

?

Estimating lending impacts using original 1600 households

February 22, 2019

19:27

Seiro Ito

Contents

I	Summary	2
I.1	Definitions	2
I.2	Inference	2
I.3	Findings	2
II	Read files	4
II.1	Read from a list	4
II.2	Sample selection and treatment assignment	5
II.2.1	Merge admin and roster files	5
II.2.2	Merge village level info	6
II.3	Merge admin-roster with other files	7
II.3.1	Choosing sample in admin-roster	7
II.3.2	Attach variables from admin-roster to other files	9
III	Descriptive statistics of original 1600 HHs	13
IV	Estimation using original 1600 HHs	15
IV.1	Repayment and net saving	15
IV.2	Schooling	22
IV.3	Assets	29
IV.4	Livestock	34
IV.5	Assets+Livestock	42
IV.6	Incomes	46
IV.7	Consumption	49
IV.8	IGA	52

I Summary

I.1 Definitions

Traditional A cash loan of Tk. 560 with one year maturity.

Large A cash loan of Tk. 16800 with three year maturity.

Large Grace A cash loan of Tk. 16800 with a one year grace period and three year maturity.

Cow An in-kind loan of a cow worth Tk. 16800 with a one year grace period and three year maturity.

LargeSize An indicator variable takes the value of 1 if the arm is Large, Large Grace, or Cow.

WithGrace An indicator variable takes the value of 1 if the arm is Large Grace or Cow.

InKind Same as Cow.

When one uses covariates Large, Large Grace, Cow in estimation, their estimates represent each arm's characteristics relative to Traditional. When one uses covariates LargeSize, WithGrace, InKind, their estimates represent their labeled names.

I.2 Inference

- First-difference estimators are used. This can be seen as an extension of DID to multi-periods (although historically the latter precedes the former). FD is used also for a binary indicator such as schooling.
- All the standard errors are clustered at the group (char) level.
- To aid the understanding if the data is more suited to the assumption of first-difference rather than fixed-effects, I used a check suggested by ?, 10.71. It is an AR(1) regression of FD residuals. Most of results show low autocorrelations which is consistent with the assumption of FD estimator. The use of cluster-robust standard errors gives consistent estimates of SEs, so it boils down to efficiency.
- I rely more on the formulation using LargeSize, WithGrace, InKind than Large, LargeGrace, Cow due to an ease in interpretation. Numerically, both are equivalent.
- A caution on reading the estimates: All are estimates on increments. If LargeSize has an estimate of 10, then it is a 10 unit larger change than the baseline (traditional). If the interaction of LargeSize with rd 2-3 is 10, then it is a 10 unit larger change than rd 2-3 change of baseline. If the estimated value of intercept is 10 and rd 2-3 is 10, then rd 2-3 change is 20 for baseline, 30 for LargeSize.

I.3 Findings

Overall, the intervention reveals that larger sized loans accerelate the timing of becoming an owner of large livestock without adversely affecting the repayments. This applies to both the ultra poor and the moderately poor. A loan amount seems to have convex returns at a low level of assets. Higher growths come at a cost of slower school progression of older girls and smaller increases in consumption for arms with a grace period, so the welfare implication is mixed. In addition, given that the number of cows per owner remains the similar after 2 years, it does not provide evidence for

accelerated growth of livestock after becoming an owner in this short window. Another note is that the loan repayment was poor for unknown reasons so, in the hindsight, the risks required a higher margin for this type of lending to the target population, which could have reduced participation.

Net saving and repayments Sample uses all administrative records available. Smaller net saving for traditional arm. Period of rd 2-3 saw a decline in net saving, even further for LargeGrace, Cow, but remain just about zero, then become negative in rd 3-4. Repayment is greater for Large, LargeGrace, Cow in rd 2-3 but they become statistically the same with Traditional in rd 3-4 (TABLE 4). TABLE 5 reveals LargeSize have larger net saving while both WithGrace and NonCash have smaller. Repayment is larger with LargeSize but smaller with WithGrace and NonCash in (3). (4) shows rd 2-3 have larger repayment for WithGrace, which is by design. Repayment is positively autocorrelated and is negatively correlated with previous net saving. The ultra poor repaid just as much as the moderately poor, or even more (TABLE 6). This is evidence against the popular belief that the ultra poor are riskier.

Flow net saving and repayments Sample uses all administrative records available. Net saving decreased steadily for all arms, and larger decrease for LargeGrace, Cow arms. There are no statistically noticeable increases in net saving in all rounds as observed in (2). Repayment increased in round 2 for LargeGrace, Cow which is by design. All arms increased the repayment throughout in 4 (TABLE 7). TABLE 8 reveals WithGrace have repayment increases in rd 2, which then declined in rd 4. The ultra poor's repayment changes are not different from the moderately poor except in rd 1 and 4 (TABLE 6). This is changes in repayment which does not inform about repayment total or debt outstanding. This needs to be contrasted against the result that the repayment rate is higher with the ultra poor, so slower repayment change is a result of larger repayment at the beginning. This is evidence against the popular belief that the ultra poor are riskier.

Schooling Enrollment changes are larger for primary school girls in Large and Cow arms for primary but smaller for junior in rd 1 vs rd 4 comparisons (TABLE 13). When seen by attributes in TABLE 14, LargeSize shows smaller changes especially for primary school boys. Primary school girls in LargeSize and NonCash show larger changes, while junior and high school girls in LargeSize show smaller changes than boys. This indicates that large sized arms have detrimental impacts on older girls' schooling but promotional impacts on primary school aged girls. No decline in enrollment changes when repaying for the arms of WithGrace, despite the larger installments.

Assets Household assets increased in all arms. Initially increased then decreased. There might have been liquidation of assets to repay the loans. Productive assets declined consecutively. Flood in rd 1 makes the increase in household assets smaller. Productive assets see a major decline among Large during rd 3-4 period (TABLE 15). Comparison by attributes (TABLE 16) or of rd 2 and rd 4 gives the same picture (TABLE 18). Comparison against the loan non-recipients shows that they also experience a similar, increase-increase-decrease pattern. This indicates that the pattern observed among the loan recipients may be a systemic pattern of the area, not necessarily reflecting the repayment burden (TABLE 19).


Livestock Larger increases in holding values in rd 1-2, smaller increases in rd 2-3, no change in rd 3-4. Previous cow owners show a smaller increase in rd 1-2 while not rd 3-4 or rd 2-3 in the Cow arm (TABLE 20). Figures show that cow ownership increased for all arms but the traditional arm. TABLE 21 shows baseline trend is a large increase in rd 1-2, a small increase in rd 2-3, a small decline in rd 3-4, while LargeSize sees an even larger increase in rd 1-2 and similar trend as baseline afterwards. This shows that member who received a larger sized disbursement could hold on to its level of livestock accumulation. TABLE 22 shows, albeit at p values around 10%, the ultra poor has a larger increase relative to the moderately poor, which



is another manifestation against the popular notion that the ultra poor are riskier.

Total asset values Similar results as assets.

Labour incomes Small sample. Increased during rd 2-3 in all arms (TABLE 27).

Consumption Increased during rd 2-3 in all arms, a decrease in rd 3-4 (TABLE 30). Another notable result is that Non^{sh} reduced the consumption in rd 3-4 even further than the baseline loan (TABLE 31). 

IGAs Multiple IGAs for Traditional arm. Everyone else chose to invest in cows, suggesting entrepreneurship does not seem to matter in the uptake of loans. It is consistent with the presence of a poverty trap induced by a liquidity constraint and convexity in livestock production technology.

One sees changes in investment choices when one compares traditional and all other arms. However, consumption does not seem to differ. Repayments and asset holding are greater in all other arms. These are consistent with households enforcing the repayment disciplines and reinvesting the proceeds rather than increasing consumption.

[From the previous memo] A more detailed summary:

Low repayment rates Repayment was poor. Net saving was forfeit for repayment. Mean raw loan recovery rate (counting only repayments) measured at the end of third year was 0.67 overall, and was lowest for traditional at 0.48. Counting also net saving, these numbers change to 0.85, 0.59, respectively.

Large-sized or grace period loans resulted in higher repayment rates Controlling for the loan size, larger initial lending resulted in larger repayment and net saving. As opposed to GUK's anxiety, lending was relatively less risky with large loans and loans with a grace period.

No difference in repayment risk by poverty status Raw loan recovery rates are 0.67, 0.67, respectively, for ultra poor and moderately poor. Also no statistically meaningful difference is found for cumulative repayment plus cumulative net saving.

No difference in household assets Household assets increased in rd 1 - 3, then reduced in rd 4 (possibly liquidating for repayment purpose), with the overall impact of increased household asset values yet no statistically significant difference between arms.

No difference in labour incomes, per member consumption, marriage rates Per member consumption increased in all arms with no difference between arms. Marriage rates do not differ between arms. A greater swing in labour incomes for large.

II Read files

II.1 Read from a list

In reading raw files, I added ID information (./ID/ID_Updated_received_from_Abu.dta) to all pages. I further added HH ID information from the admin file.

Description of data:

- ad Administrative data: Up to [-24, 48] months after first loan disbursement. This file has not been used in read_cleaned_data.rnw.
- ros roster to condition the initial status prior to participation.
- sch Schooling panel with attrition. Aged 6-18 in rd1. Enrolled={0,1} is defined for children aged

6-18 in rd1 by referencing to currently_enrolled and age information.

- ass Assets. Household assets (houses, durables) and productive assets (machines, tools).
- lvo Livestock holding.
- lab Labour incomes.
- far Farming revenues (no costs reported).
- con Household consumption. Food expenditure asks both bought and consumed volumes and prices. We impute consumption values by using median prices. All quantity is set to annualised quantity.
- shk Shocks. Merged with all other files.

II.2 Sample selection and treatment assignment

II.2.1 Merge admin and roster files

How I combined between pages: First, merge time-invariant portion of admin data with roster data ros with hhid as a key. Then it is merged with time-variant portion of admin data using hhid, Year, Month as keys. Second, merge the resulting file with other data sch, ass, ...

By merging in this way, I get arm information for each HH in survey 1 with some NAs. I fill in NAs by using village level information.

traditional	large	large	grace	cow	<NA>
485	464		467	487	220

1	2	3	4
14943	30119	24364	26526

Warning in `[.data.table`(arAll, is.na(groupid), `:=`(groupid, group.id)): Coerced double

There are 26 members (oldMember in Mstatus), 20 members (newGroup in Mstatus), 162 members (iReplacement in Mstatus) who did not borrow but only saved.

survey	DisDate1	creditstatus	Mstatus
Min. :1	Min. :NA	Yes : 0	gErosion : 80
1st Qu.:1	1st Qu.:NA	No :208	gRejection :140
Median :1	Median :NA	Replaced Member: 0	iRejection :159
Mean :1	Mean :NA	NA's :220	iReplacement: 3
3rd Qu.:1	3rd Qu.:NA		newGroup : 20
Max. :1	Max. :NA		oldMember : 26
	NA's :428		

Create BorrowerStatus to indicate these guys as a pure saver. Set No in creditstatus if NA in DisDate1.

survey	DisDate1	creditstatus	Mstatus
Min. :1	Min. :NA	Yes : 0	gErosion : 80
1st Qu.:1	1st Qu.:NA	No :428	gRejection :140
Median :1	Median :NA	Replaced Member: 0	iRejection :159
Mean :1	Mean :NA		iReplacement: 3
3rd Qu.:1	3rd Qu.:NA		newGroup : 20
Max. :1	Max. :NA		oldMember : 26
	NA's :428		
BorrowerStatus			
borrower			:379

Need to merge in 2 steps: Merge admin (time-invariant) with roster with hhid as a key, then merge to admin (time-variant [e.g., OtherRepaid, OtherNetSaving, OtherMisses, CumOtherMisses, CumRepaid, CumEffectiveRepayment, CumNetSaving, CumPlannedInstallment, CumOtherRepaid, CumOtherNetSaving, CumMisses, CumRepaidRate, CumEffectiveRepaidRate, RMOtherNetSaving, RMOtherRepaid]) with hhid, Year, Month as keys. This is because there are 8398 non-matching cases if we merge using Year, Month of IntDate in roster data and Year, Month of Date in admin data. This is inevitable because survey precedes the first meeting of borrowers: The admin data starts from 2013-05-01 while survey data starts from 2011-10-09 and rd 1 ends at 2013-10-12 for oldMembers with the median date 2012-10-20. Below gives Year, Month in roster data in rd 1 with no match in admin data.

2011-October	2011-November	2012-January	2012-October	2012-November
6	1	19	1146	327
2012-December	2013-September	2013-October	2014-January	2014-October
79	6	19	12	83
2014-November	2014-December	2015-November	2015-December	2016-January
43	36	111	40	26
2017-January	2017-February	2017-March	2017-April	NA-NA
44	97	17	17	21

After 2014, it is mostly drop out members who do not match with admin data because they do not attend the meeting.

```
table0(ar00[is.na(MonthsElapsed) & MemNum == 1 & Year ≥ 2014,
Mgroup])
```

continued	drop outs	new group replacements
78	381	58
		9

No additional match if matching only with Year.

	FALSE	TRUE
YearMonthMatch	2055	5958
YearMatch	2055	5958

In roster + admin (base: roster): Tabulate hhid observations by survey round and RArm before supplementing with AssignOriginal and VArm. Note: 220 observations with NA are also pointed in read_cleaned_data.rnw and are going to be dealt with in the next subsection.

	RArm					
survey	traditional	large	large	grace	cow	<NA>
1	485	464		467	487	220
2	472	445		447	446	173
3	472	448		452	453	168
4	465	444		447	444	114

II.2.2 Merge village level info

I use arm VArm from village level information. Tabulation of AssignOriginal against VArm shows complementarity so I can use one variable to fill in NAs in another.

	VArm					
AssignOriginal	traditional	large	large	grace	cow	<NA>
traditional		1244	0	0	0	650
large		0	1423	0	0	378
large grace		0	0	1437	0	376

cow	0	0	0	1631	199
<NA>	418	158	40	59	0

Tabulation of RArm after supplementing with AssignOriginal and VArm.

```
ar[is.na(RArm) & !is.na(AssignOriginal), RArm := AssignOriginal]
ar[is.na(RArm) & !is.na(VArm), RArm := VArm]
```

	RArm				
survey	traditional	large	large	grace	cow
1	605	504		507	507
2	585	485		447	466
3	582	487		452	472
4	540	483		447	444

Below is what is supplemented from VArm of village level information to the 220 NAs.

	RArm				
BorrowerStatus	traditional	large	large	grace	cow
borrower		0	0	0	0
pure saver		0	0	0	0
quit membership		120	40	40	20

II.3 Merge admin-roster with other files

II.3.1 Choosing sample in admin-roster

Tabulation of RArm when dropping twice, double in traditional arm.

	traditional	large	large	grace	cow	total
1	441	504		507	507	1959
2	319	485		447	466	1717
3	316	487		452	472	1727
4	278	483		447	444	1652

Tabulation of RArm when dropping twice in traditional arm. This may make most sense but a large attrition between rd 1 and 2.

	traditional	large	large	grace	cow	total
1	505	504		507	507	2023
2	430	485		447	466	1828
3	426	487		452	472	1837
4	388	483		447	444	1762

Tabulation of RArm when dropping dirbursement after 2015-01-01. This has less attrition but includes heterogenous treatment among traditional.

	traditional	large	large	grace	cow	total
1	328	385		359	328	1400
2	323	371		350	316	1360
3	323	372		349	318	1362
4	321	370		345	312	1348

In roster + admin 1: Tabulate observations after keeping only observations used in estimation: Keep if Mstatus includes strings old, iRej, gEro, gRej, & DisDate1 is before 2015-01-01, & TradGroup does not include strings tw.

	traditional	large	large	grace	cow	total
1	170	296		278	248	992
2	137	285		270	240	932
3	137	286		270	239	932
4	136	284		266	235	921

In roster + admin 2: Keep if Mstatus includes strings old, iRej, gEro, gRej, & TradGroup does not include strings tw (relaxing DisDate1 is before 2015-01-01). [This the data used in this note.](#) This also shows a lower attrition rate for large arm.

	traditional	large	large	grace	cow	total
1	400	400		400	400	1600
2	327	384		342	366	1419
3	324	386		348	366	1424
4	287	382		343	342	1354

Create o1600 to indicate the original 1600 HHs. Tabulation of total observations in roster by o1600 and survey.

	survey			
o1600	1	2	3	4
0	2101	2510	2543	2457
1	6532	5817	5843	5420

Tabulation of total observations in roster by o1600 and survey after restring to 1 obs per HH.

	survey			
o1600	1	2	3	4
0	523	611	616	607
1	1600	1372	1377	1307

Tabulate observations without disbursement date info. Note: iRejection are borrower in BorrowerStatus. (Did they remain as a member? Maybe we need to change to quit membership or pure saver.)

	survey	DisDate1	creditstatus	Mstatus
Min.	:1	Min. :NA	Yes	: 0
1st Qu.:	:1	1st Qu. :NA	No	:428
Median	:1	Median :NA	Replaced Member:	0
Mean	:1	Mean :NA		
3rd Qu.:	:1	3rd Qu. :NA		
Max.	:1	Max. :NA		
		NA's :428		
		BorrowerStatus		
borrower		:159		
pure saver		: 49		
quit membership:		220		

These are people who rejected loans. Add RejectedLoans to FirstDisPeriod.

	survey	DisDate1	FirstDisPeriod
Min.	:1	Min. :2013-05-01 00:00:00	BeforeJan2015:1400
1st Qu.:	:1	1st Qu. :2013-07-01 00:00:00	Year2015 : 295
Median	:1	Median :2013-11-01 00:00:00	Year2016 : 0
Mean	:1	Mean :2014-03-23 17:07:57	AfterJan2017 : 0
3rd Qu.:	:1	3rd Qu. :2014-12-01 00:00:00	RejectedLoans: 428
Max.	:1	Max. :2015-12-01 00:00:00	
		NA's :428	
		creditstatus	Mstatus
Yes		:1695	gErosion : 80
No		: 428	gRejection : 140
Replaced Member:		0	iRejection : 160
			iReplacement: 115
			newGroup : 408
			oldMember :1220
			BorrowerStatus
			borrower :1854
			pure saver : 49
			quit membership: 220

There are 114 cases of group rejections in GroupStatus classified as individual rejections in Mstatus. Overwrite Mstatus with GroupStatus in these cases.

Mstatus	GroupStatus			
	accepted	erosion	group	rejection
gErosion	0	189		0
gRejection	0	0		486
iRejection	543	0		0
iReplacement	445	0		0
newGroup	1603	0		0
oldMember	4747	0		0

	traditional	large	large	grace	cow	total
accepted	1894	1801		1813	1830	7338
erosion	110	0		20	59	189
group rejection	308	158		20	0	486

As one can see below, gRejection is more frequent in traditional and large, while there is none in cow. traditional, cow have more frequent iRejection. So traditional was disliked both at group and individual levels, large was disliked as a group, cow was disliked at an individual level, and large grace were well received at both group and individual levels. This indicates attractiveness of a grace period at least at the group level, and a large cash form (over small cash or in-kind) at the individual level.

Mstatus	RArm				
	traditional	large	large	grace	cow
gErosion	40	0		20	20
gRejection	80	40		20	0
iRejection	54	12		22	72
iReplacement	39	8		11	57
newGroup	166	96		96	50
oldMember	226	348		338	308

	traditional	large	large	grace	cow
gErosion	0.07	0.00		0.03	0.04
gRejection	0.16	0.08		0.04	0.00
iRejection	0.11	0.02		0.04	0.12
iReplacement	0.08	0.02		0.02	0.11
newGroup	0.27	0.19		0.16	0.10
oldMember	0.45	0.69		0.67	0.61
total	1.14	1.00		0.96	0.98

Save roster-admin data.

```
saveRDS(ar, paste0(pathsaveOriginal1600, "RosterAdminData.rds"))
saveRDS(arA, paste0(pathsaveOriginal1600, "AllMeetingsRosterAdminData.rds"))
fwrite(ar, paste0(pathsaveOriginal1600, "RosterAdminData.prn"), sep = "\t", quote = F)
fwrite(arA, paste0(pathsaveOriginal1600, "AllMeetingsRosterAdminData.prn"), sep = "\t", quote = F)
```

II.3.2 Attach variables from admin-roster to other files

Attach RArm, Arm, TradGroup, Mem, ObPattern, AttritIn, o1600, Mstatus, BorrowerStatus, creditstatus, povertystatus, RMvalue.repay, RMvalue.NetSaving, RMOtherNetSaving, RMOtherRepaid, HHsize, HeadLiteracy, IntDate, DisDate1 from ar.

```
vartoattach <- c("RArm", "Arm", "TradGroup", "Mem",
  "ObPattern", "AttritIn", "o1600", "Mstatus", "BorrowerStatus",
  "creditstatus", "povertystatus", "RMvalue.repay",
  "RMvalue.NetSaving", "RMOtherNetSaving", "RMOtherRepaid",
  "HHsize", "HeadLiteracy", "IntDate", "DisDate1")
dfiles <- c("ass", "s1", "lvo", "lab", "far", "con", "shk")
```

```

for (j in 1:length(dfiles)) {
  dd ← get(dfiles[j])
  dd[, groupid := as.integer(as.numeric(as.character(gid)))]
  dd[, gid := NULL]
  dd[, Year := as.numeric(format(as.Date(IntDate), "%Y"))]
  dd[, Month := as.character(format(as.Date(IntDate), "%B"))]
  dd[Year ≤ 2010, Year := Year + 10]
  # drop all variables in each page before copying from ar0
  dd[, (varstoattach) := NULL]
  setorder(dd, groupid, hhid, survey, Year, Month)
  setkey(dd, groupid, hhid, survey)
  if (j < length(dfiles)) dd ← ar0[dd]
  assign(dfiles[j], dd)
}

```

Check number of HHs in assets by o1600:

```
table(ass[, .(creditstatus, survey, o1600)])
```

```

, , o1600 = 0

      survey
creditstatus  1    2    3    4
Yes          478  588  593  586
No           23   23   23   21
Replaced Member  0    0    0    0

, , o1600 = 1

      survey
creditstatus  1    2    3    4
Yes         1192 1047 1054 1039
No           403  323  323  268
Replaced Member  0    0    0    0

```

```
#table0(ass[o1600 == 0L, .(creditstatus, survey)])
```

Save all data.

```

fwrite(s1, paste0(pathsaveOriginal1600, "RosterAdminSchoolingData.prn"), sep = "\t", quote = F)
fwrite(ass, paste0(pathsaveOriginal1600, "AssetAdminData.prn"), sep = "\t", quote = F)
fwrite(lvo, paste0(pathsaveOriginal1600, "LivestockAdminData.prn"), sep = "\t", quote = F)
fwrite(lab, paste0(pathsaveOriginal1600, "LabourIncomeAdminData.prn"), sep = "\t", quote = F)
fwrite(far, paste0(pathsaveOriginal1600, "FarmRevenueAdminData.prn"), sep = "\t", quote = F)
fwrite(con, paste0(pathsaveOriginal1600, "ConsumptionAdminData.prn"), sep = "\t", quote = F)
fwrite(shk, paste0(pathsaveOriginal1600, "Shocks.prn"), sep = "\t", quote = F)

```

Further data preparations (trimming, adding shocks, round numbering, creating dummy vectors, interaction terms) for estimation. Produces files: RosterAdminDataUsedForEstimation.prn, AllMeetingsRosterAdminDataUsedForEstimation.prn, AssetAdminDataUsedForEstimation.prn, LivestockAdminDataUsedForEstimation.prn, LabourIncomeAdminDataUsedForEstimation.prn, FarmRevenueAdminDataUsedForEstimation.prn, ConsumptionAdminDataUsedForEstimation.prn, ShocksAdminDataUsedForEstimation.prn.

TABLE 1: DATA TRIMMING RESULTS

file	old Rej ^g in		No tw dou in		
	Mstatus		TradGroup		
all rounds					
sch1	9007	⇒	6013	⇒	5781
ar	33223	⇒	24806	⇒	23612
arA	95952	⇒	66240	⇒	61200
ass	7989	⇒	5958	⇒	5649
lvo	7989	⇒	5953	⇒	5645
lab	16004	⇒	12102	⇒	11723
far	589	⇒	411	⇒	393
con	5888	⇒	4360	⇒	4051
round 1 only					
sch1	2904	⇒	1931	⇒	1931
ar	2123	⇒	1600	⇒	1600
arA	1999	⇒	1380	⇒	1275
ass	2121	⇒	1596	⇒	1596
lvo	2121	⇒	1574	⇒	1574
lab	2121	⇒	1596	⇒	1596
far	336	⇒	236	⇒	226
con	2022	⇒	1505	⇒	1401

Source: GUK survey data.

Notes: 1. Top panel is observations for all rounds. Bottom panel is observations for round 1 only. We aim for ITT estimates and need to retain original sampled individuals. old|iRej|^g in Mstatus are strings for old members, individual rejecters, group rejecters, group erosion. con|^dro|^rep in Mgroup indicates continuing, dropouts, replacing members. tw|dou in TradGroup are members who received loans twice and double amount in the 2nd loans. They are omitted from analysis because they are under a different treatment arm.

2.

TABLE 2: NUMBER OF OBSERVATIONS IN EACH FILE AT ROUND 1 FROM HHs WITH SINGLE TREATMENT

files	rounds	traditional	large	large grace	cow	total
sch	1	728	622	618	614	2582
	2	630	523	471	522	2146
	3	560	473	438	453	1924
	4	463	406	369	358	1596
arA	1	485	464	467	487	1903
	2	476	451	457	465	1849
	3	473	448	453	454	1828
	4	465	444	447	444	1800
ass	1	603	504	507	507	2121
	2	590	491	457	484	2022
	3	581	485	453	467	1986
	4	528	478	431	418	1855
lvo	1	603	504	507	507	2121
	2	590	491	457	484	2022
	3	581	485	452	466	1984
	4	528	477	412	416	1833
lab	1	601	504	507	507	2119
	2	588	491	457	485	2021
	3	581	487	453	472	1993
	4	534	481	443	433	1891
far	1	78	123	70	64	335
	2	35	68	39	30	172
	3	13	27	25	12	77
	4	2	1	2	1	6
con	2	590	490	457	484	2021
	3	581	484	453	470	1988
	4	536	477	435	428	1876

Source: Estimated with GUK administrative and survey data.

Notes: 1. Sample is all households: Original 1600 and added households through new groups and individuals replacing opt-out members. All households in traditional arm who received more than one loan are excluded.

2.

TABLE 3: NUMBER OF OBSERVATIONS IN EACH FILE AT ROUND 1 FROM ORIGINAL 1600 HHs

files	rounds	traditional	large	large grace	cow	total
sch	1	460	479	505	487	1931
	2	300	396	369	403	1468
	3	266	356	340	351	1313
	4	204	306	282	277	1069
arA	1	175	360	360	380	1275
	2	169	349	352	359	1229
	3	167	347	349	348	1211
	4	165	343	343	342	1193
ass	1	398	400	400	400	1598
	2	283	389	352	378	1402
	3	276	384	349	365	1374
	4	238	378	330	329	1275
lvo	1	398	400	400	400	1598
	2	283	389	352	378	1402
	3	276	384	348	365	1373
	4	238	377	330	327	1272
lab	1	398	400	400	400	1598
	2	385	389	352	379	1505
	3	364	386	349	367	1466
	4	303	381	342	340	1366
far	1	21	96	52	57	226
	2	5	51	28	27	111
	3	2	22	17	12	53
	4	2	1	2	1	6
con	2	283	388	352	378	1401
	3	276	383	349	365	1373
	4	238	377	331	331	1277

Source: Estimated with GUK administrative and survey data.

Notes: 1. Sample is original 1600 households who agree to join the group. This includes households who later dropped out due to flood, group rejections, and individual rejections. All original 1600 households are tracked but some attrit from the sample.

2.

III Descriptive statistics of original 1600 HHs

- c continuing members.
- d drop out members.
- a absence.
- n members of a new group.
- r replacing members.

Mpattern															
ObPattern	caaa	caca	cacc	ccaa	ccac	ccca	cccc	daaa	dada	dadd	ddaa	ddda	dddd	naaa	
0111	0	0	14	0	0	0	0	0	0	13	0	0	0	0	
1000	25	0	0	0	0	0	0	68	0	0	0	0	0	5	
1010	0	4	0	0	0	0	0	0	1	0	0	0	0	0	
1011	0	0	0	0	1	0	0	0	0	0	0	0	0	0	
1100	0	0	0	11	0	0	0	0	0	0	14	0	0	0	
1110	0	0	0	0	0	13	0	0	0	0	0	54	0	0	
1111	0	0	0	0	0	0	1153	0	0	0	0	0	229	0	

Mpattern											
ObPattern	nann	nnaa	nnna	nnnn	raaa	rara	rarr	rcaa	rrra	rrrr	
0111	4	0	0	0	0	0	5	0	0	0	
1000	0	0	0	0	2	0	0	0	0	0	
1010	0	0	0	0	0	1	0	0	0	0	
1011	0	0	0	0	0	0	0	0	0	0	
1100	0	2	0	0	0	0	0	1	0	0	
1110	0	0	9	0	0	0	0	0	6	0	
1111	0	0	0	440	0	0	0	0	0	144	

AttritIn: Attrition round. 9 is nonattriting members.

2	3	4	9
100	56	258	7975

ObPattern								
AttritIn	0111	1000	1010	1011	1100	1110	1111	
2	0	100	0	0	0	0	0	
3	0	0	0	0	28	0	0	
4	0	0	6	0	0	82	0	
9	36	0	0	1	0	0	1966	

survey				
AttritIn	1	2	3	4
2	100	0	0	0
3	28	28	0	0
4	88	82	88	0
9	2003	1967	2002	2003

Mstatus changes for some groupids. Correct Mstatus by checking comment for dropping out (taken from CharRandomization2012.prn).

survey				
Mstatus	1	2	3	4
gErosion	0	0	0	0
gRejection	114	114	114	0
iRejection	1	1	1	114

iReplacement	0	0	0	0
newGroup	0	0	0	0
oldMember	0	0	0	1

See how Mstatus changes at rd 4: This suggests iRejection needs to change to gRejection, and iRejection to oldMember.

	survey			
Mstatus	1	2	3	4
gErosion	80	55	54	0
gRejection	140	118	114	0
iRejection	7	7	5	118
iReplacement	6	6	6	6
newGroup	0	0	0	0
oldMember	13	13	13	14

group.id (created from first characters of hhid) and their reasons for dropping out.

	comment	
group.id	denial	<NA>
70317	19	0
70319	20	0
70539	16	0
70858	20	0
71372	0	1
81483	20	0
81697	19	0

Correct Mstatus in rd 4 from iRejection to gRejection if denial is the comment.

	survey			
Mstatus	1	2	3	4
gErosion	0	0	0	0
gRejection	114	114	114	114
iRejection	1	1	1	0
iReplacement	0	0	0	0
newGroup	0	0	0	0
oldMember	0	0	0	1

Correct Mstatus in rd 1-3 from iRejection to oldMember if NA is the comment.

	hhid	Mstatus	survey	creditstatus
1:	7137220	iRejection	1	Yes
2:	7137220	iRejection	2	Yes
3:	7137220	iRejection	3	Yes
4:	7137220	oldMember	4	Yes

	survey			
Mstatus	1	2	3	4
gErosion	0	0	0	0
gRejection	0	0	0	0
iRejection	1	1	1	0
iReplacement	0	0	0	0
newGroup	0	0	0	0
oldMember	0	0	0	1

	survey			
Mstatus	1	2	3	4
gErosion	0	0	0	0
gRejection	0	0	0	0
iRejection	0	0	0	0
iReplacement	0	0	0	0

newGroup	0	0	0	0
oldMember	1	1	1	1

Original 1600 HHs (original sample) by arm and membership status.

Mstatus	AssignOriginal				
	traditional	large	large	grace	cow
gErosion	40	0		20	20
gRejection	80	40		20	0
iRejection	53	12		22	72
iReplacement	0	0		0	0
newGroup	0	0		0	0
oldMember	227	348		338	308

Including r or individually replacing HHs (replacing sample): 1759

Mstatus	AssignOriginal				
	traditional	large	large	grace	cow
gErosion	40	0		20	20
gRejection	80	40		20	0
iRejection	53	12		22	72
iReplacement	53	12		22	72
newGroup	0	0		0	0
oldMember	227	348		338	308

Use original sample. Attrition.

Number of obs per survey round in the schooling file:

tee				
teenum	1	2	3	4
1	1600	1600	1600	1600
2	682	511	446	322
3	248	150	120	83
4	50	26	17	11
5	13	3	2	2
6	2	0	0	0

Assets: Original arm assignment by membership status in rd 1: 1820 households.

Mstatus	AssignOriginal					<NA>
	traditional	large	large	grace	cow	
gErosion	40	0		20	20	0
gRejection	80	40		20	0	0
iRejection	53	12		22	72	0
iReplacement	0	0		0	0	0
newGroup	0	0		0	0	0
oldMember	227	348		338	308	0
<NA>	0	0		0	0	220

IV Estimation using original 1600 HHs

IV.1 Repayment and net saving

Dropped 1275 obs due to NA.

Dropped 7650 obs due to NA.

Repayment formally started in round 2. So taking a first-difference leaves us with period 2-3 and period 3-4. After first-differencing, arA has 59925 rows with 1275 individuals with repeatedly observed

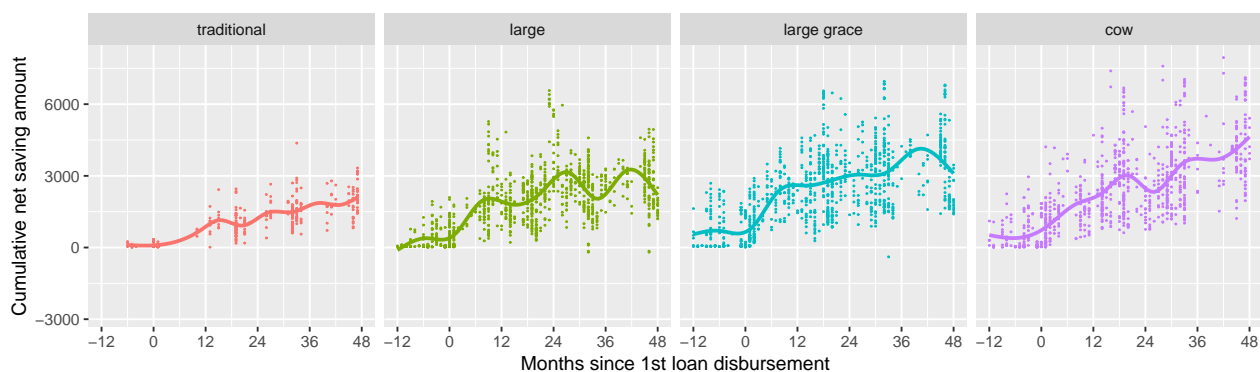


Figure 1: Cumulative weekly net saving

for 48 times, respectively. By survey rounds, there are 2, 18, 13, 15 observations per household in rounds 1, 2, 3, 4, respectively. Saving started in rd 1.

Note all binary interaction terms are demeaned and then interacted.

Tabulation at rd 1:

Mstatus	RArm			
	traditional	large	large grace	cow
gErosion	0	0	0	0
gRejection	0	0	0	0
iRejection	54	9	18	70
iReplacement	0	0	0	0
newGroup	0	0	0	0
oldMember	84	276	235	241

Warning: Removed 973 rows containing non-finite values (stat_smooth).

Warning: Removed 973 rows containing missing values (geom_point).

Dropped 1275 obs due to NA.

Dropped 7650 obs due to NA.

TABLE 4: FD ESTIMATION OF CUMULATIVE NET SAVING AND REPAYMENT

	Cumulative net saving		Cumulative repayment		Cumulative net saving + cumulative repayment			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	22.2*** (3.1)	14.7 (9.9)	141.3*** (22.9)	−3.3 (28.4)	11.4 (27.2)	147.6*** (20.3)	10.8 (27.8)	25.5 (31.1)
Large	35.5*** (4.0)	34.4*** (4.1)	141.1*** (23.8)	141.0*** (24.5)	113.8*** (19.7)	175.0*** (21.9)	175.3*** (22.9)	157.5*** (22.0)
LargeGrace	36.5*** (4.8)	37.0*** (5.3)	93.9*** (26.7)	85.9*** (27.0)	55.8*** (20.6)	140.7*** (25.0)	131.1*** (26.1)	107.9*** (24.1)
Cow	26.7*** (4.8)	24.5*** (4.8)	57.6** (28.1)	50.8* (28.4)	22.5 (20.9)	89.2*** (26.4)	80.0*** (27.2)	59.7** (24.7)
rd 2		21.6** (9.5)		64.4*** (17.0)	57.0*** (11.6)		81.7*** (18.5)	83.6*** (14.7)
Large × rd 2		−12.9 (13.6)		78.1** (37.1)	101.0** (45.3)		53.2* (31.9)	67.6** (32.1)
LargeGrace × rd 2		−44.1** (17.2)		234.0*** (39.2)	68.0 (42.2)		165.8*** (33.1)	54.1* (32.0)
Cow × rd 2		−18.5 (15.0)		190.1*** (36.3)	46.4 (41.1)		140.1*** (29.4)	45.0 (29.5)
rd 3		−7.5 (9.8)		182.5*** (16.5)	202.9*** (14.1)		173.0*** (18.2)	189.1*** (16.8)
Large × rd 3		1.7 (14.6)		149.4*** (28.4)	214.4*** (42.9)		140.6*** (22.6)	182.6*** (29.7)
LargeGrace × rd 3		−72.9*** (18.4)		407.8*** (29.3)	382.8*** (40.6)		331.5*** (23.7)	304.6*** (30.7)
Cow × rd 3		−48.3*** (16.0)		352.9*** (31.1)	320.0*** (42.2)		289.6*** (23.9)	261.1*** (29.9)
rd 4		−18.1* (10.6)		428.0*** (44.5)	204.5*** (18.1)		251.5*** (19.6)	180.1*** (18.7)
Large × rd 4		−15.9 (15.9)		160.4 (156.8)	193.2*** (48.4)		125.6*** (45.2)	149.1*** (38.7)
LargeGrace × rd 4		−84.8*** (20.6)		247.4 (155.2)	315.3*** (35.8)		287.0*** (42.4)	253.7*** (31.0)
Cow × rd 4		−52.5*** (17.2)		256.1 (173.8)	308.6*** (40.4)		264.9*** (43.4)	253.6*** (29.6)
FloodInRd1					−27.9*** (9.9)			−26.3** (11.5)
Head literate					7.6 (10.2)			10.3 (11.1)
Head age					−0.1 (0.3)			−0.2 (0.4)
6M renavment					5041.6*** (135.0)			3483.5*** (64.3)
6M net saving					−296.3*** (75.2)			874.6*** (136.8)
6M other member net saving					−339.9** (159.7)			−515.3*** (157.8)
6M other member Repaid					60.7 (186.6)			130.1 (84.7)
Effectiverenavmentment						0.8*** (0.0)	0.8*** (0.0)	0.3*** (0.0)
\bar{R}^2	0.011	0.051	0.012	0.074	0.756	0.598	0.644	0.786
$\hat{\rho}$	0.521	0.444	0.761	0.671	0.722	0.800	0.753	0.788
Pr[$\hat{\rho} = 0$]	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N	59925	53550	59925	53550	53046	59925	53550	53046

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\text{Pr}[\rho = 0]$ is its p value. Saving and repayment information is taken from administrative data. Time invariant household characteristics are taken from household survey data. Administrative data are merged with survey data by the dating the survey rounds in administrative data. Net saving is saving - withdrawal.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 5: FD ESTIMATION OF CUMULATIVE NET SAVING AND REPAYMENT BY ATTRIBUTES

	Cumulative net saving		Cumulative repayment		Cumulative net saving + cumulative repayment			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	22.2*** (3.1)	14.7 (9.9)	141.3*** (22.9)	-3.3 (28.4)	11.4 (27.2)	147.6*** (20.3)	10.8 (27.8)	25.5 (31.1)
WithGrace	1.0 (4.5)	2.6 (5.2)	-47.2*** (15.4)	-55.1*** (15.4)	-57.9*** (13.7)	-34.3** (16.6)	-44.2*** (17.1)	-49.7*** (16.1)
LargeSize	35.5*** (4.0)	34.4*** (4.1)	141.1*** (23.8)	141.0*** (24.5)	113.8*** (19.7)	175.0*** (21.9)	175.3*** (22.9)	157.5*** (22.0)
NonCash	-9.9* (5.1)	-12.5** (5.7)	-36.3* (21.4)	-35.1* (21.0)	-33.3** (15.1)	-51.5** (22.2)	-51.1** (22.4)	-48.2** (19.3)
rd 2		21.6** (9.5)		64.4*** (17.0)	57.0*** (11.6)		81.7*** (18.5)	83.6*** (14.7)
LargeSize × rd 2		-12.9 (13.6)		78.1** (37.1)	101.0** (45.3)		53.2* (31.9)	67.6** (32.1)
WithGrace × rd 2		-31.2* (17.7)		155.9*** (33.5)	-33.0 (30.3)		112.5*** (27.9)	-13.5 (22.3)
NonCash × rd 2		25.6 (18.9)		-43.9 (32.6)	-21.6 (24.1)		-25.7 (25.2)	-9.2 (19.6)
rd 3		-7.5 (9.8)		182.5*** (16.5)	202.9*** (14.1)		173.0*** (18.2)	189.1*** (16.8)
LargeSize × rd 3		1.7 (14.6)		149.4*** (28.4)	214.4*** (42.9)		140.6*** (22.6)	182.6*** (29.7)
WithGrace × rd 3		-74.7*** (19.9)		258.4*** (25.3)	168.3*** (31.5)		190.9*** (21.7)	121.9*** (25.5)
NonCash × rd 3		24.7 (21.0)		-54.9* (28.3)	-62.8* (32.1)		-41.8* (23.1)	-43.4 (26.6)
rd 4		-18.1* (10.6)		428.0*** (44.5)	204.5*** (18.1)		251.5*** (19.6)	180.1*** (18.7)
LargeSize × rd 4		-15.9 (15.9)		160.4 (156.8)	193.2*** (48.4)		125.6*** (45.2)	149.1*** (38.7)
WithGrace × rd 4		-68.9*** (23.1)		86.9 (83.4)	122.1*** (40.9)		161.4*** (45.2)	104.6*** (40.4)
NonCash × rd 4		32.3 (24.2)		8.7 (112.2)	-6.7 (30.9)		-22.2 (43.0)	-0.1 (32.5)
FloodInRd1					-27.9*** (9.9)			-26.3** (11.5)
Head literate					7.6 (10.2)			10.3 (11.1)
Head age					-0.1 (0.3)			-0.2 (0.4)
6M renavment					5041.6*** (135.0)			3483.5*** (64.3)
6M net saving					-296.3*** (75.2)			874.6*** (136.8)
6M other member net saving					-339.9** (159.7)			-515.3*** (157.8)
6M other member Repaid					60.7 (186.6)			130.1 (84.7)
Effectiverenavment						0.8*** (0.0)	0.8*** (0.0)	0.3*** (0.0)
\bar{R}^2	0.011	0.051	0.012	0.074	0.756	0.598	0.644	0.786
$\hat{\rho}$	0.521	0.444	0.761	0.671	0.722	0.800	0.753	0.788
Pr($\hat{\rho} = 0$)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N	59925	53550	59925	53550	53046	59925	53550	53046

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. LargeSize is an indicator function if the arm is of large size, WithGrace is an indicator function if the arm is with a grace period, NonCash is an indicator function if the arm provides a cow. Saving and repayment information is taken from administrative data. Time invariant household characteristics are taken from household survey data. Administrative data are merged with survey data by the dating the survey rounds in administrative data. Net saving is saving - withdrawal.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 6: FD ESTIMATION OF NET CUMULATIVE SAVING AND REPAYMENT, ULTRA POOR VS. MODERATELY POOR

	Cumulative net saving		Cumulative repayment		Cumulative net saving + cumulative repayment			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	48.6*** (2.8)	42.7*** (10.0)	218.5*** (10.3)	49.6** (23.1)	46.4** (19.0)	253.0*** (11.8)	94.6*** (25.4)	99.8*** (24.7)
UltraPoor	2.7* (1.5)	2.7* (1.6)	9.1* (5.4)	8.5 (5.4)	10.4** (4.7)	14.8** (6.0)	14.1** (6.1)	14.7** (5.9)
rd 2		19.1** (9.6)		84.9*** (20.0)	73.4*** (14.6)		98.4*** (21.8)	96.5*** (18.1)
UltraPoor × rd 2		-3.8 (3.8)		10.0** (4.9)	7.1** (3.3)		6.4 (6.7)	4.2 (5.1)
rd 3		-10.0 (9.8)		202.8*** (23.7)	217.5*** (18.3)		189.6*** (25.0)	201.1*** (22.2)
UltraPoor × rd 3		-7.1* (4.3)		13.6** (6.9)	16.7** (6.6)		6.9 (6.9)	7.7 (6.3)
rd 4		-20.6** (10.4)		448.3*** (46.1)	222.8*** (21.7)		268.3*** (25.3)	194.7*** (23.8)
UltraPoor × rd 4		-4.1 (5.0)		-18.7 (25.5)	7.8 (9.6)		13.8 (15.6)	10.1 (11.1)
FloodInRd1					-27.4** (12.3)			-27.9* (14.5)
Head literate					8.8 (11.7)			11.5 (13.1)
Head age					-0.2 (0.3)			-0.3 (0.4)
6M renavment					5033.6*** (136.3)			3472.5*** (64.5)
6M net saving					-265.5*** (73.2)			890.7*** (135.2)
6M other member net saving					-87.9 (173.5)			-395.9** (181.4)
6M other member Repaid					-18.6 (191.9)			75.6 (85.7)
Effectiverenavmentment						0.8*** (0.0)	0.8*** (0.0)	0.4*** (0.0)
\bar{R}^2	0	0.025	0	0.053	0.731	0.581	0.621	0.762
$\hat{\rho}$	0.481	0.465	0.745	0.695	0.759	0.791	0.789	0.814
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N	59925	53550	59925	53550	53046	59925	53550	53046

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. UltraPoor is an indicator function if the household is classified as the ultra poor. Saving and repayment information is taken from administrative data. Time invariant household characteristics are taken from household survey data. Administrative data are merged with survey data by the dating the survey rounds in administrative data. Net saving is saving - withdrawal.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 7: FD ESTIMATION OF FLOW NET SAVING AND REPAYMENT

	Net saving		Repayment			Net saving + Repayment		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	-1.1*** (0.2)	-8.0 (12.7)	21.8* (12.6)	8.8 (14.9)	-5.7 (10.7)	20.6 (12.6)	0.8 (20.3)	-20.5 (18.6)
Large	-1.7 (1.1)	-0.5 (1.6)	3.8 (13.2)	0.7 (13.6)	-21.7** (9.2)	2.2 (13.2)	0.1 (13.9)	-19.2** (9.2)
LargeGrace	-3.9*** (1.5)	-0.7 (2.1)	-9.4 (13.2)	-9.8 (13.7)	-30.5*** (8.5)	-13.3 (13.4)	-10.5 (13.9)	-25.6*** (8.9)
Cow	-3.2*** (1.2)	-2.2 (1.7)	-3.2 (14.7)	-3.7 (15.0)	-24.0*** (8.5)	-6.4 (14.5)	-6.0 (15.4)	-20.4** (8.7)
rd 2		5.0 (12.4)		0.6 (9.1)	1.1 (9.4)		5.6 (15.8)	17.4 (17.7)
Large × rd 2		2.3 (10.1)		13.1 (16.6)	30.1 (38.9)		15.4 (18.8)	19.0 (36.7)
LargeGrace × rd 2		-10.4 (14.2)		41.4*** (11.6)	-108.4*** (32.1)		31.0 (19.2)	-130.2*** (32.4)
Cow × rd 2		4.7 (11.2)		35.8*** (11.5)	-96.2*** (31.6)		40.5** (17.5)	-111.4*** (31.7)
rd 3		8.2 (12.6)		-5.5 (9.1)	17.1** (8.1)		2.6 (15.9)	29.5* (16.7)
Large × rd 3		3.4 (9.8)		10.1 (14.2)	63.9* (36.9)		13.5 (16.3)	51.6 (36.2)
LargeGrace × rd 3		-5.8 (13.3)		10.1 (9.2)	-18.1 (30.9)		4.4 (16.6)	-41.1 (33.9)
Cow × rd 3		6.8 (10.6)		12.5 (9.1)	-23.2 (30.6)		19.3 (14.2)	-40.7 (31.7)
rd 4		10.7 (12.6)		192.3*** (40.4)	0.5 (15.2)		203.1*** (41.6)	14.4 (21.9)
Large × rd 4		8.1 (10.6)		16.2 (156.7)	42.1 (50.3)		24.3 (154.7)	34.7 (48.0)
LargeGrace × rd 4		-0.3 (14.0)		-159.2 (156.7)	-107.5** (45.9)		-159.6 (156.6)	-128.1*** (47.8)
Cow × rd 4		5.7 (10.7)		-84.3 (174.0)	-46.1 (49.6)		-78.6 (172.1)	-66.6 (49.3)
FloodInRd1					0.6 (1.8)			1.8 (2.0)
Head literate					0.1 (1.6)			0.0 (1.6)
Head age					0.1 (0.1)			0.0 (0.1)
6M renavment					4586.4*** (194.7)			4607.3*** (191.1)
6M net saving					251.5*** (78.7)			2115.5*** (150.7)
6M other member net saving					-389.7** (191.8)			-936.0*** (230.7)
6M other member Repaid					-124.4 (276.6)			-162.2 (278.4)
\bar{R}^2	0	0	0	0.021	0.605	0	0.02	0.568
$\hat{\rho}$	-0.351	-0.364	-0.306	-0.242	0.165	-0.337	-0.283	0.102
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N	59925	53550	59925	53550	53046	59925	53550	53046

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. Saving and repayment information is taken from administrative data. Time invariant household characteristics are taken from household survey data. Administrative data are merged with survey data by the dating the survey rounds in administrative data. Net saving is saving - withdrawal.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 8: FD ESTIMATION OF FLOW NET SAVING AND REPAYMENT BY ATTRIBUTES

	Net saving		Repayment			Net saving + Repayment		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	-1.1*** (0.2)	-8.0 (12.7)	21.8* (12.6)	8.8 (14.9)	-5.7 (10.7)	20.6 (12.6)	0.8 (20.3)	-20.5 (18.6)
WithGrace	-2.2 (1.8)	-0.1 (2.1)	-13.2** (5.7)	-10.5** (5.3)	-8.9** (3.9)	-15.4** (6.1)	-10.6** (4.9)	-6.5 (4.4)
LargeSize	-1.7 (1.1)	-0.5 (1.6)	3.8 (13.2)	0.7 (13.6)	-21.7** (9.2)	2.2 (13.2)	0.1 (13.9)	-19.2** (9.2)
NonCash	0.7 (1.9)	-1.6 (2.2)	6.2 (8.5)	6.1 (8.4)	6.5** (2.8)	6.9 (8.5)	4.5 (8.3)	5.2 (3.9)
rd 2		5.0 (12.4)		0.6 (9.1)	1.1 (9.4)		5.6 (15.8)	17.4 (17.7)
LargeSize × rd 2		2.3 (10.1)		13.1 (16.6)	30.1 (38.9)		15.4 (18.8)	19.0 (36.7)
WithGrace × rd 2		-12.7 (14.7)		28.3** (12.4)	-138.5*** (27.3)		15.6 (17.5)	-149.2*** (28.4)
NonCash × rd 2		15.1 (15.4)		-5.6* (3.3)	12.2 (11.1)		9.5 (16.1)	18.8 (19.6)
rd 3		8.2 (12.6)		-5.5 (9.1)	17.1** (8.1)		2.6 (15.9)	29.5* (16.7)
LargeSize × rd 3		3.4 (9.8)		10.1 (14.2)	63.9* (36.9)		13.5 (16.3)	51.6 (36.2)
WithGrace × rd 3		-9.2 (13.7)		0.0 (11.1)	-81.9*** (17.8)		-9.1 (16.3)	-92.8*** (22.3)
NonCash × rd 3		12.6 (14.3)		2.4 (2.1)	-5.2 (6.8)		14.9 (14.2)	0.4 (19.1)
rd 4		10.7 (12.6)		192.3*** (40.4)	0.5 (15.2)		203.1*** (41.6)	14.4 (21.9)
LargeSize × rd 4		8.1 (10.6)		16.2 (156.7)	42.1 (50.3)		24.3 (154.7)	34.7 (48.0)
WithGrace × rd 4		-8.5 (15.0)		-175.4** (69.5)	-149.6*** (27.2)		-183.9** (74.0)	-162.9*** (30.7)
NonCash × rd 4		6.0 (15.0)		74.9 (102.7)	61.4** (24.7)		81.0 (105.7)	61.5* (31.7)
FloodInRd1					0.6 (1.8)			1.8 (2.0)
Head literate					0.1 (1.6)			0.0 (1.6)
Head age					0.1 (0.1)			0.0 (0.1)
6M repavment					4586.4*** (194.7)			4607.3*** (191.1)
6M net saving					251.5*** (78.7)			2115.5*** (150.7)
6M other member net saving					-389.7** (191.8)			-936.0*** (230.7)
6M other member Repaid					-124.4 (276.6)			-162.2 (278.4)
\bar{R}^2	0	0	0	0.021	0.605	0	0.02	0.568
$\hat{\rho}$	-0.351	-0.364	-0.306	-0.242	0.165	-0.337	-0.283	0.102
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N	59925	53550	59925	53550	53046	59925	53550	53046

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. LargeSize is an indicator function if the arm is of large size, WithGrace is an indicator function if the arm is with a grace period, NonCash is an indicator function if the arm provides a cow. Saving and repayment information is taken from administrative data. Time invariant household characteristics are taken from household survey data. Administrative data are merged with survey data by the dating the survey rounds in administrative data. Net saving is saving - withdrawal.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 9: FD ESTIMATION OF NET FLOW SAVING AND REPAYMENT, ULTRA POOR VS. MODERATELY POOR

	Net saving		Repayment			Net saving + Repayment		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	-3.6*** (0.7)	-10.1 (12.8)	21.9*** (3.4)	7.2 (9.1)	-20.6** (9.7)	18.3*** (3.4)	-2.9 (15.9)	-31.3* (17.5)
UltraPoor	-0.1 (0.3)	-0.1 (0.6)	-3.8* (2.0)	-3.5* (2.1)	-2.7** (1.3)	-3.9* (2.0)	-3.6* (2.1)	-2.8* (1.6)
rd 2		6.2 (12.6)		1.0 (9.2)	-5.1 (9.9)		7.2 (15.8)	10.4 (18.1)
UltraPoor × rd 2		0.2 (3.6)		-0.4 (2.8)	-4.5 (3.8)		-0.2 (5.0)	-1.6 (6.3)
rd 3		9.3 (12.7)		-5.1 (9.1)	10.1 (8.6)		4.2 (16.0)	21.8 (16.6)
UltraPoor × rd 3		0.7 (3.6)		-1.2 (2.7)	0.0 (3.2)		-0.6 (4.8)	1.9 (5.7)
rd 4		11.9 (12.7)		192.7*** (41.3)	-4.8 (15.7)		204.6*** (42.9)	8.3 (22.6)
UltraPoor × rd 4		3.1 (4.1)		-50.0** (23.5)	-27.1** (11.3)		-46.9* (24.1)	-23.8* (12.7)
FloodInRd1					3.7 (2.7)			4.8* (2.8)
Head literate					0.6 (2.0)			0.5 (2.0)
Head age					0.1 (0.1)			0.1 (0.1)
6M renavment					4580.5*** (194.9)			4601.7*** (191.2)
6M net saving					254.8*** (78.9)			2117.6*** (152.4)
6M other member net saving					-254.2 (176.6)			-813.7*** (217.6)
6M other member Repaid					-158.1 (286.8)			-195.4 (287.9)
\bar{R}^2	0	0	0	0.018	0.603	0	0.018	0.565
$\hat{\rho}$	-0.353	-0.367	-0.313	-0.262	0.173	-0.343	-0.297	0.101
Pr[$\hat{\rho} = 0$]	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N	59925	53550	59925	53550	53046	59925	53550	53046

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. UltraPoor is an indicator function if the household is classified as the ultra poor. Saving and repayment information is taken from administrative data. Time invariant household characteristics are taken from household survey data. Administrative data are merged with survey data by the dating the survey rounds in administrative data. Net saving is saving - withdrawal.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

Finding IV.1

IV.2 Schooling

Dropped 1721 obs due to NA.
Dropped 1721 obs due to NA.
Dropped 399 obs due to T<2.
Dropped 1136 obs due to NA.

Enrollment pattern in original schooling panel. 'n' indicates NA (either attrition or not reported).

SchPattern															
ObPattern	0000	0001	000n	0011	001n	00nn	0100	010n	0111	011n	01nn	0nnn	1000	1001	
0111	0	0	0	0	0	0	0	0	0	2	2	6	0	0	
1000	0	0	0	0	0	0	0	0	0	0	0	63	0	0	
1010	0	0	0	0	0	1	0	0	0	0	0	4	0	0	
1011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1100	0	0	0	0	0	2	0	0	0	0	5	2	0	0	
1110	0	0	7	0	2	2	0	0	0	8	0	3	0	0	

	1111	40	7	41	25	4	50	2	2	173	15	11	182	13	2
	SchPattern														
ObPattern	100n	1011	101n	10nn	1100	1101	110n	1110	1111	111n	11n1	11nn	1nnn		
0111	0	0	0	1	0	0	0	0	0	12	0	0	5		
1000	0	0	0	0	0	0	0	0	0	0	0	0	56		
1010	0	0	0	0	0	0	0	0	0	0	0	1	4		
1011	0	0	0	0	0	0	0	0	0	0	0	1	0		
1100	0	0	0	0	0	0	0	0	0	0	0	12	3		
1110	2	0	1	0	0	0	1	0	0	42	0	5	0		
1111	9	9	4	17	11	1	16	4	781	77	1	44	135		

Left panel is before dropping nnn, right panel is after: Original panel.

	traditional	large	large	grace	cow	traditional	large	large	grace	cow
1	460	479		505	487	300	396		369	403
2	300	396		369	403	300	396		369	403
3	266	356		340	351	266	356		340	351
4	204	306		282	277	204	306		282	277

sch has 5781 rows. Drop 463 observations in sch with nnn in SchPattern.

With OLS, 154, 246, 1068 individuals are repeatedly observed for 2, 3, 4 times, respectively. With FD, sch is reduced to 3597 rows after first-differencing with 140, 231, 993 individuals with repeatedly observed for 1, 2, 3 times, respectively. Individuals with NAs in Enrolled: 0 obs for sch. Check missingness in schooling level information.

0	1
3065	2253

Drop 3065 obs without school level information.

Dropped 1721 obs due to NA.
Dropped 1721 obs due to NA.
Dropped 399 obs due to T<2.
Dropped 1136 obs due to NA.

TABLE 10: FD ESTIMATION OF SCHOOL ENROLLMENT

covariates	(1)	(2)	(3)	(4)
(Intercept)	0.13*** (0.02)	0.05 (0.03)	0.08* (0.04)	0.08* (0.04)
Junior	-0.11*** (0.01)	-0.13*** (0.02)	-0.13*** (0.02)	-0.13*** (0.02)
High	-0.13*** (0.01)	-0.17*** (0.03)	-0.17*** (0.03)	-0.17*** (0.03)
Large	-0.03** (0.02)	-0.04** (0.02)	-0.04** (0.02)	-0.04** (0.02)
LargeGrace	-0.03 (0.02)	-0.04* (0.02)	-0.04* (0.02)	-0.04* (0.02)
Cow	-0.02 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)
Large × Junior		0.03 (0.03)	0.03 (0.03)	0.03 (0.03)
LargeGrace × Junior		0.01 (0.03)	0.01 (0.03)	0.01 (0.03)
Cow × Junior		0.02 (0.03)	0.02 (0.03)	0.02 (0.03)
Large × High		0.05 (0.04)	0.05 (0.04)	0.05 (0.04)
LargeGrace × High		0.07* (0.04)	0.07* (0.04)	0.07* (0.04)
Cow × High		0.05 (0.03)	0.06* (0.03)	0.06* (0.03)
Female		-0.00 (0.02)	0.01 (0.02)	0.01 (0.02)
Junior × Female		-0.03 (0.04)	-0.02 (0.04)	-0.02 (0.04)
High × Female		0.04 (0.06)	0.05 (0.06)	0.05 (0.06)
Large × Female		0.00 (0.03)	0.00 (0.03)	0.00 (0.03)
LargeGrace × Female		0.01 (0.02)	0.01 (0.02)	0.01 (0.02)
Cow × Female		0.02 (0.02)	0.02 (0.02)	0.02 (0.02)
Large × Junior × Female		0.00 (0.05)	-0.00 (0.05)	-0.00 (0.05)
LargeGrace × Junior × Female		0.08* (0.05)	0.08* (0.05)	0.08* (0.05)
Cow × Junior × Female		0.08 (0.06)	0.08 (0.06)	0.08 (0.06)
Large × High × Female		0.00 (0.07)	0.01 (0.07)	0.01 (0.07)
LargeGrace × High × Female		0.03 (0.07)	0.04 (0.07)	0.04 (0.07)
Cow × High × Female		0.03 (0.07)	0.03 (0.07)	0.03 (0.07)
FloodInRd1			-0.00 (0.01)	-0.00 (0.01)
Head literate			-0.00 (0.02)	-0.00 (0.02)
Head age			-0.00 (0.00)	-0.00 (0.00)
EldestSon			0.00 (0.01)	0.00 (0.01)
EldestDaughter			-0.02 (0.01)	-0.02 (0.01)
AgeComputed		0.06*** (0.01)	0.06*** (0.01)	0.06*** (0.01)
ChildAgeOrderAtRd1		-0.04* (0.02)	-0.04* (0.02)	-0.04* (0.02)
$T = 2$	148	148	147	147
$T = 3$	235	235	230	230
$T = 4$	993	993	992	992
\bar{R}^2	0.038	0.047	0.047	0.047
$\hat{\rho}$	-0.029	-0.031	-0.031	-0.031
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000
N	3597	3597	3583	3583

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 11: FD ESTIMATION OF SCHOOL ENROLLMENT BY ATTRIBUTES

covariates	(1)	(2)	(3)	(4)
(Intercept)	0.06*** (0.02)	0.05 (0.03)	0.08* (0.04)	0.08* (0.04)
Junior		-0.13*** (0.02)	-0.13*** (0.02)	-0.13*** (0.02)
High		-0.17*** (0.03)	-0.17*** (0.03)	-0.17*** (0.03)
WithGrace	0.00 (0.01)	0.00 (0.02)	0.00 (0.02)	0.00 (0.02)
LargeSize	-0.03* (0.02)	-0.04** (0.02)	-0.04** (0.02)	-0.04** (0.02)
NonCash	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)	0.01 (0.02)
WithGrace \times Junior		-0.02 (0.03)	-0.02 (0.03)	-0.02 (0.03)
WithGrace \times High		0.02 (0.03)	0.02 (0.03)	0.02 (0.03)
LargeSize \times Junior		0.03 (0.03)	0.03 (0.03)	0.03 (0.03)
LargeSize \times High		0.05 (0.04)	0.05 (0.04)	0.05 (0.04)
NonCash \times Junior		0.01 (0.03)	0.01 (0.03)	0.01 (0.03)
NonCash \times High		-0.02 (0.03)	-0.01 (0.03)	-0.01 (0.03)
Female		-0.00 (0.02)	0.01 (0.02)	0.01 (0.02)
Junior \times Female		-0.03 (0.04)	-0.02 (0.04)	-0.02 (0.04)
High \times Female		0.04 (0.06)	0.05 (0.06)	0.05 (0.06)
WithGrace \times Female		0.00 (0.02)	0.01 (0.02)	0.01 (0.02)
LargeSize \times Female		0.00 (0.03)	0.00 (0.03)	0.00 (0.03)
NonCash \times Female		0.01 (0.02)	0.02 (0.02)	0.02 (0.02)
WithGrace \times Junior \times Female		0.08* (0.04)	0.09** (0.04)	0.09** (0.04)
WithGrace \times High \times Female		0.03 (0.06)	0.03 (0.06)	0.03 (0.06)
LargeSize \times Junior \times Female		0.00 (0.05)	-0.00 (0.05)	-0.00 (0.05)
LargeSize \times High \times Female		0.00 (0.07)	0.01 (0.07)	0.01 (0.07)
NonCash \times Junior \times Female		0.00 (0.05)	0.00 (0.05)	0.00 (0.05)
NonCash \times High \times Female		-0.01 (0.06)	-0.01 (0.06)	-0.01 (0.06)
FloodInRd1			-0.00 (0.01)	-0.00 (0.01)
Head literate			-0.00 (0.02)	-0.00 (0.02)
Head age			-0.00 (0.00)	-0.00 (0.00)
EldestSon			0.00 (0.01)	0.00 (0.01)
EldestDaughter			-0.02 (0.01)	-0.02 (0.01)
AgeComputed		0.06*** (0.01)	0.06*** (0.01)	0.06*** (0.01)
ChildAgeOrderAtRd1		-0.04* (0.02)	-0.04* (0.02)	-0.04* (0.02)
$T = 2$	148	148	147	147
$T = 3$	235	235	230	230
$T = 4$	993	993	992	992
\bar{R}^2	0	0.047	0.047	0.047
$\hat{\rho}$	-0.026	-0.031	-0.031	-0.031
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000
N	3597	3597	3583	3583

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. LargeSize is an indicator function if the arm is of large size, WithGrace is an indicator function if the arm is with a grace period, NonCash is an indicator function if the arm provides a cow.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 12: FD ESTIMATION OF NET SCHOOL ENROLLMENT, ULTRA POOR VS. MODERATELY POOR

covariates	(1)	(2)	(3)	(4)
(Intercept)	0.11*** (0.01)	0.02 (0.02)	0.06 (0.04)	0.06 (0.04)
Junior	-0.11*** (0.01)	-0.11*** (0.01)	-0.11*** (0.01)	-0.11*** (0.01)
High	-0.13*** (0.02)	-0.13*** (0.02)	-0.12*** (0.02)	-0.12*** (0.02)
UltraPoor	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
UltraPoor \times Junior	-0.00 (0.02)	0.00 (0.02)	-0.00 (0.02)	-0.00 (0.02)
UltraPoor \times High	0.00 (0.02)	0.00 (0.02)	0.00 (0.02)	0.00 (0.02)
Female		-0.01 (0.01)	-0.00 (0.02)	-0.00 (0.02)
Junior \times Female		0.01 (0.03)	0.00 (0.03)	0.00 (0.03)
High \times Female		0.10** (0.04)	0.11** (0.04)	0.11** (0.04)
UltraPoor \times Female		0.02 (0.02)	0.03 (0.02)	0.03 (0.02)
UltraPoor \times Junior \times Female		0.02 (0.05)	0.03 (0.04)	0.03 (0.04)
UltraPoor \times High \times Female		-0.07 (0.06)	-0.07 (0.06)	-0.07 (0.06)
FloodInRd1			-0.01 (0.01)	-0.01 (0.01)
Head literate			-0.01 (0.02)	-0.01 (0.02)
Head age			-0.00 (0.00)	-0.00 (0.00)
EldestSon			-0.00 (0.01)	-0.00 (0.01)
EldestDaughter			-0.02 (0.01)	-0.02 (0.01)
AgeComputed		0.06*** (0.01)	0.06*** (0.01)	0.06*** (0.01)
ChildAgeOrderAtRd1		-0.04* (0.02)	-0.04* (0.02)	-0.04* (0.02)
$T = 2$	148	148	147	147
$T = 3$	235	235	230	230
$T = 4$	993	993	992	992
\bar{R}^2	0.036	0.048	0.048	0.048
$\hat{\rho}$	0.300	-0.017	-0.029	-0.029
$\Pr[\hat{\rho} = 0]$	0.000	0.010	0.000	0.000
N	3597	3597	3583	3583

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. UltraPoor is an indicator function if the household is classified as the ultra poor.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 13: FD ESTIMATION OF SCHOOL ENROLLMENT, ROUND 1 VS. ROUND 4 DIFFERENCES

covariates	(1)	(2)	(3)	(4)
(Intercept)	0.58*** (0.10)	0.74*** (0.09)	0.75*** (0.08)	0.75*** (0.08)
Junior	-0.42*** (0.10)	-0.47*** (0.09)	-0.47*** (0.09)	-0.47*** (0.09)
High	-0.49*** (0.10)	-0.54*** (0.10)	-0.53*** (0.10)	-0.53*** (0.10)
Large	-0.15* (0.08)	-0.18*** (0.07)	-0.18** (0.07)	-0.18** (0.07)
LargeGrace	-0.14* (0.08)	-0.16** (0.07)	-0.16** (0.07)	-0.16** (0.07)
Cow	-0.11 (0.08)	-0.14* (0.08)	-0.14* (0.08)	-0.14* (0.08)
Large × Junior	0.09 (0.13)	0.15 (0.13)	0.15 (0.13)	0.15 (0.13)
LargeGrace × Junior	0.06 (0.12)	0.10 (0.12)	0.10 (0.12)	0.10 (0.12)
Cow × Junior	0.01 (0.12)	0.06 (0.11)	0.06 (0.11)	0.06 (0.11)
Large × High	0.09 (0.13)	0.14 (0.13)	0.14 (0.13)	0.14 (0.13)
LargeGrace × High	0.06 (0.13)	0.09 (0.14)	0.09 (0.14)	0.09 (0.14)
Cow × High	0.05 (0.13)	0.11 (0.12)	0.11 (0.12)	0.11 (0.12)
Female		-0.25*** (0.07)	-0.24*** (0.07)	-0.24*** (0.07)
Junior × Female		0.48*** (0.13)	0.49*** (0.13)	0.49*** (0.13)
High × Female		0.35*** (0.13)	0.34*** (0.13)	0.34*** (0.13)
Large × Female		0.23** (0.10)	0.23** (0.10)	0.23** (0.10)
LargeGrace × Female		0.12 (0.08)	0.12 (0.08)	0.12 (0.08)
Cow × Female		0.28*** (0.09)	0.28*** (0.09)	0.28*** (0.09)
Large × Junior × Female		-0.42** (0.18)	-0.43** (0.17)	-0.43** (0.17)
LargeGrace × Junior × Female		-0.21 (0.18)	-0.22 (0.18)	-0.22 (0.18)
Cow × Junior × Female		-0.41** (0.18)	-0.42** (0.18)	-0.42** (0.18)
Large × High × Female		-0.28* (0.17)	-0.28* (0.17)	-0.28* (0.17)
LargeGrace × High × Female		0.00 (0.20)	0.01 (0.20)	0.01 (0.20)
Cow × High × Female		-0.20 (0.24)	-0.19 (0.23)	-0.19 (0.23)
FloodInRd1			-0.01 (0.03)	-0.01 (0.03)
EldestSon			-0.02 (0.04)	-0.02 (0.04)
EldestDaughter			-0.03 (0.03)	-0.03 (0.03)
ChildAgeOrderAtRd1		-0.01 (0.03)	-0.01 (0.03)	-0.01 (0.03)
\bar{R}^2	0.158	0.166	0.165	0.165
N	1002	1002	1002	1002

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 14: FD ESTIMATION OF SCHOOL ENROLLMENT, ROUND 1 VS. ROUND 4 DIFFERENCES BY ATTRIBUTES

covariates	(1)	(2)	(3)	(4)
(Intercept)	0.23*** (0.04)	0.74*** (0.09)	0.74*** (0.12)	0.74*** (0.12)
Junior		-0.47*** (0.09)	-0.48*** (0.09)	-0.48*** (0.09)
High		-0.54*** (0.10)	-0.54*** (0.10)	-0.54*** (0.10)
WithGrace	0.00 (0.04)	0.02 (0.06)	0.02 (0.06)	0.02 (0.06)
LargeSize	-0.08* (0.05)	-0.18*** (0.07)	-0.18** (0.07)	-0.18** (0.07)
NonCash	0.03 (0.05)	0.02 (0.07)	0.02 (0.07)	0.02 (0.07)
WithGrace × Junior		-0.05 (0.12)	-0.05 (0.12)	-0.05 (0.12)
WithGrace × High		-0.05 (0.13)	-0.05 (0.13)	-0.05 (0.13)
LargeSize × Junior		0.15 (0.13)	0.15 (0.12)	0.15 (0.12)
LargeSize × High		0.14 (0.13)	0.14 (0.13)	0.14 (0.13)
NonCash × Junior		-0.05 (0.10)	-0.05 (0.10)	-0.05 (0.10)
NonCash × High		0.02 (0.12)	0.02 (0.12)	0.02 (0.12)
Female		-0.25*** (0.07)	-0.24*** (0.07)	-0.24*** (0.07)
Junior × Female		0.48*** (0.13)	0.49*** (0.13)	0.49*** (0.13)
High × Female		0.35*** (0.13)	0.34** (0.13)	0.34** (0.13)
WithGrace × Female		-0.11 (0.09)	-0.10 (0.09)	-0.10 (0.09)
LargeSize × Female		0.23** (0.10)	0.23** (0.10)	0.23** (0.10)
NonCash × Female		0.16** (0.08)	0.15* (0.08)	0.15* (0.08)
WithGrace × Junior × Female		0.21 (0.16)	0.21 (0.16)	0.21 (0.16)
WithGrace × High × Female		0.28 (0.19)	0.28 (0.19)	0.28 (0.19)
LargeSize × Junior × Female		-0.42** (0.18)	-0.43** (0.17)	-0.43** (0.17)
LargeSize × High × Female		-0.28* (0.17)	-0.27 (0.17)	-0.27 (0.17)
NonCash × Junior × Female		-0.20 (0.17)	-0.19 (0.17)	-0.19 (0.17)
NonCash × High × Female		-0.20 (0.25)	-0.19 (0.25)	-0.19 (0.25)
FloodInRd1			-0.01 (0.03)	-0.01 (0.03)
Head literate			-0.04 (0.07)	-0.04 (0.07)
Head age			0.00 (0.00)	0.00 (0.00)
EldestSon			-0.01 (0.04)	-0.01 (0.04)
EldestDaughter			-0.03 (0.03)	-0.03 (0.03)
ChildAgeOrderAtRd1		-0.01 (0.03)	-0.01 (0.03)	-0.01 (0.03)
\bar{R}^2	0.002	0.166	0.164	0.164
N	1002	1002	1001	1001

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. LargeSize is an indicator function if the arm is of large size, WithGrace is an indicator function if the arm is with a grace period, NonCash is an indicator function if the arm provides a cow. Saving and repayment information is taken from administrative data. Time invariant household characteristics are taken from household survey data. Administrative data are merged with survey data by the dating the survey rounds in administrative data. Net saving is saving - withdrawal.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

IV.3 Assets

Assets reported in rd 1 is too small, indicating possible errors or different way of reporting only in rd 1. So we also examine rd 2 vs. rd 4 differences (as3, as4).

Dropped	2804	obs	due	to	NA.
Dropped	4027	obs	due	to	NA.
Dropped	2804	obs	due	to	NA.
Dropped	4027	obs	due	to	NA.
Dropped	2039	obs	due	to	NA.
Dropped	2040	obs	due	to	NA.
Dropped	2039	obs	due	to	NA.
Dropped	2040	obs	due	to	NA.

Main assets are household assets (HAssetAmount) and production assets (PAssetAmount) both with 4973 observations. After first-differencing, they become 3595 observations, with 21, 94, 3480 households observed for 2, 3, 4 times. We also examine rd 2 vs. rd 4 differences, which has 2389 observations. After first-differencing, they become 1161 observations.

TABLE 15: FD ESTIMATION OF ASSETS

covariates	Household asset amount (Tk)				Productive asset amount (Tk)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	6633.5*** (940.5)	8132.6*** (1333.8)	9544.7*** (1616.5)	10414.0*** (2469.8)	-216.2*** (58.7)	-59.4 (160.4)	18.7 (165.0)	-350.7* (212.0)
Large	1022.0 (1538.5)	386.6 (1454.4)	317.4 (1366.9)	2911.6 (3111.6)	129.0 (100.1)	354.2* (193.5)	355.4* (185.7)	20.9 (353.4)
LargeGrace	1835.7 (1544.1)	1437.4 (1647.4)	987.4 (1629.1)	3150.3 (3063.7)	-62.7 (96.1)	54.9 (159.0)	32.9 (156.1)	-134.4 (265.0)
Cow	1508.8 (1585.9)	1861.9 (1943.0)	1574.1 (1811.9)	3233.1 (3599.7)	135.1 (91.2)	148.4 (137.9)	144.6 (134.2)	145.1 (196.7)
rd 2 - 3		2530.7 (1940.5)	2533.2 (1950.4)			-265.4 (295.6)	-265.7 (296.0)	
Large × rd 2 - 3		4774.1 (4892.3)	4820.3 (4899.8)			-823.6 (928.4)	-823.5 (929.6)	
LargeGrace × rd 2 - 3		4650.6 (5183.8)	4689.1 (5183.9)			-276.5 (653.7)	-276.2 (654.6)	
Cow × rd 2 - 3		3499.1 (6180.8)	3422.5 (6229.7)			152.6 (507.3)	151.2 (507.5)	
rd 3 - 4		-6539.4*** (1680.9)	-6510.9*** (1676.2)	-9357.6*** (2159.8)		-488.7** (227.2)	-489.9** (227.7)	-298.3 (202.2)
Large × rd 3 - 4		2022.6 (2561.2)	2037.1 (2562.8)	-3813.6 (5799.2)		-1479.2** (628.5)	-1481.5** (628.7)	-998.5 (675.7)
LargeGrace × rd 3 - 4		-242.7 (3642.9)	-269.3 (3645.0)	-5618.1 (4931.6)		-909.3 (608.7)	-912.6 (611.6)	-742.5* (398.0)
Cow × rd 3 - 4		-6742.5 (5364.1)	-6688.8 (5343.6)	-10379.9 (7374.1)		-275.1 (286.9)	-277.7 (287.0)	-352.7 (316.1)
FloodInRd1			-3003.2*** (1069.5)	-2897.1** (1463.2)			-113.8 (70.4)	197.4 (161.3)
Head literate			2259.9 (1974.6)	1338.2 (3276.6)			-124.1** (58.8)	-39.4 (254.2)
6M repayment				1914.3 (1812.4)				-25.3 (407.3)
6M net saving				-8134.5 (9978.7)				-740.1 (911.0)
6M other member net saving				-9892.3 (40250.7)				-5633.7 (3695.1)
6M other member Renaid				-3184.9 (4587.9)				287.0 (537.8)
$T = 2$	21	21	21	44	21	21	21	44
$T = 3$	47	47	44	1160	47	47	44	1160
$T = 4$	1160	1160	1160	0	1160	1160	1160	0
\bar{R}^2	-0.001	0.013	0.014	0.014	-0.001	0.001	0	0
$\hat{\rho}$	0.062	0.104	0.091	-0.017	-0.091	-0.077	-0.065	0.413
$\Pr[\hat{\rho} = 0]$	0.006	0.000	0.000	0.334	0.000	0.000	0.000	0.000
N	3595	3595	3589	2364	3595	3595	3589	2364

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 16: FD ESTIMATION OF ASSETS BY ATTRIBUTES

covariates	Household asset amount (Tk)				Productive asset amount (Tk)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	6633.5*** (940.5)	8132.6*** (1333.8)	9544.7*** (1616.5)	10414.0*** (2469.8)	-216.2*** (58.7)	-59.4 (160.4)	18.7 (165.0)	-350.7* (212.0)
WithGrace	813.8 (1726.8)	1050.8 (1625.7)	670.0 (1589.6)	238.7 (3532.1)	-191.7* (111.2)	-299.3 (216.9)	-322.6 (213.6)	-155.3 (405.9)
LargeSize	1022.0 (1538.5)	386.6 (1454.4)	317.4 (1366.9)	2911.6 (3111.6)	129.0 (100.1)	354.2* (193.5)	355.4* (185.7)	20.9 (353.4)
NonCash	-326.9 (1769.2)	424.5 (2074.3)	586.7 (1988.0)	82.9 (3590.3)	197.8* (103.3)	93.5 (169.2)	111.7 (165.7)	279.4 (238.7)
rd 2 - 3		2530.7 (1940.5)	2533.2 (1950.4)			-265.4 (295.6)	-265.7 (296.0)	
LargeSize × rd 2 - 3		4774.1 (4892.3)	4820.3 (4899.8)			-823.6 (928.4)	-823.5 (929.6)	
WithGrace × rd 2 - 3		-123.5 (4672.4)	-131.1 (4665.6)			547.1 (1006.2)	547.3 (1008.0)	
NonCash × rd 2 - 3		-1151.5 (6008.3)	-1266.7 (6047.7)			429.1 (638.8)	427.4 (639.7)	
rd 3 - 4		-6539.4*** (1680.9)	-6510.9*** (1676.2)	-9357.6*** (2159.8)		-488.7** (227.2)	-489.9** (227.7)	-298.3 (202.2)
LargeSize × rd 3 - 4		2022.6 (2561.2)	2037.1 (2562.8)	-3813.6 (5799.2)		-1479.2** (628.5)	-1481.5** (628.7)	-998.5 (675.7)
WithGrace × rd 3 - 4		-2265.3 (3741.4)	-2306.4 (3737.3)	-1804.5 (5104.5)		569.9 (820.3)	568.9 (822.6)	256.0 (676.4)
NonCash × rd 3 - 4		-6499.8 (6017.6)	-6419.5 (5989.5)	-4761.8 (7760.0)		634.2 (600.2)	634.9 (603.1)	389.8 (393.2)
FloodInRd1			-3003.2*** (1069.5)	-2897.1** (1463.2)			-113.8 (70.4)	197.4 (161.3)
Head literate			2259.9 (1974.6)	1338.2 (3276.6)			-124.1** (58.8)	-39.4 (254.2)
6M repayment				1914.3 (1812.4)				-25.3 (407.3)
6M net saving				-8134.5 (9978.7)				-740.1 (911.0)
6M other member net saving				-9892.3 (40250.7)				-5633.7 (3695.1)
6M other member Renaid				-3184.9 (4587.9)				287.0 (537.8)
$T = 2$	21	21	21	44	21	21	21	44
$T = 3$	47	47	44	1160	47	47	44	1160
$T = 4$	1160	1160	1160	0	1160	1160	1160	0
\hat{R}^2	-0.001	0.013	0.014	0.014	-0.001	0.001	0	0
$\hat{\rho}$	0.062	0.104	0.091	-0.017	-0.091	-0.077	-0.065	0.413
$\Pr[\hat{\rho} = 0]$	0.006	0.000	0.000	0.334	0.000	0.000	0.000	0.000
N	3595	3595	3589	2364	3595	3595	3589	2364

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. LargeSize is an indicator function if the arm is of large size, WithGrace is an indicator function if the arm is with a grace period, NonCash is an indicator function if the arm provides a cow.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 17: FD ESTIMATION OF ASSETS, MODERATELY POOR VS. ULTRA POOR

	Household asset amount (Tk)				Productive asset amount (Tk)			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	8177.1*** (798.4)	9490.4*** (1405.0)	10659.9*** (1690.0)	14212.2*** (2697.2)	-107.1 (84.5)	99.5 (259.7)	163.0 (275.1)	-209.2 (153.6)
UltraPoor	-412.7 (736.6)	-473.4 (818.6)	-407.2 (837.8)	-1525.1 (2343.1)	-72.9 (92.1)	1.0 (181.2)	-2.2 (182.1)	-182.4 (197.4)
rd 2 - 3		3013.1 (2202.6)	3010.1 (2218.7)			-250.9 (300.4)	-251.2 (300.7)	
UltraPoor × rd 2 - 3		-2097.3 (4635.3)	-2054.8 (4683.0)			-338.6 (628.8)	-339.0 (629.3)	
rd 3 - 4		-6884.0*** (1987.6)	-6846.1*** (1977.8)	-10253.3*** (2582.3)		-507.3** (249.4)	-508.4** (249.9)	-302.8 (187.4)
UltraPoor × rd 3 - 4		2198.9 (2579.2)	2092.0 (2540.4)	4089.0 (5340.8)		-444.7 (516.4)	-446.7 (516.8)	-98.6 (330.3)
FloodInRd1			-3076.3*** (997.0)	-3033.8** (1366.2)			-97.2 (67.0)	217.6 (155.4)
Head literate			2251.9 (1916.0)	1288.9 (3200.2)			-109.8* (61.8)	-32.7 (254.6)
6M repayment				2017.0 (1869.0)				-4.1 (409.8)
6M net saving				-7199.5 (9757.7)				-505.1 (939.8)
6M other member net saving				-20703.9 (28681.9)				-4043.1 (2979.1)
6M other member Repaid				-2023.3 (4841.0)				360.2 (483.9)
$T = 2$	21	21	21	44	21	21	21	44
$T = 3$	47	47	44	1160	47	47	44	1160
$T = 4$	1160	1160	1160	0	1160	1160	1160	0
\bar{R}^2	0	0.012	0.014	0.014	0	0.001	0	-0.001
$\hat{\rho}$	0.061	0.106	0.088	-0.015	-0.088	-0.072	-0.061	0.462
$\Pr[\hat{\rho} = 0]$	0.007	0.000	0.000	0.400	0.000	0.000	0.000	0.000
N	3595	3595	3589	2364	3595	3595	3589	2364

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. UltraPoor is an indicator function if the household is classified as the ultra poor. Household assets do not include livestock.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 18: FD ESTIMATION OF ASSETS, ROUND 2 AND 4 COMPARISON

covariates	Household asset amount (Tk)				Productive asset amount (Tk)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	11278.8*** (2441.3)	14311.5*** (3199.6)	14311.5*** (3199.6)	15968.4*** (3455.0)	-366.5* (203.8)	-637.4** (301.9)	-637.4** (301.9)	-716.9** (301.3)
Large	4182.6 (4208.9)	4020.4 (3959.7)	4020.4 (3959.7)	2964.2 (3990.0)	-509.9 (486.9)	-499.0 (470.5)	-499.0 (470.5)	-443.0 (465.4)
LargeGrace	5448.6 (4212.5)	4472.7 (4482.6)	4472.7 (4482.6)	4738.8 (4819.6)	-532.9 (447.8)	-448.3 (436.1)	-448.3 (436.1)	-632.4 (443.2)
Cow	1777.3 (4181.1)	1225.8 (3931.4)	1225.8 (3931.4)	1692.4 (4146.1)	241.4 (254.4)	284.0 (264.8)	284.0 (264.8)	121.8 (320.9)
FloodInRd1		-5927.5** (2960.2)	-5927.5** (2960.2)	-5095.4* (2870.0)		497.1 (327.1)	497.1 (327.1)	312.4 (335.9)
Head literate		2684.2 (6714.2)	2684.2 (6714.2)	2425.4 (6702.1)		-83.3 (526.8)	-83.3 (526.8)	-90.2 (519.2)
6M repayment				9310.3*** (2922.7)				847.1* (476.2)
6M net saving				2548.1 (26233.0)				1822.8 (1897.9)
6M other member net saving				25421.9 (47296.6)				-6666.5 (6219.5)
6M other member Renaid				-16346.6** (7304.6)				11.5 (552.4)
\bar{R}^2	-0.001	0.003	0.003	0.008	0	0	0	0
N	1161	1161	1161	1160	1161	1161	1161	1160

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates between round 2 and 4. A first-difference is defined as $\Delta x_{t+k} \equiv x_{t+k} - x_t$ for $k = 1, 2, \dots$. Saving and repayment misses are taken from administrative data and merged with survey data at Year-Month of survey interviews. Intercept terms are omitted in estimating equations. Sample is continuing members and replacing members of early rejecters and received loans prior to 2015 January. 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. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

Robustness: To understand underlying pattern of asset accumulation, we compare the loan recipients and loan rejecters. This distinction is made by households by choice, so the indicator variable is considered to be endogenous to asset level. This is a limitation, however, it has its own merit in giving an idea how loan recipients fared during the study period relative to loan nonrecipients. TABLE 19 shows that the pure controls also experience similar increase-increase-decrease pattern for household assets. This suggests the pattern observed among the loan recipients may be a systemic pattern of the area, not necessarily reflecting the repayment burden. This partially relieves a concern that repayment burden was excessive for loan recipients.

TABLE 19: FD ESTIMATION OF ASSETS, LOAN RECIPIENTS VS. PURE CONTROL

	Household asset amount (Tk)			Productive asset amount (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	8359.6*** (756.9)	3001.4** (1344.1)	4069.9*** (1332.9)	-187.1*** (51.7)	-532.7*** (133.6)	-481.8*** (135.5)
NonCash	-4.7 (1398.8)	-1141.8 (1217.9)	-1180.0 (1212.7)	104.9 (80.3)	192.6** (91.4)	197.8** (89.2)
PureControl	-2044.6 (1657.6)	-2124.5 (1977.0)	-1924.0 (1996.5)	-24.0 (65.7)	-312.1 (344.5)	-309.9 (346.3)
PureControl × rd 2 - 3		994.1 (2912.7)	966.7 (2916.9)		479.0 (473.2)	477.9 (473.7)
PureControl × rd 3 - 4		-2090.3 (4286.2)	-2012.4 (4281.5)		345.4 (579.2)	348.6 (579.9)
rd 1 - 2		6820.0*** (2013.3)	6790.1*** (2006.7)		678.3** (288.1)	679.6** (288.8)
NonCash × rd 1 - 2		6105.8 (5170.4)	6008.3 (5149.6)		-773.7** (373.2)	-773.0** (374.0)
rd 2 - 3		10076.8*** (2526.8)	10051.3*** (2545.6)		289.4 (215.8)	290.6 (216.4)
NonCash × rd 2 - 3		4885.0 (6385.2)	4686.0 (6446.9)		-164.7 (311.6)	-165.3 (312.1)
FloodInRd1			-2654.4*** (943.9)			-87.7 (63.5)
Head literate			1642.0 (1803.3)			-99.5* (57.3)
$T = 2$	28	28	28	28	28	28
$T = 3$	100	100	97	100	100	97
$T = 4$	1274	1274	1274	1274	1274	1274
\bar{R}^2	0	0.016	0.017	0	0.001	0.001
$\hat{\rho}$	0.041	0.083	0.077	-0.096	-0.077	-0.065
Pr[$\hat{\rho} = 0$]	0.063	0.000	0.000	0.000	0.000	0.000
N	4050	4050	4044	4050	4050	4044

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates between round 2 and 4. A first-difference is defined as $\Delta x_{t+k} \equiv x_{t+k} - x_t$ for $k = 1, 2, \dots$. Saving and repayment misses are taken from administrative data and merged with survey data at Year-Month of survey interviews. Pure control is members not receiving loans while they were put on a wait list. Sample is continuing members and replacing members of early rejecters. Household assets do not include livestock. Regressions (1)-(2), (4)-(5) use only arm and calendar information. (3) and (6) information if the household was exposed to the flood in round 1. Pure controls are households who rejected to receive a loan.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

IV.4 Livestock

Dropped 2807 obs due to NA.
Dropped 4031 obs due to NA.
Dropped 2041 obs due to NA.
Dropped 2042 obs due to NA.

Dropped 196 obs due to T<2.
Dropped 1402 obs due to NA.
Dropped 196 obs due to T<2.
Dropped 3080 obs due to NA.
Dropped 154 obs due to T<2.
Dropped 1272 obs due to NA.
Dropped 154 obs due to T<2.
Dropped 1386 obs due to NA.

TABLE 20: FD ESTIMATION OF LIVESTOCK HOLDING VALUES

covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	5396.9*** (532.8)	11936.0*** (1007.8)	11945.2*** (1026.3)	12836.2*** (1031.5)	13169.8*** (961.7)	13082.9*** (943.5)	12693.7*** (1016.9)
Large	3468.5*** (866.3)	4794.9*** (1250.5)	4834.5*** (1265.6)	4984.4*** (1327.6)	5006.7*** (1325.9)	4202.5*** (1043.3)	5005.4*** (1326.1)
LargeGrace	2292.9** (892.2)	2723.4** (1248.4)	2750.6** (1256.7)	3007.2** (1215.0)	3030.0** (1209.4)	3834.6*** (1085.3)	3185.8*** (1215.6)
Cow	2882.8*** (680.9)	3410.3*** (973.0)	3501.7*** (970.6)	3473.1*** (924.3)	3502.4*** (921.2)	3727.0*** (1001.3)	3460.5*** (928.2)
rd 2 - 3		-9110.0*** (1523.4)	-9045.3*** (1528.0)	-9047.8*** (1530.2)	-9056.8*** (1208.3)	-9034.6*** (1192.8)	-9043.9*** (1529.9)
Large × rd 2 - 3		-5014.4 (4506.8)	-4796.4 (4525.8)	-4849.2 (4536.9)	-4868.1 (4487.2)	-4328.5 (3457.2)	-4851.7 (4533.5)
LargeGrace × rd 2 - 3		-1075.8 (3753.8)	-1077.6 (3756.3)	-1116.4 (3757.6)	-1130.8 (3727.2)	-2120.9 (3058.1)	-1121.2 (3758.9)
Cow × rd 2 - 3		-3186.3 (3386.1)	-3172.2 (3387.5)	-3204.5 (3389.7)	-3215.5 (3390.1)	-6356.4** (3138.1)	-3210.3 (3390.3)
rd 3 - 4		-12529.8*** (1251.9)	-12584.6*** (1252.3)	-12608.7*** (1248.6)	-13679.8*** (948.6)	-13692.8*** (937.9)	-12619.9*** (1245.5)
Large × rd 3 - 4		-6142.0* (3728.9)	-6358.3* (3729.7)	-6403.0* (3742.4)	-6570.3* (3736.5)	-4376.6* (2547.1)	-6389.6* (3738.1)
LargeGrace × rd 3 - 4		-655.4 (2565.2)	-652.2 (2565.1)	-660.1 (2570.6)	-928.1 (2513.3)	-1101.4 (2129.6)	-651.2 (2568.7)
Cow × rd 3 - 4		-742.8 (2315.7)	-759.3 (2313.2)	-924.5 (2278.2)	-841.7 (2209.4)	-1618.7 (2181.6)	-956.1 (2267.8)
HadCows				-5608.3*** (781.7)	-7474.1** (2939.4)	-6244.3* (3553.0)	
Large × HadCows						6725.0 (7971.0)	
LargeGrace × HadCows						-12123.8 (8379.8)	
Cow × HadCows						-6986.1 (5122.8)	
HadCows × rd 2 - 3					43.6 (4355.2)	-5552.0 (5513.5)	
Large × HadCows × rd 2 - 3						-1841.7 (11622.5)	
LargeGrace × HadCows × rd 2 - 3						7632.1 (12565.0)	
Cow × HadCows × rd 2 - 3						18487.8** (8184.9)	
HadCows × rd 3 - 4					5802.1 (4025.2)	7578.0** (3304.1)	
Large × HadCows × rd 3 - 4						-10221.2 (11226.1)	
LargeGrace × HadCows × rd 3 - 4						10785.2 (12060.0)	
Cow × HadCows × rd 3 - 4						4737.1 (5655.0)	
NumCowsOwnedAtRd1							-3843.6*** (607.0)
FloodInRd1			218.6 (545.9)	297.7 (528.3)	291.9 (528.8)	349.4 (527.6)	481.9 (550.1)
Head literate			-1300.3** (659.6)	-1098.6* (659.3)	-1102.7* (658.4)	-933.3 (629.2)	-1028.5 (639.2)
$T = 2$	29	29	28	28	28	28	28
$T = 3$	101	101	99	99	99	99	99
$T = 4$	1272	1272	1272	1272	1272	1272	1272
\bar{R}^2	0.003	0.072	0.073	0.084	0.086	0.091	0.088
$\hat{\rho}$	-0.237	-0.247	-0.255	-0.260	-0.263	-0.268	-0.267
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N	4047	4047	4042	4042	4042	4042	4042

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. Saving and repayment information is taken from administrative data. Time invariant household characteristics are taken from household survey data. Administrative data are merged with survey data by the dating the survey rounds in administrative data. Net saving is saving - withdrawal. Sample is continuing members and replacing members of early rejecters and received loans prior to 2015 January. Regressand is TotalImputedValue, a sum of all livestock holding values evaluated at respective median market prices in the same year.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 21: FD ESTIMATION OF LIVESTOCK HOLDING VALUES BY ATTRIBUTES

covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	5396.9*** (532.8)	11936.0*** (1007.8)	11945.2*** (1026.3)	12836.2*** (1031.5)	13169.8*** (961.7)	13131.8*** (957.2)	12693.7*** (1016.9)
WithGrace	-1175.6 (989.3)	-2071.5 (1485.1)	-2083.9 (1521.3)	-1977.1 (1544.1)	-1976.7 (1551.0)	-1801.8 (1446.5)	-1819.6 (1560.2)
LargeSize	3468.5*** (866.3)	4794.9*** (1250.5)	4834.5*** (1265.6)	4984.4*** (1327.6)	5006.7*** (1325.9)	4924.2*** (1261.3)	5005.4*** (1326.1)
NonCash	589.8 (831.9)	686.9 (1260.3)	751.1 (1257.5)	465.9 (1169.4)	472.3 (1157.4)	348.7 (1127.9)	274.7 (1176.2)
rd 2 - 3		-9110.0*** (1523.4)	-9045.3*** (1528.0)	-9047.8*** (1530.2)	-9056.8*** (1208.3)	-9034.6*** (1192.8)	-9043.9*** (1529.9)
LargeSize × rd 2 - 3		-5014.4 (4506.8)	-4796.4 (4525.8)	-4849.2 (4536.9)	-4868.1 (4487.2)	-4668.5 (4396.5)	-4851.7 (4533.5)
WithGrace × rd 2 - 3		3938.5 (4839.9)	3718.8 (4858.6)	3732.8 (4866.8)	3737.4 (4885.4)	3616.4 (4630.3)	3730.5 (4865.8)
NonCash × rd 2 - 3		-2110.5 (3818.2)	-2094.6 (3821.4)	-2088.1 (3820.3)	-2084.7 (3798.3)	-1891.8 (3646.5)	-2089.1 (3822.8)
rd 3 - 4		-12529.8*** (1251.9)	-12584.6*** (1252.3)	-12608.7*** (1248.6)	-13679.8*** (948.6)	-13692.8*** (937.9)	-12619.9*** (1245.5)
LargeSize × rd 3 - 4		-6142.0* (3728.9)	-6358.3* (3729.7)	-6403.0* (3742.4)	-6570.3* (3736.5)	-6463.3* (3601.7)	-6389.6* (3738.1)
WithGrace × rd 3 - 4		5486.6 (4147.5)	5706.2 (4147.7)	5742.9 (4154.1)	5642.2 (4244.7)	5466.0 (3968.5)	5738.4 (4151.0)
NonCash × rd 3 - 4		-87.4 (2942.7)	-107.1 (2941.9)	-264.4 (2907.7)	86.4 (2829.6)	253.1 (2738.1)	-305.0 (2906.4)
HadCows				-5608.3*** (781.7)	-7474.1** (2939.4)	-7584.6*** (2564.9)	
HadCows × rd 2 - 3					43.6 (4355.2)	223.4 (3891.8)	
HadCows × rd 3 - 4					5802.1 (4025.2)	6147.9* (3541.7)	
NumCowsOwnedAtRd1							-3843.6*** (607.0)
FloodInRd1			218.6 (545.9)	297.7 (528.3)	291.9 (528.8)	349.4 (527.6)	481.9 (550.1)
Head literate			-1300.3** (659.6)	-1098.6* (659.3)	-1102.7* (658.4)	-933.3 (629.2)	-1028.5 (639.2)
HadCows × LargeSize						3909.9 (3115.0)	
HadCows × LargeSize × rd 2 - 3						-1841.7 (11622.5)	
HadCows × LargeSize × rd 3 - 4						-10221.2 (11226.1)	
HadCows × WithGrace						-7767.7** (3107.6)	
HadCows × WithGrace × rd 2 - 3						7632.1 (12565.0)	
HadCows × WithGrace × rd 3 - 4						10785.2 (12060.0)	
HadCows × NonCash						2471.8 (2217.6)	
HadCows × NonCash × rd 2 - 3						12697.5 (9473.2)	
HadCows × NonCash × rd 3 - 4						4173.2 (7165.3)	
$T = 2$	29	29	28	28	28	28	28
$T = 3$	101	101	99	99	99	99	99
$T = 4$	1272	1272	1272	1272	1272	1272	1272
\bar{R}^2	0.003	0.072	0.073	0.084	0.086	0.091	0.088
$\hat{\rho}$	-0.237	-0.247	-0.255	-0.260	-0.263	-0.268	-0.267
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N	4047	4047	4042	4042	4042	4042	4042

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. LargeSize is an indicator function if the arm is of large size, WithGrace is an indicator function if the arm is with a grace period, NonCash is an indicator function if the arm provides a cow. Saving and repayment information is taken from administrative data. Time invariant household characteristics are taken from household survey data. Administrative data are merged with survey data by the dating the survey rounds in administrative data. Net saving is saving - withdrawal. Sample is continuing members and replacing members of early rejecters and received loans prior to 2015 January. Regressand is TotalImputedValue, a sum of all livestock holding values evaluated at respective median market prices in the same year.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 22: FD ESTIMATION OF LIVESTOCK HOLDING VALUES, ULTRA VS. MODERATELY POOR

covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	7254.6*** (393.7)	14715.9*** (1320.3)	14646.4*** (1277.8)	15763.5*** (1287.1)	16145.6*** (1066.0)	16145.6*** (1066.0)	15713.2*** (1265.7)
UltraPoor	759.1* (416.5)	263.9 (789.8)	249.2 (781.0)	19.6 (814.7)	-12.3 (804.3)	-12.3 (804.3)	-38.4 (807.3)
rd 2 - 3		-9135.4*** (1540.4)	-9069.4*** (1543.6)	-9071.6*** (1546.1)	-9107.2*** (1234.8)	-9107.2*** (1234.8)	-9067.3*** (1545.9)
UltraPoor × rd 2 - 3		3099.8 (3350.9)	3193.0 (3350.7)	3191.3 (3358.6)	3198.6 (3271.7)	3198.6 (3271.7)	3193.5 (3356.7)
rd 3 - 4		-12580.1*** (1294.5)	-12637.5*** (1297.6)	-12652.6*** (1293.6)	-13731.9*** (985.4)	-13731.9*** (985.4)	-12660.2*** (1291.1)
UltraPoor × rd 3 - 4		3963.2 (2725.2)	3881.4 (2732.5)	3935.2 (2721.2)	4152.6 (2670.0)	4152.6 (2670.0)	3973.6 (2713.7)
HadCows				-5509.4*** (842.2)	-7432.0** (3039.4)	-7432.0** (3039.4)	
HadCows × rd 2 - 3					185.7 (4338.7)	185.7 (4338.7)	
HadCows × rd 3 - 4					5813.2 (4076.3)	5813.2 (4076.3)	
NumCowsOwnedAtRd1							-3777.6*** (635.5)
FloodInRd1			421.8 (524.9)	497.2 (502.9)	493.9 (503.5)	493.9 (503.5)	666.0 (515.7)
Head literate			-1030.8 (677.8)	-849.3 (679.3)	-851.4 (678.3)	-851.4 (678.3)	-792.2 (660.0)
$T = 2$	29	29	28	28	28	28	28
$T = 3$	101	101	99	99	99	99	99
$T = 4$	1272	1272	1272	1272	1272	1272	1272
\bar{R}^2	0	0.068	0.069	0.08	0.082	0.082	0.083
$\hat{\rho}$	-0.232	-0.239	-0.240	-0.252	-0.257	-0.257	-0.252
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N	4047	4047	4042	4042	4042	4042	4042

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. UltraPoor is an indicator function if the household is classified as the ultra poor. Sample is continuing members and replacing members of early rejecters and received loans prior to 2015 January. Regressand is TotalImputedValue, a sum of all livestock holding values evaluated at respective median market prices in the same year.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 23: FD ESTIMATION OF LIVESTOCK HOLDING VALUES, RD 1 VS. RD 4 COMPARISON

covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	4480.1*** (1575.0)	4480.1*** (1575.0)	5118.2*** (1838.6)	6616.7*** (1951.7)	6616.7*** (1951.7)	6623.0*** (1955.6)	6121.7*** (1894.0)
LargeSize	3972.5** (1924.7)	3972.5** (1924.7)	3962.1** (1937.5)	4099.9** (1936.1)	4099.9** (1936.1)	4093.8** (1939.8)	4155.5** (1944.7)
HadCows				-9212.2*** (2895.7)	-9212.2*** (2895.7)	-9188.7*** (2789.0)	
NumCowsOwnedAtRd1							-4982.9** (1987.4)
FloodInRd1			-1737.0 (1477.8)	-1600.0 (1435.0)	-1600.0 (1435.0)	-1608.8 (1450.3)	-1425.5 (1464.8)
Head literate			1781.3 (2198.6)	2053.9 (2179.0)	2053.9 (2179.0)	2056.0 (2183.8)	2052.2 (2186.6)
HadCows × LargeSize						-664.8 (4317.9)	
\bar{R}^2	0.003	0.003	0.004	0.025	0.025	0.025	0.022
N	1272	1272	1272	1272	1272	1272	1272

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. Sample is continuing members and replacing members of early rejecters and received loans prior to 2015 January. Regressand is TotalImputedValue, a sum of all livestock holding values evaluated at respective median market prices in the same year.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

Check quickly if the estimated results make sense.

hhid	Arm	Year	LivestockCode	number_owned	mrkt_value
1: 7020319	large	2012	cow/ox	2	0
2: 7020319	large	2014	cow/ox	5	18000
3: 7020319	large	2015	cow/ox	6	19000

4:	7020319		large	2017		cow/ox	5	25000
5:	7020614	large	grace	2012			0	0
6:	7020614	large	grace	2014		cow/ox	2	16000
7:	7020614	large	grace	2015		cow/ox	5	16000
8:	7020614	large	grace	2017		cow/ox	6	24000
9:	7021003	large	grace	2012		cow/ox	1	0
10:	7021003	large	grace	2014		cow/ox	8	18000
11:	7021003	large	grace	2015		cow/ox	4	20000
12:	7021003	large	grace	2017		cow/ox	4	23000
13:	7021012	large	grace	2012	Chicken/duck		4	0
14:	7021012	large	grace	2014		cow/ox	2	24000
15:	7021012	large	grace	2015		cow/ox	3	19000
16:	7021012	large	grace	2017		cow/ox	8	25000
17:	7021216		cow	2012		cow/ox	6	0
18:	7021216		cow	2014		cow/ox	5	20000
19:	7021216		cow	2015		cow/ox	3	18000
20:	7021216		cow	2017		cow/ox	3	30000
21:	7031706		large	2012		cow/ox	1	0
22:	7031706		large	2014		cow/ox	7	12000
23:	7031706		large	2015		cow/ox	3	15000
24:	7031706		large	2017		cow/ox	3	38000
25:	7031715		large	2012		cow/ox	2	0
26:	7031715		large	2014		cow/ox	9	15000
27:	7031715		large	2015		cow/ox	8	16000
28:	7031715		large	2017		cow/ox	1	30000
29:	7031716		large	2012		cow/ox	1	0
30:	7031716		large	2014		cow/ox	6	16000
31:	7031716		large	2015		cow/ox	5	17000
32:	7031716		large	2017		cow/ox	2	42000
33:	7031905		large	2012		cow/ox	4	0
34:	7031905		large	2014		cow/ox	5	16000
35:	7031905		large	2015		cow/ox	7	20000
36:	7031905		large	2017		cow/ox	7	20000
37:	7042017		large	2012			0	0
38:	7042017		large	2014		cow/ox	3	18000
39:	7042017		large	2015		cow/ox	6	20000
40:	7042017		large	2017		cow/ox	4	20000
41:	7054005	large	grace	2012			0	0
42:	7054005	large	grace	2014		cow/ox	4	18000
43:	7054005	large	grace	2015		cow/ox	2	16000
44:	7054005	large	grace	2017		cow/ox	10	15000
45:	7054012	large	grace	2012		cow/ox	4	0
46:	7054012	large	grace	2014		cow/ox	15	20000
47:	7054012	large	grace	2015		cow/ox	12	16000
48:	7054012	large	grace	2017		cow/ox	10	22000
49:	7085916		cow	2012			0	0
50:	7085916		cow	2014			NA	NA
51:	7085916		cow	2015		cow/ox	2	18000
52:	7085916		cow	2017		cow/ox	6	20000
53:	7096202		large	2012		cow/ox	4	0
54:	7096202		large	2014		cow/ox	2	10000
55:	7096202		large	2015		cow/ox	8	14000
56:	7096202		large	2017		cow/ox	9	20000
57:	7096207		large	2012		cow/ox	1	0
58:	7096207		large	2014		cow/ox	6	12000
59:	7096207		large	2015		cow/ox	7	22000
60:	7096207		large	2017		cow/ox	6	16000
61:	7096218		large	2012		cow/ox	1	0
62:	7096218		large	2014		cow/ox	9	16000
63:	7096218		large	2015		cow/ox	7	16000
64:	7096218		large	2017		cow/ox	6	20000

65:	7106408	cow	2012	cow/ox	2	0
66:	7106408	cow	2014	cow/ox	3	15000
67:	7106408	cow	2016	cow/ox	7	14500
68:	7137207	traditional	2012		0	0
69:	7137207	traditional	2014	cow/ox	1	16000
70:	7137207	traditional	2015	cow/ox	6	14000
71:	7137207	traditional	2017	cow/ox	6	16000
72:	8169519	large grace	2012	Chicken/duck	4	0
73:	8169519	large grace	2014	cow/ox	1	20000
74:	8169519	large grace	2015	cow/ox	6	25000
75:	8169519	large grace	2017	cow/ox	3	40000
76:	8169619	large	2012	Chicken/duck	4	0
77:	8169619	large	2014	cow/ox	3	16000
78:	8169619	large	2016	cow/ox	6	18000
79:	8169619	large	2017	cow/ox	6	38000
	hhid	Arm	Year	LivestockCode	number_owned	mrkt_value

TotalImputedValue

1:	40000
2:	100000
3:	120000
4:	100000
5:	0
6:	40000
7:	100000
8:	120000
9:	20000
10:	160000
11:	80000
12:	80000
13:	0
14:	40000
15:	60000
16:	160000
17:	120000
18:	100000
19:	60000
20:	60000
21:	20000
22:	140000
23:	60000
24:	60000
25:	40000
26:	180000
27:	160000
28:	20000
29:	20000
30:	120000
31:	100000
32:	40000
33:	80000
34:	100000
35:	140000
36:	140000
37:	0
38:	60000
39:	120000
40:	80000
41:	0
42:	80000
43:	40000
44:	200000

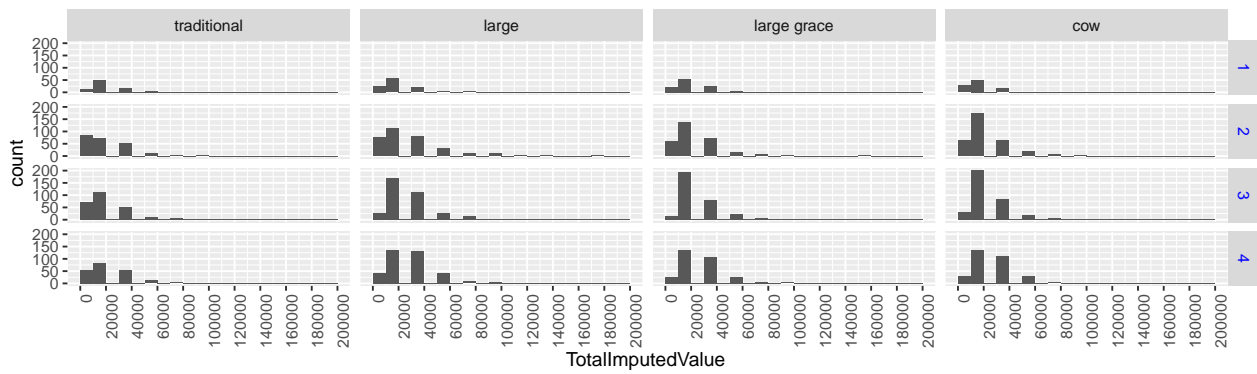


Figure 2: Total imputed value of livestock holding
Livestock holding values are computed by using respective median prices of each year.

45:	80000
46:	300000
47:	240000
48:	200000
49:	0
50:	0
51:	40000
52:	120000
53:	80000
54:	40000
55:	160000
56:	180000
57:	20000
58:	120000
59:	140000
60:	120000
61:	20000
62:	180000
63:	140000
64:	120000
65:	40000
66:	60000
67:	140000
68:	0
69:	20000
70:	120000
71:	120000
72:	0
73:	20000
74:	120000
75:	60000
76:	0
77:	60000
78:	120000
79:	120000
TotalImputedValue	

- cow reports above 20000 holding in rds 2-4 while traditional does not.

	Arm	survey	MeanImputedVal	MeanNumCows	N
1:	traditional	1	5065.33	0.233668	398
2:	traditional	2	15854.00	0.817844	280
3:	traditional	3	20179.62	1.022059	277

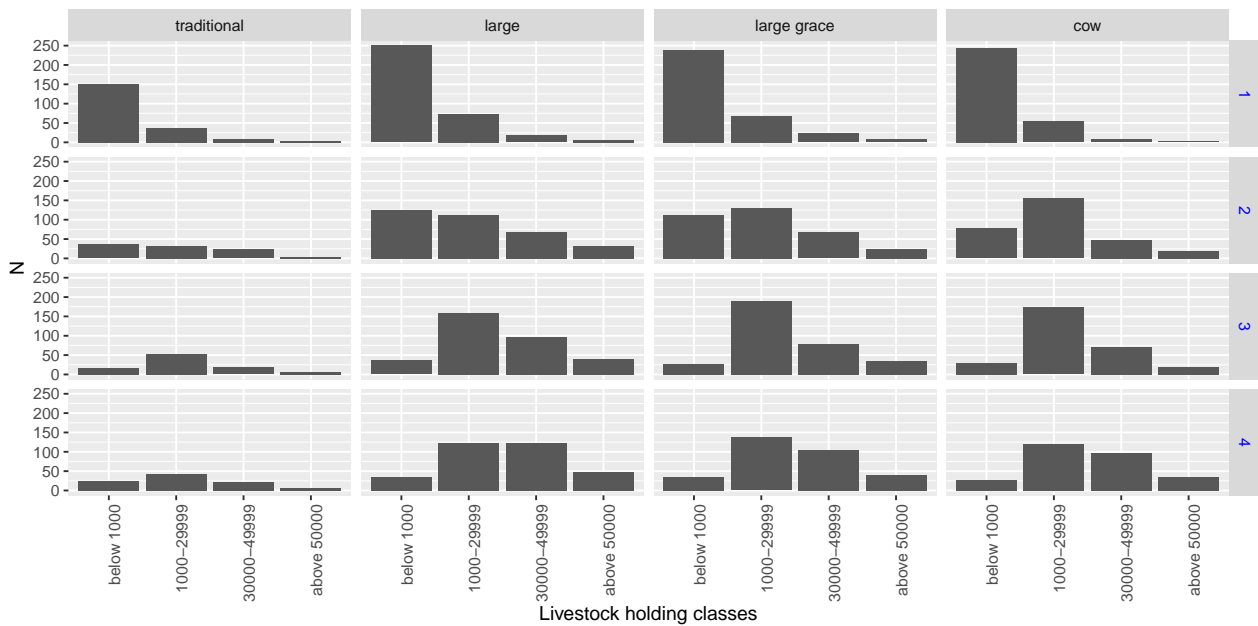


Figure 3: Histogram of livestock holding classes
Livestock holding values are computed by using respective median prices of each year.

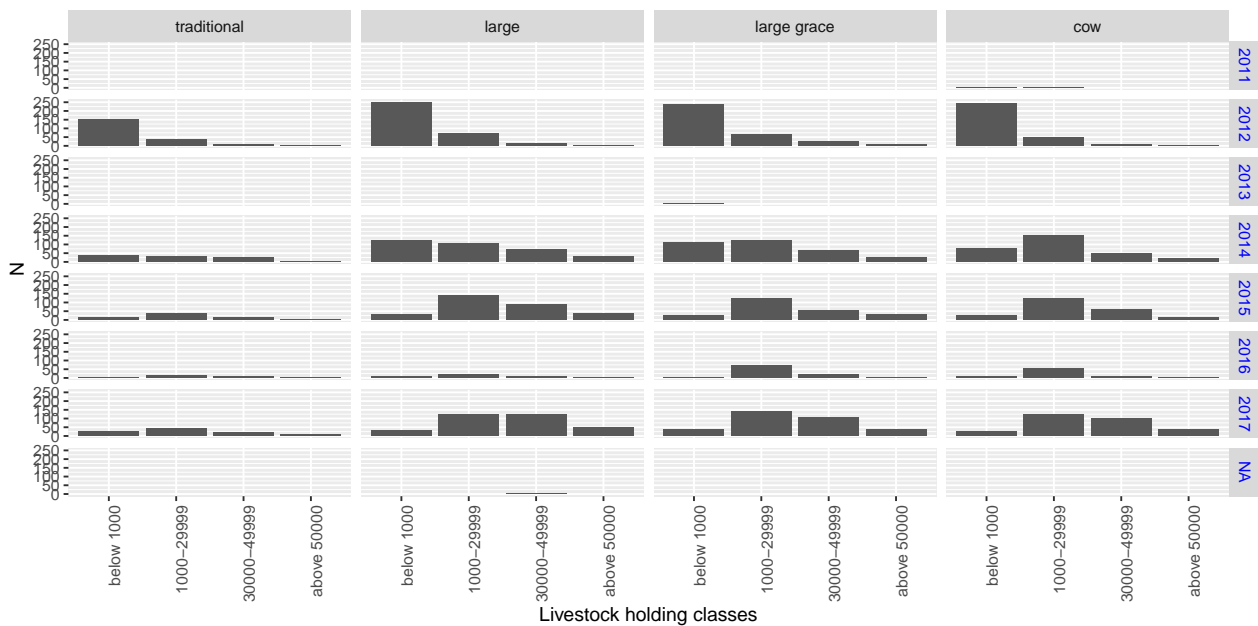


Figure 4: Histogram of livestock holding classes by year
Livestock holding values are computed by using respective median prices of each year.

4:	traditional	4	21233.75	1.050000	240
5:	large	1	6092.42	0.275689	399
6:	large	3	31056.41	1.625000	386
7:	large	2	24992.86	1.278820	383
8:	large	4	32686.07	1.630890	382
9:	large grace	1	7392.54	0.333333	399
10:	large grace	2	21510.32	1.150943	341
11:	large grace	3	27565.65	1.422619	347
12:	large grace	4	30276.97	1.528024	343
13:	cow	1	4997.68	0.218045	399
14:	cow	2	20550.29	1.078035	364
15:	cow	3	25399.62	1.300562	365

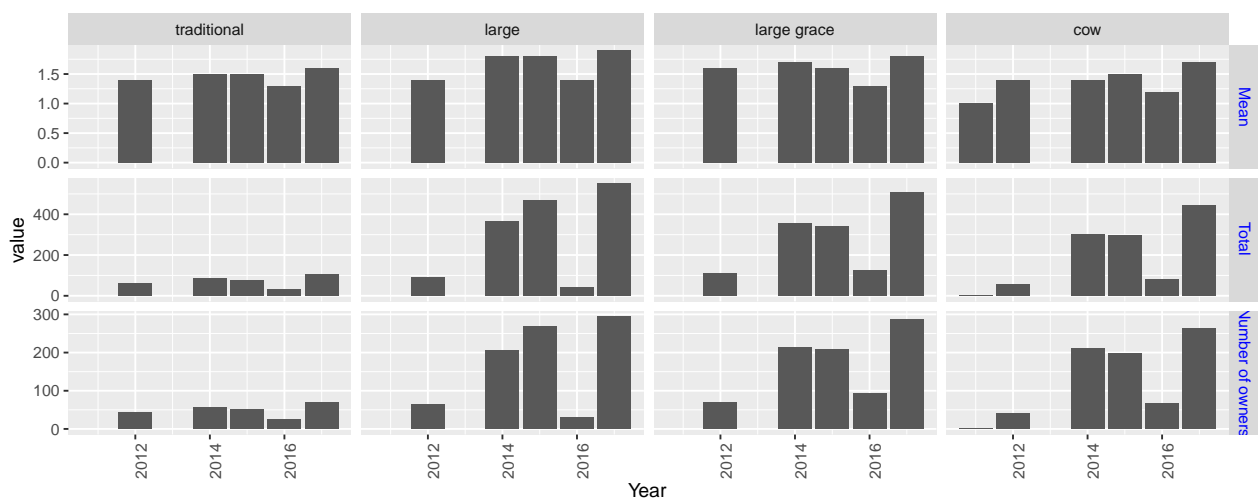


Figure 5: Number of cows/oxen by year

Means are mean holding among the owners. Totals are total number of cows/oxen owned. Mean and total number of cows/oxen may diverge because the number of owners differ across round.

16: cow 4 28700.23 1.436950 342

Finding IV.2 FIGURE 4 shows increasing livestock accumulation in all arms but traditional. FIGURE 5 shows increasing cow ownership relative to traditional in the bottom panel while the holding per owner is similar across all arms. This is evidence of an acceleration of becoming a large livestock owner for the large sized arms relative to the small size arm. Given that the number of cows per owner remains the similar, it does not provide evidence for accelerated growth of livestock after becoming an owner.

IV.5 Assets+Livestock

	creditstatus	
BorrowerStatus	Yes	No
borrower	1192	157
pure saver	0	26
quit membership	0	220

	creditstatus	
Mstatus	Yes	No
gErosion	0	80
gRejection	0	140
iRejection	1	157
iReplacement	0	0
newGroup	0	0
oldMember	1191	26

Dropped 196 obs due to T<2.
Dropped 1402 obs due to NA.
Dropped 196 obs due to T<2.
Dropped 3080 obs due to NA.
Dropped 196 obs due to T<2.
Dropped 1402 obs due to NA.

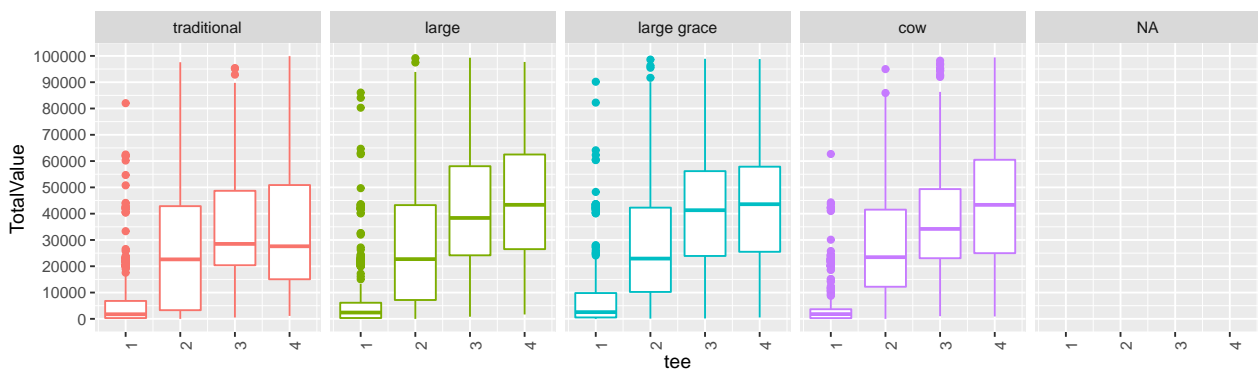


Figure 6: Total asset values
Sum of assets and livestock holding values. Original 1600 HHs.

Dropped 196 obs due to T<2.
Dropped 3080 obs due to NA.
Dropped 130 obs due to T<2.
Dropped 1274 obs due to NA.
Dropped 130 obs due to T<2.
Dropped 1388 obs due to NA.
Dropped 130 obs due to T<2.
Dropped 1274 obs due to NA.
Dropped 130 obs due to T<2.
Dropped 1388 obs due to NA.

tee	traditional	large	large grace	cow
1	398	399	379	398
2	283	390	373	379
3	276	384	348	365
4	238	377	330	328

tee	traditional	large	large grace	cow
1	66	78	81	63
2	151	254	258	283
3	189	348	323	324
4	156	328	291	287

Dropped 196 obs due to T<2.
Dropped 1402 obs due to NA.
Dropped 196 obs due to T<2.
Dropped 3080 obs due to NA.
Dropped 154 obs due to T<2.
Dropped 1272 obs due to NA.
Dropped 154 obs due to T<2.
Dropped 1386 obs due to NA.

Warning in `[.data.table`(AL2R, , `:=`(grepout("Time", colnames(AL2)), NULL)): length(LHS)

TABLE 24: FD ESTIMATION OF TOTAL ASSETS, ORIGINAL HHs

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	11404.6*** (1118.0)	19753.6*** (1690.1)	21220.8*** (1869.8)	21734.1*** (1970.4)	23377.7*** (1896.0)	21081.9*** (2138.4)
Large	5104.6*** (1607.4)	4735.4*** (1742.9)	4703.6*** (1586.1)	4589.2*** (1608.6)	4474.7*** (1624.3)	4732.4*** (1595.8)
LargeGrace	4487.9** (1882.2)	4162.1** (2096.7)	3707.6* (2115.7)	3665.0* (2117.6)	3610.8* (2109.3)	3694.6* (2092.1)
Cow	4867.7*** (1712.9)	5528.9** (2194.3)	5300.5*** (2042.2)	5100.3** (2045.4)	4896.3** (2026.9)	5364.9*** (2070.9)
rd 2 - 3		-6257.7*** (2257.5)	-6188.8*** (2255.6)	-6190.8*** (2255.8)	-8759.7*** (2385.2)	-6188.3*** (2256.1)
Large × rd 2 - 3		5066.2 (5917.0)	5357.9 (5877.8)	5354.6 (5878.7)	6033.4 (5624.2)	5358.9 (5879.1)
LargeGrace × rd 2 - 3		5009.0 (5663.8)	5026.6 (5664.7)	5023.3 (5667.3)	5323.5 (5443.0)	5027.4 (5665.6)
Cow × rd 2 - 3		1083.7 (6448.4)	1023.6 (6484.5)	1022.7 (6485.0)	2204.7 (6218.8)	1023.8 (6485.6)
rd 3 - 4		-18818.5*** (1810.6)	-18849.6*** (1812.3)	-18847.0*** (1811.4)	-20890.1*** (1844.3)	-18850.7*** (1812.4)
Large × rd 3 - 4		-630.0 (4012.9)	-850.0 (4048.5)	-841.0 (4045.1)	-319.6 (3970.2)	-851.7 (4050.0)
LargeGrace × rd 3 - 4		-900.0 (4236.3)	-918.7 (4241.7)	-900.9 (4234.5)	-689.4 (4120.7)	-923.2 (4240.2)
Cow × rd 3 - 4		-7556.5 (5850.3)	-7494.5 (5824.0)	-7482.3 (5822.3)	-6560.3 (5616.4)	-7497.4 (5825.0)
HadCows				-2278.7 (1515.2)	-10323.3*** (2703.7)	
HadCows × rd 2 - 3					13442.7*** (4486.2)	
HadCows × rd 3 - 4					10656.4** (4511.6)	
NumCowsOwnedAtRd1						487.1 (2133.7)
FloodInRd1			-2878.7** (1237.8)	-2867.4** (1240.5)	-2871.8** (1241.0)	-2903.5** (1175.5)
Head literate			1146.7 (1926.6)	1240.8 (1912.6)	1217.6 (1909.8)	1108.1 (1810.0)
$T = 2$	22	22	22	22	22	22
$T = 3$	45	45	43	43	43	43
$T = 4$	1159	1159	1159	1159	1159	1159
\bar{R}^2	0.001	0.038	0.039	0.039	0.042	0.039
$\Pr[\hat{\rho} = 0]$	-0.162 0.000	-0.137 0.000	-0.141 0.000	-0.140 0.000	-0.144 0.000	-0.140 0.000
N	3589	3589	3585	3585	3585	3585

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. Sample is continuing members and replacing members of early rejecters and received loans prior to 2015 January. 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. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 25: FD ESTIMATION OF TOTAL ASSETS BY ATTRIBUTES

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	11404.6*** (1118.0)	19753.6*** (1690.1)	21220.8*** (1869.8)	21734.1*** (1970.4)	23207.8*** (1856.2)	21081.9*** (2138.4)
WithGrace	-616.7 (1904.4)	-573.2 (1986.4)	-996.0 (2056.0)	-924.2 (2043.3)	-809.4 (2024.1)	-1037.8 (1964.3)
LargeSize	5104.6*** (1607.4)	4735.4*** (1742.9)	4703.6*** (1586.1)	4589.2*** (1608.6)	4579.6*** (1609.3)	4732.4*** (1595.8)
NonCash	379.7 (1994.2)	1366.8 (2392.3)	1592.9 (2412.9)	1435.3 (2372.8)	1161.0 (2340.1)	1670.3 (2282.7)
rd 2 - 3		-6257.7*** (2257.5)	-6188.8*** (2255.6)	-6190.8*** (2255.8)	-8711.7*** (2356.5)	-6188.3*** (2256.1)
LargeSize × rd 2 - 3		5066.2 (5917.0)	5357.9 (5877.8)	5354.6 (5878.7)	5938.8 (5660.6)	5358.9 (5879.1)
WithGrace × rd 2 - 3		-57.2 (6105.9)	-331.2 (6060.7)	-331.3 (6061.2)	-754.1 (5837.4)	-331.5 (6061.9)
NonCash × rd 2 - 3		-3925.3 (6622.1)	-4003.0 (6651.3)	-4000.6 (6651.3)	-3013.2 (6353.7)	-4003.6 (6652.6)
rd 3 - 4		-18818.5*** (1810.6)	-18849.6*** (1812.3)	-18847.0*** (1811.4)	-20870.6*** (1808.7)	-18850.7*** (1812.4)
LargeSize × rd 3 - 4		-630.0 (4012.9)	-850.0 (4048.5)	-841.0 (4045.1)	-364.0 (3961.4)	-851.7 (4050.0)
WithGrace × rd 3 - 4		-269.9 (4086.8)	-68.7 (4126.2)	-59.9 (4121.1)	-378.1 (4037.1)	-71.5 (4126.2)
NonCash × rd 3 - 4		-6656.5 (5901.2)	-6575.8 (5875.0)	-6581.4 (5872.5)	-5832.4 (5628.4)	-6574.2 (5876.0)
HadCows				-2278.7 (1515.2)	-10139.4*** (2592.2)	
HadCows × rd 2 - 3					13317.1*** (4300.6)	
HadCows × rd 3 - 4					10623.6** (4429.2)	
NumCowsOwnedAtRd1						487.1 (2133.7)
FloodInRd1			-2878.7** (1237.8)	-2867.4** (1240.5)	-2850.0** (1237.2)	-2903.5** (1175.5)
Head literate			1146.7 (1926.6)	1240.8 (1912.6)	1305.8 (1892.5)	1108.1 (1810.0)
HadCows × WithGrace					-3933.7 (2933.8)	
HadCows × WithGrace × rd 2 - 3					3515.8 (8486.7)	
HadCows × WithGrace × rd 3 - 4					1384.1 (8823.0)	
$T = 2$	22	22	22	22	22	22
$T = 3$	45	45	43	43	43	43
$T = 4$	1159	1159	1159	1159	1159	1159
\bar{R}^2	0.001	0.038	0.039	0.039	0.041	0.039
$\hat{\rho}$	-0.162	-0.137	-0.141	-0.140	-0.146	-0.140
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000
N	3589	3589	3585	3585	3585	3585

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. LargeSize is an indicator function if the arm is of large size, WithGrace is an indicator function if the arm is with a grace period, NonCash is an indicator function if the arm provides a cow. Sample is continuing members and replacing members of early rejecters and received loans prior to 2015 January. 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. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 26: FD ESTIMATION OF TOTAL ASSETS, MODERATELY POOR VS. ULTRA POOR, ORIGINAL HHs

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	15537.3*** (932.3)	24333.5*** (1768.0)	25590.3*** (1985.6)	25590.3*** (1985.6)	25590.3*** (1985.6)	25472.5*** (2224.6)
UltraPoor	25.0 (963.9)	-514.3 (1108.0)	-478.5 (1130.9)	-478.5 (1130.9)	-478.5 (1130.9)	-442.4 (1211.0)
rd 2 - 3		-5986.3** (2520.3)	-5927.6** (2524.1)	-5927.6** (2524.1)	-5927.6** (2524.1)	-5926.9** (2524.8)
UltraPoor × rd 2 - 3		-157.7 (5300.2)	-26.2 (5342.4)	-26.2 (5342.4)	-26.2 (5342.4)	-28.8 (5342.4)
rd 3 - 4		-19412.3*** (2056.5)	-19431.0*** (2052.2)	-19431.0*** (2052.2)	-19431.0*** (2052.2)	-19431.7*** (2052.4)
UltraPoor × rd 3 - 4		4363.8 (3176.7)	4170.7 (3135.6)	4170.7 (3135.6)	4170.7 (3135.6)	4168.9 (3133.1)
NumCowsOwnedAtRd1						378.7 (2218.5)
FloodInRd1			-2953.3*** (1131.6)	-2953.3*** (1131.6)	-2953.3*** (1131.6)	-2969.9*** (1082.9)
Head literate			1273.2 (1873.4)	1273.2 (1873.4)	1273.2 (1873.4)	1249.8 (1780.0)
$T = 2$	22	22	22	22	22	22
$T = 3$	45	45	43	43	43	43
$T = 4$	1159	1159	1159	1159	1159	1159
\bar{R}^2	0	0.037	0.038	0.038	0.038	0.038
$\hat{\rho}$	-0.157	-0.144	-0.140	-0.140	-0.140	-0.136
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000
N	3589	3589	3585	3585	3585	3585

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. UltraPoor is an indicator function if the household is classified as the ultra poor. Sample is continuing members and replacing members of early rejecters and received loans prior to 2015 January. Household assets do not include livestock.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

IV.6 Incomes

Dropped 4546 obs due to $T < 2$.
Dropped 1133 obs due to NA.
Dropped 4546 obs due to $T < 2$.
Dropped 1469 obs due to NA.
Dropped 6242 obs due to NA.
Dropped 6250 obs due to NA.

Dropped 4546 obs due to $T < 2$.
Dropped 1133 obs due to NA.
Dropped 4546 obs due to $T < 2$.
Dropped 1469 obs due to NA.
Dropped 6242 obs due to NA.
Dropped 6250 obs due to NA.

Income sources are mainly labour incomes (lab) and farm revenues (far) with 6165 and 6400 observations, respectively. After first-differencing, they become 486 and 150 observations, with 486 households observed for 487 times.

Obs for survey labour income.

1	2	3	4
1	311	128	46

Obs for survey labour income and admin repayment data.

3	4
106	43

3 4
79 71

Obs for survey farm revenue.

3 4
79 71

Obs for survey farm revenue and admin repayment data.

3 4
79 71

TABLE 27: FD ESTIMATION OF INCOMES

	Labour income (Tk)				Farm income (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	5.77** (2.93)	1.79 (3.70)	-1.98 (4.12)	3.71 (5.50)	-8.30 (6.88)	-12.09 (7.91)	-13.90 (8.47)
Large	-1.46 (4.10)	0.07 (4.54)	0.72 (4.18)	-7.41 (5.45)	9.95 (7.00)	11.72 (7.51)	10.60 (8.05)
LargeGrace	-5.55 (4.49)	-3.18 (5.13)	-2.26 (4.55)	-11.58** (5.20)	9.82 (7.04)	4.92 (8.92)	-8.15 (17.68)
Cow	-7.57 (4.98)	-6.37 (5.42)	-5.56 (4.89)	2.73 (10.02)	6.90 (7.13)	7.52 (7.77)	-0.40 (10.54)
rd 2 - 3		10.53*** (3.62)	10.43*** (3.68)	15.42*** (5.46)		7.12 (8.70)	15.49 (14.99)
Large × rd 2 - 3		-2.05 (10.60)	-4.24 (10.87)	6.99 (10.78)		10.01 (11.79)	1.45 (24.63)
LargeGrace × rd 2 - 3		-9.10 (11.77)	-8.73 (12.04)	0.75 (11.55)		57.96 (35.81)	37.68 (30.26)
Cow × rd 2 - 3		1.74 (12.13)	1.45 (12.53)	-9.88 (16.26)		18.42 (12.21)	-14.08 (36.04)
rd 3 - 4		-2.45 (6.20)	-2.02 (6.87)				
Large × rd 3 - 4		4.19 (20.89)	1.75 (22.21)				
LargeGrace × rd 3 - 4		10.92 (20.98)	10.33 (22.02)				
Cow × rd 3 - 4		22.38 (25.28)	22.81 (26.87)				
FloodInRd1			8.45*** (3.19)	1.57 (2.85)			-3.39 (3.17)
Head literate			-10.73 (7.42)	-11.10** (5.61)			1.89 (2.56)
6M repayment				-4.16 (8.53)			17.33 (15.06)
6M net saving				53.01** (22.38)			61.67 (61.19)
6M other member net saving				-68.04 (90.53)			-409.32 (355.57)
6M other member Repaid				-56.00*** (14.01)			-22.53 (28.02)
T = 2	240	240	239	82	56	56	56
T = 3	78	78	76	31	47	47	47
T = 4	30	30	30	0	0	0	0
R ²	0	0.008	0.026	0.202	-0.018	0.027	0.031
Pr[ρ̂ = 0]	-0.142 0.056	-0.190 0.006	-0.184 0.011	-0.350 0.067	-0.575 0.000	-0.675 0.000	-0.612 0.000
N	486	486	481	144	150	150	150

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\text{Pr}[\rho = 0]$ is its p value. Sample is continuing members and replacing members of early rejecters and received loans prior to 2015 January. Labour income is in 1000 Tk unit and is sum of all earned labour incomes. Farm revenue is total of agricultural produce sales.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 28: FD ESTIMATION OF INCOMES BY ATTRIBUTES

	Labour income (Tk)				Farm income (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	5.77** (2.93)	1.79 (3.70)	-1.98 (4.12)	3.71 (5.50)	-8.30 (6.88)	-12.09 (7.91)	-13.90 (8.47)
WithGrace	-4.09 (4.45)	-3.25 (4.74)	-2.99 (4.24)	-4.18 (4.77)	-0.13 (1.98)	-6.80 (5.01)	-18.75 (14.89)
LargeSize	-1.46 (4.10)	0.07 (4.54)	0.72 (4.18)	-7.41 (5.45)	9.95 (7.00)	11.72 (7.51)	10.60 (8.05)
NonCash	-2.02 (5.27)	-3.19 (5.59)	-3.29 (5.01)	14.31 (9.95)	-2.92 (2.39)	2.60 (5.41)	7.75 (10.04)
rd 2 - 3		10.53*** (3.62)	10.43*** (3.68)	15.42*** (5.46)		7.12 (8.70)	15.49 (14.99)
LargeSize × rd 2 - 3		-2.05 (10.60)	-4.24 (10.87)	6.99 (10.78)		10.01 (11.79)	1.45 (24.63)
WithGrace × rd 2 - 3		-7.04 (8.55)	-4.49 (8.61)	-6.23 (8.12)		47.95 (34.26)	36.23 (24.81)
NonCash × rd 2 - 3		10.84 (10.39)	10.18 (10.64)	-10.63 (13.07)		-39.54 (34.41)	-51.77 (41.55)
rd 3 - 4		-2.45 (6.20)	-2.02 (6.87)				
LargeSize × rd 3 - 4		4.19 (20.89)	1.75 (22.21)				
WithGrace × rd 3 - 4		6.73 (7.16)	8.58 (7.70)				
NonCash × rd 3 - 4		11.46 (15.94)	12.49 (16.99)				
FloodInRd1			8.45*** (3.19)	1.57 (2.85)			-3.39 (3.17)
Head literate			-10.73 (7.42)	-11.10** (5.61)			1.89 (2.56)
6M repayment				-4.16 (8.53)			17.33 (15.06)
6M net saving				53.01** (22.38)			61.67 (61.19)
6M other member net saving				-68.04 (90.53)			-409.32 (355.57)
6M other member Renaid				-56.00*** (14.01)			-22.53 (28.02)
$T = 2$	240	240	239	82	56	56	56
$T = 3$	78	78	76	31	47	47	47
$T = 4$	30	30	30	0	0	0	0
\bar{R}^2	0	0.008	0.026	0.202	-0.018	0.027	0.031
$\hat{\rho}$	-0.142	-0.190	-0.184	-0.350	-0.575	-0.675	-0.612
$\Pr[\hat{\rho} = 0]$	0.056	0.006	0.011	0.067	0.000	0.000	0.000
N	486	486	481	144	150	150	150

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. LargeSize is an indicator function if the arm is of large size, WithGrace is an indicator function if the arm is with a grace period, NonCash is an indicator function if the arm provides a cow. Sample is continuing members and replacing members of early rejecters and received loans prior to 2015 January. Labour income is in 1000 Tk unit and is sum of all earned labour incomes. Farm revenue is total of agricultural produce sales.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 29: FD ESTIMATION OF INCOMES, MODERATELY POOR VS. ULTRA POOR

	Labour income (Tk)				Farm income (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	0.55 (3.43)	-2.50 (4.13)	-4.89 (4.13)	3.29 (4.72)	0.27 (1.43)	-2.58 (4.01)	-7.83 (8.24)
UltraPoor	1.60 (3.47)	1.75 (3.73)	0.67 (3.76)	-5.43 (5.36)	0.26 (1.17)	-2.18 (2.18)	-1.03 (1.93)
rd 2 - 3		11.37*** (3.60)	11.39*** (3.62)	13.58*** (4.59)		8.44 (9.23)	10.95 (12.17)
UltraPoor × rd 2 - 3		-6.80 (7.41)	-8.11 (7.56)	11.22 (7.71)		18.97 (14.94)	15.57 (12.36)
rd 3 - 4		0.02 (4.71)	0.47 (5.40)				
UltraPoor × rd 3 - 4		-12.68 (8.70)	-13.99 (9.04)				
FloodInRd1			8.60*** (3.01)	3.05 (2.99)			-3.11 (3.08)
Head literate			-10.70 (7.16)	-8.16 (6.10)			2.17 (2.86)
6M repayment				-3.76 (7.19)			16.01 (12.19)
6M net saving				54.47** (21.50)			58.06 (56.78)
6M other member net saving				-25.90 (80.60)			-259.81 (225.98)
6M other member Renaid				-59.22*** (11.96)			-1.66 (11.70)
$T = 2$	240	240	239	82	56	56	56
$T = 3$	78	78	76	31	47	47	47
$T = 4$	30	30	30	0	0	0	0
\bar{R}^2	-0.002	0.01	0.029	0.192	-0.007	0.003	-0.002
$\hat{\rho}$	-0.142	-0.156	-0.181	-0.120	-0.801	-0.860	-0.365
$\Pr[\hat{\rho} = 0]$	0.067	0.034	0.019	0.495	0.000	0.000	0.000
N	486	486	481	144	150	150	150

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. UltraPoor is an indicator function if the household is classified as the ultra poor. Sample is continuing members and replacing members of early rejecters and received loans prior to 2015 January. Labour income is in 1000 Tk unit and is sum of all earned labour incomes. Farm revenue is total of agricultural produce sales.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

IV.7 Consumption

	ConsumptionBaseline	
Arm	0	1
traditional	513	284
large	146	1002
large grace	51	981
cow	200	874

Dropped 4028 obs due to NA.
Dropped 4029 obs due to NA.

Warning in `[.data.table`(dat, , `:=`(grepout("Time.?2", colnames(dat)), : length(LHS)==0;

Consumption is observed in rd 2-4. There are 6400 observations, with first-differencing, it becomes 2372 observations with 42, 2330 households observed for 2, 3 times.

Dropped 4028 obs due to NA.
Dropped 4029 obs due to NA.

Warning in `[.data.table`(dat, , `:=`(grepout("Time.?2|Arm", colnames(dat)), : length(LHS);

TABLE 30: FD ESTIMATION OF CONSUMPTION

covariates	Per capita consumption (Tk)				Per capita hygiene consumption (Tk)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	336.8*** (37.7)	571.9*** (60.1)	569.1*** (61.6)	562.8*** (64.5)	171.7*** (21.3)	214.9*** (32.2)	207.3*** (33.9)
Large	8.9 (50.7)	8.6 (68.8)	7.5 (68.6)	16.2 (70.3)	28.4 (26.7)	46.9 (36.6)	43.4 (37.8)
LargeGrace	-36.8 (50.1)	-82.0 (60.3)	-82.5 (60.5)	-88.5 (63.2)	13.6 (27.6)	4.1 (32.0)	13.8 (30.8)
Cow	-40.6 (46.4)	-9.1 (58.8)	-20.5 (57.9)	-27.2 (64.8)	1.2 (28.0)	35.5 (35.0)	37.4 (34.9)
rd 3 - 4		-461.2*** (70.8)	-448.9*** (70.7)	-449.1*** (73.1)		-109.5*** (35.1)	-91.4*** (34.0)
Large \times rd 3 - 4		3.5 (222.4)	8.2 (222.9)	-8.6 (236.1)		-103.3 (103.7)	-61.2 (108.3)
LargeGrace \times rd 3 - 4		260.1 (220.6)	261.7 (220.7)	270.4 (220.4)		53.1 (110.9)	81.9 (110.5)
Cow \times rd 3 - 4		-158.3 (209.6)	-118.6 (208.6)	-105.5 (210.1)		-186.2* (100.7)	-163.1* (98.5)
FloodInRd1			-9.3 (27.6)	-14.0 (31.8)			-1.0 (17.3)
Head literate			35.8 (37.5)	35.2 (37.9)			28.7 (24.5)
6M repayment				22.2 (84.4)			37.1 (49.2)
6M net saving				-118.1 (219.2)			69.2 (130.8)
6M other member net saving				-222.7 (1063.8)			578.1 (427.9)
6M other member Renaid				58.4 (161.7)			15.5 (80.7)
$T = 2$	42	42	42	43	42	42	43
$T = 3$	1165	1165	1162	1161	1165	1165	1161
\bar{R}^2	-0.001	0.072	0.07	0.07	-0.001	0.019	0.018
$\hat{\rho}$	-0.456	-0.374	-0.370	-0.360	-0.319	-0.266	-0.253
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N	2372	2372	2366	2365	2372	2372	2365

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. Sample is continuing members and replacing members of early rejecters and received loans prior to 2015 January. Consumption is annualised values.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

TABLE 31: FD ESTIMATION OF CONSUMPTION BY ATTRIBUTES

covariates	Per capita consumption (Tk)				Per capita hygiene consumption (Tk)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	336.8*** (37.7)	571.9*** (60.1)	569.1*** (61.6)	562.8*** (64.5)	171.7*** (21.3)	214.9*** (32.2)	207.3*** (33.9)
WithGrace	-45.7 (47.3)	-90.6 (59.6)	-90.0 (59.8)	-104.7* (62.3)	-14.9 (23.8)	-42.8 (29.9)	-29.6 (31.6)
LargeSize	8.9 (50.7)	8.6 (68.8)	7.5 (68.6)	16.2 (70.3)	28.4 (26.7)	46.9 (36.6)	43.4 (37.8)
NonCash	-3.8 (42.7)	72.9 (47.7)	62.0 (47.4)	61.3 (49.1)	-12.3 (25.2)	31.4 (27.8)	23.5 (25.3)
rd 3 - 4		-461.2*** (70.8)	-448.9*** (70.7)	-449.1*** (73.1)		-109.5*** (35.1)	-91.4*** (34.0)
LargeSize × rd 3 - 4		3.5 (222.4)	8.2 (222.9)	-8.6 (236.1)		-103.3 (103.7)	-61.2 (108.3)
WithGrace × rd 3 - 4		256.5 (198.0)	253.4 (198.4)	279.0 (196.7)		156.3 (100.5)	143.1 (96.7)
NonCash × rd 3 - 4		-418.4** (183.6)	-380.3** (182.3)	-375.9** (182.6)		-239.2** (97.4)	-245.0*** (93.6)
FloodInRd1			-9.3 (27.6)	-14.0 (31.8)			-1.0 (17.3)
Head literate			35.8 (37.5)	35.2 (37.9)			28.7 (24.5)
6M repayment				22.2 (84.4)			37.1 (49.2)
6M net saving				-118.1 (219.2)			69.2 (130.8)
6M other member net saving				-222.7 (1063.8)			578.1 (427.9)
6M other member Renaid				58.4 (161.7)			15.5 (80.7)
$T = 2$	42	42	42	43	42	42	43
$T = 3$	1165	1165	1162	1161	1165	1165	1161
\bar{R}^2	-0.001	0.072	0.07	0.07	-0.001	0.019	0.018
$\hat{\rho}$	-0.456	-0.374	-0.370	-0.360	-0.319	-0.266	-0.253
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N	2372	2372	2366	2365	2372	2372	2365

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. LargeSize is an indicator function if the arm is of large size, WithGrace is an indicator function if the arm is with a grace period, NonCash is an indicator function if the arm provides a cow. Sample is continuing members and replacing members of early rejecters and received loans prior to 2015 January. Consumption is annualised values.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

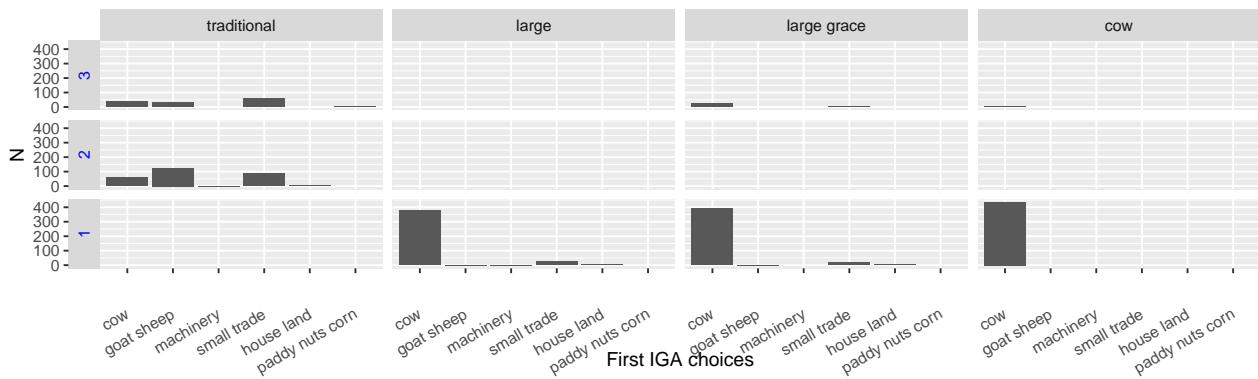


Figure 7: Income generating activity choices
The first income generating activity choices are plotted.

TABLE 32: FD ESTIMATION OF CONSUMPTION, MODERATELY POOR VS. ULTRA POOR

covariates	Per capita consumption (Tk)				Per capita hygiene consumption (Tk)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	335.3*** (25.4)	565.2*** (47.1)	547.9*** (45.4)	547.3*** (46.7)	195.7*** (14.4)	255.0*** (24.5)	246.6*** (25.3)
UltraPoor	-25.5 (24.2)	-26.8 (29.2)	-16.3 (28.0)	-18.9 (27.8)	-16.3 (16.3)	-19.9 (17.2)	-15.5 (17.4)
rd 3 - 4		-454.9*** (75.1)	-438.8*** (74.2)	-443.4*** (77.2)		-113.3*** (38.2)	-95.7*** (36.1)
UltraPoor × rd 3 - 4		-20.0 (89.1)	-56.7 (82.5)	-53.6 (83.6)		12.7 (54.9)	-3.6 (55.1)
FloodInRd1			-4.9 (28.0)	-5.7 (31.4)			-1.7 (17.2)
Head literate			35.5 (35.9)	34.8 (36.4)			27.5 (23.6)
6M repayment				17.6 (86.5)			37.5 (49.9)
6M net saving				-112.3 (227.7)			82.0 (131.5)
6M other member net saving				-182.6 (971.7)			428.8 (430.7)
6M other member Renaid				0.9 (163.2)			-0.3 (78.1)
T = 2	42	42	42	43	42	42	43
T = 3	1165	1165	1162	1161	1165	1165	1161
\bar{R}^2	0	0.065	0.064	0.063	0	0.011	0.01
$\hat{\rho}$	-0.458	-0.375	-0.369	-0.363	-0.322	-0.298	-0.282
Pr[$\hat{\rho} = 0$]	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N	2372	2372	2366	2365	2372	2372	2365

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using administrative and survey data. First-differenced ($\Delta x_{t+1} \equiv x_{t+1} - x_t$) regressands are regressed on categorical and time-variant covariates. Head age and literacy are from baseline survey data. ρ indicates the AR(1) coefficient of first-difference residuals as suggested by ?, 10.71 and $\Pr[\rho = 0]$ is its p value. UltraPoor is an indicator function if the household is classified as the ultra poor. Sample is continuing members and replacing members of early rejecters and received loans prior to 2015 January. Consumption is annualised values.

2. ***, **, * indicate statistical significance at 1%, 5%, 10%, respectively. Standard errors are clustered at group (village) level.

IV.8 IGA

Finding IV.3 FIGURE 7, 8 show that there are very few members who chose to invest in more than one project for the “large” arms, while in the traditional arm, almost no one invested only in one project. Goat/sheep and small trades are the top choices for the first IGA in traditional. This indicates the existence of both a liquidity constraint and convexity in the production technology of large domestic animals. This also validates our supposition that dairy livestock production is the most preferred and probably the only economically viable investment choice. It reduces a concern that the cow arm may have imposed an unnecessary restriction in an in-

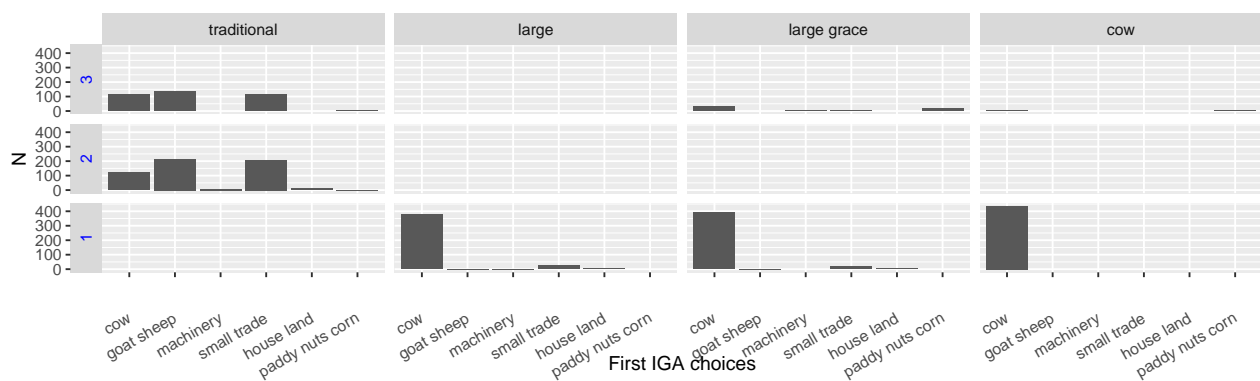


Figure 8: All income generating activity choices
All of multiple investment choices are summed by arms and the number of IGAs and plotted as bars.

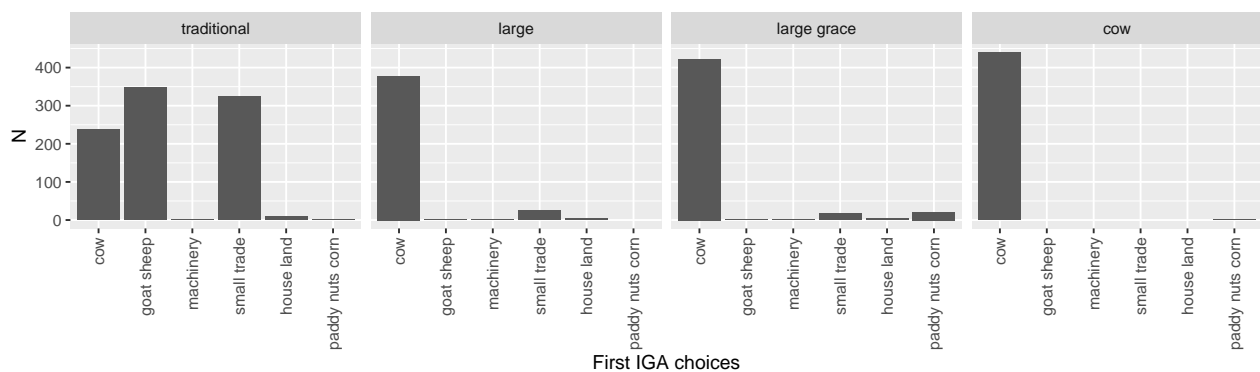


Figure 9: All income generating activity choices collapsed over different number of IGAs
All of multiple investment choices are summed by arms and plotted as bars.

vestment choice by forcing to receive a cow. FIGURE 9 shows there are a significant number of cases in the traditional arm that members reportedly raise cows, yet they are also accompanied by parallel projects in smaller livestock production and small trades. Contrasting large, large grace with cow arms, it suggests that entrepreneurship (to the extent that is necessary for dairy livestock production) may not be an impediment for a microfinance loan uptake among members.

Together with TABLE 11 showing smaller net saving and repayment among traditional, the restriction on a project choice induced by a smaller loaned sum resulted in smaller returns.