per day (liters) | | Milk sold | | Cattle in lean phase | |
|--------------------------------|--------------------------------|--------------------|--------------------|----------------------|----------------------|-------------------|
| | Last day | Last week | Liters | Share (%) | Dummy | Number |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Smaller fixed loan | -0.114 (0.108) | -0.110 (0.110) | -0.196* (0.106) | -4.984*** (1.700) | -0.043*** (0.016) | -0.037 (0.024) |
| Dairy specific flexible loan | 0.232** (0.105) | 0.236** (0.106) | 0.120 (0.101) | 1.023 (1.707) | -0.013 (0.016) | -0.021 (0.022) |
| Coupon flexible loan | 0.171* (0.099) | 0.180* (0.100) | 0.115 (0.096) | 1.047 (1.598) | -0.006 (0.015) | 0.004 (0.022) |
| R-squared | 0.012 | 0.012 | 0.020 | 0.019 | 0.011 | 0.007 |
| Joint F-test of flexible loans | 0.065 | 0.059 | 0.381 | 0.766 | 0.699 | 0.480 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 11475 | 11707 | 11513 | 11490 | 11827 | 11827 |
| Number of households | 2895 | 2898 | 2898 | 2898 | 2898 | 2898 |
| Survey rounds | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 | Rounds 2-6 |

Notes: Dependent variables: (1) Milk production in liters last day. (2) Average milk production in liters per day last week. (3) Average liters of milk sold per day. (4) Share (in %) of last 5 months' milk production sold. For all milk production data, milk production is set to 0 when household does not own cattle. Appendix Table A.4 confirms the results when only looking at cattle owners. (5) Cattle in lean phase - binary variable equal 1 if any cattle are in lean phase, 0 otherwise. (6) Number of cattle in lean phase, 0 if no cattle in lean phase. Milk production data winsorized at the top 1% level to reduce effect of outliers. Data: Only survey rounds 2 - 6 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until 3 month before loan repayment (round 6)). Survey round fixed effects included in all regressions. Standard errors clustered at the individual level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.

TABLE G.7: ITT Treatment effects on self-reported repayment behavior

| Binary variable =1 if | Any repayment problems (1) | Repaid every month at group meeting (2) | Not paid in a month (3) | Another group member paid for self (4) | Paid for a defaulting peer (5) | Know flexible repayment schedule (6) | Understood flexible repayment schedule (7) |
|--------------------------------|----------------------------|---|-------------------------|--|--------------------------------|--------------------------------------|--|
| Smaller fixed loan | 0.016 (0.014) | -0.005 (0.015) | -0.044** (0.018) | -0.001 (0.003) | -0.001 (0.002) | | |
| Dairy specific flexible loan | 0.088*** (0.014) | -0.166*** (0.015) | 0.127*** (0.018) | -0.001 (0.003) | 0.003 (0.002) | 0.926*** (0.009) | 0.910*** (0.009) |
| Coupon flexible loan | 0.049*** (0.014) | -0.054*** (0.015) | 0.106*** (0.018) | 0.001 (0.003) | 0.005** (0.002) | 0.954*** (0.005) | 0.947*** (0.005) |
| R-squared | 0.012 | 0.072 | 0.052 | 0.006 | 0.007 | .906857 | .9385651 |
| Joint F-test of flexible loans | 0.004 | 0.000 | 0.221 | 0.520 | 0.330 | 0.001 | 0.000 |
| Survey round fixed effects | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Observations | 14413 | 14371 | 14361 | 14398 | 14403 | 7299 | 6994 |
| Number of households | 2968 | 2968 | 2967 | 2968 | 2968 | 1489 | 1482 |
| Survey rounds | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 | Rounds 2-7 |

Notes: Dependent variables are binary indicators equal 1 if household agreed to the statement in the survey, 0 otherwise. (1) Any repayment problems: faced any difficulty in repaying the monthly installments in the last 5 months. (2) Paid the monthly installment at every group meeting. (3) Did not repay at least one monthly installment. (4) Another group member paid the installment when respondent could not pay herself. (5) Respondent paid the installment for a peer who could not repay the installment herself. (6) The borrower knows (self-reported) the repayment schedule. (7) The borrower can explain the loan schedule to the enumerator during the household survey, 0 otherwise. Both columns (6) and (7) are estimated without the constant. Data: Only survey rounds 2-7 (i.e. 6 months after treatment assignment and loan disbursement (round 2) until after loan repayment (round 7)). Survey round fixed effects included in all regressions. Standard errors clustered at the individual level and reported in parentheses. * p < 0.10, ** p < 0.05, *** p < 0.01.