An escape from a poverty trap and the role of entrepreneurship: Microfinance lending to the ultra poor in Bangladesh

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Abstract Can we extend large microcredit lending to the ultra-poor, who are typically excluded from the microcredit access? With a randomised controlled trial in a rural, low income setting of northern Bangladesh, we assess the creditworthiness of the ultra poor and suitability of various debt contract designs to help them escape from poverty through productive investments. We use a stepped-wedge design over the key features of loans, i.e., small-scale sequential disbursement vs. lumpy upfront disbursement, with vs. without a grace period, and cash vs. in-kind loan with a managerial support program, each corresponds to a liquidity constraint, a saving constraint, and an entrepreneurship constraint, respectively. Compared with the traditional microcredit, provision of large, upfront liquidity increases the net assets by 0.84 times the baseline overall standard deviation in the second year (p value=0.07%), 1.15 times by the fourth year (p value=0.03%), and their repayment rates are higher. These results hold broadly regardless of different contents of assets or with different cattle rearing experiences prior to the intervention. This is consistent with the existence of an asset-based poverty trap which can be overcome by increasing the loan size. Provision of a grace period does not change the repayment rates or asset levels. Managerial supports induce participation of less experienced and poorer households to microfinance, yet resulted in similar repayment rates and asset accumulation as with other participants, indicating a farther successful outreach to the ultra poor. Our main findings, a large, upfront disbursement results in faster asset accumulation that is suggestive of an escape from a poverty trap and managerial support programs induce the participation of the ultra poor, are expected to be generalisable to other rural areas relying on small livestock under a liquidity constraint.

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Revisions

Overall changes:

1. Intro, empirical strategy, results, conclusion are rewritten to align with experimental design. We have not written the impacts of saving and entreprenuership constraints which are two of main design components of experimental design. These are added now. This is the major part of the revision.
2. In existing studies and intro, relying on Buera et al. and Cull and Morduch, we place this study as the impact study on the greenfield population. This contrasts with the studies from MFI rich area. Similar studies to ours show larger impacts than those from MFI rich areas (=mostly estimating impacts on intensive margins or existing borrowers).
3. I found and corrected errors in codes of schooling impacts. Now primary school aged boys wiyth Upfront functional attribute are mildly negatively affected in later periods. This is mostly from Large arm while Large grace and Cattle arms show more positive impacts, which hints not having a grace period may hurt, but we have no information to back up such a hunch.
4. I tested for impact difference by poverty class, and found ultra poor's consumption is smaller in later periods. Other outcomes are not different by poverty class.
5. For consistency, I changed the names: broad net assets $\Rightarrow$ net broad assets. Only the names are changed.
6. The biggest challenge in my view is to defend the precision of our net assset measure. The main results show the impacts on net assets values. I used several variations in asset definitions and found the results to be the same. But all of these assets may be equally poorly measured.
7. One suggestion from Abu-san that I have not tried is pooling post periods to gain stat power. This makes sense for flow variables such as consumption and incomes, but not so much for stock variables as they may be trending and pooling makes estimates noisier.

I highlighted corrected texts like this.

Title and abstract:

1. Start with a question, added some numbers, following Abu san's suggestion.

Introduction:

1. Added the second research question more explicitly: Does loan size/upfront liquidity matter?, following Abu san's suggestion.
2. Added results on saving and entrepreneurship constraints.

Existing studies:

1. Added Balboni et al.'s point that it takes experimental variations in assets to identify a poverty trap.

Theory:

1. I made a small change in the figure.

Study sample:

1. No changes

Experimental design:

1. No changes

Empirical strategy:

1. Added more description on variables and estimating equations.
2. Added a description that we also use permutation tests to understand participation in addition to ANCOVA.
3. Added a caveat on what we are testing in saving and entrepreneurship constraints.

Results:

1. Added more explanation on overview of results.
2. Added/modified explanations in the main text on Figures and Tables.
3. Can be summarised as:

Summary of results by functional attribute

		Results	
		Participation (permutation test)	Outcomes (vs. comparison)
F. attributes	Upfront		net assets↑, repayments↑
	WithGrace		zero cross effect
	InKind	small asset holders, less experienced	less variable returns

4. Simplified the main results that display only net assets in Figure 5. Other assets are separately shown in Figure 6.
5. Emphasized more of asset poor participation in Cattle arm while no difference in impacts and repayments.
6. Added we are not testing for a saving constraint for Traditional or in the study area in general. It is only relative to upfront impacts (=a cross derivative).
7. Added explanations on why we get zero impacts on consumption and labour incomes.
8. Added schooling of primary aged boys are negatively affected in Upfront functional attribute. This is concurrent difference relative to Traditional arm. In footnote, I noted time-varying impacts ($b_{a_1} + b_{ta_1}$) are less pronounced and WithGrace and InKind have positive impacts (relative to Upfront). My explanations on this is not very convincing.
9. Moved povety class comparison from Conclusion to the robustness check.

Conclusion:

1. Added explanations why our impacts are large relative to other microfinance lending impact studies. Greenfield.
2. Added a suggestion of a longer pre-lending period or a maturity for the ultra poor.

Appendix:

1. Dropped figures and tables not referred in the main text.

Requests for Abu-san

1. Our sample is drawn from the population of river island villages in Northern Bangladesh. Abu-san, please provide the regional characteristics of the area, esp. poverty, using CLP/TUP program data and reports.
    - Please provode a succinct description.
2. A leading proponent is the nobel laureate Professor Mohammad Yunus who claims that "we are all entrepreneurs." Yunus and Jolis (2003), Cosic (2017) [Abu-san: Do you have access to library to get the exact page number(s) in his book?
    - Please get the information when everything is settled down.

Contrasts with Balboni et al. (2020)

Balboni et al. (2020) collect data from transfer recipients and control group of BRAC's TUP. Using the recipient data, they estimate the equation of motion $K_{t+1} = \phi(K_t)$, show the S shape, and compute the threshold asset level $\hat{k}$ that separates the low and high equilibria. They then show that individuals who are above $\hat{k}$ increase the assets while individuals below it decrease them. The variations of initial asset level allows the identification of bifurcation as these variations effectively allocate inidividuals to below and above the threshold. Anticipating the endogeneity of initial asset levels to asset growths, they show that initial asset levels have no correlation with post intervention asset growths after conditioning on the above-threshold dummy. This is suggestive evidence that the unobservables that correlate with initial asset levels are exogenous to post-transfer asset increases.

In the poverty trap dynamics, the key is the low returns among the low k holders. The returns to high k holders are qualitatively similar in the covex and concave production functions so long as they are above the 45 degree line. Why are they low? Authors show the baseline vehicle ownership is statistically smaller by 4% (but not for other assets, total assets are not tested) for the below threshold households, and the differences relative to the above threshold households grew after the transfer receipt. They conclude that the complimentary assets serve as the fixed inputs of production, and the lack thereof withholds households from escaping the poverty trap.

their strength Large sample size, precise asset and labour data, direct estimation of equation of motion, and associated tests of multiple equilibria.

our strength Experimental variations in contract design (Upfront, support programs), use of IGA information that allows the (poverty trap) interpretations without structural estimation, reference to market costs/prices.

Contrasts with Banerjee et al. (2019)

Banerjee et al. (2019) use regionally matched-pair data under staggered branch opening of an urban MFI. They divide the sample into borrowers with a prior business experience (GE) and others (non-GE), and show that impacts are persistently positive for GE borrowers but not for non-GE borrowers. With structural estimation, given a talent distribution, they interpret this as evidence of a poverty trap through a liquidity constraint. They also note the impact heterogeneity is due to MFI selection but not talent heterogeneity, as pre-MFI entry businesses are more profitable than post-MFI entry businesses of the same firm age.

their strength Urban setting, contrast of long-run versus short-run impacts, data on business outcomes, gross substitute/compliment with demand for informal loans, explaining the lack of average impacts by finding the subpopulation with superior talents and contrasting with other subpopulation.

our strength Ultra poor population, rural and fragile setting, selection on entrepreneurship without affecting outcomes, Upfront leads to faster asset accumulation and higher repayment rates.

What the three papers agree

- A need for larger lending than regular MF.
- Existence of a poverty trap.
- Evidence of a nonconvex production set as a source of poverty trap.

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I Introduction

After the microcredit became popular in Bangladesh in the late 1980's, the number of borrowers increased rapidly throughout the world. According to over 3700 microfinance institutions (MFIs), there are estimated 204 million borrowers around the world in 2013, of which 110 million are the poor borrowers whose incomes are below the national poverty line (Microcredit Summit Campaign, 2015). Since then, financial inclusion of the poor has been a priority in international development. Its funding worldwide reached 22 billion US dollars in 2013 then doubled to 44 billion US dollars in 2020 (Tolzmann, 2022). The outreach to the extremely poor population or the *ultra poor*, however, is arguably slow in comparison.[*1]

There are demand and supply side reasons behind the slow outreach to the ultra poor. On the demand side, the ultra poor borrowers may face an inferior production possibility or face a more restrictive constraint in production than the wealthier borrowers, or may not be entrepreneurial enough to demand credits for production. On the supply side, MFIs may perceive the ultra poor as riskier than the moderately poor, or their loan size may be too small to justify the fixed transaction costs while the lender is constrained to keep the interest rate low to avoid adverse selection and moral hazard.

As the rigorous evaluations of microfinance progress, some of the demand side reasons are shown to exist. A group of influential research has shown that only a subgroup of borrowers, those with prior experiences or high ability, leap positive returns from borrowing (Banerjee et al., 2015c; McKenzie, 2017; Banerjee et al., 2019; Buera et al., 2020). This is in a stark contrast to the popular belief in the traditional microfinance that anyone can become a successful borrower.[*2] Logically, there must be some minimal level of entrepreneurship to participate and continue as a borrower in any form of finance. Then, the question is, what sort or how much of entrepreneurship is required for the ultra poor in microfinance?

Another, recent strand of literature showed that the asset scale may matter in subsequent wealth growth of the poor. Using an experiment that transfers a large sum asset, Balboni et al. (2020) directly estimated the $S-$shaped poverty trap curve. They cofirmed its existence: Individuals above a threshold level of asset size increase the assets while individuals below it decrease them four years after the transfer. This also calls the popular convention into question. Is the conventional scale of borrowing large enough for a borrower to be economically viable?

To shed light on the required level of entrepreneurship and borrowing, we took these questions to the Northern Bangladesh where a flood threat limits the production process to be least complex: livestock rearing. About a quarter of residents own livestock so its know-how is semi-public knowledge. The required entrepreneurship, then, is to gather all the pieces of relevant information, decide to raise livestock, form a production and a sales plan, and implement. This is the definition of entrepreneurship we use in our paper. In our intervention, we provided a heifer to a selected subgroup of participants as an in-kind loan and bundled it with training and consultation services to make sure the borrower has the right cookbook to follow. Under this treatment, the entrepreneurship to decide what to invest and how to come up with a solid plan is no longer a necessity. To align the heifer investment cashflow with repayment, we also bundled a grace period so repayment begins one year after the loan disbursement.

[*1] MF is not successful in reaching out to the poorest of the poor, or the ultra poor (Scully, 2004). Empirical evidence in Yaron (1994); Navajas et al. (2000); Rahman and Razzaque (2000); Armendáriz-Aghion and Morduch (2007) supports this claim. Some authors discuss the tradeoff between sustainability and outreach for microfinance institutions (MFIs) Hermes and Lensink (2011); Hermes et al. (2011); Cull et al. (2011).

[*2] A leading proponent is the nobel laureate Professor Mohammad Yunus who claims that "we are all entrepreneurs." (Yunus and Jolis, 2003), (Cosic, 2017) [Abu-san: Can you get the exact page number(s) in his book?

In our study, we compare the borrowers who were provided with such knowledge and the managerial supports against the borrowers who were not. By randomising the offers, we identify the causal impacts of not requiring the entrepreneurship on both the participation and the outcomes. We find that our managerial support program, that helps filling the gap in entrepreneurial skills, induces residents with fewer experiences in livestock production and a lower asset level to participate, while the outcomes are the same as in the group without managerial supports.

In bridging these two experimental arms that are different in multiple aspects, we introduced two intermediate arms. One with large upfront liquidity, another with large upfront liquidity with a grace period. These additional features, upfront liquidity, a grace period, and in-kind loan with managerial supports, are intended to relax constraints in productive investsmens by the poor: A liquidity constraint, a saving constraint, and an entrepreneurship constraint. We test if any of these constraints binds in escaping the povery trap.

By offering large liquidity upfront while keeping the total loan size and maturity equivalent to multiple rounds of traditional microcredit loans, we can see how it matters for the future asset level. The investment of choice by residents, a heiffer, creates a cashflow only after one year. So we offer large upfront liquidity with one year grace period of same size, same maturity, and same total interest payments in one experimental arm. We expected there are residents not familar with cattle rearing. In another arm, we offer an in-kind loan in the form of a heiffer with managerial supports that are repayable under the same conditions as in the offer of the large upfront loan with a grace period.

If the production technology is nonconvex and if there is a credit constraint, it gives rise to a poverty trap which can result in larger asset accumulation under large upfront liquidity. While we do not directly test for a poverty trap, the investment choices strongly indicate its existence: Only borrowers without a large upfront loan opted for smaller, multiple investments. Provided that the loan size is chosen appropriately to support livestock procurement of choice, our experiment can test if the upfront liquidity provision breaks a poverty trap, under an assumption that there is one. We find that it results in larger asset accumulation without affecting the repayment rates. Relative to the traditional microfinance lending, the upfront liquidity provision increases the net assets by 0.84 times the baseline overall standard deviation (denoted hereafter with σ) in the second year (p value=0.07%), 1.15σ by the fourth year (p value=0.03%), and the number of cattle holding by 0.59σ in the second year (p value=0.36%), and 0.66σ by the end of fourth year (p value=5.65%).[*3] These results hold broadly regardless of different cattle rearing experiences prior to the intervention.

We find that the saving constraint does not bind. The outcomes and repayment are not different when a grace period is offered additionally. However, we find some indication that the ultra poor exerted more efforts in repayment because of their smaller saving. Their net asset growth is slower during the grace period. This suggests the saving build up was not sufficient prior to loan disbursement. Their consumption is smaller than the moderately poor of the same arm towards the end of repayment. This is suggestive of repayment efforts through consumption suppression.

We find the entrepreneurship constraint also does not bind. Offering managerial supports does not marginally affect the outcomes, which makes all other participants without them equally entrepreneurial. But we find farther outreach when managerial supports are provided, as individuals with smaller assets participated. The borrowers with managerial supports have, on average per household, lower baseline cattle holding rate 0.22 (while other borrowers have .308, p value=15.7%), and smaller net asset values BDT 5762 (in contrast to BDT 10287, p value=2.8%).[*4] The outcomes and repayment rates are no lower than the other borrowers, implying the managerial supports had a farther outreach without compromising the outcomes and loan repayents.

Our study follows the literature of microfinance debt contract design as hallmarked in Field et al. (2013) who found a grace period induces more risk taking and subsequent loan delinquency. Under our setting of limited production choices, it is irrational to invest in riskier assets, such as goats, when

[*3] The p values are linear hypothesis tests of group level differences using ANCOVA estimates.

[*4] The p values are from randomisation tests of group level differences.

the designed grace period suits the heifer cash flow and a heifer's risk-return profile is considered to be Pareto-dominating. A strategic default is also more difficult in our setting because the number of formal credit suppliers is limited, which is probably zero,[*5] and relocation is difficult, because it requires not just moving costs but also financially reliable mainland contacts to help settling in. The repayment rates in our study turned out to be no lower than the comparable microfinance schemes (Banerjee et al., 2015a).

Our study is closely related to a large scale cattle transfer study conducted in the neighbouring area (Bandiera et al., 2017; Balboni et al., 2020). The targeted population of their study is similar to ours, yet our study population resides on less stable terrain, are more exposed to flood and water logging, are considered to be less well connected to the market, are equally less skilled, and are probably poorer. The chance of survival for each investment project is expected to be no higher. More prominently, our study is more commercially oriented: It uses a loan than a transfer, and charge market level fees to all the services provided.

We consider our finding is generalisable to rural areas where small scale livestock production is prevalent. While there is a caveat that the domain of our results is a low level herd size and the entrepreneurial capacity to hold a larger herd size can be different from what our study suggests,[*6] the successful livestock transfer program in the neighbouring areas (Bandiera et al., 2017; Balboni et al., 2020) and our results indicate that supporting asset accumulation through large livestock has wide applicability in assisting the rural ultra poor to escape from poverty.

In the following section, we summarise the existing literature. Section II gives the link to the previous literature. Section III gives the brief account of background of study site. Section IV shows a possible mechanism of poverty trap that our target population is under. Section V gives characteristics of subjects. Section VI lays out the details of experimental design. Section VII explains the estimation strategy. In section VIII, we provide the analysis of participation and attrition processes, experimental results and contents of income generating activities (IGAs). Section IX discusses the interpretation of results.

II A brief review of existing studies

There are four aspects in our study that relate to the existing literature: The role of entrepreneurship in microfinance impacts, variations in debt contract design, empirical assessment of a poverty trap, and targeting the ultra poor. We will discuss these in turn.

Much has been discussed about the poverty reduction impacts of microfinance in the early days of microfinance studies (Pitt and Khandker, 1998; Morduch, 1999). Recently, doubts are cast on the magnitude of microfinance impacts (Banerjee et al., 2015a; Duvendack and Mader, 2019; Meager, 2019) while asset grants (capital injection) remain to show high returns (de Mel et al., 2008; de Mel et al., 2014; Fafchamps et al., 2014; Bandiera et al., 2017; Buera et al., 2020). [*7] Lack of mean impacts in microcredit led researchers to look for a particular subgroup which shows impacts, or impact heterogeneity (Banerjee et al., 2017): Borrowers with prior experiences or high ability are shown to have higher returns (Banerjee et al., 2015c; McKenzie, 2017; Banerjee et al., 2019; Buera et al., 2020). These microfinance impact studies with a focus on experienced members or existing

[*5] As we surveyed the area before the study, we note several NGOs provide a relief credit to flood victims, but not regular finance. In selecting the study site, we purposefully chose the population without access to any financial institution.[Abu-san: A better description for this?]

[*6] Our study matches the scale of lower equilibrium of Lybbert et al. (2004) which is much smaller than the scale of the high equilibrium of around 50 herd size.

[*7] This is due partly to insufficient statistical power (McKenzie and Woodruff, 2013). Banerjee et al. (2015a) collects six studies of microfinance lending impacts. They also point the lack of statistical power due to low take up while noting more able and experienced borrowers saw larger "transformative effects." In the current study, in contrast, the take up rate is relatively high at 74.42%, of which 5.19% is lost to the flood.

firms can be considered as looking at impacts on the intensive margins. In contrast, our study is focused on an isolated greenfield population which are relatively less studied.[*8]

The fact that the experienced members gain larger benefits from microcredit is consistent with the positive impacts of capital grant programs on existing firm owners. Whether such experience is trainable for novice entrepreneurs remains unsettled. A recent microfinance study indicates that there is an advantageous selection through talents in the existing firm owners, so trainability is called into question (Banerjee et al., 2019). A growing body of management capital literature in developing countries is insightful yet most of the research is necessarily geared to existing firms, so it does not inform much on how one can assist novice entrepreneurs.[*9] Karlan and Valdivia (2011); Bruhn and Zia (2011); Argent et al. (2014) are few exceptions, but results and quality of evidence are mixed and inconclusive. Two other studies train novice entrepreneurs in Uganda and show large impacts. However, both programs bundle training with a cash grant and impacts cannot be estimated separately (Blattman et al., 2014, 2016). The current study tests the marginal contribution of entrepreneurship in microfinance, on top of the impacts of lending, by comparing a heifer lending with a manegerial support program with cash lending. We also examine the self-selection on entrepreneurship into microfinance, which we find to exist.

The corporate finance devotes a substantial part of its field in understanding the consequences of contract designs on entrepreneur's incentives. Field et al. (2013) was the first to examine in the development context by experimentally allocating different types of debt contracts if the traditional lending style of microfinance inhibits the spawning of entrepreneurship. As we disscuss in the Section VI, our study follows the similar strategy. In an attempt to tease out the impacts of entrepreneurship, we introduced longer maturity and a grace period in other arms. While there was a strong concern among practitioners that a grace period induces untruthful borrowing, there was no alternative in borrowing other than relatives and money lenders due to ruralness and isolation. This gave us flexibility in designing the debt contracts. Similar to Beaman et al. (2015) who redesigned the repayment schedule to adapt the borrower's cash flow profile (repay after harvest), we designed the debt contract to best suit the cash flow profile of the most popular investment project in the area, rearing a heifer. Our study exemplifies the economic gains from designing the debt contract to match the presumed investment choices in microfinance.

Another strand of the literature related to our study links capital grant effectiveness with the production set nonconvexity. Theories base lumpiness and credit market imperfection as keys to a povety trap (e.g., Galor and Zeira, 1993). When the production set is nonconvex, a small scale transfer may not lead to a sustained increase in income, as it can be either consumed or invested in a technology with inferior productivity that brings back to the original income level (i.e., the lower equilibrium of a poverty trap).

Despite its popularity as a theory, the empirical evidence of a poverty trap is mixed. Kraay and McKenzie (2014, p.129) note that a poverty trap finding is rare, while Barrett et al. (2016, p.321) state the otherwise and there is overwhelming evidence.[*10] Interestingly, they both agree that, when

[*8] Impacts on greenfield population is not the same as impacts on the extensive margins. Greenfield refers to a previously unserved population. Extensive margin refers to impacts on *any* new borrowers, including those not in the previously unserved population.

[*9] Bruhn et al. (2018) shows intensive management consulting services to the small scale firms in Mexico resulted in sustained improvements in management practices which led to higher TFP and larger employment. Others also show effectiveness (Calderon et al., 2011; Berge et al., 2012; Bloom et al., 2013) while others do not (Bruhn et al., 2012; Karlan et al., 2015). McKenzie and Woodruff (2013) put them as: These managerial impacts studies are too different to compare, in terms of population, interventions, measurement (variables, timing), and most importantly, implied statistical power in the design. McKenzie (2021) summarises recent findings on the intensive margins.

[*10] Kraay and McKenzie (2014) also note that upward transition from one poverty trap to another may negate the notion of a trap, while Barrett et al. (2016) base their affirmation by counting both the direct asset dynamics and the indirect inference that tests the behavioral responses that are consistent with poverty traps. See also Carter and Barrett (2006); Barrett and Carter (2013) for earlier evidence and discussions.

there is a range of assets and production opportunities, it is inherently difficult to emipirically single out a particular poverty trap. The latter authors note that existing evidence comes mostly from remote and isolated areas with a single primary production opportunity and an associated asset. Our study is no exception. It comes from a remote and isolated area of northern Bangladesh where the single most important production opportunity to increase income in otherwise subsistence-oriented paddy producing villages is livestock production. In terms of poverty trap identification, Balboni et al. (2020, Figure IV) exemplifies a crucial point that large exogenous variations in assets are necessary to identify the existence of a poverty trap, because, observationally, the poor stays poor can be an outcome of a single low ability equilibrium. Our study also induces exogenous variations in asset levels through an experimental variation in debt contract design.

An earlier finding of a poverty trap includes the cattle herd size dynamics of Southern Ethiopian pastoralists that indicates existence of a poverty trap over a 17 year recall period (Lybbert et al., 2004). More recently, Balboni et al. (2020) estimate the equation of motion for assets and show the direct evidence of a poverty trap among the recipients of a large scale transfer program targeted in the neighbouring areas of our study site. The source of nonconvexity is cattle and the complimentary assets (vehicles) at the baseline which serve as a fixed input that the ultra poor cannot afford. Similar to these studies, our study examines the nonconvexity of a higher-return production set. Our study regresses the future asset values on the current asset values and intervention dummies, thereby adding evidence, in the Barrett et al. (2016)'s terminology, using the *direct method*. By complementing this estimated result with the fact that borrowers purchase cattle only when large upfront liquidity is provided, we conclude that there is a poverty trap. In our study, the source of nonconvexity is the price of a heifer that is about three times the price of a goat. We also show that the upfront liquidity is effective in escaping the poverty trap by showing large impacts on asset holding.

Lastly, selecting the ultra poor as the population to provide supports have often involved free consultation/training and transfers in the past. A handful of studies on ultra poor transfer programs report sustained increase in assets and incomes (Blattman et al., 2014; Banerjee et al., 2015b; Blattman et al., 2016; Haushofer and Shapiro, 2016). A transfer program in the Northern Bangladesh shows an occupational change and an income increase (Bandiera et al., 2017) and long-run asset accumulation (Balboni et al., 2020). In an attempt to examine commercial viability, our experimental design makes a reference to markets. It uses loans rather than transfers, and any training and consulting components charge a fee for service. The resulting repayment rates are not lower than the majority of representative microfinance programs, and we also find accumulation of assets. These results show that the costs of microfinance programs targeted to the ultra poor can be reduced by using loans and charging fees at a competitive level. Use of loans and fees can increase the likelihood of long run viability often overlooked in transfer programs. Our study lays a ground for market based interventions that can play a role in ultra poor programs.

III Background

The study area is in the river island, known as *chars* in Bengali, of northern Bangladesh in Gaibandha and Kurigram districts. Chars are formed by sediments and silt depositions and are prone to cyclical river erosions and floods. Chars are not stable in size and even in existence, and episodes of their partial or complete erosion or submerging are common. Chars accommodate ultra-poor inhabitants who are forced, as a desperate attempt for survival, to relocate across islands due to river erosion and floods.

In the study area, heifers are the prime investment choice. Female goats are considered to be a secondary choice by residents. A heifer needs to be at least two years old to start lactation.[*11]

[*11] They typically need to be about 15 months old to be ready for insemination and takes about 9.5 months to deliver a calf as it starts lactation, or the total of about 2 years.

Rearing costs are higher for cattle as it requires fodder while a goat will eat the bushes. Cattle requires vaccination shots when a goat is usually left unvaccinated. Reproductive capacity of goats are high.[*12] However, in comparison with cattle, their higher reproductive capacity and lower rearing costs are more than offset by the elevated morbidity and mortality risks,[*13] and a less frequent cash flow.[*14] Residents also report that a goat herd is less mobile than single cattle when they are forced to evacuate during the flood. All of these considerations prompt residents to opt for cattle when they can afford it, and do not expand the herd size of goats, which are both confirmed in our data.

IV Theory

In this section, we use a simplified version of Galor and Zeira (1993) to illustrate a theoretical framework to aid the interpretation of the empirical finding that asset accumulation is faster while the repayment rate is higher for upfront lending. Let us consider that there are two production sets called 'goats' and 'cattle.' Both sets are nonconvex with fixed inputs as shown in Figure 1 (top panel). In the top panel, the current period per capita asset size in monetary units k_t is shown on the horizontal axis, the current period production in monetary units y_t is shown on the vertical axis. For production set $j = \{\text{goats, cattle}\}$, the production becomes positive only after k_t becomes greater than its fixed input portion $\underline{k}_j \in \mathbb{R}_{++}$. The production after $\underline{k}_j$ follows a decreasing return to scale technology.

In the two bottom panels, period t per capita asset size in monetary units k_t is given on the horizontal axis and the period $t+1$ per capita asset size in monetary units k_{t+1} is given on the vertical axis. We take cattle production as an example. In the bottom left panel, saving out of production is given by the dotted line $sf(k_t)$ with a fixed saving rate $s \in (0, 1)$. Saving is zero for the flat segment, and becomes positive once the production becomes positive. For $k_t > \underline{k}_{\text{cattle}}$, the saving traces the cattle production set after rescaling with the saving rate s, or $sf(k)$.

The next period net per capita asset size is given by the sum of saving and carry over asset net of depreciation (including mortality) $(1-\delta)k_t$. The depreciation rate $\delta \in (0, 1)$ is assumed to be constant. To keep the figure from being overly complicated, the depreciation rate is assumed to be common between the cattle and goat production. Carry over asset net of depreciation is given as the linear slope segment next to the origin. Once the production becomes positive, saving out of production is added to the linear carry over asset line, which forms an S-shaped line as depicted with a thick green line for goat and a thick blue line for cattle.

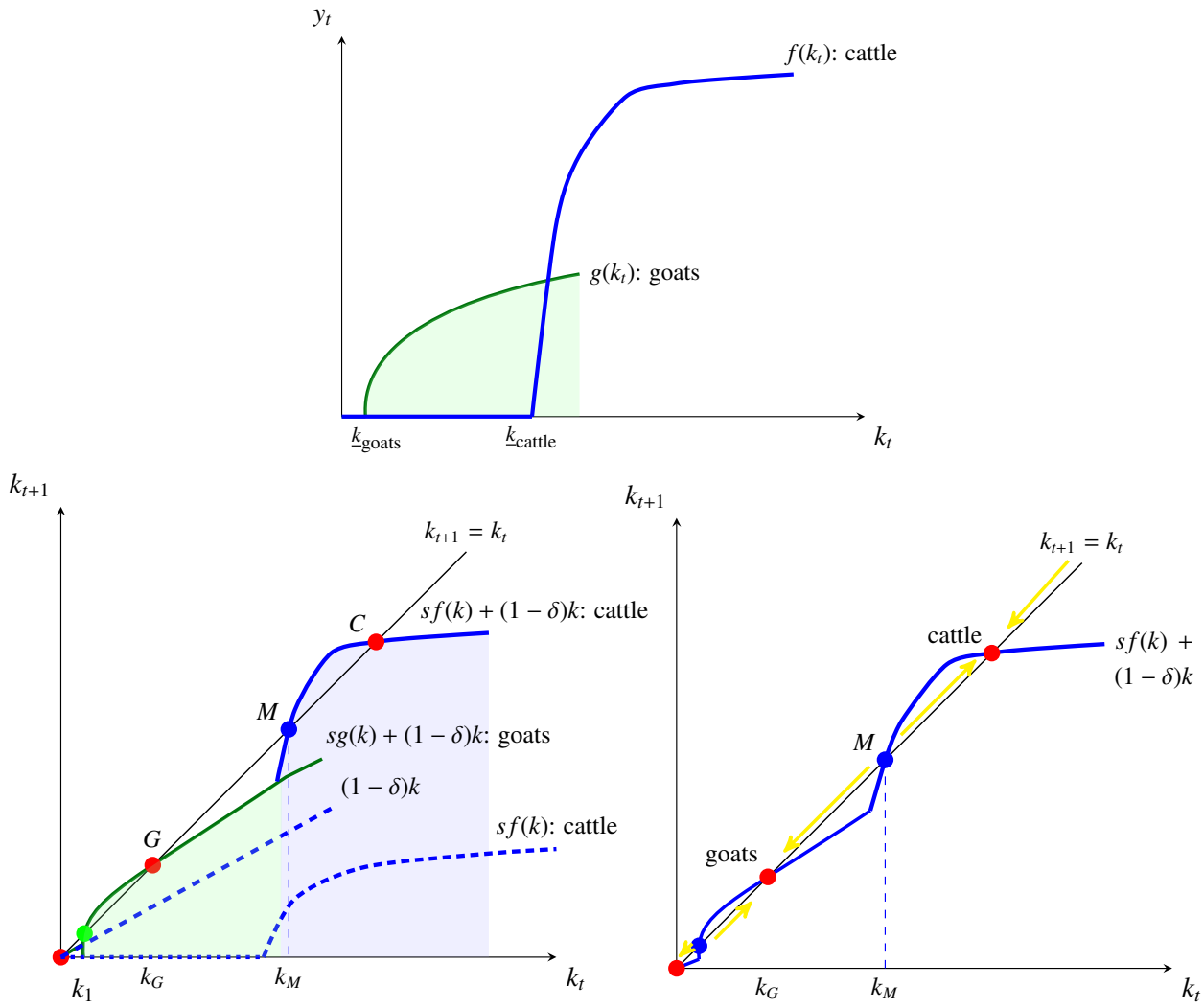
When cattle production is feasible in the long run, which we assume to be so, or when the thick blue line gets to pass the steady state line $k_{t+1} = k_t$, it will have two intersections, C, M. As shown in the bottom left figure, when the current asset level is greater than k_M, the asset level corresponding to the intersection D, the production eventually reaches C, a steady state where the per capita asset

[*12] Parity size approaches to 2 at the third birth, and the birth interval is about 200 days (Hasan et al., 2014). An indigenous cow has a birth interval of 375 to 458 days (Hasan et al., 2018), resulting in about 2 years for gestation and calving interval (Habib et al., 2012) with the mean lifetime births of 4 (Hasan et al., 2018, Table 1). We procure one year old heifers in our project to match the one year grace period with the two year gestation period.

[*13] Indeed, morbidity of goat kids ranges from 12% (Mahmud et al., 2015) to more than 50% in some diseases (Nandi et al., 2011, Table 5), while cattle morbidity is around 22% (Bangar et al., 2013). Goat kid mortality ranges from 6% (Mahmud et al., 2015) to 30% (Paul et al., 2014, Table 5) (Ershaduzzaman et al., 2007). Heifer mortality is between 5% (Hossain et al., 2014, p.332R) to 10% (Alauddin et al., 2018). Higher morbidity of goat kids partly reflects their eating style that uses lips rather than tongues (as cattles do) and vulnerability to logging water.

[*14] The produce of goats is mostly meat and their milk is seldom marketed. A meat market requires a cluster of relatively high income earners, usually located far from river islands, and the demand is highly seasonal. In contrast, cow milk can be marketed locally with stable demand, the lactation length is 227 days, and milk yield is 2.2 kg per day (Rokonuzzaman et al., 2009).

FIGURE 1: A POVERTY TRAP WITH GOATS AND CATTLE



Note: In the top panel, the current period per capita asset size k_t is on the horizontal axis, the current period production y_t is on the vertical axis. For production set $j = \{\text{goats, cattle}\}$, the production becomes positive only after k_t becomes greater than its fixed input portion $\underline{k}_j \in \mathbb{R}_{++}$. The positive production portion follows a decreasing return to scale production function for each j. In two bottom panels, period t per capita asset size in monetary units k_t is given on the horizontal axis and the period $t+1$ per capita asset size in monetary units k_{t+1} on the vertical axis. In the bottom left panel, the production function for cattle $f(k)$ is multiplied with a fixed saving rate s and is added current herd size net of mortality $(1-\delta)k_t$ that is passed on to the next period. The depreciation rate δ is applied in the fixed cost segment. Similar description applies to the goat production function $g(k_t)$. Saving rate and depreciation rate are assumed to be common with the cattle production. The bottom left panel shows each production sets, the bottom right panel shows the contour of two production sets. The point M exists if for some $k \in (\underline{k}_{\text{cattle}}, \infty)$, $sf(k) + (1-\delta)k > k$ holds. The point C exists as long as the point M exists and the Inada condition $\lim_{k_t \to \infty} f'(k_t) = 0$ is met. Red points are stable equilibria, blue points are unstable equilibria.

size is constant, or $k_{t+1} = k_t$. If the current asset level is smaller than k_M, the producer eventually will not choose to invest in cattle.

Similarly for the goat production, there is much smaller fixed inputs and production, hence smaller saving $sg(k_t)$. The shape of next period net per capita asset size is similar with the cattle, only smaller. We note from the previous section that the returns to goats net of mortality and the steady state goat asset size are smaller than the cattle in the region depicted in FIGURE 1. We also note that a goat investment, when compared to a cattle investment, requires smaller upfront costs but has an infrequent income stream, faces a more limited local demand, shows vulnerability to logging water, all pointing to smaller investments and their returns. We will use these points, and by neglecting risk implications, to assume that the fixed costs and steady state production level are smaller for goats than cattle.

For simplicity, we assume that all individual has an asset no smaller than k_B. Then, when there is only a goat production technology, individuals eventually reaches the point G. When the cattle production technology is added to the picture, there is no change in the equlibrium for individuals whose initial assets are in $[k_B, k_M)$. For individuals with initial assets in $[k_M, \infty)$, one chooses cattle, because the resulting income level is higher, and eventually arrive at the steady state C.[*15]

Over the domain of $k_t \in [0, \infty)$, the production possibility frontier, or the contour of the union of two production sets, becomes M-shaped (BOTTOM RIGHT PANEL). Under the configuration depicted in the figure, there will be five equilibria of which three are stable. Ruling out the zero equilbrium as irrelevant, one is left with two stable equilibria, named as goats and cattle in the figure.[*16, *17]

In light of this argument, a loan that is larger than $k_M - k_G$ allows individuals in the goat equilibrium to transition to cattle production and arrive at the cattle equilibrium. The entire region depicted in the diagram is considered as in the realm of poverty, so it shows a poverty trap within poverty (i.e., goat as ultra poor and cattle as moderately poor).

A government lending can support the productive investments of borrowers without incurring an efficiency loss. If the lender charges according to marginal costs, the interest rate is the same as the marginal return on capital $sf'(k_C) + 1 - \delta$ or $sf'(k_G) + 1 - \delta$. The slope of such interest rate is smaller than the marginal return on investment, which is the 45 degree line. Therefore, a lending, not a transfer, suffices for the transition, so long as the the loan size is no smaller than $k_M - k_G$ and if there is a way to reduce the costs of information asymmetry and transactions, for example, by group lending and an overhead cost subsidy.

In the empirical section, we follow Bandiera et al. (2017) in interpreting the lower repayment rates and smaller cattle holding for a smaller loan size as evidence consistent with a poverty trap with a nonconvex production technology.

V Study sample

Our sample is drawn from the population of river island villages in Northern Bangladesh. [Abusan will provide the regional characteristics of the area, esp. poverty, using CLP/TUP program data

[*15] M is an unstable equilibrium that all individuals would deviate from, but we include this point to the region of attraction of C for the sake of simplicity.

[*16] A similar diagram is found in Kraay and McKenzie (2014, Figure 3, with $k - y$ space).

[*17] Formally, one requires the production set j = {goat, cattle} to satisfy: there exists $\underline{k}_j > 0$ that the production is zero for input $k < \underline{k}_j$ and is strictly positive for $k \geqslant \underline{k}_j$. We assume the production set exhibits decreasing returns to scale for $k \geqslant \underline{k}_j$. Let the contour of the production set be $f_j(k)$. Assume for expositional simplcity that the saving rate s and depreciation rate δ are fixed. Further assume that there exists $k_M > \underline{k}_j$ such that $sf_j(k) + (1 - \delta)k > k$ for $k \in (k_M, k^*)$, with $k^* > k_M$ is a fixed point $k^* = sf_j(k^*) + (1 - \delta)k^*$. For k^* to be finite, under the assumption that cattle rearing is feasible so the intersection C exists, we need $sf_j'(k^*) + (1 - \delta) < 1$ which holds for any $s > 0$ as long as the Inada condition $\lim_{k_t \to \infty} f'(k_t) = 0$ is met. Under these assumptions, for j, there exists two intersections between the steady state line, one unstable and the other stable equilibria.

and reports.]

In the *char* region, the majority of *char*s have only one village. The majority of *char*s have no MFI activity, and we delisted the *char*s if an MFI or an NGO is engaging in microfinance activies, or if *Char Livelihood Program (CLP)* is active.[*18] Using Landsat imagery, we identified 128 *char*s within a day's boat ride from the Gaibandha peer and collected information by field visits. From this list of *char*s, we randomly selected 80 *char*s. In each village, we conducted a census of households with their wealth ranking made through a participatory ranking process. Following a process similar to the paired ranking as in Alatas et al. (2012, p.1212) and the Peruvian ultra poor case of Karlan and Thuysbaert (2019, p.66), we asked the least wealthy households in terms of asset ownership. We then asked to form a member committee of 20 households, of which 14 are ultra poor and six are moderately poor. The ultra poor are the poorest in the ranking, while the moderately poor are all other households. As we admitted households on a first come, first served basis, these 20 households are the first to join the membership of microfinance in respective poverty classes. After receiving acceptance for study participation ('pre-acceptance' in FIGURE 3) from 80 groups comprising 1,600 members, baseline data was collected in 2012 prior to the debt contract type randomization. In each group, 10 out of 20 members were randomly offered the credit and the remaining members were kept as pure control groups who did not receive a loan until 1 or 2 years into the program. Due to a concern for within group spill overs, we do not use the subsample of these control members in this paper. We thus have 800 members for the impact evaluation of this paper whom we surveyed in the baseline and offered one of the four credit products. From these 800 members, we exclude 24 members whose intervention did not strictly follow the experimental design explained below.

After the baseline data was collected in 2012, we offered the debt contracts to each group. There are four debt contract types that are randomised at the group level. After offering the each type of debt contract, three groups opted out as a group, resulting in 77 groups participating the intervention. In addition to the group level rejection, we had 89 individual loan rejectors before loan disbursements. This happened despite we had explained about the debt contract types, random assignment process, various other group based obligations, and had obtained everyone's consent to participate before randomisation. Although both types of rejecters refused to receive a loan, they gave a consent to be surveyed so we tracked them in subsequent survey rounds.

In 2013, we lost four groups to floods. As they relocated, we had no choice but to drop them from the study. This resulted in 76 groups remaining in our data, including 4 groups who group-rejected the loans. In our study, attrition refers to dropouts from our household survey. Rejection refers to loan rejecters in our intervention, and majority of rejecters (81.25%) did not attrit from our household survey. Counting all individual attriters, we have a total of 92 subjects (11.9%) out of 776 subjects who attrited by the final round of the household survey.

As a result, among the baseline survey sample, there are flood victims whom we do not track, as well as group rejectors, individual rejectors and borrowers that we track. See Takahashi et al. (2017) for more details on the randomisation and acceptance process. We track all — barring the flood victims whose villages were washed away and other attriters — the potential borrowers in the data, including who eventually opted out the borrowing. This enables us to estimate the intention-to-treat effects of offering vrious debt contracts on the population who showed interests in joining microfinance membership.

TABLE 1 shows descriptive statistics of sample households. As we randomly allocate them into four different arms named as Traditional, Large, Large grace, and Cattle, summary is shown by the arms and the overall. As shown in the Appendix B TABLE B1, these baseline household characteristics do not differ statistically between the arms, except for production asset amount of Large grace arm being larger than other arms (p value = 5.8%). Our sample is characterised by relatively low literacy rate (HeadLiteracy) and relatively young age (HeadAge) of the household heads. Literacy rate is lower than the national average of adult males at 61.54% in 2012 (UNESCO). Household

[*18] The *Char Livelihood Program (CLP)* is run by DFID of the United Kingdom and transfers assets to the poor.

TABLE 1: DESCRIPTIVE STATISTICS BY RCT ARM FOR ALL HOUSEHOLDS INCLUDING NONPARTICIPANTS

Variable	Traditional	Large	Large grace	Cattle	Overall
HeadLiteracy (Head literate)	0.097 (0.296)	0.110 (0.314)	0.105 (0.307)	0.155 (0.363)	0.117 (0.322)
HeadAge (Head age)	38.429 (10.115)	37.465 (10.165)	38.409 (9.271)	38.015 (10.746)	38.067 (10.075)
HHsize (Household size)	4.091 (1.447)	4.295 (1.506)	4.245 (1.492)	4.115 (1.368)	4.189 (1.454)
FloodInRd1 (Flood in round 1)	0.463 (0.500)	0.618 (0.487)	0.407 (0.493)	0.497 (0.501)	0.497 (0.500)
NLHAssetAmount (Household asset value$_{(1)}$)	1428 (922)	1268 (762)	1317 (698)	1534 (1174)	1383 (910)
PAssetAmount (Productive asset value$_{(1)}$)	1020 (1724)	1234 (2330)	2022 (9364)	1027 (2572)	1332 (5118)
TotalImputedValue (Livestock value$_{(1)}$)	4343 (11116)	6500 (14725)	5397 (13147)	4121 (10304)	5111 (12490)
NumCows (Number of cattle)	0.217 (0.556)	0.325 (0.736)	0.270 (0.657)	0.206 (0.515)	0.256 (0.624)
NetValue (Net asset value$_{(1)}$)	8011 (14877)	10074 (16402)	9671 (21510)	5649 (11752)	8375 (16557)
NetBroadValue (NetBroad Value)	9012 (15030)	10830 (16604)	9931 (21371)	6962 (12878)	9206 (16784)
Attrited (Attrited)	0.182 (0.387)	0.040 (0.196)	0.145 (0.353)	0.115 (0.320)	0.119 (0.323)
IRejected (Individually rejected)	0.176 (0.382)	0.045 (0.208)	0.065 (0.247)	0.185 (0.389)	0.116 (0.320)
GRejected (Group rejected)	0.227 (0.420)	0.100 (0.301)	0.050 (0.218)	0.000 (0.000)	0.090 (0.287)
Non-attriting borrowers (Non-attriting borrowers)	0.472 (0.501)	0.820 (0.385)	0.800 (0.401)	0.735 (0.442)	0.714 (0.452)
RiskPrefVal (Risk preference value)	115 (31)	108 (32)	113 (37)	110 (32)	111 (33)
TimePref1Val (Time preference value 1)	374 (132)	373 (153)	376 (147)	407 (142)	383 (144)
TimePref2Val (Time preference value 2)	483 (127)	485 (137)	476 (155)	512 (121)	490 (136)
PresentBias (Present bias)	0.470 (0.501)	0.450 (0.499)	0.480 (0.501)	0.458 (0.500)	0.464 (0.499)
N	176	200	200	200	776

Source: Information of 776 households in GUK administrative data and household survey data at the baseline. Survey respondents include nonparticipants to the experiments.

Notes: 1. Mean values at the baseline. Values in brackets are standard deviations.

2. Head literate is an indicator variable of household head literacy. Head age is age of household head. Household size is total number of household members. Flood at baseline is an indicator variable of flood exposure. Household asset amount and Productive asset amount are amount of non-livestock household and productive assets, respectively, in BDT. Livestock value is BDT value of all livestock holding beyond cattle. Number of cattle holding is number of cattle holding. Net asset value is net asset values in BDT using asset items observed in all 4 rounds. Broad net asset value is net asset values in BDT for all asset items. Attrited indicates attrition rates in the household survey, and GRejected and IRejected show group rejection rates and individual rejection rates to the lending program. Non-attriting borrowers indicates the ratio of non-attriting borrowers to all borrowers. Because attrition and rejection are separate events, a household can reject and attrit, so non-attrited borrowers $\geqslant$ total - (rejected members + attrited members). USD 1 is about BDT 80. Risk preference is the respondent's choice of the acceptable minimum excess monetary value of the risky option over a certainty option. Lower values indicate a greater risk tolerance. Time preference 1 is the respondent's choice of the acceptable minimum excess monetary value in 3 months that is no smaller than present monetary benefit, and Time preference 2 is the the minimum excess value in 1 year and 3 months that is no smaller than monetary benefits of 1 year from now. Lower values indicate a greater patience. If a respondent's Time preference 1 is greater than Time preference 2, the respondent is considered to be present-biased. Present bias is an indicator function that takes the value of 1 if the respondent is considered to be present-biased, 0 otherwise.

size (HHsize) is not large, 4.189 members overall, due probably to the constant flood threats, as indicated by above 49% exposure overall at the baseline (FloodInRd1), that do not easily allow a large household formation. Cattle holding per household (NumCows) shows cattle rearing is not common and the mean herd size is between .2 to .4.[*19] Net asset value of household (NetValue) is a sum of the monetary value of livestock, household asset values (HAssetAmount), and productive asset values (PAssetAmount), less total indebted amount.[*20] The latter two differ to some extent

[*19] TABLE B2 in Appendix B shows the test results that NumCows do not differ across arms at the baseline.

[*20] Debts include borrowing from relatives, friends, money lenders, NGOs, and the borrowing under the experiment.

by arms, but they mostly reflect sampling errors as indicated in the large standard deviations.[*21] The number of cattle holding (NumCows) indicates a low rate of cattle holding overall, and a large standard deviation indicates there are many zero holders.

Attrited indicates attrition rates in the household survey, and GRejected and IRejected show group rejection rates and individual rejection rates to the lending program. We analyse attrition and rejection in Section VIII.1, VIII.2, but at this point, we just note that the attrition rates are not statistically different between the arms at the group level. RiskPrefVal, TimePref1Val, TimePref2Val are the minimum acceptable excess of risky options (vs. certainty), 3 month future options (vs. present), and 15 month future options (vs. 12 months in future), respectively, in monetary values. Smaller values indicate greater risk torelance and patience. PresentBias is the ratio of respondents who indicate present biasedness, TimePref1Val > TimePref2Val. All these measures are similar across arms in values, and also are similar statistically as shown in TABLE B1 of Appendix B.

VI Experimental design

To investigate the detailed demand-side constraints and suitable credit scheme for the ultra poor, we implemented the village-level clustered randomization across the four treatment arms as follows (see FIGURE 2):

T1 Traditional microcredit. Members of the group receive 5600 BDT (approximately USD 50) credit, and the loan repayment begins two weeks after the disbursement. Members repay with weekly installments and are required to attend weekly meetings as well as to regularly save an amount decided jointly by the group members. The loan maturity is one year, and borrowers are unconditionally allowed to take another two loan contracts of equivalent amounts over the next consecutive years. The weekly repayment is 125 BDT (approximately USD 1.1) payable in 50 installments.

T2 Upfront lumpy credit. Members receive 16,800 BDT (approximately USD 150) credit with a longer loan maturity, and the loan repayments begin two weeks after the disbursement. The weekly repayment and the design of compulsory saving are exactly the same as in T1 arm. The loan maturity is three years. The required weekly repayment is 125 BDT payable in 150 weekly instalments.

T3 Upfront lumpy credit with a grace period. Members receive 16,800 BDT credit with loan repayments begin one year after the disbursement. During the first year grace period, members are required to meet weekly and follow group activities such as compulsory savings just as in other arms. The design of compulsory saving is the same as in the T1, T2 arms. The loan maturity is three years. The required weekly repayment is 190 BDT (approximately USD 1.7) payable in 100 weekly installments, starting after one year.

T4 In-kind credit with a one-year grace period and managerial support programs.[*22] Members receive in-kind credit in the form of a one-year old heifer with the price of 16,000 BDT (approximately USD 142), and the loan repayments begin one year after the disbursement. The grace period length is equal to the one provided under T3 and T4 arms. In addition, the members receive input (fodder, veterinary and vaccination services) procurement supports, marketing consultancy (milk sales), and basic training on cattle rearing with the local NGO,

[*21] There is an alternative measure for net assets, which we call the broad net assets, in which, in addition to the regular asset items observed in all 4 rounds for household assets, we use all asset items. All estimation results hold with broad net assets with wider confidence intervals due to greater noises across time. See FIGURE 6 for details.

[*22] Heifer ownership was never explicitly agreed upon, but it was generally understood by the borrowers that they owned the heifer. T4 is thus more similar to a debt contract with the purchased asset as collateral than to a finance lease under which the asset ownership belongs to the lessor.

FIGURE 2: DESCRIPTION OF EXPERIMENTAL ARMS

T1 Traditional microcredit.

- **Credit** 5600 BDT (approximately USD 50).
- **Repayment start** Two weeks after the disbursement.
- **Installments** Repay with weekly installments of 125 BDT (approximately USD 1.1) which amounts to a simple interest rate of 11.61%.
- **Maturity** Total installments of 50 or a loan maturity of one year. Take another two loan contracts of equivalent amounts over the next consecutive years.
- **Weekly obligations** Attend a meeting and deposit an amount decided jointly with group members.

T2 Upfront lumpy credit. Following conditions in black colours differ from T1:

- **Credit** 16,800 BDT (approximately USD 150).
- **Repayment start** Two weeks after the disbursement.
- **Installments** Repay with weekly installments of 125 BDT (approximately USD 1.1)which amounts to a simple interest rate of 11.61%.
- **Maturity** Total installments of 150 or a loan maturity of three years.
- **Weekly obligations** Attend a meeting and deposit an amount decided jointly with group members.

T3 Upfront lumpy credit with a grace period. Following conditions in black colour differ from T2:

- **Credit** 16,800 BDT (approximately USD 150).
- **Repayment start** One year after the disbursement.
- **Installments** Repay with weekly installments of 190 BDT (approximately USD 1.7) which amounts to a simple interest rate of 13.1% when repaying.
- **Maturity** Total installments of 100 or two years.
- **Weekly obligations** Attend a meeting and deposit an amount decided jointly with group members.

T4 In-kind credit with a one-year grace period and managerial support programs. Following conditions in black colours differ from T3:

- **Credit** Receive a credit in the form of a one-year old heifer with the price of 16,000 BDT (approximately USD 143).
- **Repayment start** One year after the disbursement.
- **Installments** Repay with weekly installments of 190 BDT (approximately USD 1.7) which amounts to a simple interest rate of 18.75% when repaying. After adding the support program costs 800 BDT to the principal, the interest rate will be the same as T3.
- **Maturity** Total installments of 100 or two years.
- **Weekly obligations** Attend a meeting and deposit an amount decided jointly with group members.
- **Support program** Provide input support (fodder, veterinary and vaccination services), marketing consultancy (milk sales), and basic training on cattle rearing with the local NGO, at the total fee of 800 BDT (approximately USD 7.2) charged for the three years. With 800 BDT for the support program, the total cost sums to BDT 16,800 which is the same as in all other arms.

Note: Grayed texts in T2-T4 arms are unchanged conditions from the respective previous arms.

at the total fee of 800 BDT (approximately USD 7.2) charged for the subscription period of three years. With 800 BDT for the support program, the total cost sums to BDT 16,800 which is the same as in all other arms.

One of the aims of the study is to assess if the entrepreneurship matters in microfinance lending outcomes. Assuming, below 17000 Taka, that the productive asset with the highest return is a heifer, we bundle training and consultation with a heifer lending. At the start of a loan, the NGO's procurement officer buys a heifer from the local market, so the borrower does not have to have the knowledge required for the quality purchase. By providing the knowledge to a group of borrowers through training and disallowing an investment choice with in-kind, heifer lending, some aspects of entrepreneurship will no longer be a prerequisite. It can be seen that we are offering a capacity to use the best practice or the *cristalised intelligence* related to cattle production (Cattell, 1963). This is only a part of entrepreneurial skills. The remainder, a capacity to apply a suitable action to un-

foreseen events or the *fluid intelligence* related to cattle production, and other inter-personal skills, are left unchanged. If the entrepreneurship raises productivity, borrowers of other arms who are not provided the knowledge are expected to opt out the loan more frequently or perform worse. One can measure effects of the entrepreneurship on participation and outcomes by comparing these two groups, in-kind credit with training vs. cash credit.

As a natural reference, we want to compare the training cum in-kind loan T4 with the traditional regular microcredit T1, a classic Grameen style loan that is about a third in loan size and maturity with no grace period. In order to make comparison less noisy, we added two intermediate treatment arms to bridge them: Two arms with upfront lumpy lending that is equivalent of a heifer price, one with a grace period T3 and another without a grace period T2. With the loan sizes that are three times the traditional microfinance loans, we extended the maturity to three years to even out the repayment burden. The comparison arm, the traditional regular microcredit, has only one year maturity. We therefore provided the total of three loans in three loan cycles in T1 which are unconditionally disbursed annually, so the total loaned amount will be aligned and there is no exit-selection due to delinquency before three cycles are complete.

Under this setting, upfront liquidity without changing the total loan size eases a liquidity constraint, attaching a grace period under the same loan size and disbursement timing eases a saving constraint prior to repayment, and offering an in-kind loan with a managerial support without changing other features eases an entrepreneurship constraint. In effect, we constructed a stepped-wedge design over these key features of loans, namely, upfront liquidity (Upfront), a grace period (WithGrace), and in-kind with managerial supports (InKind), to assess the impacts of respective constraints on participation and outcomes as indicated in Table 2.

An in-kind offer in treatment T4 is generally thought to be less efficient than a cash offer as it takes away an investment choice from the borrower. However, the local microfinance practitioners and NGO members widely agree that other production opportunities are limited, so not much is lost in terms of the choice set, under our setting of island location.[*23] Given the small set of the productive investment choices, our experiment gives a unique chance to compare cash lending against in-kind lending, even without controlling for a potentially wider choice set of cash lending. Indeed, we found in our data that most of T2 and T3 cash borrowers started to invest in cattle after receiving a loan. Consequently, in our study, the cash-grace-period and in-kind-grace-period lending differ effectively only in the managerial support services bundled in the latter.

All loan products are of individual liability and the committee was intended to serve only as an activity platform for microfinance operations. Among the Traditional members, there were 24 members who received disbursements twice, not three times, due to logistical limitations. We drop them from the analysis and use 776 members in the below.

Lastly, because of the severe flood damages caused on borrowers and the associated administrative delays in 2013, the repayment was halted in 2013 and resumed after one year in 2014. This resulted in an extension of loan maturity from 36 months to 48 months for all arms. This gave substantial leniency to the borrowers in terms of loan repayment burden.

Randomisation was generally successful as we show in Table B1 of Appendix B.

VII Empirical strategy

We collected data at one baseline survey and three annual follow up surveys. With successful randomisation, we use ANCOVA estimators to measure impacts of each experimental arms and loan attributes. ANCOVA estimators are more efficient than DID estimators (Frison and Pocock, 1992; McKenzie, 2012). As we include loan rejecters, what we are estimating is intention-to-treat effects. For an ease of interpretation, we sometimes use indicator variables of each attributes, Upfront, With-

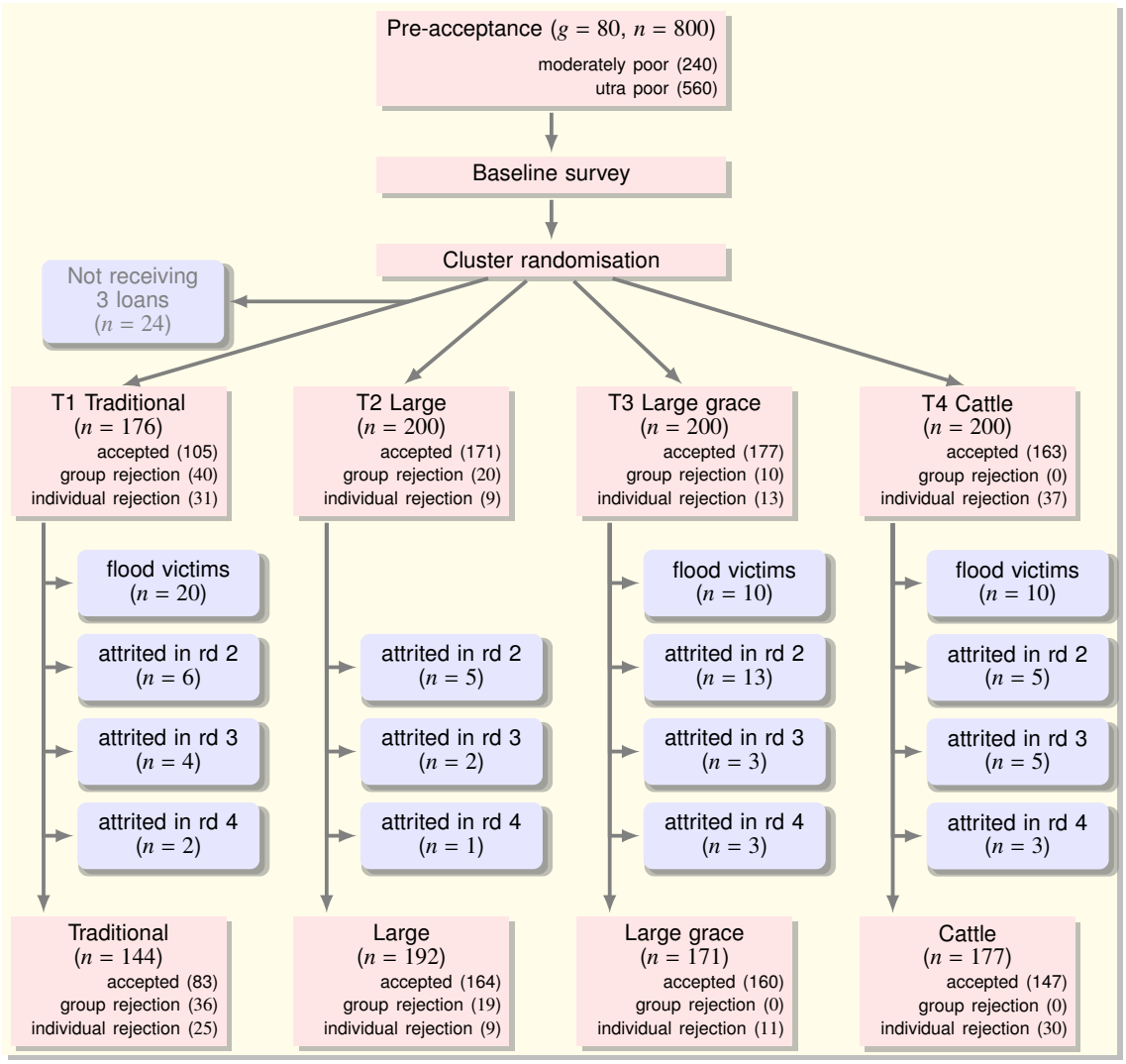
[*23] A closely related project in the neighbouring areas transfers an asset in the form of a cow (Bandiera et al., 2017).

TABLE 2: A 4×4 FACTORIAL, STEPPED WEDGE DESIGN

	Large, grace	Large	Traditional
Cattle	entrepreneurship constraint (InKind)	saving constraint (WithGrace)	liquidity constraint (Upfront)
Large, grace		saving constraint (WithGrace)	liquidity constraint (Upfront)
Large			liquidity constraint (Upfront)

Note: Cell contents are hypothesised constraints on investments that exists in the column arm but are eased in the row arm. Contents in brackets are variable names of respective attributes.

FIGURE 3: SAMPLING FRAMEWORK, REJECTION, AND ATTRITION



Note: Each 20 subjects (14 ultra poor, 6 moderately poor) in 80 groups agreed to participate in the lending program. Each 10 subjects (7 ultra poor, 3 moderately poor) in 80 groups were randomly assigned to the experiment. 80 groups were randomly assigned to 4 arms after the baseline household survey. After the arm assignment is revealed, 7 groups (70 subjects) group-rejected and 90 subjects individually-rejected to participate in the lending program. 24 subjects in the Traditional arm were given the same loan amount but in 2 disbursements for logistical errors, and they were dropped from the analysis sample. Total of 706 subjects participated in the lending program while all 776 subjects were tracked in the subsequent household surveys. The household survey sample size was reduced to 684 by attrition at the round 4 survey (attrition rate 0.119). See FIGURE 2 for description of each arms.

Grace, InKind in place of arms in estimating equations. Numerically, both are equivalent.[*24] In what follows, we will refer to these attributes as *functional attributes*.

The estimating equation for our intention-to-treat effects is:

$$y_{it} = b_1 y_{i1} + b_{a_0} + \boldsymbol{b}'\mathbf{d}_i + e_{it}, \quad t = 2, 3, 4, \tag{1}$$

where, for member i in survey round t ($t = 1$ is the baseline), y_{it} is an outcome measure, $\mathbf{d}_i$ is a vector of three indicator variables in non-Traditional arms or functional attributes that i receives, $\boldsymbol{b}' = \begin{pmatrix} b_{a_1} & b_{a_2} & b_{a_3} \end{pmatrix}$ is associated impacts of the $k-$th arm a_k relative to Traditional arm or functional attribute $a_{k'}$, e_{it} is an error term. For the Traditional arm, the conditional mean of outcome given baseline outcome variable is given by b_{a_0}. For an arm a_k or a functional attribute $a_{k'}$, the impact relative to the traditional arm is measured with b_{a_k} or $b_{a_{k'}}$. In this section, we will only use a_k for simplicity.

As we are interested in the time course of relative impacts, we extend equation (1) as:

$$y_{it} = b_1 y_{i1} + b_{a_0} + \boldsymbol{b}'\mathbf{d}_i + b_{3a_0} c_3 + \boldsymbol{b}_3'\mathbf{d}_i c_3 + b_{4a_0} c_4 + \boldsymbol{b}_4'\mathbf{d}_i c_4 + \boldsymbol{\gamma}'\mathbf{x}_{it} + e_{it}, \quad t = 2, 3, 4, \tag{2}$$

where $\boldsymbol{b}_t' = \begin{pmatrix} b_{ta_1} & b_{ta_2} & b_{ta_3} \end{pmatrix}$ is a vector of time-varying impacts relative to concurrent Traditional arm in period $t = 3, 4$, c_3 is a dummy variable for $t = 3$ and c_4 is a dummy variable for $t = 4$. $\boldsymbol{b}'$ picks up impacts for $t = 2$ for non-traditional arms. $\mathbf{x}_{it} = \begin{pmatrix} \mathbf{x}_{1it}' & \mathbf{x}_{2it}' & x_{3it} \end{pmatrix}'$ is a vector of covariates consisting of $\mathbf{x}_{1it}, \mathbf{x}_{2it}, x_{3it}$. $\mathbf{x}_{1it}$ is a vector of baseline demographic characteristics, $\mathbf{x}_{2it}$ is a vector of previous cattle rearing experiences and their interactions with treatment arms, and x_{3it} is number of owned cattle at the baseline. The regression specifications are: First is estimated without $\mathbf{x}_{it}$, second is estimated with $\mathbf{x}_{1it}$, third is estimated with $\mathbf{x}_{1it}, \mathbf{x}_{2it}$, fourth is estimated with $\mathbf{x}_{1it}, x_{3it}$, and fifth is estimated with $\mathbf{x}_{1it}, \mathbf{x}_{2it}, x_{3it}$.[*25]

Our main interest is on the time-varying impacts of k-th non-traditional arm relative to the traditional arm outcomes. In equation (2), this is captured by b_{a_k} for period 2, $b_{a_k} + b_{3a_k}$ for period 3, and $b_{a_k} + b_{4a_k}$ for period 4. We plot these estimates for time-varying impacts using error bar charts in the next section. Given our sample is obtained by cluster sampling with clusters as chars, and intervention was randomised at the char level, all the standard errors are clustered at the char (group) level as suggested by Abadie et al. (2022).

One needs to be careful that, in the formulation of (1) and (2) applied to functional attributes, a grace period (saving constraint) and in-kind with managerial supports (entrepreneurial contsraint) are tested for its marginal impacts over other non-Traditional arm(s), where the latter is measured against the Traditional arm. In short, they are tested like null cross derivatives. The saving constraint is tested against the traditional microcredit lending on top of the impact of upfront liquidity, so it tests if its impact is different from the upfront impact which is measured relative to traditional mcirocredit lending. The entreprenuerial constraints are tested against the traditional microcredit lending on top of the combination of upfront liquidity and a grace period, so it tests if its impact is different from the sum of upfront impact and a grace period impact, whose sum is measured relative to traditional mcirocredit lending. In this way, saving and entrepreneurship constraints are not directly tested against the Traditional arm. Therefore, wheather the Traditional arm members faced

[*24] From the discussions of Table 2, using the expression in (1), we know:

$$\begin{aligned} b_{a_{\text{Large}}} &\equiv b_{a_1} = b_{a_{1'}}, & b_{a_{\text{Upfront}}} &\equiv b_{a_{1'}} = b_{a_1} \\ b_{a_{\text{Large grace}}} &\equiv b_{a_2} = b_{a_{1'}} + b_{a_{2'}}, & b_{a_{\text{WithGrace}}} &\equiv b_{a_{2'}} = b_{a_2} - b_{a_1}, \\ b_{a_{\text{Cattle}}} &\equiv b_{a_3} = b_{a_{1'}} + b_{a_{2'}} + b_{a_{3'}}, & b_{a_{\text{InKind}}} &\equiv b_{a_{3'}} = b_{a_3} - b_{a_2}. \end{aligned}$$

[*25] In outcomes that are not directly related to cattle rearing, we do not use previous cattle rearing experience and number of owned cattle at the baseline for covariates, so we only have specification 1 and 2.

these constraints, or whether these constraints exist in the study area, are not directly tested. To test a saving constraint in the study area, not its marginal contribution to upfront attribute impacts, one must have an arm with traditional microfinance with a grace period.[*26] This caveat applies only to functional attributes and non-Traditional arms are directly tested against the Traditional arm.

In addition to outcome impact estimates, we also use permutation tests to examine the member differences by arm. A different debt contract design may attract individuals with different characteristics. The tests allow us to understand how the self-selected members differ by arm whom we base our impact inference. In Section VIII.1, we show that the Large arm participants are richer in assets and cattle rearing experiences than other arms, and the Cattle arm participants are poorer in both respects. These give us clues when we interpret the impact estimates.

VIII Results

The reasons behind nonparticipation are fundamental in understanding the outreach. We will therefore analyse nonparticipation in relation to the debt contract design that they were randomly allocated to. We first examine the difference in characteristics of participants and rejecters, and observe that rejecter characteristics differ between Traditional and non-Traditional arms. We argue it can result in underestimation of impacts. Next, given our interests on the Cattle arm, we compare the participant characteristics of Cattle arm with other arms. We show that Cattle arm participants are poorer in terms of asset holding and have fewer cattle rearing experiences, both of which hint farther outreach. Lastly, we compare the attriters' characteristics with the nonattriters' and show that there is no selective attrition in our household surveys. After these exercises, we assess the impacts of debt contract design on repayment, assets, labour incomes, consumption, and schooling. We show that the non-Traditional arms accumulate more net assets with higher repayment rates than the Traditional arm. In the robustness check, we confirm these results hold under various definitions of assets and across poverty class of borrowers. We also find some evidence that the ultra poor may have faced a challenge in repayment, therefore, suggest an option of a longer saving period and/or a maturity.

VIII.1 Participation

As noted in Section VI, there are two kinds of rejecters in participation. One is group rejecters who turned down the offer jointly as a group, and another is individual rejecters who decided not to participate while fellow members of the group participated. To examine the differences statistically, we use permutation tests of R's coin package with 100000 random draws from all admissible permutations.

We compare the group rejecters and group non-rejecters in the Appendix C. We find that the asset-poor households group-rejected in the Traditional arm (Table C6), while it is younger, recent flood victims who group-rejected in the non-Traditional arms (Table C7).

Given that all members reside on equally unstable river islands, we argue that flood shocks are random. If this is correct, the group rejection among non-Traditional arms will not affect estimates asymptotically. To the extent that asset-poor households of the Traditional arm have non-larger returns due to their inability to invest in heiffers, their group rejection can result in inflated asset values whcich causes underestimation of impacts of non-Traditional arms. We consider that it is lack of Upfront liquidity that prevented asset-poor households of Traditional arm from participating because they cannot purchase cattle due to insufficient net asset values or an insufficient resale value of owned livestock, when members of similar characteristics partcipated in non-Traditional arms.

[*26] An arm with traditional microfinance with in-kind (heifer) and managerial supports cannot be constructed, because a heifer price is more than the lending amount.

TABLE 3: INDIVIDUAL REJECTERS VS. NON-REJECTERS

	Traditional arm			non-Traditional arms			All arms		
variables	Not rejected	Rejected	*p* value	Not rejected	Rejected	*p* value	Not rejected	Rejected	*p* value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Head literate	0.095	0.161	(26.1)	0.133	0.068	(18.1)	0.127	0.100	(44.3)
Head age	38.848	36.258	(21.3)	38.000	39.732	(22.4)	38.145	38.494	(76.4)
Household size	4.181	3.645	(6.6)	4.270	3.932	(9.6)	4.255	3.833	(1.0)
Prop. of non-Trad arms							0.830	0.656	(0.0)
Flood at baseline	0.514	0.533	(91.9)	0.467	0.627	(2.4)	0.475	0.596	(3.5)
Household asset amount	1538	1360	(56.5)	1400	1174	(13.7)	1420	1226	(14.8)
Productive asset amount	1016	869	(71.7)	1521	804	(16.0)	1434	826	(16.8)
Livestock value	6095	3333	(28.4)	5619	3051	(15.3)	5700	3146	(8.5)
Number of cattle holding	0.305	0.167	(28.1)	0.281	0.153	(15.0)	0.285	0.157	(8.5)
Net asset value	11103	7761	(51.0)	8773	6580	(45.9)	9114	6921	(38.6)
NetBroadValue	12547	9001	(47.8)	9656	6634	(31.3)	10080	7317	(27.7)
Risk preference	115	123	(21.5)	109	118	(7.6)	110	120	(2.2)
Time preference 1	376	342	(25.0)	385	393	(70.1)	383	375	(66.0)
Time preference 2	485	492	(79.1)	495	489	(78.2)	493	490	(88.8)
Present bias	0.465	0.385	(44.4)	0.449	0.478	(69.8)	0.451	0.444	(95.0)
n	105	31	(rate 0.228)	511	59	(rate 0.104)	616	90	(rate 0.127)

Note: Individual rejecters are the members who did not accept a loan based on an individual decision after the period when group participation was decided. After 70 people group-rejected, the total number of individuals who was in a position to individually reject the loan was 706 people, of which 90 individually rejected. Traditional arm panel compares individual rejecters against non rejecters in the Traditional arm, non-Traditional arm panel shows the comparison in the non-Traditional arms, All arms panel shows the comparison in the all arms. Non-Traditional arms are Large, Large grace and Cattle arms. The variable Prop. of non-Traditional Arm is the ratio of non-Traditional arm members in individual nonrejecters and individual rejecters. Respective rejection rates are given in the brackets in the row n. *P* values are permutation test results using coin package of R with 100000 replications. See TABLE 1 for variable descriptions.

TABLE 4: CONTRASTING CATTLE ARM AND OTHER ARMS, BORROWERS AND NON-ATTRITING BORROWERS

	Borrowers			Non-attriting borrowers		
variables	Cattle arm	Other arms	*p* value	Cattle arm	Other arms	*p* value
	(1)	(2)	(3)	(4)	(5)	(6)
Head literate	0.172	0.110	(4.7)	0.150	0.113	(27.5)
Head age	37.642	38.325	(44.6)	37.973	38.226	(78.8)
Household size	4.166	4.287	(34.1)	4.102	4.285	(17.1)
Flood at baseline	0.463	0.479	(75.1)	0.459	0.484	(59.5)
Household asset amount	1623	1349	(1.3)	1657	1330	(0.5)
Productive asset amount	1083	1561	(40.1)	1105	1334	(45.9)
Livestock value	4444	6150	(15.7)	3425	6437	(1.6)
Number of cattle holding	0.222	0.308	(15.7)	0.171	0.322	(1.7)
Net asset value	5762	10287	(2.8)	5236	10152	(1.5)
NetBroadValue	7400	11017	(8.3)	7038	10691	(7.4)
Risk preference	109	110	(69.6)	108	109	(68.2)
Time preference 1	411	373	(0.6)	412	371	(0.5)
Time preference 2	512	486	(4.2)	515	486	(3.0)
Present bias	0.472	0.444	(54.7)	0.466	0.439	(59.5)
n	163	453	(rate 0.265)	147	407	(rate 0.265)

Note: Borrowers are members who accepted a loan, non-attriting borrowers are borrowers who stayed in the household survey until the final round. Borrowers panel compares the difference in participant characteristics between Cattle and other arms. Non-attriting borrowers panel compares the difference in non-attriting participant characteristics between Cattle and other arms. Ratios of Cattle arm members in respective groups are given in the brackets in the row n. *P* values are permutation test results using coin package of R with 100000 replications. See TABLE 1 for variable descriptions.

In the same way, we compare individual rejecters and individual non-rejecters for Traditional arm, non-Traditional arms, and all arms combined in Table 3.[*27] Traditional arm panel compares individual rejecters against non rejecters in the Traditional arm, non-Traditional arm panel shows the same comparison in the all non-Traditional arms combined, and All arms panel shows the comparison in the all arms combined.

As seen in Livestock value, Number of cattle holding, Net asset value, individual rejecters in both Traditional and non-Traditional subsamples tend to have less assets. While the differences between individual rejecters and non individual rejecters are not statistically meaningful due to small sample sizes in both subsamples, they become statistically unignorable when both subsamples are combined[*28]: In the All arms panel, the common factors associated with nonparticipation are a smaller household size (p = 1.3%) and smaller livestock holding (p = 9.3%).[*29] The variable Prop. of non-Trad arms is the ratio of non-Traditional arm members in individual nonrejecters and individual rejecters and shows individual rejection rate is higher under the Traditional arm (p = 0.1%).

The smaller household size of rejecters hints that cattle rearing may require a certain household size. To interpret, small households may be facing a domestic labour constraint or a space limitation to accommodate cattle under the roof.[*30, *31] We conjecture that the households under a binding domestic capacity constraint did not meet the conditions to raise cattle, and have withheld themselves from the program with an individual rejection. This self-selection may have caused the repayment rates to be higher than when everyone participated.

One of the few differences between the two subsamples is flood exposure: It is related to individual rejection only among the non-Traditional arm members. A strong correlation between baseline flood exposure and individual rejection among the non-Traditional arm members suggests that a population prone to natural calamity and associated asset shocks have voluntarily opted out the borrowing. This partly explains the lack of commercial and even noncommercial/NGO lenders in the flood prone areas.

Risk preference value indicates that individual rejecters tend to demand higher compensation for risks, and the p value becomes small enough only with entire sample of All arms. This suggests some individual rejecters are more risk averse than non rejecters, which is not surprising and validates our participation process being voluntary and free of strong peer pressures. Time preference value1, Time preference value2, Present bias all do not show statistically recognisable differences.

In Table 4, we compare if the Cattle arm participants (borrowers) differ from participants in other arms at the baseline. In the Borrowers panel, we compare all participants including attriters. Non-attriting borrowers panel compares the difference in non-attriting participant characteristics between Cattle and other arms. Non-attriting borrowers are borrowers who stayed in the household survey until the final round.

All partcipants of Cattle arm in the Borrowers panel differ from other arms in having less cattle rearing experience as observed in smaller initial cattle holding (p value = 15.7%) and in having lower net asset values (p value = 2.8%). Despite these disadvantageous features in rearing a heifer, the Cattle arm, which provides managerial supports and in-kind lending, induced partcipation.[*32]

[*27] As shown in Table C9, characteristics of individual rejecters are similar between Traditional and non-Traditional arms.

[*28] For example, net asset values have p values of 29.9% and 13.1% for both subsamples, which is reduced to 6.8% in the all arms sample.

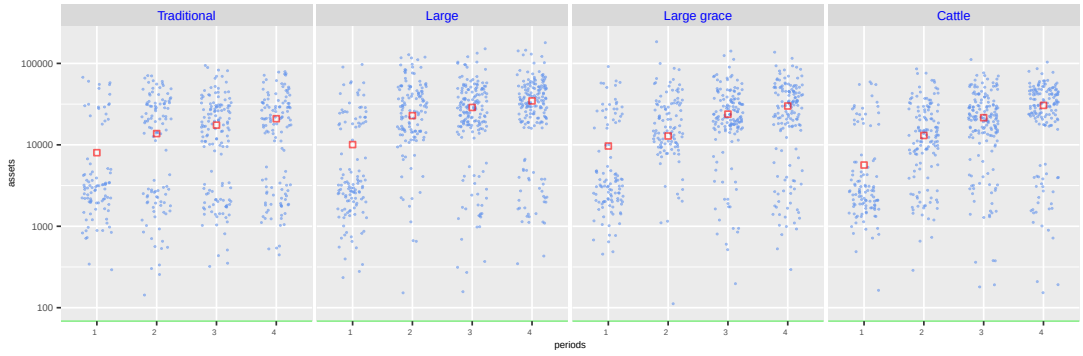
[*29] Flood at baseline also has a small p value but this arises only from the non-Traditional arms.

[*30] These constraints are expected to be absent in asset transfer programs where targeted residents can sell the asset if either of constraints binds.

[*31] Rejecters of non-Traditional arms have larger household size than the rejecters of Traditional arm. This result is consistent with the idea that the threshold of household size is higher than the Traditional arm because they invests more on cattle.

[*32] Household asset amount is larger but the total asset Net asset value is smaller in the Cattle arm. We also note Cattle arm borrowers show relative impatience as indicated in TimePrefVal1 (p value = 0.6%), TimePrefVal2 (p value =

FIGURE 4: NET ASSETS BY PERIOD



Source: Tabulated with survey data.

Note: Red squares are means of respective data. Vertical axis is in logarithms.

As we will see in Section VIII.3, the choice of lending instrument (cash or in-kind) does not matter in the investment choice. So it is natural to infer that the managerial support component has induced the members with less experiences and fewer assets to take up loans.

The Non-attriting borrowers examined in the right panel can be seen as successful borrowers. At the baseline, these successful borrowers of Cattle arm have smaller baseline livestock holding (p value = 1.7%) and smaller baseline net asset holding (p value = 1.5%) than other arms' successful borrowers. This hints that asset-poor, less experienced borrowers participated and managed to stay on the survey until the end of the study in the Cattle arm with a help of managerial supports. Combining the two panels indicates that the Cattle arm resulted in outreach to asset-poor households from the beginning to the end of the project.

VIII.2 Attrition

The survey resulted in the attrition (including the flood victims) of a moderate rate, 11.9%. We checked for systematic differences between attriters and nonattriters and found the attrition is not correlated with any household level characteristics (see more detailed attrition examination in Appendix D). We also found that Traditional arm attriters have a lower rate of head literacy while non-Traditional arm attriters have a higher rate of head literacy, are more exposed to the flood and have a larger household size. One can argue that, if the household head's literacy is positively correlated with economic impacts of borrowing, the impacts of borrowing *under no attrition* could have been smaller for the Traditional arm and larger for the non-Traditional arms. As we assume that the flood damage is random, these considerations of sample attrition hint that there can be underestimation, if any, because of possible overestimation of the Traditional arm and possible underestimatoin of the non-Traditional arms.

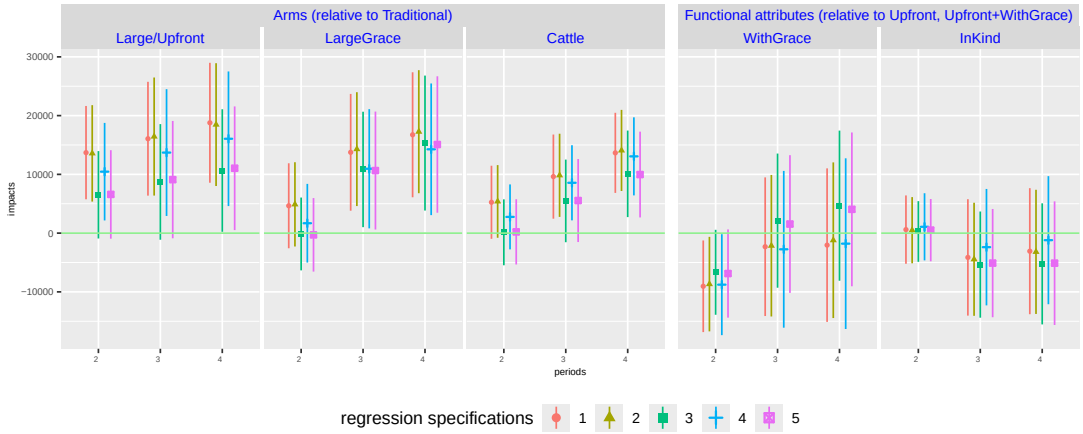
VIII.3 Impacts

VIII.3.1 Assets

In FIGURE 4, we show the time paths of net assets by arm in logarithms. Overall, we see increased levels of asset holding in all arms. We see bifercation of net asset holding into large and small values in all arms. At the start of the program, the majority is the small holders in all arms. As periods progress, we see large holders become the majority group in non-Traditional arms while the substantial small holders remain in the Traditional arm. The difference between Traditional arm and

4.4%). There is a chance that individuals with a weaker preference to save may have participated in Cattle arm.

FIGURE 5: EFFECTS ON NET ASSETS



Source: Estimated with survey data. Constructed from ANCOVA estimation results TABLE F1, TABLE F2.

Note: 1. Time-varying impacts on net assets, non-livestock assets (BDT), and cattle holding (counts). Net asset value = livestock asset value + non-livestock asset value - debt. In the left panel under Arms, Large/Upfront, Large grace, Cattle show impacts relative to the Traditional arm. In the right panel under Functional attributes, With grace shows impacts relative to Upfront, and In kind shows impacts relative to Upfront plus With grace. Large arm and Upfront functional attribute are numerically the same and are displayed in a single figure. Points indicate estimates, vertical bars indicate 95% confidence intervals using clustered standard errors. Clusters are the groups.

2. The regression specifications are: 1. Estimated without $\mathbf{x}_{it}$. 2. Estimated with $\mathbf{x}_{1it}$. 3. Estimated with $\mathbf{x}_{1it}, \mathbf{x}_{2it}$. 4. Estimated with $\mathbf{x}_{1it}, x_{3it}$. 5. Estimated with $\mathbf{x}_{1it}, \mathbf{x}_{2it}, x_{3it}$. $\mathbf{x}_{1it}$ is a vector of baseline demographic characteristics, $\mathbf{x}_{2it}$ is a vector of previous cattle rearing experiences and their interactions with treatment arms, and x_{3it} is number of owned cattle at the baseline.

non-Traditional arms are visually subtle and one must use statistical tests to examine differences.

FIGURE 5 summarises the time-varying impacts on net assets using the equation (2). See TABLE F1, TABLE F2 of Appendix F for full estimation results. Points are the estimates and vertical bars are 95% confidence intervals using clustered standard errors. For all panels, in each period, there are five estimation specifications bunched side-by-side. This is intended to show the robustness to specification changes at a glance.[*33] One sees that there is little variation across specifications.

There are three columns of arms on left, and two columns of functional attributes on right. Since Large arm and Upfront functional attribute are numerically the same in (2), they are put in one panel column. The left group panel under Arms shows the deviation from concurrent Traditional arm values, or how much the impacts relative to Traditional arm have evolved over time. In the right group panel under Functional attributes, With grace shows impacts relative to Upfront, and In Kind shows impacts relative to Upfront plus With grace.

There are three notable findings from the figure. First, point estimates show that all the non-Traditional arms have increased net assets over time relative to the Traditional arm. Time course of impacts may differ, however, all achieve similar impacts in period 4. Note also that the confidence intervals are narrowest in the Cattle arm. Given the sample size is the same, this hints that the Cattle arm may have contents that reduce the variations in asset returns relative to other functional attributes.

Second, it is the Upfront functional attribute that shows positive impacts on the net assets. This is consistent with the nonconvex production technology with fixed costs under a liquidity constraint, coupled with an inferior, smaller fixed cost production technology. TABLE F1 [specification (2)] in the Appendix shows that, relative to the traditional microfinance lending, the upfront liquidity provision increases the net assets by BDT 18783 [CI 8577, 28988] or 1.15σ (of the baseline standard deviation) by the fourth year (p value=0.03%). The grace period and in-kind loan with managerial supports

[*33] As multiple specifications are estimated to show uniformity of results, not to pick one specific estimate, inference corrections for multiple testing are unncessary.

do not add any marginal impacts beyond the upfront functional attribute (-2044 [CI -15109, 11022] or -0.13σ, p value=75.90% for grace period, -3077 [CI -13804, 7651] or -0.19σ, p value=57.38 for in-kind and managerial supports) by the fourth year. As we discuss in the robustness checks, these results hold when other various definitions of assets are adopted or other covariates are controlled for, including cattle rearing experiences.

Third, while InKind panel shows its marginal contribution is negative, it is statistically zero. The finding that the Cattle arm outcomes are statistically indistinguishable from other non-Traditional arms implies that it facilitated the returns to cattle rearing at a no lower level. In light of the fact that individuals with less cattle rearing experiences and lower asset values participated and continued in the Cattle arm, the returns at a no lower level by themselves are an achievement.

We interpret this as evidence of no entrepreneurship constraint once the borrowng is made. This is consisitent with the finding by previous studies that, on the greenfield population who had not been exposed to microfinance services, the returns are high across the board and there is no evidence of negative nor positive returns on skills in microfinance. In the current study, the population resides in a remote, rural area. This is not to imply that entrepreneurship has no role to play. As we saw in Section VIII.1, in terms of participation, supporting entrepreneurship may matter. Even the simpler production process of cattle rearing that consists of procuring feeds, grazing, insemination and calving turns out to demand unignorable codifiable skills or the crystalised intelligence for the asset-poor to participate. We show the returns to experience have not affected the outcomes in more details in VIII.4.[*34]

One of the reasons behind the difference in net asset impacts of non-Traditional arms relative to Traditional arm is the number of cattle holding. In Figure 6, we show the impacts on the subcomponents of net assets. The Cattle (counts) row shows the impacts on number of cattle owned[*35,*36]The figure shows that, on average, the non-Traditional arms continue to own about .4 more cattle than the Traditional arm members conditional on the initial cattle holding, although estimates are indistinguishable from zero for some arms and regression specifications. In the row of Net non-livestock assets, a similar pattern is found and non-Traditional arms accumulate about 5000 BDT larger net non-livestock assets (3830 BDT [1472, 6187] for Large, 6057 BDT [3579, 8535] for Large grace, 4856 BDT [2559, 7154] for Cattle) than the Traditional arm by period 4.

To gain insights on larger cattle holding among the non-Traditional members, we decompose the cattle ownership of each arms in Figure 7. Holder rates (HolderRates) are the number of cattle owners per arm size, holding size (HoldingSize) is average holding per owner, initial owners' holding (InitalOwnerHolding) are herd size in each period of owners who held cattle at baseline, and per capita holding (PerCapitaHolding) is mean cattle holding in each arm. Initial owner holding and holder rates reflect impacts on the intensive and extensive margins, respectively. Per capita holding tracks impacts on both the intensive margins (growth of initial owners) and the extensive margins (growth of new owners). All the indicators are similar across arms at the baseline.

We see that the holder rates increased, or the extensive margin "impacts" were positive, in all arms, although the increase was smallest for the Traditional.[*37] This shows that, even the small upfront lending of Traditional arm helped increase catte ownership but to a lesser degree. With no large upfront liquidity provision and the repayment pressure that begins immediately after the

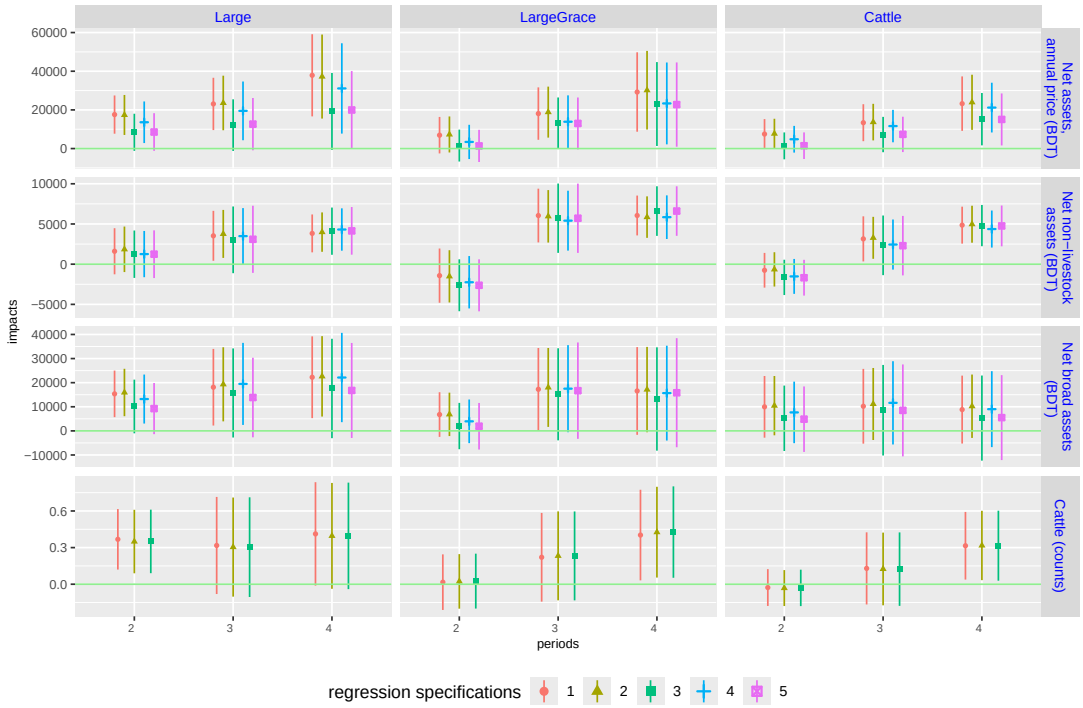
[*34] An alternative interpretation is that the smaller variations of impacts, not the codifiable skills or managerial support programs *per se*, among Cattle arm borrowers mentioned earlier can induce more risk averse individuals to participate. Under this self-selection process, we should end up with more risk averse individuals in Cattle arm. However, this is not the case as participants of Cattle and other arms do not differ in what is measured by Riks preference value.

[*35] This also serves as a check that non-Traditional members actually own cattle once the loan is made, which is affrimative in all arms.

[*36] The ANCOVA estimates plotted in the figure are net of baseline cattle holding, so even the non-traditional holding estimates sometimes add up to less than 1.

[*37] To be precise, increases of cattle holding is not an impact estimate, so we are abusing the terminology.

FIGURE 6: IMPACTS ON VARIOUS ASSET MEASURES



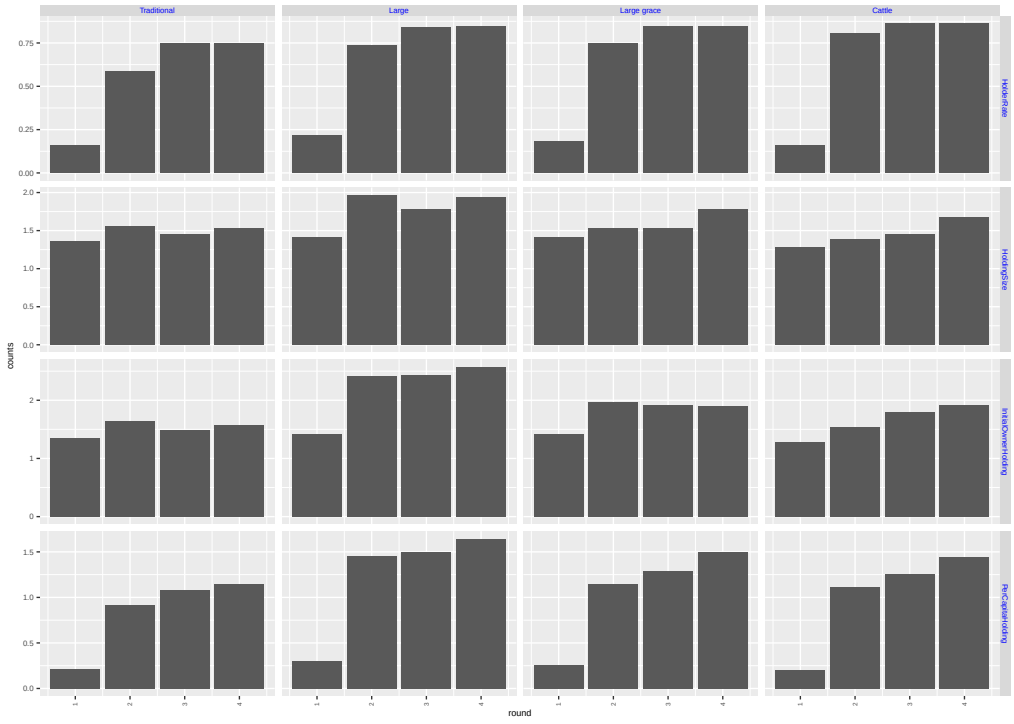
Source: Estimated with survey data. Results are from TABLE F1, TABLE F7, TABLE F4, TABLE F3.

Note: Time-varying impacts on net assets evaluated with annualised price, net broad assets, non-livestock assets (BDT), and cattle holding (counts). Net asset value = livestock asset value + non-livestock asset value - debt. Net broad assets use all asset items, net assets in our main results only use asset items appearing in all rounds. Net assets, annual price uses annual median price for livestock evaluation while Net assets uses median price of all rounds. Columns of Large, Large grace, and Cattle show impacts relative to the Traditional arm. 4th and 5th regression specifications use baseline cattle count and baseline cattle ownership dummy variable as covariates, hence they are omitted from impacts on Cattle (counts).

disbursement, a smaller fraction of borrowers could purchase their first cattle. HoldingSize increased in all non-Traditional arms, while the Traditional arm remained stagnant. In InitialOwnerHolding, it is also the Traditional arm that has the smallest, or negligible, changes between round 1 and 4. For the non-Traditional arm, InitialOwnerHolding size is larger than the average holding size per owner, hinting the higher returns to members with experiences, or on the intensive margins. However, as we see in Section VIII.4, this conjecture is not supported in a formal test of return to cattle ownership at baseline. The per capita holding growth was smallest in the Traditional arm. This is due to smaller changes on the extensive margins (fewer new ownership, smaller growth by new owners) and little change on the intensive margins (negligible growth by initial owners).

To understand the reasons behind the slower pace of asset accumulation of Traditional arm, in FIGURE 8, we plot the contents of first IGAs of members. The first IGA is defined as the oldest IGA for the household. For most of the households, the oldest IGA had started after the baseline, and it is the IGA with the largest cash flow. Of course, there is a small percentage of households with an existing IGA before the baseline, but, with randomisation, the fraction of such households are similar across arms. Therefore, the between arm comparison of the first IGA gives us an idea about how the households had chosen the initial investments. In the Traditional arm, there are 33 borrowing members (30.28%) who report cattle as their first IGA, and 76 borrowing members (69.72%) who report other than cattle as their first IGA. This contrasts with the non-Traditional arms that 466 borrowing members (94.91%) who report cattle as their first IGA and 25 borrowing members (5.09%) other than cattle as their first IGA. Correspondingly, the data confirms that the Traditional arm borrowers hold a diversified IGA portfolio while only a small minority of non-Traditional arm borrowers have

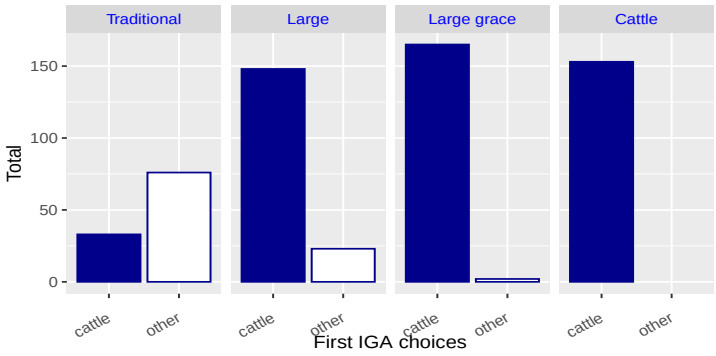
FIGURE 7: CATTLE HOLDING BY ARM



Source: Household survey data.

Note: HolderRate is the ratio of cattle owners in each arm, HoldingSize is average holding per owner, InitialOownerHolding are average holding per owner who held cattle at baseline, and PerCapitaHolding is cattle owned per arm member. InitialOownerHolding and HolderRates show impacts on the intensive and extensive margins, respectively. PerCapitaHolding shows the time trend in mean cattle holding.

FIGURE 8: CONTENTS OF FIRST IGA



Source: Administrative data, based on the information reported at the weekly meeting. Only borrowing member data are shown.

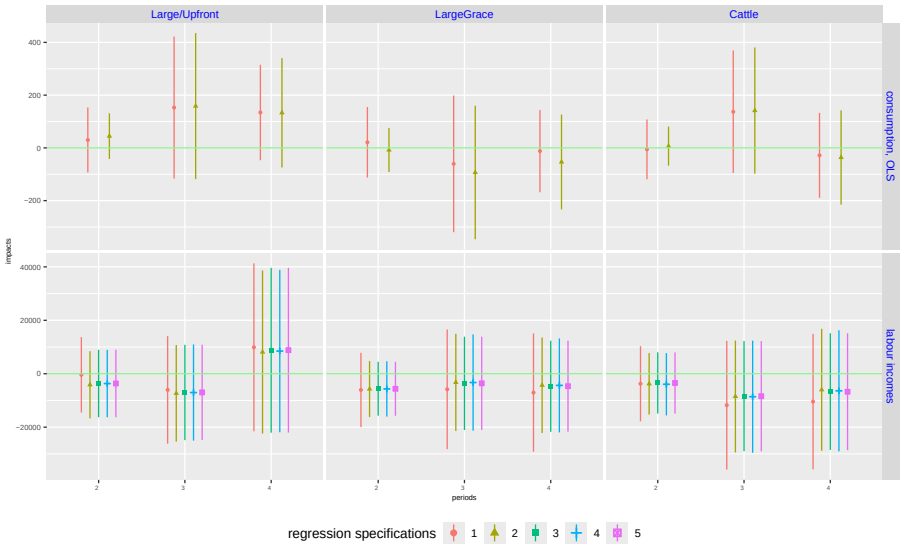
Note: Contents of IGAs are cattle, goat/sheep, growing cereals (paddy, corn) and nuts, small trades, and house and land leasing. The first IGA is defined as the oldest IGA for the household. Colour-filled bars are the cattle rearing, white bars are the sum of all other projects.

a diversified portfolio.[*38] One may wonder why so little of Traditional members invested in cattle. This may be due to our experiment design that requires them to start repay immediately after the loan disbursement, so they did not have an option to save the cash for three years to invest in a heifer.

The results of WithGrace panel in FIGURE 5 show that the saving constraint is not binding. We note that this only tells that it did not bind additionally on top of Upfront functional attribute, and does not directly speak to the constraint faced by Traditional arm. The fact that the Traditional arm members invested in smaller assets or smaller trades hints that the saving constraint was binding for them

[*38] As observed earlier, a stagnant growth of InitialOownerHolding indicates the Traditional arm initial owners diversified their portfolio rather than increasing the cattle investments.

FIGURE 9: PER CAPITA CONSUMPTION AND EFFECTS ON LABOUR INCOMES



Source: Constructed from results of OLS for consumption and ANCOVA for labour incomes. TABLE F14, TABLE F18.

Note: Per capita consumption is a total of food, hygiene, social, and energy expenditure divided by the number of household members, expressed as the annuaslied values in BDT. In-kind consumption of home made products is imputed at median prices. Labour income is total labour incomes of household in BDT. Changes in per capita consumption is considered unrelated to baseline cattle ownership under our assumption, so only two regression specifications are estimated. Baseline cattle ownership may be related to changes in labour income when baseline cattle ownership brings in heterogenous returns on investments that change the cashflow to the household, so all specifications are estimated. See also the footnotes of FIGURE 5.

before the program began. The puzzle that the Large arm members, who were also asked to repay immediately, invested in cattle can be understood by the difference in self-selection process. At the baseline, Large arm's household size is larger, cattle owner rate is higher, and net asset values are greater (see TABLE 1), all of which indicate wealthier individuals who might have cash for repayment. Although their p values are all large (TABLE B1), one may still speculate if the less wealthy individuals could have invested in a heifer without a grace period.

VIII.3.2 Consumption and labour incomes

FIGURE 9 shows impacts on per capita expenditure of the household[*39] and household labour income which sums the earnings from casual jobs.[*40] Consumption is not measured at the baseline, so we use the OLS, not ANCOVA, estimator. Labour income impacts use the ANCOVA estimator.[*41]

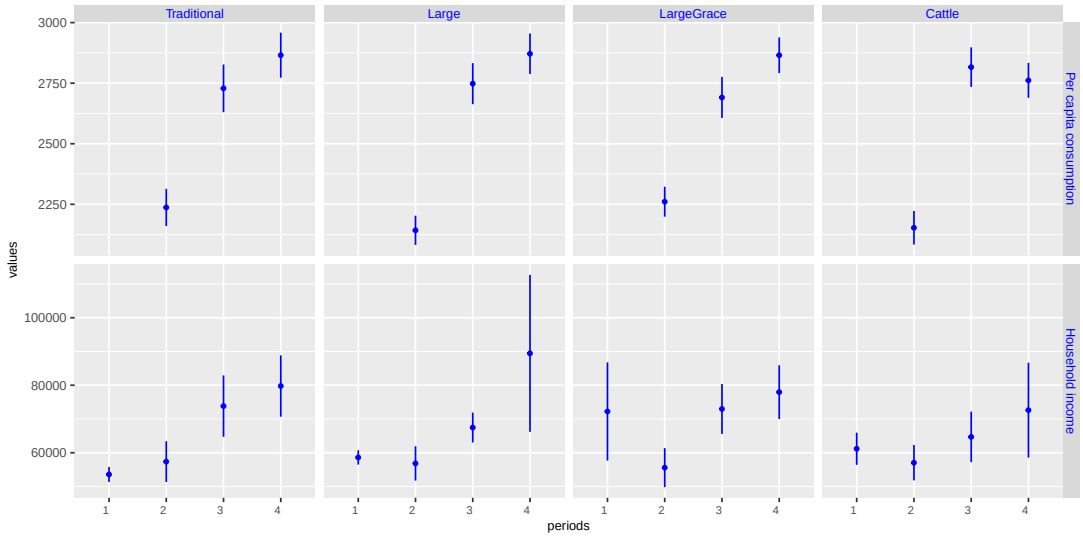
Consumption does not seem to be particularly different between all arms. Labour incomes also do not show any impact by the arm relative to the Traditional arm. These imply that the borrowing and its repayment do not seem to affect the household welfare in terms of consumption, nor the

[*39] Consumption is based on the annualised expenditure on following items: rice, wheat, maize, potato, lentil, other pulses, other staples, chicken, other meat, fish, milk, egg, chili, stem, carrot, leafy vegetable, other vegetable, banana, seasonal fruits, other fruit, puffed rice, onion, pgarlic, ginger, oil, sugar, salt, hard spices, soft spices, tea, bettle, other drinks, biscuit, cigarette, chew tobacco, transport, fuel wood, cloth, soap, haircut, cosmetic, communication, festivities, mosque related, contraceptive, wedding/funeral, other. It focuses on daily consumption, while education, health, housing, maintainance and other productive (livestock, farming) expenditures are not included.

[*40] Results do not differ if we use per capita labour incomes because household size stays stable.

[*41] Changes in per capita consumption is considered unrelated to baseline cattle ownership under our assumption, so only two regression specifications are reported. Other specification results are similar and are available from authors. Baseline cattle ownership may be related to changes in labour income when baseline cattle ownership brings in heterogenous returns on investments that change the cashflow to the household, so all specifications are estimated.

FIGURE 10: MEAN PER CAPITA CONSUMPTION AND LABOUR INCOMES BY ARM AND PERIOD



Source: Survey data.

Note: Points indicate means, vertical bars indicate 95% confidence intervals. Per capita consumption is an annualised total of food, hygiene, social, and energy expenditure in BDT divided by the number of household members. In-kind consumption of home made products is imputed at median prices. Household labour income is annual labour income of household in BDT.

repayment efforts as measured by earned labour incomes. As the wealth effects of asset accumulation and the repayment pressure work in the opposite directions on consumption, this may not be a surprising result. No impacts on labour incomes are also not surprising. There are only a limited number of casual jobs on the river islands, and jobs on mainland are less lucrative due to costs of boat ride and commuting time. These, at least, suggest that the borrowers of non-Traditional arm are not under an extra heavy repayment burden relative to the borrowers of Traditional arm.

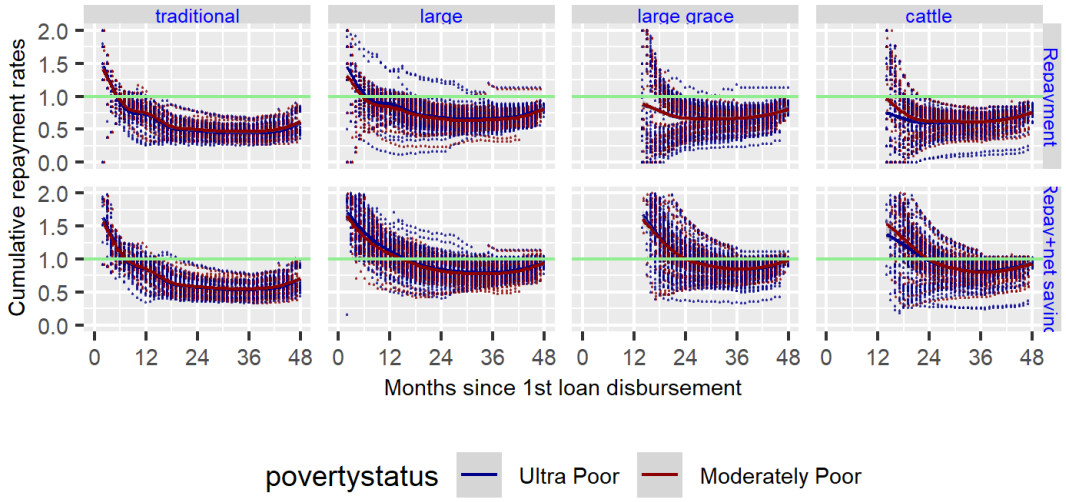
To understand the welfare levels, in FIGURE 10, we plot the mean consumption and incomes by arm and period. We see that, in all arms, per capita consumption in period 3 and 4 increased relative to period 2. Given this is also observed in the Traditional arm, we do not detect marked difference relative to it in OLS. The labour incomes are increasing from period 3. Non increasing per capita consumption between periods 3 and 4 despite the growth in labour incomes suggest that households seem to have put asset accumulation and repayment a priority before consumption growth.[*42] It just does not show up in the impact estimates because members of all arms are behaving the same way. This also indicates that the borrowers did not choose to strategically default but tried to repay.

VIII.3.3 Repayments

FIGURE 11 shows the repayment results. Top panel shows the ratios of cumulative repayment to cumulative planned installment, the bottom panel further adds the cumulative net saving (saving - withdrawal) to the numerator to indicate the total cash amount in the member's account. Both are plotted against weeks after first disbursement. Each dot represents a member at each time point. Value of 1, which is given by a horizontal line, indicates the member is at per with repayment schedule. Some members repaid or saved more than the required amount that go beyond 1 in the figure. One sees that the repayment rates are above 1 at the beginning but stay below 1 for most of the time. The majority of borrowing members did not repay the loan by the 48th month with

[*42] One notes that the labour income both in per capita or household total are lowest in period 2 for all non-Traditional arms, second lowest for the Traditional arm, and start increasing from period 3. The fall in period 2 income is due to the floods as the demand for labour plummeted. Similarly, NGO members suggest that period 2 consumption is lower than period 3 and 4 because of flood damages.

FIGURE 11: CUMULATIVE WEEKLY NET REPAYMENT RATES



Note: Each dot represents weekly observations. Only members who received loans are shown. Each panel shows ratios of cumulative repayment against cumulative due amount, sum of cumulative repayment and cumulative net saving (saving - withdrawal) against cumulative due amount, against weeks after first disbursement. Lines are smoothed lines with a penalized cubic regression spline in ggplot2::geom_smooth function, originally from mgcv::gam with bs='cs'.

prespecified installments. One notes the Traditional arm has more of lower repayment rates among all arms.

When a member does not reach the due amount with installments, they had to repay from the (net) saving, an arrangement to which the lender and the borrowers made at the loan contract signment. Repayment rates at the end of period 4 after using net saving are 44.71, 93.57, 97.01, 95.42%, respectively, for traditional, large, large grace, cow arms, 87.85% for overall, and 95.32% for the average of non-Traditional lending arms. The overall repayment rate is comparable to the two microfinance programs with repayment rate information 74% and 99% examined in Banerjee et al. (2015a), and the non-Traditional lending has exceptionally high repayment rates. The low repayment rates among Traditional arm borrowers may be due to our experimental design that a new loan is disbursed unconditionally up to three cycles, lacking the dynamic incentives to repay, or due to the fact that they had lower returns on their investments. Our finding of growing labour incomes and the steady consumption levels in the subsection VIII.3.2 indicates the latter possibility is more likely.

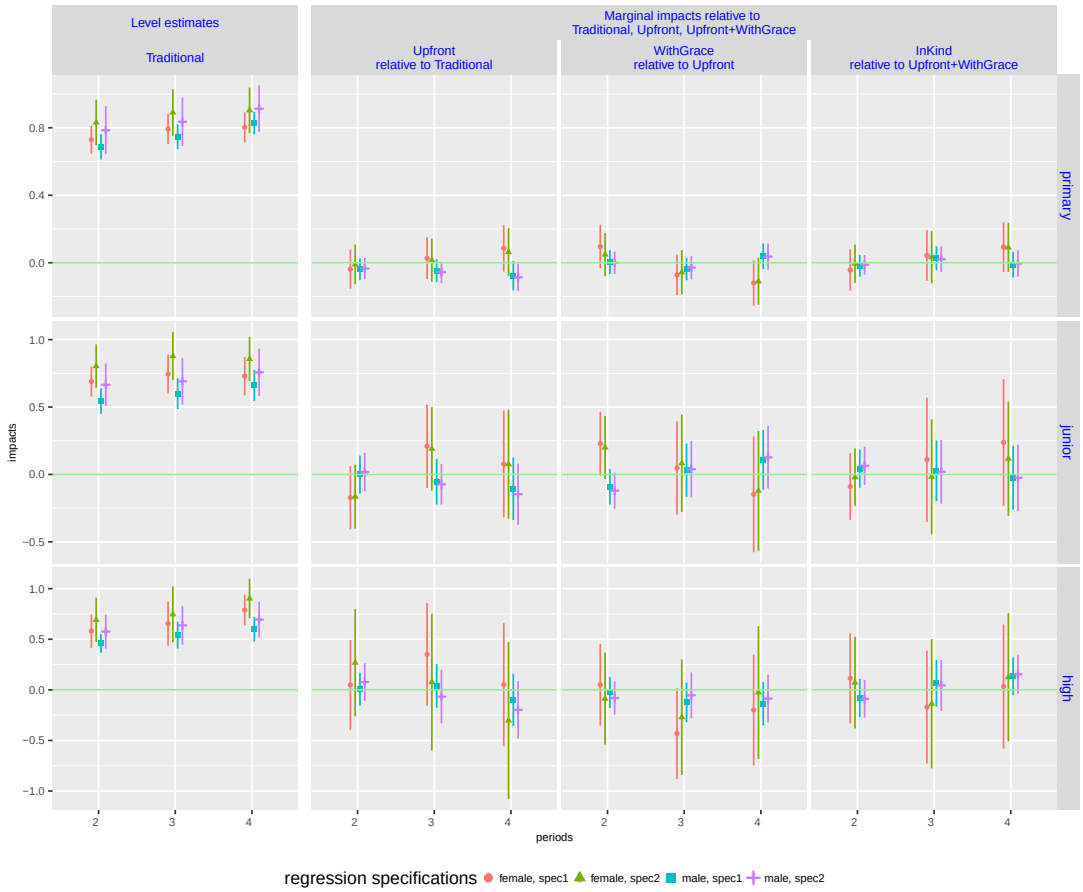
There is little difference in repayment rates by poverty class. FIGURE 11 depicts both moderately poor and ultra poor in different colours. It is impossible to distinguish between them with eyeballs, and ANCOVA estimates on repayment and repayment shortfall also confirms this (see Appendix F.4, TABLE F8, F9 for details). Permutation tests also confirm that cumulative shortfall of repayment relative to cumulative planned installments are similar between the ultra poor and the moderately poor (p value=68.16%, 34.11%, 41.95%, 35.28% for loan year 1, 2, 3, and 4, see TABLE E1).

Smaller cumulative impacts and lower repayment rates of Traditional arm members stand out once we acknowledge that they are receiving an equivalent amount and their contract differs with other arms only in the functional attributes we focus on. These differences arise partly from the different investment choices observed in FIGURE 8, which were induced mostly by the lack of Upfront functional attribute in lending.

VIII.3.4 Schooling

In Section VIII.1, we observed that nonparticipation is correlated with smaller household size. If the household size limits the participation to microfinance, we may observe adverse impacts of borrowing on the children's school enrollment. In FIGURE 12, the effects on child school enrollment are displayed. Unlike the previous figures, we show per period impacts relative to the concurrent

FIGURE 12: PERIOD WISE EFFECTS ON SCHOOLING BY FUNCTIONAL ATTRIBUTE



Source: Constructed from ANCOVA estimation results TABLE F10, TABLE F12.

Note: Per period impacts ($\boldsymbol{b}_{3k}$ for period 3 and $\boldsymbol{b}_{4k}$ for period 4). The left most column shows schooling level of Traditional arm. The right three columns show marginal impacts of each functional attributes. Upfront shows impacts relative to the Traditional arm, With grace shows impacts relative to Upfront, and In Kind shows impacts relative to Upfront plus With grace. Each rows are grouped into primary, junior, and high school levels. See also the footnotes of FIGURE 5.

Traditional arm values. [*43]

There is a possible negative impact for boys at the primary level in period 3 and 4 with the Upfront functional attribute. Point estimates on boys are mostly negative for other school levels with this functional atttribute, yet none of them are precisely estimated. Estimates on girls switch signs across specifications and arms. They have wider CIs than boys that include zero in their CIs, so they are incoherent, but a few estimates have reasonablly low p values. Negative impacts of boy's schooling may be due to a stronger household labor demand derived from increased cattle production in a household. This is in line with the finding in program rejection that the limited household size can be a constraint on participation. Cattle ownership naturally shifts the relative shadow prices in a household against child schooling, and the cattle rearing tasks are not so brawn intensive enough that even the primary school aged boys can handle. This may be a potential downside of having greater cattle production in a household. The estimated impacts on primary school aged boys range from -9

[*43] We chose to show per period impacts because annual enrollment status matters in schooling. Using estimated parameters of (2), what we display in FIGURE 12 are the per period impacts ($\boldsymbol{b}_{3k}$ for period 3 and $\boldsymbol{b}_{4k}$ for period 4), not the cumulative impacts ($\boldsymbol{b}_{2k}+\boldsymbol{b}_{3k}$ for period 3 and $\boldsymbol{b}_{2k}+\boldsymbol{b}_{4k}$ for period 4). Results are less pronounced under time-varying impact estimates and WithGrace and InKind have positive impacts. This may be that having a grace period allows households to hire labour, in place of sons, for cattle rearing. See FIGURE F1 and FIGURE F2 in Appendix F.

to -8 percentage points, which amounts to -10.5 to -9.3 percent of the period 4 mean enrollment rate of Traditional arm students at 83 percent.

VIII.3.5 Summary of impacts

In summary, we found that our managerial support programs induce the members of disadvantaged background to participate in microfinance, achieving the farther outreach, and have the impacts that are no different with other borrowers. We also found their repayment rate is comparable with other treated arms and are higher than the regular microcredit arm. This is consistent with the finding of the previous studies that a certain level of skills is necessary for participation, and our managerial support progams supplemented the lack thereof. We found that the large upfront disbursement allows borrowers to invest in cattle while members with sequential disbursements mostly opted for smaller livestock and small trades. In combination with a greater return to cattle measured by net asset accumulation and a greater rate of loan repayment, we consider it as evidence of a poverty trap and an effective measure to break it. One condition for taking up a larger loan size is a household capacity that accommodates cattle rearing, in terms of household labour and/or a space to house the livestock. Consistent with such interpretation, we find lower enrollment rates of boys at primary school ages in later periods, which is likely to arise from the increased labour demand by households.

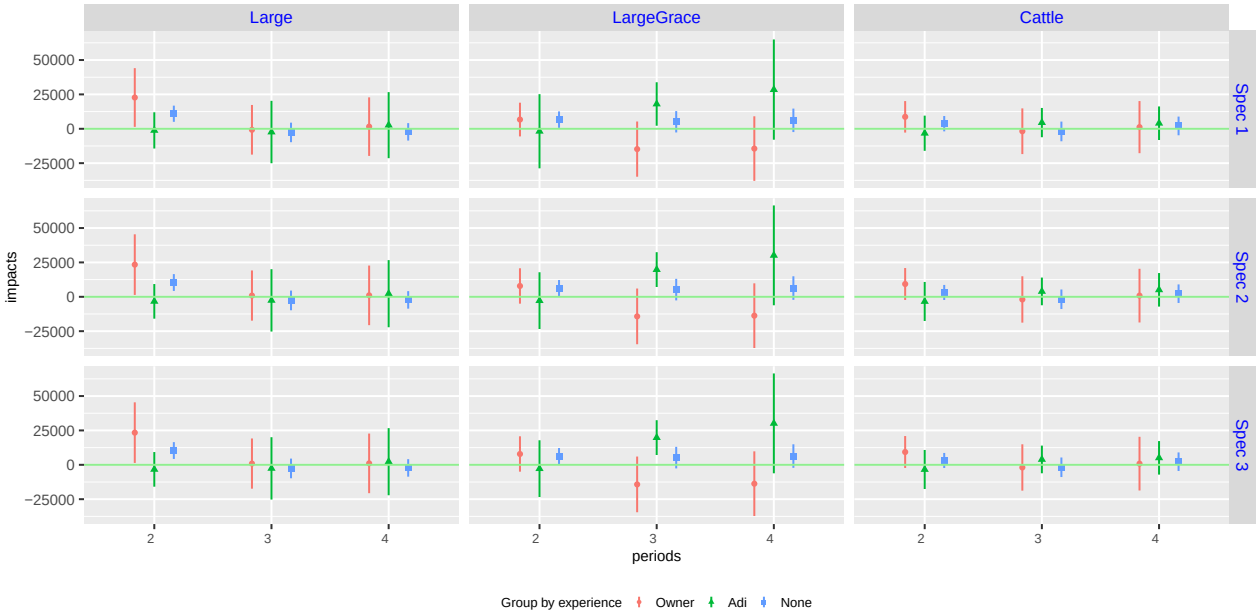
VIII.4 Robustness checks

The previous literature has shown that returns to lending are higher for the borrowers with business experiences (Banerjee et al., 2015a). To check if the same can be found in our experiment, we divide the subjects into three groups of different cattle rearing experiences at the baseline: Owner group, defined by the cattle ownership, Adi group, defined by no cattle ownership but having an experience with cattle lease contracts (called *Adi*) within three years prior to the baseline, and None group who has neither of the two. In Figure 13 and Figure 14, we show how impacts on the net assets and cattle holding differ by the experience group. Net asset results in Figure 13 do not show differences by experience except for Adi group of Large grace arm. Cattle holding results in Figure 14 show that the Owner group has the largest point estimates in both outcomes under the Large/Upfront and Cattle treatments, followed by the None group, and virtually no impact among the Adi group. The Owner group estimates are mostly larger than None group estimates yet the CIs are wider. This is due to smaller sample size of Owner group, which is precisely the problem of the area that motivated this study.

Consistent with the previous literature, there are some cases of higher returns to microfinance among the members with previous cattle rearing experience through ownership in cattle holding, and also though leasehood for net assets, although these differences do not have low p values. We also find the returns among the members with no previous experience are smaller yet not statiscally zero in some cases. In particular, when we choose cattle holding as an outcome in Figure 14, Cattle arm has a statistically meaningful impact even among the None group, which is consistent with our main finding that the managerial support program may have helped them in participating and sustaining the level of returns.

We also ran a robustness check over the choice of asset concepts by using various measures of net assets in Figure 6: Net broad assets which we include all other household assets that are observed in certain rounds of surveys, Net assets, annual price which we use annual median price of cattle in computing the livestock values in net assets, Net non-livestock assets which we drop livestock values from net assets, and Cattle which is the number of cattle holding. In the Appendix Figure F4, we show the time paths of various assets by arm. The dynamic patterns of asset accumulation is

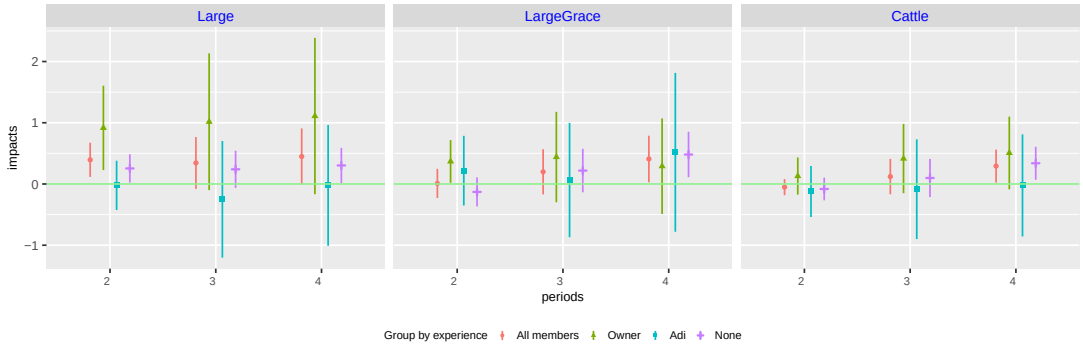
FIGURE 13: IMPACTS ON NET ASSETS RELATIVE TO TRADITIONAL ARM BY EXPERIENCE



Source: Estimated with survey data. TABLE F20.

Note: Rows indicate regression specifications 1, 2, and 3. Columns indicate impacts of each arms relative to the Traditional arm. Owner is a group who holds cattle at the baseline, Adi is a group who has an experience of lease-in cattle contract at the baseline, and None are all other individuals. There are 141 members who owned cattle at the baseline, 112 members who ever practiced Adi at the baseline, and 523 members who have no experience in cattle rearing. See also the footnotes of FIGURE 5.

FIGURE 14: IMPACTS ON CATTLE HOLDING RELATIVE TO TRADITIONAL ARM BY EXPERIENCE



Source: Estimated with survey data. TABLE F24.

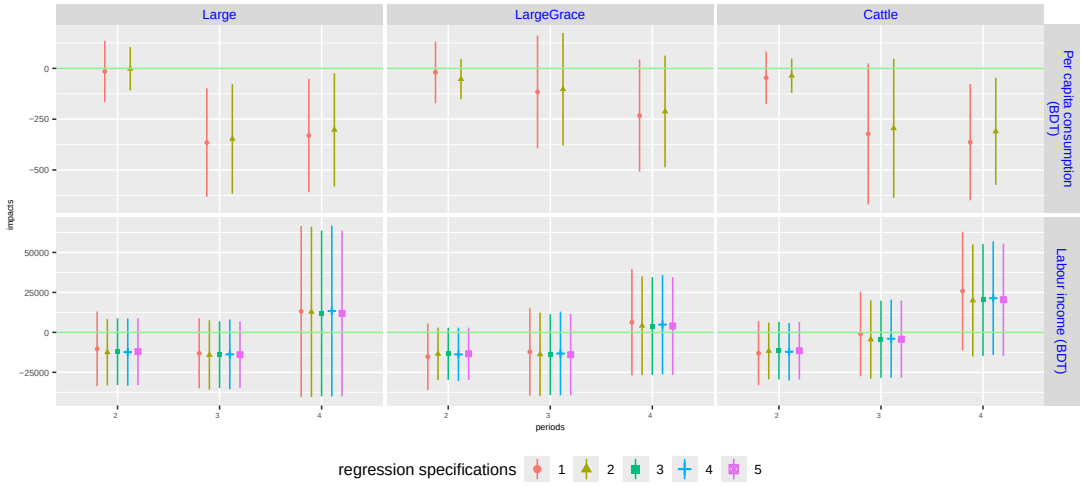
Note: Estimates from OLS. We can not obtain ANCOVA estimates for Adi or None subsamples because they did not own cattle before the program began. See also the footnote of FIGURE 13.

similar to Net assets of FIGURE 4.[*44]

As expected, all asset measures show similar impact patterns. Net broad assets show a similar pattern as in the Net assets. However, the standard error bars cross zero in round 4 for some specifications, possibly because of larger noises in computing the values as some asset items are observed only in certain rounds.

[*44] Asset values are expressed in BDT. Net assets=total assets - debts. Debts include outstanding loaned amount of the experiment. Total assets use items observed in all 4 rounds of household surveys. Net non livestock assets=net assets-livestock asset values. Number of cattle is a headcount of cattle holding.

FIGURE 15: CONSUMPTION AND LABOUR INCOME IMPACTS OF THE ULTRA POOR RELATIVE TO THE MODERATELY POOR



Source: OLS estimates for consumption impacts and ANCOVA estimates for labour income impacts using administrative and survey data of TABLE F30.

Note: Impacts of ultra poor members - impacts of moderately poor members of the same arm. See also the footnotes of FIGURE 5.

We examined if the impacts differ by poverty class. The impacts on net assets, net non-livestock assets, cattle holding are not statistically different between the poverty classes (see FIGURE F3 of Appendix F.9). However, we find negative impacts on consumption for the ultra poor relative to the moderately poor in Large and Cattle arms in period 3 and 4, while labour incomes are not affected (FIGURE 15). This hints that the repayment efforts may have resulted in consumption suppression for the ultra poor borrowers. To help smoothing the repayment burden of the ultra poor borrowers over time, an option of a longer maturity or a longer pre-disbursement period to accommodate larger saving build up may induce their loan take up. We observe that the ultra poor are more likely to experience cash shortfall, however, their repayment rates are no lower. This is another evidence of repayment discipline that the ultra poor borrowers put repayment before consumption.

IX Conclusion

Conclusion

- Upfront liquidity increases asset holding and repayment rates.
  - Despite widely believed fears of inefficiency due to information asymmetry.
  - The ultra poor are not different from the moderately poor.
  - Caveat: Remote rural setting. Simpler production and no strategic default.
- Lending uptake of the ultra poor is impeded by small household size, asset shocks, and a lack of supports for managerial capacity.
- If these are relaxed, a poverty trap may be overcome.
  - Goat-Cattle is an example of a poverty trap. Cattle has higher returns with lower risks, resulting in higher repayment rates, but also has larger initial fixed costs.
- Consumption of the ultra poor was smaller than the moderately poor in the same arm towards the end of repayment. Their net asset accumulation is slower during the grace period.
  - Consumption and labour incomes at the arm level were not affected relative to the Traditional arm.

- An option of a longer saving period or maturity is recommended for the ultra poor.
- Schooling of primary school aged boys was negatively affected in later periods.

The poverty reduction impacts of microfinance was a firm belief in the early days of microfinance. Yet its outreach is slow and the returns are modest. In this study, we examined the role of upfront liquidity, a grace period, entrepreneurship in leaping benefits.

This study employs a stepped-wedge design of multiple arms to isolate different functional attributes of loan contracts: Upfront liquidity, a grace period, and in-kind loan with management supports. These functional attributes are intended to relax various constraints in productive investsments by the poor: A liquidity constraint, a saving constraint, and an entrepreneurship constraint. Only the upfront disbursement matters in all outcomes, which signifies the importance of a liquidity constraint. With evidence that borrowers with upfront liqudity arms invested in cattle while the borrowers under incremental lending invested in multiple, smaller projects, and the repayment rates are higher for the upfront liquidity arms, we conclude that there is a poverty trap which cannot be overcome by the traditional approach of microfinance. Under the study's setting, escaping from the poverty trap requires upfront disbursements, not incremental as practiced by the majority of microfinance institutions. In addition, lending rather than a transfer may suffice to support the transition.

We showed, under the rural setting in the context of cattle production, experiences or entrepreneurship does not affect the mean outcomes. This is in contrast to other microfinance impact evaluations that show returns to experiences and skills. While impacts are no different, managerial supports induced participation of smaller asset holders and achieved less variable returns on investments. This implies that managerial supports can invite more disadvantaged prospective borrowers without adversely affecting the outcomes. Our impacts are large across the board, and there is no returns to entrepreneurship nor experiences, which are all consistent with the previous studies of greenfield population who are not exposed to microfinance that show inherently greater impacts than the intensive margins (Cull and Morduch, 2018; Buera et al., 2020).

We have witnessed that a binding domestic capacity constraint may impede potential borrowers from participation. This limits the potential benefit of large, upfront lending. Consistent with this, we have seen negative impacts on schooling of primary school aged boys. While it in unclear why the outsourced labour cannot substitute the domestic labour, one can organise an arrangement in each group, tended by the group members, to collectively graze the cattle during the daytime. This partly eases the domestic labour and/or space constraints faced by small households.

We observed a grace period does not result in differences in mean outcomes. At the mean, a saving constraint does not bind. However, in targeting the ultra poor, we find slower net asset growth during the initial period and negative consumption effects toward the end of repayment, which we interpret as a binding saving constraint. This suggests that giving an option of a longer saving period prior to lending and/or a longer maturity, may be necessary for the ultra poor. At the same time, we find the asset impacts of the ultra poor are no different from the moderately poor borrowers of the same arms. This validates that the production opportunity is no inferiror for the ultra poor individuals.

We note that our study site is rich in rainfall, giving more advantages to cattle production over sheep/goat production. In contrast, if the climate is more arid, sheep and goats are better suited because of less water logging and their greater viability in relying on natural grass. This raises a concern that our results may not directly transferrable to more arid areas. However, one of the the key lessons from the study is the presence of fixed inputs in scaling the herd size. While sheep/goats are easier to scale than cattle, it will require larger land and roofed facilities at some point as one increases the herd size. This can effectively form nonconvexity in the production set, and large enough finance may allow herders to go pass the threshold.

We have seen that borrowers accumulated assets but did not increase consumption. This is consistent with a high morale of repayment, which can partly be explained by the lack of alternative lenders in the study area. With stronger incentives to repay, the evidence on stronger repayment

discipline of large sized arm members need not generalise to the areas outside the study site. On the other hand, the necessity of codifiable knowledge in participation even for a simple production process and the scope for escaping the poverty trap with large, upfront lending may be generalisable to other rural areas with liquidity constraints.

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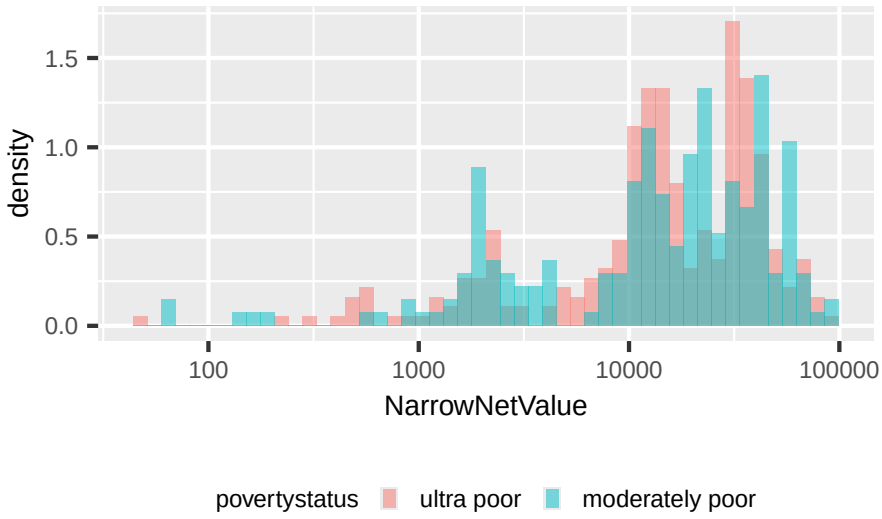
A Data description

FIGURE A1: NET ASSET VALUES AT BASELINE



Source: Survey data.

Note: Net asset values = total gross asset values - debt outstanding. Debt outstanding takes the value of the month immediately after the respective survey round interview.

TABLE A1: NUMBER OF OBSERVATIONS BY BORROWER STATUS AND ARM

	(a)		(c)	(d)	(e)	(f)
File	BStatus	traditional	large	large grace	cattle	Sum
Schooling	borrower	101	224	205	183	713
	individual rejection	23	9	16	41	89
	group rejection	54	13	17	0	84
	rejection by flood	27	0	13	11	51
	Sum	205	246	251	235	937
Repayment	borrower	85	171	167	153	576
	individual rejection	31	9	13	37	90
	group rejection	40	20	10	0	70
	rejection by flood	20	0	10	10	40
	Sum	176	200	200	200	776
Asset	borrower	85	171	167	153	576
	individual rejection	30	9	13	37	89
	group rejection	39	20	9	0	68
	rejection by flood	20	0	10	10	40
	Sum	174	200	199	200	773
Livestock	borrower	85	171	166	152	574
	individual rejection	30	9	13	37	89
	group rejection	40	20	0	0	60
	rejection by flood	20	0	10	10	40
	Sum	175	200	189	199	763
LivestockProducts	borrower	85	171	167	153	576
	individual rejection	30	9	13	37	89
	group rejection	40	20	10	0	70
	rejection by flood	20	0	10	10	40
	Sum	175	200	200	200	775
LabourIncome	borrower	85	171	167	153	576
	individual rejection	30	9	13	37	89
	group rejection	40	20	10	0	70
	rejection by flood	20	0	10	10	40
	Sum	175	200	200	200	775
FarmIncome	borrower	9	38	24	23	94
	individual rejection	2	0	0	2	4
	group rejection	0	8	0	0	8
	rejection by flood	1	0	0	0	1
	Sum	12	46	24	25	107
Consumption	borrower	84	166	166	152	568
	individual rejection	27	9	11	33	80
	group rejection	39	19	0	0	58
	rejection by flood	18	0	0	10	28
	Sum	168	194	177	195	734
OtherBorrowing	borrower	169	336	332	304	1141
	individual rejection	57	18	24	70	169
	group rejection	79	40	10	0	129
	rejection by flood	38	0	10	20	68
	Sum	343	394	376	394	1507

Source: Survey data.

Note:

B Randomisation checks

TABLE B1: PERMUTATION TEST RESULTS

Variables	*P* values (%)			
	Traditional	Large	LargeGrace	Cattle
HeadLiteracy	30.0	56.1	92.0	92.0
HeadAge	98.8	98.8	94.2	89.7
HHsize	75.3	53.2	75.3	58.2
FloodInRd1	99.1	99.1	35.6	31.2
HAssetAmount	97.6	87.8	97.6	97.6
PAssetAmount	39.9	68.2	5.8	97.8
NumCows	75.7	75.7	76.9	47.8
NetValue	57.0	61.2	61.2	48.7
BroadNetValue	57.9	58.8	58.8	48.7
RiskPrefVal	89.8	73.7	89.8	78.2
TimePref1Val	21.5	51.7	86.4	85.3
TimePref2Val	18.3	72.6	71.6	73.4
PresentBias	97.9	97.9	93.6	97.9
Attrition	93.8	33.8	93.8	30.3
N	176	200	200	200

Source: Estimated with GUK administrative and survey data.

Notes: 1. *P* values of equality in mean between each arm and all other arms. R's package coin is used for baseline group mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000. Number of groups is 72. Holm's step-down method is used to adjust for multiple testing of a multi-factor grouping variable.

2. See the footnote of TABLE 3 for description of variables.

TABLE B2: ANOVA RESULTS FOR CATTLE HOLDING EQUALITY BY ARM

	(1)	(2)	(3)	(4)	(5)
Tests	rd4	rd4 edited	rd3	rd2	rd1
a	b	c	d	e	f
ANOVA	(0.06)	(0.04)	(0.17)	(0.01)	(34.90)
Kruskal-Wallis	(0.07)	(0.02)	(0.52)	(0.10)	(42.63)
Tukey HST					
Large-Traditional	0.5016	0.5016	0.4172	0.5392	0.0894
	(0.02)	(0.02)	(0.07)	(0.01)	(48.58)
Large grace-Traditional	0.3561	0.3561	0.2113	0.2286	0.0391
	(2.35)	(2.05)	(22.54)	(24.96)	(92.48)
Cattle-Traditional	0.3031	0.3737	0.1713	0.2044	−0.0111
	(6.90)	(1.19)	(39.63)	(31.90)	(99.80)
Large grace-Large	−0.1455	−0.1455	−0.2059	−0.3106	−0.0503
	(57.96)	(56.63)	(21.05)	(4.09)	(84.19)
Cattle-Large	−0.1984	−0.1279	−0.2459	−0.3348	−0.1005
	(29.35)	(65.68)	(8.59)	(1.68)	(34.97)
Cattle-Large grace	−0.0529	0.0176	−0.0400	−0.0242	−0.0503
	(96.92)	(99.87)	(98.21)	(99.68)	(84.19)

Source: Survey data.

Note: Each column uses respective year cattle ownership information. Columns (1) to (5) tests cattle holding equality for each survey rounds. In column (2), we edited the data by assigning 1 to members of Cattle arm who report holding is NA or zero. For ANOVA and Kruskal-Wallis, each entry indicates *p* values. ANOVA tests for the null of equality of all means under normality. Kruskal-Wallis tests for the null of no stochastic dominance among samples without using the normality assumption. Tukey's honest significant tests show difference in means and *p* values in parenthesis that account for multiple testing under the normality assumption.

In TABLE B1, we use independence_test of R's coin package: Approximate permutation tests by randomly resampling 100000 times. The test examines if the arm a's mean is different from all other arms' means. This is done by randomly reassigning group labels to get the permuted distribution of arm a means. If the arm a does not differ from non-a arms, then the p value becomes large (non small). All the values are relatively large, except for Time preference 1, Time preference 2 of Traditional arm are around 20%.

In TABLE B2, we show the cattle ownership ratios by each arm at various points in time and examine their equality with ANOVA, Kruskal-Wallis, and Tukey Honest Significant Test. For ANOVA and Kruskal-Wallis, each entry indicates p values. ANOVA tests for the null of equality of all means under normality. Kruskal-Wallis tests for the null of no stochastic dominance among samples with-

out using the normality assumption. Tukey's honest significant tests show difference in means and p values in parenthesis that account for multiple testing under the normality assumption.

In column (1), for example, the final round cattle holding is tested. ANOVA and Kruskall-Wallis give .06% and .07%, respectively. Tukey HST is tested for each pair wise differences in ownewship ratios. Large-Traditional shows .5016 percentage points larger for Large arm relative to Traditional, and the null p value of equality is .02%. Likewise, Large grace-Traditional, Cattle-Traditional give p values of 2.35% and 6.90%, respectively. Differences between arms with large loan size, Large, Large grace, Cattle show relatively large p values. It shows the results are statistically different between Traditional and the other arms.

Similarly, columns (2) to (5) show test results at each different points of time. In column (2), we edited the data by assigning 1 to members of Cattle arm who report holding is NA or zero at round 4. We did so because there is a possibility of misreporting and decided to check the sensitivity of permutation test results if we correct them. We see effectively no difference between (1) and (2) except the difference Cattle-Traditional becomes larger and associated p value becomes smaller. Looking at (5), all the p values are large and do not indicate statistically meaningful differences between arms.

C Rejection

We use R's coin package independence_test: Approximate permutation tests by randomly re-sampling 100000 times.

Among 776 observations, there are 40 whose villages are washed away by a flood and 70 who, by group decisions, rejected the assigned arms (traditional, large, large grace with 40, 20, 10 individuals, respectively). There are 31, 9, 13, 37 individuals who individually rejected traditional, large, large grace, cattle, respectively.

For risks preference values, the larger the more risk averse. For time preferences values 1 and 2, larger the more impatient. If time preference value 1 (3 months) is larger than value 2 (1 year 3 monhts), time inconsistent, if 3 months < 1 year 3 months, a future bias.[*45]

[*45] Risk preference is the respondent's choice of the acceptable minimum excess monetary value of the risky option over a certainty option. Lower values indicate a greater risk tolerance. Time preference 1 is the respondent's choice of the acceptable minimum excess monetary value in 3 months that is no smaller than present monetary benefit, and Time preference 2 is the the minimum excess value in 1 year and 3 months that is no smaller than monetary benefits of 1 year from now. Lower values indicate a greater patience. If a respondent's Time preference 1 is greater than Time preference 2, the respondent is considered to be present-biased. Present bias is an indicator function that takes the value of 1 if the respondent is considered to be present-biased, 0 otherwise.

Table C1: Permutation test results of rejection

variables	NonRejected	Rejected	p-value.lower	p-value.mid	p-value.upper
Head literate	0.127	0.081	(9.6)	(11.2)	(12.8)
Head age	38.145	37.763	(66.9)	(67.1)	(67.3)
Household size	4.255	3.938	(1.4)	(1.5)	(1.5)
Prop. of non-textsfTraditional arms	0.830	0.556	(0.0)	(0.0)	(0.0)
Flood at baseline	0.475	0.585	(1.3)	(1.5)	(1.7)
Household asset amount	1420	1235	(7.5)	(7.5)	(7.5)
Productive asset amount	1434	932	(25.3)	(25.3)	(25.3)
Livestock value	5700	2685	(0.7)	(0.8)	(0.8)
Number of cattle holding	0.285	0.134	(0.6)	(0.7)	(0.7)
Net asset value	9114	5339	(4.8)	(4.8)	(4.8)
NetBroadValue	10080	5618	(2.2)	(2.2)	(2.2)
Risk preference	110	117	(2.1)	(2.4)	(2.7)
Time preference 1	383	383	(94.5)	(95.9)	(97.3)
Time preference 2	493	474	(13.1)	(14.1)	(15.1)
Present bias	0.451	0.519	(14.6)	(16.1)	(17.6)
n	616	160	(rate: 0.206)		

Source: Estimated with GUK administrative and survey data.

Notes: 1. R's package coin is used for baseline mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000. Step-down method is used to adjust for multiple testing of a multi-factor grouping variable. The second and third columns show means of each group. For Arm, proportions of non-traditional arm between two groups are tested.

2. p-value.lower, p-value.mid, p-value.upper indicate lower-bound, mid point value, and upper-bound of the p values for observed test statistic and the null distribution, expressed in per centage units.

3. Head literate is an indicator variable of household head literacy. Head age is age of household head. Household size is total number of household members. Flood at baseline is an indicator variable of flood exposure. Household asset amount and Productive asset amount are amount of non-livestock household and productive assets, respectively, in BDT. Livestock value is BDT value of all livestock holding beyond cattle. Number of cattle holding is number of cattle holding. Net asset value is net asset values in BDT using asset items observed in all 4 rounds. Broad net asset value is net asset values in BDT for all asset items. Attrited indicates attrition rates in the household survey, and GRejected and IRejected show group rejection rates and individual rejection rates to the lending program. Non-attriting borrowers indicates the ratio of non-attriting borrowers to all borrowers. Because attrition and rejection are separate events, a household can reject and attrit, so non-attrited borrowers $\geqslant$ total - (rejected members + attrited members). USD 1 is about BDT 80.Risk preference is the respondent's choice of the acceptable minimum excess monetary value of the risky option over a certainty option. Lower values indicate a greater risk tolerance. Time preference 1 is the respondent's choice of the acceptable minimum excess monetary value in 3 months that is no smaller than present monetary benefit, and Time preference 2 is the the minimum excess value in 1 year and 3 months that is no smaller than monetary benefits of 1 year from now. Lower values indicate a greater patience. If a respondent's Time preference 1 is greater than Time preference 2, the respondent is considered to be present-biased. Present bias is an indicator function that takes the value of 1 if the respondent is considered to be present-biased, 0 otherwise.

Table C2: Permutation test results of rejection among traditional arm

variables	NonRejected	Rejected	p-value.lower	p-value.mid	p-value.upper
Head literate	0.095	0.099	(79.5)	(89.7)	(100.0)
Head age	38.848	37.800	(49.8)	(50.3)	(50.8)
Household size	4.181	3.958	(31.8)	(33.1)	(34.4)
Flood at baseline	0.514	0.386	(9.0)	(10.6)	(12.2)
Household asset amount	1538	1291	(18.6)	(18.7)	(18.8)
Productive asset amount	1016	1024	(99.0)	(99.0)	(99.0)
Livestock value	6095	1714	(0.7)	(0.8)	(1.0)
Number of cattle holding	0.305	0.086	(0.7)	(0.9)	(1.0)
Net asset value	11103	4076	(1.6)	(1.6)	(1.6)
NetBroadValue	12547	4513	(0.6)	(0.6)	(0.6)
Risk preference	115	116	(74.6)	(80.8)	(87.1)
Time preference 1	376	370	(77.2)	(79.1)	(81.0)
Time preference 2	485	480	(70.7)	(75.6)	(80.5)
Present bias	0.465	0.477	(87.5)	(93.7)	(100.0)
n	105	71	(rate: 0.403)		

Source: Estimated with GUK administrative and survey data.

Notes: 1. R's package coin is used for baseline mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000.

2. See footnotes of Table C1 for description of variables.

Table C3: Permutation test results of rejection among non-traditional arm

variables	NonRejected	Rejected	p-value.lower	p-value.mid	p-value.upper
Head literate	0.133	0.067	(8.3)	(9.9)	(11.5)
Head age	38.000	37.733	(81.9)	(82.1)	(82.3)
Household size	4.270	3.921	(3.6)	(3.8)	(3.9)
Flood at baseline	0.467	0.742	(0.0)	(0.0)	(0.0)
Household asset amount	1400	1185	(11.3)	(11.4)	(11.4)
Productive asset amount	1521	859	(19.5)	(19.5)	(19.5)
Livestock value	5619	3544	(15.8)	(17.5)	(19.1)
Number of cattle holding	0.281	0.177	(15.7)	(17.4)	(19.0)
Net asset value	8773	6473	(37.4)	(37.4)	(37.4)
NetBroadValue	9656	6612	(24.7)	(24.7)	(24.7)
Risk preference	109	118	(2.6)	(3.1)	(3.7)
Time preference 1	385	395	(59.0)	(60.6)	(62.1)
Time preference 2	495	468	(12.6)	(13.9)	(15.2)
Present bias	0.449	0.561	(6.3)	(7.5)	(8.8)
n	511	89	(rate: 0.148)		

Source: Estimated with GUK administrative and survey data.

Notes: 1. R's package coin is used for baseline mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000.

2. See footnotes of Table C2.

Table C4: Permutation test results of rejecters, traditional vs. non-traditional arm

variables	NonTradArm	TradArm	p-value.lower	p-value.mid	p-value.upper
Head literate	0.067	0.099	(38.6)	(47.4)	(56.2)
Head age	37.733	37.800	(96.7)	(96.9)	(97.2)
Household size	3.921	3.958	(88.1)	(90.1)	(92.0)
Prop. of non-textsfTraditional arms	1.000	0.000	(0.0)	(0.0)	(0.0)
Flood at baseline	0.742	0.386	(0.0)	(0.0)	(0.0)
Household asset amount	1185	1291	(47.0)	(47.3)	(47.5)
Productive asset amount	859	1024	(24.8)	(24.8)	(24.8)
Livestock value	3544	1714	(17.3)	(20.5)	(23.8)
Number of cattle holding	0.177	0.086	(17.2)	(20.6)	(23.9)
Net asset value	6473	4076	(25.6)	(25.6)	(25.6)
NetBroadValue	6612	4513	(32.0)	(32.0)	(32.0)
Risk preference	118	116	(56.0)	(62.9)	(69.9)
Time preference 1	395	370	(25.2)	(26.7)	(28.2)
Time preference 2	468	480	(51.5)	(60.6)	(69.6)
Present bias	0.561	0.477	(29.6)	(34.0)	(38.4)
n	89	71	(rate: 0.444)		

Source: Estimated with GUK administrative and survey data.

Notes: 1. R's package coin is used for baseline mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000.

2. See footnotes of Table C2.

Table C5: Permutation test results of group rejection

variables	NonGRejected	GRejected	p-value.lower	p-value.mid	p-value.upper
Head literate	0.123	0.057	(7.7)	(9.8)	(11.9)
Head age	38.188	36.841	(28.7)	(28.8)	(29.0)
Household size	4.201	4.071	(46.4)	(47.8)	(49.2)
Prop. of non-textsfTraditional arms	0.807	0.429	(0.0)	(0.0)	(0.0)
Flood at baseline	0.490	0.571	(16.8)	(19.0)	(21.2)
Household asset amount	1397	1246	(30.4)	(30.4)	(30.4)
Productive asset amount	1357	1070	(62.7)	(62.7)	(62.7)
Livestock value	5377	2000	(3.9)	(4.3)	(4.8)
Number of cattle holding	0.269	0.100	(4.0)	(4.4)	(4.9)
Net asset value	8852	3333	(4.1)	(4.1)	(4.1)
NetBroadValue	9749	3464	(2.3)	(2.3)	(2.3)
Risk preference	111	114	(51.5)	(55.8)	(60.1)
Time preference 1	382	393	(59.3)	(61.0)	(62.7)
Time preference 2	493	454	(3.7)	(4.1)	(4.5)
Present bias	0.451	0.610	(1.3)	(1.6)	(2.0)
n	706	70	(rate: 0.090)		

Source: Estimated with GUK administrative and survey data.

Notes: 1. R's package coin is used for baseline mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000.

2. See footnotes of Table C1 for description of variables.

Table C6: Permutation test results of group rejection among traditional arm

variables	NonGRejected	GRejected	p-value.lower	p-value.mid	p-value.upper
Head literate	0.110	0.050	(22.2)	(29.3)	(36.5)
Head age	38.257	39.026	(67.4)	(67.7)	(68.0)
Household size	4.059	4.200	(57.7)	(59.9)	(62.0)
Flood at baseline	0.519	0.275	(0.3)	(0.5)	(0.7)
Household asset amount	1500	1257	(22.9)	(23.0)	(23.2)
Productive asset amount	984	1147	(60.4)	(60.4)	(60.4)
Livestock value	5481	500	(0.9)	(1.0)	(1.1)
Number of cattle holding	0.274	0.025	(1.0)	(1.1)	(1.2)
Net asset value	10397	2171	(1.0)	(1.0)	(1.0)
NetBroadValue	11798	2191	(0.3)	(0.3)	(0.3)
Risk preference	116	111	(34.8)	(40.0)	(45.3)
Time preference 1	369	389	(40.0)	(43.2)	(46.3)
Time preference 2	487	472	(47.2)	(52.0)	(56.9)
Present bias	0.449	0.538	(27.3)	(31.9)	(36.5)
n	136	40	(rate: 0.227)		

Source: Estimated with GUK administrative and survey data.

Notes: 1. R's package coin is used for baseline mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000.

2. See footnotes of Table C2.

Table C7: Permutation test results of group rejection among non-traditional arm

variables	NonGRejected	GRejected	p-value.lower	p-value.mid	p-value.upper
Head literate	0.126	0.067	(24.7)	(33.0)	(41.3)
Head age	38.171	34.000	(2.8)	(2.8)	(2.8)
Household size	4.235	3.900	(19.6)	(20.8)	(22.1)
Flood at baseline	0.483	0.967	(0.0)	(0.0)	(0.0)
Household asset amount	1377	1221	(53.6)	(53.6)	(53.7)
Productive asset amount	1447	970	(55.9)	(55.9)	(55.9)
Livestock value	5352	5000	(85.9)	(93.0)	(100.0)
Number of cattle holding	0.268	0.250	(85.5)	(92.8)	(100.0)
Net asset value	8549	6141	(60.8)	(60.8)	(60.8)
NetBroadValue	9348	6541	(56.4)	(56.4)	(56.4)
Risk preference	110	119	(20.1)	(24.6)	(29.0)
Time preference 1	386	400	(66.3)	(70.2)	(74.2)
Time preference 2	494	420	(1.5)	(1.8)	(2.2)
Present bias	0.451	0.750	(0.5)	(0.8)	(1.1)
n	570	30	(rate: 0.050)		

Source: Estimated with GUK administrative and survey data.

Notes: 1. R's package coin is used for baseline mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000.

2. See footnotes of Table C2.

Table C8: Permutation test results of group rejecters, traditional vs. non-traditional arm

variables	NonTradArm	TradArm	p-value.lower	p-value.mid	p-value.upper
Head literate	0.067	0.050	(62.7)	(81.4)	(100.0)
Head age	34.000	39.026	(2.7)	(2.7)	(2.8)
Household size	3.900	4.200	(34.2)	(36.6)	(39.0)
Prop. of non-textsfTraditional arms	1.000	0.000	(0.0)	(0.0)	(0.0)
Flood at baseline	0.967	0.275	(0.0)	(0.0)	(0.0)
Household asset amount	1221	1257	(88.1)	(88.4)	(88.6)
Productive asset amount	970	1147	(50.4)	(50.4)	(50.5)
Livestock value	5000	500	(0.1)	(0.7)	(1.3)
Number of cattle holding	0.250	0.025	(0.1)	(0.7)	(1.3)
Net asset value	6141	2171	(9.7)	(9.7)	(9.7)
NetBroadValue	6541	2191	(5.7)	(5.7)	(5.7)
Risk preference	119	111	(23.3)	(31.3)	(39.3)
Time preference 1	400	389	(56.7)	(67.4)	(78.0)
Time preference 2	420	472	(12.0)	(14.9)	(17.9)
Present bias	0.750	0.538	(9.3)	(12.7)	(16.0)
n	30	40	(rate: 0.571)		

Source: Estimated with GUK administrative and survey data.

Notes: 1. R's package coin is used for baseline mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000.

2. See footnotes of Table C2.

TABLE C9: PERMUTATION TEST RESULTS OF INDIVIDUAL REJECTERS, TRADITIONAL VS. NON-TRADITIONAL ARM

variables	NonTradArm	TradArm	p-value.lower	p-value.mid	p-value.upper
Head literate	0.068	0.161	(15.7)	(21.1)	(26.5)
Head age	39.732	36.258	(21.9)	(22.0)	(22.2)
Household size	3.932	3.645	(44.5)	(46.5)	(48.4)
Prop. of non-textsfTraditional arms	1.000	0.000	(0.0)	(0.0)	(0.0)
Flood at baseline	0.627	0.533	(36.9)	(43.2)	(49.5)
Household asset amount	1174	1360	(39.9)	(40.3)	(40.8)
Productive asset amount	804	869	(68.1)	(68.1)	(68.1)
Livestock value	3051	3333	(82.3)	(91.1)	(100.0)
Number of cattle holding	0.153	0.167	(82.4)	(91.2)	(100.0)
Net asset value	6580	7761	(70.1)	(70.1)	(70.1)
NetBroadValue	6634	9001	(53.5)	(53.5)	(53.5)
Risk preference	118	123	(40.1)	(49.2)	(58.2)
Time preference 1	393	342	(10.3)	(13.1)	(16.0)
Time preference 2	489	492	(86.4)	(93.2)	(100.0)
Present bias	0.478	0.385	(32.4)	(39.8)	(47.1)
n	59	31	(rate: 0.344)		

Source: Estimated with GUK administrative and survey data.
Notes: 1. R's package coin is used for baseline mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000.
2. See footnotes of TABLE C2.

TABLE C1 shows test results of independence between loan receivers and nonreceivers (group, individual rejecters) on the analysis sample of 776 members. It shows that lower head literacy, smaller household size, being affected by flood at the baseline, smaller livestock holding, and smaller net assets are correlated with opting out the offered type of lending. TABLE C2 indicates that lower asset and livestock holding is more pronounced among traditional rejecters relative to loan receivers. It also shows that flood exposure is less frequent, contrary to TABLE C1, among the rejecters. TABLE C3 indicates that lower head literacy, smaller household size, higher flood exposure, are more pronounced among non-traditional rejecters relative to loan receivers. It also shows that asset and livestock holding is no different relative to the receivers. Comparing rejecters of traditional arm, lower flood exposure may be the only stark difference against non-traditional arm members, and smaller asset and livestock holding is merely suggestive (TABLE C4).

Group rejecters and non-group rejecters are compared in TABLE C5. Marked differences are found in Arm (proportion of non-traditional arm members) and head literacy. TimePrefVal1 and TimePrefVal2 are values of premium required to give up the immediate gratification, now or 1 year from now, respectively. TimePrefVal2 shows that group rejecters are less impatient than the non-group rejecters. In the meantime, group rejecters have a higher proportion of individuals with present bias as indicated in PresentBias. There are no difference in terms of risk tolerance in RiskPrefVal. Group rejecters tend to have smaller livestock assets, as indicated by NumCows, LivestockValue and smaller overall assets in NarrowNetValue, NetValue. TABLE C6 compares group rejecters in traditional arm and finds smaller flood exposure and lower livestock and net asset holding are associated with group rejection. Group rejecters in non-traditional arm are examined in TABLE C7 and younger head age, flood at baseline, and smaller household asset holding are correlated with rejection. We also note group rejecters in non-traditional arms are less impatient but have a higher proportion of present biased members.

Comparing group rejecters between traditional and non-traditional arms in TABLE C8, younger head age, higher flood exposure, larger net asset values and livestock holding are noted among the non-traditional group rejecters. These hint that for non-traditional arm group rejecters, it is the smaller household size and the baseline flood that may have constrained them from participation, and for traditional group rejecters, it is the low asset levels. Comparison of individual rejecters between traditional and non-traditional arms show no detectable difference (TABLE C9). This suggests that indvidual rejecters in all arms were constrained with small household size and small asset holding.

D Attrition

TABLE D1: PERMUTATION TEST RESULTS OF ATTRITION

variables	NonAttrited	Attrited	p-value.lower	p-value.mid	p-value.upper
Head literate	0.115	0.130	(60.9)	(67.0)	(73.1)
Head age	37.996	38.598	(59.1)	(59.3)	(59.5)
Household size	4.178	4.272	(54.2)	(55.5)	(56.8)
Prop. of non-textsfTraditional arms	0.789	0.652	(0.0)	(0.0)	(0.0)
Flood at baseline	0.493	0.527	(50.2)	(54.0)	(57.7)
Household asset amount	1369	1515	(29.2)	(29.4)	(29.5)
Productive asset amount	1213	2239	(10.9)	(10.9)	(10.9)
Livestock value	5124	5000	(92.5)	(96.3)	(100.0)
Number of cattle holding	0.256	0.250	(92.5)	(96.3)	(100.0)
Net asset value	8309	8974	(79.4)	(79.4)	(79.4)
NetBroadValue	9072	10432	(59.9)	(59.9)	(59.9)
Risk preference	110	128	(0.0)	(0.0)	(0.1)
Time preference 1	382	404	(28.2)	(29.4)	(30.7)
Time preference 2	490	486	(82.7)	(87.0)	(91.3)
Present bias	0.459	0.531	(30.1)	(33.7)	(37.4)
n	684	92	(rate: 0.119)		

Source: Estimated with GUK administrative and survey data.

Notes: 1. R's package coin is used for baseline mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000.

2. See footnotes of TABLE C1 for description of variables.

TABLE D2: PERMUTATION TEST RESULTS OF ATTRITION AMONG TRADITIONAL ARM

variables	NonAttrited	Attrited	p-value.lower	p-value.mid	p-value.upper
Head literate	0.118	0.000	(1.8)	(3.2)	(4.6)
Head age	38.497	38.125	(84.8)	(85.2)	(85.6)
Household size	4.167	3.750	(13.7)	(14.7)	(15.6)
Flood at baseline	0.479	0.387	(32.6)	(37.7)	(42.8)
Household asset amount	1373	1700	(17.5)	(17.7)	(17.9)
Productive asset amount	1027	982	(88.0)	(88.0)	(88.0)
Livestock value	4722	2581	(28.0)	(33.3)	(38.5)
Number of cattle holding	0.236	0.129	(28.2)	(33.4)	(38.6)
Net asset value	8223	6979	(76.2)	(76.2)	(76.2)
NetBroadValue	9232	7938	(75.1)	(75.1)	(75.1)
Risk preference	113	131	(1.3)	(1.6)	(1.9)
Time preference 1	371	391	(49.8)	(54.6)	(59.4)
Time preference 2	485	470	(47.6)	(53.9)	(60.2)
Present bias	0.462	0.522	(50.1)	(57.7)	(65.3)
n	144	32	(rate: 0.182)		

Source: Estimated with GUK administrative and survey data.

Notes: 1. R's package coin is used for baseline mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000.

2. See footnotes of TABLE C2.

TABLE D3: PERMUTATION TEST RESULTS OF ATTRITION AMONG NON-TRADITIONAL ARM

variables	NonAttrited	Attrited	p-value.lower	p-value.mid	p-value.upper
Head literate	0.115	0.200	(3.6)	(5.1)	(6.5)
Head age	37.862	38.850	(47.0)	(47.2)	(47.4)
Household size	4.181	4.550	(6.1)	(6.4)	(6.7)
Flood at baseline	0.497	0.600	(10.2)	(12.0)	(13.8)
Household asset amount	1368	1410	(80.8)	(81.1)	(81.4)
Productive asset amount	1263	2879	(9.5)	(9.5)	(9.5)
Livestock value	5232	6531	(50.1)	(53.4)	(56.7)
Number of cattle holding	0.262	0.327	(49.8)	(53.1)	(56.3)
Net asset value	8330	10105	(57.7)	(57.7)	(57.7)
NetBroadValue	9033	11845	(38.3)	(38.3)	(38.3)
Risk preference	110	125	(2.2)	(2.8)	(3.4)
Time preference 1	385	415	(27.3)	(29.2)	(31.1)
Time preference 2	491	500	(66.3)	(71.7)	(77.1)
Present bias	0.458	0.538	(43.2)	(49.0)	(54.8)
n	540	60	(rate: 0.100)		

Source: Estimated with GUK administrative and survey data.

Notes: 1. R's package coin is used for baseline mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000.

2. See footnotes of TABLE C2.

Table D4: Permutation test results of attriters of traditional and non-traditional arms

variables	NonTradArm	TradArm	p-value.lower	p-value.mid	p-value.upper
Head literate	0.200	0.000	(0.3)	(0.5)	(0.7)
Head age	38.850	38.125	(76.8)	(77.2)	(77.6)
Household size	4.550	3.750	(2.1)	(2.3)	(2.6)
Prop. of non-textsfTraditional arms	1.000	0.000	(0.0)	(0.0)	(0.0)
Flood at baseline	0.600	0.387	(4.8)	(6.2)	(7.5)
Household asset amount	1410	1700	(38.5)	(38.9)	(39.3)
Productive asset amount	2879	982	(87.3)	(87.4)	(87.4)
Livestock value	6531	2581	(17.2)	(20.5)	(23.8)
Number of cattle holding	0.327	0.129	(17.0)	(20.3)	(23.6)
Net asset value	10105	6979	(78.3)	(78.3)	(78.3)
NetBroadValue	11845	7938	(69.6)	(69.6)	(69.6)
Risk preference	125	131	(39.1)	(48.6)	(58.1)
Time preference 1	415	391	(50.4)	(57.6)	(64.8)
Time preference 2	500	470	(29.8)	(36.3)	(42.9)
Present bias	0.538	0.522	(77.7)	(88.8)	(100.0)
n	60	32	(rate: 0.348)		

Source: Estimated with GUK administrative and survey data.

Notes: 1. R's package coin is used for baseline mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000.
2. See footnotes of Table C2.

Table D5: Permutation test results of active status

variables	NonActive	Active	p-value.lower	p-value.mid	p-value.upper
Head literate	0.104	0.123	(38.9)	(42.7)	(46.5)
Head age	37.835	38.159	(68.8)	(69.0)	(69.1)
Household size	4.072	4.236	(14.9)	(15.3)	(15.7)
Prop. of non-textsfTraditional arms	0.581	0.850	(0.0)	(0.0)	(0.0)
Flood at baseline	0.548	0.477	(6.6)	(7.2)	(7.9)
Household asset amount	1300	1414	(22.1)	(22.2)	(22.2)
Productive asset amount	1482	1273	(69.0)	(69.0)	(69.0)
Livestock value	3714	5642	(5.0)	(5.4)	(5.8)
Number of cattle holding	0.186	0.282	(5.0)	(5.4)	(5.8)
Net asset value	7015	8877	(27.9)	(27.9)	(27.9)
NetBroadValue	7751	9743	(25.2)	(25.2)	(25.2)
Risk preference	120	109	(0.0)	(0.0)	(0.0)
Time preference 1	388	382	(60.1)	(61.2)	(62.3)
Time preference 2	476	494	(13.7)	(14.6)	(15.4)
Present bias	0.520	0.446	(7.9)	(8.7)	(9.5)
n	222	554	(rate: 0.714)		

Source: Estimated with GUK administrative and survey data.

Notes: 1. R's package coin is used for baseline mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000.
2. See footnotes of Table C1 for description of variables.

Table D6: Permutation test results of active members of cattle and large grace arms

variables	NonCattleArm	CattleArm	p-value.lower	p-value.mid	p-value.upper
Head literate	0.106	0.150	(23.6)	(27.1)	(30.6)
Head age	38.481	37.973	(64.4)	(64.7)	(64.9)
Household size	4.181	4.102	(57.3)	(58.9)	(60.4)
Flood at baseline	0.352	0.459	(4.6)	(5.5)	(6.3)
Household asset amount	1323	1657	(1.9)	(1.9)	(2.0)
Productive asset amount	1535	1105	(29.9)	(29.9)	(29.9)
Livestock value	5375	3425	(12.5)	(13.8)	(15.1)
Number of cattle holding	0.269	0.171	(12.5)	(13.8)	(15.1)
Net asset value	8666	5236	(12.4)	(12.4)	(12.4)
NetBroadValue	8972	7038	(40.5)	(40.5)	(40.5)
Risk preference	112	108	(24.3)	(26.4)	(28.6)
Time preference 1	373	412	(2.0)	(2.2)	(2.3)
Time preference 2	479	515	(2.2)	(2.5)	(2.8)
Present bias	0.462	0.466	(90.9)	(95.4)	(100.0)
n	160	147	(rate: 0.479)		

Source: Estimated with GUK administrative and survey data.

Notes: 1. R's package coin is used for baseline mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000.
2. See footnotes of Table C2.

TABLE D7: PERMUTATION TEST RESULTS OF ACTIVE MEMBERS OF CATTLE AND ALL OTHER ARMS

variables	NonCattleArm	CattleArm	p-value.lower	p-value.mid	p-value.upper
Head literate	0.113	0.150	(24.6)	(27.5)	(30.4)
Head age	38.226	37.973	(78.6)	(78.8)	(79.0)
Household size	4.285	4.102	(16.6)	(17.1)	(17.7)
Flood at baseline	0.484	0.459	(56.1)	(59.5)	(62.9)
Household asset amount	1330	1657	(0.5)	(0.5)	(0.5)
Productive asset amount	1334	1105	(45.9)	(45.9)	(45.9)
Livestock value	6437	3425	(1.4)	(1.6)	(1.7)
Number of cattle holding	0.322	0.171	(1.5)	(1.7)	(1.8)
Net asset value	10152	5236	(1.5)	(1.5)	(1.5)
NetBroadValue	10691	7038	(7.4)	(7.4)	(7.4)
Risk preference	109	108	(64.8)	(68.2)	(71.6)
Time preference 1	371	412	(0.4)	(0.5)	(0.5)
Time preference 2	486	515	(2.8)	(3.0)	(3.3)
Present bias	0.439	0.466	(56.2)	(59.5)	(62.8)
n	407	147	(rate: 0.265)		

Source: Estimated with GUK administrative and survey data.

Notes: 1. R's package coin is used for baseline mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000.

2. See footnotes of TABLE C2.

TABLE D1 shows results from tests of independence between attriters and nonattriters. Attrition is defined as attrition from household surveys, not from the lending program. We see the moderate rate of attrition is not correlated with household level characteristicsat the conventional p value level. Productive asset amounts seem to differ between attriters and nonattriters at $p = .105$, with the former being larger than the latter. This positive attrition selection can cause underestimation of impacts, if the asset values are positively correlated with entrepreneurial capacity. We also see that the attriters are less risk tolerant in terms of minimum expected payoff to choose a risky option in RiskPrefVal. TABLE D2 shows attrition in the traditional arm. Household heads of attriters are relatively less literate than nonattriters. We observe the traditional arm attriters are less risk tolerant the nonattriters. TABLE D3 compares attriters and nonattriters in the non-traditional arm. Unlike traditional arm attriters, non-traditional arm attriters have more literate household heads, have a larger household size, are more exposed to floods, and have larger productive assets. The traditional arm attriters may be less entrepreneurial, if anything, so their attrition may upwardly bias the positive gains of the arm, hence understate the impacts of non-traditional arm. These are explicitly shown in TABLE D4 where we compare attriters of traditional and non-traditional arms. Overall, attrition may have attenuated the impacts but is not likely to have inflated them. We observe the non-traditional arm attriters are also less risk tolerant than the nonattriters.

For the microfinance institutions (MFIs), attrition of the loan receiving members poses a threat to their business continuation. Financial institutions often use observable characteristics, such as collateralisable assets, and easily surveyed chracteristics, such as job experiences and schooling of borrowers, and are likely to lend if the assets levels are greater and the borrowers have relevant job experiences and more schooling. We first examine if such screening variables have any predictive power in terms of loan rejection or borrower attrition under our lending. TABLE D5 compares potential MFI targets (nonattriting borrowers, noted as Active) vs. non-targets (attriting borrowers or loan rejecters, noted as NonActive) in all arms. It shows potential targets at the baseline have larger values in livestock and greater number of cattle, and are less affected by the flood, which conforms the conventional wisdom of lenders in using these aspects in their loan decisions. We also see that more risk torelant members are likely to be borrowers and do not attrit. Next, we examine if the relationship of having "less favourable" values in these characteristics and attrition is mitigated under various loan characteristics. In TABLE D6, we restrict our attention to the potential MFI targets, or the nonattriting borrowers, and compare between cattle and large grace arms, whose difference is efffectively the presence of managerial supports that the former provides. Comparing against the large grace arm, nonattriting borrowers of the cattle arm are more exposed to the flood ($p = .055$), have lower net asset values ($p = .124$), and have fewer livestock ($p = .138$). This shows that the smaller livestock holders or individuals with less experienced in livestock are encouraged to

participate and continue to operate in the cattle arm that has a managerial support program, with all other features being equal. This is consistent with our analysis of participation in TABLE 4 which weakly hints that the cattle arm's managerial support programs may have encouraged participation of inexperienced or lower asset holders. This also underscores our interpretation that the current impact estimates may be downwardly biased, if any, as people who would otherwise attrit or reject in the cattle arm stayed on. This result is confirmed with lower p values due to a larger sample size when we compare the nonattriting borrowers between cattle arm with all other arms in TABLE D7. At the baseline, cattle arm nonattriting borrowers have smaller baseline livestock holding (p value = .016) and smaller baseline net asset holding (p value = .015) than other arms' nonattriting borrowers.

E Repayment

TABLE E1: PERMUTATION TEST RESULTS ON REPAYMENT EQUALITY BY POVERTY CLASS

	Mean cumulative shortfall ratio		p value
Loan year	Ultra poor	Moderately poor	
1	0.100	0.110	68.16%
2	0.029	0.016	34.11%
3	0.016	0.024	41.95%
4	−0.071	−0.062	35.28%

Source: Estimated with GUK administrative and survey data. Mid term (July) values are used in each year.

Notes:
1. Cumulative shortfall ratio = 1 - (cumulative sum of repayment)/(cumulative sum of planned installments). A positive value indicates shortfall, a negative value indicates overrepayment ahead of planned istallments. R's package coin is used to conduct approximate permutation tests. Number of repetition is set to 100000.
2. See the footnote of TABLE 3 for description of variables.

F Impact estimation results

In this section, the ANCOVA estimates on various outcomes using (2) are presented. In each table, the first column shows the covariate names and their means and standard deviations in the second column in the sample of the richest specification of the table. Specification (1) follows the most basic specification under (2). From (2), we progressively add more covariates to control for the differences in initial conditions in an attempt to get more precise ANCOVA estimates. In FIGURE 9, we use OLS estimates. It regresses on the intercept, $\mathbf{d}_i$, and its period interactions.

We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4).

F.1 Net assets

TABLE F1: ANCOVA ESTIMATION OF NET ASSETS BY PERIOD

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		9866.9	6943.1	−166.6	8022.1	3297.9	6994.4
		(0.0)	(2.3)	(97.0)	(9.8)	(47.0)	(15.5)
Large	0.048	13640.0	13700.5	13573.3	6523.4	10458.4	6586.4
	(0.46)	(0.0)	(0.1)	(0.1)	(8.6)	(1.4)	(8.6)
LargeGrace	0.006	5845.5	4654.5	4894.7	−142.5	1685.6	−291.9
	(0.43)	(5.0)	(20.7)	(18.1)	(96.4)	(62.1)	(92.7)
Cattle	0.009	5617.4	5252.0	5392.0	135.8	2761.9	215.5
	(0.44)	(1.1)	(9.8)	(8.7)	(96.2)	(32.7)	(93.9)
HadCattle	0.265				7844.7		10322.0
	(0.44)				(20.3)		(11.8)
rd 3	0.342	5544.8	5721.4	6002.1	8494.7	7501.6	8592.1
	(0.47)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Large × rd 3	0.104	893.6	2366.2	2863.9	2191.4	3249.5	2519.2
	(0.30)	(79.1)	(56.0)	(49.1)	(65.3)	(45.3)	(60.6)
LargeGrace × rd 3	0.085	6979.9	9099.6	9400.5	10981.5	9269.2	10942.2
	(0.28)	(2.1)	(2.3)	(1.8)	(1.8)	(3.3)	(1.9)
Cattle × rd 3	0.087	3204.7	4368.0	4449.5	5346.2	5803.4	5332.1
	(0.28)	(25.3)	(17.7)	(16.3)	(16.3)	(7.2)	(16.5)
rd 4	0.315	10346.3	10364.5	10531.5	14091.2	12042.9	14153.5
	(0.46)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Large × rd 4	0.102	3419.5	5082.2	4896.4	4129.9	5601.6	4453.6
	(0.30)	(44.1)	(25.2)	(27.0)	(37.8)	(21.5)	(34.2)
LargeGrace × rd 4	0.080	9104.8	12084.4	12367.1	15469.4	12581.3	15375.2
	(0.27)	(0.5)	(0.2)	(0.2)	(0.1)	(0.3)	(0.1)
Cattle × rd 4	0.079	7225.5	8410.3	8680.4	9955.1	10302.6	9753.9
	(0.27)	(2.3)	(1.5)	(1.1)	(0.8)	(0.2)	(0.9)
HadCattle	0.265				7844.7		10322.0
	(0.44)				(20.3)		(11.8)
HadCattle × Large	0.024				17624.6		17922.7
	(0.25)				(11.2)		(10.5)
HadCattle × LargeGrace	0.009				7123.7		7883.5
	(0.23)				(32.2)		(26.1)
HadCattle × Cattle	−0.012				11774.6		11719.1
	(0.21)				(8.6)		(7.9)
HadCattle × rd 3	0.092				−4533.7		−4613.9
	(0.29)				(11.0)		(10.2)
HadCattle × Large × rd 3	0.008				3450.3		3020.9
	(0.15)				(69.2)		(72.8)
HadCattle × LargeGrace × rd 3	0.003				−24243.5		−24292.4
	(0.14)				(1.1)		(1.1)
HadCattle × Cattle × rd 3	−0.004				−3368.5		−3444.3
	(0.12)				(65.9)		(65.1)
HadCattle × rd 4	0.084				−2318.8		−2443.7
	(0.28)				(54.3)		(52.1)
HadCattle × Large × rd 4	0.009				818.9		665.8
	(0.14)				(94.2)		(95.2)
HadCattle × LargeGrace × rd 4	0.004				−29993.9		−29696.8
	(0.13)				(1.7)		(1.8)
HadCattle × Cattle × rd 4	−0.005				−7135.7		−6917.8
	(0.11)				(45.5)		(46.7)
Flood in round 1	0.414			217.4	1956.7	377.2	2134.2
	(0.49)			(92.0)	(41.3)	(87.7)	(39.4)
Head literate0	0.149			−231.7	−1625.8	−2035.7	−1618.0
	(0.36)			(93.2)	(58.6)	(47.3)	(59.1)
NetValue0	10261.899		0.5	0.5	0.2	0.6	0.7
	(15197.09)		(0.0)	(0.0)	(38.7)	(5.5)	(4.7)
Household size0	4.538			1551.0	1341.8	1633.0	1273.0
	(1.35)			(5.0)	(15.2)	(6.6)	(17.1)
Number of cattle0	0.380					−2867.9	−12092.9
	(0.73)					(66.8)	(15.4)
mean of dependent variable		21884	21884	21884	21884	21884	21884
$T = 2$		42	13	13	13	10	13
$T = 3$		137	84	81	38	40	36
$T = 4$		569	377	377	327	362	327
$\bar{R}^2$		0.07	0.151	0.156	0.138	0.127	0.141
N	1081	2023	1312	1306	1070	1176	1066

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Large, LargeGrace, Cattle are indicator variables of the large, large grace, and cattle arms, respectively. The default arm category is traditional arm. rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Net assets use only assets observed for

Table F2: ANCOVA estimation of net assets by attributes and period

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		9866.9	6943.1	−166.6	8022.1	3297.9	6994.4
		(0.0)	(2.3)	(97.0)	(9.8)	(47.0)	(15.5)
Upfront	0.063	13640.0	13700.5	13573.3	6523.4	10458.4	6586.4
	(0.39)	(0.0)	(0.1)	(0.1)	(8.6)	(1.4)	(8.6)
WithGrace	0.014	−7794.4	−9046.0	−8678.6	−6666.0	−8772.8	−6878.3
	(0.50)	(3.1)	(2.3)	(3.5)	(7.1)	(4.5)	(7.3)
InKind	0.009	−228.1	597.6	497.3	278.3	1076.3	507.4
	(0.44)	(92.7)	(84.0)	(86.3)	(91.6)	(71.2)	(85.1)
HadCattle	0.265				7844.7		10322.0
	(0.44)				(20.3)		(11.8)
rd 3	0.342	5544.8	5721.4	6002.1	8494.7	7501.6	8592.1
	(0.47)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Upfront × rd 3	0.276	893.6	2366.2	2863.9	2191.4	3249.5	2519.2
	(0.45)	(79.1)	(56.0)	(49.1)	(65.3)	(45.3)	(60.6)
WithGrace × rd 3	0.172	6086.3	6733.5	6536.6	8790.2	6019.7	8423.0
	(0.38)	(8.9)	(13.4)	(15.3)	(6.4)	(20.7)	(7.5)
InKind × rd 3	0.087	−3775.2	−4731.7	−4951.0	−5635.3	−3465.8	−5610.1
	(0.28)	(21.5)	(21.4)	(18.9)	(12.4)	(36.3)	(12.4)
rd 4	0.315	10346.3	10364.5	10531.5	14091.2	12042.9	14153.5
	(0.46)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Upfront × rd 4	0.260	3419.5	5082.2	4896.4	4129.9	5601.6	4453.6
	(0.44)	(44.1)	(25.2)	(27.0)	(37.8)	(21.5)	(34.2)
WithGrace × rd 4	0.158	5685.3	7002.3	7470.7	11339.5	6979.7	10921.6
	(0.37)	(23.0)	(16.4)	(13.9)	(2.9)	(18.3)	(3.4)
InKind × rd 4	0.079	−1879.3	−3674.1	−3686.7	−5514.3	−2278.7	−5621.3
	(0.27)	(60.0)	(38.9)	(38.3)	(20.3)	(59.8)	(19.7)
HadCattle	0.265				7844.7		10322.0
	(0.44)				(20.3)		(11.8)
HadCattle × Upfront	0.021				17624.6		17922.7
	(0.20)				(11.2)		(10.5)
HadCattle × WithGrace	−0.003				−10500.8		−10039.2
	(0.26)				(31.2)		(34.1)
HadCattle × InKind	−0.012				4650.9		3835.7
	(0.21)				(41.6)		(50.2)
HadCattle × rd 3	0.092				−4533.7		−4613.9
	(0.29)				(11.0)		(10.2)
HadCattle × Upfront × rd 3	0.006				3450.3		3020.9
	(0.12)				(69.2)		(72.8)
HadCattle × WithGrace × rd 3	−0.001				−27693.8		−27313.3
	(0.15)				(0.1)		(0.1)
HadCattle × InKind × rd 3	−0.004				20875.1		20848.1
	(0.12)				(0.5)		(0.5)
HadCattle × rd 4	0.084				−2318.8		−2443.7
	(0.28)				(54.3)		(52.1)
HadCattle × Upfront × rd 4	0.007				818.9		665.8
	(0.11)				(94.2)		(95.2)
HadCattle × WithGrace × rd 4	−0.001				−30812.8		−30362.7
	(0.14)				(1.0)		(1.1)
HadCattle × InKind × rd 4	−0.005				22858.2		22779.1
	(0.11)				(2.9)		(2.9)
Flood in round 1	0.414			217.4	1956.7	377.2	2134.2
	(0.49)			(92.0)	(41.3)	(87.7)	(39.4)
Head literate0	0.149			−231.7	−1625.8	−2035.7	−1618.0
	(0.36)			(93.2)	(58.6)	(47.3)	(59.1)
NetValue0	10261.899		0.5	0.5	0.2	0.6	0.7
	(15197.09)		(0.0)	(0.0)	(38.7)	(5.5)	(4.7)
Household size0	4.538			1551.0	1341.8	1633.0	1273.0
	(1.35)			(5.0)	(15.2)	(6.6)	(17.1)
Number of cattle0	0.380					−2867.9	−12092.9
	(0.73)					(66.8)	(15.4)
mean of dependent variable		21884	21884	21884	21884	21884	21884
$T = 2$		42	13	13	13	10	13
$T = 3$		137	84	81	38	40	36
$T = 4$		569	377	377	327	362	327
$\tilde{R}^2$		0.07	0.151	0.156	0.138	0.127	0.141
N	1081	2023	1312	1306	1070	1176	1066

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Upfront is an indicator variable of the arm with an upfront large disbursement, WithGrace is an indicator variable of the arm with a grace period, InKind is an indicator variable of the arm which lends a heifer. rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Net assets use only assets observed for all 4 rounds in household assets. Household assets do not include livestock. Regressions (1)-(3), (5)-(6) use only arm and calendar information. (4) and (7) use previous six month repayment and saving information which is lacking in rd 1, hence starts from rd 2.

2. P values in percentages in parenthesises. Standard errors are clustered at group (village) level.

Table F3: ANCOVA estimation of net broad assets by period

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		16278.0 (0.0)	14254.8 (0.0)	318.7 (96.3)	8686.5 (27.4)	4284.2 (57.2)	9212.5 (23.2)
Large	0.048 (0.46)	17352.0 (0.0)	15354.5 (0.2)	15924.8 (0.2)	10126.5 (7.5)	13206.9 (1.1)	9255.0 (8.7)
LargeGrace	0.006 (0.43)	9114.6 (0.8)	6774.6 (15.2)	6854.9 (13.6)	2004.6 (68.2)	3964.7 (39.0)	1923.1 (69.6)
Cattle	0.009 (0.44)	10586.5 (4.1)	9973.2 (12.6)	10463.3 (9.5)	5224.4 (45.0)	7663.8 (23.9)	4852.7 (48.4)
HadCattle	0.265 (0.44)				9282.7 (26.4)		7888.9 (39.9)
rd 3	0.342 (0.47)	14774.1 (0.0)	15425.4 (0.0)	15978.9 (0.0)	18035.8 (0.0)	17231.4 (0.0)	17856.9 (0.0)
Large × rd 3	0.104 (0.30)	5227.0 (28.6)	2758.5 (66.9)	3394.0 (59.9)	5603.6 (45.0)	6282.0 (35.5)	4590.5 (52.3)
LargeGrace × rd 3	0.085 (0.28)	11120.3 (4.4)	10478.8 (10.6)	11163.3 (8.0)	13170.2 (8.3)	13549.3 (5.0)	14769.6 (6.8)
Cattle × rd 3	0.087 (0.28)	473.3 (93.1)	239.7 (97.3)	694.6 (92.1)	3347.8 (67.8)	3962.9 (58.8)	3641.5 (66.0)
rd 4	0.315 (0.46)	20830.9 (0.0)	22161.5 (0.0)	22734.9 (0.0)	25861.6 (0.0)	24170.6 (0.0)	26001.2 (0.0)
Large × rd 4	0.102 (0.30)	7410.9 (23.2)	6891.7 (30.0)	6695.4 (31.9)	7467.0 (34.7)	8931.1 (20.4)	7506.9 (31.0)
LargeGrace × rd 4	0.080 (0.27)	9853.3 (7.2)	9793.4 (15.5)	10283.3 (13.3)	11227.8 (18.6)	11703.6 (11.5)	13910.8 (11.4)
Cattle × rd 4	0.079 (0.27)	1456.1 (79.4)	−1140.1 (87.7)	−236.1 (97.2)	89.7 (99.1)	1348.3 (85.0)	658.5 (93.1)
HadCattle	0.265 (0.44)				9282.7 (26.4)		7888.9 (39.9)
HadCattle × Large	0.024 (0.25)						18684.8 (13.6)
HadCattle × LargeGrace	0.009 (0.23)						7006.0 (48.2)
HadCattle × Cattle	−0.012 (0.21)						10421.7 (33.4)
HadCattle × rd 3	0.092 (0.29)						7546.2 (10.4)
HadCattle × Large × rd 3	0.008 (0.15)						10585.1 (41.8)
HadCattle × LargeGrace × rd 3	0.003 (0.14)						−23992.5 (9.3)
HadCattle × Cattle × rd 3	−0.004 (0.12)						286.9 (98.2)
HadCattle × rd 4	0.084 (0.28)						7898.2 (19.5)
HadCattle × Large × rd 4	0.009 (0.14)						−2582.6 (89.0)
HadCattle × LargeGrace × rd 4	0.004 (0.13)						−39105.5 (4.4)
HadCattle × Cattle × rd 4	−0.005 (0.11)						2737.5 (88.2)
Flood in round 1	0.414 (0.49)			−4625.3 (21.8)	−2540.2 (55.0)	−4534.4 (27.1)	−2251.8 (59.4)
Head literate0	0.149 (0.36)			3104.4 (56.6)	2835.3 (64.5)	1335.1 (81.2)	3028.5 (63.0)
NetBroad Value0	10261.899 (15197.09)		0.6 (0.0)	0.6 (0.0)	0.2 (44.2)	0.5 (31.3)	0.6 (26.2)
Household size0	4.538 (1.35)			3316.7 (0.7)	3025.1 (2.7)	3361.8 (1.2)	2911.7 (2.7)
Number of cattle0	0.380 (0.73)					804.6 (93.5)	−7936.6 (51.7)
mean of dependent variable		38180	38180	38180	38180	38180	38180
$T = 2$		42	13	13	13	10	13
$T = 3$		137	84	81	38	40	36
$T = 4$		569	377	377	327	362	327
$\tilde{R}^2$		0.062	0.091	0.104	0.084	0.092	0.087
N	1081	2023	1312	1306	1070	1176	1066

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Large, LargeGrace, Cattle are indicator variables of the large, large grace, and cattle arms, respectively. The default arm category is traditional arm. rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Household assets do not include livestock. Regressions (1)-(3), (5)-(6) use only arm and calendar information. (4) and (7) use previous six month repayment and saving information which is lacking in rd 1, hence starts from rd 2.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

F.2 Non land Assets

TABLE F4: ANCOVA ESTIMATION OF NET NON-LIVESTOCK ASSETS BY PERIOD

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		−4125.2 (0.0)	−4436.1 (0.0)	−4236.5 (0.0)	−3908.8 (0.0)	−3447.2 (0.1)	−3966.9 (0.0)
Large	0.048 (0.46)	749.4 (52.8)	1607.6 (27.1)	1849.9 (20.0)	1240.8 (40.9)	1256.7 (39.1)	1240.6 (41.2)
LargeGrace	0.006 (0.43)	−1710.5 (14.7)	−1424.1 (40.8)	−1513.8 (36.1)	−2624.6 (11.1)	−2247.0 (17.6)	−2629.4 (11.1)
Cattle	0.009 (0.44)	−1319.7 (12.5)	−758.0 (49.1)	−647.9 (55.2)	−1643.8 (14.2)	−1520.5 (17.0)	−1681.7 (13.8)
HadCattle	0.265 (0.44)				−665.3 (55.3)		268.3 (89.2)
rd 3	0.342 (0.47)	4656.4 (0.0)	5066.9 (0.0)	5076.3 (0.0)	5370.0 (0.0)	5072.1 (0.0)	5388.3 (0.0)
Large × rd 3	0.104 (0.30)	2907.0 (1.1)	1920.1 (21.6)	1915.9 (22.0)	1787.9 (37.3)	2233.7 (20.5)	1852.4 (35.8)
LargeGrace × rd 3	0.085 (0.28)	7428.0 (0.0)	7474.8 (0.0)	7467.4 (0.0)	8343.5 (0.1)	7659.7 (0.1)	8341.9 (0.1)
Cattle × rd 3	0.087 (0.28)	4954.6 (0.0)	3905.5 (0.8)	3926.3 (0.8)	3988.8 (4.1)	3963.6 (2.1)	3986.5 (4.1)
rd 4	0.315 (0.46)	7760.3 (0.0)	7931.5 (0.0)	7937.7 (0.0)	7895.3 (0.0)	7645.7 (0.0)	7904.8 (0.0)
Large × rd 4	0.102 (0.30)	2900.9 (6.1)	2221.9 (24.6)	2139.4 (26.4)	2865.1 (13.3)	3055.2 (11.9)	2905.4 (12.9)
LargeGrace × rd 4	0.080 (0.27)	7275.2 (0.0)	7481.2 (0.3)	7369.8 (0.4)	9231.2 (0.0)	8094.4 (0.2)	9236.4 (0.0)
Cattle × rd 4	0.079 (0.27)	6609.8 (0.0)	5614.4 (0.2)	5618.4 (0.2)	6444.4 (0.1)	5890.8 (0.2)	6441.1 (0.1)
HadCattle	0.265 (0.44)				−665.3 (55.3)		268.3 (89.2)
HadCattle × Large	0.024 (0.25)				2386.6 (49.1)		2262.8 (51.5)
HadCattle × LargeGrace	0.009 (0.23)				6685.1 (8.9)		6663.2 (8.8)
HadCattle × Cattle	−0.012 (0.21)				5578.7 (5.9)		5428.7 (7.3)
HadCattle × rd 3	0.092 (0.29)				58.9 (97.3)		51.4 (97.6)
HadCattle × Large × rd 3	0.008 (0.15)				−1111.6 (85.6)		−1171.7 (84.9)
HadCattle × LargeGrace × rd 3	0.003 (0.14)				−8868.6 (18.0)		−8883.2 (17.8)
HadCattle × Cattle × rd 3	−0.004 (0.12)				−3749.8 (53.4)		−3765.7 (53.2)
HadCattle × rd 4	0.084 (0.28)				1180.3 (56.1)		1175.7 (56.3)
HadCattle × Large × rd 4	0.009 (0.14)				−2954.3 (64.3)		−2958.0 (64.4)
HadCattle × LargeGrace × rd 4	0.004 (0.13)				−11657.5 (12.0)		−11648.0 (12.2)
HadCattle × Cattle × rd 4	−0.005 (0.11)				−4660.8 (46.7)		−4704.6 (46.2)
Flood in round 1	0.414 (0.49)			−1413.8 (4.9)	−1532.3 (6.6)	−1732.7 (2.7)	−1522.9 (7.1)
Head literate0	0.149 (0.36)			271.7 (65.0)	−8.8 (99.0)	210.2 (72.5)	0.1 (100.0)
NetAssetValue0	2657.829 (2852.68)		0.1 (1.1)	0.1 (1.0)	0.2 (6.1)	0.2 (9.6)	0.2 (6.9)
Household size0	4.538 (1.35)			56.9 (80.8)	169.2 (55.1)	96.9 (72.7)	185.9 (52.7)
Number of cattle0	0.380 (0.73)					−422.3 (48.2)	−660.9 (54.7)
mean of dependent variable		−315	−315	−315	−315	−315	−315
$T = 2$		42	13	13	13	10	13
$T = 3$		137	84	81	38	40	36
$T = 4$		569	377	377	327	362	327
$\bar{R}^2$		0.14	0.113	0.116	0.113	0.113	0.113
N	1081	2023	1312	1306	1070	1176	1066

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Large, LargeGrace, Cattle are indicator variables of the large, large grace, and cattle arms, respectively. The default arm category is traditional arm. Net non-livestockassets do not include livestock.

TABLE F5: ANCOVA ESTIMATION OF NET NON-LIVESTOCK ASSETS BY ARM, POVERTY STATUS, AND PERIOD

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		−4434.6 (0.0)	−5249.1 (0.0)	−5121.4 (0.0)	−4888.0 (0.0)	−4547.6 (0.0)	−4972.6 (0.0)
Large	0.048 (0.46)	998.7 (36.4)	2340.8 (12.2)	2485.8 (10.1)	2025.0 (24.3)	2041.0 (21.8)	2032.0 (24.5)
LargeGrace	0.006 (0.43)	−1502.6 (19.5)	−798.2 (66.2)	−966.4 (58.5)	−2147.0 (25.0)	−1555.6 (40.9)	−2152.3 (25.1)
Cattle	0.009 (0.44)	−996.8 (20.8)	−88.9 (93.8)	−56.3 (96.1)	−1032.0 (43.9)	−759.1 (57.0)	−1069.9 (42.7)
HadCattle	0.265 (0.44)				−397.7 (71.5)		734.3 (69.4)
UltraPoor	0.607 (0.49)	−1303.3 (5.7)	−1669.3 (9.0)	−1595.0 (10.3)	−1570.5 (16.8)	−1763.2 (8.8)	−1557.5 (17.7)
Large × UltraPoor	0.045 (0.37)	−331.4 (87.6)	382.2 (90.2)	−261.7 (93.7)	−781.2 (83.9)	60.2 (98.7)	−746.0 (84.7)
LargeGrace × UltraPoor	0.027 (0.35)	3333.6 (6.4)	4364.4 (11.1)	4029.6 (14.0)	4641.2 (15.6)	4482.3 (14.0)	4796.2 (14.2)
Cattle × UltraPoor	0.001 (0.34)	821.7 (52.4)	2408.9 (24.1)	2036.7 (30.6)	1587.8 (49.4)	2269.8 (33.7)	1652.8 (47.8)
rd 3	0.342 (0.47)	4633.0 (0.0)	5144.3 (0.0)	5154.5 (0.0)	5439.3 (0.0)	5137.3 (0.0)	5461.4 (0.0)
Large × rd 3	0.104 (0.30)	3198.9 (0.6)	1841.3 (34.0)	1821.9 (34.8)	1868.5 (41.0)	2152.7 (34.6)	1948.9 (39.2)
LargeGrace × rd 3	0.085 (0.28)	7790.7 (0.0)	7553.4 (0.3)	7548.4 (0.3)	8759.9 (0.2)	7752.5 (0.5)	8760.4 (0.2)
Cattle × rd 3	0.087 (0.28)	5135.9 (0.0)	3896.4 (3.6)	3908.8 (3.7)	4163.1 (6.0)	3935.9 (7.8)	4162.1 (6.0)
UltraPoor × rd 3	0.204 (0.40)	−305.6 (68.8)	36.8 (97.6)	52.2 (96.5)	−459.7 (73.9)	−21.6 (98.7)	−477.1 (72.9)
Large × UltraPoor × rd 3	0.014 (0.21)	2166.6 (24.9)	−21.2 (99.5)	−98.0 (97.6)	673.5 (84.6)	−116.4 (97.5)	610.6 (86.1)
LargeGrace × UltraPoor × rd 3	0.010 (0.21)	−184.0 (94.5)	−1835.0 (68.3)	−1954.1 (66.5)	−2517.0 (63.1)	−1826.3 (71.1)	−2494.0 (63.5)
Cattle × UltraPoor × rd 3	−0.000 (0.19)	3134.1 (6.3)	1542.4 (60.6)	1624.1 (58.9)	2565.2 (43.0)	1591.7 (65.4)	2573.4 (43.0)
rd 4	0.315 (0.46)	7869.8 (0.0)	8254.3 (0.0)	8257.8 (0.0)	8212.6 (0.0)	8011.9 (0.0)	8224.2 (0.0)
Large × rd 4	0.102 (0.30)	2676.0 (7.3)	1121.5 (61.4)	1048.0 (63.8)	1875.6 (44.2)	1831.8 (45.9)	1912.4 (43.4)
LargeGrace × rd 4	0.080 (0.27)	7163.2 (0.0)	6549.3 (2.2)	6464.2 (2.6)	8605.3 (0.6)	7056.2 (2.3)	8606.5 (0.6)
Cattle × rd 4	0.079 (0.27)	6176.1 (0.0)	4563.5 (3.2)	4560.8 (3.4)	5652.0 (2.1)	4771.5 (4.9)	5644.0 (2.1)
UltraPoor × rd 4	0.195 (0.40)	1551.4 (10.2)	2584.2 (5.6)	2538.1 (6.0)	1886.1 (21.3)	2371.9 (9.2)	1914.9 (20.5)
Large × UltraPoor × rd 4	0.016 (0.21)	304.0 (90.6)	−2967.7 (40.4)	−3055.1 (39.2)	−1371.9 (70.5)	−3022.1 (43.8)	−1340.6 (71.1)
LargeGrace × UltraPoor × rd 4	0.008 (0.20)	−4933.3 (8.0)	−7067.8 (13.0)	−7261.7 (12.2)	−6996.6 (19.4)	−7221.1 (14.8)	−7008.6 (19.3)
Cattle × UltraPoor × rd 4	−0.001 (0.19)	1176.4 (53.8)	−1008.8 (75.3)	−1073.1 (73.8)	−559.7 (86.4)	−1730.9 (62.7)	−548.3 (86.7)
HadCattle	0.265 (0.44)				−397.7 (71.5)		734.3 (69.4)
HadCattle × Large	0.024 (0.25)				1352.6 (66.6)		1192.2 (70.3)
HadCattle × LargeGrace	0.009 (0.23)				6254.7 (9.9)		6235.5 (9.7)
HadCattle × Cattle	−0.012 (0.21)				4863.1 (5.5)		4666.4 (7.2)
HadCattle × rd 3	0.092 (0.29)				−135.7 (93.3)		−144.7 (92.8)
HadCattle × Large × rd 3	0.008 (0.15)				−959.2 (85.7)		−1035.1 (84.6)
HadCattle × LargeGrace × rd 3	0.003 (0.14)				−9460.5 (12.8)		−9477.2 (12.7)
HadCattle × Cattle × rd 3	−0.004 (0.12)				−3847.3 (45.9)		−3867.2 (45.6)
HadCattle × rd 4	0.084 (0.28)				661.0 (74.1)		653.1 (74.4)
HadCattle × Large × rd 4	0.009 (0.14)				−1444.2 (80.5)		−1435.3 (80.7)
HadCattle × LargeGrace × rd 4	0.004 (0.13)				−10967.9 (13.9)		−10951.1 (14.1)
HadCattle × Cattle × rd 4	−0.005 (0.11)				−3767.9 (51.6)		−3819.8 (51.0)
Flood in round 1	0.414 (0.49)			−1351.5 (7.3)	−1568.7 (8.0)	−1665.7 (4.3)	−1542.5 (8.7)
Head literate0	0.149 (0.36)			163.6 (80.5)	−127.7 (86.0)	118.7 (85.7)	−92.7 (89.7)
NetAssetValue0	2657.829 (2852.68)		0.1 (1.1)	0.1 (0.9)	0.2 (5.2)	0.2 (9.0)	0.2 (6.0)
Household size0	4.538 (1.35)			88.5 (70.6)	207.6 (47.4)	130.6 (63.9)	225.9 (44.8)
Number of cattle0	0.380 (0.73)					−345.4 (56.8)	−797.1 (45.7)

TABLE F6: ANCOVA ESTIMATION OF NET NON-LIVESTOCK ASSETS BY ATTRIBUTES, POVERTY STATUS, AND PERIOD

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		−4434.6 (0.0)	−5249.1 (0.0)	−5121.4 (0.0)	−4888.0 (0.0)	−4547.6 (0.0)	−4972.6 (0.0)
Upfront	0.063 (0.39)	998.7 (36.4)	2340.8 (12.2)	2485.8 (10.1)	2025.0 (24.3)	2041.0 (21.8)	2032.0 (24.5)
WithGrace	0.014 (0.50)	−2501.3 (6.3)	−3139.0 (9.1)	−3452.3 (5.5)	−4172.0 (2.9)	−3596.6 (4.5)	−4184.4 (2.9)
InKind	0.009 (0.44)	505.8 (64.7)	709.4 (65.1)	910.1 (54.9)	1115.0 (47.1)	796.5 (59.8)	1082.5 (48.3)
HadCattle	0.265 (0.44)				−397.7 (71.5)		734.3 (69.4)
UltraPoor	0.607 (0.49)	−1303.3 (5.7)	−1669.3 (9.0)	−1595.0 (10.3)	−1570.5 (16.8)	−1763.2 (8.8)	−1557.5 (17.7)
Upfront × UltraPoor	0.072 (0.27)	−331.4 (87.6)	382.2 (90.2)	−261.7 (93.7)	−781.2 (83.9)	60.2 (98.7)	−746.0 (84.7)
WithGrace × UltraPoor	0.027 (0.39)	3665.0 (12.4)	3982.2 (23.1)	4291.3 (21.3)	5422.4 (17.3)	4422.1 (20.7)	5542.1 (16.7)
InKind × UltraPoor	0.001 (0.34)	−2511.9 (13.7)	−1955.5 (40.5)	−1992.9 (40.0)	−3053.4 (26.7)	−2212.5 (35.9)	−3143.4 (25.5)
rd 3	0.342 (0.47)	4633.0 (0.0)	5144.3 (0.0)	5154.5 (0.0)	5439.3 (0.0)	5137.3 (0.0)	5461.4 (0.0)
UltraPoor × rd 3	0.204 (0.40)	−305.6 (68.8)	36.8 (97.6)	52.2 (96.5)	−459.7 (73.9)	−21.6 (98.7)	−477.1 (72.9)
Upfront × rd 3	0.276 (0.45)	3198.9 (0.6)	1841.3 (34.0)	1821.9 (34.8)	1868.5 (41.0)	2152.7 (34.6)	1948.9 (39.2)
WithGrace × rd 3	0.172 (0.38)	4591.8 (0.2)	5712.2 (0.6)	5726.5 (0.6)	6891.3 (0.2)	5599.8 (0.7)	6811.5 (0.2)
InKind × rd 3	0.087 (0.28)	−2654.8 (6.7)	−3657.0 (7.0)	−3639.6 (7.3)	−4596.8 (3.1)	−3816.6 (5.6)	−4598.3 (3.1)
Upfront × UltraPoor × rd 3	0.024 (0.16)	2166.6 (24.9)	−21.2 (99.5)	−98.0 (97.6)	673.5 (84.6)	−116.4 (97.5)	610.6 (86.1)
WithGrace × UltraPoor × rd 3	0.010 (0.23)	−2350.6 (35.9)	−1813.8 (63.6)	−1856.1 (62.9)	−3190.4 (47.9)	−1709.9 (65.8)	−3104.5 (49.0)
InKind × UltraPoor × rd 3	−0.000 (0.19)	3318.1 (17.1)	3377.4 (35.3)	3578.2 (32.5)	5082.2 (23.9)	3418.0 (35.1)	5067.4 (24.0)
rd 4	0.315 (0.46)	7869.8 (0.0)	8254.3 (0.0)	8257.8 (0.0)	8212.6 (0.0)	8011.9 (0.0)	8224.2 (0.0)
UltraPoor × rd 4	0.195 (0.40)	1551.4 (10.2)	2584.2 (5.6)	2538.1 (6.0)	1886.1 (21.3)	2371.9 (9.2)	1914.9 (20.5)
Upfront × rd 4	0.260 (0.44)	2676.0 (7.3)	1121.5 (61.4)	1048.0 (63.8)	1875.6 (44.2)	1831.8 (45.9)	1912.4 (43.4)
WithGrace × rd 4	0.158 (0.37)	4487.3 (1.6)	5427.8 (3.5)	5416.3 (3.7)	6729.8 (1.2)	5224.5 (4.4)	6694.1 (1.2)
InKind × rd 4	0.079 (0.27)	−987.2 (57.5)	−1985.9 (42.6)	−1903.4 (45.2)	−2953.3 (26.8)	−2284.8 (36.8)	−2962.6 (26.7)
Upfront × UltraPoor × rd 4	0.024 (0.16)	304.0 (90.6)	−2967.7 (40.4)	−3055.1 (39.2)	−1371.9 (70.5)	−3022.1 (43.8)	−1340.6 (71.1)
WithGrace × UltraPoor × rd 4	0.008 (0.22)	−5237.2 (11.0)	−4100.1 (35.2)	−4206.6 (34.0)	−5624.7 (27.5)	−4198.9 (34.0)	−5668.0 (27.1)
InKind × UltraPoor × rd 4	−0.001 (0.19)	6109.6 (2.8)	6059.0 (14.3)	6188.6 (13.6)	6436.9 (19.1)	5490.1 (18.3)	6460.3 (18.9)
HadCattle	0.265 (0.44)				−397.7 (71.5)		734.3 (69.4)
HadCattle × Upfront	0.021 (0.20)				1352.6 (66.6)		1192.2 (70.3)
HadCattle × WithGrace	−0.003 (0.26)				4902.1 (16.3)		5043.3 (14.7)
HadCattle × InKind	−0.012 (0.21)				−1391.6 (66.1)		−1569.1 (61.6)
HadCattle × rd 3	0.092 (0.29)				−135.7 (93.3)		−144.7 (92.8)
HadCattle × Upfront × rd 3	0.006 (0.12)				−959.2 (85.7)		−1035.1 (84.6)
HadCattle × WithGrace × rd 3	−0.001 (0.15)				−8501.3 (2.5)		−8442.1 (2.6)
HadCattle × InKind × rd 3	−0.004 (0.12)				5613.2 (12.2)		5610.0 (12.2)
HadCattle × rd 4	0.084 (0.28)				661.0 (74.1)		653.1 (74.4)
HadCattle × Upfront × rd 4	0.007 (0.11)				−1444.2 (80.5)		−1435.3 (80.7)
HadCattle × WithGrace × rd 4	−0.001 (0.14)				−9523.8 (9.0)		−9515.8 (8.9)
HadCattle × InKind × rd 4	−0.005 (0.11)				7200.0 (19.4)		7131.3 (20.2)
Flood in round 1	0.414 (0.49)			−1351.5 (7.3)	−1568.7 (8.0)	−1665.7 (4.3)	−1542.5 (8.7)
Head literate0	0.149 (0.36)			163.6 (80.5)	−127.7 (86.0)	118.7 (85.7)	−92.7 (89.7)
NetAssetValue0	2657.829 (2852.68)		0.1 (1.1)	0.1 (0.9)	0.2 (5.2)	0.2 (9.0)	0.2 (6.0)
Household size0	4.538 (1.35)			88.5 (70.6)	207.6 (47.4)	130.6 (63.9)	225.9 (44.8)
Number of cattle0	0.380 (0.73)					−345.4 (56.8)	−797.1 (45.7)

F.3 Cattle holding

TABLE F7: ANCOVA ESTIMATION OF CATTLE HOLDING BY ARM AND PERIOD

covariates	mean/std	(1)	(2)	(3)	(4)
(Intercept)		1.47	1.36	1.12	1.11
		(0.0)	(0.0)	(0.0)	(0.0)
Large	0.273	0.39	0.37	0.35	0.35
	(0.45)	(0.6)	(0.4)	(0.8)	(0.8)
LargeGrace	0.248	0.01	0.02	0.02	0.03
	(0.43)	(94.3)	(88.5)	(83.9)	(82.5)
Cattle	0.264	−0.05	−0.03	−0.03	−0.03
	(0.44)	(44.1)	(72.3)	(67.5)	(69.1)
HadCattle	0.195				0.14
	(0.40)				(45.4)
rd 3	0.348	−0.02	0.00	0.00	0.01
	(0.48)	(71.4)	(96.9)	(93.8)	(91.5)
Large × rd 3	0.094	−0.05	−0.05	−0.05	−0.05
	(0.29)	(74.9)	(75.5)	(77.9)	(77.2)
LargeGrace × rd 3	0.085	0.19	0.20	0.21	0.21
	(0.28)	(28.5)	(25.5)	(24.9)	(25.1)
Cattle × rd 3	0.091	0.17	0.16	0.16	0.15
	(0.29)	(18.0)	(23.6)	(24.6)	(25.3)
rd 4	0.326	0.16	0.18	0.19	0.19
	(0.47)	(0.9)	(0.5)	(0.4)	(0.4)
Large × rd 4	0.094	0.05	0.04	0.05	0.05
	(0.29)	(74.5)	(79.1)	(78.2)	(78.7)
LargeGrace × rd 4	0.081	0.40	0.39	0.40	0.40
	(0.27)	(3.3)	(3.6)	(3.0)	(3.0)
Cattle × rd 4	0.085	0.34	0.34	0.35	0.35
	(0.28)	(0.8)	(1.1)	(1.1)	(1.2)
HadCattle	0.195				0.14
	(0.40)				(45.4)
Flood in round 1	0.491			0.05	0.05
	(0.50)			(57.2)	(56.4)
Head literate0	0.114			0.02	0.02
	(0.32)			(85.6)	(87.2)
Number of cattle0	0.266		0.31	0.29	0.21
	(0.62)		(0.2)	(0.6)	(21.4)
Household size0	4.219			0.05	0.05
	(1.43)			(3.7)	(3.8)
TotalImputed2Value0	5315.315				
	(12450.23)				
mean of dependent variable		1.62	1.62	1.62	1.62
$T = 2$		87	87	85	85
$T = 3$		168	168	168	168
$T = 4$		395	395	395	395
$\bar{R}^2$		0.04	0.086	0.089	0.089
N	1998	1608	1608	1606	1606

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Large, LargeGrace, Cattle are indicator variables of the large, large grace, and cattle arms, respectively. The default arm category is traditional arm. rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Sample is continuing members and replacing members of early rejecters and received loans prior to 2015 Janunary. Regressand is NumCows, number of cattle holding.

2. P values in percentages in parenthesises. Standard errors are clustered at group (village) level.

F.4 Repayment

F.4.1 Saving and repayment

TABLE F8: ANCOVA ESTIMATION OF NET SAVING AND REPAYMENT, ULTRA POOR VS. MODERATELY POOR

		Net saving					Repayment				
covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(Intercept)		38.1 (0.0)	105.4 (0.0)	37.3 (0.0)	104.5 (0.0)	102.1 (0.0)	255.5 (0.0)	135.0 (0.0)	256.4 (0.0)	136.7 (0.0)	143.2 (0.0)
Upfront	0.851 (0.36)	7.2 (4.2)	6.6 (6.5)	5.5 (13.6)	4.9 (19.2)	4.6 (19.9)	80.1 (0.0)	80.5 (0.0)	79.8 (0.0)	80.0 (0.0)	80.2 (0.0)
WithGrace	0.555 (0.50)	13.7 (0.6)	13.8 (0.6)	12.4 (1.1)	12.4 (1.1)	13.2 (0.4)	1.6 (87.6)	1.6 (87.2)	1.0 (92.6)	0.5 (96.0)	−2.1 (82.8)
InKind	0.264 (0.44)	1.6 (80.1)	1.5 (82.1)	1.9 (76.3)	1.7 (78.3)	1.3 (83.1)	−5.9 (58.2)	−6.1 (57.1)	−5.9 (58.2)	−6.1 (57.0)	−5.1 (61.9)
UltraPoor	0.714 (0.45)	2.4 (5.7)	2.5 (5.0)	2.4 (6.8)	2.4 (5.8)	2.6 (4.7)	−6.5 (3.8)	−6.6 (3.6)	−6.5 (3.8)	−6.6 (3.7)	−6.2 (5.7)
Upfront × UltraPoor	0.609 (0.49)	−4.8 (15.7)	−4.6 (18.7)	−4.6 (19.4)	−4.4 (22.4)	−4.3 (25.4)	12.7 (42.7)	12.6 (43.1)	12.9 (42.6)	12.9 (42.5)	13.0 (44.3)
WithGrace × UltraPoor	0.401 (0.49)	0.9 (80.7)	0.9 (79.1)	1.2 (73.8)	1.3 (72.0)	1.5 (66.5)	−5.6 (44.8)	−5.6 (44.6)	−5.6 (44.6)	−5.6 (44.4)	−6.6 (35.8)
InKind × UltraPoor	0.191 (0.39)	4.3 (21.8)	4.6 (18.4)	3.3 (33.5)	3.6 (28.8)	3.4 (30.3)	−0.3 (96.8)	−0.4 (95.2)	−0.3 (96.7)	−0.5 (95.0)	0.5 (94.7)
LY2	0.258 (0.44)		−81.2 (0.0)		−81.1 (0.0)	−81.2 (0.0)		149.3 (0.0)		149.3 (0.0)	148.6 (0.0)
LY3	0.258 (0.44)		−85.7 (0.0)		−85.7 (0.0)	−85.7 (0.0)		223.2 (0.0)		223.2 (0.0)	222.9 (0.0)
LY4	0.233 (0.42)		−102.0 (0.0)		−102.0 (0.0)	−102.1 (0.0)		102.5 (0.1)		102.6 (0.1)	101.6 (0.1)
Flood in round 1	0.477 (0.50)					1.5 (64.3)					−11.7 (2.2)
Head literate0	0.122 (0.33)					2.1 (41.2)					9.8 (15.1)
Net saving0	355.719 (513.67)			0.0 (3.7)	0.0 (3.4)	0.0 (4.6)					
Household size0	4.241 (1.38)					0.3 (61.3)					−0.3 (83.3)
Repaid0	98.890 (195.66)								−0.0 (83.3)	−0.0 (70.3)	−0.0 (71.7)
mean of dependent variable		54	54	54	54	54	318	318	318	318	318
R^2		0.008	0.164	0.009	0.166	0.165	0.005	0.051	0.005	0.051	0.051
N	26627	26758	26758	26758	26758	26627	26758	26758	26758	26758	26627

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Upfront is an indicator variable of the arm with an upfront large disbursement, WithGrace is an indicator variable of the arm with a grace period, InKind is an indicator variable of the arm which lends a heifer. UltraPoor is an indicator variable if the household is classified as the ultra poor. Saving and repayment information is taken from administrative data. Net saving is saving - withdrawal. LY2, LY3, LY4 are dummy variables for second, third, and fourth year into borrowing. Repayment starts from the year 2 for WithGrace functional attributes. The first regression of repayment gives a mean monthly repayment for each arms. Mean monthly repayment is zero in the year 1 for WithGrace functional attributes.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

F.4.2 Shortfall

TABLE F9: INDIVIDUAL LEVEL EFFECTS OF REPAYMENT SHORTFALL

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	3.11 (3.9)	14.20 (12.6)	31.23 (0.8)	131.82 (0.0)	51.21 (0.0)	51.21 (0.0)
Large	−1.13 (53.2)	−4.99 (9.9)	23.71 (9.6)		21.65 (18.2)	
LargeGrace	−1.21 (53.5)	−6.71 (3.6)	−138.02 (0.0)		−148.27 (0.0)	
Cattle	−1.37 (46.8)	−6.65 (5.0)	−140.01 (0.0)		−152.05 (0.0)	
Upfront				−16.99 (9.6)		21.65 (18.2)
WithGrace				−75.48 (0.0)		−169.92 (0.0)
InKind				2.08 (75.4)		−3.78 (80.0)
UltraPoor					−0.07 (99.5)	−0.07 (99.5)
Large × UltraPoor					−4.07 (75.7)	
LargeGrace × UltraPoor					7.80 (49.0)	
Cattle × UltraPoor					10.38 (37.3)	
Upfront × UltraPoor						−4.07 (75.7)
WithGrace × UltraPoor						11.87 (14.1)
InKind × UltraPoor						2.57 (64.3)
LY2			21.94 (7.6)	86.56 (0.0)	53.91 (0.2)	53.91 (0.2)
Large × LY2			−20.54 (1.5)		−47.15 (1.7)	
LargeGrace × LY2			202.85 (0.0)		166.12 (0.0)	
Cattle × LY2			216.04 (0.0)		182.78 (0.0)	
Upfront × LY2				−1.51 (91.5)		−47.15 (1.7)
WithGrace × LY2				54.29 (0.1)		213.27 (0.0)
InKind × LY2				−15.18 (36.8)		16.65 (46.7)
UltraPoor × LY2					−7.27 (54.8)	−7.27 (54.8)
Large × UltraPoor × LY2					5.27 (70.3)	
LargeGrace × UltraPoor × LY2					6.76 (63.9)	
Cattle × UltraPoor × LY2					−1.32 (93.3)	
Upfront × UltraPoor × LY2						5.27 (70.3)
WithGrace × UltraPoor × LY2						1.49 (88.5)
InKind × UltraPoor × LY2						−8.09 (53.6)

Table F9: Individual level effects of repayment shortfall (continued)

covariates	(1)	(2)	(3)	(4)	(5)	(6)
LY3			43.46	70.77	76.73	76.73
			(0.4)	(0.0)	(0.0)	(0.0)
Large × LY3			−17.04		−83.16	
			(17.2)		(0.1)	
LargeGrace × LY3			242.61		184.25	
			(0.0)		(0.0)	
Cattle × LY3			260.48		225.16	
			(0.0)		(0.0)	
Upfront × LY3				−89.08		−83.16
				(0.0)		(0.1)
WithGrace × LY3				140.00		267.41
				(0.0)		(0.0)
InKind × LY3				−9.03		40.91
				(68.9)		(23.6)
UltraPoor × LY3					−10.02	−10.02
					(26.8)	(26.8)
Large × UltraPoor × LY3					17.87	
					(33.4)	
LargeGrace × UltraPoor × LY3					7.12	
					(60.8)	
Cattle × UltraPoor × LY3					−29.52	
					(20.0)	
Upfront × UltraPoor × LY3						17.87
						(33.4)
WithGrace × UltraPoor × LY3						−10.75
						(58.1)
InKind × UltraPoor × LY3						−36.64
						(12.3)
LY4			−283.74	−168.44	−269.18	−269.18
			(0.0)	(0.0)	(0.0)	(0.0)
Large × LY4			−264.49		−7.66	
			(0.0)		(87.4)	
LargeGrace × LY4			−91.78		155.19	
			(0.2)		(0.1)	
Cattle × LY4			−136.17		141.55	
			(0.1)		(2.3)	
Upfront × LY4				−125.24		−7.66
				(0.8)		(87.4)
WithGrace × LY4				227.68		162.85
				(0.0)		(0.2)
InKind × LY4				−13.03		−13.63
				(83.0)		(83.2)
UltraPoor × LY4					−13.10	−13.10
					(69.5)	(69.5)
Large × UltraPoor × LY4					17.81	
					(67.1)	
LargeGrace × UltraPoor × LY4					43.79	
					(27.6)	
Cattle × UltraPoor × LY4					13.61	
					(73.8)	
Upfront × UltraPoor × LY4						17.81
						(67.1)
WithGrace × UltraPoor × LY4						25.98
						(44.8)
InKind × UltraPoor × LY4						−30.18
						(36.6)

Source: Estimated with GUK administrative data.

Notes: 1. Estimates of repayment shortfall controlling for group/village and year-month fixed effects using 48 month administrative records. The estimated model is $\tilde{y}_{it} = b_1 + \boldsymbol{b}_1'\mathbf{d}_i + b_2\mathsf{LY2} + \boldsymbol{b}_2'\mathbf{d}_i\mathsf{LY2} + b_3\mathsf{LY3} + \boldsymbol{b}_3'\mathbf{d}_i\mathsf{LY3} + b_4\mathsf{LY4} + \boldsymbol{b}_4'\mathbf{d}_i\mathsf{LY4} + \tilde{e}_{it}$, where $\tilde{x}_{it}$ is group and time demeaned value of variable x, $t = 1, \ldots, 48$ is an ellapsed month index, $\mathbf{d}_i$ is a three element vector of arms or functional attributes, $\mathsf{LY2}, \mathsf{LY3}, \mathsf{LY4}$ are indicator variables of loan years 2, 3, 4. Loan years are defined with the ellapsed months since the first disbursement date, 13-24 for LY2, 25-36 for LY3, and 37-48 for LY4. Fixed effects are controlled by differencing out respecive means from the data matrix. Shortfall y_{it} is (planned installment) - (actual repayment). Group shortfall$_{t-1}$ indicates a one month lagged mean shortfall amount of a group. Per member group net saving$_{t-1}$ and Per member cumulative group net saving (BDT1000)$_{t-1}$ give one month lagged average net saving in a group and their accumulated sums, respectively. Median group repayent shortfall rate is -1.42. 69 groups participated in the lending program.

2. Standard errors are clustered at group (village) level.

Table F9: Individual level effects of repayment shortfall (continued)

covariates	(1)	(2)	(3)	(4)	(5)	(6)
Group shortfall$_{t-1}$		−0.07 (23.6)			−0.22 (0.0)	−0.22 (0.0)
shortfall$_{t-1}$		0.45 (0.0)	0.27 (0.0)	−0.05 (0.0)	0.30 (0.0)	0.30 (0.0)
Per member group net saving$_{t-1}$					−0.11 (0.0)	−0.11 (0.0)
Per member cumulative group net saving (BDT1000)$_{t-1}$					−0.03 (41.0)	−0.03 (41.0)
number of clusters	69	69	69	69	69	69
$\bar{R}^2$	0	0.102	0.172	0.121	0.179	0.179
N	41901	41722	41722	41722	41722	41722

Source: Estimated with GUK administrative data.

Notes: 1. Estimates of repayment shortfall controlling for group/village and year-month fixed effects using 48 month administrative records. The estimated model is $\tilde{y}_{it} = b_1 + \boldsymbol{b}_1'\mathbf{d}_i + b_2\mathsf{LY2} + \boldsymbol{b}_2'\mathbf{d}_i\mathsf{LY2} + b_3\mathsf{LY3} + \boldsymbol{b}_3'\mathbf{d}_i\mathsf{LY3} + b_4\mathsf{LY4} + \boldsymbol{b}_4'\mathbf{d}_i\mathsf{LY4} + \tilde{e}_{it}$, where $\tilde{x}_{it}$ is group and time demeaned value of variable x, $t = 1, \ldots, 48$ is an ellapsed month index, $\mathbf{d}_i$ is a three element vector of arms or functional attributes, $\mathsf{LY2}, \mathsf{LY3}, \mathsf{LY4}$ are indicator variables of loan years 2, 3, 4. Loan years are defined with the ellapsed months since the first disbursement date, 13-24 for LY2, 25-36 for LY3, and 37-48 for LY4. Fixed effects are controlled by differencing out respecive means from the data matrix. Shortfall y_{it} is (planned installment) - (actual repayment). Group shortfall$_{t-1}$ indicates a one month lagged mean shortfall amount of a group. Per member group net saving$_{t-1}$ and Per member cumulative group net saving (BDT1000)$_{t-1}$ give one month lagged average net saving in a group and their accumulated sums, respectively. Median group repayent shortfall rate is -1.42. 69 groups participated in the lending program.

2. Standard errors are clustered at group (village) level.

F.5 Schooling

TABLE F10: ANCOVA ESTIMATION OF SCHOOL ENROLLMENT BY TIME

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		0.86 (0.0)	0.65 (0.0)	0.70 (0.0)	0.82 (0.0)	0.69 (0.0)	0.79 (0.0)
Secondary	0.338 (0.47)			−0.14 (0.0)	−0.12 (0.0)	−0.14 (0.0)	−0.12 (0.0)
College	0.172 (0.38)			−0.24 (0.0)	−0.21 (0.0)	−0.23 (0.0)	−0.21 (0.0)
Large	0.272 (0.44)	−0.02 (59.3)	−0.03 (44.7)	−0.04 (23.7)	−0.03 (31.2)	−0.04 (23.9)	−0.03 (29.5)
LargeGrace	0.247 (0.43)	−0.03 (36.5)	−0.04 (26.6)	−0.04 (22.1)	−0.04 (19.0)	−0.03 (25.7)	−0.03 (22.7)
Cattle	0.257 (0.44)	−0.03 (39.5)	−0.04 (16.7)	−0.06 (5.3)	−0.05 (8.5)	−0.05 (6.3)	−0.05 (10.1)
Large × Secondary	0.085 (0.28)	0.08 (30.4)	0.04 (61.0)	0.04 (51.1)	0.05 (41.6)	0.04 (52.5)	0.05 (40.9)
LargeGrace × Secondary	0.083 (0.28)	−0.06 (47.8)	−0.06 (46.6)	−0.07 (30.1)	−0.07 (28.8)	−0.06 (36.9)	−0.07 (31.8)
Cattle × Secondary	0.088 (0.28)	−0.01 (94.5)	0.00 (99.9)	−0.00 (95.7)	0.00 (97.4)	0.00 (96.6)	0.01 (91.3)
Large × College	0.049 (0.22)	0.07 (55.8)	0.05 (68.1)	0.04 (65.8)	0.10 (27.9)	0.04 (56.5)	0.11 (20.1)
LargeGrace × College	0.049 (0.22)	0.02 (89.9)	0.01 (91.9)	0.02 (83.6)	0.02 (77.4)	0.01 (86.1)	0.03 (72.3)
Cattle × College	0.035 (0.18)	−0.04 (76.4)	−0.01 (90.8)	−0.06 (51.2)	−0.06 (48.7)	−0.05 (57.4)	−0.05 (59.2)
Female	0.450 (0.50)					0.04 (6.1)	0.05 (8.1)
Secondary × Female	0.152 (0.36)					0.10 (0.5)	0.09 (1.0)
College × Female	0.059 (0.24)					0.08 (17.0)	0.07 (27.8)
Large × Female	0.121 (0.33)	−0.01 (86.7)	−0.01 (82.8)	−0.01 (87.2)	0.02 (76.8)	0.00 (99.5)	0.02 (64.3)
LargeGrace × Female	0.114 (0.32)	0.10 (11.7)	0.09 (12.1)	0.09 (11.2)	0.07 (15.6)	0.09 (8.1)	0.07 (12.3)
Cattle × Female	0.114 (0.32)	0.06 (45.2)	0.06 (28.3)	0.06 (28.5)	0.07 (15.8)	0.07 (18.5)	0.08 (10.0)
Large × Secondary × Female	0.041 (0.20)	−0.19 (14.3)	−0.17 (16.5)	−0.18 (12.0)	−0.22 (3.1)	−0.17 (11.0)	−0.21 (2.9)
LargeGrace × Secondary × Female	0.036 (0.19)	0.04 (75.8)	0.06 (60.9)	0.05 (69.1)	0.05 (61.8)	0.06 (60.6)	0.06 (51.4)
Cattle × Secondary × Female	0.037 (0.19)	0.01 (91.8)	−0.05 (72.1)	−0.07 (60.9)	−0.04 (76.1)	−0.05 (66.8)	−0.03 (81.6)
Large × College × Female	0.016 (0.12)	0.11 (68.8)	0.10 (63.9)	0.04 (84.3)	0.16 (45.5)	0.04 (81.6)	0.17 (42.8)
LargeGrace × College × Female	0.018 (0.13)	−0.06 (81.3)	−0.02 (94.6)	0.05 (81.7)	0.12 (55.9)	0.03 (88.9)	0.11 (58.7)
Cattle × College × Female	0.010 (0.10)	0.39 (14.5)	0.26 (24.3)	0.22 (26.3)	0.25 (21.9)	0.25 (18.6)	0.27 (18.8)

Table F10: ANCOVA estimation of school enrollment by time (continued)

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
rd 3	0.343 (0.47)	0.05 (0.0)	0.04 (0.1)	0.06 (0.0)	0.05 (0.0)	0.06 (0.0)	0.05 (0.0)
Secondary × rd 3	0.120 (0.32)			−0.01 (84.6)	−0.02 (46.7)	−0.01 (87.6)	−0.02 (47.3)
College × rd 3	0.055 (0.23)			0.03 (49.9)	0.02 (68.7)	0.02 (62.0)	0.01 (79.1)
Large × rd 3	0.091 (0.29)	−0.04 (29.4)	−0.04 (28.5)	−0.05 (17.0)	−0.05 (9.9)	−0.05 (17.3)	−0.06 (8.4)
LargeGrace × rd 3	0.086 (0.28)	−0.07 (5.5)	−0.07 (3.2)	−0.08 (2.2)	−0.08 (2.6)	−0.08 (2.0)	−0.08 (2.2)
Cattle × rd 3	0.089 (0.28)	−0.05 (22.0)	−0.06 (11.0)	−0.06 (11.1)	−0.07 (6.3)	−0.06 (11.2)	−0.06 (7.8)
Large × Secondary × rd 3	0.028 (0.17)	−0.04 (64.5)	0.00 (96.8)	0.00 (99.5)	−0.01 (89.1)	−0.01 (93.5)	−0.02 (81.4)
LargeGrace × Secondary × rd 3	0.028 (0.16)	0.05 (56.2)	0.08 (33.1)	0.08 (33.0)	0.06 (44.4)	0.06 (43.8)	0.05 (53.9)
Cattle × Secondary × rd 3	0.032 (0.18)	0.02 (82.0)	0.06 (49.7)	0.06 (49.6)	0.05 (58.1)	0.06 (48.8)	0.05 (57.7)
Large × College × rd 3	0.015 (0.12)	0.09 (54.0)	0.05 (66.2)	0.09 (44.4)	−0.01 (94.6)	0.09 (42.2)	−0.01 (93.4)
LargeGrace × College × rd 3	0.017 (0.13)	−0.04 (66.6)	−0.03 (72.5)	−0.01 (89.9)	−0.04 (70.1)	0.00 (99.4)	−0.04 (72.5)
Cattle × College × rd 3	0.012 (0.11)	0.05 (74.2)	0.03 (83.5)	0.04 (76.8)	−0.01 (95.0)	0.04 (76.2)	−0.01 (92.7)
Female × rd 3	0.155 (0.36)					0.00 (90.1)	0.01 (69.1)
Large × Female × rd 3	0.040 (0.20)	0.07 (29.9)	0.06 (31.9)	0.07 (23.3)	0.06 (27.9)	0.07 (19.2)	0.07 (24.6)
LargeGrace × Female × rd 3	0.039 (0.19)	0.04 (53.2)	0.03 (55.6)	0.03 (59.4)	0.04 (51.8)	0.04 (48.6)	0.04 (43.0)
Cattle × Female × rd 3	0.040 (0.20)	0.03 (64.0)	0.05 (36.2)	0.05 (37.5)	0.05 (42.4)	0.06 (37.6)	0.06 (41.1)
Large × Secondary × Female × rd 3	0.014 (0.12)	0.16 (43.0)	0.16 (36.8)	0.15 (38.8)	0.14 (30.7)	0.19 (26.2)	0.19 (17.3)
LargeGrace × Secondary × Female ×	0.012 (0.11)	0.23 (25.8)	0.19 (28.8)	0.21 (23.3)	0.22 (17.9)	0.24 (14.9)	0.26 (9.5)
Cattle × Secondary × Female × rd 3	0.012 (0.11)	0.31 (10.1)	0.30 (7.8)	0.29 (9.1)	0.18 (22.6)	0.31 (7.5)	0.22 (14.4)
Large × College × Female × rd 3	0.003 (0.06)	0.29 (32.4)	0.29 (20.5)	0.24 (26.1)	0.08 (76.4)	0.24 (25.9)	0.07 (78.1)
LargeGrace × College × Female × rd 3	0.006 (0.08)	0.08 (72.8)	0.10 (61.7)	−0.05 (78.3)	−0.13 (54.8)	−0.04 (84.0)	−0.12 (58.5)
Cattle × College × Female × rd 3	0.004 (0.06)	−0.43 (16.4)	−0.28 (27.8)	−0.29 (25.7)	−0.30 (28.5)	−0.29 (25.3)	−0.31 (28.4)
Secondary × Female × rd 3	0.052 (0.22)					−0.00 (97.3)	0.04 (46.1)
College × Female × rd 3	0.017 (0.13)					−0.01 (90.4)	−0.02 (85.6)

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Large, LargeGrace, Cattle are indicator variables of the large, large grace, and cattle arms, respectively. The default arm category is traditional arm. Secondary and College are indicator variables of secondary schooling (ages 13-15) and tertiary schooling (ages 16-18), both at the time of baseline. Default category is primary (ages 05-12). rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Interaction terms of dummy variables are demeaned before interacting. The first column gives mean and standard deviation (in parenthesises) of each covariates before demeaning.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

TABLE F11: ANCOVA ESTIMATION OF SCHOOL ENROLLMENT BY TIME (CONTINUED 2)

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
rd 4	0.276 (0.45)	0.10 (0.0)	0.08 (0.0)	0.14 (0.0)	0.13 (0.0)	0.14 (0.0)	0.13 (0.0)
Secondary × rd 4	0.143 (0.35)			−0.02 (58.3)	−0.03 (43.3)	−0.02 (54.9)	−0.04 (40.7)
College × rd 4	0.057 (0.23)			0.02 (61.7)	0.00 (94.4)	−0.00 (96.0)	−0.01 (84.5)
WithGrace × rd 4	0.136 (0.34)	0.04 (36.8)	0.03 (54.0)	0.04 (34.8)	0.03 (40.2)	0.04 (32.9)	0.04 (35.9)
Upfront × rd 4	0.216 (0.41)	−0.06 (27.2)	−0.04 (49.1)	−0.07 (10.9)	−0.08 (6.0)	−0.08 (8.5)	−0.09 (3.7)
InKind × rd 4	0.067 (0.25)	−0.02 (69.7)	−0.02 (60.2)	−0.01 (75.8)	−0.01 (89.8)	−0.01 (77.5)	−0.00 (91.9)
WithGrace × Secondary × rd 4	0.073 (0.26)	0.14 (20.4)	0.13 (18.9)	0.10 (29.0)	0.11 (28.9)	0.07 (47.1)	0.09 (38.9)
Upfront × Secondary × rd 4	0.109 (0.31)	−0.11 (37.9)	−0.11 (32.6)	−0.04 (68.7)	−0.06 (52.8)	−0.03 (75.6)	−0.06 (53.2)
InKind × Secondary × rd 4	0.037 (0.19)	−0.05 (67.3)	−0.03 (82.6)	−0.03 (79.7)	−0.04 (75.2)	−0.01 (90.1)	−0.02 (85.0)
WithGrace × College × rd 4	0.026 (0.16)	−0.20 (15.7)	−0.14 (24.2)	−0.20 (6.6)	−0.14 (23.2)	−0.18 (8.0)	−0.12 (27.5)
Upfront × College × rd 4	0.044 (0.21)	−0.10 (57.5)	−0.14 (34.5)	−0.03 (84.5)	−0.11 (44.0)	−0.02 (85.7)	−0.11 (43.0)
InKind × College × rd 4	0.011 (0.10)	0.14 (23.1)	0.14 (13.2)	0.15 (14.4)	0.15 (16.9)	0.15 (9.8)	0.16 (9.5)
Female × rd 4	0.131 (0.34)					−0.07 (0.5)	−0.06 (1.8)
WithGrace × Female × rd 4	0.064 (0.24)	−0.14 (10.2)	−0.12 (13.3)	−0.15 (3.2)	−0.14 (3.9)	−0.16 (1.7)	−0.15 (2.9)
Upfront × Female × rd 4	0.102 (0.30)	0.08 (25.6)	0.12 (12.1)	0.15 (1.1)	0.14 (3.3)	0.16 (0.3)	0.15 (1.3)
InKind × Female × rd 4	0.030 (0.17)	0.06 (51.5)	0.09 (30.6)	0.10 (20.4)	0.09 (21.8)	0.10 (17.3)	0.09 (18.2)
WithGrace × Secondary × Female × rd 4	0.035 (0.18)	−0.12 (57.9)	−0.20 (31.1)	−0.11 (55.8)	−0.13 (45.0)	−0.10 (58.3)	−0.10 (54.1)
Upfront × Secondary × Female × rd	0.052 (0.22)	0.22 (33.7)	0.11 (56.6)	0.05 (80.5)	0.11 (50.1)	0.02 (90.6)	0.07 (66.2)
InKind × Secondary × Female × rd 4	0.018 (0.13)	0.17 (42.1)	0.21 (25.3)	0.17 (36.6)	0.05 (75.5)	0.16 (36.8)	0.05 (76.7)
WithGrace × College × Female × rd	0.010 (0.10)	0.23 (34.6)	0.21 (36.7)	0.04 (88.1)	0.14 (57.9)	0.10 (66.1)	0.21 (41.7)
Upfront × College × Female × rd 4	0.021 (0.14)	0.14 (66.7)	0.06 (80.5)	0.05 (83.9)	−0.20 (49.7)	−0.01 (96.2)	−0.25 (37.9)
InKind × College × Female × rd 4	0.004 (0.06)	−0.34 (30.4)	−0.28 (34.6)	−0.23 (44.0)	−0.14 (62.1)	−0.21 (47.9)	−0.12 (67.8)
Secondary × Female × rd 4	0.067 (0.25)					−0.01 (88.6)	0.02 (78.2)
College × Female × rd 4	0.029 (0.17)					0.14 (15.6)	0.15 (17.0)
EldestSon	0.267 (0.44)				0.01 (80.4)		0.04 (23.2)
EldestDaughter	0.188 (0.39)				0.03 (30.8)		0.01 (77.7)
Flood in round 1	0.464 (0.50)				−0.05 (4.1)		−0.05 (3.2)
Head literate0	0.108 (0.31)				0.06 (2.2)		0.06 (2.3)
Head age0	39.153 (7.38)				−0.00 (17.9)		−0.00 (18.8)
Enrolled0	0.760 (0.43)		0.28 (0.0)	0.32 (0.0)	0.30 (0.0)	0.31 (0.0)	0.29 (0.0)
ChildAgeOrderAtRd1	1.826 (0.98)				0.02 (28.3)		0.02 (25.9)
Household size0	4.974 (1.15)				−0.01 (34.3)		−0.01 (41.1)
mean of dependent variable $T = 2$		0.88 89	0.88 89	0.88 89	0.88 75	0.88 89	0.88 75
$T = 3$ $T = 4$		135 539	135 539	135 539	126 500	135 539	126 500
$\tilde{R}^2$ N	 1841	0.021 1976	0.16 1976	0.232 1976	0.216 1841	0.24 1976	0.222 1841

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Large, LargeGrace, Cattle are indicator variables of the large, large grace, and cattle arms, respectively. The default arm category is traditional arm. Secondary and College are indicator variables of secondary schooling (ages 13-15) and tertiary schooling (ages 16-18), both at the time of baseline. Default category is primary (ages 05-12). rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Interaction terms of dummy variables are demeaned before interacting. The first column gives mean and standard deviation (in parenthesises) of each covariates before demeaning.

2. P values in percentages in parenthesises. Standard errors are clustered at group (village) level.

TABLE F12: ANCOVA ESTIMATION OF SCHOOL ENROLLMENT BY ATTRIBUTES AND TIME

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		0.86 (0.0)	0.65 (0.0)	0.70 (0.0)	0.82 (0.0)	0.69 (0.0)	0.79 (0.0)
Secondary	0.338 (0.47)			−0.14 (0.0)	−0.12 (0.0)	−0.14 (0.0)	−0.12 (0.0)
College	0.172 (0.38)			−0.24 (0.0)	−0.21 (0.0)	−0.23 (0.0)	−0.21 (0.0)
Upfront	0.776 (0.42)	−0.02 (59.3)	−0.03 (44.7)	−0.04 (23.7)	−0.03 (31.2)	−0.04 (23.9)	−0.03 (29.5)
WithGrace	0.504 (0.50)	−0.01 (79.4)	−0.01 (76.0)	0.00 (98.5)	−0.00 (90.5)	0.00 (91.8)	0.00 (99.8)
InKind	0.257 (0.44)	0.00 (98.6)	−0.01 (87.5)	−0.02 (57.9)	−0.01 (71.2)	−0.02 (58.3)	−0.01 (68.9)
WithGrace × Secondary	0.171 (0.38)	−0.13 (6.8)	−0.10 (20.0)	−0.11 (6.3)	−0.13 (5.1)	−0.10 (10.2)	−0.12 (6.3)
Upfront × Secondary	0.255 (0.44)	0.08 (30.4)	0.04 (61.0)	0.04 (51.1)	0.05 (41.6)	0.04 (52.5)	0.05 (40.9)
InKind × Secondary	0.088 (0.28)	0.05 (50.9)	0.06 (44.1)	0.06 (29.6)	0.08 (25.1)	0.06 (31.9)	0.08 (25.6)
WithGrace × College	0.084 (0.28)	−0.06 (60.4)	−0.03 (73.9)	−0.02 (79.4)	−0.07 (34.1)	−0.03 (65.6)	−0.08 (26.8)
Upfront × College	0.134 (0.34)	0.07 (55.8)	0.05 (68.1)	0.04 (65.8)	0.10 (27.9)	0.04 (56.5)	0.11 (20.1)
InKind × College	0.035 (0.18)	−0.06 (63.9)	−0.03 (81.6)	−0.08 (33.1)	−0.09 (26.4)	−0.06 (40.5)	−0.08 (30.5)
Female	0.450 (0.50)					0.04 (6.1)	0.05 (8.1)
Secondary × Female	0.152 (0.36)					0.10 (0.5)	0.09 (1.0)
College × Female	0.059 (0.24)					0.08 (17.0)	0.07 (27.8)
WithGrace × Female	0.228 (0.42)	0.11 (13.3)	0.10 (16.0)	0.10 (17.0)	0.05 (43.7)	0.09 (16.5)	0.05 (45.6)
Upfront × Female	0.349 (0.48)	−0.01 (86.7)	−0.01 (82.8)	−0.01 (87.2)	0.02 (76.8)	0.00 (99.5)	0.02 (64.3)
InKind × Female	0.114 (0.32)	−0.05 (60.2)	−0.03 (71.4)	−0.03 (66.1)	0.00 (97.2)	−0.02 (70.4)	0.01 (92.1)
WithGrace × Secondary × Female	0.074 (0.26)	0.23 (6.2)	0.24 (2.2)	0.22 (2.3)	0.27 (0.2)	0.23 (1.0)	0.27 (0.1)
Upfront × Secondary × Female	0.115 (0.32)	−0.19 (14.3)	−0.17 (16.5)	−0.18 (12.0)	−0.22 (3.1)	−0.17 (11.0)	−0.21 (2.9)
InKind × Secondary × Female	0.037 (0.19)	−0.03 (83.3)	−0.11 (33.6)	−0.11 (33.9)	−0.09 (40.4)	−0.11 (30.0)	−0.09 (35.0)
WithGrace × College × Female	0.028 (0.17)	−0.17 (44.3)	−0.12 (53.6)	0.01 (96.1)	−0.04 (82.9)	−0.02 (91.7)	−0.05 (75.6)
Upfront × College × Female	0.044 (0.21)	0.11 (68.8)	0.10 (63.9)	0.04 (84.3)	0.16 (45.5)	0.04 (81.6)	0.17 (42.8)
InKind × College × Female	0.010 (0.10)	0.46 (4.4)	0.27 (16.1)	0.17 (30.4)	0.13 (44.0)	0.22 (16.2)	0.15 (35.2)

TABLE F12: ANCOVA ESTIMATION OF SCHOOL ENROLLMENT BY ATTRIBUTES AND TIME (CONTINUED)

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
rd 3	0.343 (0.47)	0.05 (0.0)	0.04 (0.1)	0.06 (0.0)	0.05 (0.0)	0.06 (0.0)	0.05 (0.0)
Secondary × rd 3	0.120 (0.32)			−0.01 (84.6)	−0.02 (46.7)	−0.01 (87.6)	−0.02 (47.3)
College × rd 3	0.055 (0.23)			0.03 (49.9)	0.02 (68.7)	0.02 (62.0)	0.01 (79.1)
WithGrace × rd 3	0.175 (0.38)	−0.03 (38.9)	−0.03 (30.8)	−0.04 (27.4)	−0.03 (43.3)	−0.04 (26.6)	−0.03 (42.1)
Upfront × rd 3	0.266 (0.44)	−0.04 (29.4)	−0.04 (28.5)	−0.05 (17.0)	−0.05 (9.9)	−0.05 (17.3)	−0.06 (8.4)
InKind × rd 3	0.089 (0.28)	0.02 (62.6)	0.01 (72.4)	0.02 (51.6)	0.02 (68.5)	0.03 (46.1)	0.02 (59.5)
WithGrace × Secondary × rd 3	0.060 (0.24)	0.10 (31.9)	0.08 (36.9)	0.08 (36.1)	0.07 (42.8)	0.07 (42.6)	0.07 (46.0)
Upfront × Secondary × rd 3	0.088 (0.28)	−0.04 (64.5)	0.00 (96.8)	0.00 (99.5)	−0.01 (89.1)	−0.01 (93.5)	−0.02 (81.4)
InKind × Secondary × rd 3	0.032 (0.18)	−0.03 (76.9)	−0.02 (83.5)	−0.02 (85.9)	−0.01 (89.5)	0.00 (99.7)	−0.00 (99.1)
WithGrace × College × rd 3	0.029 (0.17)	−0.13 (27.6)	−0.08 (39.8)	−0.10 (29.5)	−0.03 (76.9)	−0.09 (34.6)	−0.03 (81.3)
Upfront × College × rd 3	0.044 (0.21)	0.09 (54.0)	0.05 (66.2)	0.09 (44.4)	−0.01 (94.6)	0.09 (42.2)	−0.01 (93.4)
InKind × College × rd 3	0.012 (0.11)	0.09 (47.3)	0.06 (60.4)	0.05 (67.0)	0.03 (80.7)	0.04 (73.8)	0.02 (85.3)
Female × rd 3	0.155 (0.36)					0.00 (90.1)	0.01 (69.1)
WithGrace × Female × rd 3	0.079 (0.27)	−0.03 (62.9)	−0.03 (66.0)	−0.03 (54.6)	−0.03 (62.8)	−0.03 (54.4)	−0.03 (64.3)
Upfront × Female × rd 3	0.119 (0.32)	0.07 (29.9)	0.06 (31.9)	0.07 (23.3)	0.06 (27.9)	0.07 (19.2)	0.07 (24.6)
InKind × Female × rd 3	0.040 (0.20)	−0.01 (84.3)	0.02 (73.6)	0.02 (73.0)	0.02 (80.4)	0.02 (79.6)	0.01 (85.2)
WithGrace × Secondary × Female × rd 3	0.024 (0.15)	0.07 (69.6)	0.03 (85.8)	0.06 (71.3)	0.08 (63.8)	0.05 (74.6)	0.07 (65.0)
Upfront × Secondary × Female × rd	0.038 (0.19)	0.16 (43.0)	0.16 (36.8)	0.15 (38.8)	0.14 (30.7)	0.19 (26.2)	0.19 (17.3)
InKind × Secondary × Female × rd 3	0.012 (0.11)	0.08 (65.7)	0.11 (48.6)	0.09 (60.1)	−0.04 (80.8)	0.07 (68.9)	−0.05 (75.8)
WithGrace × College × Female × rd	0.010 (0.10)	−0.21 (37.6)	−0.20 (34.1)	−0.29 (10.0)	−0.21 (31.1)	−0.27 (12.8)	−0.19 (38.6)
Upfront × College × Female × rd 3	0.013 (0.11)	0.29 (32.4)	0.29 (20.5)	0.24 (26.1)	0.08 (76.4)	0.24 (25.9)	0.07 (78.1)
InKind × College × Female × rd 3	0.004 (0.06)	−0.50 (5.1)	−0.38 (11.4)	−0.23 (28.9)	−0.18 (44.3)	−0.25 (26.5)	−0.19 (42.8)
Secondary × Female × rd 3	0.052 (0.22)					−0.00 (97.3)	0.04 (46.1)
College × Female × rd 3	0.017 (0.13)					−0.01 (90.4)	−0.02 (85.6)

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Upfront is an indicator variable of the arm with an upfront large disbursement, WithGrace is an indicator variable of the arm with a grace period, InKind is an indicator variable of the arm which lends a heifer. Secondary and College are indicator variables of secondary schooling (ages 13-15) and tertiary schooling (ages 16-18), both at the time of baseline. Default category is primary (ages 05-12). rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Interaction terms of dummy variables are demeaned before interacting. The first column gives mean and standard deviation (in parenthesises) of each covariates before demeaning.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

TABLE F13: ANCOVA ESTIMATION OF SCHOOL ENROLLMENT BY ATTRIBUTES AND TIME (CONTINUED 3)

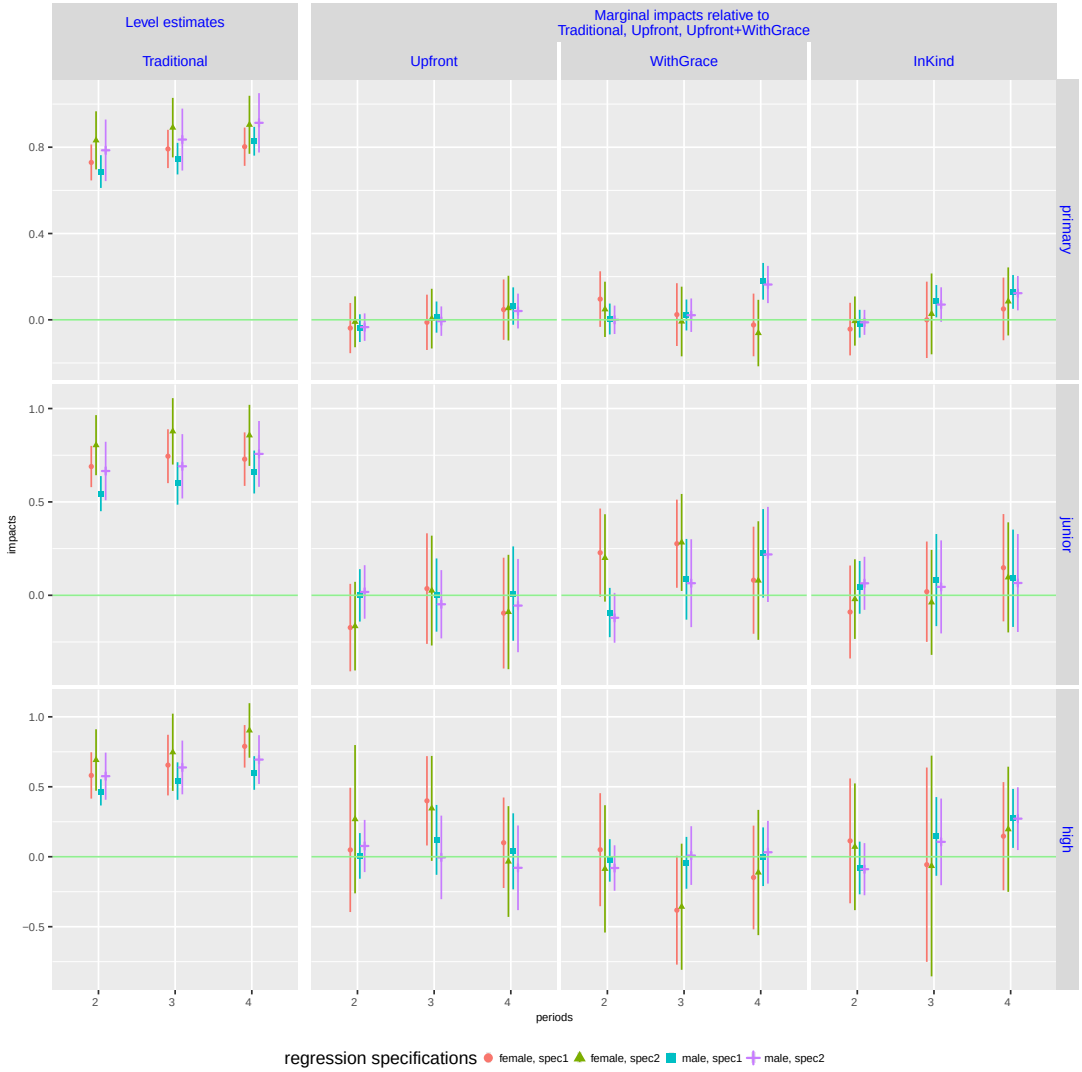
covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
rd 4	0.276 (0.45)	0.10 (0.0)	0.08 (0.0)	0.14 (0.0)	0.13 (0.0)	0.14 (0.0)	0.13 (0.0)
Secondary × rd 4	0.143 (0.35)			−0.02 (58.3)	−0.03 (43.3)	−0.02 (54.9)	−0.04 (40.7)
College × rd 4	0.057 (0.23)			0.02 (61.7)	0.00 (94.4)	−0.00 (96.0)	−0.01 (84.5)
WithGrace × rd 4	0.136 (0.34)	0.04 (36.8)	0.03 (54.0)	0.04 (34.8)	0.03 (40.2)	0.04 (32.9)	0.04 (35.9)
Upfront × rd 4	0.216 (0.41)	−0.06 (27.2)	−0.04 (49.1)	−0.07 (10.9)	−0.08 (6.0)	−0.08 (8.5)	−0.09 (3.7)
InKind × rd 4	0.067 (0.25)	−0.02 (69.7)	−0.02 (60.2)	−0.01 (75.8)	−0.01 (89.8)	−0.01 (77.5)	−0.00 (91.9)
WithGrace × Secondary × rd 4	0.073 (0.26)	0.14 (20.4)	0.13 (18.9)	0.10 (29.0)	0.11 (28.9)	0.07 (47.1)	0.09 (38.9)
Upfront × Secondary × rd 4	0.109 (0.31)	−0.11 (37.9)	−0.11 (32.6)	−0.04 (68.7)	−0.06 (52.8)	−0.03 (75.6)	−0.06 (53.2)
InKind × Secondary × rd 4	0.037 (0.19)	−0.05 (67.3)	−0.03 (82.6)	−0.03 (79.7)	−0.04 (75.2)	−0.01 (90.1)	−0.02 (85.0)
WithGrace × College × rd 4	0.026 (0.16)	−0.20 (15.7)	−0.14 (24.2)	−0.20 (6.6)	−0.14 (23.2)	−0.18 (8.0)	−0.12 (27.5)
Upfront × College × rd 4	0.044 (0.21)	−0.10 (57.5)	−0.14 (34.5)	−0.03 (84.5)	−0.11 (44.0)	−0.02 (85.7)	−0.11 (43.0)
InKind × College × rd 4	0.011 (0.10)	0.14 (23.1)	0.14 (13.2)	0.15 (14.4)	0.15 (16.9)	0.15 (9.8)	0.16 (9.5)
Female × rd 4	0.131 (0.34)					−0.07 (0.5)	−0.06 (1.8)
WithGrace × Female × rd 4	0.064 (0.24)	−0.14 (10.2)	−0.12 (13.3)	−0.15 (3.2)	−0.14 (3.9)	−0.16 (1.7)	−0.15 (2.9)
Upfront × Female × rd 4	0.102 (0.30)	0.08 (25.6)	0.12 (12.1)	0.15 (1.1)	0.14 (3.3)	0.16 (0.3)	0.15 (1.3)
InKind × Female × rd 4	0.030 (0.17)	0.06 (51.5)	0.09 (30.6)	0.10 (20.4)	0.09 (21.8)	0.10 (17.3)	0.09 (18.2)
WithGrace × Secondary × Female × rd 4	0.035 (0.18)	−0.12 (57.9)	−0.20 (31.1)	−0.11 (55.8)	−0.13 (45.0)	−0.10 (58.3)	−0.10 (54.1)
Upfront × Secondary × Female × rd	0.052 (0.22)	0.22 (33.7)	0.11 (56.6)	0.05 (80.5)	0.11 (50.1)	0.02 (90.6)	0.07 (66.2)
InKind × Secondary × Female × rd 4	0.018 (0.13)	0.17 (42.1)	0.21 (25.3)	0.17 (36.6)	0.05 (75.5)	0.16 (36.8)	0.05 (76.7)
WithGrace × College × Female × rd	0.010 (0.10)	0.23 (34.6)	0.21 (36.7)	0.04 (88.1)	0.14 (57.9)	0.10 (66.1)	0.21 (41.7)
Upfront × College × Female × rd 4	0.021 (0.14)	0.14 (66.7)	0.06 (80.5)	0.05 (83.9)	−0.20 (49.7)	−0.01 (96.2)	−0.25 (37.9)
InKind × College × Female × rd 4	0.004 (0.06)	−0.34 (30.4)	−0.28 (34.6)	−0.23 (44.0)	−0.14 (62.1)	−0.21 (47.9)	−0.12 (67.8)
Secondary × Female × rd 4	0.067 (0.25)					−0.01 (88.6)	0.02 (78.2)
College × Female × rd 4	0.029 (0.17)					0.14 (15.6)	0.15 (17.0)
EldestSon	0.267 (0.44)				0.01 (80.4)		0.04 (23.2)
EldestDaughter	0.188 (0.39)				0.03 (30.8)		0.01 (77.7)
Flood in round 1	0.464 (0.50)				−0.05 (4.1)		−0.05 (3.2)
Head literate0	0.108 (0.31)				0.06 (2.2)		0.06 (2.3)
Head age0	39.153 (7.38)				−0.00 (17.9)		−0.00 (18.8)
Enrolled0	0.760 (0.43)		0.28 (0.0)	0.32 (0.0)	0.30 (0.0)	0.31 (0.0)	0.29 (0.0)
ChildAgeOrderAtRd1	1.826 (0.98)				0.02 (28.3)		0.02 (25.9)
Household size0	4.974 (1.15)				−0.01 (34.3)		−0.01 (41.1)
mean of dependent variable		0.88	0.88	0.88	0.88	0.88	0.88
$T = 2$		89	89	89	75	89	75
$T = 3$		135	135	135	126	135	126
$T = 4$		539	539	539	500	539	500
$\bar{R}^2$		0.021	0.16	0.232	0.216	0.24	0.222
N	1841	1976	1976	1976	1841	1976	1841

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Upfront is an indicator variable of the arm with an upfront large disbursement, WithGrace is an indicator variable of the arm with a grace period, InKind is an indicator variable of the arm which lends a heifer. Secondary and College are indicator variables of secondary schooling (ages 13-15) and tertiary schooling (ages 16-18), both at the time of baseline. Default category is primary (ages 05-12). rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Interaction terms of dummy variables are demeaned before interacting. The first column gives mean and standard deviation (in parenthesises) of each covariates before demeaning.

2. P values in percentages in parenthesises. Standard errors are clustered at group (village) level.

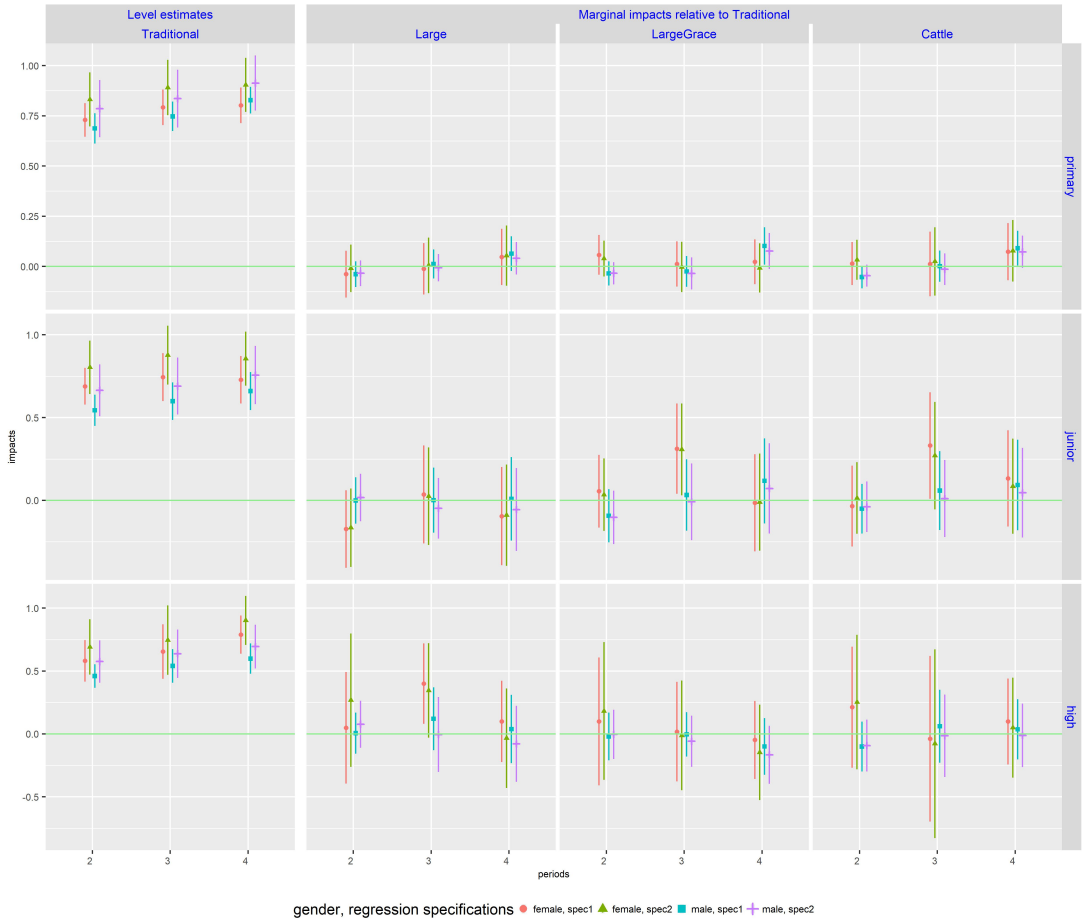
FIGURE F1: IMPACTS OF SCHOOLING BY ATTRIBUTE, TIME VARYING



Source: Estimated with administrative and survey data in TABLE F12.

Note: ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Upfront is an indicator variable of the arm with an upfront large disbursement, WithGrace is an indicator variable of the arm with a grace period, InKind is an indicator variable of the arm which lends a heifer. Secondary and College are indicator variables of secondary schooling (ages 13-15) and tertiary schooling (ages 16-18), both at the time of baseline. Default category is primary (ages 05-12). rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Interaction terms of dummy variables are demeaned before interacting. The first column gives mean and standard deviation (in parenthesises) of each covariates before demeaning. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

FIGURE F2: IMPACTS OF SCHOOLING BY ARM, TIME VARYING



Source: Estimated with administrative and survey data in TABLE F10.

Note: ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Upfront is an indicator variable of the arm with an upfront large disbursement, WithGrace is an indicator variable of the arm with a grace period, InKind is an indicator variable of the arm which lends a heifer. Secondary and College are indicator variables of secondary schooling (ages 13-15) and tertiary schooling (ages 16-18), both at the time of baseline. Default category is primary (ages 05-12). rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Interaction terms of dummy variables are demeaned before interacting. The first column gives mean and standard deviation (in parenthesises) of each covariates before demeaning. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

F.6 Consumption

TABLE F14: OLS ESTIMATION OF CONSUMPTION BY PERIOD

		Per capita consumption (Tk)			Total consumption (Tk)		
covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		2202.0	3179.3	1858.4	8984.1	2955.7	1204.3
		(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Large	0.283	−24.8	30.0	44.6	293.2	−28.5	38.3
	(0.45)	(70.7)	(63.3)	(31.2)	(43.8)	(90.9)	(79.8)
LargeGrace	0.255	−9.2	21.2	−8.0	350.0	147.7	−57.8
	(0.44)	(87.7)	(75.6)	(85.2)	(43.3)	(59.4)	(70.8)
Cattle	0.265	−36.6	−5.6	6.6	105.4	−108.1	33.6
	(0.44)	(54.8)	(92.3)	(86.2)	(76.1)	(62.1)	(80.5)
rd 3	0.340	558.1	552.3	546.5	2077.7	2071.6	2046.6
	(0.47)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Large × rd 3	−0.001	131.6	122.9	113.9	389.1	431.3	400.3
	(0.21)	(22.6)	(25.6)	(28.7)	(35.3)	(30.2)	(33.4)
LargeGrace × rd 3	−0.001	−80.0	−81.7	−85.3	−367.4	−360.1	−363.1
	(0.21)	(42.4)	(41.3)	(38.5)	(33.3)	(34.3)	(33.3)
Cattle × rd 3	0.000	170.7	142.7	135.0	740.4	774.6	750.0
	(0.21)	(8.1)	(14.5)	(16.4)	(7.6)	(6.1)	(6.9)
rd 4	0.322	660.0	659.0	653.9	2075.6	2080.1	2050.7
	(0.47)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Large × rd 4	0.003	124.3	104.1	88.5	1.6	134.6	101.5
	(0.21)	(18.2)	(24.2)	(30.9)	(99.6)	(67.6)	(75.7)
LargeGrace × rd 4	0.003	−18.3	−33.6	−45.4	−432.2	−330.3	−340.5
	(0.20)	(84.1)	(70.1)	(59.5)	(21.0)	(33.4)	(32.6)
Cattle × rd 4	−0.001	12.7	−22.7	−42.9	−220.7	−31.9	−91.9
	(0.21)	(87.4)	(76.6)	(57.2)	(47.7)	(91.7)	(76.9)
Flood in round 1	0.480		−43.5	−29.4		23.1	97.0
	(0.50)		(18.9)	(23.6)		(86.8)	(24.3)
Head literate0	0.119		−9.2	22.8		146.8	229.8
	(0.32)		(76.4)	(38.4)		(33.0)	(2.4)
Household size0	4.403		−223.9	−141.3		1408.7	691.5
	(1.50)		(0.0)	(0.0)		(0.0)	(0.0)
PCExpenditure0	2192.380			0.4			
	(632.03)			(0.0)			
TotalExpenditure0	9221.300						0.5
	(3107.21)						(0.0)
mean of dependent variable		2586	2586	2586	10558	10558	10558
$T = 2$		28	28	28	28	28	28
$T = 3$		96	96	96	96	96	96
$T = 4$		1277	1274	1274	1277	1274	1274
$\bar{R}^2$		0.137	0.324	0.421	0.086	0.47	0.601
N	77	4051	4042	4042	4051	4042	4042

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Large, LargeGrace, Cattle are indicator variables of the large, large grace, and cattle arms, respectively. The default arm category is traditional arm. Consumption is annualised values.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

Table F15: OLS estimation of consumption by attributes and period

		Per capita consumption (Tk)			Total consumption (Tk)		
covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		2202.0 (0.0)	3179.3 (0.0)	1858.4 (0.0)	8984.1 (0.0)	2955.7 (0.0)	1204.3 (0.0)
Upfront	0.803 (0.40)	−24.8 (70.7)	30.0 (63.3)	44.6 (31.2)	293.2 (43.8)	−28.5 (90.9)	38.3 (79.8)
WithGrace	0.520 (0.50)	15.6 (80.4)	−8.9 (89.8)	−52.6 (21.4)	56.9 (89.7)	176.2 (57.6)	−96.1 (55.2)
InKind	0.265 (0.44)	−27.3 (63.4)	−26.8 (67.5)	14.5 (68.7)	−244.7 (55.5)	−255.7 (36.9)	91.5 (53.8)
rd 3	0.340 (0.47)	558.1 (0.0)	552.3 (0.0)	546.5 (0.0)	2077.7 (0.0)	2071.6 (0.0)	2046.6 (0.0)
Upfront × rd 3	−0.002 (0.19)	131.6 (22.6)	122.9 (25.6)	113.9 (28.7)	389.1 (35.3)	431.3 (30.2)	400.3 (33.4)
WithGrace × rd 3	−0.000 (0.24)	−211.5 (5.0)	−204.6 (5.8)	−199.2 (6.0)	−756.4 (6.5)	−791.5 (5.5)	−763.5 (6.1)
InKind × rd 3	0.000 (0.21)	250.6 (1.0)	224.4 (2.1)	220.3 (2.2)	1107.7 (0.7)	1134.8 (0.5)	1113.1 (0.6)
rd 4	0.322 (0.47)	660.0 (0.0)	659.0 (0.0)	653.9 (0.0)	2075.6 (0.0)	2080.1 (0.0)	2050.7 (0.0)
Upfront × rd 4	0.004 (0.18)	124.3 (18.2)	104.1 (24.2)	88.5 (30.9)	1.6 (99.6)	134.6 (67.6)	101.5 (75.7)
WithGrace × rd 4	0.001 (0.23)	−142.6 (13.4)	−137.7 (14.7)	−133.9 (15.5)	−433.8 (22.4)	−464.9 (19.2)	−441.9 (21.3)
InKind × rd 4	−0.001 (0.21)	31.0 (70.7)	10.9 (89.6)	2.6 (97.6)	211.5 (53.9)	298.4 (38.2)	248.6 (46.5)
Flood in round 1	0.480 (0.50)		−43.5 (18.9)	−29.4 (23.6)		23.1 (86.8)	97.0 (24.3)
Head literate0	0.119 (0.32)		−9.2 (76.4)	22.8 (38.4)		146.8 (33.0)	229.8 (2.4)
Household size0	4.403 (1.50)		−223.9 (0.0)	−141.3 (0.0)		1408.7 (0.0)	691.5 (0.0)
PCExpenditure0	2192.380 (632.03)			0.4 (0.0)			
TotalExpenditure0	9221.300 (3107.21)						0.5 (0.0)
mean of dependent variable		2586	2586	2586	10558	10558	10558
$T = 2$		28	28	28	28	28	28
$T = 3$		96	96	96	96	96	96
$T = 4$		1277	1274	1274	1277	1274	1274
$\bar{R}^2$		0.137	0.324	0.421	0.086	0.47	0.601
N	77	4051	4042	4042	4051	4042	4042

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Upfront is an indicator variable of the arm with an upfront large disbursement, WithGrace is an indicator variable of the arm with a grace period, InKind is an indicator variable of the arm which lends a heifer. Consumption is annualised values.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

F.7 Income

TABLE F16: ANCOVA ESTIMATION OF HOUSEHOLD LABOUR INCOMES AND FARM INCOMES

A. Labour incomes

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		3467.90	4762.90	−51324.87	−51013.61	−51278.10	−51095.75
		(60.8)	(47.5)	(0.0)	(0.0)	(0.0)	(0.0)
Large	0.278	1539.79	1116.21	−1820.99	−1318.49	−1407.42	−1307.09
	(0.45)	(85.9)	(89.6)	(81.5)	(86.5)	(85.6)	(86.6)
LargeGrace	0.248	−1101.37	−5851.84	−4626.75	−4714.40	−4629.61	−4708.50
	(0.43)	(90.5)	(47.9)	(46.3)	(43.0)	(45.6)	(43.1)
Cattle	0.254	−5460.61	−6390.44	−5023.86	−4787.67	−5212.95	−4821.08
	(0.44)	(52.5)	(44.8)	(47.9)	(49.2)	(46.3)	(48.9)
HadCattle	0.182				−9054.34		−7309.60
	(0.39)				(1.0)		(23.8)
HadCattle	0.182				−9054.34		−7309.60
	(0.39)				(1.0)		(23.8)
HadCattle × Large	0.062				2669.83		2761.13
	(0.24)				(80.4)		(79.8)
HadCattle × LargeGrace	0.041				−2179.16		−2144.35
	(0.20)				(82.5)		(82.8)
HadCattle × Cattle	0.042				10936.21		10778.70
	(0.20)				(34.2)		(34.9)
Flood in round 1	0.488			7167.72	7135.10	7211.68	7156.90
	(0.50)			(14.2)	(14.7)	(14.1)	(14.5)
Head literate0	0.113			−6975.05	−6274.69	−6200.28	−6257.83
	(0.32)			(19.6)	(22.0)	(24.5)	(22.2)
TotalHHLabourIncome0	2397.862		0.11	0.09	0.09	0.09	0.09
	(172385.37)		(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Household size0	4.405			12198.30	12450.26	12462.50	12467.29
	(1.53)			(0.0)	(0.0)	(0.0)	(0.0)
Number of cattle0	0.250					−5537.82	−1284.88
	(0.60)					(2.4)	(74.2)
mean of dependent variable		2233	2233	2233	2233	2233	2233
$\bar{R}^2$		0	0.051	0.106	0.107	0.107	0.107
N	2557	2566	2566	2557	2557	2557	2557

B. Farm incomes

covariates	mean/std	(1)	(2)	(3)
(Intercept)		−2300.56	−4771.71	−33850.03
		(24.0)	(9.1)	(11.4)
Large	0.468	2324.78	4927.78	2351.52
	(0.50)	(53.5)	(13.4)	(53.7)
LargeGrace	0.273	27687.83	24706.80	23323.79
	(0.45)	(18.1)	(12.1)	(7.9)
Flood in round 1	0.532			11079.15
	(0.50)			(18.0)
Head literate0	0.156			−6527.84
	(0.37)			(48.5)
TotalRevenue0	2668.874		0.77	0.51
	(15293.24)		(0.9)	(7.0)
Household size0	5.013			5280.49
	(1.41)			(18.7)
mean of dependent variable		6338	6338	6338
$T = 2$		30	30	30
$T = 3$		22	22	22
$T = 4$		1	1	1
$\bar{R}^2$		0.042	0.098	0.102
N	77	77	77	77

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Large, LargeGrace, Cattle are indicator variables of the large, large grace, and cattle arms, respectively. The default arm category is traditional arm. Labour incomes are in 1000 Tk units and are a sum of all earned labour incomes of household members. Farm revenues are in 1000 Tk units and are a total of agricultural produce sales.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

TABLE F17: ANCOVA ESTIMATION OF HOUSEHOLD LABOUR INCOMES AND FARM INCOMES BY ATTRIBUTES

A. Labour incomes

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		3296.95	5566.63	−50592.91	−49837.24	−50372.76	−49948.55
		(62.9)	(40.6)	(0.0)	(0.0)	(0.0)	(0.0)
Upfront	0.779	2991.60	2525.93	−569.19	−340.56	−296.37	−316.47
	(0.41)	(68.6)	(72.7)	(93.2)	(96.0)	(96.5)	(96.3)
WithGrace	0.502	−2482.13	−6193.09	−2168.17	−2687.66	−2552.34	−2699.26
	(0.50)	(75.7)	(38.9)	(72.8)	(65.9)	(67.6)	(65.7)
InKind	0.254	−3902.13	−723.33	−579.10	−351.37	−769.36	−393.11
	(0.44)	(62.7)	(92.0)	(92.1)	(95.0)	(89.3)	(94.4)
HadCattle	0.182				−8606.65		−6435.88
	(0.39)				(1.0)		(30.6)
UltraPoor	0.621	−2441.68	−3963.23	−3069.32	−3171.66	−3113.92	−3173.01
	(0.49)	(61.6)	(37.9)	(45.8)	(44.6)	(45.9)	(44.7)
Upfront × UltraPoor	0.518	19386.78	18855.00	16329.03	14183.34	14975.68	14288.87
	(0.50)	(21.2)	(21.2)	(24.4)	(30.3)	(28.1)	(30.1)
WithGrace × UltraPoor	0.343	−7082.33	−13043.29	−9797.20	−10395.99	−9766.32	−10355.81
	(0.47)	(62.3)	(29.8)	(43.5)	(41.4)	(44.4)	(41.6)
InKind × UltraPoor	0.167	−9261.96	−2704.97	−2382.29	−1145.05	−2207.01	−1241.30
	(0.37)	(46.9)	(81.0)	(82.9)	(92.0)	(84.6)	(91.3)
HadCattle	0.182				−8606.65		−6435.88
	(0.39)				(1.0)		(30.6)
HadCattle × Upfront	0.145				471.95		562.32
	(0.35)				(96.3)		(95.6)
HadCattle × WithGrace	0.083				−5993.99		−6059.49
	(0.28)				(49.6)		(49.5)
HadCattle × InKind	0.042				13409.74		13162.46
	(0.20)				(14.5)		(15.9)
Flood in round 1	0.488			7757.33	7620.92	7745.48	7651.21
	(0.50)			(12.9)	(13.6)	(13.0)	(13.4)
Head literate0	0.113			−6741.44	−6085.01	−6077.66	−6062.64
	(0.32)			(18.2)	(20.8)	(22.7)	(21.1)
TotalHHLabourIncome0	2397.862		0.11	0.09	0.09	0.09	0.09
	(172385.37)		(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Household size0	4.405			12058.32	12281.43	12314.49	12301.70
	(1.53)			(0.0)	(0.0)	(0.0)	(0.0)
Number of cattle0	0.250					−5271.19	−1593.44
	(0.60)					(2.5)	(69.3)
mean of dependent variable		2233	2233	2233	2233	2233	2233
$\bar{R}^2$		0.001	0.053	0.106	0.107	0.108	0.107
N	2557	2566	2566	2557	2557	2557	2557

B. Farm incomes

covariates	mean/std	(1)	(2)	(3)
(Intercept)		3683.94	−11409.33	−42940.88
		(26.3)	(25.4)	(11.2)
Upfront	0.922	−3659.72	11573.77	10386.47
	(0.27)	(42.6)	(25.6)	(32.7)
WithGrace	0.455	25363.06	19424.19	20090.77
	(0.50)	(22.6)	(19.4)	(13.0)
InKind	0.182	−30252.62	−21739.98	−19464.51
	(0.39)	(14.6)	(14.3)	(10.2)
Flood in round 1	0.532			9792.53
	(0.50)			(21.9)
Head literate0	0.156			−6265.76
	(0.37)			(51.1)
TotalRevenue0	2668.874		0.82	0.59
	(15293.24)		(0.6)	(3.4)
Household size0	5.013			5645.29
	(1.41)			(17.8)
mean of dependent variable		6338	6338	6338
$T = 2$		30	30	30
$T = 3$		22	22	22
$T = 4$		1	1	1
$\bar{R}^2$		0.031	0.087	0.092
N	77	77	77	77

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Upfront is an indicator variable of the arm with an upfront large disbursement, WithGrace is an indicator variable of the arm with a grace period, InKind is an indicator variable of the arm which lends a heifer. Labour incomes are in 1000 Tk units and are a sum of all earned labour incomes of household members. Farm revenues are in 1000 Tk units and are a total of agricultural produce sales.

2. P values in percentages in parenthesises. Standard errors are clustered at group (village) level.

TABLE F18: ANCOVA ESTIMATION OF HOUSEHOLD LABOUR INCOMES AND FARM INCOMES BY PERIOD

A. Labour incomes

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		−8816.85 (11.6)	−7430.78 (18.0)	−62547.07 (0.0)	−62677.75 (0.0)	−62495.27 (0.0)	−62763.21 (0.0)
Large	0.278 (0.45)	57.86 (99.4)	−423.32 (95.3)	−4123.79 (52.0)	−3650.26 (57.1)	−3671.96 (56.8)	−3644.75 (57.2)
LargeGrace	0.248 (0.43)	−1640.12 (83.4)	−6062.81 (39.3)	−5711.80 (28.6)	−5623.68 (27.4)	−5680.42 (28.2)	−5618.50 (27.5)
Cattle	0.254 (0.44)	−2639.37 (72.4)	−3736.48 (60.2)	−3779.51 (52.0)	−3437.02 (55.7)	−3936.97 (50.8)	−3470.55 (55.3)
HadCattle	0.182 (0.39)				−6243.86 (4.3)		−4304.91 (46.2)
rd 3	0.343 (0.47)	12756.19 (0.0)	12656.12 (0.0)	12527.04 (0.0)	12455.94 (0.0)	12511.17 (0.0)	12453.48 (0.0)
Large × rd 3	0.094 (0.29)	−5829.95 (35.6)	−5631.78 (36.7)	−3203.30 (57.7)	−3356.01 (56.7)	−3365.26 (55.8)	−3349.47 (56.8)
LargeGrace × rd 3	0.085 (0.28)	936.02 (88.8)	238.98 (97.1)	2477.92 (67.3)	2021.13 (72.8)	2397.09 (68.2)	2021.63 (72.8)
Cattle × rd 3	0.086 (0.28)	−8803.54 (27.0)	−8036.22 (29.7)	−4730.16 (49.8)	−4955.94 (47.6)	−4659.65 (50.2)	−4955.97 (47.6)
rd 4	0.326 (0.47)	23425.62 (0.0)	23178.45 (0.0)	23358.08 (0.0)	23196.86 (0.0)	23281.62 (0.0)	23187.90 (0.0)
Large × rd 4	0.095 (0.29)	10206.37 (43.8)	10316.22 (43.3)	12236.73 (34.5)	12423.59 (34.8)	12155.38 (34.6)	12455.76 (34.6)
LargeGrace × rd 4	0.082 (0.27)	−32.79 (99.7)	−995.65 (89.4)	1417.26 (83.7)	944.34 (88.9)	1313.79 (84.8)	951.48 (88.8)
Cattle × rd 4	0.081 (0.27)	−6838.00 (49.5)	−6698.93 (50.2)	−2219.15 (81.2)	−3239.63 (71.8)	−2454.82 (79.3)	−3267.38 (71.6)
HadCattle	0.182 (0.39)				−6243.86 (4.3)		−4304.91 (46.2)
HadCattle × Large	0.062 (0.24)				7668.70 (36.6)		7737.34 (36.3)
HadCattle × LargeGrace	0.041 (0.20)				2053.10 (80.2)		2088.17 (80.0)
HadCattle × Cattle	0.042 (0.20)				15462.97 (11.1)		15316.35 (11.4)
HadCattle × rd 3	0.063 (0.24)				−2822.82 (51.5)		−2835.09 (51.4)
HadCattle × Large × rd 3	0.020 (0.14)				−4048.82 (80.4)		−4027.17 (80.7)
HadCattle × LargeGrace × rd 3	0.014 (0.12)				−11496.21 (50.3)		−11499.33 (50.5)
HadCattle × Cattle × rd 3	0.016 (0.12)				−2998.49 (85.9)		−3021.18 (85.8)
HadCattle × rd 4	0.058 (0.23)				−12206.87 (5.0)		−12251.58 (4.9)
HadCattle × Large × rd 4	0.021 (0.14)				−17854.54 (35.9)		−17704.72 (36.1)
HadCattle × LargeGrace × rd 4	0.013 (0.11)				−8432.04 (51.9)		−8411.57 (51.9)
HadCattle × Cattle × rd 4	0.012 (0.11)				−21790.20 (20.4)		−21969.19 (20.5)
Flood in round 1	0.488 (0.50)			6929.81 (15.4)	6851.29 (16.1)	6972.80 (15.3)	6875.29 (15.9)
Head literate0	0.113 (0.32)			−6779.24 (21.3)	−6184.79 (22.4)	−6024.13 (26.2)	−6167.96 (22.6)
TotalHHLabourIncome0	2397.862 (172385.37)		0.11 (0.0)	0.09 (0.0)	0.09 (0.0)	0.09 (0.0)	0.09 (0.0)
Household size0	4.405 (1.53)			12181.57 (0.0)	12408.28 (0.0)	12439.85 (0.0)	12426.66 (0.0)
Number of cattle0	0.250 (0.60)					−5434.02 (2.5)	−1421.91 (71.4)
mean of dependent variable		2233	2233	2233	2233	2233	2233
R^2		0.013	0.065	0.119	0.119	0.121	0.118
N	2557	2566	2566	2557	2557	2557	2557

B. Farm incomes

covariates	mean/std	(1)	(2)	(3)
(Intercept)		6127.53 (20.2)	12149.79 (1.2)	−22113.92 (46.9)
Large	0.468 (0.50)	−2993.33 (26.1)	−4893.71 (24.4)	−12983.69 (7.2)
LargeGrace	0.273 (0.45)	6981.60 (68.6)	3214.09 (81.2)	4910.96 (71.6)
rd 3	0.468 (0.50)	1256.59 (90.4)	−4099.95 (62.4)	2343.54 (85.3)
Large × rd 3	0.234 (0.43)	4337.50 (52.0)	23571.16 (2.0)	43554.00 (4.9)
LargeGrace × rd 3	0.130 (0.34)	69932.50 (4.1)	91500.93 (1.1)	82676.16 (0.3)
rd 4	0.481 (0.50)	−2961.43 (50.9)	−11504.25 (1.1)	−4355.08 (36.9)

TABLE F19: ANCOVA ESTIMATION OF HOUSEHOLD LABOUR INCOMES AND FARM INCOMES BY ATTRIBUTES AND PERIOD

A. Labour incomes

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		−8816.85 (11.6)	−7430.78 (18.0)	−62547.07 (0.0)	−62677.75 (0.0)	−62495.27 (0.0)	−62763.21 (0.0)
Upfront	0.779 (0.41)	57.86 (99.4)	−423.32 (95.3)	−4123.79 (52.0)	−3650.26 (57.1)	−3671.96 (56.8)	−3644.75 (57.2)
WithGrace	0.502 (0.50)	−1697.98 (81.5)	−5639.49 (37.3)	−1588.01 (75.9)	−1973.43 (69.9)	−2008.46 (69.1)	−1973.76 (69.9)
InKind	0.254 (0.44)	−999.25 (89.1)	2326.34 (71.2)	1932.29 (67.7)	2186.66 (62.5)	1743.45 (70.2)	2147.95 (63.0)
HadCattle	0.182 (0.39)				−6243.86 (4.3)		−4304.91 (46.2)
rd 3	0.343 (0.47)	12756.19 (0.0)	12656.12 (0.0)	12527.04 (0.0)	12455.94 (0.0)	12511.17 (0.0)	12453.48 (0.0)
Upfront × rd 3	0.266 (0.44)	−5829.95 (35.6)	−5631.78 (36.7)	−3203.30 (57.7)	−3356.01 (56.7)	−3365.26 (55.8)	−3349.47 (56.8)
WithGrace × rd 3	0.172 (0.38)	6765.97 (20.2)	5870.76 (25.0)	5681.21 (23.9)	5377.14 (26.4)	5762.35 (22.9)	5371.10 (26.5)
InKind × rd 3	0.086 (0.28)	−9739.55 (17.7)	−8275.20 (22.6)	−7208.08 (24.6)	−6977.07 (24.9)	−7056.74 (25.3)	−6977.60 (24.9)
rd 4	0.326 (0.47)	23425.62 (0.0)	23178.45 (0.0)	23358.08 (0.0)	23196.86 (0.0)	23281.62 (0.0)	23187.90 (0.0)
Upfront × rd 4	0.258 (0.44)	10206.37 (43.8)	10316.22 (43.3)	12236.73 (34.5)	12423.59 (34.8)	12155.38 (34.6)	12455.76 (34.6)
WithGrace × rd 4	0.163 (0.37)	−10239.16 (41.8)	−11311.87 (36.4)	−10819.47 (38.6)	−11479.25 (36.8)	−10841.58 (38.4)	−11504.28 (36.7)
InKind × rd 4	0.081 (0.27)	−6805.21 (46.4)	−5703.29 (53.0)	−3636.42 (67.2)	−4183.97 (60.8)	−3768.62 (66.2)	−4218.86 (60.6)
HadCattle	0.182 (0.39)				−6243.86 (4.3)		−4304.91 (46.2)
HadCattle × Upfront	0.145 (0.35)				7668.70 (36.6)		7737.34 (36.3)
HadCattle × WithGrace	0.083 (0.28)				−5615.59 (48.3)		−5649.17 (48.3)
HadCattle × InKind	0.042 (0.20)				13409.86 (14.0)		13228.17 (14.9)
HadCattle × rd 3	0.063 (0.24)				−2822.82 (51.5)		−2835.09 (51.4)
HadCattle × Upfront × rd 3	0.050 (0.22)				−4048.82 (80.4)		−4027.17 (80.7)
HadCattle × WithGrace × rd 3	0.030 (0.17)				−7447.39 (44.3)		−7472.16 (44.1)
HadCattle × InKind × rd 3	0.016 (0.12)				8497.72 (42.2)		8478.15 (42.3)
HadCattle × rd 4	0.058 (0.23)				−12206.87 (5.0)		−12251.58 (4.9)
HadCattle × Upfront × rd 4	0.046 (0.21)				−17854.54 (35.9)		−17704.72 (36.1)
HadCattle × WithGrace × rd 4	0.025 (0.16)				9422.50 (58.7)		9293.14 (59.2)
HadCattle × InKind × rd 4	0.012 (0.11)				−13358.15 (35.2)		−13557.61 (35.1)
Flood in round 1	0.488 (0.50)			6929.81 (15.4)	6851.29 (16.1)	6972.80 (15.3)	6875.29 (15.9)
Head literate0	0.113 (0.32)			−6779.24 (21.3)	−6184.79 (22.4)	−6024.13 (26.2)	−6167.96 (22.6)
TotalHHLabourIncome0	2397.862 (172385.37)		0.11 (0.0)	0.09 (0.0)	0.09 (0.0)	0.09 (0.0)	0.09 (0.0)
Household size0	4.405 (1.53)			12181.57 (0.0)	12408.28 (0.0)	12439.85 (0.0)	12426.66 (0.0)
Number of cattle0	0.250 (0.60)					−5434.02 (2.5)	−1421.91 (71.4)
mean of dependent variable		2233	2233	2233	2233	2233	2233
R^2		0.013	0.065	0.119	0.119	0.121	0.118
N	2557	2566	2566	2557	2557	2557	2557

B. Farm incomes

covariates	mean/std	(1)	(2)	(3)
(Intercept)		5780.95 (47.5)	−7373.91 (58.0)	−54279.46 (25.5)
Upfront	0.922 (0.27)	−2973.40 (52.0)	13333.59 (26.1)	14697.92 (29.1)
WithGrace	0.455 (0.50)	9974.93 (57.0)	8002.21 (55.4)	17722.59 (33.9)
InKind	0.182 (0.39)	−8911.22 (61.0)	−1330.02 (91.9)	−2374.63 (85.0)
rd 3	0.468 (0.50)	1927.82 (85.7)	−1913.28 (82.5)	6486.76 (65.4)
Upfront × rd 3	0.442 (0.50)	−16156.25 (7.3)	−846.50 (92.9)	−2463.13 (76.0)
WithGrace × rd 3	0.208	79595.00	67270.05	37061.73

TABLE F20: ANCOVA ESTIMATION OF NET ASSETS BY PERIOD, CATTLE REARING EXPERIENCES

F.8 By experience

	mean/std			(1)		
	Adi	Own	None	Adi	Own	None
(Intercept)				26892.0 (0.0)	27409.7 (0.0)	13260.5 (0.0)
Large	0.327 (0.47)	0.343 (0.48)	0.262 (0.44)	2749.7 (59.1)	21672.9 (1.0)	10201.1 (0.0)
LargeGrace	0.135 (0.34)	0.269 (0.44)	0.253 (0.44)	1949.7 (75.5)	10698.8 (4.5)	5386.3 (3.6)
Cattle	0.316 (0.47)	0.202 (0.40)	0.271 (0.44)	1985.9 (66.0)	7598.3 (12.1)	5126.8 (2.7)
rd 3	0.345 (0.48)	0.343 (0.48)	0.354 (0.48)	−977.4 (71.3)	−213.2 (93.6)	3679.8 (0.0)
Large × rd 3	0.111 (0.32)	0.114 (0.32)	0.090 (0.29)	−8254.5 (36.9)	−795.1 (92.5)	−3863.7 (17.0)
LargeGrace × rd 3	0.047 (0.21)	0.091 (0.29)	0.088 (0.28)	−1387.6 (82.5)	−12060.0 (18.9)	2699.0 (29.1)
Cattle × rd 3	0.111 (0.32)	0.071 (0.26)	0.098 (0.30)	−3657.0 (50.7)	−3022.4 (69.3)	−2475.6 (39.5)
rd 4	0.333 (0.47)	0.327 (0.47)	0.335 (0.47)	921.9 (79.6)	395.2 (90.1)	4520.5 (0.0)
Large × rd 4	0.111 (0.32)	0.114 (0.32)	0.090 (0.29)	−601.7 (95.4)	4756.1 (62.9)	−3983.4 (21.3)
LargeGrace × rd 4	0.047 (0.21)	0.091 (0.29)	0.087 (0.28)	5087.7 (62.0)	−9613.7 (32.9)	2886.7 (31.8)
Cattle × rd 4	0.105 (0.31)	0.061 (0.24)	0.093 (0.29)	−767.4 (90.9)	1293.0 (87.5)	791.6 (78.1)
Flood in round 1	0.526 (0.50)	0.444 (0.50)	0.396 (0.49)			
Head literate0	0.135 (0.34)	0.165 (0.37)	0.142 (0.35)			
NetValue0	1344.942 (6621.59)	31070.976 (15261.17)	2746.425 (3434.12)			
Household size0	4.573 (1.24)	4.586 (1.41)	4.382 (1.37)			
mean of dependent variable				28555	39185	21496
$T = 2$				9	6	27
$T = 3$				18	17	97
$T = 4$				83	113	354
$\bar{R}^2$				−0.031	0.054	0.031
N	171	297	809	294	379	1283

TABLE F20: ANCOVA ESTIMATION OF NET ASSETS BY PERIOD, CATTLE REARING EXPERIENCES (CONTINUED)

	(2)			(3)		
	Adi	Own	None	Adi	Own	None
(Intercept)	31829.0 (0.0)	21652.1 (1.4)	12537.5 (0.0)	3882.8 (74.2)	21758.4 (12.5)	4176.1 (26.4)
Large	−1183.5 (85.9)	22742.5 (3.7)	10945.5 (0.0)	−3319.5 (60.3)	23397.4 (3.7)	10379.3 (0.1)
LargeGrace	−1798.0 (89.5)	6710.7 (28.2)	6652.8 (2.9)	−2794.4 (78.9)	7870.4 (23.0)	6186.8 (4.3)
Cattle	−3240.6 (61.8)	8695.5 (13.6)	3695.7 (19.4)	−3402.0 (63.7)	9309.2 (11.6)	3145.2 (26.0)
rd 3	−2205.1 (53.4)	58.2 (98.4)	3679.9 (0.8)	−1217.6 (72.3)	729.8 (79.5)	3846.2 (0.7)
Large × rd 3	−2352.8 (83.8)	−733.2 (93.6)	−2643.4 (46.5)	−2595.9 (82.1)	899.9 (92.3)	−2637.7 (46.9)
LargeGrace × rd 3	18024.1 (2.6)	−14784.7 (14.8)	5097.1 (19.8)	19783.2 (0.2)	−14244.5 (16.7)	5230.4 (19.1)
Cattle × rd 3	4495.1 (40.5)	−1784.8 (83.3)	−1924.8 (59.7)	3908.1 (44.4)	−1935.2 (82.1)	−1778.2 (62.3)
rd 4	881.3 (87.3)	2214.8 (51.7)	3812.7 (0.9)	2324.8 (68.1)	2220.8 (51.5)	3994.3 (0.7)
Large × rd 4	2635.2 (82.9)	1553.1 (88.6)	−2233.2 (49.0)	2269.7 (85.4)	1053.4 (92.4)	−2250.4 (48.8)
LargeGrace × rd 4	28494.3 (12.5)	−14395.7 (22.8)	6145.4 (15.8)	30131.0 (10.3)	−13720.6 (25.2)	6359.5 (14.5)
Cattle × rd 4	4039.4 (51.4)	1204.4 (90.1)	2075.6 (54.9)	5068.8 (41.3)	845.8 (93.2)	2256.1 (51.2)
Flood in round 1				−10818.3 (2.3)	1288.0 (82.4)	1142.1 (60.8)
Head literate0				6543.4 (37.6)	−3614.3 (53.2)	746.4 (79.6)
NetValue0	0.7 (0.8)	0.2 (26.2)	0.3 (32.7)	0.7 (0.1)	0.2 (29.1)	0.3 (38.7)
Household size0				7114.2 (0.5)	−380.9 (88.0)	1887.2 (0.9)
mean of dependent variable $T = 2$	28555 2	39185 1	21496 10	28555 2	39185 1	21496 10
$T = 3$ $T = 4$	10 48	11 92	60 222	10 48	9 92	60 222
$\bar{R}^2$ N	−0.018 166	0.07 299	0.034 796	0.105 166	0.062 295	0.045 796

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Large, LargeGrace, Cattle are indicator variables of the large, large grace, and cattle arms, respectively. The default arm category is traditional arm. rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Net assets uses only assets observed for all 4 rounds in household assets. Household assets do not include livestock.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

TABLE F20 and TABLE F20 (CONTINUED) show estimation after dividing into three subsamples: Individuals who had a cattle lease contract (Adi, $n = 92$) at the baseline, individuals who owned cattle at the baseline (Own, $n = 137$), and individuals who had neither (None, $n = 505$). The total of 734 is fewer than baseline sample size of 774 as we lost 40 observations by round 2. The number of individuals with Adi is small that makes the estimates inprecise. Specifications (2) - (4) show that the individuals of Own responded well to the non-Traditional lending by round 2, particularly so under Large and Large grace arms. Individuals of None have the smallest net asset holding under Traditional as indicated by the intercept terms. They have excess positive returns under all non-Traditional arms relative to the Traditional arm. Among the individuals of None, or who had no prior cattle rearing experience at the baseline, the Cattle arm gives the higher mean returns than the Large grace arm. As argued in the main text, it strongly suggests that the effective difference of the two arms, the managerial support program, resulted in a higher return for the None group.

The household size is positively correlated with the net asset values in Adi and None groups while not in Own group. This implies that there may be selection into cattle ownership at the baseline that requires a certain household size, either labour and/or a barn, and Own group may already have a way to acquire them as they become necessary. Returns to baseline net asset holding is meaningful only among the Own group, and estimates on other groups are less precise. Adi group has a large

point estimate, although the p value is greater than .1, which is consistent with a conjecture that the skills acquired through Adi have high returns but they are cash constrained.

TABLE F21: ANCOVA ESTIMATION OF NARROW NET ASSETS BY ATTRIBUTES AND PERIOD, CATTLE REARING EXPERIENCES

	mean/std			(1)		
	Adi	Own	None	Adi	Own	None
(Intercept)				26892.0 (0.0)	27409.7 (0.0)	13260.5 (0.0)
Upfront	0.778 (0.42)	0.815 (0.39)	0.786 (0.41)	2749.7 (59.1)	21672.9 (1.0)	10201.1 (0.0)
WithGrace	0.450 (0.50)	0.471 (0.50)	0.524 (0.50)	−800.0 (90.4)	−10974.1 (16.5)	−4814.8 (4.0)
InKind	0.316 (0.47)	0.202 (0.40)	0.271 (0.44)	36.2 (99.5)	−3100.5 (44.1)	−259.5 (90.8)
rd 3	0.345 (0.48)	0.343 (0.48)	0.354 (0.48)	−977.4 (71.3)	−213.2 (93.6)	3679.8 (0.0)
Upfront × rd 3	0.269 (0.44)	0.276 (0.45)	0.276 (0.45)	−8254.5 (36.9)	−795.1 (92.5)	−3863.7 (17.0)
WithGrace × rd 3	0.158 (0.37)	0.162 (0.37)	0.185 (0.39)	6866.9 (43.6)	−11264.9 (12.3)	6562.7 (2.9)
InKind × rd 3	0.111 (0.32)	0.071 (0.26)	0.098 (0.30)	−2269.4 (64.1)	9037.6 (15.7)	−5174.5 (9.5)
rd 4	0.333 (0.47)	0.327 (0.47)	0.335 (0.47)	921.9 (79.6)	395.2 (90.1)	4520.5 (0.0)
Upfront × rd 4	0.263 (0.44)	0.266 (0.44)	0.269 (0.44)	−601.7 (95.4)	4756.1 (62.9)	−3983.4 (21.3)
WithGrace × rd 4	0.152 (0.36)	0.152 (0.36)	0.179 (0.38)	5689.4 (65.0)	−14369.8 (13.5)	6870.1 (5.7)
InKind × rd 4	0.105 (0.31)	0.061 (0.24)	0.093 (0.29)	−5855.1 (54.8)	10906.7 (17.0)	−2095.1 (52.5)
Flood in round 1	0.526 (0.50)	0.444 (0.50)	0.396 (0.49)			
Head literate0	0.135 (0.34)	0.165 (0.37)	0.142 (0.35)			
NetValue0	1344.942 (6621.59)	31070.976 (15261.17)	2746.425 (3434.12)			
Household size0	4.573 (1.24)	4.586 (1.41)	4.382 (1.37)			
mean of dependent variable $T = 2$				28555 9	39185 6	21496 27
$T = 3$				18	17	97
$T = 4$				83	113	354
$\tilde{R}^2$				−0.031	0.054	0.031
N	171	297	809	294	379	1283

TABLE F21: ANCOVA ESTIMATION OF NET ASSETS BY ATTRIBUTES AND PERIOD, CATTLE REARING EXPERIENCES (CONTINUED)

	(2)			(3)		
	Adi	Own	None	Adi	Own	None
(Intercept)	31829.0 (0.0)	21652.1 (1.4)	12537.5 (0.0)	3882.8 (74.2)	21758.4 (12.5)	4176.1 (26.4)
Upfront	−1183.5 (85.9)	22742.5 (3.7)	10945.5 (0.0)	−3319.5 (60.3)	23397.4 (3.7)	10379.3 (0.1)
WithGrace	−614.5 (96.5)	−16031.8 (12.5)	−4292.7 (13.2)	525.1 (95.8)	−15527.0 (17.3)	−4192.5 (14.9)
InKind	−1442.6 (91.6)	1984.8 (69.2)	−2957.1 (28.3)	−607.6 (95.4)	1438.8 (78.3)	−3041.6 (26.0)
rd 3	−2205.1 (53.4)	58.2 (98.4)	3679.9 (0.8)	−1217.6 (72.3)	729.8 (79.5)	3846.2 (0.7)
Upfront × rd 3	−2352.8 (83.8)	−733.2 (93.6)	−2643.4 (46.5)	−2595.9 (82.1)	899.9 (92.3)	−2637.7 (46.9)
WithGrace × rd 3	20376.9 (11.2)	−14051.5 (6.2)	7740.5 (7.2)	22379.1 (6.4)	−15144.3 (4.5)	7868.1 (7.2)
InKind × rd 3	−13529.0 (8.3)	12999.9 (5.2)	−7021.9 (10.1)	−15875.1 (1.4)	12309.3 (6.1)	−7008.6 (10.8)
rd 4	881.3 (87.3)	2214.8 (51.7)	3812.7 (0.9)	2324.8 (68.1)	2220.8 (51.5)	3994.3 (0.7)
Upfront × rd 4	2635.2 (82.9)	1553.1 (88.6)	−2233.2 (49.0)	2269.7 (85.4)	1053.4 (92.4)	−2250.4 (48.8)
WithGrace × rd 4	25859.0 (22.6)	−15948.7 (9.4)	8378.7 (7.9)	27861.3 (19.3)	−14774.0 (12.9)	8609.9 (7.3)
InKind × rd 4	−24454.8 (18.8)	15600.1 (6.2)	−4069.8 (40.6)	−25062.3 (17.8)	14566.4 (6.7)	−4103.5 (40.9)
Flood in round 1				−10818.3 (2.3)	1288.0 (82.4)	1142.1 (60.8)
Head literate0				6543.4 (37.6)	−3614.3 (53.2)	746.4 (79.6)
NetValue0	0.7 (0.8)	0.2 (26.2)	0.3 (32.7)	0.7 (0.1)	0.2 (29.1)	0.3 (38.7)
Household size0				7114.2 (0.5)	−380.9 (88.0)	1887.2 (0.9)
mean of dependent variable	28555	39185	21496	28555	39185	21496
$T = 2$	2	1	10	2	1	10
$T = 3$	10	11	60	10	9	60
$T = 4$	48	92	222	48	92	222
$\bar{R}^2$	−0.018	0.07	0.034	0.105	0.062	0.045
N	166	299	796	166	295	796

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Upfront is an indicator variable of the arm with an upfront large disbursement, WithGrace is an indicator variable of the arm with a grace period, InKind is an indicator variable of the arm which lends a heifer. rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Net assets uses only assets observed for all 4 rounds in household assets. Household assets do not include livestock.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

TABLE F22: ANCOVA ESTIMATION OF NET ASSETS BY ARM, POVERTY STATUS, AND PERIOD, CATTLE REARING EXPERIENCES

	mean/std			(1)		
	Adi	Own	None	Adi	Own	None
(Intercept)				28159.5	31859.7	15972.9
				(0.0)	(0.0)	(0.0)
Large	0.327	0.343	0.262	2259.6	16723.9	7281.2
	(0.47)	(0.48)	(0.44)	(64.2)	(3.1)	(0.0)
LargeGrace	0.135	0.269	0.253	799.2	6458.0	2738.0
	(0.34)	(0.44)	(0.44)	(89.3)	(8.2)	(20.9)
Large × UltraPoor	0.205	0.212	0.166	−9355.0	−791.5	−5309.2
	(0.40)	(0.41)	(0.37)	(31.9)	(93.2)	(35.7)
LargeGrace × UltraPoor	0.094	0.152	0.197	3786.8	26032.0	−4192.6
	(0.29)	(0.36)	(0.40)	(70.4)	(0.0)	(30.9)
rd 3	0.345	0.343	0.354	−1164.0	−216.9	3923.6
	(0.48)	(0.48)	(0.48)	(66.2)	(93.2)	(0.1)
Large × rd 3	0.111	0.114	0.090	−6610.5	1563.9	−2804.2
	(0.32)	(0.32)	(0.29)	(44.3)	(76.9)	(29.3)
LargeGrace × rd 3	0.047	0.091	0.088	303.1	−10870.8	4308.9
	(0.21)	(0.29)	(0.28)	(94.9)	(11.6)	(12.8)
Large × UltraPoor × rd 3	0.070	0.071	0.057	1963.4	14229.2	−3236.3
	(0.26)	(0.26)	(0.23)	(91.5)	(20.1)	(61.9)
LargeGrace × UltraPoor × rd 3	0.035	0.051	0.068	−8639.8	−2241.3	−8434.5
	(0.18)	(0.22)	(0.25)	(51.8)	(87.6)	(27.3)
rd 4	0.333	0.327	0.335	1074.9	877.9	4775.3
	(0.47)	(0.47)	(0.47)	(76.0)	(77.4)	(0.0)
Large × rd 4	0.111	0.114	0.090	382.7	4328.2	−4508.5
	(0.32)	(0.32)	(0.29)	(96.8)	(52.7)	(12.2)
LargeGrace × rd 4	0.047	0.091	0.087	5069.6	−11472.6	2755.4
	(0.21)	(0.29)	(0.28)	(58.9)	(14.4)	(36.3)
Large × UltraPoor × rd 4	0.070	0.071	0.057	−5066.7	29199.8	894.0
	(0.26)	(0.26)	(0.23)	(77.0)	(6.2)	(89.3)
LargeGrace × UltraPoor × rd 4	0.035	0.051	0.067	−409.3	−6531.0	−5254.2
	(0.18)	(0.22)	(0.25)	(98.1)	(71.4)	(48.6)
Flood in round 1	0.526	0.444	0.396			
	(0.50)	(0.50)	(0.49)			
Head literate0	0.135	0.165	0.142			
	(0.34)	(0.37)	(0.35)			
NetValue0	1344.942	31070.976	2746.425			
	(6621.59)	(15261.17)	(3434.12)			
Household size0	4.573	4.586	4.382			
	(1.24)	(1.41)	(1.37)			
mean of dependent variable				28555	39185	21496
$T = 2$				9	6	27
$T = 3$				18	17	97
$T = 4$				83	113	354
$\tilde{R}^2$				−0.031	0.08	0.027
N	171	297	809	294	379	1283

TABLE F22: ANCOVA ESTIMATION OF NET ASSETS BY ARM, POVERTY STATUS, AND PERIOD, CATTLE REARING EXPERIENCES (CONTINUED)

	(2)			(3)		
	Adi	Own	None	Adi	Own	None
(Intercept)	30010.9 (0.0)	28150.5 (0.0)	14605.2 (0.0)	3463.0 (76.9)	31530.2 (0.9)	5689.6 (11.1)
Large	661.5 (91.4)	17814.5 (8.0)	8693.5 (0.0)	−1214.3 (81.9)	18322.4 (8.2)	8426.7 (0.1)
LargeGrace	−583.4 (96.6)	3000.5 (55.5)	4471.3 (9.5)	−1711.0 (86.7)	3383.6 (50.1)	4216.0 (12.0)
Large × UltraPoor	−9583.7 (42.6)	−7218.8 (52.0)	−4899.0 (53.9)	−8409.9 (40.6)	−6357.4 (57.6)	−5446.3 (52.1)
LargeGrace × UltraPoor	4425.4 (78.3)	19930.9 (4.3)	−2908.3 (60.8)	4984.7 (73.8)	21290.0 (3.6)	−2542.4 (64.4)
rd 3	−2071.7 (57.1)	−132.6 (96.1)	4171.3 (1.8)	−746.6 (83.0)	616.9 (81.5)	4343.2 (1.5)
Large × rd 3	−4925.2 (66.2)	976.6 (86.0)	−2033.1 (53.9)	−5296.3 (64.2)	2353.2 (67.4)	−2099.1 (52.9)
LargeGrace × rd 3	15522.2 (3.3)	−14207.2 (6.5)	7292.4 (10.0)	17584.9 (0.5)	−13356.4 (7.7)	7391.9 (10.2)
Large × UltraPoor × rd 3	429.4 (98.5)	16517.2 (25.7)	1535.6 (83.0)	−1999.2 (93.2)	19657.6 (19.1)	1715.8 (81.1)
LargeGrace × UltraPoor × rd 3	5335.3 (84.3)	−3771.3 (82.1)	−12828.7 (32.0)	−4649.8 (83.7)	−1842.6 (90.8)	−12974.8 (31.3)
rd 4	522.7 (91.3)	2139.2 (52.7)	4376.2 (1.2)	2347.9 (63.9)	2192.6 (51.1)	4561.1 (1.0)
Large × rd 4	487.2 (96.5)	1328.1 (84.8)	−3810.9 (23.1)	−905.2 (93.5)	848.5 (90.7)	−3906.1 (22.2)
LargeGrace × rd 4	24304.2 (15.1)	−15993.4 (8.8)	5927.3 (21.1)	25321.1 (15.0)	−14887.6 (10.2)	6104.7 (20.5)
Large × UltraPoor × rd 4	−13211.0 (55.2)	29070.7 (12.0)	874.7 (88.9)	−15432.2 (49.1)	27878.4 (13.8)	997.5 (87.5)
LargeGrace × UltraPoor × rd 4	21353.0 (45.1)	−7002.4 (73.9)	−11033.3 (33.3)	11700.7 (63.6)	−6016.2 (76.9)	−11242.8 (32.3)
Flood in round 1				−11755.6 (0.7)	1208.2 (83.8)	1022.2 (67.0)
Head literate0				5142.4 (44.0)	−204.6 (97.2)	481.0 (87.4)
NetValue0	0.8 (2.3)	0.2 (43.1)	0.3 (37.3)	0.8 (0.6)	0.2 (44.1)	0.2 (43.8)
Household size0				6893.7 (0.5)	−1114.1 (65.0)	1967.1 (0.8)
mean of dependent variable	28555	39185	21496	28555	39185	21496
$T = 2$	2	1	10	2	1	10
$T = 3$	10	11	60	10	9	60
$T = 4$	48	92	222	48	92	222
$\tilde{R}^2$	−0.015	0.083	0.031	0.105	0.076	0.044
N	166	299	796	166	295	796

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). UltraPoor is an indicator variable if the household is classified as the ultra poor. Large, LargeGrace, Cattle are indicator variables of the large, large grace, and cattle arms, respectively. The default arm category is traditional arm. rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Net assets uses only assets observed for all 4 rounds in household assets. Household assets do not include livestock.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

TABLE F23: ANCOVA ESTIMATION OF NET ASSETS BY ATTRIBUTES, POVERTY STATUS, AND PERIOD, CATTLE REARING EXPERIENCES

	mean/std			(1)		
	Adi	Own	None	Adi	Own	None
(Intercept)				26973.4	28203.8	13809.6
				(0.0)	(0.0)	(0.0)
Upfront	0.778	0.815	0.786	3584.9	20389.3	9512.0
	(0.42)	(0.39)	(0.41)	(48.2)	(1.7)	(0.0)
WithGrace	0.450	0.471	0.524	−1437.9	−10268.8	−4621.4
	(0.50)	(0.50)	(0.50)	(83.3)	(18.6)	(4.6)
InKind	0.316	0.202	0.271	−45.1	−3254.1	−397.3
	(0.47)	(0.40)	(0.44)	(99.4)	(38.0)	(86.2)
Upfront × UltraPoor	0.444	0.505	0.536	−7440.8	4391.1	−6008.9
	(0.50)	(0.50)	(0.50)	(47.0)	(68.4)	(36.5)
WithGrace × UltraPoor	0.240	0.293	0.371	13186.7	26867.7	1205.5
	(0.43)	(0.46)	(0.48)	(29.3)	(0.5)	(85.3)
InKind × UltraPoor	0.146	0.141	0.174	−2799.1	−21489.7	1394.2
	(0.35)	(0.35)	(0.38)	(80.4)	(2.3)	(75.2)
rd 3	0.345	0.343	0.354	−1374.7	−199.2	3876.8
	(0.48)	(0.48)	(0.48)	(60.6)	(94.0)	(0.1)
Upfront × rd 3	0.269	0.276	0.276	−7524.9	295.6	−4185.5
	(0.44)	(0.45)	(0.45)	(41.1)	(97.1)	(14.2)
WithGrace × rd 3	0.158	0.162	0.185	6907.5	−12432.2	7180.2
	(0.37)	(0.37)	(0.39)	(45.8)	(9.0)	(3.5)
InKind × rd 3	0.111	0.071	0.098	−2083.3	9663.6	−5999.7
	(0.32)	(0.26)	(0.30)	(67.0)	(13.8)	(8.4)
Upfront × UltraPoor × rd 3	0.158	0.168	0.188	9001.9	10568.4	−2206.3
	(0.37)	(0.37)	(0.39)	(65.6)	(46.0)	(75.0)
WithGrace × UltraPoor × rd 3	0.088	0.098	0.131	−10598.7	−16509.3	−5290.9
	(0.28)	(0.30)	(0.34)	(62.7)	(26.2)	(57.6)
InKind × UltraPoor × rd 3	0.053	0.047	0.063	15785.0	−1133.6	10915.6
	(0.22)	(0.21)	(0.24)	(23.2)	(93.8)	(18.8)
rd 4	0.333	0.327	0.335	621.0	845.6	4599.3
	(0.47)	(0.47)	(0.47)	(85.8)	(78.7)	(0.0)
Upfront × rd 4	0.263	0.266	0.269	1791.8	5535.9	−3723.3
	(0.44)	(0.44)	(0.44)	(86.2)	(54.1)	(23.9)
WithGrace × rd 4	0.152	0.152	0.179	4743.1	−15799.9	7292.9
	(0.36)	(0.36)	(0.38)	(70.2)	(8.1)	(5.5)
InKind × rd 4	0.105	0.061	0.093	−5317.9	12601.0	−2679.5
	(0.31)	(0.24)	(0.29)	(58.1)	(12.1)	(45.7)
Upfront × UltraPoor × rd 4	0.152	0.168	0.185	5979.5	25684.4	1625.8
	(0.36)	(0.37)	(0.39)	(75.4)	(16.2)	(82.1)
WithGrace × UltraPoor × rd 4	0.082	0.098	0.129	4797.8	−35745.5	−6208.8
	(0.27)	(0.30)	(0.33)	(83.1)	(6.4)	(50.6)
InKind × UltraPoor × rd 4	0.047	0.047	0.062	9323.6	2730.2	6333.9
	(0.21)	(0.21)	(0.24)	(59.4)	(89.3)	(45.3)
Flood in round 1	0.526	0.444	0.396			
	(0.50)	(0.50)	(0.49)			
Head literate0	0.135	0.165	0.142			
	(0.34)	(0.37)	(0.35)			
NetValue0	1344.942	31070.976	2746.425			
	(6621.59)	(15261.17)	(3434.12)			
Household size0	4.573	4.586	4.382			
	(1.24)	(1.41)	(1.37)			
mean of dependent variable				28555	39185	21496
$T = 2$				9	6	27
$T = 3$				18	17	97
$T = 4$				83	113	354
$\bar{R}^2$				−0.045	0.074	0.029
N	171	297	809	294	379	1283

TABLE F23: ANCOVA ESTIMATION OF NET ASSETS BY ATTRIBUTES, POVERTY STATUS, AND PERIOD, CATTLE REARING EXPERIENCES (CONTINUED)

	(2)			(3)		
	Adi	Own	None	Adi	Own	None
(Intercept)	31177.1 (0.0)	23152.6 (1.2)	14489.7 (0.0)	4835.9 (68.5)	23909.4 (8.9)	6362.6 (17.9)
Upfront	−349.2 (95.7)	22308.0 (4.5)	8891.3 (1.5)	−2742.2 (67.5)	22738.0 (4.9)	8286.5 (3.2)
WithGrace	−1312.6 (92.7)	−14812.1 (16.7)	−4242.9 (15.6)	−267.4 (98.0)	−14286.8 (22.4)	−4295.8 (16.3)
InKind	21.6 (99.9)	1005.6 (84.7)	−3090.5 (28.2)	528.5 (96.2)	275.8 (96.0)	−3035.2 (28.7)
Upfront × UltraPoor	−4088.1 (77.1)	−2493.3 (84.4)	−9574.4 (32.9)	−5898.1 (65.7)	−1959.5 (87.2)	−10802.1 (31.8)
WithGrace × UltraPoor	14586.3 (42.0)	27105.2 (2.3)	2042.4 (82.6)	13126.3 (40.1)	27050.3 (2.2)	3273.1 (74.0)
InKind × UltraPoor	−1205.6 (94.4)	−16312.7 (18.9)	−2382.1 (67.9)	−3427.0 (83.6)	−17523.0 (16.8)	−2695.7 (64.8)
rd 3	−2360.9 (52.2)	64.2 (98.2)	4019.3 (2.9)	−997.0 (77.8)	801.7 (77.7)	4160.5 (2.5)
Upfront × rd 3	−2097.2 (85.9)	−166.9 (98.5)	−2507.9 (53.6)	−3138.1 (79.4)	1238.4 (89.2)	−2442.8 (54.7)
WithGrace × rd 3	20427.2 (11.9)	−15162.2 (5.2)	9361.3 (7.6)	22846.8 (6.7)	−15747.8 (4.2)	9517.5 (7.5)
InKind × rd 3	−13769.3 (7.7)	13947.0 (4.9)	−8483.5 (10.3)	−16281.8 (1.8)	12968.8 (5.8)	−8506.1 (10.7)
Upfront × UltraPoor × rd 3	1017.6 (96.9)	12346.3 (49.6)	4546.9 (58.8)	−3442.0 (89.4)	15738.9 (39.7)	4942.3 (55.7)
WithGrace × UltraPoor × rd 3	4936.4 (89.9)	−20293.8 (26.2)	−14426.4 (29.9)	−2460.0 (94.6)	−21384.3 (24.0)	−14717.7 (28.9)
InKind × UltraPoor × rd 3	−4734.4 (86.0)	748.6 (96.5)	16812.0 (20.7)	3530.4 (87.7)	−1208.2 (94.2)	17117.5 (19.8)
rd 4	125.9 (97.9)	2473.4 (48.7)	4060.4 (2.3)	1958.9 (69.4)	2558.1 (46.7)	4205.8 (2.0)
Upfront × rd 4	4340.2 (70.1)	2058.7 (84.7)	−1913.3 (62.0)	2767.8 (81.2)	1512.0 (88.9)	−1865.4 (62.8)
WithGrace × rd 4	23660.7 (21.5)	−17271.3 (7.1)	9690.0 (7.0)	26087.2 (18.7)	−15735.8 (10.8)	9941.9 (6.6)
InKind × rd 4	−21651.4 (21.3)	18176.9 (4.8)	−5152.4 (34.6)	−22807.0 (21.1)	16980.0 (5.4)	−5257.7 (34.4)
Upfront × UltraPoor × rd 4	−6766.1 (77.8)	20084.4 (34.8)	3398.2 (65.6)	−12079.6 (62.1)	19424.1 (37.4)	3923.0 (60.9)
WithGrace × UltraPoor × rd 4	35291.5 (35.9)	−36030.7 (11.5)	−11845.8 (32.5)	27859.7 (44.2)	−33714.9 (14.3)	−12135.1 (31.3)
InKind × UltraPoor × rd 4	−17761.3 (53.9)	−2933.2 (90.5)	12268.1 (31.6)	−10220.5 (69.1)	−4072.4 (86.7)	12671.9 (30.1)
Flood in round 1				−11106.9 (1.8)	1672.5 (78.5)	560.8 (81.4)
Head literate0				5909.8 (42.6)	−1672.1 (77.1)	−162.5 (96.1)
NetValue0	0.8 (2.5)	0.2 (41.3)	0.3 (35.7)	0.8 (0.7)	0.2 (44.5)	0.3 (41.7)
Household size0				6856.8 (0.6)	−524.9 (83.2)	1940.7 (0.9)
mean of dependent variable $T = 2$	28555 2	39185 1	21496 10	28555 2	39185 1	21496 10
$T = 3$ $T = 4$	10 48	11 92	60 222	10 48	9 92	60 222
$\tilde{R}^2$ N	−0.048 166	0.073 299	0.032 796	0.071 166	0.065 295	0.044 796

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). UltraPoor is an indicator variable if the household is classified as the ultra poor. Upfront is an indicator variable of the arm with an upfront large disbursement, WithGrace is an indicator variable of the arm with a grace period, InKind is an indicator variable of the arm which lends a heifer. rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Net assets uses only assets observed for all 4 rounds in household assets. Household assets do not include livestock.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

TABLE F24: ANCOVA ESTIMATION OF CATTLE HOLDING BY PERIOD, SUBSAMPLES BY CATTLE REARING EXPERIENCES

	mean/std			(1)		
	Adi	Own	None	Adi	Own	None
(Intercept)				1.60 (0.0)	1.50 (0.0)	1.41 (0.0)
Large	0.333 (0.47)	0.342 (0.48)	0.268 (0.44)	−0.02 (91.5)	0.92 (0.9)	0.25 (3.1)
LargeGrace	0.127 (0.33)	0.268 (0.44)	0.254 (0.44)	0.22 (45.2)	0.37 (3.8)	−0.13 (28.3)
Cattle	0.321 (0.47)	0.200 (0.40)	0.278 (0.45)	−0.12 (56.3)	0.13 (40.1)	−0.08 (38.6)
rd 3	0.352 (0.48)	0.346 (0.48)	0.349 (0.48)	−0.09 (37.2)	0.04 (73.8)	0.01 (90.1)
Large × rd 3	0.115 (0.32)	0.115 (0.32)	0.091 (0.29)	−0.23 (56.4)	0.10 (75.9)	−0.01 (92.5)
LargeGrace × rd 3	0.048 (0.22)	0.092 (0.29)	0.088 (0.28)	−0.15 (62.1)	0.07 (83.8)	0.35 (5.9)
Cattle × rd 3	0.109 (0.31)	0.071 (0.26)	0.095 (0.29)	0.04 (91.4)	0.29 (30.4)	0.18 (17.1)
rd 4	0.315 (0.47)	0.319 (0.47)	0.327 (0.47)	0.27 (10.6)	0.14 (29.1)	0.17 (0.6)
Large × rd 4	0.115 (0.32)	0.112 (0.32)	0.091 (0.29)	−0.00 (99.8)	0.19 (63.0)	0.05 (75.3)
LargeGrace × rd 4	0.036 (0.19)	0.088 (0.28)	0.083 (0.28)	0.30 (58.7)	−0.08 (83.4)	0.61 (0.2)
Cattle × rd 4	0.103 (0.30)	0.061 (0.24)	0.091 (0.29)	0.10 (79.1)	0.38 (20.0)	0.42 (0.2)
Flood in round 1	0.533 (0.50)	0.447 (0.50)	0.393 (0.49)			
Head literate0	0.133 (0.34)	0.166 (0.37)	0.129 (0.34)			
Number of cattle0		1.420 (0.71)				
NetValue0	959.667 (8196.80)	30907.220 (15484.74)	2795.554 (3689.93)			
Household size0	4.655 (1.17)	4.563 (1.42)	4.346 (1.38)			
mean of dependent variable				2	2	1
$T = 2$				13	13	61
$T = 3$				24	16	128
$T = 4$				64	104	227
$\bar{R}^2$				0.007	0.058	0.05
N	165	295	791	253	357	998

TABLE F24: ANCOVA ESTIMATION OF CATTLE HOLDING BY PERIOD, SUBSAMPLES BY CATTLE REARING EXPERIENCES (CONTINUED)

	(2)			(3)		
	Adi	Own	None	Adi	Own	None
(Intercept)	1.60	1.20	1.41	0.98	1.35	1.29
	(0.0)	(0.0)	(0.0)	(1.9)	(2.2)	(0.0)
Large	−0.02	0.89	0.25	−0.03	0.89	0.07
	(91.5)	(0.9)	(3.1)	(91.7)	(9.1)	(68.4)
LargeGrace	0.22	0.36	−0.13	0.59	0.20	−0.09
	(45.2)	(6.1)	(28.3)	(16.6)	(50.0)	(56.8)
Cattle	−0.12	0.14	−0.08	−0.05	0.10	−0.17
	(56.3)	(40.9)	(38.6)	(87.2)	(68.2)	(25.6)
rd 3	−0.09	0.04	0.01	−0.16	−0.00	−0.06
	(37.2)	(72.2)	(90.1)	(32.4)	(96.9)	(33.0)
Large × rd 3	−0.23	0.11	−0.01	−0.54	0.20	0.20
	(56.4)	(73.9)	(92.5)	(29.2)	(57.5)	(28.8)
LargeGrace × rd 3	−0.15	0.11	0.35	0.12	0.06	0.33
	(62.1)	(75.6)	(5.9)	(75.0)	(88.2)	(7.1)
Cattle × rd 3	0.04	0.30	0.18	−0.16	0.24	0.30
	(91.4)	(28.4)	(17.1)	(68.7)	(37.3)	(7.4)
rd 4	0.27	0.14	0.17	0.38	0.09	0.10
	(10.6)	(29.1)	(0.6)	(23.0)	(48.6)	(11.3)
Large × rd 4	−0.00	0.18	0.05	−0.21	0.15	0.16
	(99.8)	(64.6)	(75.3)	(69.5)	(71.1)	(37.2)
LargeGrace × rd 4	0.30	−0.07	0.61	1.37	−0.18	0.58
	(58.7)	(84.0)	(0.2)	(21.6)	(61.3)	(0.3)
Cattle × rd 4	0.10	0.41	0.42	−0.06	0.20	0.47
	(79.1)	(16.8)	(0.2)	(87.6)	(48.5)	(0.7)
Flood in round 1				−0.35	0.06	0.20
				(15.2)	(83.1)	(4.5)
Head literate0				0.39	−0.18	0.00
				(22.1)	(53.7)	(97.7)
Number of cattle0		0.23			−0.74	
		(10.6)			(8.2)	
NetValue0				0.00	0.00	−0.00
				(1.8)	(1.2)	(89.4)
Household size0				0.16	0.01	0.04
				(5.3)	(94.8)	(23.8)
mean of dependent variable	2	2	1	2	2	1
$T = 2$	13	13	61	8	6	31
$T = 3$	24	16	128	12	12	83
$T = 4$	64	104	227	35	79	134
$\bar{R}^2$	0.007	0.07	0.05	0.094	0.06	0.035
N	253	357	998	137	267	599

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Large, LargeGrace, Cattle are indicator variables of the large, large grace, and cattle arms, respectively. The default arm category is traditional arm. rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Narrow net assets uses only assets observed for all 4 rounds in household assets. Household assets do not include livestock. OwnCattle0 is an indicator if a household owned cattle at the baseline. AdiCattle0 is an indicator if a household engaged in the cattle lease-in contract at the baseline. Adi and None subgroups do not own cattle at the baseline. We used net asset values at the baseline NetAssets0 in place of NumCows0 in ANCOVA estimation.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

F.9 By poverty class

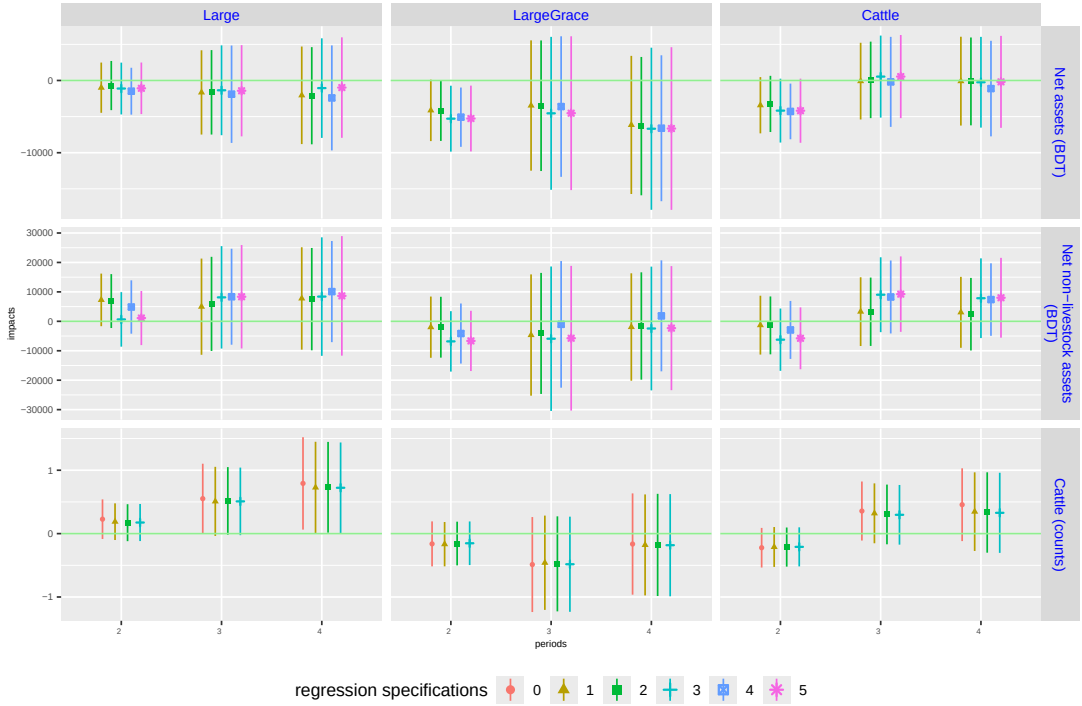
TABLE F25: BASELINE VARIABLES OF ULTRA POOR RELATIVE TO THE MODERATELY POOR

	Mean			*p* value
Variables	Ultra poor	Moderately poor	Overall	
Net asset value	8435	8249	8375	91.00%
Number of cattle	0.256	0.256	0.256	97.51%
Individually rejected	0.105	0.142	0.116	12.60%
Household size	4.175	4.224	4.189	65.80%

Notes: 1. R's package coin is used for baseline group mean covariates to conduct approximate permutation tests. Number of repetition is set to 100000.

2. See the footnote of TABLE 3 for description of variables.

FIGURE F3: IMPACTS OF THE ULTRA POOR RELATIVE TO THE MODERATELY POOR



Source: Estimated with administrative and survey data in TABLE F26.

Note: Impacts of ultra poor members - impacts of moderately poor members. Asset values are expressed in BDT. Net assets=total assets - debts. Debts include outstanding loaned amount of the experiment. Total assets use items observed in all 4 rounds of household surveys. Net non livestock assets=net assets-livestock asset values. Number of cattle is a headcount of cattle holding.

FIGURE F3 shows net asset impacts are no different for the ultra poor borrowers at period 4. However, their time paths may be different. In Large grace and Cattle arms, the ultra poor borrowers accumulate smaller net assets in period 2 than their moderately poor counterparts of the same arms. Period 2 is the grace period and the repayment commence in the next period. The ultra poor borrowers may have saved up during the grace period to get ready for the installments of period 3 and 4. If this interpretation is correct, a grace period may have encouraged the ultra poor individuals to take up the loans. The ultra poor of Large arm does not show difference relative to the moderately poor borrowers. This hints that there may be self-selection of the ultra poor of the Large arm that they are better prepared for repayment than the ultra poor borrowers of Large grace and Cattle arms. There is no difference between arms for Net non-livestock assets, while the ultra poor of Large arm may have more cattle holding in period 4 than the moderately poor of the same arm.

FIGURE 15 shows negative impacts on consumption relative to moderately poor members among Large and Cattle arms in period 4. This hints that repayment efforts may have resulted in consumption suppression for the ultra poor borrowers. Together with slower net asset accumulation, we may need to incorporate smaller, more distributed repayment installments and/or longer saving opportunities before the disbursement of loans for the ultra poor relative to the moderately poor.

TABLE F26: ANCOVA ESTIMATION OF NET ASSETS BY ARM, POVERTY STATUS, AND PERIOD

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		9479.2 (0.0)	6156.6 (7.2)	−1241.0 (79.4)	7082.7 (15.4)	2480.2 (61.7)	5923.2 (24.5)
Large	0.048 (0.46)	13878.9 (0.0)	14435.6 (0.1)	14364.7 (0.1)	7508.6 (5.0)	11049.6 (1.2)	7649.0 (4.9)
LargeGrace	0.006 (0.43)	6270.1 (3.4)	5175.2 (17.8)	5486.2 (15.4)	45.2 (98.9)	2043.9 (58.5)	−114.9 (97.3)
Cattle	0.009 (0.44)	6073.2 (0.6)	5861.9 (8.6)	6103.5 (7.2)	622.4 (84.2)	3262.9 (31.7)	768.2 (80.7)
HadCattle	0.265 (0.44)				8201.7 (18.5)		10868.0 (10.7)
UltraPoor	0.607 (0.49)	−3814.7 (1.3)	−3579.9 (8.0)	−3741.7 (6.6)	−3429.9 (12.0)	−3093.2 (15.4)	−3269.3 (13.9)
Large × UltraPoor	0.045 (0.37)	−5067.8 (31.8)	−5349.5 (40.5)	−5420.0 (41.8)	−10297.4 (14.1)	−6934.7 (33.5)	−9742.9 (16.8)
LargeGrace × UltraPoor	0.027 (0.35)	2426.3 (44.9)	5051.3 (30.0)	5334.0 (25.6)	5148.5 (28.3)	4198.2 (41.5)	6480.1 (19.5)
Cattle × UltraPoor	0.001 (0.34)	172.4 (96.0)	−242.9 (96.1)	−53.2 (99.2)	914.8 (87.0)	−97.2 (98.6)	1232.1 (82.6)
rd 3	0.342 (0.47)	5535.3 (0.0)	5735.0 (0.0)	6005.6 (0.0)	8409.4 (0.0)	7403.5 (0.0)	8518.2 (0.0)
Large × rd 3	0.104 (0.30)	1588.3 (63.2)	2811.2 (51.2)	3255.2 (45.5)	3066.1 (54.2)	3960.2 (39.1)	3429.5 (49.7)
LargeGrace × rd 3	0.085 (0.28)	7824.2 (1.6)	9975.0 (3.3)	10190.4 (2.9)	12851.2 (1.3)	10298.2 (4.1)	12836.1 (1.3)
Cattle × rd 3	0.087 (0.28)	3572.6 (20.9)	5017.5 (15.8)	5058.5 (14.9)	6788.3 (9.5)	6747.0 (6.6)	6779.7 (9.6)
UltraPoor × rd 3	0.204 (0.40)	−316.8 (88.3)	580.6 (84.2)	930.3 (74.8)	143.8 (96.5)	1529.2 (60.1)	134.5 (96.7)
Large × UltraPoor × rd 3	0.014 (0.21)	6699.5 (28.3)	7973.7 (29.7)	8732.3 (24.8)	11429.2 (17.1)	9920.7 (20.4)	11482.0 (17.2)
LargeGrace × UltraPoor × rd 3	0.010 (0.21)	−1374.6 (81.7)	−1662.6 (85.2)	−1296.5 (88.5)	−2623.9 (81.0)	528.9 (95.5)	−2610.2 (81.1)
Cattle × UltraPoor × rd 3	−0.000 (0.19)	7253.8 (8.2)	6290.8 (23.7)	6065.2 (25.6)	12323.3 (4.6)	9830.8 (9.0)	12377.2 (4.6)

TABLE F26: ANCOVA ESTIMATION OF NET ASSETS BY ARM, POVERTY STATUS, AND PERIOD (CONTINUED)

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
rd 4	0.315 (0.46)	10421.2 (0.0)	10599.1 (0.0)	10759.0 (0.0)	14209.8 (0.0)	12224.6 (0.0)	14285.9 (0.0)
Large × rd 4	0.102 (0.30)	3661.7 (38.6)	4176.7 (36.2)	3965.4 (38.7)	3790.8 (43.3)	4808.3 (30.7)	4114.0 (39.7)
LargeGrace × rd 4	0.080 (0.27)	9283.5 (0.7)	11180.0 (1.6)	11395.8 (1.4)	15566.2 (0.3)	11699.1 (1.8)	15465.5 (0.3)
Cattle × rd 4	0.079 (0.27)	7037.6 (3.1)	7743.1 (4.7)	7966.7 (3.7)	10073.9 (1.4)	9756.3 (1.1)	9854.6 (1.6)
UltraPoor × rd 4	0.195 (0.40)	3036.3 (22.8)	5219.9 (7.0)	5199.8 (7.3)	3773.1 (25.7)	6025.0 (3.7)	3789.8 (25.6)
Large × UltraPoor × rd 4	0.016 (0.21)	10671.3 (17.2)	6133.4 (44.4)	6082.2 (45.0)	8060.4 (39.4)	7172.6 (37.8)	8124.8 (39.2)
LargeGrace × UltraPoor × rd 4	0.008 (0.20)	−1561.2 (79.5)	−3574.4 (64.3)	−3040.4 (69.6)	−2782.9 (76.7)	−1073.3 (89.6)	−2836.3 (76.3)
Cattle × UltraPoor × rd 4	−0.001 (0.19)	6504.0 (16.7)	1419.6 (79.0)	961.3 (86.0)	7501.8 (24.6)	4461.2 (43.0)	7483.2 (24.5)
HadCattle	0.265 (0.44)				8201.7 (18.5)		10868.0 (10.7)
HadCattle × Large	0.024 (0.25)				16251.4 (14.2)		16436.7 (13.6)
HadCattle × LargeGrace	0.009 (0.23)				7162.6 (31.8)		8007.8 (24.5)
HadCattle × Cattle	−0.012 (0.21)				11221.7 (10.3)		11051.8 (9.6)
HadCattle × rd 3	0.092 (0.29)				−4604.1 (10.5)		−4700.3 (9.5)
HadCattle × Large × rd 3	0.008 (0.15)				2819.2 (72.2)		2354.9 (76.5)
HadCattle × LargeGrace × rd 3	0.003 (0.14)				−27087.1 (0.5)		−27149.5 (0.4)
HadCattle × Cattle × rd 3	−0.004 (0.12)				−5263.1 (44.6)		−5335.2 (43.9)
HadCattle × rd 4	0.084 (0.28)				−2566.2 (51.5)		−2711.1 (49.1)
HadCattle × Large × rd 4	0.009 (0.14)				1764.4 (87.5)		1601.7 (88.6)
HadCattle × LargeGrace × rd 4	0.004 (0.13)				−30352.9 (2.1)		−30071.5 (2.2)
HadCattle × Cattle × rd 4	−0.005 (0.11)				−7993.4 (42.1)		−7746.0 (43.3)
Flood in round 1	0.414 (0.49)			152.9 (94.4)	1582.2 (51.0)	202.6 (93.4)	1813.4 (47.4)
Head literate0	0.149 (0.36)			−659.9 (81.7)	−2041.6 (49.9)	−2419.1 (41.3)	−1951.1 (52.0)
NetValue0	10261.899 (15197.09)		0.5 (0.0)	0.5 (0.0)	0.2 (41.6)	0.6 (5.0)	0.7 (4.0)
Household size0	4.538 (1.35)			1621.4 (3.9)	1477.5 (10.9)	1713.7 (5.2)	1403.1 (12.7)
Number of cattle0	0.380 (0.73)					−2855.6 (66.5)	−12408.5 (14.7)
mean of dependent variable		21884	21884	21884	21884	21884	21884
$T = 2$		42	13	13	13	10	13
$T = 3$		137	84	81	38	40	36
$T = 4$		569	377	377	327	362	327
$\bar{R}^2$		0.075	0.152	0.158	0.146	0.128	0.149
N	1081	2023	1312	1306	1070	1176	1066

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). UltraPoor is an indicator variable if the household is classified as the ultra poor. Large, LargeGrace, Cattle are indicator variables of the large, large grace, and cattle arms, respectively. The default arm category is traditional arm. rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Net assets use only assets observed for all 4 rounds in household assets. Household assets do not include livestock. Regressions (1)-(3), (5)-(6) use only arm and calendar information. (4) and (7) use previous six month repayment and saving information which is lacking in rd 1, hence starts from rd 2.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

TABLE F27: ANCOVA ESTIMATION OF NET ASSETS BY ATTRIBUTES, POVERTY STATUS, AND PERIOD

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		9479.2 (0.0)	6156.6 (7.2)	−1241.0 (79.4)	7082.7 (15.4)	2480.2 (61.7)	5923.2 (24.5)
Upfront	0.063 (0.39)	13878.9 (0.0)	14435.6 (0.1)	14364.7 (0.1)	7508.6 (5.0)	11049.6 (1.2)	7649.0 (4.9)
WithGrace	0.014 (0.50)	−7608.8 (2.5)	−9260.4 (1.6)	−8878.6 (2.6)	−7463.4 (3.5)	−9005.7 (3.5)	−7763.8 (3.5)
InKind	0.009 (0.44)	−196.9 (93.6)	686.7 (81.5)	617.4 (82.9)	577.2 (82.7)	1219.0 (67.6)	883.1 (74.4)
HadCattle	0.265 (0.44)				8201.7 (18.5)		10868.0 (10.7)
UltraPoor	0.607 (0.49)	−3814.7 (1.3)	−3579.9 (8.0)	−3741.7 (6.6)	−3429.9 (12.0)	−3093.2 (15.4)	−3269.3 (13.9)
Upfront × UltraPoor	0.072 (0.27)	−5067.8 (31.8)	−5349.5 (40.5)	−5420.0 (41.8)	−10297.4 (14.1)	−6934.7 (33.5)	−9742.9 (16.8)
WithGrace × UltraPoor	0.027 (0.39)	7494.2 (13.4)	10400.7 (11.4)	10754.0 (11.0)	15445.9 (2.6)	11132.9 (10.1)	16223.0 (2.1)
InKind × UltraPoor	0.001 (0.34)	−2253.9 (49.4)	−5294.1 (28.5)	−5387.2 (27.8)	−4233.6 (43.5)	−4295.4 (39.4)	−5248.0 (34.3)
rd 3	0.342 (0.47)	5535.3 (0.0)	5735.0 (0.0)	6005.6 (0.0)	8409.4 (0.0)	7403.5 (0.0)	8518.2 (0.0)
UltraPoor × rd 3	0.204 (0.40)	−316.8 (88.3)	580.6 (84.2)	930.3 (74.8)	143.8 (96.5)	1529.2 (60.1)	134.5 (96.7)
Upfront × rd 3	0.276 (0.45)	1588.3 (63.2)	2811.2 (51.2)	3255.2 (45.5)	3066.1 (54.2)	3960.2 (39.1)	3429.5 (49.7)
WithGrace × rd 3	0.172 (0.38)	6235.9 (8.7)	7163.8 (13.7)	6935.2 (15.6)	9785.1 (5.3)	6338.0 (21.1)	9406.7 (6.2)
InKind × rd 3	0.087 (0.28)	−4251.6 (18.6)	−4957.5 (24.0)	−5131.9 (22.1)	−6062.9 (13.8)	−3551.2 (39.9)	−6056.5 (13.6)
Upfront × UltraPoor × rd 3	0.024 (0.16)	6699.5 (28.3)	7973.7 (29.7)	8732.3 (24.8)	11429.2 (17.1)	9920.7 (20.4)	11482.0 (17.2)
WithGrace × UltraPoor × rd 3	0.010 (0.23)	−8074.2 (27.8)	−9636.4 (34.6)	−10028.8 (32.4)	−14053.1 (22.3)	−9391.8 (35.9)	−14092.1 (22.2)
InKind × UltraPoor × rd 3	−0.000 (0.19)	8628.4 (13.8)	7953.4 (35.3)	7361.7 (39.0)	14947.2 (13.6)	9301.9 (28.4)	14987.4 (13.5)

TABLE F27: ANCOVA ESTIMATION OF NET ASSETS BY ATTRIBUTES, POVERTY STATUS, AND PERIOD (CONTINUED)

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
rd 4	0.315 (0.46)	10421.2 (0.0)	10599.1 (0.0)	10759.0 (0.0)	14209.8 (0.0)	12224.6 (0.0)	14285.9 (0.0)
UltraPoor × rd 4	0.195 (0.40)	3036.3 (22.8)	5219.9 (7.0)	5199.8 (7.3)	3773.1 (25.7)	6025.0 (3.7)	3789.8 (25.6)
Upfront × rd 4	0.260 (0.44)	3661.7 (38.6)	4176.7 (36.2)	3965.4 (38.7)	3790.8 (43.3)	4808.3 (30.7)	4114.0 (39.7)
WithGrace × rd 4	0.158 (0.37)	5621.8 (21.4)	7003.4 (17.1)	7430.4 (14.8)	11775.4 (2.7)	6890.9 (19.6)	11351.5 (3.3)
InKind × rd 4	0.079 (0.27)	−2245.8 (53.8)	−3436.9 (45.2)	−3429.0 (45.1)	−5492.3 (23.7)	−1942.8 (67.1)	−5610.9 (22.9)
Upfront × UltraPoor × rd 4	0.024 (0.16)	10671.3 (17.2)	6133.4 (44.4)	6082.2 (45.0)	8060.4 (39.4)	7172.6 (37.8)	8124.8 (39.2)
WithGrace × UltraPoor × rd 4	0.008 (0.22)	−12232.4 (16.2)	−9707.8 (33.5)	−9122.6 (36.7)	−10843.4 (34.6)	−8245.9 (41.3)	−10961.1 (34.3)
InKind × UltraPoor × rd 4	−0.001 (0.19)	8065.2 (18.8)	4994.0 (53.5)	4001.8 (62.3)	10284.7 (26.2)	5534.5 (49.5)	10319.5 (26.0)
HadCattle	0.265 (0.44)				8201.7 (18.5)		10868.0 (10.7)
HadCattle × Upfront	0.021 (0.20)				16251.4 (14.2)		16436.7 (13.6)
HadCattle × WithGrace	−0.003 (0.26)				−9088.9 (38.4)		−8428.9 (42.7)
HadCattle × InKind	−0.012 (0.21)				4059.1 (49.4)		3044.0 (60.5)
HadCattle × rd 3	0.092 (0.29)				−4604.1 (10.5)		−4700.3 (9.5)
HadCattle × Upfront × rd 3	0.006 (0.12)				2819.2 (72.2)		2354.9 (76.5)
HadCattle × WithGrace × rd 3	−0.001 (0.15)				−29906.2 (0.1)		−29504.4 (0.1)
HadCattle × InKind × rd 3	−0.004 (0.12)				21824.0 (0.9)		21814.3 (0.8)
HadCattle × rd 4	0.084 (0.28)				−2566.2 (51.5)		−2711.1 (49.1)
HadCattle × Upfront × rd 4	0.007 (0.11)				1764.4 (87.5)		1601.7 (88.6)
HadCattle × WithGrace × rd 4	−0.001 (0.14)				−32117.3 (0.9)		−31673.2 (1.0)
HadCattle × InKind × rd 4	−0.005 (0.11)				22359.5 (4.7)		22325.5 (4.7)
Flood in round 1	0.414 (0.49)			152.9 (94.4)	1582.2 (51.0)	202.6 (93.4)	1813.4 (47.4)
Head literate0	0.149 (0.36)			−659.9 (81.7)	−2041.6 (49.9)	−2419.1 (41.3)	−1951.1 (52.0)
NetValue0	10261.899 (15197.09)		0.5 (0.0)	0.5 (0.0)	0.2 (41.6)	0.6 (5.0)	0.7 (4.0)
Household size0	4.538 (1.35)			1621.4 (3.9)	1477.5 (10.9)	1713.7 (5.2)	1403.1 (12.7)
Number of cattle0	0.380 (0.73)					−2855.6 (66.5)	−12408.5 (14.7)
mean of dependent variable		21884	21884	21884	21884	21884	21884
$T = 2$		42	13	13	13	10	13
$T = 3$		137	84	81	38	40	36
$T = 4$		569	377	377	327	362	327
$\bar{R}^2$		0.075	0.152	0.158	0.146	0.128	0.149
N	1081	2023	1312	1306	1070	1176	1066

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). UltraPoor is an indicator variable if the household is classified as the ultra poor. Upfront is an indicator variable of the arm with an upfront large disbursement, WithGrace is an indicator variable of the arm with a grace period, InKind is an indicator variable of the arm which lends a heifer. rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Net assets use only assets observed for all 4 rounds in household assets. Household assets do not include livestock. Regressions (1)-(3), (5)-(6) use only arm and calendar information. (4) and (7) use previous six month repayment and saving information which is lacking in rd 1, hence starts from rd 2.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

TABLE F28: ANCOVA ESTIMATION OF CATTLE HOLDING BY ARM, PERIOD, AND POVERTY CLASS

covariates	mean/std	(1)	(2)	(3)	(4)
(Intercept)		1.52 (0.0)	1.40 (0.0)	1.14 (0.0)	1.12 (0.0)
Large	0.273 (0.45)	0.42 (0.2)	0.40 (0.1)	0.38 (0.2)	0.38 (0.2)
LargeGrace	0.248 (0.43)	0.03 (80.7)	0.04 (67.9)	0.05 (61.4)	0.06 (59.1)
Cattle	0.264 (0.44)	−0.03 (59.1)	0.00 (100.0)	−0.00 (96.5)	−0.00 (100.0)
HadCattle	0.195 (0.40)				0.16 (42.9)
UltraPoor	0.630 (0.48)	−0.09 (16.5)	−0.11 (13.3)	−0.10 (14.6)	−0.10 (14.4)
Large × UltraPoor	0.172 (0.38)	−0.25 (17.9)	−0.17 (33.8)	−0.16 (38.2)	−0.14 (44.5)
LargeGrace × UltraPoor	0.171 (0.38)	0.42 (1.9)	0.50 (1.0)	0.53 (0.5)	0.55 (0.3)
Cattle × UltraPoor	0.181 (0.39)	0.19 (21.7)	0.29 (9.6)	0.32 (6.3)	0.34 (4.8)
rd 3	0.348 (0.48)	−0.03 (59.3)	−0.00 (93.9)	−0.00 (98.3)	0.00 (98.8)
Large × rd 3	0.094 (0.29)	−0.03 (84.8)	−0.03 (82.8)	−0.03 (84.7)	−0.03 (83.4)
LargeGrace × rd 3	0.085 (0.28)	0.24 (15.0)	0.24 (15.3)	0.25 (15.3)	0.24 (15.4)
Cattle × rd 3	0.091 (0.29)	0.19 (12.3)	0.17 (19.1)	0.17 (20.3)	0.17 (21.2)
UltraPoor × rd 3	0.217 (0.41)	−0.05 (62.8)	−0.04 (73.2)	−0.03 (76.0)	−0.03 (76.2)
Large × UltraPoor × rd 3	0.058 (0.23)	0.70 (0.6)	0.65 (1.1)	0.65 (1.0)	0.65 (1.1)
LargeGrace × UltraPoor × rd 3	0.060 (0.24)	−0.34 (31.3)	−0.32 (34.6)	−0.34 (31.8)	−0.35 (30.9)
Cattle × UltraPoor × rd 3	0.061 (0.24)	0.50 (1.7)	0.46 (3.7)	0.44 (4.7)	0.43 (4.9)

TABLE F29: ANCOVA ESTIMATION OF CATTLE HOLDING BY ARM, PERIOD, AND POVERTY CLASS (CONTINUED)

covariates	mean/std	(1)	(2)	(3)	(4)
rd 4	0.326 (0.47)	0.15 (0.8)	0.18 (0.4)	0.18 (0.3)	0.18 (0.3)
Large × rd 4	0.094 (0.29)	0.06 (67.8)	0.05 (75.8)	0.05 (75.5)	0.05 (76.8)
LargeGrace × rd 4	0.081 (0.27)	0.41 (2.2)	0.39 (2.9)	0.40 (2.6)	0.40 (2.6)
Cattle × rd 4	0.085 (0.28)	0.34 (0.9)	0.34 (1.5)	0.35 (1.6)	0.34 (1.7)
UltraPoor × rd 4	0.211 (0.41)	0.09 (44.6)	0.08 (51.7)	0.08 (50.8)	0.09 (49.7)
Large × UltraPoor × rd 4	0.060 (0.24)	0.79 (1.9)	0.75 (2.7)	0.75 (2.7)	0.74 (2.8)
LargeGrace × UltraPoor × rd 4	0.056 (0.23)	−0.16 (65.6)	−0.15 (67.5)	−0.16 (67.1)	−0.16 (65.8)
Cattle × UltraPoor × rd 4	0.060 (0.24)	0.46 (9.3)	0.37 (21.0)	0.35 (24.1)	0.35 (24.8)
HadCattle	0.195 (0.40)				0.16 (42.9)
Flood in round 1	0.491 (0.50)			0.05 (52.5)	0.05 (51.4)
Head literate0	0.114 (0.32)			0.02 (84.5)	0.02 (85.9)
Number of cattle0	0.266 (0.62)		0.32 (0.2)	0.30 (0.6)	0.21 (23.7)
Household size0	4.219 (1.43)			0.06 (1.8)	0.06 (1.8)
TotalImputed2Value0	5315.315 (12450.23)				
mean of dependent variable		1.62	1.62	1.62	1.62
$T = 2$		87	87	85	85
$T = 3$		168	168	168	168
$T = 4$		395	395	395	395
$\bar{R}^2$		0.055	0.103	0.107	0.108
N	1998	1608	1608	1606	1606

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Large, LargeGrace, Cattle are indicator variables of the large, large grace, and cattle arms, respectively. The default arm category is traditional arm. rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Sample is continuing members and replacing members of early rejecters and received loans prior to 2015 Janunary. Regressand is NumCows, number of cattle holding.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

Table F30: OLS estimation of consumption by period and poverty class

		Per capita consumption (Tk)			Total consumption (Tk)		
covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		2191.1 (0.0)	3175.7 (0.0)	1868.6 (0.0)	9057.7 (0.0)	2976.6 (0.0)	1269.7 (0.0)
Large	0.283 (0.45)	−4.9 (94.0)	44.7 (51.0)	45.9 (33.9)	283.4 (49.4)	−16.0 (95.3)	−10.4 (94.8)
LargeGrace	0.255 (0.44)	11.0 (85.2)	40.5 (58.0)	−5.1 (91.4)	405.2 (40.0)	202.4 (50.3)	−82.1 (61.7)
Cattle	0.265 (0.44)	−12.1 (84.2)	13.7 (82.9)	12.0 (77.7)	97.0 (80.1)	−95.9 (69.5)	−17.0 (91.0)
UltraPoor	0.625 (0.48)	−26.0 (34.7)	−29.9 (21.4)	−23.9 (18.1)	−140.5 (40.4)	−95.5 (41.6)	−55.7 (49.9)
Large × UltraPoor	0.000 (0.22)	133.4 (12.2)	116.2 (16.4)	−8.3 (90.0)	125.6 (82.2)	174.3 (64.7)	−391.3 (11.4)
LargeGrace × UltraPoor	0.021 (0.20)	95.7 (23.3)	29.2 (71.2)	−16.1 (80.3)	−849.0 (10.9)	−471.4 (11.7)	−643.6 (0.3)
Cattle × UltraPoor	0.018 (0.21)	38.5 (67.2)	20.9 (79.5)	−49.9 (46.0)	−112.2 (82.8)	35.2 (91.2)	−301.8 (22.3)
rd 3	0.340 (0.47)	567.3 (0.0)	559.3 (0.0)	553.0 (0.0)	2124.7 (0.0)	2127.0 (0.0)	2101.4 (0.0)
Large × rd 3	−0.001 (0.21)	91.2 (39.7)	85.2 (42.9)	76.9 (47.0)	195.1 (63.9)	219.7 (59.5)	189.0 (64.6)
LargeGrace × rd 3	−0.001 (0.21)	−128.2 (20.1)	−128.3 (20.1)	−130.9 (18.6)	−532.3 (16.2)	−535.0 (15.8)	−536.0 (15.2)
Cattle × rd 3	0.000 (0.21)	140.8 (14.7)	110.4 (26.0)	102.8 (29.2)	545.9 (20.2)	575.1 (16.9)	549.8 (18.9)
UltraPoor × rd 3	−0.003 (0.23)	−38.3 (43.9)	−10.8 (82.6)	−5.5 (90.9)	−32.0 (88.4)	−100.4 (63.3)	−93.1 (65.5)
Large × UltraPoor × rd 3	0.001 (0.10)	−338.9 (0.7)	−324.4 (1.1)	−317.7 (1.3)	−1252.0 (1.2)	−1368.2 (0.4)	−1378.5 (0.4)
LargeGrace × UltraPoor × rd 3	0.001 (0.10)	−97.5 (44.3)	−75.2 (56.2)	−73.0 (57.5)	−1329.9 (1.0)	−1478.0 (0.3)	−1484.8 (0.3)
Cattle × UltraPoor × rd 3	−0.001 (0.10)	−393.3 (1.2)	−281.5 (6.8)	−265.2 (8.2)	−955.2 (18.3)	−1228.6 (6.9)	−1213.7 (7.4)
rd 4	0.322 (0.47)	672.3 (0.0)	668.5 (0.0)	661.6 (0.0)	2098.1 (0.0)	2118.8 (0.0)	2084.6 (0.0)
Large × rd 4	0.003 (0.21)	89.2 (33.2)	76.2 (39.6)	66.9 (45.1)	−136.1 (67.1)	−46.7 (88.4)	−63.7 (84.3)
LargeGrace × rd 4	0.003 (0.20)	−51.1 (58.7)	−60.5 (51.1)	−65.2 (47.3)	−572.9 (9.4)	−506.9 (13.8)	−497.1 (14.4)
Cattle × rd 4	−0.001 (0.21)	−5.9 (94.1)	−38.0 (63.0)	−53.8 (50.0)	−379.2 (22.4)	−209.9 (49.4)	−260.2 (39.9)
UltraPoor × rd 4	0.005 (0.23)	−76.9 (10.4)	−62.1 (17.1)	−56.2 (19.6)	33.4 (85.2)	−31.7 (85.9)	−9.3 (95.7)
Large × UltraPoor × rd 4	−0.001 (0.10)	−272.2 (6.0)	−238.1 (9.6)	−222.1 (11.3)	−1272.8 (2.1)	−1473.7 (0.4)	−1499.8 (0.4)
LargeGrace × UltraPoor × rd 4	−0.001 (0.10)	−182.5 (20.0)	−140.3 (31.9)	−131.9 (34.6)	−773.0 (15.2)	−1022.9 (4.3)	−1060.1 (4.0)
Cattle × UltraPoor × rd 4	0.001 (0.10)	−369.3 (1.4)	−271.0 (5.8)	−229.5 (8.9)	−452.2 (38.1)	−992.8 (5.1)	−921.1 (6.4)
Flood in round 1	0.480 (0.50)		−39.8 (22.7)	−29.6 (23.9)		25.6 (85.3)	82.4 (32.1)
Head literate0	0.119 (0.32)		−8.0 (79.4)	20.2 (44.2)		157.1 (29.4)	222.4 (2.5)
Household size0	4.403 (1.50)		−223.9 (0.0)	−141.3 (0.0)		1406.8 (0.0)	688.6 (0.0)
PCExpenditure0	2192.380 (632.03)			0.4 (0.0)			
TotalExpenditure0	9221.300 (3107.21)						0.5 (0.0)
mean of dependent variable		2586	2586	2586	10558	10558	10558
$T = 2$		28	28	28	28	28	28
$T = 3$		96	96	96	96	96	96
$T = 4$		1277	1274	1274	1277	1274	1274
$\bar{R}^2$		0.138	0.325	0.421	0.087	0.471	0.602
N	1380	4051	4042	4042	4051	4042	4042

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Large, LargeGrace, Cattle are indicator variables of the large, large grace, and cattle arms, respectively. The default arm category is traditional arm. Consumption is annualised values.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

TABLE F31: ANCOVA ESTIMATION OF SCHOOL ENROLLMENT BY POVERTY STATUS

covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		0.93	0.70	0.76	0.90	0.74	0.86
		(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Secondary	0.338			−0.11	−0.09	−0.11	−0.09
	(0.47)			(0.0)	(0.0)	(0.0)	(0.0)
College	0.172			−0.21	−0.18	−0.19	−0.18
	(0.38)			(0.0)	(0.0)	(0.0)	(0.0)
Upfront	0.776	−0.05	−0.04	−0.05	−0.05	−0.04	−0.05
	(0.42)	(17.7)	(10.8)	(8.2)	(8.6)	(10.5)	(9.4)
WithGrace	0.504	−0.01	−0.01	−0.00	−0.00	−0.00	−0.00
	(0.50)	(81.7)	(76.7)	(98.7)	(92.8)	(91.9)	(91.6)
InKind	0.257	−0.01	−0.01	−0.02	−0.02	−0.02	−0.01
	(0.44)	(81.2)	(75.6)	(47.5)	(64.0)	(54.6)	(68.0)
UltraPoor	0.612	0.04	0.03	0.03	0.03	0.03	0.03
	(0.49)	(10.6)	(22.0)	(21.2)	(22.9)	(21.2)	(20.4)
WithGrace × Secondary	0.171			−0.07	−0.09	−0.06	−0.08
	(0.38)			(9.3)	(5.4)	(11.4)	(5.9)
Upfront × Secondary	0.255			−0.00	0.01	−0.00	0.01
	(0.44)			(99.2)	(84.5)	(97.5)	(88.4)
InKind × Secondary	0.088			0.06	0.07	0.06	0.08
	(0.28)			(14.5)	(11.8)	(13.2)	(9.1)
WithGrace × College	0.084			−0.05	−0.07	−0.05	−0.08
	(0.28)			(41.1)	(26.0)	(37.0)	(18.0)
Upfront × College	0.134			0.01	0.03	0.02	0.05
	(0.34)			(80.2)	(68.4)	(69.4)	(46.2)
InKind × College	0.035			−0.09	−0.10	−0.05	−0.06
	(0.18)			(23.0)	(18.3)	(40.2)	(38.8)
Upfront × UltraPoor	0.514	−0.04	−0.02	−0.01	0.00	−0.01	−0.00
	(0.50)	(69.1)	(78.1)	(91.1)	(99.2)	(89.1)	(97.8)
WithGrace × UltraPoor	0.350	−0.02	0.00	0.00	0.02	−0.01	0.01
	(0.48)	(79.2)	(97.6)	(96.9)	(74.1)	(94.1)	(84.9)
InKind × UltraPoor	0.186	0.01	0.03	0.01	−0.02	0.03	0.01
	(0.39)	(80.0)	(58.3)	(77.4)	(72.4)	(52.8)	(85.2)
Secondary × UltraPoor	0.215	−0.02	−0.04	−0.03	−0.03	−0.03	−0.03
	(0.41)	(59.5)	(30.4)	(36.1)	(40.6)	(32.4)	(35.5)
College × UltraPoor	0.103	0.09	0.04	0.04	0.05	0.06	0.05
	(0.30)	(19.8)	(48.4)	(40.1)	(39.5)	(25.6)	(32.4)
Female	0.450					0.05	0.05
	(0.50)					(2.7)	(4.9)
Secondary × Female	0.152					0.08	0.08
	(0.36)					(0.6)	(1.3)
College × Female	0.059					0.12	0.11
	(0.24)					(1.3)	(4.4)
Female × UltraPoor	0.276					0.07	0.07
	(0.45)					(7.3)	(7.2)
WithGrace × Female	0.228					0.07	0.03
	(0.42)					(24.9)	(61.9)
Upfront × Female	0.349					−0.00	0.02
	(0.48)					(96.2)	(74.8)
InKind × Female	0.114					−0.02	0.01
	(0.32)					(76.0)	(87.5)
WithGrace × Secondary × Female	0.074					0.19	0.23
	(0.26)					(0.6)	(0.1)
Upfront × Secondary × Female	0.115					−0.10	−0.12
	(0.32)					(27.1)	(17.4)
InKind × Secondary × Female	0.037					−0.04	−0.04
	(0.19)					(61.7)	(57.6)
WithGrace × College × Female	0.028					−0.09	−0.08
	(0.17)					(46.5)	(57.4)
Upfront × College × Female	0.044					0.06	0.09
	(0.21)					(63.9)	(53.4)
InKind × College × Female	0.010					0.22	0.18
	(0.10)					(12.7)	(26.6)
EldestSon	0.267				0.00		0.04
	(0.44)				(94.0)		(31.0)
EldestDaughter	0.188				0.04		0.01
	(0.39)				(22.2)		(70.9)
Flood in round 1	0.464				−0.04		−0.05
	(0.50)				(4.4)		(2.5)
Head literate0	0.108				0.06		0.05
	(0.31)				(2.3)		(2.9)
Head age0	39.153				−0.00		−0.00
	(7.38)				(10.6)		(11.2)
Enrolled0	0.760		0.29	0.32	0.29	0.31	0.29
	(0.43)		(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
ChildAgeOrderAtRd1	1.826				0.02		0.02
	(0.98)				(22.9)		(27.4)
Household size0	4.974				−0.02		−0.01
	(1.15)				(19.7)		(36.0)
mean of dependent variable		0.88	0.88	0.88	0.88	0.88	0.88
$T = 2$		89	89	89	75	89	75
$T = 3$		135	135	135	126	135	126
$T = 4$		539	539	539	500	539	500
$\bar{R}^2$		0.008	0.151	0.209	0.201	0.225	0.212
N	1841	1976	1976	1976	1841	1976	1841

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Large, LargeGrace, Cattle

Table F32: ANCOVA estimation of school enrollment by time by poverty class

Table F32: ANCOVA estimation of school enrollment by time (continued)

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Large, LargeGrace, Cattle are indicator variables of the large, large grace, and cattle arms, respectively. The default arm category is traditional arm. Secondary and College are indicator variables of secondary schooling (ages 13-15) and tertiary schooling (ages 16-18), both at the time of baseline. Default category is primary (ages 05-12). rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Interaction terms of dummy variables are demeaned before interacting. The first column gives mean and standard deviation (in parenthesises) of each covariates before demeaning.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

Table F33: ANCOVA estimation of school enrollment by time (continued 2)

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Large, LargeGrace, Cattle are indicator variables of the large, large grace, and cattle arms, respectively. The default arm category is traditional arm. Secondary and College are indicator variables of secondary schooling (ages 13-15) and tertiary schooling (ages 16-18), both at the time of baseline. Default category is primary (ages 05-12). rd2, rd3, rd4 are dummy variables for second, third, and fourth round of survey. Interaction terms of dummy variables are demeaned before interacting. The first column gives mean and standard deviation (in parenthesises) of each covariates before demeaning.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

Table F34: ANCOVA estimation of consumption by poverty class

		Per capita consumption (Tk)			Total consumption (Tk)		
covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		2766.8 (0.0)	2089.0 (0.0)	3281.5 (0.0)	11087.4 (0.0)	5509.4 (0.0)	3615.0 (0.0)
Upfront	0.778 (0.42)	53.1 (42.9)	66.1 (28.7)	102.0 (10.5)	623.7 (19.8)	448.8 (15.7)	314.7 (22.8)
WithGrace	0.505 (0.50)	−27.5 (70.5)	−60.2 (35.9)	−70.5 (25.3)	−290.3 (58.8)	−455.6 (17.3)	−229.7 (42.5)
InKind	0.261 (0.44)	42.7 (51.6)	73.4 (20.1)	16.6 (76.8)	−277.8 (56.2)	271.0 (38.2)	61.7 (82.3)
UltraPoor	0.633 (0.48)	−29.9 (49.7)	−20.0 (62.8)	−12.8 (69.5)	−193.7 (45.0)	−98.0 (60.9)	−86.4 (63.2)
Upfront × UltraPoor	0.030 (0.21)	56.4 (67.7)	−35.6 (77.8)	25.5 (81.8)	−305.3 (66.4)	−1005.3 (2.9)	−569.7 (27.1)
WithGrace × UltraPoor	0.032 (0.24)	26.2 (81.3)	71.6 (49.4)	−4.9 (96.0)	−859.1 (20.0)	−219.6 (68.6)	−290.0 (58.6)
InKind × UltraPoor	0.013 (0.21)	−172.2 (13.9)	−196.1 (7.6)	−129.5 (12.0)	470.8 (51.1)	281.7 (63.0)	474.6 (32.0)
Flood in round 1	0.489 (0.50)			−48.3 (22.8)			12.8 (94.0)
Head literate0	0.117 (0.32)			115.0 (2.1)			543.6 (2.9)
PCExpenditure0	2212.703 (653.86)		0.3 (0.0)	0.1 (0.2)			
Household size0	4.354 (1.47)			−189.0 (0.0)			1170.9 (0.0)
TotalExpenditure0	9208.982 (3172.47)					0.6 (0.0)	0.3 (0.0)
mean of dependent variable		2787	2787	2787	11201	11201	11201
$T = 2$		50	50	50	50	50	50
$T = 3$		668	668	665	668	668	665
$\bar{R}^2$		−0.002	0.068	0.2	0.005	0.33	0.484
N	77	1386	1386	1380	1386	1386	1380

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). UltraPoor is an indicator variable if the household is classified as the ultra poor. Upfront is an indicator variable of the arm with an upfront large disbursement, WithGrace is an indicator variable of the arm with a grace period, InKind is an indicator variable of the arm which lends a heifer. Consumption is annualised values.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

Table F35: ANCOVA estimation of household labour incomes by poverty class

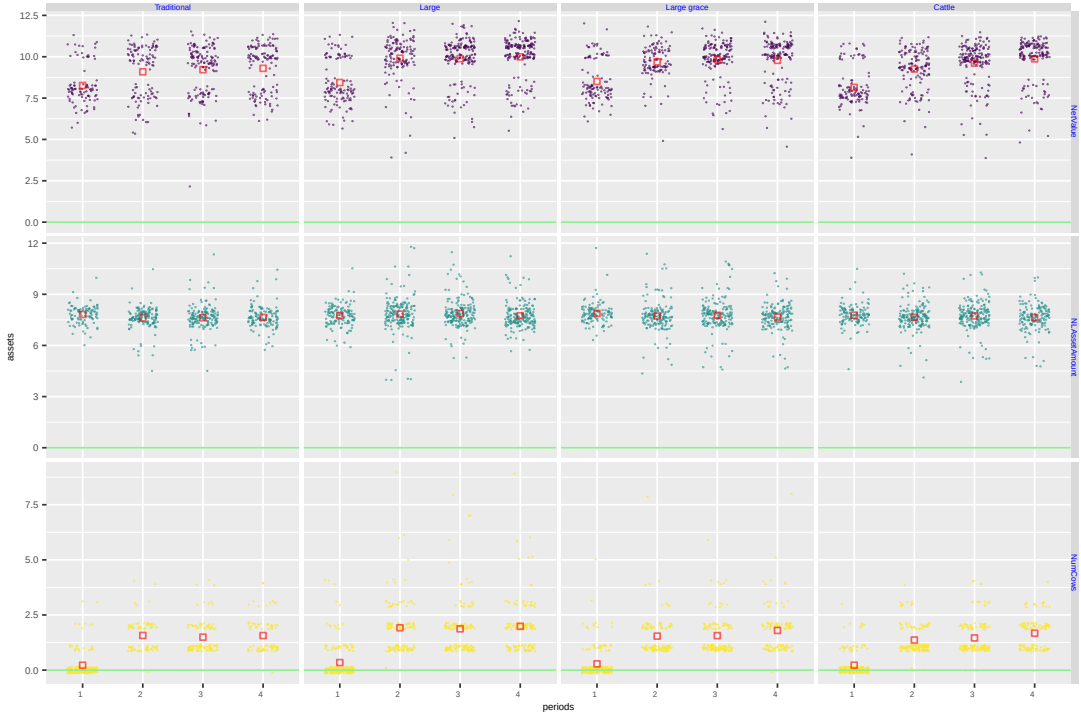
covariates	mean/std	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)		−8816.85	−7430.78	−62547.07	−62677.75	−62495.27	−62763.21
		(11.6)	(18.0)	(0.0)	(0.0)	(0.0)	(0.0)
Large	0.278	57.86	−423.32	−4123.79	−3650.26	−3671.96	−3644.75
	(0.45)	(99.4)	(95.3)	(52.0)	(57.1)	(56.8)	(57.2)
LargeGrace	0.248	−1640.12	−6062.81	−5711.80	−5623.68	−5680.42	−5618.50
	(0.43)	(83.4)	(39.3)	(28.6)	(27.4)	(28.2)	(27.5)
Cattle	0.254	−2639.37	−3736.48	−3779.51	−3437.02	−3936.97	−3470.55
	(0.44)	(72.4)	(60.2)	(52.0)	(55.7)	(50.8)	(55.3)
HadCattle	0.182				−6243.86		−4304.91
	(0.39)				(4.3)		(46.2)
rd 3	0.343	12756.19	12656.12	12527.04	12455.94	12511.17	12453.48
	(0.47)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Large × rd 3	0.094	−5829.95	−5631.78	−3203.30	−3356.01	−3365.26	−3349.47
	(0.29)	(35.6)	(36.7)	(57.7)	(56.7)	(55.8)	(56.8)
LargeGrace × rd 3	0.085	936.02	238.98	2477.92	2021.13	2397.09	2021.63
	(0.28)	(88.8)	(97.1)	(67.3)	(72.8)	(68.2)	(72.8)
Cattle × rd 3	0.086	−8803.54	−8036.22	−4730.16	−4955.94	−4659.65	−4955.97
	(0.28)	(27.0)	(29.7)	(49.8)	(47.6)	(50.2)	(47.6)
rd 4	0.326	23425.62	23178.45	23358.08	23196.86	23281.62	23187.90
	(0.47)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Large × rd 4	0.095	10206.37	10316.22	12236.73	12423.59	12155.38	12455.76
	(0.29)	(43.8)	(43.3)	(34.5)	(34.8)	(34.6)	(34.6)
LargeGrace × rd 4	0.082	−32.79	−995.65	1417.26	944.34	1313.79	951.48
	(0.27)	(99.7)	(89.4)	(83.7)	(88.9)	(84.8)	(88.8)
Cattle × rd 4	0.081	−6838.00	−6698.93	−2219.15	−3239.63	−2454.82	−3267.38
	(0.27)	(49.5)	(50.2)	(81.2)	(71.8)	(79.3)	(71.6)
HadCattle	0.182				−6243.86		−4304.91
	(0.39)				(4.3)		(46.2)
HadCattle × Large	0.062				7668.70		7737.34
	(0.24)				(36.6)		(36.3)
HadCattle × LargeGrace	0.041				2053.10		2088.17
	(0.20)				(80.2)		(80.0)
HadCattle × Cattle	0.042				15462.97		15316.35
	(0.20)				(11.1)		(11.4)
HadCattle × rd 3	0.063				−2822.82		−2835.09
	(0.24)				(51.5)		(51.4)
HadCattle × Large × rd 3	0.020				−4048.82		−4027.17
	(0.14)				(80.4)		(80.7)
HadCattle × LargeGrace × rd 3	0.014				−11496.21		−11499.33
	(0.12)				(50.3)		(50.5)
HadCattle × Cattle × rd 3	0.016				−2998.49		−3021.18
	(0.12)				(85.9)		(85.8)
HadCattle × rd 4	0.058				−12206.87		−12251.58
	(0.23)				(5.0)		(4.9)
HadCattle × Large × rd 4	0.021				−17854.54		−17704.72
	(0.14)				(35.9)		(36.1)
HadCattle × LargeGrace × rd 4	0.013				−8432.04		−8411.57
	(0.11)				(51.9)		(51.9)
HadCattle × Cattle × rd 4	0.012				−21790.20		−21969.19
	(0.11)				(20.4)		(20.5)
Flood in round 1	0.488			6929.81	6851.29	6972.80	6875.29
	(0.50)			(15.4)	(16.1)	(15.3)	(15.9)
Head literate0	0.113			−6779.24	−6184.79	−6024.13	−6167.96
	(0.32)			(21.3)	(22.4)	(26.2)	(22.6)
TotalHHLabourIncome0	2397.862		0.11	0.09	0.09	0.09	0.09
	(172385.37)		(0.0)	(0.0)	(0.0)	(0.0)	(0.0)
Household size0	4.405			12181.57	12408.28	12439.85	12426.66
	(1.53)			(0.0)	(0.0)	(0.0)	(0.0)
Number of cattle0	0.250					−5434.02	−1421.91
	(0.60)					(2.5)	(71.4)
mean of dependent variable		2233	2233	2233	2233	2233	2233
R^2		0.013	0.065	0.119	0.119	0.121	0.118
N	2557	2566	2566	2557	2557	2557	2557

Source: Estimated with GUK administrative and survey data.

Notes: 1. ANCOVA estimates using administrative and survey data. Post treatment regressands are regressed on categorical variables, pre-treatment regressand and other covariates. FloodInRd1 and HeadLiterate0 are indicator variables for the presence of self reported damage by a flood at the baseline, and literacy of household head, respectively. HHsize0 is household size at the baseline. We annotate the number of periods that a household is observed with T. The total number of households is shown for each values of T. T=4 indicates the number of households with complete panel information, T=3 indicates number of households observed three times, T=2 indicates the number of households observed twice. N indicates total number of observations used in ANCOVA estimation, or N=1×(T=2)+2×(T=3)+3×(T=4). Large, LargeGrace, Cattle are indicator variables of the large, large grace, and cattle arms, respectively. The default arm category is traditional arm. Labour incomes are in 1000 Tk units and are a sum of all earned labour incomes of household members. Farm revenues are in 1000 Tk units and are a total of agricultural produce sales.

2. *P* values in percentages in parenthesises. Standard errors are clustered at group (village) level.

FIGURE F4: ASSETS BY PERIOD



Source: Tabulated with survey data.

Note: Red squares are means of respective data. Asset values are expressed in BDT. Net assets=total assets - debts. Debts include outstanding loaned amount of the experiment. Total assets use items observed in all 4 rounds of household surveys. Net non livestock assets=net assets-livestock asset values. Number of cattle is a headcount of cattle holding. All net assets are in logarithms, number of cattle is in natural numbers.