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# I Summary

**Schooling** Increased in Cow arms for girls in rd 1 vs rd 4 comparisons.

**Net saving and repayments** Smaller in traditional arm.

**Assets** Increased in all arms. Initially increased then decreased. There might have been liquidation of assets to repay the loans.

**Labour incomes** Increased steadily during rd 2-4 in all arms.

**Consumption** Increased during rd 2-4 in all arms.

**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.

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 will further add HH ID information from the admin file if possible.

## 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.
- sch1 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.
- sch2 Schooling panel after augmenting attrited children to sch1. Attrited children are augmented by assuming to be out of school. AssignRegression is group classification: Number of observation is 618, 633, 594, 593, 363, 100 for traditional, large, largeGrace, cow, dropOuts, forcedDropOuts, respectively.
- ros roster to condition the initial status prior to participation.
- ass Assets. Household assets (houses, durables) and productive assets (machines, tools).
- lvo Livestock holding. Rd 3 data is not entered yet.
- 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.

## II.2 Sample selection and treatment assignment

### II.2.1 Admin info

```
adw2 <- readRDS(paste0(path1234, "admin_data_wide2.rds"))
idfu <- readRDS(paste0(pathsave, "idfu.rds"))
```

Redefine arms to include DropOuts in original arms.

```
setkey(idfu, hhid)
setkey(adw2, hhid)
adw3 <- idfu[adw2]
adw3[, MemNum := 1:N, by = .(hhid, Year)]
#table0(adw3[MemNum==1, .(ArmInidfu, randomArm)])
adw3[, RArm := Arm]
adw3[grepl("^drop", Arm) & grepl("con", randomArm), RArm := "traditional"]
adw3[grepl("^drop", Arm) & grepl("^La.*t$", randomArm), RArm := "large"]
adw3[grepl("^drop", Arm) & grepl("^La.*gr", randomArm), RArm := "large grace"]
adw3[grepl("^drop", Arm) & grepl("^pack", randomArm), RArm := "cow"]
ad0 <- adw3[,
.(RArm, Arm, randomArm, groupid, hhid, TradGroup,
creditstatus, Mem, povertystatus,
Date, Year, Month, DisDate1, MonthsElapsed, MonthsRepaid, LoanYear,
EffectiveRepayment, value.repay, value.NetSaving, value.missw,
OtherRepaid, OtherNetSaving, OtherMisses, CumOtherMisses,
CumRepaid, CumEffectiveRepayment, CumNetSaving, CumPlannedInstallment,
CumOtherRepaid, CumOtherNetSaving, CumMisses, EffectivelyFullyRepaid,
CumRepaidRate, CumEffectiveRepaidRate)]
```

## II.2.2 Merge admin and roster files

How I combined between pages: First, merge time-invariant portion of admin data adbase with roster data ros with hhid as a key. Then it is merged with time-variant portion of admin data adrest with hhid, Year, Month as keys. Second, merge adbase+adrest+ros with other data sch1, sch2, ass, ...

By merging in this way, I have RArm information for each HH in survey 1:

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

AssignOriginal					
Arm	traditional	large	large	grace	cow <NA>
traditional	7812	0		0	0
large	0	7596		0	0
large grace	0	0		7453	0
cow	0	0		0	7597
<NA>	0	0		0	2765

Observations with no povertystatus are drop outs and rejecters.

```
table0(ar.0[, povertystatus])
```

Ultra Poor	Moderate	Poor	<NA>
21203		9255	2765

```
table0(ar.0[is.na(povertystatus), .(Mstatus, survey)])
```

survey				
Mstatus	1	2	3	4
gErosion	344	229	233	0
gRejection	560	487	466	0
iRejection	0	0	0	446
iReplacement	0	0	0	0
newGroup	0	0	0	0
oldMember	0	0	0	0

```
summary(ar.0[hhid %in% hhid[is.na(povertystatus)],  
.(hhid, Mstatus, survey, creditstatus)])
```

hhid	Mstatus	survey	creditstatus
Min. : 7020501	gErosion : 806	Min. : 1.00	Yes : 0
1st Qu.: 7031914	gRejection : 1513	1st Qu.: 1.00	No : 0
Median : 7085811	iRejection : 446	Median : 2.00	Replaced Member: 0
Mean : 13884824	iReplacement: 0	Mean : 2.25	NA's : 2765
3rd Qu.: 8148314	newGroup : 0	3rd Qu.: 3.00	
Max. : 81710220	oldMember : 0	Max. : 4.00	

There are 46 members (newGroup 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		

So are the same with 104 oldMember in Mstatus:

groupid	survey	DisDate1	creditstatus	
70425:20	Min. :1.00	Min. :NA	Yes	: 0
70650:12	1st Qu.:1.75	1st Qu.:NA	No	:104
70861:28	Median :2.50	Median :NA	Replaced Member:	0
71166: 8	Mean :2.50	Mean :NA		
71372:12	3rd Qu.:3.25	3rd Qu.:NA		
81693:24	Max. :4.00	Max. :NA		
		NA's :104		
Mstatus	CumRepaid	CumNetSaving	Arm	
gErosion : 0	Min. : 0	Min. : -2780	traditional:	104
gRejection : 0	1st Qu.: 0	1st Qu.: 0	large	: 0
iRejection : 0	Median : 0	Median : 462	large grace:	0
iReplacement: 0	Mean : 844	Mean : 487	cow	: 0
newGroup : 0	3rd Qu.: 0	3rd Qu.: 958		
oldMember :104	Max. :16800	Max. : 1804		
	NA's :26	NA's :26		

There are 12 members (iReplacement in Mstatus) who did not borrow but only saved.

groupid	survey	DisDate1	creditstatus	Mstatus
70650:12	Min. :1.00	Min. :NA	Yes	: 0
	1st Qu.:1.75	1st Qu.:NA	No	:12
	Median :2.50	Median :NA	Replaced Member:	0
	Mean :2.50	Mean :NA		
	3rd Qu.:3.25	3rd Qu.:NA		
	Max. :4.00	Max. :NA		
		NA's :12		
CumRepaid	CumNetSaving	Arm		
Min. :0	Min. : 60	traditional:	12	
1st Qu.:0	1st Qu.: 150	large	: 0	
Median :0	Median : 220	large grace:	0	
Mean :0	Mean : 481	cow	: 0	
3rd Qu.:0	3rd Qu.: 585			
Max. :0	Max. :1415			

Create BorrowerStatus to indicate these guys. Set No in creditstatus if NA in DisDate1.

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 :379			
pure saver: 49			

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

	AssignOriginal					
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.2.3 Merge village level info

```
library(readstata13)
vr ← read.dta13(paste0(pathcleaned, "RCT_village.dta"),
generate.factors = T, nonint.factors = T)
vr ← data.table(vr)
vr[, GroupStatus := "accepted"]
vr[grepl("De", comment), GroupStatus := "group rejection"]
vr[grepl("Ero", comment), GroupStatus := "erosion"]
setnames(vr, c("comment", "randomization"), c("GroupComment", "VArm"))

setkey(vr, groupid)
setkey(ar.1, groupid)
ar ← vr[ar.1]
```

```
# individual replacing members: GroupStatus: NA => accepted
ar[grepl("Rep", Mstatus), GroupStatus := "accepted"]
```

Tabulation of AssignOriginal against VArm. It 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 by o1600 and round
table0(ar[, .(o1600, survey)])
```

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

```
# tabulation of 1 obs per HH by o1600 and round. o1600 == 0 is added HHs through newGroup
table0(ar[MemNum==1, .(o1600, survey)])
```

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

Tabulate observations without disbursement date info. Note: iReplacement are borrower in BorrowerStatus. (Did they remain as a member?)

	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 :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      BorrowerStatus
Yes      :1695      gErosion      : 80      borrower      :1854
No      : 428      gRejection      : 140      pure saver      : 49
Replaced Member: 0      iRejection      : 160      quit membership: 220
      iReplacement: 115
      newGroup      : 408
      oldMember      :1220

```

Breakdown of first disbursement by RArm at rd 1 in roster + admin 2.

	traditional	large	large	grace	cow
BeforeJan2015	170	296		278	248
Year2015	31	52		60	60
Year2016	0	0		0	0
AfterJan2017	0	0		0	0
RejectedLoans	199	52		62	92
total	400	400		400	400

Tabulation of membership status against GroupStatus from "RCT\_village.dta".

	GroupStatus			
Mstatus	accepted	erosion	group	rejection
gErosion	0	189		0
gRejection	0	0		372
iRejection	543	0		114
iReplacement	445	0		0
newGroup	1603	0		0
oldMember	4747	0		0

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

	GroupStatus			
Mstatus	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.

	RArm				
Mstatus	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

	RArm				
Mstatus	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

Create time-invariant HHinfo from ar. Create roster member total RosterMemTotal.

```
ar[, RosterMemTotal := .N, by = .(hhid, survey, IntDate)]
```

```
# HH member orders
```

```
table0(ar[, .(MemNum, survey)])
```

	survey			
MemNum	1	2	3	4
1	2123	1983	1993	1914
2	2061	1930	1930	1841
3	1874	1781	1782	1691
4	1414	1408	1415	1324
5	744	778	803	734
6	290	302	311	260
7	88	96	98	79
8	32	38	40	29
9	6	10	10	4
10	1	1	3	1
11	0	0	1	0

```
# HH size distribution
```

```
table0(ar[MemNum == RosterMemTotal, .(MemNum, survey)])
```

	survey			
MemNum	1	2	3	4
1	62	53	63	73
2	187	149	148	150
3	460	373	367	367
4	670	630	612	590
5	454	476	492	474
6	202	206	213	181
7	56	58	58	50
8	26	28	30	25
9	5	9	7	3
10	1	1	2	1
11	0	0	1	0

```
# single member HHs
```

```
ar[hhid %in% hhid[RosterMemTotal == 1],
```

```
.(hhid, mid, survey, IntDate, sex, Age_1, marital, HeadAge)]
```

	hhid	mid	survey	IntDate	sex	Age_1	marital	HeadAge
1:	7020405	1	1	2012-10-07	Female	55	widowed	55
2:	7020405	1	2	2014-10-14	Female	55	3	55
3:	7020405	1	3	2015-12-31	Female	55	3	55
4:	7020405	1	4	2017-04-26	Female	55	widowed	55

5:	7020413	1	1	2012-10-10	Female	55	widowed	55
---								
485:	99081912103	1	4	2017-03-30	Female	20	married	20
486:	99081912103	2	4	2017-03-30	Male	24	married	20
487:	99081912406	1	1	2013-09-08	Female	50	divorced	50
488:	99081912406	1	3	2016-01-11	Female	50	3	50
489:	99081912406	1	4	2017-04-05	Female	50	widowed	50

Save roster-admin data.

```
saveRDS(ar , paste0(pathsavemembership1or4 , "RosterAdminData.rds"))
fwrite(ar , paste0(pathsavemembership1or4 , "RosterAdminData.prn"), sep = "\t", quote = F)
```

Schooling. Schooling pattern in sch1.

0000	0001	000n	0011	001n	00nn	0100	0101	010n	0111	011n	01nn	0nnn	1000	1001	100n
208	36	216	152	33	192	16	4	9	840	105	70	316	64	8	45
1011	101n	10nn	1100	1101	110n	1110	1111	111n	11nn	1nnn					
56	24	86	48	16	84	28	5172	654	326	199					

In sch1: Number of unique hhids by year (original entry) or Year (extracted from IntDate).

	Year							
year	2011	2012	2013	2014	2015	2016	2017	<NA>
2012	4	1069	1	0	0	0	0	168
2013	0	0	359	0	0	0	0	100
2014	0	0	0	1251	0	0	0	0
2015	0	0	0	1	849	358	0	2
2017	0	0	0	0	0	1	1118	8

In sch1: Number of observations tabulated by year (original entry) and round (survey).

	survey			
year	1	2	3	4
2012	1931	0	0	0
2013	651	0	0	0
2014	0	2059	0	0
2015	0	0	1911	0
2017	0	0	0	1696

In sch1: RoundOrder is 1 if individual is observed for the first time in data, 2 if for the second time, ...

	RoundOrder			
year	1	2	3	4
2012	2098	0	0	0
2013	806	0	0	0
2014	0	2282	0	0
2015	0	79	1945	0
2017	0	28	107	1662

In sch2: Number of observations tabulated by year (original entry) and round (survey).

	survey			
year	1	2	3	4
2012	1931	0	0	0
2013	651	0	0	0
2014	0	2417	0	0
2015	0	0	2347	0
2017	0	0	0	2202

In sch2: RoundOrder.

	RoundOrder				
year	1	2	3	4	5
2012	2904	0	0	0	0
2013	0	2904	0	0	0
2014	0	0	2904	0	0
2015	0	0	0	2904	0
2017	0	0	0	0	2904

In sch1: Number of observations tabulated by year (original entry) and age (AgeComputed).

	AgeComputed																	
year	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
2012	168	264	279	114	333	77	237	109	104	173	103	43	94	0	0	0	0	0
2013	48	93	90	61	118	60	79	55	46	58	46	14	38	0	0	0	0	0
2014	0	43	222	317	298	211	346	131	234	121	124	152	62	15	6	0	0	0
2015	0	0	42	225	311	291	198	302	118	192	100	93	95	38	11	8	0	0
2017	0	0	0	0	40	218	289	279	186	272	110	171	90	64	51	22	4	1

In sch2: Number of observations tabulated by year (original entry) and age (AgeComputed).

AgeComputed																		
year	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
2012	48	261	354	340	232	393	156	292	155	162	219	117	81	94	0	0	0	0
2013	0	48	261	354	340	232	393	156	292	155	162	219	117	81	94	0	0	0
2014	0	0	48	261	354	340	232	393	156	292	155	162	219	117	81	94	0	0
2015	0	0	0	48	261	354	340	232	393	156	292	155	162	219	117	81	94	0
2017	0	0	0	0	0	48	261	354	340	232	393	156	292	155	162	219	117	81

AgeComputed	
year	23
2012	0
2013	0
2014	0
2015	0
2017	94

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

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

```

varstoattach ← c("RArm", "Arm", "TradGroup", "Mem", "ObPattern", "AttritIn",
  "o1600", "Mstatus", "BorrowerStatus", "creditstatus", "povertystatus",
  "HHsize", "HeadLiteracy", "IntDate", "DisDate1")
dfiles ← c("ass", "s1", "s2", "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)
}

```

Create Arm\*HadCows, Arm\*HadCows\*Time interactions in lvo. 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(pathsavemembership1or4, "RosterAdminSchoolingData.prn"), sep = "\t", quote = F)
fwrite(s2, paste0(pathsavemembership1or4, "RosterAdminSchoolingAugmentedData.prn"), sep = "\t", quote = F)
fwrite(ass, paste0(pathsavemembership1or4, "AssetAdminData.prn"), sep = "\t", quote = F)
fwrite(lvo, paste0(pathsavemembership1or4, "LivestockAdminData.prn"), sep = "\t", quote = F)
fwrite(lab, paste0(pathsavemembership1or4, "LabourIncomeAdminData.prn"), sep = "\t", quote = F)
fwrite(far, paste0(pathsavemembership1or4, "FarmRevenueAdminData.prn"), sep = "\t", quote = F)
fwrite(con, paste0(pathsavemembership1or4, "ConsumptionAdminData.prn"), sep = "\t", quote = F)
fwrite(shk, paste0(pathsavemembership1or4, "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, 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	8248	⇒	6013	⇒	5781
sch2	9548	⇒	7033	⇒	6733
ar	33223	⇒	24806	⇒	23612
ass	7984	⇒	5958	⇒	5649
lvo	7960	⇒	5953	⇒	5645
lab	15988	⇒	12102	⇒	11723
far	587	⇒	411	⇒	393
con	5885	⇒	4360	⇒	4051
round 1 only					
sch1	2582	⇒	1931	⇒	1931
sch2	1931	⇒	1931	⇒	1931
ar	2123	⇒	1600	⇒	1600
ass	2119	⇒	1596	⇒	1596
lvo	2095	⇒	1574	⇒	1574
lab	2117	⇒	1596	⇒	1596
far	334	⇒	236	⇒	226
con	2021	⇒	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.

Number of observations after trimming: 1. Keep only membership = 1 or 4, which corresponds to Mstatus old, iRej, gR, gE; 2. Keep only continuing, dropouts members in Mgroup.

	file	tee	traditional	large	large	grace	cow
1:	ar	1	400	400		400	400
2:	ar	2	398	400		400	398
3:	ar	3	379	399		398	394
4:	ar	4	347	395		389	387
5:	ar	5	307	378		369	370
6:	ar	6	289	376		355	369
7:	ar	7	270	374		340	360
8:	ar	8	267	371		337	359
9:	ar	9	248	351		317	335
10:	ar	10	241	350		316	330
11:	ar	11	232	338		311	322
12:	ar	12	225	334		300	318
13:	ar	13	187	287		254	269
14:	ar	14	183	283		250	267
15:	ar	15	173	274		234	251
16:	ar	16	156	250		217	229
17:	ar	17	99	169		147	166
18:	ar	18	94	162		142	159
19:	ar	19	86	146		126	138
20:	ar	20	77	131		110	120
21:	ar	21	41	65		64	61
22:	ar	22	39	64		60	57
23:	ar	23	33	55		50	44
24:	ar	24	28	48		39	39
25:	ar	25	12	25		18	18
26:	ar	26	11	25		14	16
27:	ar	27	9	24		13	10
28:	ar	28	8	19		12	8
29:	ar	29	5	12		8	2
30:	ar	30	5	12		7	1
31:	ar	31	4	8		6	NA
32:	ar	32	4	6		4	NA
33:	ar	33	2	2		2	NA

34:	ar	34	2	2	2	NA
35:	ar	35	1	1	1	NA
36:	ar	36	1	NA	NA	NA
37:	ar	37	1	NA	NA	NA
38:	ar	38	1	NA	NA	NA
39:	ar	39	1	NA	NA	NA
40:	ar	40	1	NA	NA	NA
41:	ass	1	398	400	399	399
42:	ass	2	283	389	353	378
43:	ass	3	276	384	349	365
44:	ass	4	238	378	330	330
45:	con	1	283	388	352	378
46:	con	2	276	383	349	365
47:	con	3	238	377	331	331
48:	far	1	21	96	52	57
49:	far	2	5	51	28	27
50:	far	3	2	22	17	12
51:	far	4	NA	2	NA	1
52:	lab	1	398	400	399	399
53:	lab	2	396	400	400	397
54:	lab	3	378	399	398	394
55:	lab	4	351	394	387	385
56:	lab	5	305	374	366	363
57:	lab	6	258	347	327	332
58:	lab	7	191	283	250	271
59:	lab	8	119	187	173	170
60:	lab	9	71	121	104	100
61:	lab	10	39	86	67	64
62:	lab	11	29	57	44	45
63:	lab	12	21	40	27	29
64:	lab	13	14	21	19	18
65:	lab	14	9	13	15	8
66:	lab	15	8	10	9	6
67:	lab	16	5	8	5	3
68:	lab	17	3	3	3	1
69:	lab	18	1	1	1	NA
70:	lab	19	1	NA	1	NA
71:	lab	20	1	NA	1	NA
72:	lvo	1	398	399	379	398
73:	lvo	2	283	390	373	379
74:	lvo	3	276	384	348	365
75:	lvo	4	238	377	330	328
76:	sch1	1	460	479	505	487
77:	sch1	2	300	396	369	403
78:	sch1	3	266	356	340	351
79:	sch1	4	204	306	282	277
80:	sch2	1	460	479	505	487
81:	sch2	3	336	460	422	453
82:	sch2	4	325	448	417	434
83:	sch2	5	278	439	401	389
file tee traditional large large grace cow						

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

files	rounds	traditional	large	large grace	cow	total
s1	1	728	622	618	614	2582
	2	630	523	471	522	2146
	3	560	473	438	453	1924
	4	463	406	369	358	1596
ar	1	605	504	507	507	2123
	2	590	491	457	485	2023
	3	583	487	453	473	1996
	4	539	482	447	442	1910
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
s1	1	460	479	505	487	1931
	2	300	396	369	403	1468
	3	266	356	340	351	1313
	4	204	306	282	277	1069
ar	1	400	400	400	400	1600
	2	385	389	352	379	1505
	3	363	386	349	367	1465
	4	299	382	343	341	1365
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

## IV Estimation

### IV.1 Schooling

	tee	traditional	large	large	grace	cow	total
1:	1	243	241		217	248	949
2:	2	180	240		217	247	884
3:	3	165	225		210	225	825
4:	4	133	206		181	190	710

If using s1, retain only the complete portion of panel. sch1 has 5781 rows. Drop 370 observations in sch1 with nnn in Spattern and 8 observations with 1001 in EnrollPattern because they are likely to be errors. This leaves us with 5403 rows. With OLS, 93, 154, 246, 1066 individuals are repeatedly observed for 1, 2, 3, 4 times, respectively. With FD, s1 is reduced to 3844 rows after first-differencing with 246, 1066 individuals with repeatedly observed for 3, 4 times, respectively.

0000	0001	000n	0011	001n	00nn	0100	0101	010n	0111	011n	01nn	0nnn	1000	1001	100n
41	8	48	27	6	58	2	0	2	184	27	19	0	13	0	12

1011	101n	10nn	1100	1101	110n	1110	1111	111n	11nn	1nnn
9	6	20	11	1	18	5	833	137	72	0

TABLE 4: OLS ESTIMATION OF SCHOOL ENROLLMENT

	original data					augmented data				
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Traditional	0.831*** (0.031)					0.704*** (0.033)				
Large	0.831*** (0.034)	-0.016 (0.051)	-0.044 (0.046)	-0.013 (0.038)	-0.040 (0.045)	0.682*** (0.039)	-0.024 (0.055)	-0.049 (0.048)	-0.001 (0.057)	-0.046 (0.048)
LargeGrace	0.846*** (0.024)	0.023 (0.040)	-0.014 (0.042)	-0.020 (0.041)	-0.018 (0.042)	0.682*** (0.028)	0.015 (0.043)	-0.034 (0.043)	-0.016 (0.060)	-0.037 (0.043)
Cow	0.839*** (0.019)	0.021 (0.037)	-0.003 (0.037)	-0.005 (0.038)	-0.001 (0.038)	0.711*** (0.020)	0.022 (0.039)	-0.005 (0.036)	0.006 (0.053)	-0.003 (0.036)
primary0512		0.878*** (0.045)	0.842*** (0.057)	1.048*** (0.063)	0.858*** (0.055)		0.721*** (0.040)	0.705*** (0.056)	1.064*** (0.080)	0.712*** (0.054)
junior1315		0.831*** (0.046)	0.782*** (0.067)	1.025*** (0.066)	0.796*** (0.065)		0.581*** (0.046)	0.541*** (0.072)	0.917*** (0.091)	0.545*** (0.071)
high1618		0.659*** (0.060)	0.607*** (0.076)	0.872*** (0.078)	0.620*** (0.075)		0.256*** (0.043)	0.188*** (0.063)	0.543*** (0.082)	0.193*** (0.063)
junior1315:Large		0.013 (0.034)	0.062 (0.039)	-0.004 (0.046)	0.064 (0.039)		-0.015 (0.048)	0.039 (0.051)	-0.039 (0.064)	0.040 (0.051)
high1618:Large		0.042 (0.065)	0.065 (0.074)	-0.022 (0.072)	0.070 (0.074)		0.018 (0.072)	0.101* (0.059)	0.034 (0.079)	0.102* (0.059)
junior1315:LargeGrace		-0.063* (0.038)	-0.069 (0.054)	-0.137** (0.062)	-0.070 (0.055)		-0.069 (0.049)	-0.057 (0.066)	-0.126 (0.082)	-0.057 (0.066)
high1618:LargeGrace		-0.052 (0.064)	0.011 (0.085)	-0.059 (0.083)	0.013 (0.084)		-0.048 (0.051)	0.024 (0.063)	-0.018 (0.083)	0.023 (0.064)
junior1315:Cow		-0.057* (0.034)	-0.046 (0.045)	-0.102* (0.059)	-0.048 (0.045)		-0.056 (0.037)	-0.018 (0.050)	-0.075 (0.070)	-0.019 (0.050)
high1618:Cow		-0.078 (0.072)	-0.089 (0.086)	-0.157* (0.085)	-0.094 (0.086)		-0.060 (0.058)	-0.012 (0.064)	-0.057 (0.082)	-0.015 (0.063)
primary0512:Female		0.021 (0.016)	-0.032 (0.030)	-0.020 (0.048)	-0.034 (0.030)		0.022 (0.017)	-0.036 (0.027)	-0.003 (0.050)	-0.037 (0.027)
junior1315:Female		0.101*** (0.021)	0.071* (0.039)	0.024 (0.045)	0.070* (0.039)		0.201*** (0.026)	0.193*** (0.047)	0.172*** (0.060)	0.192*** (0.046)
high1618:Female		0.157*** (0.041)	0.132* (0.075)	0.169*** (0.062)	0.124 (0.079)		0.159*** (0.046)	0.277*** (0.092)	0.416*** (0.112)	0.271*** (0.093)
Head age			0.000	-0.001		-		0.000	-0.001	-
			(0.001)	(0.001)	0.000 (0.001)			(0.001)	(0.001)	0.000 (0.001)
Head literate			0.070*** (0.020)	0.046*** (0.014)	0.070*** (0.020)			0.077*** (0.028)	0.045 (0.033)	0.077*** (0.028)
primary0512:Large:Female			0.052 (0.053)	0.055 (0.054)	0.057 (0.053)			0.044 (0.052)	0.014 (0.060)	0.049 (0.052)
junior1315:Large:Female			-0.044 (0.048)	-0.017 (0.054)	-0.038 (0.048)			-0.068 (0.063)	-0.048 (0.079)	-0.063 (0.063)
high1618:Large:Female			0.033 (0.094)	-0.008 (0.080)	0.047 (0.098)			-0.214* (0.130)	-0.308** (0.146)	-0.212 (0.131)
primary0512:LargeGrace:Female			0.080** (0.035)	0.050 (0.049)	0.080** (0.035)			0.104*** (0.035)	0.051 (0.055)	0.104*** (0.036)
junior1315:LargeGrace:Female			0.100* (0.054)	0.161*** (0.059)	0.100* (0.054)			0.099 (0.067)	0.129 (0.083)	0.098 (0.067)
high1618:LargeGrace:Female			-0.060 (0.123)	-0.061 (0.115)	-0.058 (0.121)			-0.113 (0.114)	-0.215 (0.132)	-0.113 (0.114)
primary0512:Cow:Female			0.048 (0.037)	0.029 (0.050)	0.045 (0.037)			0.051 (0.034)	-0.001 (0.053)	0.049 (0.034)
junior1315:Cow:Female			0.029 (0.057)	0.083 (0.067)	0.031 (0.056)			-0.037 (0.069)	0.005 (0.082)	-0.037 (0.068)
high1618:Cow:Female			0.102 (0.111)	0.072 (0.098)	0.108 (0.110)			-0.143 (0.123)	-0.263* (0.145)	-0.140 (0.122)
6M renavment				-0.018 (0.024)					-0.053 (0.032)	
6M net saving				-0.051 (0.131)					-0.052 (0.136)	
6M other member Renaid				0.042 (0.042)					0.104* (0.055)	
FloodInRd1					-0.062** (0.026)					-0.044 (0.027)
number of clusters	78	78	78	68	78	80	80	80	68	80
R <sup>2</sup>	0.837	0.851	0.853	0.907	0.854	0.694	0.747	0.75	0.781	0.751
N	5403	5403	5365	3402	5365	6733	6701	6640	4267	6640

Source: Estimated with GUK administrative and survey data.

Notes: 1. Intercept terms are omitted in estimating equations. Year effects are included in estimation (not shown). s1 is complete portion of panel. s2 is a panel data augmenting attrited members in s1 with an assumption that they are out of school unless it is explicitly stated as attending school by family members. Number of observations decreases in (2) relative to (1) because of NAs in Schooling (because Age\_1 is missing) erroneous entries in calendar Year in IntDate which result in NAs.

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

Check number of observations in each cell:

TABLE 5: NUMBER OF OBSERVATIONS IN EACH CELLS OF SCHOOLING REGRESSION IN TABLE 4

	original data					augmented data				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
× Male	648	648	648	244	648	842	842	838	341	838
× Female	512	512	511	207	511	557	557	556	223	556
× Primary0512	653	653	653	194	653	693	693	693	205	693
× Male × Primary0512	335	335	335	91	335	358	358	358	97	358
× Female × Primary0512	318	318	318	103	318	335	335	335	108	335
× Junior1315	341	341	341	170	341	401	401	400	200	400
× Male × Junior1315	205	205	205	97	205	257	257	256	123	256
× Female × Junior1315	136	136	136	73	136	144	144	144	77	144
× High1618	166	166	165	87	165	305	305	301	159	301
× Male × High1618	108	108	108	56	108	227	227	224	121	224
× Female × High1618	58	58	57	31	57	78	78	77	38	77
× Male	865	865	859	591	859	1130	1130	1118	784	1118
× Female	587	587	583	397	583	696	696	688	471	688
× Primary0512	844	844	840	484	840	911	911	907	515	907
× Male × Primary0512	461	461	460	266	460	498	498	497	280	497
× Female × Primary0512	383	383	380	218	380	413	413	410	235	410
× Junior1315	405	405	401	321	401	508	508	501	399	501
× Male × Junior1315	252	252	249	191	249	333	333	327	253	327
× Female × Junior1315	153	153	152	130	152	175	175	174	146	174
× High1618	203	203	201	183	201	407	407	398	341	398
× Male × High1618	152	152	150	134	150	299	299	294	251	294
× Female × High1618	51	51	51	49	51	108	108	104	90	104
× Male	689	689	674	487	674	959	947	923	670	923
× Female	671	671	659	486	659	786	766	754	544	754
× Primary0512	777	777	762	474	762	868	840	824	497	824
× Male × Primary0512	363	363	353	215	353	405	396	385	228	385
× Female × Primary0512	414	414	409	259	409	463	444	439	269	439
× Junior1315	385	385	377	321	377	474	470	459	381	459
× Male × Junior1315	204	204	201	163	201	275	272	266	211	266
× Female × Junior1315	181	181	176	158	176	199	198	193	170	193
× High1618	198	198	194	178	194	403	403	394	336	394
× Male × High1618	122	122	120	109	120	279	279	272	231	272
× Female × High1618	76	76	74	69	74	124	124	122	105	122
× Male	775	775	775	527	775	1006	1006	1006	697	1006
× Female	656	656	656	463	656	757	757	757	537	757
× Primary0512	857	857	857	514	857	922	922	922	548	922
× Male × Primary0512	410	410	410	240	410	444	444	444	255	444
× Female × Primary0512	447	447	447	274	447	478	478	478	293	478
× Junior1315	395	395	395	325	395	473	473	473	385	473
× Male × Junior1315	231	231	231	178	231	288	288	288	221	288
× Female × Junior1315	164	164	164	147	164	185	185	185	164	185
× High1618	179	179	179	151	179	368	368	368	301	368
× Male × High1618	134	134	134	109	134	274	274	274	221	274
× Female × High1618	45	45	45	42	45	94	94	94	80	94
total	5403	5403	5365	3402	5365	6733	6701	6640	4267	6640

Source: GUK administrative and survey data.

Notes: 1. Original data is schooling panel data with attrition. Augmented data is original data plus imputed values of schooling for attrited individuals.

2.

TABLE 6: OLS ESTIMATION OF SCHOOL ENROLLMENT, DIFFERENT GROUPING

	original data					augmented data				
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
SmallSize	0.831*** (0.031)					0.704*** (0.033)				
LargeSize	0.839*** (0.015)					0.691*** (0.017)				
primary0512		0.862*** (0.036)	0.886*** (0.036)	1.041*** (0.056)	0.828*** (0.050)		0.736*** (0.037)	0.707*** (0.052)	1.057*** (0.072)	0.714*** (0.051)
junior1315		0.840*** (0.038)	0.826*** (0.046)	1.018*** (0.059)	0.766*** (0.061)		0.653*** (0.043)	0.543*** (0.069)	0.910*** (0.084)	0.548*** (0.068)
high1618		0.684*** (0.054)	0.648*** (0.061)	0.865*** (0.073)	0.590*** (0.072)		0.297*** (0.041)	0.191*** (0.060)	0.536*** (0.073)	0.196*** (0.061)
primary0512:Female			-0.030 (0.030)	-0.020 (0.047)	-0.033 (0.030)			-0.036 (0.026)	-0.002 (0.050)	-0.037 (0.027)
junior1315:Female			0.072* (0.038)	0.024 (0.044)	0.070* (0.038)			0.193*** (0.047)	0.172*** (0.060)	0.192*** (0.046)
high1618:Female			0.140* (0.076)	0.170*** (0.062)	0.125 (0.079)			0.276*** (0.092)	0.416*** (0.113)	0.271*** (0.093)
primary0512:LargeSize		0.009 (0.035)	-0.024 (0.034)	-0.014 (0.035)	-0.020 (0.034)		0.004 (0.038)	-0.030 (0.035)	-0.004 (0.052)	-0.029 (0.035)
junior1315:LargeSize		-0.024 (0.035)	-0.040 (0.046)	-0.091** (0.042)	-0.033 (0.046)		-0.038 (0.045)	-0.038 (0.055)	-0.081 (0.068)	-0.038 (0.056)
high1618:LargeSize		-0.027 (0.059)	-0.025 (0.069)	-0.089 (0.065)	-0.022 (0.069)		-0.022 (0.047)	0.009 (0.048)	-0.016 (0.048)	0.009 (0.048)
primary0512:LargeSize:Female			0.066* (0.035)	0.044 (0.049)	0.062* (0.035)			0.068** (0.032)	0.020 (0.052)	0.069** (0.032)
junior1315:LargeSize:Female			0.036 (0.046)	0.073 (0.051)	0.027 (0.045)			-0.003 (0.055)	0.028 (0.068)	-0.002 (0.055)
high1618:LargeSize:Female			0.019 (0.091)	-0.010 (0.078)	0.021 (0.092)			-0.156 (0.103)	-0.261** (0.123)	-0.154 (0.104)
Head age				-0.001 (0.001)	-				-	-
Head literate				0.046*** (0.014)	0.000 (0.001)			0.000 (0.001)	0.001 (0.001)	0.000 (0.001)
6M repayment				-0.019 (0.025)						
6M net saving				-0.016 (0.129)						
6M other member Repaid				0.045 (0.044)						
FloodInRd1					-0.060** (0.027)					
number of clusters	78	78	78	68	78	80	80	80	68	80
R <sup>2</sup>	0.837	0.849	0.851	0.906	0.854	0.694	0.742	0.75	0.781	0.75
N	5403	5403	5403	3402	5365	6733	6701	6640	4267	6640

Source: Estimated with GUK administrative and survey data.

Notes: 1. Intercept terms are omitted in estimating equations. Year effects are included in estimation (not shown). s1 is complete portion of panel. s2 is a panel data augmenting attrited members in s1 with an assumption that they are out of school unless it is explicitly stated as attending school by family members. SmallSize includes Traditional, LargeSize includes Large, Large grace, Cow. WithoutGrace includes Traditional, Large, WithGrace includes Large grace, cow.

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

TABLE 7: OLS ESTIMATION OF SCHOOL ENROLLMENT, SMALL VS. LARGE SIZED

	original data					augmented data				
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
WithoutGrace	0.831*** (0.023)					0.691*** (0.026)				
WithGrace	0.842*** (0.015)					0.696*** (0.017)				
primary0512		0.861*** (0.037)	0.794*** (0.055)	1.032*** (0.046)	0.815*** (0.051)		0.663*** (0.054)	0.676*** (0.051)	1.055*** (0.062)	0.686*** (0.049)
junior1315		0.846*** (0.033)	0.771*** (0.057)	1.008*** (0.051)	0.789*** (0.053)		0.578*** (0.055)	0.535*** (0.059)	0.882*** (0.076)	0.543*** (0.059)
high1618		0.698*** (0.043)	0.598*** (0.065)	0.842*** (0.062)	0.618*** (0.063)		0.246*** (0.057)	0.217*** (0.056)	0.557*** (0.071)	0.226*** (0.056)
primary0512:Female			-0.002 (0.028)	0.018 (0.024)	-0.001 (0.028)			-0.010 (0.028)	0.006 (0.028)	-0.009 (0.028)
junior1315:Female			0.048** (0.024)	0.013 (0.026)	0.049** (0.024)			0.156*** (0.033)	0.142*** (0.039)	0.158*** (0.033)
high1618:Female			0.145*** (0.049)	0.167*** (0.040)	0.144*** (0.051)			0.154** (0.076)	0.200** (0.089)	0.150* (0.076)
primary0512:WithGrace		0.032 (0.031)	0.017 (0.031)	-0.002 (0.023)	0.014 (0.031)		0.036 (0.033)	0.010 (0.032)	-0.004 (0.031)	0.008 (0.032)
junior1315:WithGrace		-0.031 (0.027)	-0.075** (0.037)	-0.119*** (0.035)	-0.080** (0.036)		-0.015 (0.036)	-0.050 (0.047)	-0.078 (0.055)	-0.052 (0.047)
high1618:WithGrace		-0.052 (0.054)	-0.062 (0.066)	-0.095 (0.067)	-0.069 (0.064)		-0.041 (0.046)	-0.043 (0.046)	-0.065 (0.049)	-0.048 (0.046)
primary0512:WithGrace:Female			0.034 (0.031)	0.001 (0.025)	0.029 (0.031)			0.050 (0.032)	0.015 (0.032)	0.047 (0.032)
junior1315:WithGrace:Female			0.088** (0.036)	0.132*** (0.041)	0.085** (0.037)			0.067 (0.049)	0.097* (0.057)	0.065 (0.049)
high1618:WithGrace:Female			0.001 (0.082)	0.001 (0.075)	-0.001 (0.081)			-0.004 (0.092)	-0.019 (0.104)	-0.003 (0.092)
Head age			0.000	-0.001		-	0.000	0.000	-0.001	-
			(0.001)	(0.001)	0.000 (0.001)		(0.001)	(0.001)	(0.001)	0.000 (0.001)
Head literate			0.070*** (0.020)	0.046*** (0.014)	0.070*** (0.020)		0.086*** (0.028)	0.077*** (0.027)	0.046 (0.033)	0.078*** (0.027)
6M repayment				-0.019 (0.024)					-0.055* (0.033)	
6M net saving				-0.061 (0.135)					-0.092 (0.140)	
6M other member Repaid				0.043 (0.042)					0.107* (0.061)	
FloodInRd1					-0.061** (0.026)					-0.044 (0.027)
number of clusters	78	78	78	68	78	80	80	80	68	80
R <sup>2</sup>	0.837	0.849	0.853	0.907	0.854	0.694	0.745	0.75	0.78	0.751
N	5403	5403	5365	3402	5365	6733	6640	6640	4267	6640

Source: Estimated with GUK administrative and survey data.

Notes: 1. Intercept terms are omitted in estimating equations. Year effects are included in estimation (not shown). s1 is complete portion of panel. s2 is a panel data augmenting attrited members in s1 with an assumption that they are out of school unless it is explicitly stated as attending school by family members. SmallSize includes Traditional, LargeSize includes Large, Large grace, Cow. WithoutGrace includes Traditional, Large, WithGrace includes Large grace, cow.

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

TABLE 8: NUMBER OF OBSERVATIONS IN EACH CELLS OF SCHOOLING REGRESSION IN TABLE 6, 7

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Small Size										
× Male	648	648	648	244	648	842	842	838	341	838
× Female	512	512	512	207	511	557	557	556	223	556
× Primary0512	653	653	653	194	653	693	693	693	205	693
× Male × Primary0512	335	335	335	91	335	358	358	358	97	358
× Female × Primary0512	318	318	318	103	318	335	335	335	108	335
× Junior1315	341	341	341	170	341	401	401	400	200	400
× Male × Junior1315	205	205	205	97	205	257	257	256	123	256
× Female × Junior1315	136	136	136	73	136	144	144	144	77	144
× High1618	166	166	166	87	165	305	305	301	159	301
× Male × High1618	108	108	108	56	108	227	227	224	121	224
× Female × High1618	58	58	58	31	57	78	78	77	38	77
Large Size										
× Male	2329	2329	2329	1605	2308	3095	3083	3047	2151	3047
× Female	1914	1914	1914	1346	1898	2239	2219	2199	1552	2199
× Primary0512	2478	2478	2478	1472	2459	2701	2673	2653	1560	2653
× Male × Primary0512	1234	1234	1234	721	1223	1347	1338	1326	763	1326
× Female × Primary0512	1244	1244	1244	751	1236	1354	1335	1327	797	1327
× Junior1315	1185	1185	1185	967	1173	1455	1451	1433	1165	1433
× Male × Junior1315	687	687	687	532	681	896	893	881	685	881
× Female × Junior1315	498	498	498	435	492	559	558	552	480	552
× High1618	580	580	580	512	574	1178	1178	1160	978	1160
× Male × High1618	408	408	408	352	404	852	852	840	703	840
× Female × High1618	172	172	172	160	170	326	326	320	275	320
total	5403	5403	5403	3402	5365	6733	6701	6640	4267	6640
No Grace										
× Male	1513	1513	1507	835	1507	1972	1956	1956	1125	1956
× Female	1099	1099	1094	604	1094	1253	1244	1244	694	1244
× Primary0512	1497	1497	1493	678	1493	1604	1600	1600	720	1600
× Male × Primary0512	796	796	795	357	795	856	855	855	377	855
× Female × Primary0512	701	701	698	321	698	748	745	745	343	745
× Junior1315	746	746	742	491	742	909	901	901	599	901
× Male × Junior1315	457	457	454	288	454	590	583	583	376	583
× Female × Junior1315	289	289	288	203	288	319	318	318	223	318
× High1618	369	369	366	270	366	712	699	699	500	699
× Male × High1618	260	260	258	190	258	526	518	518	372	518
× Female × High1618	109	109	108	80	108	186	181	181	128	181
Grace										
× Male	1464	1464	1449	1014	1449	1965	1929	1929	1367	1929
× Female	1327	1327	1315	949	1315	1543	1511	1511	1081	1511
× Primary0512	1634	1634	1619	988	1619	1790	1746	1746	1045	1746
× Male × Primary0512	773	773	763	455	763	849	829	829	483	829
× Female × Primary0512	861	861	856	533	856	941	917	917	562	917
× Junior1315	780	780	772	646	772	947	932	932	766	932
× Male × Junior1315	435	435	432	341	432	563	554	554	432	554
× Female × Junior1315	345	345	340	305	340	384	378	378	334	378
× High1618	377	377	373	329	373	771	762	762	637	762
× Male × High1618	256	256	254	218	254	553	546	546	452	546
× Female × High1618	121	121	119	111	119	218	216	216	185	216
total	5403	5403	5365	3402	5365	6733	6640	6640	4267	6640

Source: GUK administrative and survey data.

Notes: 1.

2.

TABLE 9: OLS ESTIMATION OF SCHOOL ENROLLMENT, ULTRA POOR VS. MODERATELY POOR

	original data			augmented data			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
UltraPoor	0.851*** (0.012)						
ModeratelyPoor	0.850*** (0.018)						
primary0512		0.822*** (0.035)	0.753*** (0.058)	0.705*** (0.034)	0.662*** (0.053)	1.093*** (0.060)	1.118*** (0.063)
junior1315		0.787*** (0.029)	0.693*** (0.060)	0.609*** (0.029)	0.506*** (0.061)	0.887*** (0.082)	0.913*** (0.084)
high1618		0.584*** (0.040)	0.487*** (0.068)	0.250*** (0.029)	0.176*** (0.054)	0.536*** (0.072)	0.563*** (0.076)
primary0512:UltraPoor		0.033 (0.031)	0.024 (0.032)	0.035 (0.032)	0.018 (0.031)	-0.040* (0.024)	-0.040* (0.024)
junior1315:UltraPoor		0.014 (0.026)	0.010 (0.034)	0.004 (0.031)	-0.004 (0.036)	-0.051 (0.041)	-0.052 (0.041)
high1618:UltraPoor		0.088* (0.046)	0.074 (0.055)	0.028 (0.034)	0.019 (0.038)	-0.003 (0.042)	-0.007 (0.043)
Head age			0.000 (0.001)		0.000 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Head literate			0.070*** (0.020)		0.075*** (0.029)	0.043 (0.034)	0.044 (0.034)
primary0512:Female			0.004 (0.031)		-0.004 (0.030)	-0.027 (0.030)	-0.028 (0.030)
junior1315:Female			0.088*** (0.028)		0.174*** (0.034)	0.152*** (0.044)	0.151*** (0.043)
high1618:Female			0.106 (0.068)		0.124** (0.056)	0.133** (0.059)	0.130** (0.059)
primary0512:UltraPoor:Female			0.021 (0.037)		0.037 (0.038)	0.061 (0.038)	0.061 (0.038)
junior1315:UltraPoor:Female			0.006 (0.038)		0.026 (0.041)	0.063 (0.050)	0.064 (0.049)
high1618:UltraPoor:Female			0.071 (0.082)		0.047 (0.069)	0.082 (0.070)	0.084 (0.070)
6M repayment						-0.055* (0.033)	-0.054 (0.033)
6M net saving						-0.078 (0.141)	-0.083 (0.143)
6M other member Repaid						0.104 (0.066)	0.100 (0.066)
FloodInRd1							-0.022 (0.026)
number of clusters	78	78	78	80	80	68	68
R <sup>2</sup>	0.77	0.849	0.853	0.742	0.75	0.78	0.78
N	5403	5403	5365	6701	6640	4267	4267

Source: Estimated with GUK administrative and survey data.

Notes: 1. Intercept terms are omitted in estimating equations. Year effects are included in estimation (not shown). s1 is complete portion of panel. s2 is a panel data augmenting attrited members in s1 with an assumption that they are out of school unless it is explicitly stated as attending school by family members.

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

**Finding IV.1** *The following does not apply to first-difference estimation.* TABLE 4 shows school enrollment is higher for s1 than s2, indicating nonattriting members are school goers. When using s1 data, cow and large grace show negative impacts for older children, yet not for girls in junior high schools. In fact, (1) shows that girls in high school have higher enrollment in s1 and both junior and high schools for s2 in (4). This may be due to increased labour demand within a family for boys. Similar patterns are found in s2 data, yet not statistically significant, probably because data augmentation introduces more school dropouts among older girls. In TABLE 6 when using with grace/without grace grouping, the pattern becomes statistically significant for both s1 and s2. Large size vs. small size contrast has smaller statistical power that more subtle outcomes cannot be detected. No difference between ultra and moderately poor is found in TABLE 9. In first-difference estimation, rd 1 and rd 4 comparison of TABLE 14 (2) - (4) show a marginally statistically significant higher enrollment rates for girls of Cow.

tee	traditional	large	large	grace	cow
1	390	397		369	403
2	293	378		350	380
3	263	357		337	348
4	214	320		304	300

```
Warning in `[.data.table`(s1, , `:=`(c("Schooling", "hhid", "mid", "sex", : Adding new col
```

```
Warning in `[.data.table`(s2, , `:=`(c("Schooling", "hhid", "mid", "sex", : Adding new col
```

```
Dropped 93 obs due to T<2.
Dropped 1466 obs due to NA.
Dropped 93 obs due to T<2.
Dropped 1466 obs due to NA.
Dropped 230 obs due to T<2.
Dropped 1701 obs due to NA.
Dropped 230 obs due to T<2.
Dropped 1701 obs due to NA.
Dropped 421 obs due to T<2.
Dropped 1138 obs due to NA.
Dropped 424 obs due to T<2.
Dropped 1507 obs due to NA.
```

If using `s1`, retain only the complete portion of panel. `sch1` has 5781 rows. Drop 370 observations in `sch1` with `nnn` in `Spattern` and 8 observations with 1001 in `EnrollPattern` because they are likely to be errors. This leaves us with 5403 rows.

With OLS, 1559 individuals are repeatedly observed for 1 times, respectively. With FD, `s1` is reduced to 3844 rows after first-differencing with 133, 202, 1066 individuals with repeatedly observed for 2, 3, 4 times, respectively. Individuals with NAs in `Schooling`. Mostly older children (15.5 in `s1`, 16.5 in `s.2`) but with a high reported enrollment rate (0.7 for `s1`, 0.2 for `s.2`) at `rd 4`. We will substitute relevant schooling levels to `Schooling`.

```
1
5403
```

```
1
5403
```

An example of dummy interactions: `dummyLargeSize.dummyPrimary.Time.2`, `dummySmallSize.dummyPrimary.Time.2`, `dummyLargeSize.dummyJunior.Time.2`, `dummySmallSize.dummyJunior.Time.2`, `dummyLargeSize.dummyHigh.Time.2`, `dummySmallSize.dummyHigh.Time.2`, `dummyLargeSize.dummyPrimary.Time.3`, `dummySmallSize.dummyPrimary.Time.3`, `dummyLargeSize.dummyJunior.Time.3`, `dummySmallSize.dummyJunior.Time.3`, `dummyLargeSize.dummyHigh.Time.3`, `dummySmallSize.dummyHigh.Time.3`, `dummyLargeSize.dummyPrimary.Time.4`, `dummySmallSize.dummyPrimary.Time.4`, `dummyLargeSize.dummyJunior.Time.4`, `dummySmallSize.dummyJunior.Time.4`, `dummyLargeSize.dummyHigh.Time.4`, `dummySmallSize.dummyHigh.Time.4`. Obs for `s1`.

```
2    3    4
1401 1305 1138
```

Obs for `s1` and admin repayment data.

```
2    3    4
1401 1305 1138
```



```
      2      3      4
1671 1624 1507
```

Obs for survey s2.

```
      2      3      4
1671 1624 1507
```

Obs for survey s2 and admin repayment data.

```
      2      3      4
1671 1624 1507
```

```
arsuffixes <- c("", "g", "p", "s")
```

```
source(paste0(pathprogram, "SchoolingCovariateSelection.R"))
```

TABLE 10: FD ESTIMATION OF SCHOOL ENROLLMENT

covariates	complete panel				all panel		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Primary	0.13*** (0.02)	0.14*** (0.03)	0.16*** (0.03)	0.16*** (0.03)	0.10*** (0.01)	0.14*** (0.03)	0.14*** (0.03)
Junior	0.02 (0.01)	0.01 (0.02)	0.03 (0.03)	0.03 (0.03)	-0.03** (0.01)	-0.00 (0.03)	-0.00 (0.03)
High	0.00 (0.02)	-0.03 (0.02)	-0.01 (0.03)	-0.01 (0.03)	-0.06*** (0.01)	-0.03 (0.03)	-0.03 (0.03)
Large	-0.03** (0.02)	-0.04** (0.02)	-0.03** (0.02)	-0.03** (0.02)	-0.02 (0.02)	-0.03* (0.02)	-0.03* (0.02)
LargeGrace	-0.03* (0.02)	-0.04* (0.02)	-0.04* (0.02)	-0.04* (0.02)	-0.02 (0.02)	-0.03* (0.02)	-0.03* (0.02)
Cow	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.02 (0.02)	-0.02 (0.02)	-0.02 (0.02)
Large × Junior		0.04 (0.03)	0.04 (0.03)	0.04 (0.03)		0.02 (0.03)	0.02 (0.03)
LargeGrace × Junior		0.02 (0.03)	0.01 (0.03)	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)		0.05* (0.03)	0.05* (0.03)
Large × High		0.04 (0.03)	0.04 (0.03)	0.04 (0.03)		0.03 (0.03)	0.03 (0.03)
LargeGrace × High		0.07** (0.03)	0.07** (0.03)	0.07** (0.03)		0.04 (0.03)	0.04 (0.03)
Cow × High		0.06* (0.03)	0.06* (0.03)	0.06* (0.03)		0.02 (0.03)	0.02 (0.03)
Female		0.01 (0.02)	0.01 (0.02)	0.01 (0.02)		0.03 (0.02)	0.03 (0.02)
Primary × Female		-0.03 (0.05)	-0.03 (0.05)	-0.03 (0.05)		-0.10*** (0.04)	-0.10*** (0.04)
Junior × Female		-0.06 (0.04)	-0.06 (0.04)	-0.06 (0.04)		-0.06* (0.03)	-0.06* (0.03)
Large × Female		-0.01 (0.03)	-0.01 (0.03)	-0.01 (0.03)		-0.02 (0.03)	-0.02 (0.03)
LargeGrace × Female		0.00 (0.02)	0.00 (0.03)	0.00 (0.03)		-0.01 (0.02)	-0.01 (0.02)
Cow × Female		0.00 (0.03)	0.00 (0.03)	0.00 (0.03)		-0.03 (0.02)	-0.03 (0.02)
Large × Junior × Female		0.02 (0.05)	0.02 (0.05)	0.02 (0.05)		-0.01 (0.05)	-0.01 (0.05)
LargeGrace × Junior × Female		0.09** (0.04)	0.09** (0.04)	0.09** (0.04)		0.04 (0.05)	0.04 (0.05)
Cow × Junior × Female		0.09 (0.05)	0.09* (0.05)	0.09* (0.05)		0.03 (0.05)	0.03 (0.05)
Large × High × Female		-0.00 (0.06)	0.00 (0.06)	0.00 (0.06)		-0.01 (0.06)	-0.01 (0.06)
LargeGrace × High × Female		0.04 (0.06)	0.05 (0.06)	0.05 (0.06)		-0.02 (0.05)	-0.02 (0.05)
Cow × High × Female		0.04 (0.07)	0.04 (0.07)	0.04 (0.07)		-0.09 (0.06)	-0.09 (0.06)
FloodInRd1			-0.01 (0.01)	-0.01 (0.01)		0.01 (0.01)	0.01 (0.01)
Head literate			-0.01 (0.02)	-0.01 (0.02)		-0.02 (0.02)	-0.02 (0.02)
Head age			-0.00 (0.00)	-0.00 (0.00)		-0.00 (0.00)	-0.00 (0.00)
EldestSon			0.00 (0.01)	0.00 (0.01)		-0.01 (0.01)	-0.01 (0.01)
EldestDaughter			-0.01 (0.01)	-0.01 (0.01)		0.00 (0.01)	0.00 (0.01)
$T = 2$	154	154	153	153	72	72	72
$T = 3$	246	246	241	241	157	156	156
$T = 4$	1066	1066	1061	1061	1472	1458	1458
$\bar{R}^2$	0.061	0.06	0.06	0.06	0.038	0.038	0.038
$N$	3844	3844	3818	3818	4802	4758	4758

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal.

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

TABLE 11: FD ESTIMATION OF NET SCHOOL ENROLLMENT, ULTRA POOR VS. MODERATELY POOR

	complete panel				all panel		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Primary	0.11*** (0.01)	0.12*** (0.01)	0.14*** (0.02)	0.14*** (0.02)	0.09*** (0.01)	0.13*** (0.03)	0.13*** (0.03)
Junior	0.00 (0.01)	0.00 (0.01)	0.03 (0.02)	0.03 (0.02)	-0.03*** (0.01)	0.01 (0.03)	0.01 (0.03)
High	-0.02 (0.02)	-0.01 (0.02)	0.02 (0.03)	0.02 (0.03)	-0.06*** (0.01)	-0.01 (0.03)	-0.01 (0.03)
UltraPoor	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.02** (0.01)	-0.02** (0.01)	-0.02** (0.01)
UltraPoor × Junior	-0.01 (0.02)	-0.00 (0.02)	-0.01 (0.02)	-0.01 (0.02)	0.00 (0.02)	-0.00 (0.02)	-0.00 (0.02)
UltraPoor × High	-0.00 (0.02)	-0.00 (0.02)	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.02)	-0.00 (0.02)	-0.00 (0.02)
Female		-0.01 (0.02)	-0.00 (0.02)	-0.00 (0.02)		-0.01 (0.02)	-0.01 (0.02)
Junior × Female		0.01 (0.03)	0.01 (0.03)	0.01 (0.03)		0.02 (0.03)	0.02 (0.03)
High × Female		0.10** (0.04)	0.10** (0.04)	0.10** (0.04)		0.05 (0.04)	0.05 (0.04)
UltraPoor × Female		0.02 (0.02)	0.02 (0.02)	0.02 (0.02)		0.03 (0.02)	0.03 (0.02)
UltraPoor × Junior × Female		0.02 (0.04)	0.02 (0.04)	0.02 (0.04)		0.05 (0.05)	0.05 (0.05)
UltraPoor × High × Female		-0.08 (0.05)	-0.08 (0.06)	-0.08 (0.06)		0.03 (0.05)	0.03 (0.05)
FloodlnRd1			-0.01 (0.01)	-0.01 (0.01)		0.00 (0.01)	0.00 (0.01)
Head literate			-0.01 (0.02)	-0.01 (0.02)		-0.02 (0.02)	-0.02 (0.02)
Head age			-0.00 (0.00)	-0.00 (0.00)		-0.00 (0.00)	-0.00 (0.00)
EldestSon			0.00 (0.01)	0.00 (0.01)		-0.01 (0.01)	-0.01 (0.01)
EldestDaughter			-0.01 (0.01)	-0.01 (0.01)		0.01 (0.01)	0.01 (0.01)
$T = 2$	154	154	153	153	72	72	72
$T = 3$	246	246	241	241	157	156	156
$T = 4$	1066	1066	1061	1061	1472	1458	1458
$\bar{R}^2$	0.06	0.061	0.06	0.06	0.038	0.04	0.04
$N$	3844	3844	3818	3818	4802	4758	4758

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal.

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

TABLE 12: FD ESTIMATION OF SCHOOL ENROLLMENT, WITH VS. WITHOUT A GRACE PERIOD

	complete panel				all panel		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Primary	0.12*** (0.01)	0.11*** (0.02)	0.14*** (0.03)	0.14*** (0.03)	0.09*** (0.01)	0.12*** (0.03)	0.12*** (0.03)
Junior	0.00 (0.01)	-0.00 (0.01)	0.02 (0.03)	0.02 (0.03)	-0.04*** (0.01)	-0.01 (0.03)	-0.01 (0.03)
High	-0.04*** (0.01)	-0.03*** (0.01)	-0.01 (0.02)	-0.01 (0.02)	-0.08*** (0.01)	-0.03 (0.03)	-0.03 (0.03)
WithGrace	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
WithGrace × Junior	-0.00 (0.02)	-0.00 (0.02)	-0.01 (0.02)	-0.01 (0.02)	0.02 (0.02)	0.02 (0.02)	0.02 (0.02)
WithGrace × High	0.04* (0.02)	0.04* (0.02)	0.04* (0.02)	0.04* (0.02)	0.02 (0.02)	0.02 (0.02)	0.02 (0.02)
Female		0.01 (0.01)	0.01 (0.02)	0.01 (0.02)		0.01 (0.01)	0.01 (0.01)
Junior × Female		-0.02 (0.02)	-0.02 (0.02)	-0.02 (0.02)		0.03 (0.03)	0.03 (0.03)
High × Female		0.03 (0.03)	0.03 (0.03)	0.03 (0.03)		0.09** (0.03)	0.09** (0.03)
WithGrace × Female		0.00 (0.02)	0.00 (0.02)	0.00 (0.02)		-0.01 (0.02)	-0.01 (0.02)
WithGrace × Junior × Female		0.08** (0.03)	0.08** (0.04)	0.08** (0.04)		0.04 (0.04)	0.04 (0.04)
WithGrace × High × Female		0.04 (0.04)	0.05 (0.04)	0.05 (0.04)		-0.04 (0.04)	-0.04 (0.04)
FloodInRd1			-0.01 (0.01)	-0.01 (0.01)		0.00 (0.01)	0.00 (0.01)
Head literate			-0.01 (0.02)	-0.01 (0.02)		-0.02 (0.02)	-0.02 (0.02)
Head age			-0.00 (0.00)	-0.00 (0.00)		-0.00 (0.00)	-0.00 (0.00)
EldestSon			0.00 (0.01)	0.00 (0.01)		-0.01 (0.01)	-0.01 (0.01)
EldestDaughter			-0.01 (0.01)	-0.01 (0.01)		0.01 (0.01)	0.01 (0.01)
$T = 2$	154	154	153	153	72	72	72
$T = 3$	246	246	241	241	157	156	156
$T = 4$	1066	1066	1061	1061	1472	1458	1458
$\bar{R}^2$	0.061	0.061	0.061	0.061	0.038	0.039	0.039
$N$	3844	3844	3818	3818	4802	4758	4758

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

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

TABLE 13: FD ESTIMATION OF SCHOOL ENROLLMENT, SMALL SIZE VS. LARGE SIZE

	complete panel				all panel		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Primary	0.15*** (0.02)	0.14*** (0.03)	0.16*** (0.03)	0.16*** (0.03)	0.12*** (0.02)	0.14*** (0.03)	0.14*** (0.03)
Junior	0.01 (0.01)	0.01 (0.02)	0.03 (0.03)	0.03 (0.03)	-0.03* (0.02)	-0.01 (0.03)	-0.01 (0.03)
High	-0.03 (0.02)	-0.03 (0.02)	-0.01 (0.03)	-0.01 (0.03)	-0.08*** (0.01)	-0.03 (0.03)	-0.03 (0.03)
LargeSize	-0.03** (0.02)	-0.03** (0.02)	-0.03* (0.02)	-0.03* (0.02)	-0.02* (0.01)	-0.03* (0.01)	-0.03* (0.01)
LargeSize × Junior	0.03 (0.03)	0.03 (0.03)	0.03 (0.03)	0.03 (0.03)	0.03 (0.02)	0.02 (0.02)	0.02 (0.02)
LargeSize × High	0.05* (0.03)	0.06** (0.03)	0.06** (0.03)	0.06** (0.03)	0.05** (0.02)	0.03 (0.02)	0.03 (0.02)
Female		0.01 (0.02)	0.01 (0.02)	0.01 (0.02)		0.03 (0.02)	0.03 (0.02)
Junior × Female		-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)		0.04 (0.04)	0.04 (0.04)
High × Female		0.03 (0.05)	0.03 (0.05)	0.03 (0.05)		0.10*** (0.04)	0.10*** (0.04)
LargeSize × Female		0.00 (0.02)	-0.00 (0.02)	-0.00 (0.02)		-0.02 (0.02)	-0.02 (0.02)
LargeSize × Junior × Female		0.07* (0.04)	0.06* (0.04)	0.06* (0.04)		0.02 (0.04)	0.02 (0.04)
LargeSize × High × Female		0.03 (0.06)	0.03 (0.06)	0.03 (0.06)		-0.04 (0.04)	-0.04 (0.04)
FloodInRd1			-0.01 (0.01)	-0.01 (0.01)		0.01 (0.01)	0.01 (0.01)
Head literate			-0.01 (0.02)	-0.01 (0.02)		-0.02 (0.02)	-0.02 (0.02)
Head age			-0.00 (0.00)	-0.00 (0.00)		-0.00 (0.00)	-0.00 (0.00)
EldestSon			0.00 (0.01)	0.00 (0.01)		-0.01 (0.01)	-0.01 (0.01)
EldestDaughter			-0.01 (0.01)	-0.01 (0.01)		0.01 (0.01)	0.01 (0.01)
$T = 2$	154	154	153	153	72	72	72
$T = 3$	246	246	241	241	157	156	156
$T = 4$	1066	1066	1061	1061	1472	1458	1458
$\bar{R}^2$	0.062	0.062	0.062	0.062	0.038	0.04	0.04
$N$	3844	3844	3818	3818	4802	4758	4758

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

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

	complete panel				all panel		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Primary	0.59*** (0.09)	0.75*** (0.08)	0.78*** (0.08)	0.78*** (0.08)	0.57*** (0.10)	0.72*** (0.07)	0.72*** (0.07)
Junior	0.15*** (0.04)	0.26*** (0.05)	0.28*** (0.05)	0.28*** (0.05)	0.03 (0.04)	0.12** (0.05)	0.12** (0.05)
High	0.06 (0.05)	0.17*** (0.06)	0.20*** (0.06)	0.20*** (0.06)	-0.12** (0.05)	-0.01 (0.06)	-0.01 (0.06)
Large	-0.15** (0.07)	-0.18*** (0.06)	-0.17*** (0.06)	-0.17*** (0.06)	-0.16** (0.07)	-0.20*** (0.06)	-0.20*** (0.06)
LargeGrace	-0.14* (0.07)	-0.17** (0.07)	-0.17** (0.07)	-0.17** (0.07)	-0.14* (0.07)	-0.18** (0.07)	-0.18** (0.07)
Cow	-0.12 (0.08)	-0.15** (0.07)	-0.14** (0.07)	-0.14** (0.07)	-0.13* (0.07)	-0.17*** (0.06)	-0.17*** (0.06)
Large × Junior	0.10 (0.12)	0.15 (0.11)	0.16 (0.11)	0.16 (0.11)	0.13 (0.13)	0.20* (0.12)	0.20* (0.12)
LargeGrace × Junior	0.11 (0.12)	0.14 (0.12)	0.14 (0.12)	0.14 (0.12)	0.12 (0.13)	0.17 (0.12)	0.17 (0.12)
Cow × Junior	0.04 (0.11)	0.09 (0.10)	0.09 (0.10)	0.09 (0.10)	0.15 (0.11)	0.22** (0.10)	0.22** (0.10)
Large × High	0.12 (0.13)	0.17 (0.12)	0.17 (0.12)	0.17 (0.12)	0.16 (0.13)	0.23* (0.13)	0.23* (0.13)
LargeGrace × High	0.13 (0.13)	0.16 (0.13)	0.16 (0.13)	0.16 (0.13)	0.18 (0.14)	0.23* (0.14)	0.23* (0.14)
Cow × High	0.08 (0.12)	0.14 (0.12)	0.14 (0.12)	0.14 (0.12)	0.16 (0.13)	0.23* (0.12)	0.23* (0.12)
Female		-0.24*** (0.06)	-0.24*** (0.06)	-0.24*** (0.06)		-0.15*** (0.05)	-0.15*** (0.05)
Junior × Female		0.50*** (0.13)	0.50*** (0.13)	0.50*** (0.13)		0.66*** (0.14)	0.66*** (0.14)
High × Female		0.41*** (0.13)	0.39*** (0.13)	0.39*** (0.13)		0.64*** (0.14)	0.64*** (0.14)
Large × Female		0.22** (0.09)	0.23** (0.09)	0.23** (0.09)		0.15* (0.08)	0.15* (0.08)
LargeGrace × Female		0.17** (0.08)	0.17** (0.08)	0.17** (0.08)		0.15* (0.08)	0.15* (0.08)
Cow × Female		0.28*** (0.09)	0.27*** (0.09)	0.27*** (0.09)		0.19*** (0.07)	0.19*** (0.07)
Large × Junior × Female		-0.46*** (0.15)	-0.46*** (0.15)	-0.46*** (0.15)		-0.42** (0.17)	-0.42** (0.17)
LargeGrace × Junior × Female		-0.24 (0.17)	-0.24 (0.16)	-0.24 (0.16)		-0.29 (0.19)	-0.29 (0.19)
Cow × Junior × Female		-0.44** (0.19)	-0.44** (0.18)	-0.44** (0.18)		-0.60*** (0.18)	-0.60*** (0.18)
Large × High × Female		-0.34** (0.16)	-0.34** (0.15)	-0.34** (0.15)		-0.39** (0.19)	-0.39** (0.19)
LargeGrace × High × Female		-0.10 (0.19)	-0.09 (0.18)	-0.09 (0.18)		-0.23 (0.20)	-0.23 (0.20)
Cow × High × Female		-0.25 (0.22)	-0.23 (0.21)	-0.23 (0.21)		-0.54*** (0.17)	-0.54*** (0.17)
FloodInRd1			-0.03 (0.03)	-0.03 (0.03)		0.00 (0.03)	0.00 (0.03)
EldestSon			-0.02 (0.04)	-0.02 (0.04)		-0.05* (0.03)	-0.05* (0.03)
EldestDaughter			-0.03 (0.02)	-0.03 (0.02)		-0.05* (0.03)	-0.05* (0.03)
$\bar{R}^2$	0.263	0.27	0.27	0.27	0.15	0.169	0.169
N	1138	1138	1138	1138	1507	1507	1507

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

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

TABLE 15: FD ESTIMATION OF SCHOOL ENROLLMENT, ROUND 1 VS. ROUND 4 DIFFERENCES, GRACE PERIOD

	complete panel				all panel		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Primary	0.46*** (0.06)	0.50*** (0.07)	0.52*** (0.06)	0.52*** (0.06)	0.40*** (0.06)	0.45*** (0.07)	0.45*** (0.07)
Junior	0.10*** (0.02)	0.13*** (0.03)	0.16*** (0.04)	0.16*** (0.04)	-0.03 (0.03)	0.01 (0.04)	0.01 (0.04)
High	0.02 (0.03)	0.05 (0.03)	0.08** (0.04)	0.08** (0.04)	-0.16*** (0.03)	-0.10** (0.04)	-0.10** (0.04)
WithGrace	-0.03 (0.05)	-0.03 (0.05)	-0.03 (0.05)	-0.03 (0.05)	-0.03 (0.05)	-0.03 (0.04)	-0.03 (0.04)
WithGrace × Junior	-0.01 (0.08)	-0.02 (0.08)	-0.01 (0.08)	-0.01 (0.08)	0.03 (0.08)	0.03 (0.08)	0.03 (0.08)
WithGrace × High	0.01 (0.08)	0.01 (0.08)	0.01 (0.08)	0.01 (0.08)	0.05 (0.09)	0.05 (0.09)	0.05 (0.09)
Female		-0.07 (0.05)	-0.07 (0.05)	-0.07 (0.05)		-0.03 (0.04)	-0.03 (0.04)
Junior × Female		0.17** (0.08)	0.17** (0.08)	0.17** (0.08)		0.35*** (0.09)	0.35*** (0.09)
High × Female		0.15** (0.06)	0.14** (0.07)	0.14** (0.07)		0.34*** (0.10)	0.34*** (0.10)
WithGrace × Female		0.05 (0.06)	0.05 (0.06)	0.05 (0.06)		0.05 (0.06)	0.05 (0.06)
WithGrace × Junior × Female		-0.01 (0.11)	-0.01 (0.11)	-0.01 (0.11)		-0.14 (0.13)	-0.14 (0.13)
WithGrace × High × Female		0.08 (0.13)	0.09 (0.13)	0.09 (0.13)		-0.09 (0.13)	-0.09 (0.13)
FloodInRd1			-0.03 (0.03)	-0.03 (0.03)		-0.00 (0.03)	-0.00 (0.03)
EldestSon			-0.03 (0.04)	-0.03 (0.04)		-0.06* (0.03)	-0.06* (0.03)
EldestDaughter			-0.02 (0.03)	-0.02 (0.03)		-0.05* (0.03)	-0.05* (0.03)
$\bar{R}^2$	0.259	0.263	0.263	0.263	0.146	0.163	0.163
$N$	1138	1138	1138	1138	1507	1507	1507

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

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

TABLE 16: FD ESTIMATION OF SCHOOL ENROLLMENT, PERIOD INTERACTIONS

covariates	complete panel				all panel		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Primary	0.13*** (0.02)	0.15*** (0.03)	0.19*** (0.03)	0.23*** (0.05)	0.10*** (0.01)	0.17*** (0.05)	0.19*** (0.05)
Junior	0.02 (0.01)	0.03 (0.03)	0.06* (0.04)	0.12** (0.06)	-0.03** (0.01)	0.04 (0.05)	0.04 (0.06)
High	0.00 (0.02)	0.02 (0.03)	-0.01 (0.03)	0.05 (0.05)	-0.06*** (0.01)	-0.00 (0.05)	-0.01 (0.05)
Large	-0.03** (0.02)	-0.03* (0.02)	-0.04* (0.02)	-0.03 (0.02)	-0.02 (0.02)	-0.03 (0.02)	-0.03 (0.02)
LargeGrace	-0.03* (0.02)	-0.03* (0.02)	-0.04 (0.02)	-0.04 (0.02)	-0.02 (0.02)	-0.03 (0.02)	-0.03 (0.02)
Cow	-0.03 (0.02)	-0.02 (0.02)	-0.03 (0.03)	-0.02 (0.03)	-0.02 (0.02)	-0.02 (0.02)	-0.03 (0.02)
Large × Junior			0.00 (0.05)	0.01 (0.05)			-0.01 (0.05)
LargeGrace × Junior			-0.01 (0.04)	-0.01 (0.04)			-0.01 (0.04)
Cow × Junior			0.00 (0.04)	0.00 (0.05)			0.03 (0.04)
Large × High			0.04 (0.04)	0.05 (0.04)			0.01 (0.04)
LargeGrace × High			0.07 (0.04)	0.07 (0.04)			0.02 (0.04)
Cow × High			0.08** (0.04)	0.10** (0.04)			-0.01 (0.05)
Female		0.01 (0.02)		-0.02 (0.06)		0.02 (0.06)	0.02 (0.06)
Junior × Female		0.02 (0.02)		-0.05 (0.04)		0.04* (0.02)	0.04 (0.05)
High × Female		0.06*** (0.02)		-0.00 (0.05)		0.05** (0.02)	0.08** (0.04)
Large × Female		-0.01 (0.03)		0.00 (0.04)		-0.03 (0.03)	-0.03 (0.04)
LargeGrace × Female		0.00 (0.02)		0.01 (0.03)		-0.02 (0.03)	-0.02 (0.03)
Cow × Female		0.00 (0.02)		0.01 (0.03)		-0.05* (0.03)	-0.06* (0.03)
Large × Junior × Female				0.05 (0.06)			-0.04 (0.08)
LargeGrace × Junior × Female				0.15** (0.06)			0.04 (0.08)
Cow × Junior × Female				0.09 (0.08)			-0.01 (0.08)
Large × High × Female				0.04 (0.07)			0.02 (0.07)
LargeGrace × High × Female				0.04 (0.07)			-0.01 (0.06)
Cow × High × Female				0.10 (0.07)			-0.14* (0.08)

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

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



TABLE 16: FD ESTIMATION OF SCHOOL ENROLLMENT, PERIOD INTERACTIONS, CONTINUED

	complete panel				all panel		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
rd 2 - 3			-0.08*** (0.03)	-0.08*** (0.03)		-0.06 (0.04)	-0.06 (0.04)
Junior × rd 2 - 3			0.08 (0.06)	0.09 (0.07)		0.11*** (0.03)	0.11 (0.07)
High × rd 2 - 3			0.23** (0.09)	0.24*** (0.09)		0.19*** (0.04)	0.15 (0.09)
Large × rd 2 - 3			0.01 (0.04)	0.00 (0.04)		0.03 (0.05)	0.02 (0.05)
LargeGrace × rd 2 - 3			-0.00 (0.04)	-0.00 (0.04)		0.03 (0.06)	0.02 (0.06)
Cow × rd 2 - 3			-0.01 (0.05)	-0.01 (0.05)		0.05 (0.05)	0.05 (0.05)
Large × Junior × rd 2 - 3			0.08 (0.09)	0.05 (0.09)			0.06 (0.10)
LargeGrace × Junior × rd 2 - 3			0.04 (0.09)	0.03 (0.09)			0.01 (0.10)
Cow × Junior × rd 2 - 3			-0.00 (0.08)	-0.01 (0.08)			-0.09 (0.09)
Large × High × rd 2 - 3			-0.11 (0.12)	-0.15 (0.11)			0.01 (0.12)
LargeGrace × High × rd 2 - 3			-0.06 (0.12)	-0.05 (0.12)			0.10 (0.12)
Cow × High × rd 2 - 3			-0.22* (0.13)	-0.24* (0.14)			0.04 (0.15)
Female × rd 2 - 3				0.08 (0.09)		0.05 (0.10)	0.04 (0.10)
Large × Female × rd 2 - 3				-0.08 (0.10)		-0.01 (0.11)	0.00 (0.11)
LargeGrace × Female × rd 2 - 3				-0.06 (0.10)		0.06 (0.11)	0.07 (0.11)
Cow × Female × rd 2 - 3				-0.05 (0.10)		0.06 (0.11)	0.08 (0.11)
Large × Junior × Female × rd 2 - 3				-0.11 (0.12)			-0.10 (0.16)
LargeGrace × Junior × Female × rd 2 - 3				-0.10 (0.09)			0.02 (0.10)
Cow × Junior × Female × rd 2 - 3				0.08 (0.12)			0.15 (0.13)
Large × High × Female × rd 2 - 3				-0.13 (0.14)			-0.23* (0.13)
LargeGrace × High × Female × rd 2 - 3				0.15 (0.12)			-0.09 (0.09)
Cow × High × Female × rd 2 - 3				-0.03 (0.22)			0.19 (0.22)
rd 3 - 4			-0.09*** (0.03)	-0.09*** (0.03)		-0.08** (0.03)	-0.07 (0.04)
Junior × rd 3 - 4			0.09 (0.07)	0.10 (0.07)		0.18*** (0.04)	0.13 (0.09)
High × rd 3 - 4			0.20*** (0.07)	0.21*** (0.07)		0.27*** (0.03)	0.23*** (0.08)
Large × rd 3 - 4			0.00 (0.04)	-0.00 (0.04)		0.03 (0.04)	0.02 (0.05)
LargeGrace × rd 3 - 4			0.02 (0.04)	0.02 (0.04)		0.02 (0.04)	0.01 (0.05)
Cow × rd 3 - 4			0.01 (0.05)	0.01 (0.05)		0.06 (0.04)	0.05 (0.06)
Large × Junior × rd 3 - 4			0.11 (0.09)	0.09 (0.09)			0.10 (0.12)
LargeGrace × Junior × rd 3 - 4			0.08 (0.09)	0.07 (0.09)			0.05 (0.11)
Cow × Junior × rd 3 - 4			0.04 (0.09)	0.03 (0.10)			-0.00 (0.11)
Large × High × rd 3 - 4			0.01 (0.09)	-0.01 (0.08)			0.07 (0.10)
LargeGrace × High × rd 3 - 4			-0.01 (0.09)	-0.01 (0.09)			0.03 (0.09)
Cow × High × rd 3 - 4			-0.16* (0.09)	-0.18** (0.09)			0.03 (0.11)
Female × rd 3 - 4				0.12 (0.15)		0.04 (0.15)	0.02 (0.16)
Large × Female × rd 3 - 4				-0.01 (0.08)		0.06 (0.07)	0.06 (0.08)
LargeGrace × Female × rd 3 - 4				-0.08 (0.08)		0.05 (0.07)	0.05 (0.08)
Cow × Female × rd 3 - 4				-0.06 (0.08)		0.08 (0.07)	0.09 (0.09)
Large × Junior × Female × rd 3 - 4				-0.11 (0.10)			0.08 (0.14)
LargeGrace × Junior × Female × rd 3 - 4				-0.09 (0.07)			0.00 (0.10)
Cow × Junior × Female × rd 3 - 4				0.05 (0.11)			0.10 (0.12)
Large × High × Female × rd 3 - 4				-0.12 (0.09)			-0.12 (0.11)
LargeGrace × High × Female × rd 3 - 4				0.10 (0.10)			0.01 (0.07)
Cow × High × Female × rd 3 - 4				0.00 (0.14)			0.25 (0.16)
FloodInRd1		-0.01 (0.01)		-0.01 (0.01)		0.01 (0.01)	0.01 (0.01)
Head literate		-0.00 (0.02)		-0.00 (0.02)		-0.02 (0.02)	-0.02 (0.02)
Head age		-0.00 (0.00)		-0.00 (0.00)		-0.00* (0.00)	-0.00* (0.00)
EldestSon		0.00 (0.01)		-0.00 (0.01)		-0.01 (0.01)	-0.01 (0.01)
EldestDaughter		-0.01 (0.01)		-0.01 (0.01)		0.00 (0.01)	0.00 (0.01)
$T = 2$	154	153	154	153	72	72	72
$T = 3$	246	241	246	241	157	156	156
$T = 4$	1066	1061	1066	1061	1472	1458	1458
$R^2$	0.061	0.061	0.081	0.079	0.038	0.055	0.052
$N$	3844	3818	3844	3818	4802	4758	4758

TABLE 17: FD ESTIMATION OF SCHOOL ENROLLMENT, PERIOD INTERACTIONS, GRACE PERIOD

		complete panel				all panel		
covariates		(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Primary	0.12*** (0.01)	0.12*** (0.01)	0.16*** (0.02)	0.20*** (0.04)	0.09*** (0.01)	0.08*** (0.01)	0.16*** (0.04)
	Junior	0.00 (0.01)	0.01 (0.01)	0.04* (0.02)	0.09** (0.04)	-0.04*** (0.01)	-0.06*** (0.01)	0.02 (0.04)
	High	-0.04*** (0.01)	-0.03** (0.01)	-0.01 (0.02)	0.04 (0.03)	-0.08*** (0.01)	-0.07*** (0.01)	-0.01 (0.03)
	WithGrace	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.02)	-0.01 (0.02)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)
	WithGrace × Junior	-0.00 (0.02)	-0.00 (0.02)	-0.01 (0.03)	-0.01 (0.03)	0.02 (0.02)	0.02 (0.02)	0.02 (0.03)
	WithGrace × High	0.04* (0.02)	0.04* (0.02)	0.05* (0.03)	0.05* (0.03)	0.02 (0.02)	0.01 (0.02)	0.01 (0.03)
	Female		0.01 (0.01)		-0.02 (0.04)		0.02 (0.01)	-0.01 (0.04)
	Junior × Female		-0.02 (0.02)		-0.04 (0.03)		0.03 (0.03)	0.02 (0.03)
	High × Female		0.03 (0.03)		0.01 (0.03)		0.10*** (0.03)	0.06* (0.03)
	WithGrace × Female		0.00 (0.02)		0.01 (0.02)		-0.01 (0.02)	-0.02 (0.02)
	WithGrace × Junior × Female		0.08** (0.03)		0.10** (0.05)		0.04 (0.04)	0.03 (0.05)
	WithGrace × High × Female		0.04 (0.04)		0.05 (0.05)		-0.04 (0.04)	-0.05 (0.05)
	rd 2 - 3			-0.07*** (0.02)	-0.07*** (0.02)			-0.04* (0.02)
	Junior × rd 2 - 3			0.12*** (0.04)	0.12*** (0.04)			0.15*** (0.05)
	High × rd 2 - 3			0.17*** (0.06)	0.18*** (0.06)			0.17*** (0.06)
	WithGrace × rd 2 - 3			-0.01 (0.03)	-0.01 (0.03)			0.02 (0.03)
	WithGrace × Junior × rd 2 - 3			-0.03 (0.06)	-0.03 (0.06)			-0.08 (0.07)
	WithGrace × High × rd 2 - 3			-0.07 (0.08)	-0.06 (0.09)			0.04 (0.09)
	Female × rd 2 - 3				0.05 (0.05)			0.04 (0.05)
	WithGrace × Female × rd 2 - 3				-0.01 (0.06)			0.07 (0.06)
	WithGrace × Junior × Female × rd 2 - 3				-0.01 (0.08)			0.09 (0.08)
	WithGrace × High × Female × rd 2 - 3				0.10 (0.11)			0.04 (0.11)
	rd 3 - 4			-0.09*** (0.02)	-0.09*** (0.02)			-0.06*** (0.02)
	Junior × rd 3 - 4			0.16*** (0.04)	0.16*** (0.04)			0.19*** (0.06)
	High × rd 3 - 4			0.22*** (0.04)	0.22*** (0.04)			0.29*** (0.05)
	WithGrace × rd 3 - 4			0.02 (0.03)	0.02 (0.03)			0.02 (0.03)
	WithGrace × Junior × rd 3 - 4			-0.02 (0.06)	-0.02 (0.06)			-0.04 (0.07)
	WithGrace × High × rd 3 - 4			-0.09 (0.06)	-0.10 (0.06)			-0.04 (0.07)
	Female × rd 3 - 4				0.08 (0.09)			0.07 (0.08)
	WithGrace × Female × rd 3 - 4				-0.06 (0.05)			0.02 (0.05)
	WithGrace × Junior × Female × rd 3 - 4				-0.01 (0.07)			0.06 (0.08)
	WithGrace × High × Female × rd 3 - 4				0.08 (0.09)			0.12 (0.09)
	FloodInRd1		-0.01 (0.01)		-0.01 (0.01)		0.01 (0.01)	0.00 (0.01)
	Head literate				-0.00 (0.02)			-0.02 (0.02)
	Head age				-0.00 (0.00)			-0.00* (0.00)
	EldestSon				0.00 (0.01)			-0.01 (0.01)
	EldestDaughter				-0.01 (0.01)			0.01 (0.01)
	T = 2	154	154	154	153	72	72	72
	T = 3	246	246	246	241	157	157	156
	T = 4	1066	1066	1066	1061	1472	1472	1458
	R <sup>2</sup>	0.061	0.061	0.082	0.083	0.038	0.039	0.055
	N	3844	3844	3844	3818	4802	4802	4758

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

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

TABLE 18: FD ESTIMATION OF SCHOOL ENROLLMENT, PERIOD INTERACTIONS, SMALL VS. LARGE SIZED LOANS

		complete panel				all panel		
covariates		(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Primary	0.15*** (0.02)	0.15*** (0.02)	0.19*** (0.03)	0.23*** (0.05)	0.12*** (0.02)	0.10*** (0.02)	0.17*** (0.05)
	Junior	0.01 (0.01)	0.01 (0.02)	0.06* (0.04)	0.11** (0.06)	-0.03* (0.02)	-0.05** (0.02)	0.04 (0.06)
	High	-0.03 (0.02)	-0.02 (0.02)	-0.01 (0.03)	0.04 (0.05)	-0.08*** (0.01)	-0.08*** (0.01)	-0.01 (0.05)
	LargeSize	-0.03** (0.02)	-0.03* (0.02)	-0.03* (0.02)	-0.03 (0.02)	-0.02* (0.01)	-0.03* (0.01)	-0.03* (0.02)
	LargeSize × Junior	0.03 (0.03)	0.03 (0.03)	-0.00 (0.04)	0.00 (0.04)	0.03 (0.02)	0.02 (0.02)	0.00 (0.04)
	LargeSize × High	0.05* (0.03)	0.06** (0.03)	0.06* (0.04)	0.07* (0.04)	0.05** (0.02)	0.04 (0.02)	0.01 (0.03)
	Female		0.01 (0.02)		-0.02 (0.06)		0.03* (0.02)	0.02 (0.06)
	Junior × Female		-0.03 (0.03)		-0.05 (0.04)		0.04 (0.04)	0.04 (0.05)
	High × Female		0.03 (0.05)		-0.00 (0.05)		0.11*** (0.04)	0.08** (0.04)
	LargeSize × Female		0.00 (0.02)		0.01 (0.03)		-0.02 (0.02)	-0.04 (0.03)
	LargeSize × Junior × Female		0.07* (0.04)		0.09* (0.05)		0.02 (0.04)	-0.00 (0.06)
	LargeSize × High × Female		0.03 (0.06)		0.06 (0.06)		-0.05 (0.04)	-0.04 (0.05)
	rd 2 - 3			-0.08*** (0.03)	-0.08*** (0.03)			-0.06 (0.04)
	Junior × rd 2 - 3			0.08 (0.06)	0.09 (0.07)			0.11 (0.07)
	High × rd 2 - 3			0.23** (0.09)	0.24*** (0.09)			0.15 (0.09)
	LargeSize × rd 2 - 3			-0.00 (0.03)	-0.00 (0.03)			0.03 (0.04)
	LargeSize × Junior × rd 2 - 3			0.04 (0.07)	0.02 (0.07)			-0.00 (0.08)
	LargeSize × High × rd 2 - 3			-0.13 (0.10)	-0.13 (0.10)			0.05 (0.11)
	Female × rd 2 - 3				0.08 (0.09)			0.04 (0.10)
	LargeSize × Female × rd 2 - 3				-0.06 (0.09)			0.05 (0.10)
	LargeSize × Junior × Female × rd 2 - 3				-0.04 (0.06)			0.02 (0.08)
	LargeSize × High × Female × rd 2 - 3				0.02 (0.10)			-0.05 (0.09)
	rd 3 - 4			-0.09*** (0.03)	-0.09*** (0.03)			-0.07 (0.04)
	Junior × rd 3 - 4			0.09 (0.07)	0.10 (0.07)			0.13 (0.09)
	High × rd 3 - 4			0.20*** (0.07)	0.21*** (0.07)			0.23*** (0.08)
	LargeSize × rd 3 - 4			0.01 (0.04)	0.01 (0.04)			0.02 (0.05)
	LargeSize × Junior × rd 3 - 4			0.08 (0.08)	0.07 (0.08)			0.05 (0.10)
	LargeSize × High × rd 3 - 4			-0.05 (0.07)	-0.06 (0.07)			0.04 (0.09)
	Female × rd 3 - 4				0.12 (0.15)			0.02 (0.16)
	LargeSize × Female × rd 3 - 4				-0.04 (0.08)			0.07 (0.08)
	LargeSize × Junior × Female × rd 3 - 4				-0.05 (0.06)			0.06 (0.07)
	LargeSize × High × Female × rd 3 - 4				0.01 (0.07)			0.04 (0.07)
	FloodInRd1		-0.01 (0.01)		-0.01 (0.01)		0.01 (0.01)	0.01 (0.01)
	Head literate				-0.00 (0.02)			-0.02 (0.02)
	Head age				-0.00 (0.00)			-0.00* (0.00)
	EldestSon				-0.00 (0.01)			-0.01 (0.01)
	EldestDaughter				-0.01 (0.01)			0.01 (0.01)
	$\bar{R}^2$	0.062	0.062	0.084	0.083	0.038	0.04	0.054
	N	3844	3844	3844	3818	4802	4802	4758

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

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

## IV.2 Repayment and net saving

```
Dropped 198 obs due to T<2.  
Dropped 3084 obs due to NA.
```

```
Dropped 198 obs due to T<2.  
Dropped 3084 obs due to NA.
```

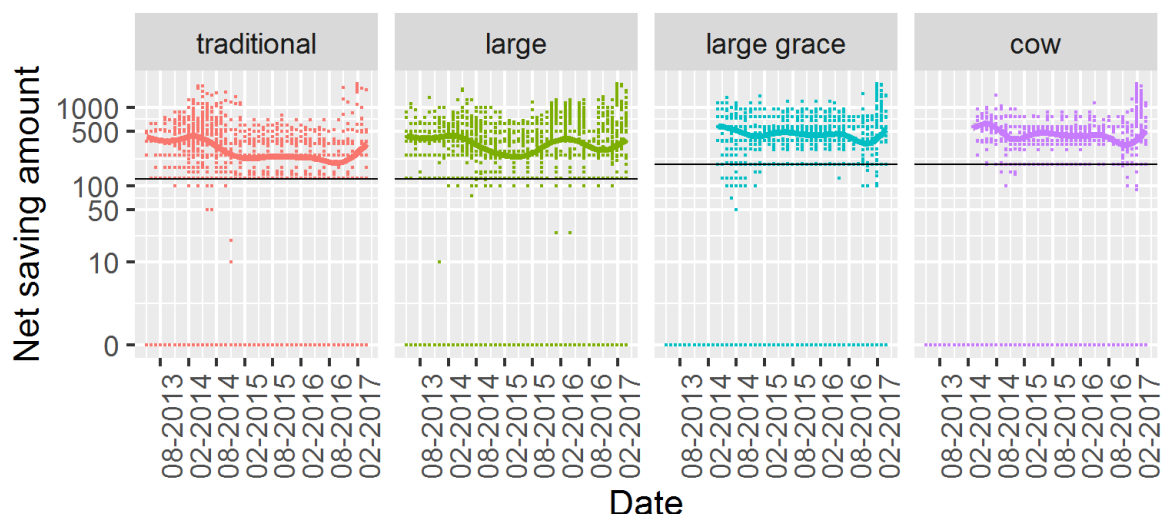
```
tee  
Tee    2    3    4  
1      0   14   28  
2      0 1163 1163  
3      2    2    2
```

Repayment started in round 2. So taking a first-difference leaves us with period 2-3 and period 3-4. Drop 2 observations in `ar` that have round 1 data (for unknown reasons). After first-differencing, `ar` has 2372 rows with 42, 2326, 4 individuals with repeatedly observed for 2, 3, 4 times, respectively. 4 individuals observed for 4 times started repayment even before official disbursement date, so its round 1 will be dropped.

Plot repayment by date. (Simple plotting does not work because repayment is ighly erratic.)

Mean group repayment shortfall shows members, on average, repay by the end of 3rd year.

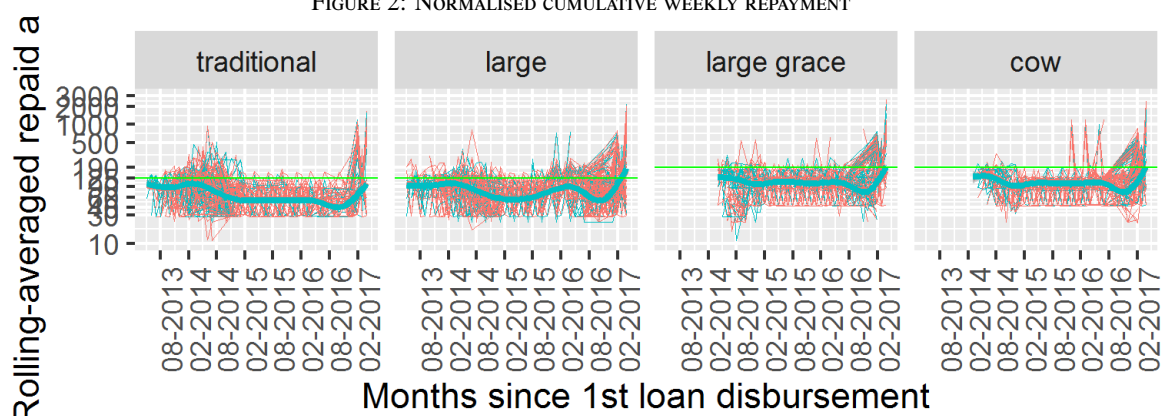
FIGURE 1: WEEKLY NET SAVING



Source: Administrative data.

Note:

FIGURE 2: NORMALISED CUMULATIVE WEEKLY REPAYMENT



povertystatus — Ultra Poor — Moderate Poor

Source: Administrative data.

Note: Weekly repayments are normalised by the number of weeks in each month.

Note all binary interaction terms are demeaned and then interacted.

NAs in CumRepaid.

Arm					
survey	traditional	large	large	grace	cow
1	398	400		398	400
2	113	41		0	20
3	110	39		0	19
4	75	39		0	0

Tabulation at rd 1:

	RArm				
Mstatus	traditional	large	large	grace	cow
gErosion		40	0	20	20
gRejection		80	40	20	0
iRejection		54	12	22	72
iReplacement		0	0	0	0
newGroup		0	0	0	0

TABLE 19: 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)	234.8*** (48.0)	301.0*** (56.8)	1841.4*** (384.7)	1338.9*** (234.0)	1140.3*** (331.4)	2076.2*** (402.6)	1639.9*** (265.0)	1406.7*** (370.9)
Large	507.6*** (66.6)	532.2*** (76.8)	2235.6*** (405.8)	2005.7*** (275.7)	2164.9*** (271.2)	2743.2*** (428.5)	2537.9*** (306.7)	2674.5*** (308.6)
LargeGrace	240.3*** (55.3)	308.2*** (66.3)	2670.1*** (440.2)	2626.1*** (343.2)	2384.9*** (328.6)	2910.3*** (464.2)	2934.3*** (378.0)	2683.6*** (374.0)
Cow	158.8*** (59.6)	194.2*** (72.0)	2170.6*** (498.9)	2015.0*** (383.8)	1739.3*** (343.6)	2329.3*** (525.7)	2209.2*** (423.7)	1910.5*** (384.9)
rd 3 - 4		-198.2*** (27.0)		1230.3*** (194.2)	1492.7*** (135.7)		1032.1*** (205.3)	1312.3*** (145.9)
Large × rd 3 - 4		-90.1 (81.2)		841.1 (694.9)	1006.1*** (279.8)		751.0 (732.5)	1012.2*** (308.5)
LargeGrace × rd 3 - 4		-248.6*** (84.7)		154.7 (711.0)	1014.9*** (343.2)		-93.9 (754.6)	849.5** (384.2)
Cow × rd 3 - 4		-126.9 (89.9)		549.0 (770.4)	1229.8*** (280.3)		422.1 (810.4)	1179.1*** (301.9)
FloodInRd1					-518.8*** (173.2)			-529.2*** (191.0)
Head literate					165.2 (178.3)			216.0 (185.5)
Head age					1.4 (5.2)			2.5 (5.5)
6M renavment					2794.9*** (494.7)			3132.5*** (448.3)
6M net saving					-5496.1*** (1605.7)			-3510.6** (1652.2)
6M other member net saving					947.8 (3136.1)			-262.6 (3317.8)
6M other member Repaid					1804.8*** (441.1)			1601.1*** (429.1)
$T = 2$	42	42	42	42	42	42	42	42
$T = 3$	1163	1163	1163	1163	1153	1163	1163	1153
$T = 4$	2	2	2	2	2	2	2	2
$\bar{R}^2$	0.115	0.163	0.095	0.15	0.301	0.113	0.15	0.3
$\hat{\rho}$	0.243	0.322	0.015	0.101	0.375	0.065	0.132	0.432
Pr[ $\hat{\rho} = 0$ ]	0.000	0.000	0.567	0.000	0.000	0.016	0.000	0.000
$N$	2374	2374	2374	2374	2354	2374	2374	2354

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using rd 2 - rd 4 data. First-differenced ( $\Delta x_{t+1} \equiv x_{t+1} - x_t$ ) regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal.

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

TABLE 20: 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)	494.6*** (38.2)	604.1*** (46.8)	3746.5*** (178.6)	3171.1*** (178.5)	2968.1*** (311.6)	4241.1*** (198.8)	3775.2*** (202.1)	3524.8*** (344.1)
UltraPoor	1.2 (23.3)	-3.8 (28.6)	179.1* (104.0)	105.7 (94.3)	130.9 (93.6)	180.3 (115.7)	101.9 (106.0)	133.4 (104.3)
rd 3 - 4		-211.3*** (28.5)		1234.4*** (176.5)	1467.7*** (151.6)		1023.1*** (188.6)	1277.0*** (163.0)
UltraPoor × rd 3 - 4		8.4 (28.6)		320.9** (147.8)	219.5** (109.3)		329.4** (151.3)	216.3* (112.8)
FloodInRd1					-637.1*** (202.2)			-633.0*** (226.7)
Head literate					161.3 (198.1)			216.8 (213.7)
Head age					0.0 (5.7)			1.1 (6.3)
6M repavment					2818.0*** (482.7)			3157.9*** (435.5)
6M net saving					-5863.9*** (1616.6)			-3879.4** (1678.8)
6M other member net saving					-1628.4 (3089.8)			-2509.6 (3351.5)
6M other member Repaid					1354.4* (755.0)			1045.0 (762.2)
$T = 2$	42	42	42	42	42	42	42	42
$T = 3$	1163	1163	1163	1163	1153	1163	1163	1153
$T = 4$	2	2	2	2	2	2	2	2
$\bar{R}^2$	0	0.041	0	0.054	0.201	0	0.035	0.177
$\hat{\rho}$	0.220	0.265	0.152	0.210	0.469	0.200	0.246	0.525
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	2374	2374	2374	2374	2354	2374	2374	2354

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using rd 2 - rd 4 data. First-differenced ( $\Delta x_{t+1} \equiv x_{t+1} - x_t$ ) regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal.

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

TABLE 21: FD ESTIMATION OF NET CUMULATIVE SAVING AND REPAYMENT, WITH VS. WITHOUT A GRACE PERIOD

	Cumulative net saving		Cumulative repayment		Cumulative net saving + cumulative repayment			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	577.2*** (54.9)	660.9*** (62.1)	3349.5*** (237.1)	2682.2*** (192.0)	2680.1*** (332.4)	3926.7*** (277.7)	3343.1*** (237.0)	3304.3*** (378.6)
WithGrace	-142.7** (59.7)	-107.2 (67.4)	913.4*** (307.7)	970.1*** (278.6)	608.0** (292.9)	770.7** (348.6)	863.0*** (324.6)	508.5 (343.5)
rd 3 - 4		-203.1*** (27.2)		1270.1*** (180.2)	1479.4*** (145.1)		1067.1*** (190.7)	1292.4*** (158.1)
WithGrace × rd 3 - 4		-128.1** (54.2)		-220.7 (361.4)	408.3 (288.3)		-348.9 (382.3)	278.9 (320.1)
FloodInRd1					-543.4** (211.4)			-556.1** (238.8)
Head literate					165.5 (197.2)			217.8 (214.5)
Head age					0.4 (5.5)			1.3 (6.2)
6M repavment					2806.0*** (488.8)			3148.8*** (441.3)
6M net saving					-5796.5*** (1627.1)			-3827.4** (1686.3)
6M other member net saving					96.2 (2993.8)			-1003.0 (3244.6)
6M other member Repaid					1270.8* (671.3)			958.8 (717.4)
$T = 2$	42	42	42	42	42	42	42	42
$T = 3$	1163	1163	1163	1163	1153	1163	1163	1153
$T = 4$	2	2	2	2	2	2	2	2
$\bar{R}^2$	0.019	0.064	0.027	0.08	0.217	0.018	0.053	0.187
$\hat{\rho}$	0.206	0.297	0.150	0.213	0.465	0.212	0.265	0.533
Pr[ $\hat{\rho} = 0$ ]	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	2374	2374	2374	2374	2354	2374	2374	2354

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using rd 2 - rd 4 data. First-differenced ( $\Delta x_{t+1} \equiv x_{t+1} - x_t$ ) regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

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



TABLE 22: FD ESTIMATION OF NET CUMULATIVE SAVING AND REPAYMENT, SMALL SIZE VS. LARGE SIZE

	Cumulative net saving		Cumulative repayment		Cumulative net saving + cumulative repayment			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	234.8*** (48.0)	301.6*** (56.8)	1841.4*** (384.6)	1340.7*** (233.9)	1251.4*** (253.6)	2076.2*** (402.4)	1642.2*** (265.0)	1440.2*** (368.9)
rd 3 - 4		-200.5*** (28.0)		1222.4*** (197.0)	1481.7*** (139.8)		1021.8*** (209.5)	1306.5*** (152.0)
LargeSize × rd 3 - 4		-156.0** (75.3)		514.4 (682.8)	1060.7*** (222.3)		358.3 (720.7)	998.6*** (257.4)
FloodInRd1					-563.0*** (188.6)			-519.5** (204.3)
Head literate								178.3 (189.6)
Head age								2.2 (5.5)
SizeLargeSize	302.7*** (56.5)	345.6*** (64.0)	2359.3*** (408.6)	2216.2*** (284.6)	2090.7*** (259.4)	2662.0*** (429.0)	2561.8*** (314.8)	2432.5*** (296.6)
6M repavment					2793.5*** (492.8)			3122.0*** (444.1)
6M net saving					-5623.9*** (1615.0)			-3559.5** (1649.3)
6M other member net saving					1485.3 (2860.6)			691.2 (3039.3)
6M other member Repaid					1685.8*** (442.9)			1408.6*** (439.6)
$T = 2$	42	42	42	42	42	42	42	42
$T = 3$	1163	1163	1163	1163	1160	1163	1163	1153
$T = 4$	2	2	2	2	2	2	2	2
$\bar{R}^2$	0.042	0.087	0.09	0.144	0.293	0.107	0.141	0.289
$\hat{\rho}$	0.209	0.305	0.017	0.086	0.370	0.077	0.138	0.441
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.537	0.000	0.000	0.004	0.000	0.000
$N$	2374	2374	2374	2374	2368	2374	2374	2354

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using rd 2 - rd 4 data. First-differenced ( $\Delta x_{t+1} \equiv x_{t+1} - x_t$ ) regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

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

**Finding IV.2** TABLE 19 (1) shows net saving increases, (2) shows that initially a larger then a smaller extent in the later rounds. This reduction may reflect the use of saving for repayment. traditional arm has the lowest repayment rates. Ultra poor and moderately poor have similar repayment rates as indicated in TABLE 20. TABLE 21 (2) shows having a grace period increases the repayment amount while reduces net saving in later rounds. (4) and (5) show cumulative repayment is greater for with grace because each installment is larger. These are all by design that they do not repay in rd 1 so saving increases then they tap in these saving for repayment.

### IV.3 Assets

Assets reportd 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 196 obs due to T<2.  
Dropped 1402 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 1402 obs due to NA.  
Dropped 196 obs due to T<2.  
Dropped 1402 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 1274 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 1274 obs due to NA.

Main assets are household assets (HAssetAmount) and production assets (PAssetAmount) both with 5648 observations. After first-differencing, they become 4050 observations, with 28, 200, 3822 households observed for 2, 3, 4 times. We also examine rd 2 vs. rd 4 differences, which has 2678 observations. After first-differencing, they become 1274 observations.

```
source ( paste0 ( pathprogram , " AssetCovariateSelection.R " ))
```

```
# Compare asset changes between arms and "pure control" (loan nonreceivers)
source ( paste0 ( pathprogram , " AssetCovariateSelectionRobustness.R " ))
```

TABLE 23: FD ESTIMATION OF ASSETS

	Household asset amount (Tk)				Productive asset amount (Tk)			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	6429.7*** (1122.6)	760.4 (1107.0)	1932.0 (1197.3)	11335.6*** (2354.0)	-226.4*** (60.6)	-391.3*** (109.0)	-137.6 (118.0)	-118.2 (151.2)
Large	1899.6 (1817.8)	1646.3 (1779.8)	1958.2 (1770.3)	3658.3 (2969.1)	133.9 (94.8)	-119.8 (123.8)	99.2 (135.8)	-263.3 (316.7)
LargeGrace	2039.6 (1660.5)	2010.9 (1444.8)	1829.4 (1499.7)	2829.0 (2890.3)	-52.5 (97.3)	-197.8 (122.6)	-64.2 (114.1)	-176.7 (228.7)
Cow	1543.8 (1673.9)	364.8 (1259.6)	369.1 (1237.7)	2403.1 (3282.7)	139.8 (90.7)	69.8 (103.3)	161.9* (86.1)	121.3 (154.2)
rd 1 - 2		7195.1*** (1788.3)	7156.5*** (1785.0)	-11753.3*** (3971.4)		570.1** (227.4)	267.5 (272.0)	3.9 (175.5)
Large × rd 1 - 2		1431.3 (3524.2)	1453.4 (3520.3)			2020.0*** (629.6)	1318.3 (813.3)	
LargeGrace × rd 1 - 2		606.4 (3521.1)	655.0 (3522.3)			1038.0* (600.6)	544.5 (588.5)	
Cow × rd 1 - 2		6661.7 (5152.1)	6598.6 (5132.5)			386.6 (263.6)	103.5 (404.3)	
rd 2 - 3		10664.9*** (2283.8)	10624.6*** (2295.7)			302.9* (167.9)		
Large × rd 2 - 3		3367.8 (5699.3)	3438.0 (5689.3)			701.6 (533.3)		
LargeGrace × rd 2 - 3		1682.4 (5033.4)	1777.7 (5022.5)			492.9 (327.9)		
Cow × rd 2 - 3		6511.8 (7111.7)	6378.8 (7161.5)			284.3 (281.0)		
rd 3 - 4				-10466.7*** (2318.2)			-303.4* (168.3)	-310.3* (169.6)
Large × rd 3 - 4				-3689.9 (5647.9)			-706.9 (534.4)	-693.3 (541.2)
LargeGrace × rd 3 - 4				-2085.3 (4971.8)			-499.2 (328.7)	-503.8 (331.2)
Cow × rd 3 - 4				-6694.6 (7231.3)			-288.2 (281.0)	-281.1 (286.4)
FloodInRd1			-2866.6*** (1001.1)	-3074.1** (1354.6)			-115.4* (65.9)	118.5 (154.6)
Head literate			1653.0 (1882.8)	912.7 (3088.4)			-115.8** (55.4)	-3.7 (244.0)
T = 2	28	28	28	96	28	28	28	96
T = 3	100	100	97	1275	100	100	97	1275
T = 4	1274	1274	1274	0	1274	1274	1274	0
R <sup>2</sup>	0	0.015	0.016	0.017	0	0.003	0.003	0
Pr[ρ̂ = 0]	0.041 0.064	0.096 0.000	0.087 0.000	-0.056 0.002	-0.091 0.000	-0.067 0.000	-0.058 0.000	0.745 0.000
N	4050	4050	4044	2646	4050	4050	4044	2646

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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.

TABLE 24: 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)	8117.0*** (1046.2)	1285.0 (1755.0)	2403.4 (1786.8)	14636.3*** (2493.9)	-139.6** (65.2)	-444.8*** (117.6)	-59.6 (95.5)	-108.2 (125.5)
UltraPoor	-352.6 (1080.0)	787.0 (1244.5)	823.6 (1260.4)	-1589.6 (2088.5)	-40.4 (75.7)	-46.4 (88.4)	-63.2 (83.5)	-139.7 (192.0)
rd 1 - 2		7263.1*** (1871.7)	7222.9*** (1866.6)	-12876.7*** (2938.9)		593.6** (249.2)	273.3 (282.8)	99.6 (126.8)
UltraPoor × rd 1 - 2		-3193.0 (2809.6)	-3080.2 (2797.0)			218.3 (513.1)	280.9 (554.6)	
rd 2 - 3		10742.0*** (2333.9)	10698.1*** (2344.7)			320.6* (173.5)		
UltraPoor × rd 2 - 3		-6512.0 (4525.0)	-6354.4 (4553.9)			-62.4 (336.3)		
rd 3 - 4				-10549.8*** (2372.5)			-321.0* (173.9)	-327.5* (175.1)
UltraPoor × rd 3 - 4				6119.1 (4608.2)			59.7 (337.2)	70.0 (340.8)
FloodInRd1			-2745.8*** (957.7)	-2935.6** (1258.5)			-90.6 (62.0)	98.6 (162.2)
Head literate			1797.7 (1823.9)	967.4 (3015.5)			-92.9* (56.4)	-0.2 (242.6)
$T = 2$	28	28	28	96	28	28	28	96
$T = 3$	100	100	97	1275	100	100	97	1275
$T = 4$	1274	1274	1274	0	1274	1274	1274	0
$\bar{R}^2$	0	0.016	0.017	0.018	0	0.001	0	-0.001
$\hat{\rho}$	0.040	0.095	0.081	-0.064	-0.092	-0.067	-0.053	0.577
$\Pr[\hat{\rho} = 0]$	0.071	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	4050	4050	4044	2646	4050	4050	4044	2646

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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.

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

TABLE 25: FD ESTIMATION OF ASSETS, SMALL VS. LARGE SIZE LOANS

	Household asset amount (Tk)				Productive asset amount (Tk)			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	6429.7*** (1122.3)	771.0 (1114.3)	1923.9 (1181.2)	11313.3*** (2334.6)	-226.4*** (60.6)	-342.7*** (108.7)	-146.6 (117.4)	-110.5 (151.5)
LargeSize	1826.7 (1353.9)	1359.6 (1085.2)	1411.9 (1068.3)	2992.6 (2330.9)	76.8 (74.5)	-78.4 (90.3)	65.3 (85.1)	-110.5 (172.2)
rd 1 - 2		7175.0*** (1811.8)	7136.6*** (1807.1)	-11787.2*** (1902.7)		578.0** (239.4)	268.6 (277.7)	195.9 (154.4)
LargeSize × rd 1 - 2		2869.4 (2682.2)	2871.1 (2674.6)			1178.2*** (356.3)	669.6 (420.3)	
rd 2 - 3		10641.1*** (2296.5)	10600.4*** (2307.0)			309.4* (170.9)		
LargeSize × rd 2 - 3		3835.3 (4641.3)	3844.5 (4635.6)			508.6* (279.7)		
rd 3 - 4				-10445.7*** (2325.9)			-309.4* (170.9)	-315.1* (173.1)
LargeSize × rd 3 - 4				-4140.0 (4589.9)			-508.6* (279.7)	-502.6* (285.3)
FloodInRd1			-2825.0*** (953.3)	-3021.3** (1251.6)		-95.4 (61.7)	-95.4 (61.7)	100.4 (159.9)
Head literate			1653.5 (1812.0)	841.9 (2995.1)		-102.7* (57.1)	-102.7* (57.1)	13.7 (247.0)
$T = 2$	28	28	28	96	28	28	28	96
$T = 3$	100	100	97	1275	100	97	97	1275
$T = 4$	1274	1274	1274	0	1274	1274	1274	0
$\bar{R}^2$	0	0.016	0.017	0.018	0	0.002	0.002	0
$\hat{\rho}$	0.040	0.099	0.083	-0.057	-0.087	-0.052	-0.052	0.593
$\Pr[\hat{\rho} = 0]$	0.072	0.000	0.000	0.001	0.000	0.000	0.000	0.000
$N$	4050	4050	4044	2646	4050	4044	4044	2646

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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.

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

TABLE 26: FD ESTIMATION OF ASSETS, WITH VS. WITHOUT A GRACE PERIOD

	Household asset amount (Tk)				Productive asset amount (Tk)			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	7551.7*** (974.8)	1725.0 (1521.8)	2996.4* (1624.6)	13412.6*** (2151.8)	-147.4*** (51.2)	-487.0*** (129.2)	-98.5 (155.6)	-268.1 (253.7)
WithGrace	664.8 (1308.2)	234.5 (1303.5)	-27.1 (1305.1)	497.9 (2351.6)	-33.6 (73.7)	20.0 (94.9)	0.9 (94.6)	132.4 (211.4)
rd 1 - 2		7186.8*** (1841.5)	7145.7*** (1836.0)	-11486.7*** (2469.0)		597.2** (246.7)	273.8 (281.4)	129.8 (155.5)
WithGrace × rd 1 - 2		2852.8 (3644.1)	2842.3 (3645.9)			-485.0 (497.0)	-443.2 (569.0)	
rd 2 - 3		10670.2*** (2319.3)	10626.9*** (2329.4)			323.6* (175.7)		
WithGrace × rd 2 - 3		2155.3 (4616.6)	2104.0 (4642.0)			-41.0 (356.5)		
rd 3 - 4				-10468.8*** (2351.4)			-323.9* (176.0)	-330.6* (177.2)
WithGrace × rd 3 - 4				-2274.7 (4677.5)			38.6 (357.2)	33.1 (358.7)
FloodInRd1			-2729.0*** (981.1)	-2979.7** (1323.1)			-93.0 (65.4)	109.7 (159.3)
Head literate			1774.6 (1803.0)	964.1 (2989.2)			-89.6 (55.6)	-0.4 (242.1)
$T = 2$	28	28	28	96	28	28	28	96
$T = 3$	100	100	97	1275	100	100	97	1275
$T = 4$	1274	1274	1274	0	1274	1274	1274	0
$\bar{R}^2$	0	0.015	0.016	0.017	0	0.001	0.001	-0.001
$\hat{\rho}$	0.043	0.094	0.080	-0.058	-0.089	-0.071	-0.056	0.604
$\Pr[\hat{\rho} = 0]$	0.048	0.000	0.000	0.001	0.000	0.000	0.000	0.000
$N$	4050	4050	4044	2646	4050	4050	4044	2646

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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.

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

TABLE 27: FD ESTIMATION OF ASSETS, ROUND 2 AND 4 COMPARISON

	Household asset amount (Tk)				Productive asset amount (Tk)			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	10964.7*** (2425.5)	13591.4*** (2979.7)	13591.4*** (2979.7)	13591.4*** (2979.7)	-279.5 (196.3)	-388.8 (265.0)	-388.8 (265.0)	-388.8 (265.0)
Large	5116.7 (4553.4)	5741.6 (4476.4)	5741.6 (4476.4)	5741.6 (4476.4)	-826.9* (468.9)	-854.6* (481.0)	-854.6* (481.0)	-854.6* (481.0)
LargeGrace	5762.6 (4201.4)	5319.1 (4277.7)	5319.1 (4277.7)	5319.1 (4277.7)	-619.9 (444.1)	-603.3 (442.5)	-603.3 (442.5)	-603.3 (442.5)
Cow	1935.1 (4198.3)	1960.4 (3913.1)	1960.4 (3913.1)	1960.4 (3913.1)	153.0 (248.4)	147.4 (259.1)	147.4 (259.1)	147.4 (259.1)
FloodInRd1		-6092.8** (2801.2)	-6092.8** (2801.2)	-6092.8** (2801.2)		234.2 (320.1)	234.2 (320.1)	234.2 (320.1)
Head literate		2048.2 (6454.3)	2048.2 (6454.3)	2048.2 (6454.3)		11.8 (505.7)	11.8 (505.7)	11.8 (505.7)
$\bar{R}^2$	0	0.004	0.004	0.004	0.002	0.001	0.001	0.001
$N$	1274	1274	1274	1274	1274	1274	1274	1274

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.

TABLE 28: FD ESTIMATION OF ASSETS, ROUND 2 AND 4 COMPARISON, GRACE PERIOD

	Household asset amount (Tk)				Productive asset amount (Tk)			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	14101.3*** (2577.5)	17025.0*** (3471.9)	17025.0*** (3471.9)	17025.0*** (3471.9)	-786.4*** (280.1)	-908.1** (383.0)	-908.1** (383.0)	-908.1** (383.0)
WithGrace	715.2 (3549.8)	136.6 (3585.2)	136.6 (3585.2)	136.6 (3585.2)	272.8 (357.8)	294.4 (359.4)	294.4 (359.4)	294.4 (359.4)
FloodInRd1		-5945.9** (2752.2)	-5945.9** (2752.2)	-5945.9** (2752.2)		224.6 (332.9)	224.6 (332.9)	224.6 (332.9)
Head literate		2113.6 (6263.4)	2113.6 (6263.4)	2113.6 (6263.4)		16.5 (503.5)	16.5 (503.5)	16.5 (503.5)
$\bar{R}^2$	-0.001	0.003	0.003	0.003	0	-0.002	-0.002	-0.002
N	1274	1274	1274	1274	1274	1274	1274	1274

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:** TABLE 29 shows that the pure controls also experience similar increase-increase-decrease pattern. This suggests the pattern observed among the loan recipients may be a systemic pattern of the area, not necessarily reflecting the repayment burden.

TABLE 29: FD ESTIMATION OF ASSETS, LOAN RECIPIENTS VS. PURE CONTROL

	Household asset amount (Tk)				Productive asset amount (Tk)			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	8358.3*** (688.3)	2640.5** (1341.1)	3694.8*** (1342.7)	13851.0*** (1881.5)	-158.0*** (45.5)	-475.5*** (125.1)	-82.9 (136.8)	-229.7 (223.9)
PureControl	-2044.3 (1677.4)	-2246.0 (1994.3)	-2041.4 (2014.6)	-1027.9 (3510.1)	-30.2 (65.5)	-293.4 (344.8)	-68.1 (144.5)	156.6 (179.6)
PureControl $\times$ rd 2 - 3		1059.9 (2993.8)	1038.0 (3002.6)			446.9 (468.8)		
PureControl $\times$ rd 3 - 4		-1680.2 (4321.1)	-1608.6 (4313.7)	-2639.1 (5458.6)		294.8 (586.5)	74.9 (411.9)	-162.3 (325.8)
rd 1 - 2		6925.6*** (2125.9)	6893.3*** (2116.9)	-10284.0*** (3066.9)		664.8** (286.9)	273.0 (282.2)	78.9 (107.5)
rd 2 - 3		10158.8*** (2633.8)	10129.0*** (2651.0)			286.9 (213.7)		
rd 3 - 4				-9962.9*** (2672.5)			-340.4* (194.9)	-291.7 (216.7)
FloodInRd1			-2651.2*** (939.9)	-2839.1** (1245.8)			-89.0 (63.1)	94.2 (156.9)
Head literate			1673.1 (1783.9)	835.8 (2971.1)			-94.6* (57.1)	6.6 (242.7)
$T = 2$	28	28	28	96	28	28	28	96
$T = 3$	100	100	97	1275	100	100	97	1275
$T = 4$	1274	1274	1274	0	1274	1274	1274	0
$\bar{R}^2$	0	0.016	0.017	0.018	0	0.001	0.001	-0.001
$\hat{\rho}$	0.041	0.087	0.073	-0.064	-0.090	-0.077	-0.053	0.579
$\Pr[\hat{\rho} = 0]$	0.063	0.000	0.001	0.000	0.000	0.000	0.000	0.000
N	4050	4050	4044	2646	4050	4050	4044	2646

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. 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.

**Finding IV.3** TABLE 23 (1) shows household assets increase after receiving the loans in all arms. Total increment is largest among the large grace arm as indicated in (2). In (3), increments are positive in rd 2 - 3, suggesting substantial purchase after receiving a loan. Significant decreases in rd 3 - 4 for all arms indicate liquidation of assets for repayment. Productive assets of large size loan arms decrease in rd 3 - 4 in TABLE 25 (6). These may indicate forced liquidation for

repayment, which can entail efficiency losses.

## IV.4 Livestock

### IV.4.1 Livestock

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 1402 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 1272 obs due to NA.

An example FD estimation.

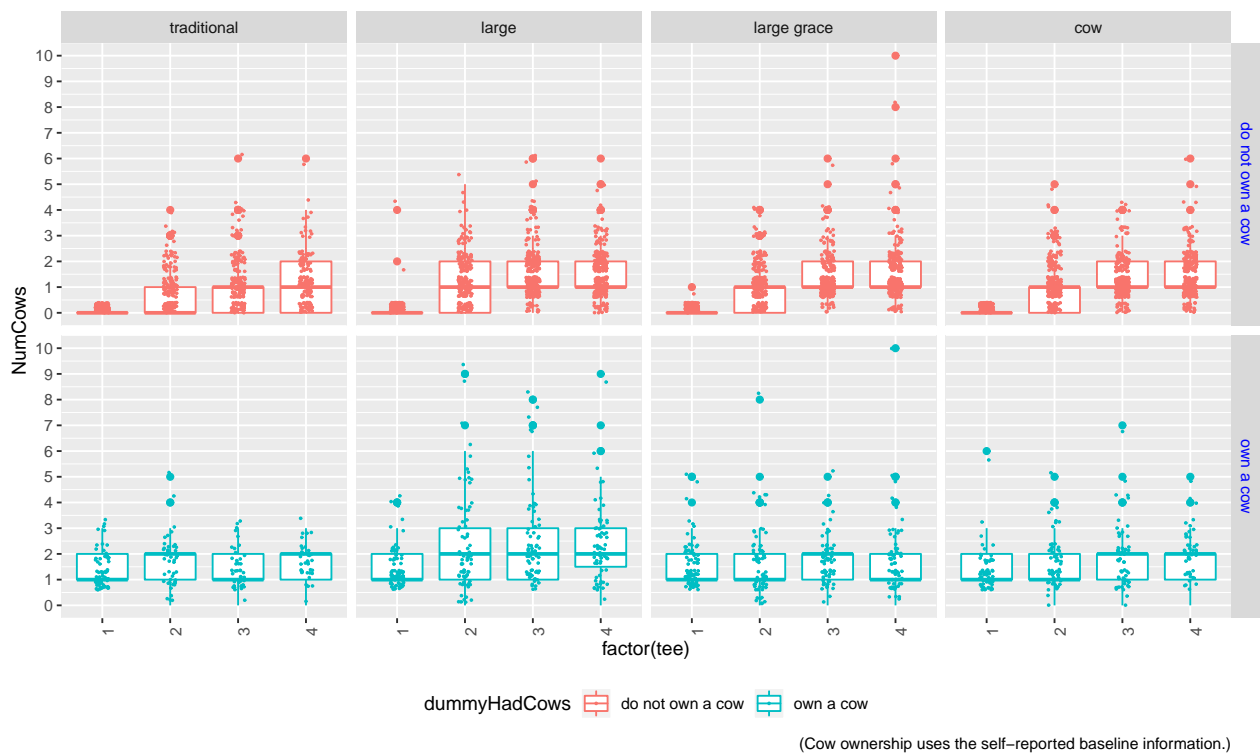
```
Call:
lm(formula = TotalImputedValue ~ dummyWithGrace + Time.2 + dummyWithGrace.Time2 +
    Time.3 + dummyWithGrace.Time3, data = dat)

Residuals:
    Min       1Q   Median       3Q      Max
-88909  -9129  -3499   9146  76281

Coefficients:
                Estimate Std. Error t value Pr(>|t|)
(Intercept)         2281       4801    0.48   0.636
dummyWithGrace        1759       6048    0.29   0.772
Time.2              16276       6902    2.36   0.021 *
dummyWithGrace.Time2   6862      13658    0.50   0.617
Time.3               7126       7034    1.01   0.315
dummyWithGrace.Time3   2911      13905    0.21   0.835
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 21900 on 66 degrees of freedom
Multiple R2: 0.0855, Adjusted R2: 0.0162
F-statistic: 1.23 on 5 and 66 DF, p-value: 0.303
```

```
source(paste0(pathprogram, "LivestockCovariateSelection.R"))
```



**Figure 3: Number of cows owned**  
Cow ownership is defined at the baseline.

```
, , Arm = traditional

  dummyHadCows
tee do not own a cow own a cow
1          332      66
2          236      47
3          230      46
4          197      41

, , Arm = large

  dummyHadCows
tee do not own a cow own a cow
1          323      76
2          314      76
3          309      75
4          302      75

, , Arm = large grace

  dummyHadCows
tee do not own a cow own a cow
1          299      80
2          295      78
3          274      74
4          259      71

, , Arm = cow

  dummyHadCows
tee do not own a cow own a cow
```

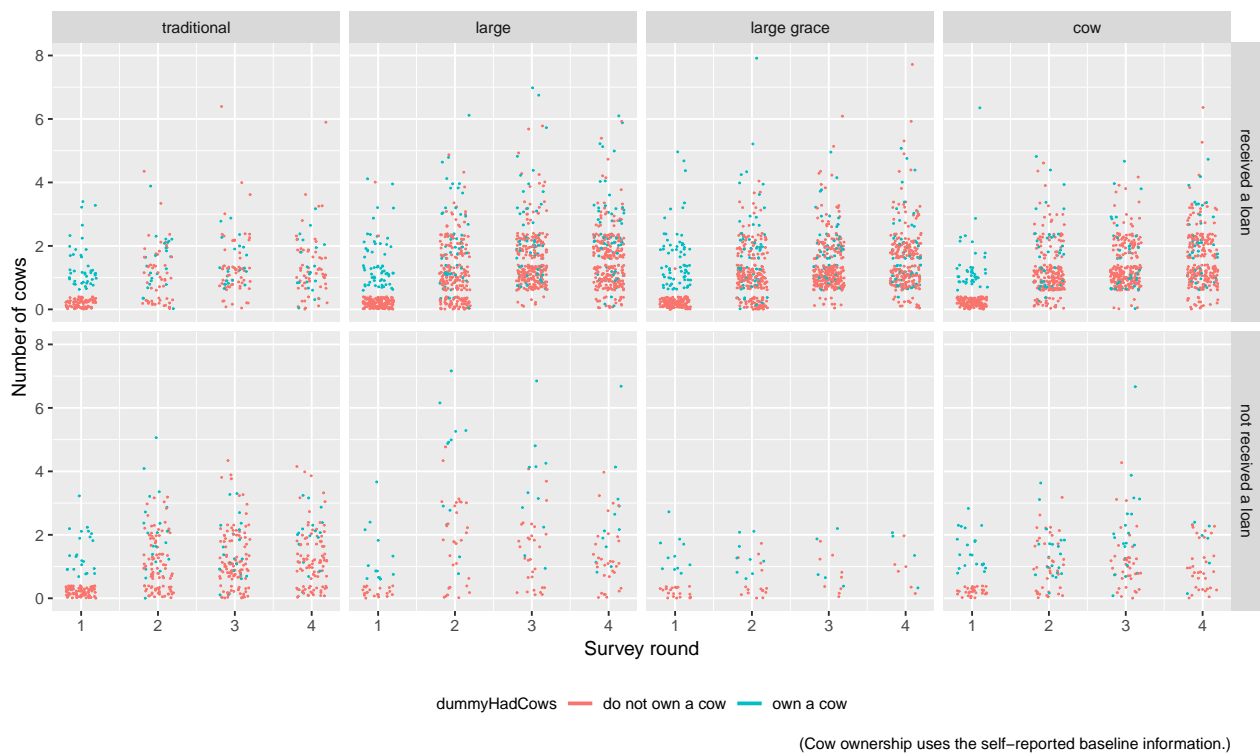


Figure 4: Number of cows owned by loan receipt  
Cow ownership is defined at the baseline.

1	335	63
2	316	63
3	303	62
4	279	49



TABLE 30: FD ESTIMATION OF LIVESTOCK HOLDING VALUES

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	5396.9*** (532.8)	11936.0*** (1007.8)	11945.2*** (1026.3)	12836.2*** (1031.5)	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)	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)	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)	3727.0*** (1001.3)	3460.5*** (928.2)
rd 2 - 3		-9110.0*** (1523.4)	-9045.3*** (1528.0)	-9047.8*** (1530.2)	-9034.6*** (1192.8)	-9043.9*** (1529.9)
Large × rd 2 - 3		-5014.4 (4506.8)	-4796.4 (4525.8)	-4849.2 (4536.9)	-4328.5 (3457.2)	-4851.7 (4533.5)
LargeGrace × rd 2 - 3		-1075.8 (3753.8)	-1077.6 (3756.3)	-1116.4 (3757.6)	-2120.9 (3058.1)	-1121.2 (3758.9)
Cow × rd 2 - 3		-3186.3 (3386.1)	-3172.2 (3387.5)	-3204.5 (3389.7)	-6356.4** (3138.1)	-3210.3 (3390.3)
rd 3 - 4		-12529.8*** (1251.9)	-12584.6*** (1252.3)	-12608.7*** (1248.6)	-13692.8*** (937.9)	-12619.9*** (1245.5)
Large × rd 3 - 4		-6142.0* (3728.9)	-6358.3* (3729.7)	-6403.0* (3742.4)	-4576.6* (2547.1)	-6389.6* (3738.1)
LargeGrace × rd 3 - 4		-655.4 (2565.2)	-652.2 (2565.1)	-660.1 (2570.6)	-1101.4 (2129.6)	-651.2 (2568.7)
Cow × rd 3 - 4		-742.8 (2315.7)	-759.3 (2313.2)	-924.5 (2278.2)	-1618.7 (2181.6)	-956.1 (2267.8)
HadCows				-5608.3*** (781.7)	-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					-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					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)	349.4 (527.6)	481.9 (550.1)
Head literate			-1300.3** (659.6)	-1098.6* (659.3)	-933.3 (629.2)	-1028.5 (639.2)
$T = 2$	29	29	28	28	28	28
$T = 3$	101	101	99	99	99	99
$T = 4$	1272	1272	1272	1272	1272	1272
$\bar{R}^2$	0.003	0.072	0.073	0.084	0.091	0.088
$\hat{\rho}$	-0.237	-0.247	-0.255	-0.260	-0.268	-0.267
Pr[ $\hat{\rho} = 0$ ]	0.000	0.000	0.000	0.000	0.000	0.000
N	4047	4047	4042	4042	4042	4042

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. 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 31: FD ESTIMATION OF LIVESTOCK HOLDING VALUES, WITH VS. WITHOUT A GRACE PERIOD

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	7445.6*** (531.6)	14730.6*** (1273.4)	14588.5*** (1272.5)	15557.9*** (1281.2)	15803.7*** (1083.5)	15434.9*** (1274.7)
WithGrace	544.8 (674.2)	293.4 (991.7)	353.2 (996.5)	376.2 (1005.1)	464.6 (955.4)	443.5 (1013.7)
rd 2 - 3		-9142.7*** (1552.4)	-9076.3*** (1555.9)	-9078.2*** (1558.2)	-9047.2*** (1211.3)	-9074.0*** (1557.9)
WithGrace × rd 2 - 3		718.7 (3125.9)	599.8 (3133.1)	595.5 (3138.1)	657.9 (3006.5)	592.3 (3137.1)
rd 3 - 4		-12553.8*** (1301.9)	-12614.8*** (1303.3)	-12633.8*** (1299.7)	-13680.2*** (986.7)	-12642.6*** (1297.1)
WithGrace × rd 3 - 4		2776.1 (2631.0)	2908.3 (2631.7)	2847.7 (2628.0)	2814.3 (2512.6)	2830.5 (2623.4)
HadCows				-5538.2*** (861.8)	-7405.2*** (2724.0)	
HadCows × rd 2 - 3					129.8 (3983.6)	
HadCows × rd 3 - 4					5916.3 (3693.2)	
NumCowsOwnedAtRd1						-3798.5*** (647.4)
FloodInRd1			495.1 (548.0)	568.3 (530.2)	613.3 (531.1)	742.7 (546.8)
Head literate			-1051.9 (680.0)	-866.3 (679.8)	-703.1 (651.4)	-809.9 (660.1)
HadCows × Large					3745.3 (3498.2)	
HadCows × LargeGrace					-4286.2 (2647.9)	
HadCows × Cow					-1777.6 (2483.8)	
HadCows × Large × rd 2 - 3					-1588.2 (11664.9)	
HadCows × LargeGrace × rd 2 - 3					6401.1 (9192.7)	
HadCows × Cow × rd 2 - 3					19037.9** (8029.3)	
HadCows × Large × rd 3 - 4					-9889.7 (11552.4)	
HadCows × LargeGrace × rd 3 - 4					1115.4 (6734.7)	
HadCows × Cow × rd 3 - 4					5205.3 (5873.9)	
$T = 2$	29	29	28	28	28	28
$T = 3$	101	101	99	99	99	99
$T = 4$	1272	1272	1272	1272	1272	1272
$R^2$	0	0.067	0.068	0.079	0.086	0.083
$\hat{\rho}$	-0.231	-0.228	-0.236	-0.244	-0.250	-0.250
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000
$N$	4047	4047	4042	4042	4042	4042

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. 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.

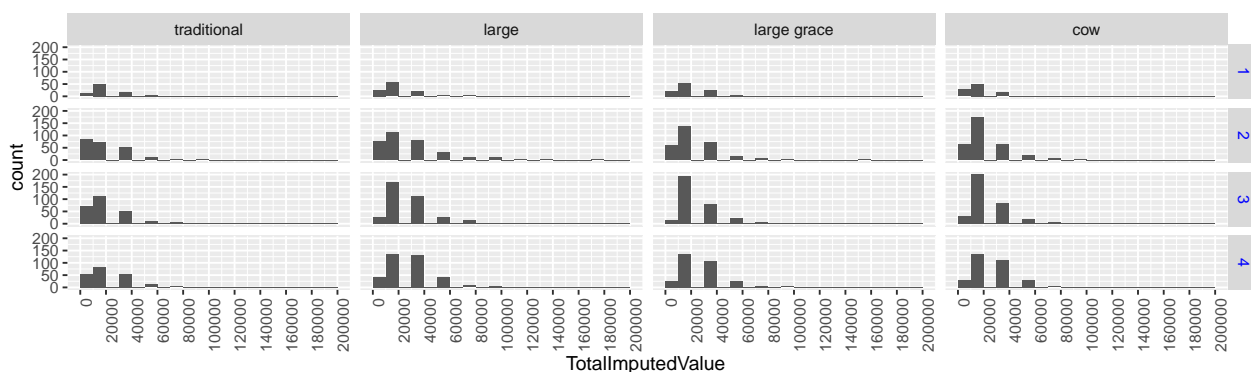


Figure 5: Total imputed value of livestock holding  
Livestock holding values are computed by using respective median prices of each year.

TABLE 32: FD ESTIMATION OF LIVESTOCK HOLDING VALUES, RD 1 VS. RD 4 COMPARISON

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	4480.1*** (1576.3)	4480.1*** (1576.3)	5085.5*** (1830.5)	6584.3*** (1932.8)	6421.1*** (1926.6)	6081.8*** (1878.5)
Large	3672.2 (3055.5)	3672.2 (3055.5)	3793.2 (3028.5)	4010.3 (2953.5)	4004.7 (2527.3)	4011.4 (2981.7)
LargeGrace	4520.5** (2039.3)	4520.5** (2039.3)	4392.8** (2060.0)	4800.7** (2043.1)	6010.2*** (2159.0)	4972.9** (2066.7)
Cow	3765.6* (1975.3)	3765.6* (1975.3)	3712.2* (1959.8)	3484.3* (1993.9)	2723.5 (2040.4)	3487.3* (1997.5)
HadCows				-9286.5*** (2885.5)	-8694.3*** (2501.5)	
Large × HadCows					-142.5 (8064.2)	
LargeGrace × HadCows					-5567.7 (8843.6)	
Cow × HadCows					5093.5 (3428.8)	
NumCowsOwnedAtRd1						-5052.0** (2003.6)
FloodInRd1			-1675.4 (1407.5)	-1518.9 (1406.1)	-1419.6 (1419.7)	-1323.5 (1440.7)
Head literate			1828.0 (2203.6)	2137.2 (2189.5)	2302.7 (2151.2)	2149.2 (2201.6)
$\bar{R}^2$	0.002	0.002	0.002	0.024	0.026	0.021
N	1272	1272	1272	1272	1272	1272

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. 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. xid is from the file I received as updated id file (Oct 18, 2017).

	min	25\%	median	75\%	max	mean
hhid	7010101	7042116	7065014	8147812	81710520	12189046.0
TotalImputedValue	0	0	20000	40000	300000	19913.8
	std	0s	NAs	n		
hhid	18472118.6	0	0	5645		
TotalImputedValue	22457.6	1596	0	5645		

- Why does cow report below 1000 holding in rds 2-4?

	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

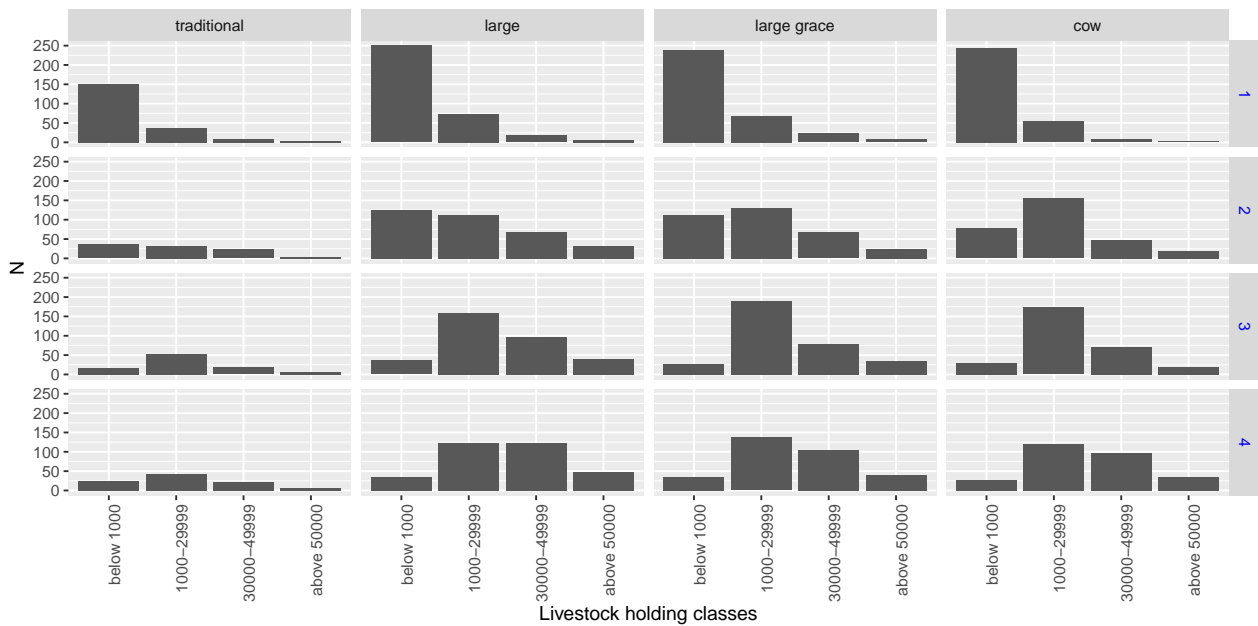


Figure 6: Histogram of livestock holding classes  
Livestock holding values are computed by using respective median prices of each year.

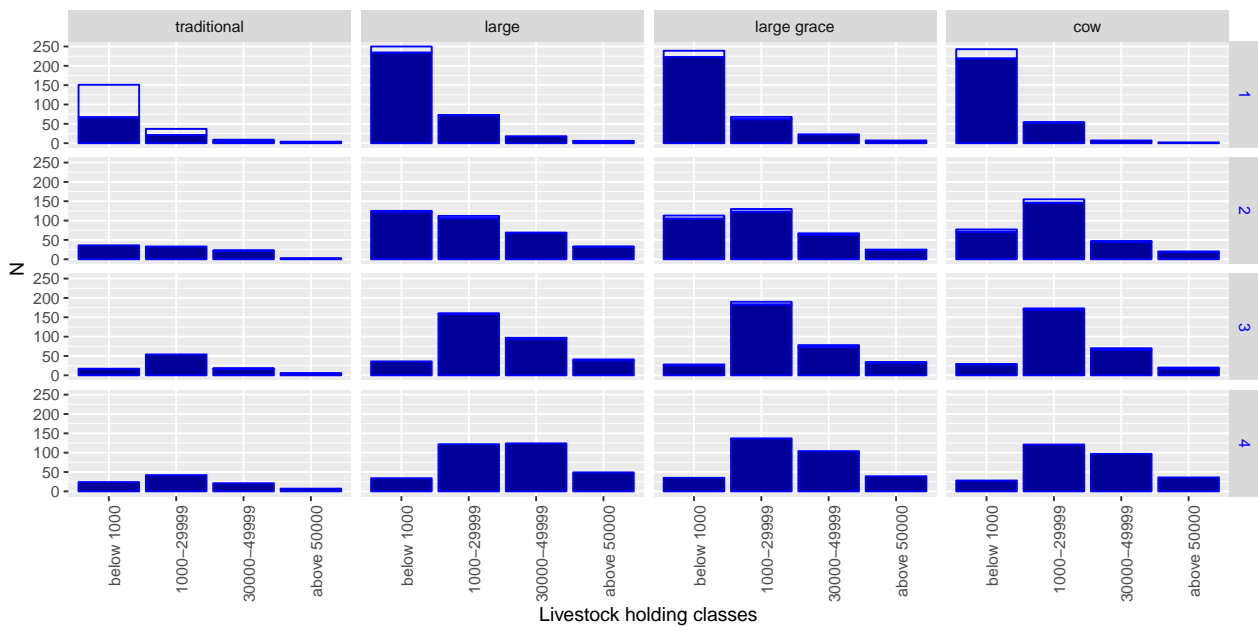


Figure 7: Histogram of livestock holding classes  
Livestock holding values are computed by using respective median prices of each year. Boxes without a colour accounts for attrited households.

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

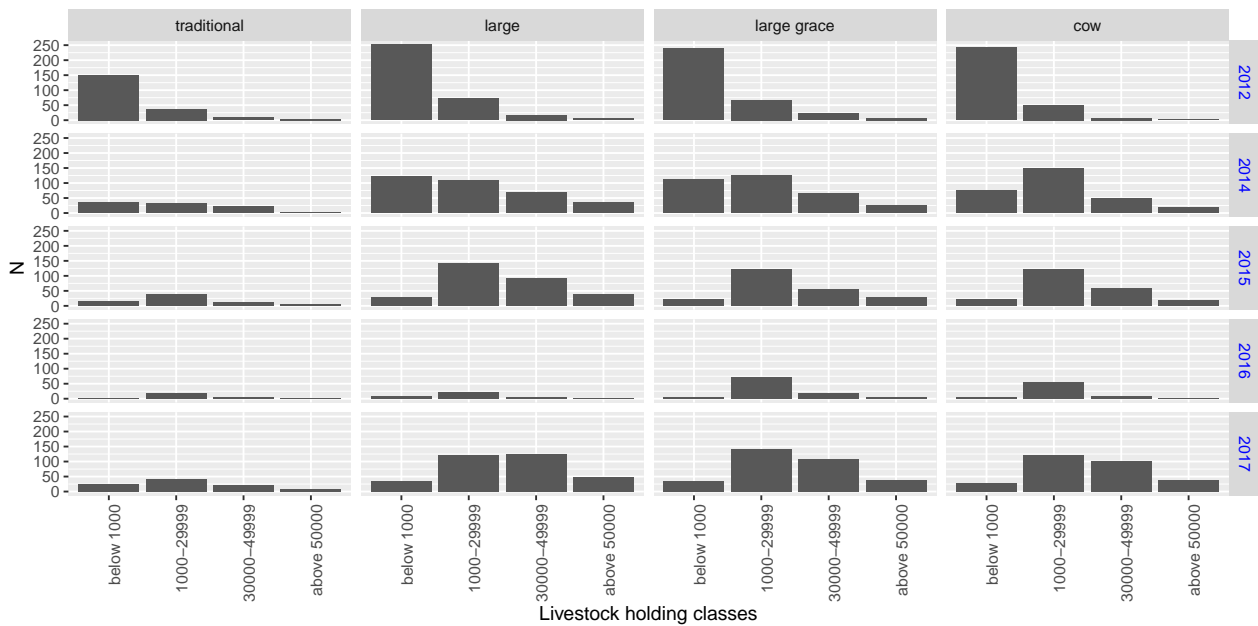


Figure 8: Histogram of livestock holding classes by year  
Livestock holding values are computed by using respective median prices of each year.

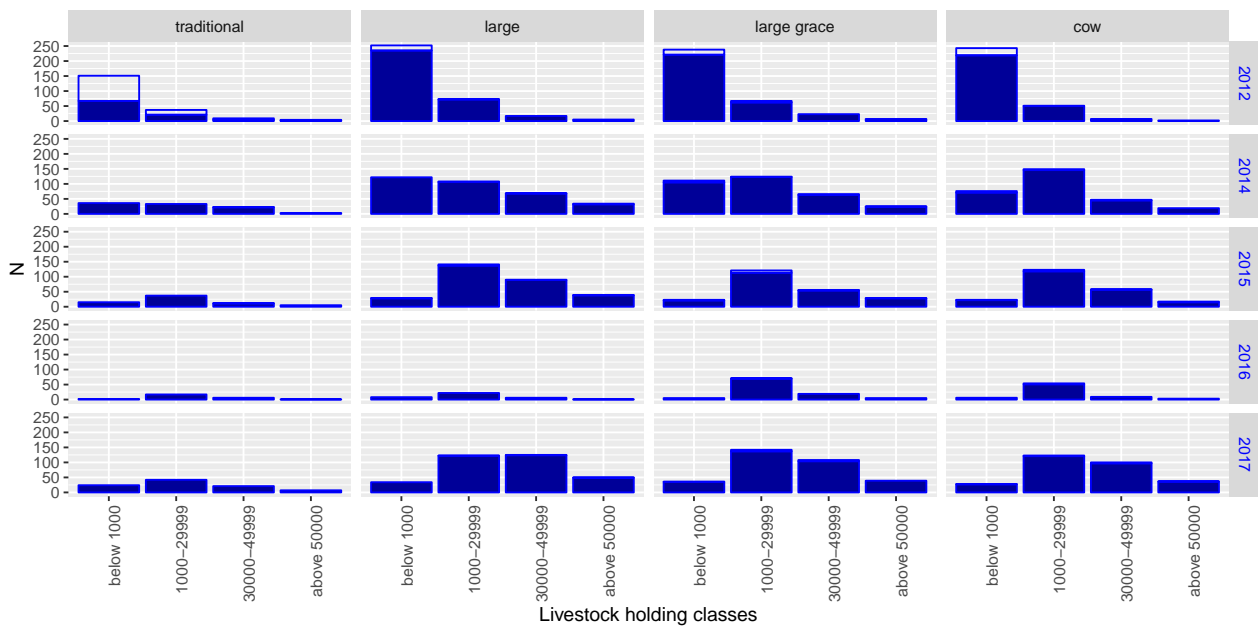


Figure 9: Histogram of livestock holding classes by year  
Livestock holding values are computed by using respective median prices of each year. Boxes without a colour accounts for attrited households.

15:	cow	3	25399.62	1.300562	365
16:	cow	4	28700.23	1.436950	342

**Finding IV.4** FIGURE 5 shows a general increase in upper holding classes round 3 and further upper holding classes in round 4. FIGURE 10 shows livestock type is not entered (yet collected) in rd3. At this moment, one needs to omit rd 3. All estimation results by far are subject to this omission.

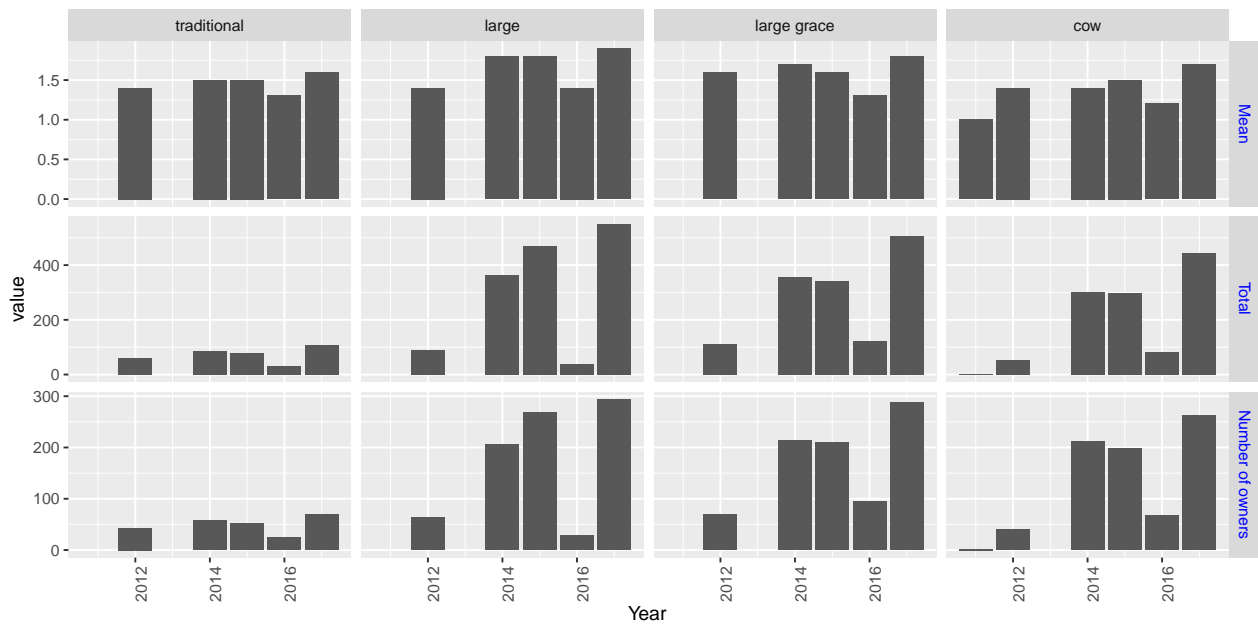


Figure 10: Number of cows/oxen by year

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.

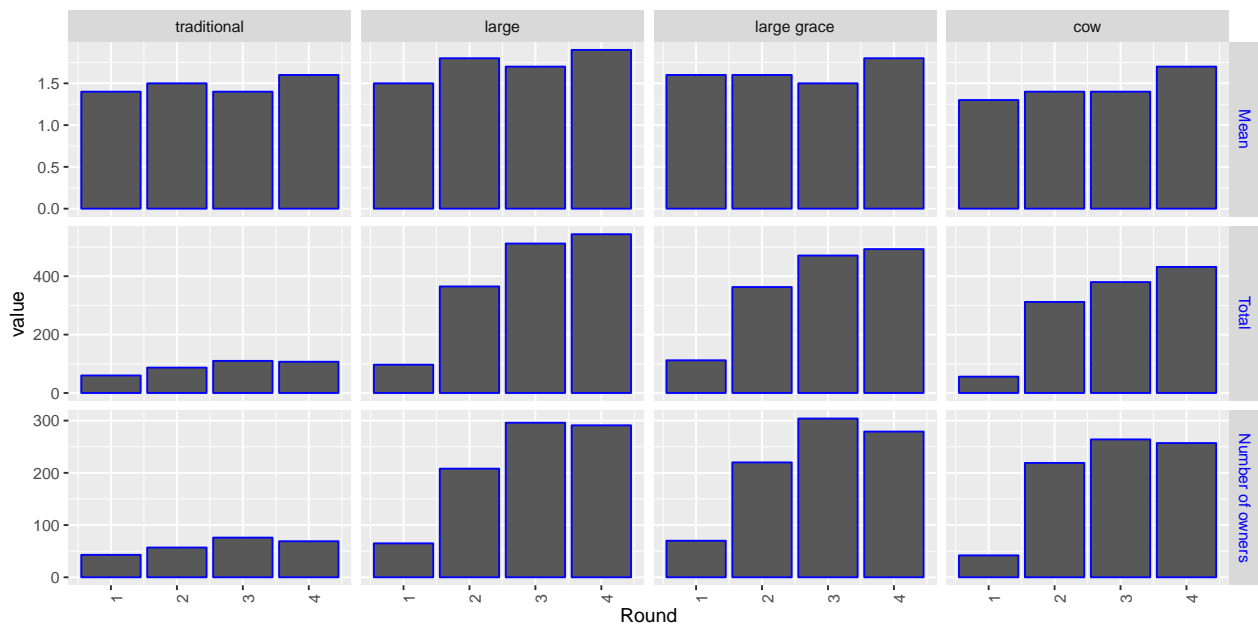


Figure 11: Number of cows/oxen by survey round

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.

#### IV.4.2 Traditional arm households who buy cows

Some traditional arm households buy cows. Characteristics of these households.

```
Warning in `[.data.table`(lvNL11, , `:=`(Variable, "total")): Invalid .internal.selfref detected
```

```
Warning in `[.data.table`(lvNL15, , `:=`(Variable, "soldied")): Invalid .internal.selfref detected
```

```
Warning in `[.data.table`(lvNL1B, , `:=`(Variable, "born")): Invalid .internal.selfref detected
```

Merge non receivers and receivers of loans.

Number of HHs in traditional arm with inconsistent (e.g., rd1 2 cows, rd2 0 cow, rd3 2 cows, etc.) reporting of cow ownership across rounds:

[1] 216

There are 1598 HHs in the livestock data, of which: 755 increased and did not decrease cow ownership (strictly increasing), 416 increased and also decreased cow ownership, and 427 did not increase (decreased or no change), totaling to 1598. Within traditional arm, there are 164 HHs without a cow throughout the survey periods, and 234 HHs with a cow at least once. Among the HHs with a cow at least once, 73 [40 with a loan, 33 without a loan] increased and did not decrease cow ownership (strictly increasing), 69 increased and also decreased cow ownership [ 33 with a loan, 36 without a loan], and 92 did not increase (decreased or no change) [ 28 with a loan, 64 without a loan], totaling to 234.

1195 and 403 HHs received and did not receive a loan, respectively.

Number of HHs in traditional arm with an increase in cows at least once among nonzero cow ownership:

[1] 142

Number of HHs in traditional arm with an increase in cows at least once and with a decrease in cows at least once:

[1] 69

There are many increase-decrease-increase patterns in cow ownership, which implies purchase-sales-purchase... which is implausible. Checking against livestock sales data. CowOx.diff is contemporaneous difference between births and sales/deaths, CowOx.totdiff is a first-difference of CowOx.total which is a sum of livestock holding by cow/ox, goat/sheep, chicken/duck.

	Arm	hhid	survey	CowOx.born	CowOx.solddied	CowOx.total
1:	traditional	7020802	2	0	0	2
2:	traditional	7020804	2	0	0	0
3:	traditional	7020804	3	0	0	1
4:	traditional	7020804	4	0	0	0
5:	traditional	7020806	2	0	0	2
---						
347:	traditional	81710219	2	0	0	0
348:	traditional	81710219	3	0	0	0
349:	traditional	81710219	4	0	0	0
350:	traditional	81710220	3	0	0	0
351:	traditional	81710220	4	0	0	0
	CowOx.diff	CowOx.totdiff	CowOx.inconsistent	NoCow		
1:	0	2	2	FALSE		
2:	0	-1	-1	FALSE		
3:	0	1	1	FALSE		
4:	0	-1	-1	FALSE		
5:	0	2	2	FALSE		
---						
347:	0	2	2	FALSE		
348:	0	-1	-1	FALSE		
349:	0	-1	-1	FALSE		
350:	0	1	1	FALSE		
351:	0	-1	-1	FALSE		

There are 188 out of 398 members in traditional arm who increased the cow ownership at least once (of which 88 have decreased at least once). Examining HH characteristics shows that all who increased the ownership received a loan while among who did not increase the cow ownership, 39.05% did not receive a loan. TABLE 33 shows that it is one of the largest contrasting difference of

traditional arm members in baseline asset holding, poverty grades, and household structure. While receiving a loan is a choice variable hence is endogenous to the outcomes, it implies that, even when the loan amount is small, members who are willing to take a loan is more likely to increase cow ownership than who are not. So the small amount lending may still have a role in poverty reduction through livestock accumulation.

Members who received a loan in traditional:

	notinincreasedCow	
increasedCow	FALSE	TRUE
FALSE	100	28
TRUE	73	0

Yes	No
73	69

Yes	No
28	64

Members who did not receive a loan in traditional:

	notinincreasedCow	
increasedCow	FALSE	TRUE
FALSE	64	64
TRUE	69	0

hhid	survey	creditstatus	Mstatus
Min. : 7031502	Min. :1	Yes : 0	gErosion :40
1st Qu.: 7054405	1st Qu.:1	No :197	gRejection :80
Median : 7086107	Median :1	Replaced Member: 0	iRejection :51
Mean :14956776	Mean :1		iReplacement: 0
3rd Qu.: 8148317	3rd Qu.:1		newGroup : 0
Max. :81710220	Max. :1		oldMember :26
NumCows			
Min. :0.000			
1st Qu.:0.000			
Median :0.000			
Mean :0.168			
3rd Qu.:0.000			
Max. :3.000			

Warning in mean.default(dd[x, ], ...): argument is not numeric or logical: returning NA

Warning in mean.default(dd[x, ], ...): argument is not numeric or logical: returning NA

Warning in mean.default(dd[x, ], ...): argument is not numeric or logical: returning NA

Warning in mean.default(dd[x, ], ...): argument is not numeric or logical: returning NA

Warning in mean.default(dd[x, ], ...): argument is not numeric or logical: returning NA

Warning in mean.default(dd[x, ], ...): argument is not numeric or logical: returning NA

Warning in mean.default(dd[x, ], ...): argument is not numeric or logical: returning NA

Warning in mean.default(dd[x, ], ...): argument is not numeric or logical: returning NA



**TABLE 33: PERMUTATION TESTS OF TRADITIONAL ARM MEMBERS THAT INCREASED VS. NOT-INCREASED COW OWNERSHIP**

variables	mean		N		p value		
	increased	not increased	increased	not increased	lowerbound	estimate	upperbound
HeadLiteracy	0.08	0.09	133	70	0.99947	1.0000	1.00000
HeadAge	39.57	37.32	133	70	0.13761	0.1466	0.15593
HHsize	4.18	4.30	133	70	0.60337	0.6160	0.62852
povertystatus	NA	NA	133	70	0.41216	0.4249	0.43772
FloodInRd1	0.54	0.69	133	70	0.04711	0.0527	0.05872
HAssetAmount	648.86	676.36	88	55	0.86944	0.8781	0.88640
PAssetAmount	962.84	1274.55	88	55	0.46759	0.4805	0.49343
AssetAmount	1611.70	1950.91	88	55	0.46420	0.4771	0.49002
dummyHadCows	0.18	0.53	88	55	0.00000	0.0001	0.00074
NumCowsOwnedAtRd1	0.24	0.76	88	55	0.00000	0.0000	0.00053
ReceivedCredit	0.83	0.51	88	55	0.00000	0.0001	0.00074

Source: Estimated with GUK administrative and survey data.

- Notes: 1. Permutation tests of each variables between members who increased cow ownership and who did not increase cow ownership in the traditional arm. Number of repetition is set at 10000. R package coin is used, and global option is used in the pvalue function. Columns under mean show means of both groups for each variates. Columns under N show number of observations of both groups for each variates. Columns under p-values show p values of the null hypothesis of equal means.
2. Baseline information is used for HeadLiteracy, HeadAge, HHsize, FloodInRd1 with numbers of observation 133, 70, baseline information for HAssetAmount, PAssetAmount, AssetAmount with number of observations 88, 55, final round information is used for dummyHadCows, NumCowsOwnedAtRd1, ReceivedCredit with number of observations 88, 55 for increased and no change in cow ownership groups, respectively. The number of observations differ due to missingness of information and attrition.

**TABLE 34: PERMUTATION TESTS OF TRADITIONAL ARM MEMBERS WHO RECEIVED CREDITS AND ONLY INCREASED VS. INCREASED-AND-DECREASED COW OWNERSHIP**

variables	mean		N		p value		
	increased	not increased	increased	not increased	lowerbound	estimate	upperbound
HeadLiteracy	0.08	0.09	133	70	0.49577	0.5087	0.52162
HeadAge	39.57	37.32	133	70	0.02226	0.0262	0.03060
HHsize	4.18	4.30	133	70	0.32030	0.3324	0.34466
povertystatus	NA	NA	133	70	0.54724	0.5601	0.57290
FloodInRd1	0.54	0.69	133	70	0.25035	0.2616	0.27308
HAssetAmount	648.86	676.36	88	55	0.89007	0.8981	0.90575
PAssetAmount	962.84	1274.55	88	55	0.20863	0.2192	0.23004
AssetAmount	1611.70	1950.91	88	55	0.31495	0.3270	0.33921
dummyHadCows	0.18	0.53	88	55	0.00125	0.0023	0.00385
NumCowsOwnedAtRd1	0.24	0.76	88	55	0.00104	0.0020	0.00346
ReceivedCredit	0.83	0.51	88	55	0.00000	0.0001	0.00074

Source: Estimated with GUK administrative and survey data.

- Notes: 1. Permutation tests of each variables between loan receiving members who increased but never decreased cow ownership and who increased and decreased cow ownership in the traditional arm. Number of repetition is set at 10000. R package coin is used, and global option is used in the pvalue function. Columns under mean show means of both groups for each variates. Columns under N show number of observations of both groups for each variates. Columns under p-values show p values of the null hypothesis of equal means.
2. Baseline information is used for HeadLiteracy, HeadAge, HHsize, FloodInRd1 with numbers of observation 2885, 366, baseline information for HAssetAmount, PAssetAmount, AssetAmount with number of observations 1038, 125, final round information is used for dummyHadCows, NumCowsOwnedAtRd1, ReceivedCredit with number of observations 1038, 125 for increased and no change in cow ownership groups, respectively. The number of observations differ due to missingness of information and attrition.

**TABLE 35: PERMUTATION TESTS OF ALL MEMBERS WHO RECEIVED CREDITS AND ONLY INCREASED VS. INCREASED-AND-DECREASED COW OWNERSHIP**

variables	mean		N		p value		
	increased	not increased	increased	not increased	lowerbound	estimate	upperbound
HeadLiteracy	0.08	0.09	133	70	0.49837	0.5113	0.52422
HeadAge	39.57	37.32	133	70	0.02328	0.0273	0.03178
HHsize	4.18	4.30	133	70	0.32466	0.3368	0.34910
povertystatus	NA	NA	133	70	0.54283	0.5557	0.56852
FloodInRd1	0.54	0.69	133	70	0.25025	0.2615	0.27298
HAssetAmount	648.86	676.36	88	55	0.88459	0.8928	0.90063
PAssetAmount	962.84	1274.55	88	55	0.20725	0.2178	0.22862
AssetAmount	1611.70	1950.91	88	55	0.31683	0.3289	0.34113
dummyHadCows	0.18	0.53	88	55	0.00272	0.0042	0.00617
NumCowsOwnedAtRd1	0.24	0.76	88	55	0.00083	0.0017	0.00308
ReceivedCredit	0.83	0.51	88	55	0.00000	0.0001	0.00074

Source: Estimated with GUK administrative and survey data.

- Notes: 1. Permutation tests of each variables between loan receiving members who increased but never decreased cow ownership and who increased and decreased cow ownership in all arms. Number of repetition is set at 10000. R package coin is used, and global option is used in the pvalue function. Columns under mean show means of both groups for each variates. Columns under N show number of observations of both groups for each variates. Columns under p-values show *p* values of the null hypothesis of equal means.
2. Baseline information is used for HeadLiteracy, HeadAge, HHsize, FloodInRd1 with numbers of observation 2885, 366, baseline information for HAssetAmount, PAssetAmount, AssetAmount with number of observations 1038, 125, final round information is used for dummyHadCows, NumCowsOwnedAtRd1, ReceivedCredit with number of observations 1038, 125 for increased and no change in cow ownership groups, respectively. The number of observations differ due to missingness of information and attrition.

**TABLE 36: PERMUTATION TESTS OF ALL MEMBERS WHO RECEIVED CREDITS VS. NOT RECEIVED CREDITS**

variables	mean		N		p value		
	received	not received	received	not received	lowerbound	estimate	upperbound
HeadLiteracy	0.08	0.09	133	70	0.28548	0.2972	0.30912
HeadAge	39.57	37.32	133	70	0.09415	0.1018	0.10983
HHsize	4.18	4.30	133	70	0.00000	0.0001	0.00074
povertystatus	NA	NA	133	70	0.02504	0.0292	0.03382
FloodInRd1	0.54	0.69	133	70	0.00000	0.0000	0.00053
HAssetAmount	648.86	676.36	88	55	0.07086	0.0776	0.08474
PAssetAmount	962.84	1274.55	88	55	0.10246	0.1104	0.11871
AssetAmount	1611.70	1950.91	88	55	0.04389	0.0493	0.05514
dummyHadCows	0.18	0.53	88	55	0.59754	0.6102	0.62276
NumCowsOwnedAtRd1	0.24	0.76	88	55	0.34190	0.3542	0.36664
ReceivedCredit	0.83	0.51	88	55	0.00000	0.0000	0.00053

Source: Estimated with GUK administrative and survey data.

- Notes: 1. Permutation tests of each variables between loan receiving members and non receiving members in all arms. Number of repetition is set at 10000. R package coin is used, and global option is used in the pvalue function. Columns under mean show means of both groups for each variates. Columns under N show number of observations of both groups for each variates. Columns under p-values show *p* values of the null hypothesis of equal means.
2. Baseline information is used for HeadLiteracy, HeadAge, HHsize, FloodInRd1 with numbers of observation 2885, 366, baseline information for HAssetAmount, PAssetAmount, AssetAmount with number of observations 1038, 125, final round information is used for dummyHadCows, NumCowsOwnedAtRd1, ReceivedCredit with number of observations 1038, 125 for increased and no change in cow ownership groups, respectively. The number of observations differ due to missingness of information and attrition.

Do these household who increased cow ownership report cows as IGA? Among who increased cow ownership, 58 report cow or ox as IGA at least once and 60 (51%) do not. Below tabulation shows reported IGA as cows/oxen against cow/ox ownership.

Cow			
CowAsIGA	FALSE	TRUE	<NA>
FALSE	147	167	2
TRUE	83	965	14
<NA>	77	138	5

We need to modify IGA summary by using livestock ownership data.

## IV.5 Assets+Livestock

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

Mstatus	creditstatus	
	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 1402 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 1402 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 1274 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 1274 obs due to NA.

Arm				
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

Arm				
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 1402 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 1272 obs due to NA.

	hhid	tee	HAssetAmount	PAssetAmount
1:	7043715	1	1400	280
2:	7043715	2	0	0
3:	7043715	3	1200	400
4:	7043715	4	5700	400

logical(0)

	hhid	FloodInRd1	groupid	Arm	HeadLiteracy	Time.2	Time.3	Time.4
1:	7043715		1	70437	large	0	0	0
2:	7043715		1	70437	large	0	0	1
3:	7043715		1	70437	large	0	0	0
	HAssetAmount	PAssetAmount	tee	teeyr	dummyTraditional	dummyLarge		
1:	1400	280	1	1		0		1
2:	1200	400	3	3		0		1
3:	5700	400	4	4		0		1
	dummyLargeGrace	dummyCow	dummyUltraPoor	dummyModeratelyPoor	dummySmallSize			
1:	0	0		0			1	0
2:	0	0		0			1	0
3:	0	0		0			1	0
	dummyLargeSize	dummyWithGrace	dummyWithoutGrace	dummyTraditional.Time2				
1:	1		0		1			0.0512659
2:	1		0		1			0.0512659
3:	1		0		1			0.0512659
	dummyLarge.Time2	dummyLargeGrace.Time2	dummyCow.Time2	dummyUltraPoor.Time2				
1:	-0.175805		0.0613903	0.0631492				0.149937
2:	-0.175805		0.0613903	0.0631492				0.149937
3:	-0.175805		0.0613903	0.0631492				0.149937
	dummyModeratelyPoor.Time2	dummySmallSize.Time2	dummyLargeSize.Time2					
1:	-0.178894		0.0512659					-0.0512659
2:	-0.178894		0.0512659					-0.0512659
3:	-0.178894		0.0512659					-0.0512659
	dummyWithoutGrace.Time2	dummyWithGrace.Time2	dummyTraditional.Time3					
1:	-0.12454		0.12454					0.0515654
2:	-0.12454		0.12454					-0.1599764
3:	-0.12454		0.12454					0.0515654
	dummyLarge.Time3	dummyLargeGrace.Time3	dummyCow.Time3	dummyUltraPoor.Time3				
1:	-0.176833		0.0617491	0.0635183				0.150813
2:	0.548605		-0.1915701	-0.1970588				-0.467881
3:	-0.176833		0.0617491	0.0635183				0.150813
	dummyModeratelyPoor.Time3	dummySmallSize.Time3	dummyLargeSize.Time3					
1:	-0.179940		0.0515654					-0.0515654
2:	0.558244		-0.1599764					0.1599764
3:	-0.179940		0.0515654					-0.0515654
	dummyWithoutGrace.Time3	dummyWithGrace.Time3	dummyTraditional.Time4					
1:	-0.125267		0.125267					0.0489441
2:	0.388629		-0.388629					0.0489441
3:	-0.125267		0.125267					-0.1625978
	dummyLarge.Time4	dummyLargeGrace.Time4	dummyCow.Time4	dummyUltraPoor.Time4				
1:	-0.167843		0.058610	0.0602893				0.143146
2:	-0.167843		0.058610	0.0602893				0.143146
3:	0.557595		-0.194709	-0.2002878				-0.475547
	dummyModeratelyPoor.Time4	dummySmallSize.Time4	dummyLargeSize.Time4					
1:	-0.170792		0.0489441					-0.0489441
2:	-0.170792		0.0489441					-0.0489441
3:	0.567391		-0.1625978					0.1625978
	dummyWithoutGrace.Time4	dummyWithGrace.Time4						
1:	-0.118899		0.118899					
2:	-0.118899		0.118899					
3:	0.394997		-0.394997					

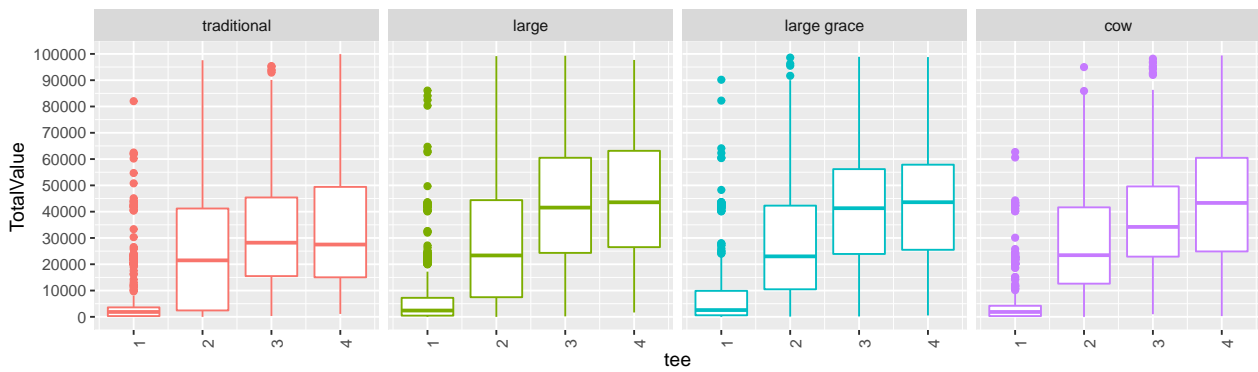


Figure 12: Total asset values  
Sum of assets and livestock holding values.

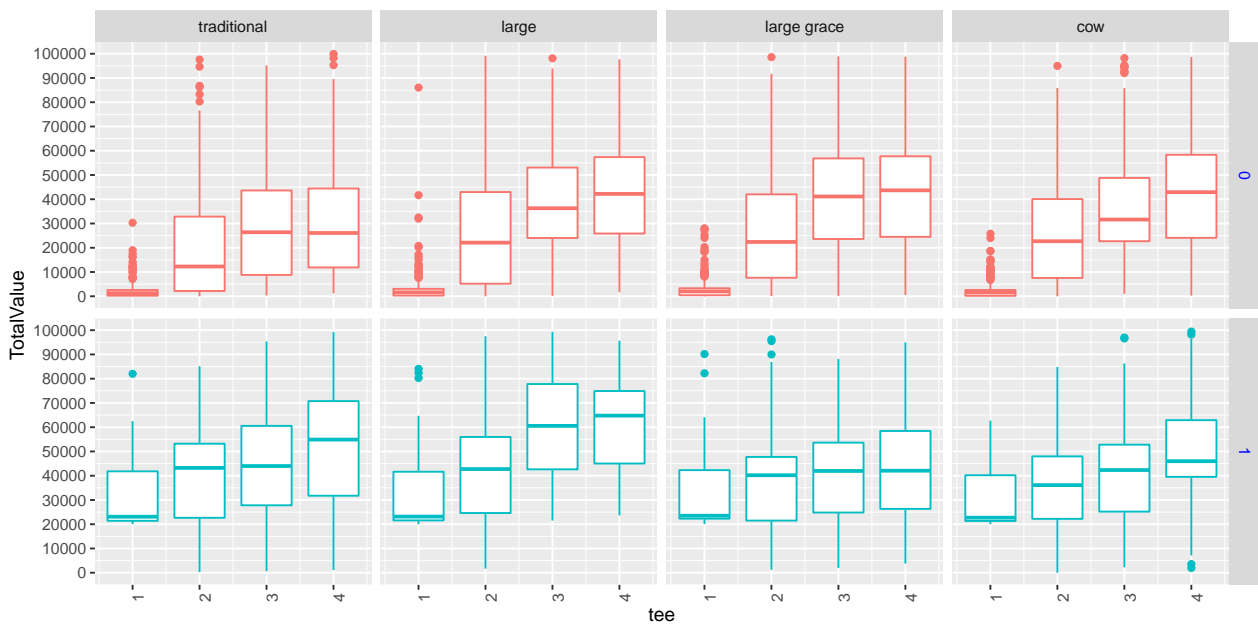


Figure 13: Total asset values by cow holding at baseline  
Sum of assets and livestock holding values.

```
Dropped 177 obs due to T<2.
Dropped 1399 obs due to NA.
Dropped 130 obs due to T<2.
Dropped 1271 obs due to NA.
Dropped 177 obs due to T<2.
Dropped 1399 obs due to NA.
Dropped 130 obs due to T<2.
Dropped 1271 obs due to NA.
```

```
source(paste0(pathprogram , "AssetLivestockCovariateSelection.R"))
```

TABLE 37: FD ESTIMATION OF TOTAL ASSETS

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	11600.1*** (1123.7)	19131.4*** (1528.1)	20310.0*** (1686.7)	20310.0*** (1686.7)	20310.0*** (1686.7)	20260.1*** (1828.4)
Large	5492.9*** (1770.9)	7310.8*** (1951.4)	7677.5*** (1929.5)	7677.5*** (1929.5)	7677.5*** (1929.5)	7665.9*** (1926.7)
LargeGrace	4292.5** (1884.5)	5005.9** (1967.9)	4856.6** (1943.5)	4856.6** (1943.5)	4856.6** (1943.5)	4827.6*** (1839.8)
Cow	4472.5*** (1692.4)	5650.3*** (2082.9)	5740.5*** (2001.5)	5740.5*** (2001.5)	5740.5*** (2001.5)	5743.1*** (2003.9)
rd 2 - 3		-5904.7** (2294.4)	-5846.3** (2294.8)	-5846.3** (2294.8)	-5846.3** (2294.8)	-5846.4** (2295.0)
Large $\times$ rd 2 - 3		-4795.6 (6120.5)	-4529.6 (6096.4)	-4529.6 (6096.4)	-4529.6 (6096.4)	-4525.9 (6098.7)
LargeGrace $\times$ rd 2 - 3		-524.1 (5265.2)	-499.9 (5262.2)	-499.9 (5262.2)	-499.9 (5262.2)	-497.0 (5263.8)
Cow $\times$ rd 2 - 3		-3025.6 (5924.7)	-3079.3 (5957.3)	-3079.3 (5957.3)	-3079.3 (5957.3)	-3076.9 (5958.7)
rd 3 - 4		-20148.2*** (2374.2)	-20163.9*** (2375.9)	-20163.9*** (2375.9)	-20163.9*** (2375.9)	-20161.6*** (2378.6)
Large $\times$ rd 3 - 4		-9460.8 (6804.3)	-9703.0 (6821.0)	-9703.0 (6821.0)	-9703.0 (6821.0)	-9700.9 (6822.4)
LargeGrace $\times$ rd 3 - 4		-2300.1 (3707.4)	-2349.7 (3716.3)	-2349.7 (3716.3)	-2349.7 (3716.3)	-2349.7 (3716.8)
Cow $\times$ rd 3 - 4		-7366.8 (5420.8)	-7318.1 (5399.1)	-7318.1 (5399.1)	-7318.1 (5399.1)	-7305.2 (5403.9)
NumCowsOwnedAtRd1						256.6 (1940.4)
FloodInRd1			-2715.2** (1138.3)	-2715.2** (1138.3)	-2715.2** (1138.3)	-2732.8** (1068.4)
Head literate			283.9 (1863.0)	283.9 (1863.0)	283.9 (1863.0)	265.8 (1780.6)
$T = 2$	29	29	29	29	29	29
$T = 3$	99	99	97	97	97	97
$T = 4$	1271	1271	1271	1271	1271	1271
$R^2$	0.001	0.043	0.043	0.043	0.043	0.043
$\hat{\rho}$	-0.176	-0.152	-0.158	-0.158	-0.158	-0.156
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000
$N$	4040	4040	4036	4036	4036	4036

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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.

TABLE 38: FD ESTIMATION OF TOTAL ASSETS, MODERATELY POOR VS. ULTRA POOR

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	15221.4*** (1117.7)	23865.8*** (2164.5)	24883.3*** (2316.8)	24883.3*** (2316.8)	24883.3*** (2316.8)	24780.6*** (2455.2)
UltraPoor	340.9 (1212.4)	137.8 (1533.1)	195.1 (1582.8)	195.1 (1582.8)	195.1 (1582.8)	222.9 (1613.4)
rd 2 - 3		-5926.4** (2324.3)	-5867.9** (2323.5)	-5867.9** (2323.5)	-5867.9** (2323.5)	-5868.1** (2323.6)
UltraPoor × rd 2 - 3		-314.7 (4878.5)	-181.4 (4901.0)	-181.4 (4901.0)	-181.4 (4901.0)	-181.5 (4901.3)
rd 3 - 4		-20272.6*** (2477.4)	-20289.8*** (2479.2)	-20289.8*** (2479.2)	-20289.8*** (2479.2)	-20287.7*** (2481.1)
UltraPoor × rd 3 - 4		6620.1 (5203.2)	6423.9 (5200.9)	6423.9 (5200.9)	6423.9 (5200.9)	6414.9 (5197.0)
NumCowsOwnedAtRd1						363.1 (2008.0)
FloodInRd1			-2374.5** (1097.6)	-2374.5** (1097.6)	-2374.5** (1097.6)	-2398.0** (1036.7)
Head literate			711.7 (1821.0)	711.7 (1821.0)	711.7 (1821.0)	689.0 (1742.3)
$T = 2$	29	29	29	29	29	29
$T = 3$	99	99	97	97	97	97
$T = 4$	1271	1271	1271	1271	1271	1271
$\bar{R}^2$	0	0.041	0.042	0.042	0.042	0.042
$\hat{\rho}$	-0.171	-0.145	-0.153	-0.153	-0.153	-0.151
Pr[ $\hat{\rho} = 0$ ]	0.000	0.000	0.000	0.000	0.000	0.000
$N$	4040	4040	4036	4036	4036	4036

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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.

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

TABLE 39: FD ESTIMATION OF TOTAL ASSETS, SMALL VS. LARGE SIZE LOANS

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	11600.1*** (1123.4)	19140.0*** (1535.8)	20236.1*** (1677.6)	20236.1*** (1677.6)	20236.1*** (1677.6)	20185.8*** (1812.7)
LargeSize	4776.3*** (1379.8)	6037.6*** (1471.8)	6139.7*** (1406.9)	6139.7*** (1406.9)	6139.7*** (1406.9)	6127.2*** (1385.1)
rd 2 - 3		-5924.2** (2305.3)	-5866.2** (2304.6)	-5866.2** (2304.6)	-5866.2** (2304.6)	-5866.4** (2304.8)
LargeSize × rd 2 - 3		-2863.1 (4284.3)	-2781.3 (4284.4)	-2781.3 (4284.4)	-2781.3 (4284.4)	-2778.4 (4286.2)
rd 3 - 4		-20164.6*** (2412.9)	-20182.4*** (2414.1)	-20182.4*** (2414.1)	-20182.4*** (2414.1)	-20180.4*** (2416.4)
LargeSize × rd 3 - 4		-6488.9* (3678.0)	-6570.8* (3678.5)	-6570.8* (3678.5)	-6570.8* (3678.5)	-6566.2* (3683.2)
NumCowsOwnedAtRd1						254.3 (1970.6)
FloodInRd1			-2537.9** (1058.7)	-2537.9** (1058.7)	-2537.9** (1058.7)	-2553.7** (1004.1)
Head literate			328.7 (1790.2)	328.7 (1790.2)	328.7 (1790.2)	313.2 (1719.3)
$T = 2$	29	29	29	29	29	29
$T = 3$	99	99	97	97	97	97
$T = 4$	1271	1271	1271	1271	1271	1271
$\bar{R}^2$	0.002	0.043	0.044	0.044	0.044	0.044
$\hat{\rho}$	-0.174	-0.152	-0.153	-0.153	-0.153	-0.154
Pr[ $\hat{\rho} = 0$ ]	0.000	0.000	0.000	0.000	0.000	0.000
$N$	4040	4040	4036	4036	4036	4036

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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.

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

TABLE 40: FD ESTIMATION OF TOTAL ASSETS, WITH VS. WITHOUT A GRACE PERIOD

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	14841.0*** (1028.6)	23376.3*** (1826.4)	24500.5*** (2008.0)	24500.5*** (2008.0)	24500.5*** (2008.0)	24424.7*** (2129.5)
WithGrace	1143.2 (1422.8)	1117.9 (1693.5)	910.4 (1689.8)	910.4 (1689.8)	910.4 (1689.8)	902.4 (1678.1)
rd 2 - 3		-5928.7** (2324.0)	-5869.7** (2323.4)	-5869.7** (2323.4)	-5869.7** (2323.4)	-5870.0** (2323.6)
WithGrace × rd 2 - 3		918.4 (4649.8)	748.5 (4646.9)	748.5 (4646.9)	748.5 (4646.9)	749.1 (4647.4)
rd 3 - 4		-20179.6*** (2483.4)	-20198.4*** (2484.1)	-20198.4*** (2484.1)	-20198.4*** (2484.1)	-20196.1*** (2486.1)
WithGrace × rd 3 - 4		539.1 (5005.6)	683.3 (5013.4)	683.3 (5013.4)	683.3 (5013.4)	690.0 (5017.4)
NumCowsOwnedAtRd1						339.7 (1979.8)
FloodInRd1			-2290.0** (1140.9)	-2290.0** (1140.9)	-2290.0** (1140.9)	-2312.1** (1077.9)
Head literate			671.2 (1796.8)	671.2 (1796.8)	671.2 (1796.8)	649.7 (1720.6)
$T = 2$	29	29	29	29	29	29
$T = 3$	99	99	97	97	97	97
$T = 4$	1271	1271	1271	1271	1271	1271
$\bar{R}^2$	0	0.04	0.041	0.041	0.041	0.04
$\hat{\rho}$	-0.172	-0.144	-0.150	-0.150	-0.150	-0.150
Pr[ $\hat{\rho} = 0$ ]	0.000	0.000	0.000	0.000	0.000	0.000
$N$	4040	4040	4036	4036	4036	4036

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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.

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

TABLE 41: FD ESTIMATION OF TOTAL ASSETS, ROUND 2 AND 4 COMPARISON

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	15165.3*** (2543.1)	14779.0*** (2602.2)	18288.4*** (3217.9)	18288.4*** (3217.9)	18288.4*** (3217.9)	16781.3*** (3726.0)
Large	7905.5 (5482.4)	7736.0 (5521.6)	8613.2 (5383.6)	8613.2 (5383.6)	8613.2 (5383.6)	8276.8 (5306.3)
LargeGrace	9663.2** (4478.2)	9644.2** (4439.9)	9107.7** (4585.6)	9107.7** (4585.6)	9107.7** (4585.6)	8229.2** (4047.0)
Cow	5790.9 (4168.0)	5576.5 (4093.8)	5770.8 (3802.6)	5770.8 (3802.6)	5770.8 (3802.6)	6111.1* (3616.7)
NumCowsOwnedAtRd1						7647.7 (6056.2)
Head literate		4179.3 (6988.7)	3929.5 (6970.9)	3929.5 (6970.9)	3929.5 (6970.9)	3445.5 (6668.0)
FloodInRd1			-7543.1** (3234.4)	-7543.1** (3234.4)	-7543.1** (3234.4)	-8079.0*** (2918.7)
$\bar{R}^2$	0.002	0.002	0.008	0.008	0.008	0.018
$N$	1271	1271	1271	1271	1271	1271

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.



TABLE 42: FD ESTIMATION OF TOTAL ASSETS, ROUND 2 AND 4 COMPARISON, GRACE PERIOD

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	20006.4*** (3190.4)	19503.6*** (3418.0)	23383.0*** (4003.7)	23383.0*** (4003.7)	23383.0*** (4003.7)	21595.3*** (4294.1)
WithGrace	2894.7 (4048.4)	2882.0 (4029.0)	2199.5 (4028.3)	2199.5 (4028.3)	2199.5 (4028.3)	2135.9 (3946.2)
NumCowsOwnedAtRd1						7845.5 (6152.2)
Head literate		4288.0 (6817.1)	4126.0 (6774.5)	4126.0 (6774.5)	4126.0 (6774.5)	3687.3 (6506.2)
FloodInRd1			-7248.7** (3219.8)	-7248.7** (3219.8)	-7248.7** (3219.8)	-7754.0*** (2948.3)
$\bar{R}^2$	0	0	0.005	0.005	0.005	0.016
N	1271	1271	1271	1271	1271	1271

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.

TABLE 43: FD ESTIMATION OF TOTAL ASSETS, ROUND 2 AND 4 COMPARISON, ULTRA POOR VS. MODERATELY POOR

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	18966.4*** (3701.2)	18412.3*** (3817.8)	22007.9*** (3844.9)	22007.9*** (3844.9)	22007.9*** (3844.9)	19834.9*** (4440.7)
UltraPoor	3941.0 (4021.2)	3989.0 (4033.4)	4069.3 (3999.7)	4069.3 (3999.7)	4069.3 (3999.7)	4557.3 (4186.8)
NumCowsOwnedAtRd1						8001.9 (6207.6)
Head literate		4403.9 (6836.9)	4233.2 (6785.9)	4233.2 (6785.9)	4233.2 (6785.9)	3797.0 (6512.5)
FloodInRd1			-7495.8** (3073.9)	-7495.8** (3073.9)	-7495.8** (3073.9)	-8009.9*** (2835.0)
$\bar{R}^2$	0.001	0.001	0.006	0.006	0.006	0.017
N	1271	1271	1271	1271	1271	1271

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.

Finding IV.5 **13** seems to show that more experienced (or wealthier) members under large grace and cow arms did not increase the asset holding as much as their counterpart who are less experienced. More experienced members under traditional arm show higher increases in assets relative to their less experienced counterpart.

## IV.6 Incomes

```
Warning in `[.data.table`(lab, , `:=`(grepout("RM", colnames(lab)), NULL)): length(LHS)==0
```

```
Warning in `[.data.table`(far, , `:=`(grepout("RM", colnames(far)), NULL)): length(LHS)==0
```

```
Dropped 436 obs due to T<2.
Dropped 1463 obs due to NA.
Dropped 436 obs due to T<2.
Dropped 1463 obs due to NA.
```

```
Dropped 116 obs due to T<2.
Dropped 111 obs due to NA.
Dropped 116 obs due to T<2.
Dropped 111 obs due to NA.
```

Income sources are mainly labour incomes (**lab**) and farm revenues (**far**) with 5649 and 393 observations, respectively. After first-differencing, they become 3750 and 158 observations, with 3750 households observed for 3751 times.

Obs for survey labour income.

```
1      2      3      4
1 1170 1303 1276
```

Obs for survey labour income and admin repayment data.

```
3      4
1303 1276
```

```
3      4
85 73
```

Obs for survey farm revenue.

```
3      4
85 73
```

Obs for survey farm revenue and admin repayment data.

```
3      4
85 73
```

```
source(paste0(pathprogram, "IncomeCovariateSelection.R"))
```

```
source(paste0(pathprogram, "IncomeCovariateSelectionRobustness.R"))
```

TABLE 44: FD ESTIMATION OF INCOMES

	Labour income (Tk)				Farm income (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	6.1*** (1.2)	0.8 (2.7)	0.4 (3.2)	7.2** (3.5)	-7.7 (5.9)	-10.5 (6.5)	-11.0 (6.8)
Large	2.2 (3.2)	0.3 (3.1)	0.3 (3.1)	1.6 (3.4)	9.3 (6.0)	9.6 (5.8)	9.9* (5.9)
LargeGrace	-4.8 (3.0)	-11.7 (7.7)	-11.6 (7.5)	0.0 (2.9)	9.2 (6.1)	3.0 (7.6)	3.4 (7.7)
Cow	6.6 (8.4)	1.1 (5.2)	1.4 (5.6)	1.7 (5.8)	6.3 (6.2)	5.6 (6.2)	5.7 (6.2)
rd 2 - 3		18.6*** (6.3)	18.8*** (6.4)	11.1* (6.2)		8.0 (8.6)	7.9 (8.7)
Large × rd 2 - 3		8.8 (7.2)	8.7 (7.1)	8.0 (7.7)		6.2 (8.6)	6.4 (8.5)
LargeGrace × rd 2 - 3		16.6 (12.3)	16.6 (12.3)	0.1 (5.9)		53.0 (34.8)	53.2 (35.0)
Cow × rd 2 - 3		27.1 (21.2)	27.3 (21.1)	27.3 (23.7)		13.5 (9.3)	13.5 (9.3)
rd 3 - 4		7.6** (3.5)	7.6** (3.5)				
Large × rd 3 - 4		0.8 (5.5)	0.8 (5.5)				
LargeGrace × rd 3 - 4		16.7 (12.3)	16.7 (12.3)				
Cow × rd 3 - 4		0.2 (7.1)	0.1 (7.2)				
FloodInRd1			1.7 (4.6)	-3.1 (6.3)			0.0 (1.6)
Head literate			-5.4 (3.7)	-7.5 (5.2)			1.9 (1.5)
$T = 2$	192	192	191	206	60	60	60
$T = 3$	255	255	253	1184	49	49	49
$T = 4$	1016	1016	1016	0	0	0	0
$\bar{R}^2$	0	0.002	0.001	-0.001	-0.017	0.028	0.016
$\hat{\rho}$	-0.119	-0.162	-0.159	-0.103	-0.555	-0.668	-0.683
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	3750	3750	3745	2574	158	158	158

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. 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 45: FD ESTIMATION OF INCOMES, MODERATELY POOR VS. ULTRA POOR

	Labour income (Tk)				Farm income (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	10.0* (5.6)	0.7 (2.7)	0.0 (4.9)	4.8 (6.4)	0.2 (1.3)	-2.9 (4.0)	-3.3 (4.4)
UltraPoor	-4.3 (5.9)	-4.0 (4.1)	-4.1 (4.1)	4.2 (6.7)	0.3 (1.1)	-2.1 (2.2)	-2.0 (2.2)
rd 2 - 3		18.9*** (6.5)	19.0*** (6.5)	11.7* (6.6)		8.9 (9.2)	8.9 (9.3)
UltraPoor × rd 2 - 3		-12.5 (15.7)	-12.5 (15.7)	-23.9 (20.0)		17.9 (14.8)	18.1 (15.0)
rd 3 - 4		7.2** (3.5)	7.3** (3.5)				
UltraPoor × rd 3 - 4		11.5 (9.2)	11.6 (9.3)				
FloodInRd1			2.4 (4.6)	-2.5 (6.2)			0.3 (1.7)
Head literate			-4.2 (2.8)	-6.1 (4.0)			1.6 (1.7)
$T = 2$	192	192	191	206	60	60	60
$T = 3$	255	255	253	1184	49	49	49
$T = 4$	1016	1016	1016	0	0	0	0
$\bar{R}^2$	0	0.002	0.002	0.001	-0.006	0.004	-0.009
$\hat{\rho}$	-0.140	-0.165	-0.165	-0.133	-0.786	-0.857	-0.865
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	3750	3750	3745	2574	158	158	158

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. 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 46: FD ESTIMATION OF INCOMES, LOAN SIZE

	Labour income (Tk)				Farm income (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	6.1*** (1.2)	0.8 (2.7)	0.1 (3.3)	7.0** (3.5)	-7.7 (5.9)	-11.1 (6.9)	-11.1 (6.9)
LargeSize	1.4 (3.3)	-3.2 (3.7)	-3.1 (3.9)	1.1 (3.1)	8.5 (5.9)	6.8 (6.1)	6.8 (6.1)
rd 2 - 3		18.5*** (6.3)	18.6*** (6.3)	11.2* (6.3)		8.7 (9.7)	8.7 (9.7)
LargeSize × rd 2 - 3		17.2* (9.0)	17.2* (9.0)	11.8 (9.5)		21.4* (12.9)	21.4* (12.9)
rd 3 - 4		7.3** (3.4)	7.4** (3.4)				
LargeSize × rd 3 - 4		5.5 (6.3)	5.6 (6.4)				
FloodInRd1			2.2 (4.8)	-2.8 (6.5)		0.2 (1.7)	0.2 (1.7)
Head literate			-4.4 (3.0)	-6.6 (4.2)		1.0 (1.8)	1.0 (1.8)
$T = 2$	192	192	191	206	60	60	60
$T = 3$	255	255	253	1184	49	49	49
$T = 4$	1016	1016	1016	0	0	0	0
$\bar{R}^2$	0	0.002	0.001	0	-0.005	-0.016	-0.016
$\hat{\rho}$	-0.148	-0.171	-0.168	-0.109	-0.719	-0.653	-0.653
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	3750	3750	3745	2574	158	158	158

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. 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 47: FD ESTIMATION OF INCOMES, WITH VS. WITHOUT A GRACE PERIOD

	Labour income (Tk)				Farm income (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	7.4*** (1.8)	0.9 (2.0)	0.1 (2.7)	7.6** (2.9)	0.7 (1.3)	-2.1 (3.7)	-1.8 (3.8)
WithGrace	-0.3 (4.9)	-5.2 (4.7)	-5.0 (4.5)	0.1 (3.0)	-0.6 (1.9)	-4.7 (3.3)	-4.8 (3.3)
rd 2 - 3		18.8*** (6.4)	18.9*** (6.4)	11.4* (6.4)		8.9 (9.1)	8.9 (9.2)
WithGrace × rd 2 - 3		16.7 (12.6)	16.8 (12.6)	9.2 (12.8)		28.4 (18.4)	28.5 (18.5)
rd 3 - 4		7.4** (3.4)	7.5** (3.5)				
WithGrace × rd 3 - 4		7.7 (6.8)	7.7 (6.9)				
FloodInRd1			2.3 (4.4)	-2.4 (6.0)			-0.6 (1.7)
Head literate			-4.3 (2.9)	-6.3 (4.1)			0.0 (2.1)
$T = 2$	192	192	191	206	60	60	60
$T = 3$	255	255	253	1184	49	49	49
$T = 4$	1016	1016	1016	0	0	0	0
$\bar{R}^2$	0	0.002	0.001	0	-0.006	0.022	0.009
$\hat{\rho}$	-0.149	-0.181	-0.176	-0.118	-0.770	-0.948	-0.952
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	3750	3750	3745	2574	158	158	158

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. 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 48: FD ESTIMATION OF INCOMES, SMALL VS. LARGE SIZE LOANS

	Labour income (Tk)				Farm income (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	6.1*** (1.2)	0.8 (2.7)	0.1 (3.3)	7.0** (3.5)	-7.7 (5.9)	-11.1 (6.9)	-11.1 (6.9)
LargeSize	1.4 (3.3)	-3.2 (3.7)	-3.1 (3.9)	1.1 (3.1)	8.5 (5.9)	6.8 (6.1)	6.8 (6.1)
rd 2 - 3		18.5*** (6.3)	18.6*** (6.3)	11.2* (6.3)		8.7 (9.7)	8.7 (9.7)
LargeSize × rd 2 - 3		17.2* (9.0)	17.2* (9.0)	11.8 (9.5)		21.4* (12.9)	21.4* (12.9)
rd 3 - 4		7.3** (3.4)	7.4** (3.4)				
LargeSize × rd 3 - 4		5.5 (6.3)	5.6 (6.4)				
FloodInRd1			2.2 (4.8)	-2.8 (6.5)		0.2 (1.7)	0.2 (1.7)
Head literate			-4.4 (3.0)	-6.6 (4.2)		1.0 (1.8)	1.0 (1.8)
$T = 2$	192	192	191	206	60	60	60
$T = 3$	255	255	253	1184	49	49	49
$T = 4$	1016	1016	1016	0	0	0	0
$\bar{R}^2$	0	0.002	0.001	0	-0.005	-0.016	-0.016
$\hat{\rho}$	-0.148	-0.171	-0.168	-0.109	-0.719	-0.653	-0.653
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	3750	3750	3745	2574	158	158	158

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. 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.

**Robustness:** TABLE 49 shows that members from larger household size (defined as more than 2 adults) have a higher labour income increase in rd 2-3 and 3-4. This suggests existence of surplus labour in households and local employment opportunities.

TABLE 49: FD ESTIMATION OF INCOMES, SMALL VS. LARGE HH SIZE SAMPLES

	Labour income (Tk)				Farm income (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	6.1*** (1.2)	0.8 (2.7)	0.4 (3.2)	7.2** (3.5)	-7.7 (5.9)	-10.5 (6.5)	-11.0 (6.8)
Large	2.2 (3.2)	0.3 (3.1)	0.3 (3.1)	1.6 (3.4)	9.3 (6.0)	9.6 (5.8)	9.9* (5.9)
LargeGrace	-4.8 (3.0)	-11.7 (7.7)	-11.6 (7.5)	0.0 (2.9)	9.2 (6.1)	3.0 (7.6)	3.4 (7.7)
Cow	6.6 (8.4)	1.1 (5.2)	1.4 (5.6)	1.7 (5.8)	6.3 (6.2)	5.6 (6.2)	5.7 (6.2)
rd 2 - 3		18.6*** (6.3)	18.8*** (6.4)	11.1* (6.2)		8.0 (8.6)	7.9 (8.7)
Large × rd 2 - 3		8.8 (7.2)	8.7 (7.1)	8.0 (7.7)		6.2 (8.6)	6.4 (8.5)
LargeGrace × rd 2 - 3		16.6 (12.3)	16.6 (12.3)	0.1 (5.9)		53.0 (34.8)	53.2 (35.0)
Cow × rd 2 - 3		27.1 (21.2)	27.3 (21.1)	27.3 (23.7)		13.5 (9.3)	13.5 (9.3)
rd 3 - 4		7.6** (3.5)	7.6** (3.5)				
Large × rd 3 - 4		0.8 (5.5)	0.8 (5.5)				
LargeGrace × rd 3 - 4		16.7 (12.3)	16.7 (12.3)				
Cow × rd 3 - 4		0.2 (7.1)	0.1 (7.2)				
FloodInRd1			1.7 (4.6)	-3.1 (6.3)			0.0 (1.6)
Head literate			-5.4 (3.7)	-7.5 (5.2)			1.9 (1.5)
T = 2	192	192	191	206	60	60	60
T = 3	255	255	253	1184	49	49	49
T = 4	1016	1016	1016	0	0	0	0
$\bar{R}^2$	0	0.002	0.001	-0.001	-0.017	0.028	0.016
$\hat{\rho}$	-0.119	-0.162	-0.159	-0.103	-0.555	-0.668	-0.683
Pr[ $\hat{\rho} = 0$ ]	0.000	0.000	0.000	0.000	0.000	0.000	0.000
N	3750	3750	3745	2574	158	158	158

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. 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.

**Finding IV.6** TABLE 44 (1) and (3) show a general decrease in rd 1 - 2 period and a general increase in rd 2 - 4 periods for labour incomes. (2) and (4) suggest Large grace arm saw a greater swing (decrease and increases) which resulted in overall significant mean increase of -4.79 (at  $p$  value of 11.07%), yet not statistically different from traditional, while other arms have estimates closer to traditional. This labour income response can be due to the flood in rd 1 which reduced the labour incomes while repayment burden in later rounds prompted households to earn more labour incomes. Strong positive correlation with other members' previous 6 month repayment in (4) may be due to concerted peer efforts in repayment. Farm revenues do not show any systematic trend.

## IV.7 Consumption

	ConsumptionBaseline	
Arm	0	1
traditional	797	0
large	892	256
large grace	814	218

```
Warning in `[.data.table`(con, , `:=`(grepout("RM", colnames(con)), NULL)): length(LHS)==0
```

```
Dropped 28 obs due to T<2.
Dropped 1373 obs due to NA.
Dropped 28 obs due to T<2.
Dropped 1373 obs due to NA.
```

Consumption is observed in rd 2-4. There are 4051 observations, with first-differencing, it becomes 2650 observations with 96, 2554 households observed for 2, 3 times.

```
source(paste0(pathprogram, "ConsumptionCovariateSelection.R"))
```

```
source(paste0(pathprogram, "ConsumptionCovariateSelectionRobustness.R"))
```

TABLE 50: FD ESTIMATION OF CONSUMPTION

covariates	Per capita consumption (Tk)				Per capita food consumption (Tk)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	336.8*** (28.0)	529.8*** (43.9)	525.3*** (44.8)	525.3*** (44.8)	186.8*** (17.2)	229.5*** (26.8)	225.8*** (28.1)
Large	22.5 (42.4)	63.2 (56.1)	61.8 (56.1)	61.8 (56.1)	23.5 (23.5)	45.8 (32.0)	44.8 (32.0)
LargeGrace	-36.7 (43.2)	-44.3 (48.5)	-44.8 (48.4)	-44.8 (48.4)	-1.5 (24.5)	-8.2 (27.4)	-8.6 (27.5)
Cow	-15.2 (45.4)	51.5 (49.5)	40.1 (49.0)	40.1 (49.0)	1.2 (28.6)	39.4 (33.5)	32.8 (32.8)
rd 3 - 4		-447.2*** (65.7)	-435.3*** (65.6)	-435.3*** (65.6)		-116.4*** (34.2)	-111.2*** (33.8)
Large × rd 3 - 4		-162.5 (186.4)	-158.1 (186.8)	-158.1 (186.8)		-118.1 (96.8)	-117.5 (96.9)
LargeGrace × rd 3 - 4		111.5 (193.4)	113.4 (193.4)	113.4 (193.4)		44.5 (107.8)	46.5 (107.8)
Cow × rd 3 - 4		-345.7* (181.7)	-306.6* (180.7)	-306.6* (180.7)		-220.6** (99.2)	-202.6** (97.1)
FloodInRd1			-7.0 (25.9)	-7.0 (25.9)			-1.8 (16.3)
Head literate			44.2 (36.4)	44.2 (36.4)			31.9 (23.7)
$T = 2$	96	96	96	96	96	96	96
$T = 3$	1277	1277	1274	1274	1277	1277	1274
$\bar{R}^2$	0	0.072	0.071	0.071	-0.001	0.022	0.02
$\hat{\rho}$	-0.458	-0.369	-0.364	-0.364	-0.329	-0.278	-0.277
Pr[ $\hat{\rho} = 0$ ]	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	2650	2650	2644	2644	2650	2650	2644

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. Consumption is annualised values.

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

TABLE 51: FD ESTIMATION OF CONSUMPTION, MODERATELY POOR VS. ULTRA POOR

	Per capita consumption (Tk)				Per capita food consumption (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	364.0*** (26.2)	573.9*** (43.9)	558.6*** (43.1)	558.6*** (43.1)	217.5*** (15.6)	274.9*** (25.6)	265.2*** (26.3)
UltraPoor	-54.3** (26.9)	-38.5 (31.3)	-32.1 (30.8)	-32.1 (30.8)	-38.2** (17.7)	-39.0* (20.2)	-35.6* (20.4)
rd 3 - 4		-445.5*** (68.8)	-433.6*** (68.3)	-433.6*** (68.3)		-115.5*** (36.1)	-110.2*** (35.6)
UltraPoor × rd 3 - 4		-45.0 (88.2)	-70.6 (84.5)	-70.6 (84.5)		18.3 (56.5)	6.5 (56.4)
FloodInRd1			-0.7 (26.8)	-0.7 (26.8)			1.5 (16.2)
Head literate			47.3 (35.3)	47.3 (35.3)			33.4 (22.9)
$T = 2$	96	96	96	96	96	96	96
$T = 3$	1277	1277	1274	1274	1277	1277	1274
$\bar{R}^2$	0.001	0.064	0.064	0.064	0.001	0.014	0.012
$\hat{\rho}$	-0.458	-0.379	-0.371	-0.371	-0.332	-0.308	-0.305
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	2650	2650	2644	2644	2650	2650	2644

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. Consumption is annualised values.

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

TABLE 52: FD ESTIMATION OF CONSUMPTION, LARGE VS. SMALL SIZE LOANS

	Per capita consumption (Tk)				Per capita food consumption (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	336.8*** (27.9)	529.5*** (44.4)	522.3*** (44.9)	522.3*** (44.9)	186.8*** (17.1)	224.6*** (28.1)	224.6*** (28.1)
rd 3 - 4		-446.3*** (68.5)	-434.5*** (68.1)	-434.5*** (68.1)		-110.7*** (35.3)	-110.7*** (35.3)
LargeSize × rd 3 - 4		-134.9 (156.2)	-119.8 (155.9)	-119.8 (155.9)		-92.9 (86.0)	-92.9 (86.0)
FloodInRd1			-1.5 (26.9)	-1.5 (26.9)		0.4 (16.5)	0.4 (16.5)
Head literate			47.4 (35.5)	47.4 (35.5)		33.1 (23.1)	33.1 (23.1)
SizeLargeSize	-8.6 (34.2)	26.0 (41.2)	21.3 (40.9)	21.3 (40.9)	8.3 (20.4)	24.3 (25.3)	24.3 (25.3)
$T = 2$	96	96	96	96	96	96	96
$T = 3$	1277	1277	1274	1274	1277	1274	1274
$\bar{R}^2$	0	0.064	0.063	0.063	0	0.013	0.013
$\hat{\rho}$	-0.456	-0.377	-0.369	-0.369	-0.330	-0.288	-0.288
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	2650	2650	2644	2644	2650	2644	2644

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. Consumption is annualised values.

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



TABLE 53: FD ESTIMATION OF CONSUMPTION, WITH VS. WITHOUT A GRACE PERIOD

	Per capita consumption (Tk)				Per capita food consumption (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	350.2*** (22.2)	565.6*** (45.0)	558.5*** (44.6)	558.5*** (44.6)	200.8*** (11.9)	255.5*** (24.6)	250.3*** (25.4)
WithGrace	-39.2 (33.0)	-30.5 (40.5)	-35.6 (39.8)	-35.6 (39.8)	-14.1 (18.7)	-9.5 (23.4)	-12.4 (22.8)
rd 3 - 4		-446.3*** (68.9)	-434.4*** (68.5)	-434.4*** (68.5)		-115.9*** (36.1)	-110.6*** (35.5)
WithGrace × rd 3 - 4		-24.0 (137.5)	-5.9 (136.6)	-5.9 (136.6)		-19.9 (71.8)	-10.1 (70.8)
FloodInRd1			-4.5 (26.5)	-4.5 (26.5)			-0.4 (16.3)
Head literate			48.8 (35.2)	48.8 (35.2)			34.3 (23.0)
$T = 2$	96	96	96	96	96	96	96
$T = 3$	1277	1277	1274	1274	1277	1277	1274
$\bar{R}^2$	0	0.064	0.063	0.063	0	0.012	0.011
$\hat{\rho}$	-0.458	-0.378	-0.370	-0.370	-0.327	-0.303	-0.308
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	2650	2650	2644	2644	2650	2650	2644

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. Consumption is annualised values.

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

TABLE 54: FD ESTIMATION OF CONSUMPTION, LOAN RECIPIENTS VS. PURE CONTROL

	Per capita consumption (Tk)				Per capita food consumption (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	311.3*** (17.5)	544.2*** (43.5)	532.0*** (42.1)	532.0*** (42.1)	183.4*** (9.8)	249.7*** (22.2)	242.1*** (21.9)
PureControl	85.5** (40.5)	24.9 (78.2)	34.7 (78.0)	34.7 (78.0)	46.2* (25.0)	4.0 (48.9)	8.9 (48.7)
PureControl × rd 3 - 4		95.0 (126.4)	80.7 (125.4)	80.7 (125.4)		80.7 (79.6)	74.5 (78.9)
rd 3 - 4		-465.5*** (78.5)	-450.5*** (77.9)	-450.5*** (77.9)		-132.4*** (39.6)	-125.8*** (38.9)
FloodInRd1			-4.9 (26.9)	-4.9 (26.9)			-1.6 (16.3)
Head literate			52.6 (35.3)	52.6 (35.3)			36.9 (23.2)
$T = 2$	96	96	96	96	96	96	96
$T = 3$	1277	1277	1274	1274	1277	1277	1274
$\bar{R}^2$	0.001	0.065	0.064	0.064	0.001	0.015	0.013
$\hat{\rho}$	-0.456	-0.378	-0.366	-0.366	-0.325	-0.287	-0.288
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	2650	2650	2644	2644	2650	2650	2644

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates of round 2 - 4. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. 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. 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.

**Finding IV.7** TABLE 50 uses rd 2 - 4 data and shows an increase in per member consumption in rd 2 - 3 period. The estimates are imprecise for all interaction terms. Continued increases in consumption hints welfare gains, but do not differ by arms. Per member food consumption increases in rd 2- 3 period but decreases in rd 3 - 4 period.

## IV.8 IGA

As written in the above at livestock section, IGA is misreported.

PositiveCows				
CowAsIGA	FALSE	TRUE	<NA>	
FALSE	524	430	5	
TRUE	1331	2588	93	
<NA>	334	328	12	

```
, , survey = 1
```

PositiveCows			
CowAsIGA	FALSE	TRUE	<NA>
FALSE	258	57	0
TRUE	870	190	0
<NA>	178	42	0

```
, , survey = 2
```

PositiveCows			
CowAsIGA	FALSE	TRUE	<NA>
FALSE	99	109	4
TRUE	287	648	49
<NA>	69	94	9

```
, , survey = 3
```

PositiveCows			
CowAsIGA	FALSE	TRUE	<NA>
FALSE	82	133	1
TRUE	62	890	39
<NA>	53	112	3

```
, , survey = 4
```

PositiveCows			
CowAsIGA	FALSE	TRUE	<NA>
FALSE	85	131	0
TRUE	112	860	5
<NA>	34	80	0

CowAsIGA = T, NumCows = 0: CowAsIGA = T may be reported as an intention, not an actual activity.

Arm					
survey	traditional	large	large	grace	cow
1		82	260	263	265
2		27	107	89	64
3		9	14	18	21
4		16	31	36	29

CowAsIGA = F, NumCows > 0:

Arm					
survey	traditional	large	large	grace	cow
1		33	7	8	9
2		47	20	13	29
3		61	25	16	31
4		55	28	15	33

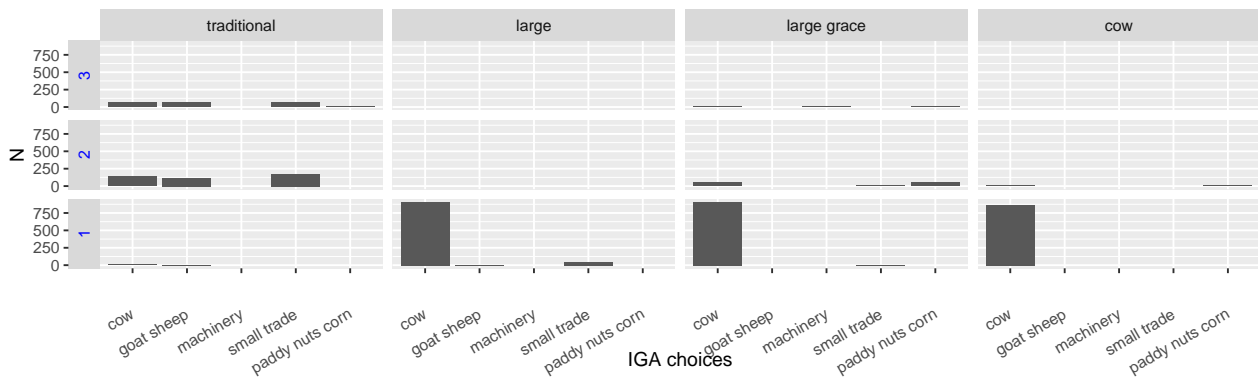


Figure 14: All income generating activity choices

All of multiple investment choices are summed by arms and the number of IGAs are plotted as bars. Cow as IGA is corrected with livestock ownership information.

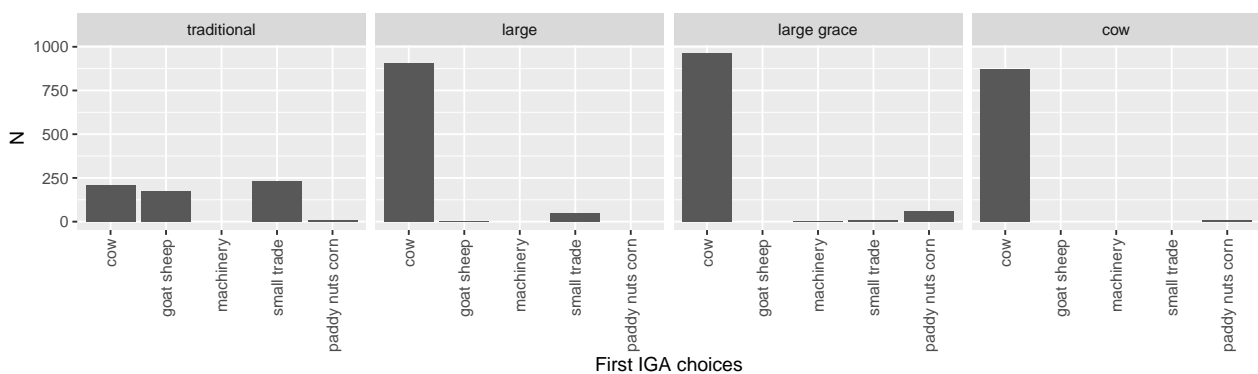


Figure 15: All income generating activity choices collapsed over different number of IGAs

All of multiple investment choices are summed by arms and plotted as bars. Cow as IGA is corrected with livestock ownership information.

Revise IGA:

- CowAsIGA = T, NumCows = 0 for all rounds: CowAsIGA = F.
- CowAsIGA = F, NumCows > 0 for any round: CowAsIGA = T.

Find HHs who do not report cows as IGA and copy CowAsIGA.

Given that it was minority households who owned a cow at baseline, cow as reported IGA in the first round indicates it is likely to include member's intention, not just actual ownership. So we base IGA according to ownership. FIGURE 16 shows that fewer members own poultry and goat/sheep in all arms, while cow ownership expanded in all arms but least pronounced in traditional arm (see the close-up plots in FIGURE 17). This suggests a loan triggered the substitution of smaller, less profitable livestock with bigger, and more profitable livestock.

**Finding IV.8** FIGURE 14, 15 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 investment choice by forcing to receive a cow. FIGURE 15 shows there are a significant number of cases in the traditional arm that members reportedly raise cows, yet they are also accompa-

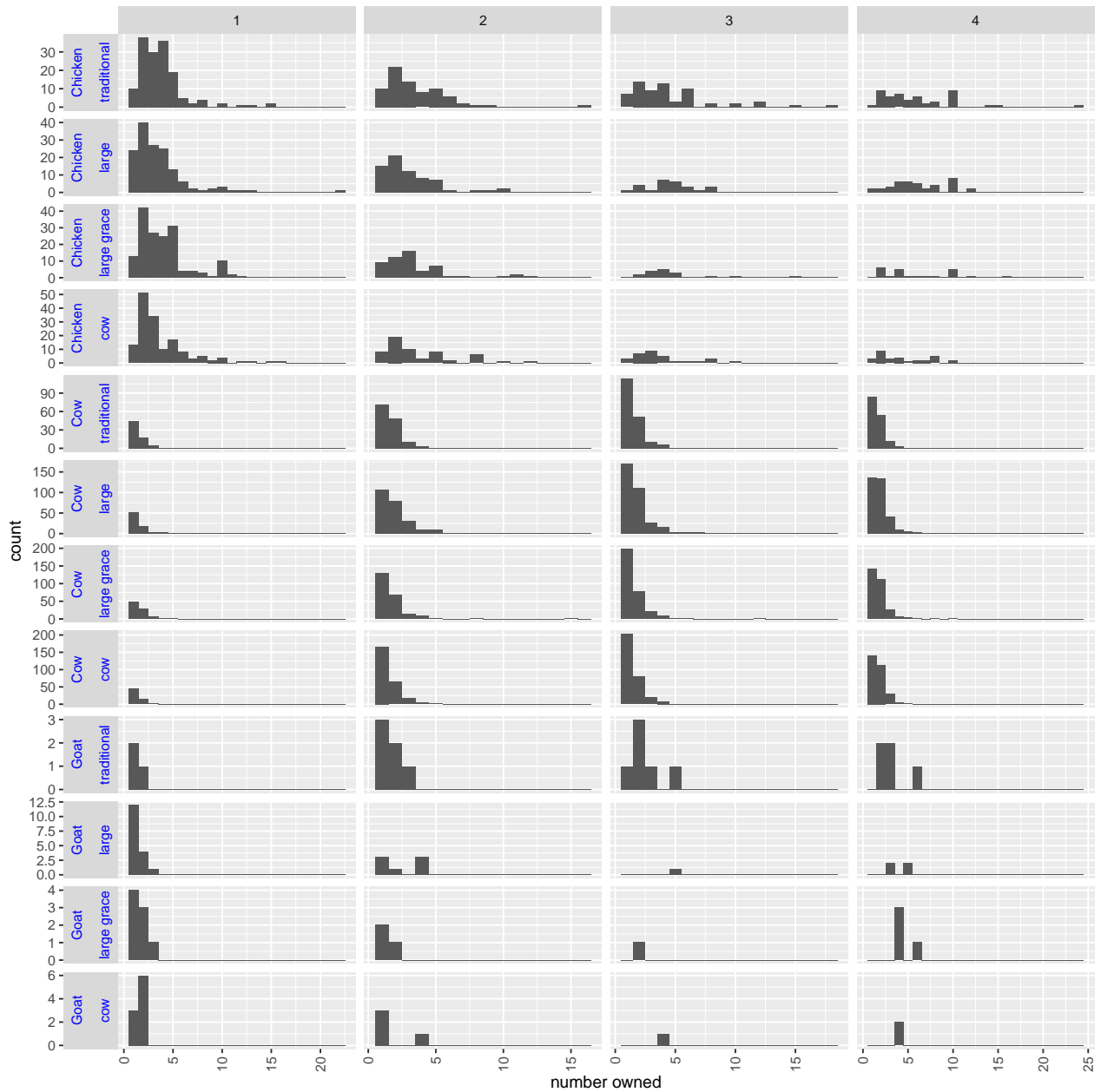


Figure 16: Livestock holding

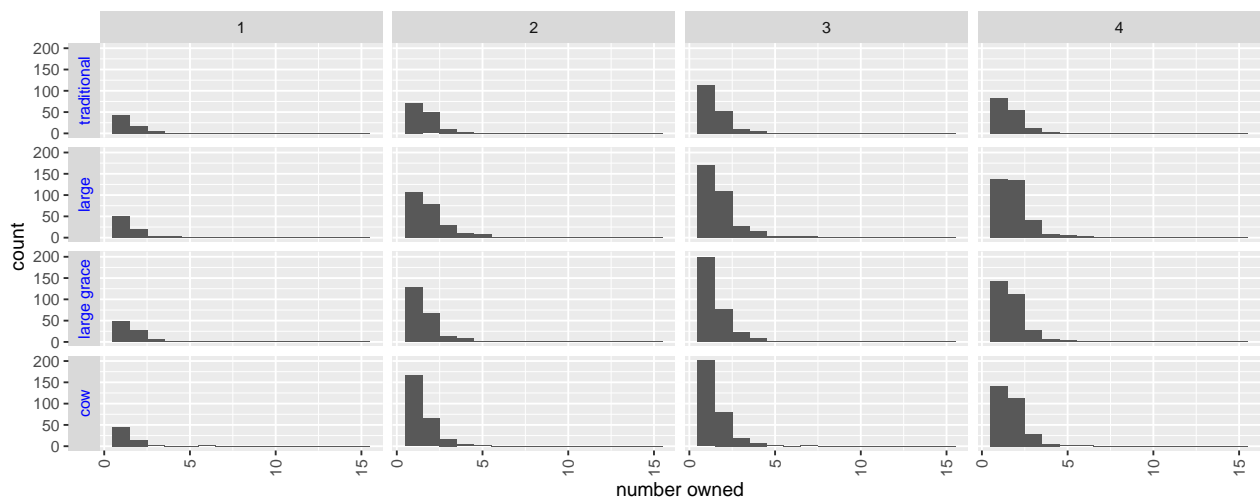


Figure 17: Livestock holding

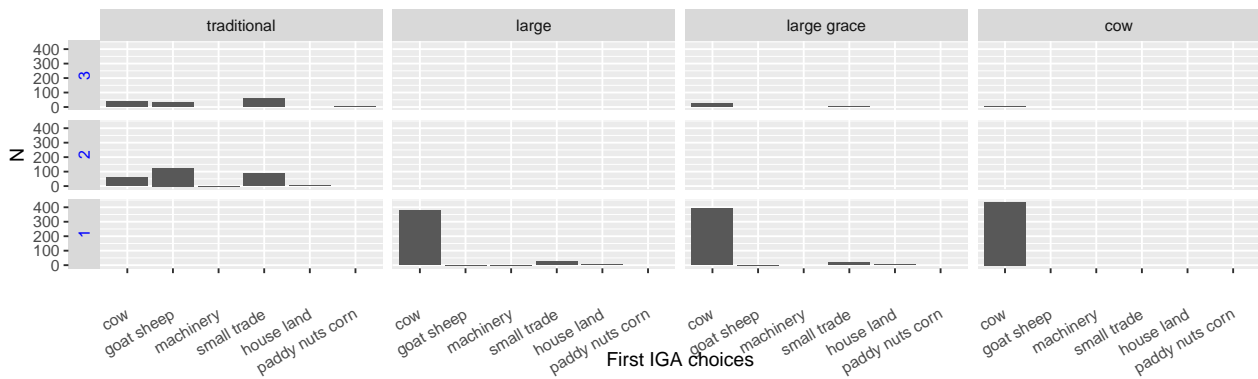


Figure 18: Income generating activity choices  
The first income generating activity choices are plotted.

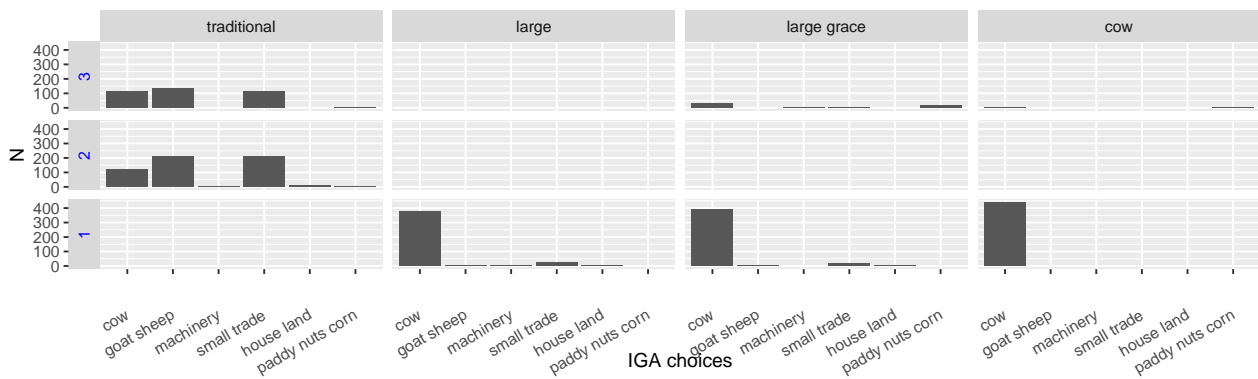


Figure 19: All income generating activity choices  
All of multiple investment choices are summed by arms and the number of IGAs are plotted as bars.

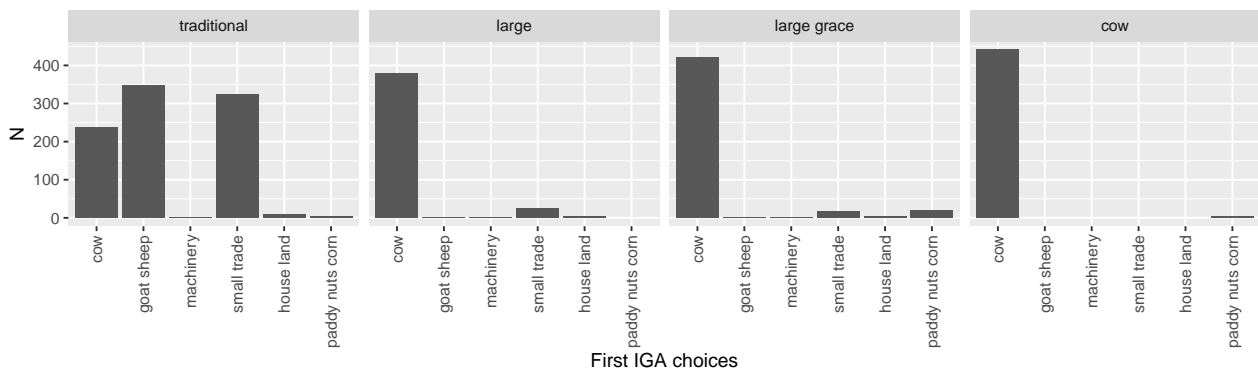


Figure 20: All income generating activity choices collapsed over different number of IGAs  
All of multiple investment choices are summed by arms and plotted as bars.

nied by pararell 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 19 showing smaller net saving and repayment among traditional, the restriction on a project choice induced by a smaller loaned sum resulted in smaller returns. Between with or no grace period loans, cumulative net saving and repayment are both larger with loans with a grace period. No such difference is found between cow and other arms.

## IV.9 Marriage

creditstatus	TradGroup			
	planned	twice	double	<NA>
Yes	63	409	265	6182
No	0	0	0	1714
Replaced Member	0	0	0	0

	Arm	NumEligible.1	NumEligible.2	NumEligible.3	NumEligible.4
1:	<NA>	59	1	0	59
2:	traditional	87	0	0	214
3:	large	110	1	0	222
4:	large grace	124	1	2	246
5:	cow	115	0	0	254

Tabulate marriage for `sex == "Female"` & `ReadyToMarry`, where the latter is unmarried females with ages between 10 and 40.

When we compare the marriage rates, we need to define the denominator sensibly. It should be all relevant aged females that are present in baseline. As we do not want to include marriages immediately after receiving loans, we need to take off some period to count the marriage cases. We will consider 1 year, 2 years, and 3 years. At the same time, there are households who chose not to receive a loan. Then, we need the denominator to be relevant aged females who do not attrit by:

- 1 year (499 individuals), or,
- 2 years (334 individuals), or,
- 3 years (242 individuals).

	Arm	AttritedBefore	NumEligible	Married	MarriageRate
1:	<NA>	year 1	119	0	0
2:	traditional	year 1	66	0	0
3:	traditional	year 2	23	0	0
4:	traditional	year 3	75	0	0
5:	traditional	never	137	0	0
6:	large	year 1	12	0	0
7:	large	year 2	30	0	0
8:	large	year 3	68	0	0
9:	large	never	223	0	0
10:	large grace	year 1	16	0	0
11:	large grace	year 2	74	0	0
12:	large grace	year 3	80	0	0
13:	large grace	never	203	0	0
14:	cow	year 1	39	0	0
15:	cow	year 2	58	0	0
16:	cow	year 3	96	0	0
17:	cow	never	176	0	0

**Finding IV.9** There is very small difference in marriage rates between arms with grace and without grace.

## V 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	rraa	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

First disbursement year of individual and replacing samples. We have about 100+ in 2013 for replacing sample.

	2013	2014	2015	<NA>
original	679	313	203	405
replacing	771	348	232	408

Use original sample. Attrition.

WillAttrit		
tee	0	1
1	1410	190
2	1410	190
3	1410	190
4	1410	190

Merge xid with other files. Keep all==T.

```

xid[, Fromxid := T]
datafiles <- c("s1", "s2", "ar", "ass", "lvo", "lab", "far", "con")
Datafiles <- c("S1", "S2", "Ar", "Ass", "Lvo", "Lab", "Far", "Con")
DataFileNames <- c(
  "Schooling", "AugmentedSchooling", "Repayment", "Asset", "Livestock",
  "LabourIncome", "FarmIncome", "Consumption")
#lapply(datafiles, function(x)
#  grepout("Assign0|^Arm$|groupi|hhid|tee", colnames(get(x))))
# use only rd 1 characteristics
xid[, c("year") := NULL]
setkey(xid, AssignOriginal, groupid, hhid, tee)
# tee numbering is not in line with survey. This causes multiple matches per hhid-tee below
corrtee <- c("ar", "ass", "lvo")
for (i in corrtee) {
  this <- get(i)
  setkey(this, hhid, survey)
  this[, tee := NULL]
  this[, tee := 1:N, by = hhid]
}

```

```

  assign(i, this)
}
for (i in 1:length(datafiles)) {
  X ← get(datafiles[i])
  X[, FromFile := 1L]
  # files up to livestock do not have AssignOriginal
  if (i ≥ 5)
    xx ← merge(xid, X, by = key(xid)[-1], all = T,
               suffixes = c("", paste0("From", Datafiles[i]))) else
    xx ← merge(xid, X, by = key(xid), all = T,
               suffixes = c("", paste0("From", Datafiles[i])))
  xx[is.na(FromFile), FromFile := 0L]
  assign(paste0(datafiles[i], "x"), xx)
  saveRDS(xx, paste0(pathsaveHere, "Roster", DataFileNames[i],
                    "AdminOriginalHHsDataUsedForEstimation.rds"))
}

```

Membership status in schooling: Schooling files have multiple observations per household.

gErosion	gRejection	iRejection	oldMember
80	140	234	1872

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.

	AssignOriginal					
Mstatus	traditional	large	large	grace	cow	<NA>
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

TABLE 55: NUMBER OF OBSERVATIONS FROM ORIGINAL 1600 HHs IN ROUND 1

files	rounds	traditional	large	large grace	cow	total
s1	1	306	449	441	466	1662
	2	171	373	369	383	1296
	3	152	336	340	333	1161
	4	128	289	282	277	976
ar	1	280	360	360	380	1380
	2	271	349	352	359	1331
	3	253	347	349	348	1297
	4	224	343	343	341	1251
ass	1	278	360	360	380	1378
	2	169	349	352	358	1228
	3	167	345	349	346	1207
	4	163	339	330	329	1161
lvo	1	278	360	360	380	1378
	2	169	349	352	358	1228
	3	167	345	348	346	1206
	4	163	339	330	327	1159
lab	1	278	360	360	379	1377
	2	271	349	352	358	1330
	3	254	347	349	348	1298
	4	228	342	342	340	1252
far	1	14	80	52	57	203
	2	4	46	28	27	105
	3	2	20	17	12	51
	4	2	1	2	1	6
con	2	387	389	352	379	1507
	3	387	389	352	379	1507
	4	387	389	352	379	1507

Source: Estimated with GUK administrative and survey data.

Notes: 1.

2.

## VI Estimation using original 1600 HHs

### VI.1 Schooling

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	17	0	0	
1010	0	0	0	0	0	1	0	0	0	0	0	2	0	0	
1011	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
1100	0	0	0	0	0	1	0	0	0	0	5	2	0	0	
1110	0	0	0	0	1	0	0	0	0	3	0	0	0	0	
1111	27	5	35	20	4	44	2	2	158	15	10	167	12	2	
<NA>	13	2	13	5	1	9	0	0	15	5	1	66	1	0	
SchPattern															
ObPattern	100n	1011	101n	10nn	1100	1101	110n	1110	1111	111n	11n1	11nn	1nnn	nnnn	
0111	0	0	0	1	0	0	0	0	0	12	0	0	5	12	
1000	0	0	0	0	0	0	0	0	0	0	0	0	30	64	
1010	0	0	0	0	0	0	0	0	0	0	0	0	3	2	
1011	0	0	0	0	0	0	0	0	0	0	0	1	0	0	
1100	0	0	0	0	0	0	0	0	0	0	0	12	3	14	
1110	0	0	1	0	0	0	0	0	0	8	0	4	0	59	

1111	8	9	4	15	10	1	16	4	725	75	1	38	131	513
<NA>	3	0	0	2	1	0	1	0	56	36	0	8	31	0

Enrollment pattern in augmented panel.

SchPattern														
SchObPattern	000	0000	0001	001	0010	0011	010	0100	0101	011	0110	0111	0n00	0n01
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1234	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0
134	0	0	0	0	0	0	0	0	0	0	0	0	32	2
1345	0	234	10	0	5	33	0	9	2	0	4	173	0	0
135	4	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	6	0	0	1	0	0	1	0	0	2	0	0	0	0
SchPattern														
SchObPattern	0n0n	0n10	0n11	0n1n	0nn0	0nnn	100	1000	1001	1010	1011	110	1100	
1	0	0	0	0	0	101	0	0	0	0	0	0	0	0
1234	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	20	0	0	9	0	0	0	0	0	0	0	0	0	0
134	0	2	10	0	0	0	0	0	0	0	0	0	0	0
1345	0	0	0	0	0	0	0	74	7	2	25	0	51	
135	0	0	0	0	0	0	2	0	0	0	0	3	0	
14	0	0	0	0	1	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	3	0	0	0	0	0	0	0
SchPattern														
SchObPattern	1101	111	1110	1111	1n00	1n01	1n0n	1n10	1n11	1n1n	1nn0	1nn1	1nnn	
1	0	0	0	0	0	0	0	0	0	0	0	0	129	
1234	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	19	0	0	19	0	0	0	0
134	0	0	0	0	9	4	0	14	49	0	0	0	0	0
1345	7	0	54	782	0	0	0	0	0	0	0	0	0	0
135	0	1	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	3	1	0	0
145	0	12	0	0	0	0	0	0	0	0	0	0	0	0
SchPattern														
SchObPattern	nnnn													
1	0													
1234	664													
13	0													
134	0													
1345	0													
135	0													
14	0													
145	0													

Drop any string with nnn in SchPattern as it does not form a panel.

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

	traditional	large	large	grace	cow	<NA>	traditional	large	large	grace	cow
1	460	479		505	487	664	300	396		369	403
2	300	396		369	403	822	300	396		369	403
3	266	356		340	351	872	266	356		340	351
4	204	306		282	277	949	204	306		282	277

Augmented panel.

	traditional	large	large	grace	cow	<NA>	traditional	large	large	grace	cow	<NA>
1	460	479		505	487	664	338	466		433	464	0
2	0	0		0	0	1600	0	0		0	0	15
3	336	460		422	453	779	336	460		422	453	15
4	325	448		417	434	787	325	448		417	434	0

5	278	439	401	389	0	278	439	401	389	0
---	-----	-----	-----	-----	---	-----	-----	-----	-----	---

```
Dropped 1520 obs due to NA.
Dropped 1520 obs due to NA.
Dropped 1796 obs due to NA.
Dropped 1796 obs due to NA.
Dropped 320 obs due to T<2.
Dropped 1037 obs due to NA.
Dropped 64 obs due to T<2.
Dropped 1563 obs due to NA.
```

If using `s1x`, retain only the complete portion of panel. `sch1` has 9088 rows. Drop 3770 observations in `sch1` with `nnn` in `SchPattern`. In augmented schooling panel, `sch2` has 10563 rows. Drop 4030 observations in `sch2` with `nnn` in `SchPattern`.

```
Warning in `[.data.table`(s1x, , `:=`(Fromxid, NULL)): Adding new column 'Fromxid' then as
```

```
Warning in `[.data.table`(s2x, , `:=`(Fromxid, NULL)): Adding new column 'Fromxid' then as
```

With OLS, 134, 187, 975 individuals are repeatedly observed for 2, 3, 4 times, respectively. With FD, `s1x` is reduced to 3209 rows after first-differencing with 121, 176, 907 individuals with repeatedly observed for 2, 3, 4 times, respectively. Individuals with NAs in `Enrolled`. 0, 0 obs for `s1x` and `s2x`. Check missingness in schooling level information.

```
1
4729
```

Check missingness in arm information.

```
1
4729
```

Drop 0 obs without school level information.

An example of dummy interactions: `dummyLargeSize.dummyPrimary.Time.2`, `dummySmallSize.dummyPrimary.Time.2`, `dummyLargeSize.dummyJunior.Time.2`, `dummySmallSize.dummyJunior.Time.2`, `dummyLargeSize.dummyHigh.Time.2`, `dummySmallSize.dummyHigh.Time.2`, `dummyLargeSize.dummyPrimary.Time.3`, `dummySmallSize.dummyPrimary.Time.3`, `dummyLargeSize.dummyJunior.Time.3`, `dummySmallSize.dummyJunior.Time.3`, `dummyLargeSize.dummyHigh.Time.3`, `dummySmallSize.dummyHigh.Time.3`, `dummyLargeSize.dummyPrimary.Time.4`, `dummySmallSize.dummyPrimary.Time.4`, `dummyLargeSize.dummyJunior.Time.4`, `dummySmallSize.dummyJunior.Time.4`, `dummyLargeSize.dummyHigh.Time.4`, `dummySmallSize.dummyHigh.Time.4`. Obs for `s1x`.

```
2      3      4
1204 1087  918
```

Obs for `s1x` and admin repayment data.

```
2      3      4
1204 1087  918
```

```
3      4
1346 1314
```

Obs for survey `s2x`.

```
3      4
1346 1314
```

Obs for survey s2x and admin repayment data.

3	4
1346	1314

```
arsuffixes ← c("", "g", "p", "s")
```

```
source(paste0(pathprogram, "SchoolingCovariateSelection.R"))
```

TABLE 56: FD ESTIMATION OF SCHOOL ENROLLMENT

		complete panel				all panel		
covariates		(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Primary	0.03 (0.03)	0.04 (0.05)	0.06 (0.06)	0.06 (0.06)	0.09** (0.04)	0.13* (0.07)	0.13* (0.07)
	Junior	-0.08** (0.03)	-0.07** (0.03)	-0.05 (0.04)	-0.05 (0.04)	-0.06 (0.03)	0.04 (0.06)	0.04 (0.06)
	High	-0.09*** (0.03)	-0.10*** (0.04)	-0.09* (0.05)	-0.09* (0.05)	-0.11*** (0.04)	-0.04 (0.07)	-0.04 (0.07)
	Large	-0.04* (0.02)	-0.04 (0.03)	-0.04 (0.03)	-0.04 (0.03)	-0.04 (0.03)	-0.04 (0.03)	-0.04 (0.03)
LargeGrace		-0.04* (0.02)	-0.04 (0.03)	-0.04 (0.03)	-0.04 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)
Cow		-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)
Large × Junior			0.00 (0.04)	0.01 (0.04)	0.01 (0.04)		-0.08 (0.05)	-0.08 (0.05)
LargeGrace × Junior			-0.01 (0.04)	-0.01 (0.04)	-0.01 (0.04)		-0.06 (0.05)	-0.06 (0.05)
Cow × Junior			-0.01 (0.04)	-0.01 (0.04)	-0.01 (0.04)		-0.06 (0.05)	-0.06 (0.05)
Large × High			0.02 (0.05)	0.02 (0.05)	0.02 (0.05)		-0.03 (0.05)	-0.03 (0.05)
LargeGrace × High			0.04 (0.04)	0.04 (0.05)	0.04 (0.05)		0.01 (0.05)	0.01 (0.05)
Cow × High			0.02 (0.04)	0.02 (0.04)	0.02 (0.04)		-0.06 (0.05)	-0.06 (0.05)
Female			-0.01 (0.02)	0.00 (0.02)	0.00 (0.02)		0.04* (0.02)	0.04* (0.02)
Primary × Female			0.01 (0.07)	0.00 (0.07)	0.00 (0.07)		-0.09 (0.05)	-0.09 (0.05)
Junior × Female			-0.03 (0.06)	-0.03 (0.06)	-0.03 (0.06)		-0.16** (0.06)	-0.16** (0.06)
Large × Female			0.01 (0.03)	0.01 (0.03)	0.01 (0.03)		-0.03 (0.04)	-0.03 (0.04)
LargeGrace × Female			0.01 (0.02)	0.01 (0.02)	0.01 (0.02)		-0.01 (0.03)	-0.01 (0.03)
Cow × Female			0.03 (0.02)	0.03 (0.02)	0.03 (0.02)		-0.05 (0.03)	-0.05 (0.03)
Large × Junior × Female			0.02 (0.06)	0.01 (0.05)	0.01 (0.05)		0.00 (0.08)	0.00 (0.08)
LargeGrace × Junior × Female			0.09* (0.05)	0.10* (0.05)	0.10* (0.05)		0.18*** (0.07)	0.18*** (0.07)
Cow × Junior × Female			0.10 (0.06)	0.10 (0.06)	0.10 (0.06)		0.16** (0.08)	0.16** (0.08)
Large × High × Female			0.06 (0.08)	0.06 (0.08)	0.06 (0.08)		-0.05 (0.09)	-0.05 (0.09)
LargeGrace × High × Female			0.08 (0.08)	0.09 (0.08)	0.09 (0.08)		-0.02 (0.07)	-0.02 (0.07)
Cow × High × Female			0.08 (0.08)	0.08 (0.08)	0.08 (0.08)		-0.14 (0.10)	-0.14 (0.10)
FloodInRd1				-0.01 (0.01)	-0.01 (0.01)		-0.00 (0.01)	-0.00 (0.01)
Head literate				-0.01 (0.02)	-0.01 (0.02)		-0.01 (0.03)	-0.01 (0.03)
Head age				-0.00 (0.00)	-0.00 (0.00)		-0.00* (0.00)	-0.00* (0.00)
EldestSon				0.01 (0.01)	0.01 (0.01)		0.00 (0.02)	0.00 (0.02)
EldestDaughter				-0.02 (0.01)	-0.02 (0.01)		-0.01 (0.02)	-0.01 (0.02)
AgeComputed		0.06*** (0.01)	0.06*** (0.01)	0.06*** (0.01)	0.06*** (0.01)	0.03 (0.02)	0.03 (0.02)	0.03 (0.02)
ChildAgeOrderAtRd1		-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)
T = 2		128	128	127	127	92	92	92
T = 3		180	180	175	175	1284	1276	1276
T = 4		907	907	906	906	0	0	0
R <sup>2</sup>		0.068	0.066	0.065	0.065	0.054	0.051	0.051
N		3209	3209	3195	3195	2660	2644	2644

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal.

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

TABLE 57: FD ESTIMATION OF NET SCHOOL ENROLLMENT, ULTRA POOR VS. MODERATELY POOR

	complete panel				all panel		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Primary	0.01 (0.02)	0.01 (0.03)	0.04 (0.04)	0.04 (0.04)	0.07** (0.03)	0.15** (0.06)	0.15** (0.06)
Junior	-0.10*** (0.02)	-0.10*** (0.02)	-0.07* (0.04)	-0.07* (0.04)	-0.07** (0.03)	0.01 (0.06)	0.01 (0.06)
High	-0.11*** (0.03)	-0.10*** (0.03)	-0.07 (0.05)	-0.07 (0.05)	-0.12*** (0.04)	-0.03 (0.06)	-0.03 (0.06)
UltraPoor	-0.01 (0.01)	-0.01 (0.01)	-0.02 (0.01)	-0.02 (0.01)	-0.02 (0.01)	-0.02 (0.02)	-0.02 (0.02)
UltraPoor × Junior	-0.01 (0.02)	-0.00 (0.02)	-0.01 (0.02)	-0.01 (0.02)	-0.00 (0.03)	-0.00 (0.03)	-0.00 (0.03)
UltraPoor × High	-0.01 (0.03)	-0.01 (0.03)	-0.01 (0.03)	-0.01 (0.03)	-0.02 (0.03)	-0.01 (0.04)	-0.01 (0.04)
Female		-0.01 (0.02)	-0.00 (0.02)	-0.00 (0.02)		-0.02 (0.03)	-0.02 (0.03)
Junior × Female		0.01 (0.03)	0.01 (0.03)	0.01 (0.03)		-0.01 (0.06)	-0.01 (0.06)
High × Female		0.11** (0.05)	0.12** (0.05)	0.12** (0.05)		0.00 (0.07)	0.00 (0.07)
UltraPoor × Female		0.03 (0.02)	0.03 (0.02)	0.03 (0.02)		0.05 (0.03)	0.05 (0.03)
UltraPoor × Junior × Female		0.01 (0.05)	0.02 (0.05)	0.02 (0.05)		0.06 (0.08)	0.06 (0.08)
UltraPoor × High × Female		-0.08 (0.07)	-0.08 (0.07)	-0.08 (0.07)		0.04 (0.10)	0.04 (0.10)
FloodlnRd1			-0.01 (0.01)	-0.01 (0.01)		-0.00 (0.01)	-0.00 (0.01)
Head literate			-0.01 (0.02)	-0.01 (0.02)		-0.01 (0.03)	-0.01 (0.03)
Head age			-0.00 (0.00)	-0.00 (0.00)		-0.00 (0.00)	-0.00 (0.00)
EldestSon			0.01 (0.01)	0.01 (0.01)		0.00 (0.02)	0.00 (0.02)
EldestDaughter			-0.02 (0.01)	-0.02 (0.01)		-0.01 (0.02)	-0.01 (0.02)
AgeComuted	0.06*** (0.01)	0.06*** (0.01)	0.06*** (0.01)	0.06*** (0.01)	0.03 (0.02)	0.03 (0.02)	0.03 (0.02)
ChildAgeOrderAtRd1	-0.03 (0.02)	-0.03 (0.02)	-0.04 (0.02)	-0.04 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)
$T = 2$	128	128	127	127	92	92	92
$T = 3$	180	180	175	175	1284	1276	1276
$T = 4$	907	907	906	906	0	0	0
$\bar{R}^2$	0.066	0.067	0.067	0.067	0.054	0.053	0.053
$N$	3209	3209	3195	3195	2660	2644	2644

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal.

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

TABLE 58: FD ESTIMATION OF SCHOOL ENROLLMENT, WITH VS. WITHOUT A GRACE PERIOD

	complete panel				all panel		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Primary	0.00 (0.03)	0.00 (0.03)	0.03 (0.04)	0.03 (0.04)	0.07* (0.04)	0.13** (0.06)	0.13** (0.06)
Junior	-0.10*** (0.03)	-0.10*** (0.03)	-0.08** (0.04)	-0.08** (0.04)	-0.08*** (0.03)	-0.01 (0.06)	-0.01 (0.06)
High	-0.13*** (0.03)	-0.13*** (0.03)	-0.11** (0.04)	-0.11** (0.04)	-0.15*** (0.04)	-0.06 (0.07)	-0.06 (0.07)
WithGrace	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.00 (0.02)	-0.01 (0.02)	-0.01 (0.02)
WithGrace × Junior	-0.01 (0.02)	-0.01 (0.02)	-0.02 (0.02)	-0.02 (0.02)	-0.00 (0.03)	-0.01 (0.04)	-0.01 (0.04)
WithGrace × High	0.02 (0.02)	0.02 (0.03)	0.02 (0.03)	0.02 (0.03)	0.02 (0.04)	0.00 (0.04)	0.00 (0.04)
Female		0.00 (0.02)	0.01 (0.02)	0.01 (0.02)		0.02 (0.02)	0.02 (0.02)
Junior × Female		-0.02 (0.03)	-0.03 (0.03)	-0.03 (0.03)		-0.06 (0.04)	-0.06 (0.04)
High × Female		0.03 (0.04)	0.04 (0.04)	0.04 (0.04)		0.05 (0.05)	0.05 (0.05)
WithGrace × Female		0.01 (0.02)	0.01 (0.02)	0.01 (0.02)		-0.00 (0.03)	-0.00 (0.03)
WithGrace × Junior × Female		0.08** (0.04)	0.09** (0.04)	0.09** (0.04)		0.16*** (0.05)	0.16*** (0.05)
WithGrace × High × Female		0.04 (0.05)	0.05 (0.05)	0.05 (0.05)		-0.03 (0.07)	-0.03 (0.07)
FloodlnRd1			-0.01 (0.01)	-0.01 (0.01)		-0.00 (0.01)	-0.00 (0.01)
Head literate			-0.01 (0.02)	-0.01 (0.02)		-0.01 (0.03)	-0.01 (0.03)
Head age			-0.00 (0.00)	-0.00 (0.00)		-0.00* (0.00)	-0.00* (0.00)
EldestSon			0.01 (0.01)	0.01 (0.01)		0.00 (0.02)	0.00 (0.02)
EldestDaughter			-0.02 (0.01)	-0.02 (0.01)		-0.01 (0.02)	-0.01 (0.02)
AgeComuted	0.06*** (0.01)	0.06*** (0.01)	0.06*** (0.01)	0.06*** (0.01)	0.03 (0.02)	0.03 (0.02)	0.03 (0.02)
ChildAgeOrderAtRd1	-0.03 (0.02)	-0.03 (0.02)	-0.04 (0.02)	-0.04 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)
$T = 2$	128	128	127	127	92	92	92
$T = 3$	180	180	175	175	1284	1276	1276
$T = 4$	907	907	906	906	0	0	0
$\bar{R}^2$	0.066	0.067	0.067	0.067	0.053	0.053	0.053
$N$	3209	3209	3195	3195	2660	2644	2644

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

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



TABLE 59: FD ESTIMATION OF SCHOOL ENROLLMENT, SMALL SIZE VS. LARGE SIZE

	complete panel				all panel		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Primary	0.04 (0.05)	0.04 (0.05)	0.06 (0.06)	0.06 (0.06)	0.08* (0.04)	0.13* (0.07)	0.13* (0.07)
Junior	-0.07** (0.03)	-0.07** (0.03)	-0.05 (0.04)	-0.05 (0.04)	-0.02 (0.04)	0.04 (0.06)	0.04 (0.06)
High	-0.11*** (0.04)	-0.10*** (0.04)	-0.09* (0.05)	-0.09* (0.05)	-0.13*** (0.04)	-0.04 (0.07)	-0.04 (0.07)
LargeSize	-0.04 (0.03)	-0.04 (0.03)	-0.04 (0.03)	-0.04 (0.03)	-0.03 (0.03)	-0.03 (0.03)	-0.03 (0.03)
LargeSize × Junior	-0.00 (0.04)	-0.00 (0.04)	-0.00 (0.04)	-0.00 (0.04)	-0.06 (0.04)	-0.06 (0.04)	-0.06 (0.04)
LargeSize × High	0.02 (0.04)	0.03 (0.04)	0.03 (0.04)	0.03 (0.04)	0.01 (0.05)	-0.03 (0.05)	-0.03 (0.05)
Female		-0.01 (0.02)	0.00 (0.02)	0.00 (0.02)		0.04* (0.02)	0.04* (0.02)
Junior × Female		-0.04 (0.04)	-0.03 (0.04)	-0.03 (0.04)		-0.07 (0.05)	-0.07 (0.05)
High × Female		-0.01 (0.07)	-0.00 (0.07)	-0.00 (0.07)		0.09 (0.05)	0.09 (0.05)
LargeSize × Female		0.02 (0.02)	0.02 (0.02)	0.02 (0.02)		-0.03 (0.02)	-0.03 (0.02)
LargeSize × Junior × Female		0.07 (0.05)	0.07 (0.05)	0.07 (0.05)		0.12* (0.06)	0.12* (0.06)
LargeSize × High × Female		0.08 (0.07)	0.08 (0.07)	0.08 (0.07)		-0.07 (0.07)	-0.07 (0.07)
FloodlnRd1			-0.01 (0.01)	-0.01 (0.01)		-0.00 (0.01)	-0.00 (0.01)
Head literate			-0.01 (0.02)	-0.01 (0.02)		-0.01 (0.03)	-0.01 (0.03)
Head age			-0.00 (0.00)	-0.00 (0.00)		-0.00 (0.00)	-0.00 (0.00)
EldestSon			0.01 (0.01)	0.01 (0.01)		0.00 (0.02)	0.00 (0.02)
EldestDaughter			-0.01 (0.01)	-0.01 (0.01)		-0.00 (0.02)	-0.00 (0.02)
AgeComuted	0.06*** (0.01)	0.06*** (0.01)	0.06*** (0.01)	0.06*** (0.01)	0.03 (0.02)	0.03 (0.02)	0.03 (0.02)
ChildAgeOrderAtRd1	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)
$T = 2$	128	128	127	127	92	92	92
$T = 3$	180	180	175	175	1284	1276	1276
$T = 4$	907	907	906	906	0	0	0
$\bar{R}^2$	0.068	0.068	0.068	0.068	0.054	0.053	0.053
$N$	3209	3209	3195	3195	2660	2644	2644

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

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

TABLE 60: FD ESTIMATION OF SCHOOL ENROLLMENT, ROUND 1 VS. ROUND 4 DIFFERENCES

covariates	complete panel				all panel		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Primary	0.50*** (0.16)	0.68*** (0.14)	0.69*** (0.14)	0.69*** (0.14)	0.29*** (0.08)	0.25*** (0.09)	0.25*** (0.09)
Junior	0.18*** (0.06)	0.28*** (0.07)	0.29*** (0.07)	0.29*** (0.07)	0.08 (0.06)	0.04 (0.06)	0.04 (0.06)
High	0.10* (0.06)	0.21*** (0.07)	0.21*** (0.07)	0.21*** (0.07)	-0.14** (0.06)	-0.15** (0.06)	-0.15** (0.06)
Large	-0.11 (0.11)	-0.15 (0.10)	-0.15 (0.10)	-0.15 (0.10)	-0.09 (0.06)	-0.09 (0.06)	-0.09 (0.06)
LargeGrace	-0.10 (0.11)	-0.14 (0.10)	-0.14 (0.10)	-0.14 (0.10)	-0.08 (0.06)	-0.08 (0.06)	-0.08 (0.06)
Cow	-0.07 (0.11)	-0.12 (0.10)	-0.12 (0.10)	-0.12 (0.10)	-0.07 (0.06)	-0.08 (0.06)	-0.08 (0.06)
Large × Junior	-0.03 (0.17)	0.05 (0.16)	0.05 (0.16)	0.05 (0.16)	-0.15 (0.12)	-0.16 (0.12)	-0.16 (0.12)
LargeGrace × Junior	-0.03 (0.16)	0.03 (0.15)	0.03 (0.15)	0.03 (0.15)	-0.11 (0.11)	-0.13 (0.11)	-0.13 (0.11)
Cow × Junior	-0.09 (0.16)	-0.02 (0.14)	-0.02 (0.14)	-0.02 (0.14)	-0.10 (0.11)	-0.11 (0.11)	-0.11 (0.11)
Large × High	-0.02 (0.17)	0.05 (0.16)	0.06 (0.16)	0.06 (0.16)	-0.04 (0.11)	-0.06 (0.11)	-0.06 (0.11)
LargeGrace × High	-0.04 (0.16)	0.02 (0.16)	0.03 (0.16)	0.03 (0.16)	0.06 (0.10)	0.03 (0.10)	0.03 (0.10)
Cow × High	-0.04 (0.16)	0.04 (0.14)	0.05 (0.14)	0.05 (0.14)	-0.01 (0.11)	-0.05 (0.10)	-0.05 (0.10)
Female		-0.23*** (0.08)	-0.22** (0.08)	-0.22** (0.08)		0.10** (0.05)	0.10** (0.05)
Junior × Female		0.57*** (0.19)	0.57*** (0.19)	0.57*** (0.19)		0.05 (0.15)	0.05 (0.15)
High × Female		0.38** (0.16)	0.38** (0.16)	0.38** (0.16)		0.14 (0.10)	0.14 (0.10)
Large × Female		0.22** (0.11)	0.22* (0.11)	0.22* (0.11)		-0.08 (0.08)	-0.08 (0.08)
LargeGrace × Female		0.10 (0.10)	0.10 (0.10)	0.10 (0.10)		-0.06 (0.05)	-0.06 (0.05)
Cow × Female		0.26** (0.10)	0.26** (0.10)	0.26** (0.10)		-0.08 (0.06)	-0.08 (0.06)
Large × Junior × Female		-0.50** (0.22)	-0.50** (0.22)	-0.50** (0.22)		-0.02 (0.17)	-0.02 (0.17)
LargeGrace × Junior × Female		-0.30 (0.22)	-0.29 (0.22)	-0.29 (0.22)		0.17 (0.17)	0.17 (0.17)
Cow × Junior × Female		-0.50** (0.23)	-0.49** (0.23)	-0.49** (0.23)		0.05 (0.18)	0.05 (0.18)
Large × High × Female		-0.32 (0.20)	-0.31 (0.20)	-0.31 (0.20)		-0.03 (0.16)	-0.03 (0.16)
LargeGrace × High × Female		-0.03 (0.22)	-0.02 (0.22)	-0.02 (0.22)		-0.02 (0.14)	-0.02 (0.14)
Cow × High × Female		-0.23 (0.25)	-0.22 (0.25)	-0.22 (0.25)		-0.22 (0.17)	-0.22 (0.17)
FloodInRd1			-0.01 (0.03)	-0.01 (0.03)		-0.01 (0.03)	-0.01 (0.03)
EldestSon			0.00 (0.04)	0.00 (0.04)		0.04 (0.04)	0.04 (0.04)
EldestDaughter			-0.03 (0.03)	-0.03 (0.03)		-0.01 (0.03)	-0.01 (0.03)
ChildAgeOrderAtRd1	-0.01 (0.04)	-0.01 (0.04)	-0.01 (0.04)	-0.01 (0.04)	0.04 (0.03)	0.05 (0.03)	0.05 (0.03)
$\bar{R}^2$	0.252	0.259	0.257	0.257	0.142	0.138	0.138
N	915	915	915	915	1321	1321	1321

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

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

TABLE 61: FD ESTIMATION OF SCHOOL ENROLLMENT, ROUND 1 VS. ROUND 4 DIFFERENCES, GRACE PERIOD

	complete panel				all panel		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Primary	0.43*** (0.08)	0.45*** (0.09)	0.45*** (0.08)	0.45*** (0.08)	0.26*** (0.04)	0.24*** (0.06)	0.24*** (0.06)
Junior	0.10*** (0.03)	0.12*** (0.04)	0.13*** (0.04)	0.13*** (0.04)	-0.04 (0.04)	-0.06 (0.04)	-0.06 (0.04)
High	0.02 (0.03)	0.04 (0.04)	0.05 (0.04)	0.05 (0.04)	-0.20*** (0.04)	-0.20*** (0.04)	-0.20*** (0.04)
WithGrace	-0.01 (0.06)	-0.01 (0.06)	-0.01 (0.06)	-0.01 (0.06)	-0.01 (0.04)	-0.02 (0.04)	-0.02 (0.04)
WithGrace × Junior	-0.06 (0.09)	-0.07 (0.09)	-0.07 (0.09)	-0.07 (0.09)	-0.02 (0.07)	-0.03 (0.08)	-0.03 (0.08)
WithGrace × High	-0.03 (0.10)	-0.04 (0.10)	-0.04 (0.10)	-0.04 (0.10)	0.05 (0.07)	0.04 (0.07)	0.04 (0.07)
Female		-0.04 (0.06)	-0.03 (0.06)	-0.03 (0.06)		0.05 (0.05)	0.05 (0.05)
Junior × Female		0.18* (0.11)	0.18* (0.11)	0.18* (0.11)		0.04 (0.08)	0.04 (0.08)
High × Female		0.12 (0.09)	0.12 (0.09)	0.12 (0.09)		0.12 (0.10)	0.12 (0.10)
WithGrace × Female		0.00 (0.07)	0.00 (0.07)	0.00 (0.07)		-0.01 (0.06)	-0.01 (0.06)
WithGrace × Junior × Female		-0.02 (0.14)	-0.01 (0.14)	-0.01 (0.14)		0.12 (0.10)	0.12 (0.10)
WithGrace × High × Female		0.12 (0.16)	0.13 (0.15)	0.13 (0.15)		-0.08 (0.13)	-0.08 (0.13)
FloodInRd1			-0.01 (0.03)	-0.01 (0.03)		-0.01 (0.03)	-0.01 (0.03)
EldestSon			0.00 (0.04)	0.00 (0.04)		0.04 (0.03)	0.04 (0.03)
EldestDaughter			-0.03 (0.03)	-0.03 (0.03)		-0.01 (0.03)	-0.01 (0.03)
ChildAgeOrderAtRd1	-0.01 (0.04)	-0.00 (0.04)	-0.00 (0.04)	-0.00 (0.04)	0.04 (0.03)	0.05 (0.03)	0.05 (0.03)
$\bar{R}^2$	0.251	0.254	0.252	0.252	0.139	0.137	0.137
N	915	915	915	915	1321	1321	1321

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

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

TABLE 62: FD ESTIMATION OF SCHOOL ENROLLMENT, PERIOD INTERACTIONS

covariates	complete panel				all panel		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Primary	0.03 (0.03)	0.06 (0.04)	0.09 (0.10)	0.17 (0.13)	0.09** (0.04)	0.36*** (0.06)	0.29*** (0.08)
Junior	-0.08** (0.03)	-0.05 (0.04)	0.01 (0.10)	0.10 (0.12)	-0.06 (0.03)	0.23*** (0.06)	0.20** (0.09)
High	-0.09*** (0.03)	-0.06 (0.05)	-0.08 (0.08)	-0.01 (0.10)	-0.11*** (0.04)	0.21** (0.09)	0.09 (0.22)
Large	-0.04* (0.02)	-0.04* (0.02)	-0.03 (0.05)	-0.02 (0.05)	-0.04 (0.03)	-0.16 (0.17)	-0.13 (0.20)
LargeGrace	-0.04* (0.02)	-0.04* (0.02)	-0.04 (0.06)	-0.04 (0.06)	-0.03 (0.03)	-0.18 (0.15)	-0.19 (0.13)
Cow	-0.03 (0.03)	-0.03 (0.03)	-0.01 (0.06)	-0.01 (0.06)	-0.03 (0.03)	-0.02 (0.03)	-0.05 (0.04)
Large × Junior			-0.04 (0.06)	-0.04 (0.06)			-0.08 (0.15)
LargeGrace × Junior			-0.06 (0.05)	-0.07 (0.06)			-0.11 (0.15)
Cow × Junior			-0.03 (0.05)	-0.04 (0.06)			0.06 (0.16)
Large × High			-0.05 (0.06)	-0.01 (0.06)			0.00 (0.27)
LargeGrace × High			0.01 (0.05)	0.03 (0.06)			-0.04 (0.29)
Cow × High			0.03 (0.06)	0.08 (0.06)			0.35 (0.33)
Female		-0.00 (0.02)		-0.10 (0.09)		-0.23*** (0.05)	-0.08 (0.09)
Junior × Female		0.03 (0.02)		-0.10* (0.05)		0.01 (0.03)	-0.12* (0.07)
High × Female		0.07*** (0.02)		-0.05 (0.07)		0.01 (0.03)	0.04 (0.07)
Large × Female		0.02 (0.02)		0.09 (0.10)		-0.25 (0.25)	-0.41 (0.27)
LargeGrace × Female		0.02 (0.02)		0.12 (0.09)		-0.08 (0.19)	-0.24 (0.20)
Cow × Female		0.04* (0.02)		0.13 (0.09)		-0.03 (0.03)	-0.06* (0.03)
Large × Junior × Female				0.03 (0.08)			0.07 (0.11)
LargeGrace × Junior × Female				0.19** (0.08)			0.16 (0.12)
Cow × Junior × Female				0.17** (0.09)			0.07 (0.11)
Large × High × Female				0.10 (0.09)			0.19 (0.16)
LargeGrace × High × Female				0.19* (0.10)			-0.03 (0.19)
Cow × High × Female				0.20** (0.10)			-0.01 (0.25)

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

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

TABLE 16: FD ESTIMATION OF SCHOOL ENROLLMENT, PERIOD INTERACTIONS, CONTINUED

	complete panel				all panel		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
rd 2 - 3			-0.01 (0.07)	-0.01 (0.07)		0.09* (0.05)	0.11 (0.07)
Junior × rd 2 - 3			0.01 (0.06)	0.02 (0.06)		-0.06 (0.08)	0.02 (0.25)
High × rd 2 - 3			0.06 (0.08)	0.10 (0.08)		-0.15 (0.11)	-0.03 (0.24)
Large × rd 2 - 3			-0.04 (0.06)	-0.04 (0.06)		0.14 (0.17)	0.10 (0.20)
LargeGrace × rd 2 - 3			-0.03 (0.07)	-0.03 (0.07)		0.16 (0.17)	0.18 (0.15)
Cow × rd 2 - 3			-0.07 (0.06)	-0.08 (0.06)		0.01 (0.04)	-0.03 (0.05)
Large × Junior × rd 2 - 3			0.08 (0.08)	0.07 (0.08)			-0.07 (0.25)
LargeGrace × Junior × rd 2 - 3			0.10 (0.07)	0.08 (0.08)			0.04 (0.26)
Cow × Junior × rd 2 - 3			0.02 (0.07)	0.02 (0.08)			-0.25 (0.32)
Large × High × rd 2 - 3			0.08 (0.10)	0.02 (0.10)			-0.02 (0.26)
LargeGrace × High × rd 2 - 3			0.06 (0.10)	0.02 (0.09)			-0.03 (0.28)
Cow × High × rd 2 - 3			-0.03 (0.11)	-0.09 (0.11)			-0.57 (0.37)
Female × rd 2 - 3				0.20 (0.16)		0.16* (0.09)	0.03 (0.13)
Large × Female × rd 2 - 3				-0.18 (0.17)		0.30 (0.24)	0.43 (0.26)
LargeGrace × Female × rd 2 - 3				-0.20 (0.16)		0.12 (0.20)	0.28 (0.23)
Cow × Female × rd 2 - 3				-0.16 (0.16)		0.05 (0.09)	0.04 (0.09)
Large × Junior × Female × rd 2 - 3				0.10 (0.08)			-0.11 (0.15)
LargeGrace × Junior × Female × rd 2 - 3				-0.04 (0.09)			0.15 (0.14)
Cow × Junior × Female × rd 2 - 3				-0.01 (0.09)			0.16 (0.18)
Large × High × Female × rd 2 - 3				-0.07 (0.10)			-0.21 (0.20)
LargeGrace × High × Female × rd 2 - 3				-0.06 (0.08)			0.06 (0.30)
Cow × High × Female × rd 2 - 3				-0.13 (0.14)			-0.39 (0.35)
rd 3 - 4			-0.14*** (0.05)	-0.15*** (0.05)			
Junior × rd 3 - 4			0.09 (0.08)	0.11 (0.09)		-0.02 (0.11)	0.03 (0.37)
High × rd 3 - 4			0.23** (0.10)	0.29** (0.11)		-0.10 (0.18)	0.05 (0.32)
Large × rd 3 - 4			-0.03 (0.11)	-0.02 (0.11)		0.24 (0.33)	0.18 (0.38)
LargeGrace × rd 3 - 4			0.02 (0.12)	0.02 (0.12)		0.31 (0.30)	0.33 (0.27)
Cow × rd 3 - 4			-0.04 (0.12)	-0.04 (0.12)			
Large × Junior × rd 3 - 4			0.12 (0.11)	0.09 (0.12)			-0.01 (0.39)
LargeGrace × Junior × rd 3 - 4			0.11 (0.11)	0.09 (0.11)			0.15 (0.41)
Cow × Junior × rd 3 - 4			0.02 (0.11)	-0.00 (0.12)			-0.35 (0.46)
Large × High × rd 3 - 4			0.15 (0.14)	0.05 (0.15)			-0.04 (0.54)
LargeGrace × High × rd 3 - 4			0.04 (0.12)	-0.04 (0.14)			0.10 (0.58)
Cow × High × rd 3 - 4			-0.15 (0.16)	-0.24 (0.16)			-0.91 (0.70)
Female × rd 3 - 4				0.34 (0.25)		0.53*** (0.09)	0.26 (0.18)
Large × Female × rd 3 - 4				-0.29 (0.27)		0.43 (0.48)	0.71 (0.52)
LargeGrace × Female × rd 3 - 4				-0.39 (0.26)		0.14 (0.37)	0.45 (0.40)
Cow × Female × rd 3 - 4				-0.35 (0.26)			
Large × Junior × Female × rd 3 - 4				0.11 (0.11)			-0.09 (0.22)
LargeGrace × Junior × Female × rd 3 - 4				-0.09 (0.12)			0.14 (0.23)
Cow × Junior × Female × rd 3 - 4				-0.02 (0.12)			0.38 (0.24)
Large × High × Female × rd 3 - 4				-0.02 (0.15)			-0.52* (0.31)
LargeGrace × High × Female × rd 3 - 4				-0.14 (0.15)			0.04 (0.47)
Cow × High × Female × rd 3 - 4				-0.10 (0.18)			-0.35 (0.58)
FloodInRd1		-0.01 (0.01)		-0.01 (0.01)		-0.00 (0.01)	-0.00 (0.01)
Head literate		-0.01 (0.02)		-0.01 (0.02)		-0.01 (0.03)	-0.01 (0.03)
Head age		-0.00 (0.00)		-0.00* (0.00)		-0.00* (0.00)	-0.00 (0.00)
EldestSon		0.01 (0.01)		0.00 (0.01)		-0.00 (0.02)	-0.00 (0.02)
EldestDaughter		-0.01 (0.01)		-0.02 (0.01)		-0.01 (0.02)	-0.01 (0.02)
AgeComputed	0.06*** (0.01)	0.06*** (0.01)	0.05 (0.04)	0.05 (0.04)	0.03 (0.02)	-0.08*** (0.02)	-0.08** (0.03)
ChildAgeOrderAtRd1	-0.03 (0.02)	-0.03 (0.02)	-0.04* (0.02)	-0.04* (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)
T = 2	128	127	128	127	92	1276	1276
T = 3	180	175	180	175	1284	1276	1276
T = 4	907	906	907	906	0	0	0

TABLE 63: FD ESTIMATION OF SCHOOL ENROLLMENT, PERIOD INTERACTIONS, GRACE PERIOD

		complete panel				all panel		
covariates		(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Primary	0.00 (0.03)	0.01 (0.03)	0.08 (0.08)	0.14 (0.10)	0.07* (0.04)	0.06 (0.04)	0.40*** (0.13)
	Junior	-0.10*** (0.03)	-0.10*** (0.03)	-0.03 (0.08)	0.04 (0.09)	-0.08*** (0.03)	-0.09*** (0.03)	0.25** (0.10)
	High	-0.13*** (0.03)	-0.13*** (0.03)	-0.12 (0.08)	-0.05 (0.09)	-0.15*** (0.04)	-0.14*** (0.04)	0.16 (0.10)
	WithGrace	-0.01 (0.01)	-0.01 (0.01)	-0.01 (0.03)	-0.00 (0.03)	-0.00 (0.02)	-0.00 (0.02)	-0.01 (0.20)
	WithGrace × Junior	-0.01 (0.02)	-0.01 (0.02)	-0.02 (0.04)	-0.02 (0.04)	-0.00 (0.03)	-0.00 (0.04)	0.03 (0.09)
	WithGrace × High	0.02 (0.02)	0.02 (0.03)	0.05 (0.04)	0.07 (0.04)	0.02 (0.04)	-0.00 (0.04)	0.18 (0.17)
	Female		0.00 (0.02)		-0.03 (0.04)		0.02 (0.02)	-0.50** (0.25)
	Junior × Female		-0.02 (0.03)		-0.05* (0.03)		-0.06 (0.04)	-0.08* (0.04)
	High × Female		0.03 (0.04)		0.01 (0.03)		0.05 (0.05)	0.03 (0.05)
	WithGrace × Female		0.01 (0.02)		0.06 (0.05)		-0.01 (0.03)	0.25 (0.28)
	WithGrace × Junior × Female		0.08** (0.04)		0.13** (0.06)		0.15*** (0.06)	0.06 (0.08)
	WithGrace × High × Female		0.04 (0.05)		0.12** (0.06)		-0.04 (0.07)	-0.05 (0.17)
	rd 2 - 3			-0.04 (0.05)	-0.04 (0.05)			0.07 (0.09)
	Junior × rd 2 - 3			0.07 (0.04)	0.07* (0.04)			-0.01 (0.09)
	High × rd 2 - 3			0.12** (0.05)	0.14*** (0.05)			0.00 (0.12)
	WithGrace × rd 2 - 3			-0.02 (0.04)	-0.02 (0.04)			-0.03 (0.20)
	WithGrace × Junior × rd 2 - 3			0.00 (0.05)	0.01 (0.05)			-0.08 (0.15)
	WithGrace × High × rd 2 - 3			-0.04 (0.07)	-0.06 (0.07)			-0.30 (0.21)
	Female × rd 2 - 3				0.08 (0.06)			0.47** (0.23)
	WithGrace × Female × rd 2 - 3				-0.06 (0.07)			-0.26 (0.27)
	WithGrace × Junior × Female × rd 2 - 3				-0.03 (0.06)			0.17 (0.13)
	WithGrace × High × Female × rd 2 - 3				-0.08 (0.07)			-0.09 (0.26)
	rd 3 - 4			-0.13*** (0.02)	-0.13*** (0.02)			
	Junior × rd 3 - 4			0.17*** (0.06)	0.17*** (0.06)			0.05 (0.14)
	High × rd 3 - 4			0.33*** (0.08)	0.34*** (0.08)			0.12 (0.22)
	WithGrace × rd 3 - 4			0.01 (0.07)	0.00 (0.07)			-0.02 (0.39)
	WithGrace × Junior × rd 3 - 4			-0.01 (0.08)	-0.01 (0.08)			-0.13 (0.23)
	WithGrace × High × rd 3 - 4			-0.15 (0.10)	-0.18* (0.10)			-0.43 (0.37)
	Female × rd 3 - 4				0.15 (0.10)			1.04** (0.49)
	WithGrace × Female × rd 3 - 4				-0.17 (0.12)			-0.51 (0.55)
	WithGrace × Junior × Female × rd 3 - 4				-0.05 (0.09)			0.29 (0.19)
	WithGrace × High × Female × rd 3 - 4				-0.10 (0.11)			-0.04 (0.42)
	FloodInRd1		-0.01 (0.01)		-0.01 (0.01)		0.00 (0.01)	-0.00 (0.01)
	Head literate				-0.01 (0.02)			-0.01 (0.03)
	Head age				-0.00* (0.00)			-0.00* (0.00)
	EldestSon				0.00 (0.01)			-0.00 (0.02)
	EldestDaughter				-0.02 (0.01)			-0.01 (0.02)
	AgeComputed	0.06*** (0.01)	0.06*** (0.01)	0.05 (0.04)	0.05 (0.04)	0.03 (0.02)	0.03 (0.02)	-0.03 (0.09)
	ChildAgeOrderAtRd1	-0.03 (0.02)	-0.03 (0.02)	-0.04* (0.02)	-0.04** (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)
	T = 2	128	128	128	127	92	92	92
	T = 3	180	180	180	175	1284	1284	1276
	T = 4	907	907	907	906	0	0	0
	R <sup>2</sup>	0.066	0.067	0.083	0.085	0.053	0.053	0.061
	N	3209	3209	3209	3195	2660	2660	2644

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

TABLE 64: FD ESTIMATION OF SCHOOL ENROLLMENT, PERIOD INTERACTIONS, SMALL VS. LARGE SIZED LOANS

		complete panel				all panel		
covariates		(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Primary	0.04 (0.05)	0.04 (0.05)	0.09 (0.10)	0.17 (0.12)	0.08* (0.04)	0.06 (0.05)	0.32*** (0.09)
	Junior	-0.07** (0.03)	-0.07** (0.03)	0.01 (0.10)	0.10 (0.11)	-0.02 (0.04)	-0.03 (0.04)	0.23** (0.10)
	High	-0.11*** (0.04)	-0.10*** (0.04)	-0.08 (0.08)	-0.02 (0.10)	-0.13*** (0.04)	-0.12*** (0.04)	0.12 (0.22)
	LargeSize	-0.04 (0.03)	-0.04 (0.03)	-0.03 (0.05)	-0.02 (0.05)	-0.03 (0.03)	-0.03 (0.03)	-0.04 (0.03)
	LargeSize × Junior	-0.00 (0.04)	-0.00 (0.04)	-0.05 (0.05)	-0.05 (0.05)	-0.06 (0.04)	-0.06 (0.04)	-0.04 (0.14)
	LargeSize × High	0.02 (0.04)	0.03 (0.04)	-0.01 (0.05)	0.03 (0.05)	0.01 (0.05)	-0.02 (0.05)	0.08 (0.27)
	Female		-0.01 (0.02)		-0.09 (0.09)		0.04* (0.02)	-0.27** (0.13)
	Junior × Female		-0.04 (0.04)		-0.10* (0.05)		-0.07 (0.05)	-0.12* (0.07)
	High × Female		-0.01 (0.07)		-0.05 (0.07)		0.09 (0.05)	0.04 (0.07)
	LargeSize × Female		0.02 (0.02)		0.11 (0.09)		-0.03 (0.02)	-0.04 (0.03)
	LargeSize × Junior × Female		0.07 (0.05)		0.13** (0.06)		0.12* (0.06)	0.09 (0.09)
	LargeSize × High × Female		0.08 (0.07)		0.17** (0.08)		-0.07 (0.06)	0.03 (0.15)
	rd 2 - 3			-0.01 (0.07)	-0.01 (0.07)			0.06 (0.08)
	Junior × rd 2 - 3			0.01 (0.06)	0.02 (0.06)			0.02 (0.24)
	High × rd 2 - 3			0.06 (0.08)	0.10 (0.08)			-0.03 (0.24)
	LargeSize × rd 2 - 3			-0.05 (0.06)	-0.05 (0.05)			-0.00 (0.05)
	LargeSize × Junior × rd 2 - 3			0.07 (0.06)	0.05 (0.07)			-0.09 (0.26)
	LargeSize × High × rd 2 - 3			0.04 (0.09)	-0.01 (0.08)			-0.19 (0.27)
	Female × rd 2 - 3				0.20 (0.16)			0.22 (0.15)
	LargeSize × Female × rd 2 - 3				-0.18 (0.16)			0.05 (0.09)
	LargeSize × Junior × Female × rd 2 - 3				0.01 (0.05)			0.08 (0.11)
	LargeSize × High × Female × rd 2 - 3				-0.08 (0.06)			-0.15 (0.20)
	rd 3 - 4			-0.14*** (0.05)	-0.15*** (0.05)			
	Junior × rd 3 - 4			0.09 (0.08)	0.11 (0.09)			0.03 (0.37)
	High × rd 3 - 4			0.23** (0.10)	0.29** (0.11)			0.05 (0.51)
	LargeSize × rd 3 - 4			-0.02 (0.10)	-0.01 (0.10)			
	LargeSize × Junior × rd 3 - 4			0.08 (0.09)	0.06 (0.10)			-0.07 (0.39)
	LargeSize × High × rd 3 - 4			0.02 (0.11)	-0.07 (0.13)			-0.24 (0.56)
	Female × rd 3 - 4				0.34 (0.25)			0.64*** (0.25)
	LargeSize × Female × rd 3 - 4				-0.34 (0.25)			
	LargeSize × Junior × Female × rd 3 - 4				-0.00 (0.07)			0.16 (0.15)
	LargeSize × High × Female × rd 3 - 4				-0.09 (0.09)			-0.22 (0.33)
	FloodInRd1		-0.01 (0.01)		-0.01 (0.01)		-0.00 (0.01)	-0.00 (0.01)
	Head literate				-0.01 (0.02)			-0.01 (0.03)
	Head age				-0.00* (0.00)			-0.00* (0.00)
	EldestSon				0.00 (0.01)			-0.00 (0.02)
	EldestDaughter				-0.02 (0.01)			-0.01 (0.02)
	AgeComputed	0.06*** (0.01)	0.06*** (0.01)	0.05 (0.04)	0.05 (0.04)	0.03 (0.02)	0.03 (0.02)	-0.03 (0.05)
	ChildAgeOrderAtRd1	-0.03 (0.02)	-0.03 (0.02)	-0.04* (0.02)	-0.04* (0.02)	-0.03 (0.02)	-0.03 (0.02)	-0.03 (0.02)
	$\bar{R}^2$	0.068	0.068	0.085	0.086	0.054	0.053	0.062
	N	3209	3209	3209	3195	2660	2660	2644

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . First-differenced regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

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

## VI.2 Repayment and net saving

```
Warning in Ops.factor(X[[FDThese[i]]], X[[paste0("L", FDThese[i])]]): '-' not meaningful for
```

```
Dropped 87 obs due to T<2.  
Dropped 5854 obs due to NA.
```

```
Warning in Ops.factor(X[[FDThese[i]]], X[[paste0("L", FDThese[i])]]): '-' not meaningful for
```

```
Dropped 87 obs due to T<2.  
Dropped 5856 obs due to NA.
```

```
< table of extent 0 x 0 >
```

Repayment started in round 2. So taking a first-difference leaves us with period 2-3 and period 3-4. Drop 0 observations in `ar` that have round 1 data (for unknown reasons). After first-differencing, `ar` has 0 rows with individuals with repeatedly observed for times, respectively. NA individuals observed for 4 times started repayment even before official disbursement date, so its round 1 will be dropped.

Note all binary interaction terms are demeaned and then interacted.

	RArm				
tee	traditional	large	large	grace	cow
1	400	400		400	400
2	280	384		342	366
3	277	386		348	366
4	240	382		343	342

NAs in `CumRepaid`.

	Arm				
tee	traditional	large	large	grace	cow
1	398	400		398	400
2	113	41		0	20
3	110	39		0	19
4	75	39		0	0

Tabulation at rd 1:

	RArm				
Mstatus	traditional	large	large	grace	cow
gErosion	40	0		20	20
gRejection	80	40		20	0
iRejection	54	12		22	72
iReplacement	0	0		0	0
newGroup	0	0		0	0
oldMember	226	348		338	308

```
source(paste0(pathprogram, "RepaymentCovariateSelection.R"))
```



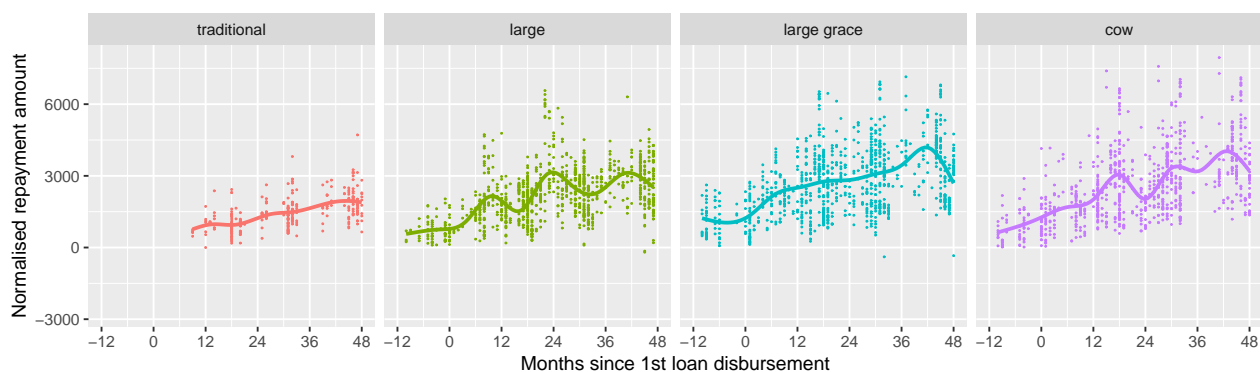


Figure 21: Cumulative weekly net saving

TABLE 65: 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)	234.8*** (48.0)	301.1*** (56.8)	1841.4*** (384.7)	1340.3*** (234.0)	1127.3*** (330.3)	2076.2*** (402.6)	1641.4*** (265.0)	1393.1*** (370.0)
Large	507.6*** (66.6)	532.2*** (76.8)	2235.6*** (405.8)	2005.7*** (275.7)	2164.5*** (271.0)	2743.2*** (428.5)	2537.9*** (306.7)	2674.1*** (308.4)
LargeGrace	240.6*** (55.4)	309.4*** (66.6)	2683.3*** (439.7)	2644.5*** (341.1)	2401.6*** (326.3)	2923.9*** (463.9)	2953.9*** (376.4)	2701.5*** (372.2)
Cow	158.8*** (59.6)	194.2*** (72.0)	2170.6*** (498.9)	2015.0*** (383.8)	1741.0*** (344.0)	2329.3*** (525.7)	2209.2*** (423.7)	1912.3*** (385.2)
rd 3 - 4		-198.6*** (27.1)		1224.3*** (193.4)	1486.9*** (134.3)		1025.7*** (204.7)	1306.0*** (144.8)
Large × rd 3 - 4		-90.1 (81.2)		841.1 (694.9)	1005.0*** (279.9)		751.0 (732.5)	1011.1*** (308.7)
LargeGrace × rd 3 - 4		-250.2*** (85.0)		130.9 (708.0)	992.4*** (335.0)		-119.3 (751.9)	825.4** (377.1)
Cow × rd 3 - 4		-126.9 (89.9)		549.0 (770.4)	1226.7*** (281.9)		422.1 (810.4)	1175.8*** (303.7)
FloodInRd1					-510.7*** (174.3)			-520.5*** (191.9)
Head literate					164.3 (178.3)			214.9 (185.5)
Head age					1.6 (5.2)			2.8 (5.5)
6M renavment					2792.9*** (494.9)			3130.2*** (448.5)
6M net saving					-5503.9*** (1608.3)			-3520.7** (1655.6)
6M other member net saving					968.7 (3154.2)			-238.7 (3336.2)
6M other member Repaid					1790.7*** (449.0)			1585.9*** (437.2)
$T = 2$	42	42	42	42	42	42	42	42
$T = 3$	1165	1165	1165	1165	1155	1165	1165	1155
$\bar{R}^2$	0.115	0.163	0.096	0.151	0.3	0.114	0.15	0.3
$\hat{\rho}$	0.244	0.322	0.014	0.100	0.371	0.060	0.129	0.429
Pr( $\hat{\rho} = 0$ )	0.000	0.000	0.585	0.000	0.000	0.025	0.000	0.000
$N$	2372	2372	2372	2372	2352	2372	2372	2352

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using rd 2 - rd 4 data. First-differenced ( $\Delta x_{t+1} \equiv x_{t+1} - x_t$ ) regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal.

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

TABLE 66: 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)	494.6*** (38.2)	604.2*** (46.8)	3746.5*** (178.6)	3172.2*** (178.6)	2958.2*** (311.5)	4241.1*** (198.8)	3776.4*** (202.1)	3514.4*** (344.0)
UltraPoor	1.3 (23.3)	-3.4 (28.6)	183.8* (103.6)	111.7 (93.6)	136.0 (93.0)	185.1 (115.2)	108.3 (105.4)	138.9 (103.7)
rd 3 - 4		-211.7*** (28.6)		1229.6*** (176.0)	1462.7*** (150.5)		1018.0*** (188.2)	1271.6*** (162.1)
UltraPoor × rd 3 - 4		7.9 (28.6)		313.2** (147.3)	213.0* (108.8)		321.1** (151.0)	209.3* (112.6)
FloodInRd1					-631.6*** (202.6)			-627.2*** (227.1)
Head literate					160.1 (198.2)			215.4 (213.7)
Head age					0.3 (5.7)			1.4 (6.3)
6M repavment					2817.0*** (482.8)			3156.8*** (435.7)
6M net saving					-5872.0*** (1619.3)			-3889.7** (1682.3)
6M other member net saving					-1637.5 (3088.8)			-2517.9 (3352.3)
6M other member Repaid					1346.5* (755.8)			1036.4 (762.7)
$T = 2$	42	42	42	42	42	42	42	42
$T = 3$	1165	1165	1165	1165	1155	1165	1165	1155
$\bar{R}^2$	0	0.042	0.001	0.054	0.2	0	0.035	0.177
$\hat{\rho}$	0.220	0.267	0.152	0.210	0.467	0.197	0.245	0.524
Pr( $\hat{\rho} = 0$ )	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	2372	2372	2372	2372	2352	2372	2372	2352

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using rd 2 - rd 4 data. First-differenced ( $\Delta x_{t+1} \equiv x_{t+1} - x_t$ ) regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal.

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

TABLE 67: FD ESTIMATION OF NET CUMULATIVE SAVING AND REPAYMENT, WITH VS. WITHOUT A GRACE PERIOD

	Cumulative net saving		Cumulative repayment		Cumulative net saving + cumulative repayment			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	577.2*** (54.9)	661.0*** (62.1)	3349.5*** (237.1)	2683.5*** (192.0)	2668.6*** (332.5)	3926.7*** (277.7)	3344.5*** (237.0)	3292.5*** (379.0)
WithGrace	-142.6** (59.7)	-106.7 (67.5)	919.6*** (307.7)	978.6*** (278.4)	616.9** (293.2)	777.0** (348.7)	871.8*** (324.5)	517.9 (343.8)
rd 3 - 4		-203.4*** (27.3)		1264.5*** (179.5)	1474.1*** (144.1)		1061.1*** (190.2)	1286.8*** (157.3)
WithGrace × rd 3 - 4		-128.7** (54.4)		-231.7 (360.2)	396.9 (288.4)		-360.4 (381.3)	266.9 (320.2)
FloodInRd1					-536.5** (212.4)			-548.7** (239.6)
Head literate					164.1 (197.3)			216.2 (214.6)
Head age					0.6 (5.5)			1.6 (6.2)
6M repavment					2804.2*** (489.0)			3146.9*** (441.6)
6M net saving					-5804.6*** (1629.6)			-3837.7** (1689.6)
6M other member net saving					128.1 (3011.4)			-967.7 (3261.2)
6M other member Repaid					1257.4* (674.1)			944.6 (719.6)
$T = 2$	42	42	42	42	42	42	42	42
$T = 3$	1165	1165	1165	1165	1155	1165	1165	1155
$\bar{R}^2$	0.019	0.065	0.028	0.08	0.217	0.018	0.053	0.187
$\hat{\rho}$	0.207	0.298	0.149	0.218	0.464	0.210	0.263	0.531
Pr( $\hat{\rho} = 0$ )	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	2372	2372	2372	2372	2352	2372	2372	2352

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using rd 2 - rd 4 data. First-differenced ( $\Delta x_{t+1} \equiv x_{t+1} - x_t$ ) regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

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

TABLE 68: FD ESTIMATION OF NET CUMULATIVE SAVING AND REPAYMENT, SMALL SIZE VS. LARGE SIZE

	Cumulative net saving		Cumulative repayment		Cumulative net saving + cumulative repayment			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	234.8*** (48.0)	301.7*** (56.8)	1841.4*** (384.6)	1342.0*** (233.9)	1250.2*** (253.6)	2076.2*** (402.4)	1643.6*** (264.9)	1428.4*** (368.6)
rd 3 - 4		-201.0*** (28.1)		1216.8*** (196.5)	1476.2*** (138.7)		1015.9*** (209.1)	1300.4*** (151.2)
LargeSize × rd 3 - 4		-156.6** (75.4)		507.4 (682.6)	1052.7*** (221.3)		350.8 (720.5)	989.7*** (256.7)
FloodInRd1					-557.4*** (189.3)			-512.9** (204.9)
Head literate								176.5 (189.6)
Head age								2.5 (5.5)
SizeLargeSize	302.9*** (56.5)	346.0*** (64.1)	2363.4*** (408.6)	2221.6*** (284.5)	2095.6*** (259.2)	2666.3*** (429.0)	2567.6*** (314.7)	2438.1*** (296.5)
6M repavment					2792.4*** (492.9)			3120.4*** (444.3)
6M net saving					-5635.4*** (1618.4)			-3572.2** (1653.5)
6M other member net saving					1479.1 (2860.2)			683.6 (3039.8)
6M other member Repaid					1676.3*** (446.9)			1398.7*** (443.7)
$T = 2$	42	42	42	42	42	42	42	42
$T = 3$	1165	1165	1165	1165	1162	1165	1165	1155
$\bar{R}^2$	0.042	0.087	0.09	0.144	0.293	0.108	0.142	0.289
$\hat{\rho}$	0.209	0.305	0.016	0.085	0.368	0.074	0.136	0.439
Pr( $\hat{\rho} = 0$ )	0.000	0.000	0.550	0.000	0.000	0.005	0.000	0.000
$N$	2372	2372	2372	2372	2366	2372	2372	2352

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using rd 2 - rd 4 data. First-differenced ( $\Delta x_{t+1} \equiv x_{t+1} - x_t$ ) regressands are regressed on categorical and time-variant covariates. Net saving is taken from administrative data and merged with survey data at Year-Month of survey interviews. Head age and literacy are from baseline data. Intercept terms are omitted in estimating equations. Net saving is saving - withdrawal. All dummy interaction terms are first demeaned and then interacted.

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

**Finding VI.1** TABLE 65 (1) shows net saving increases, (2) shows that initially a larger then a smaller extent in the later rounds. This reduction may reflect the use of saving for repayment. traditional arm has the lowest repayment rates. Ultra poor and moderately poor have similar repayment rates as indicated in TABLE 66. TABLE 67 (2) shows having a grace period increases the repayment amount while reduces net saving in later rounds. (4) and (5) show cumulative repayment is greater for with grace because each installment is larger. These are all by design that they do not repay in rd 1 so saving increases then they tap in these saving for repayment.

### VI.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 2804 obs due to NA.  
Dropped 2804 obs due to NA.  
Dropped 2804 obs due to NA.  
Dropped 2039 obs due to NA.  
Dropped 2039 obs due to NA.  
Dropped 2039 obs due to NA.  
Dropped 2039 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.

```
source ( paste0 ( pathprogram , " AssetCovariateSelection.R " ) )
```

TABLE 69: FD ESTIMATION OF ASSETS

	Household asset amount (Tk)				Productive asset amount (Tk)			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	6633.5*** (940.5)	8132.6*** (1333.8)	9544.7*** (1616.5)	10325.7*** (2477.1)	-216.2*** (58.7)	-59.4 (160.4)	-77.9 (86.9)	-324.0 (212.3)
Large	1022.0 (1538.5)	386.6 (1454.4)	317.4 (1366.9)	2703.5 (2910.7)	129.0 (100.1)	354.2* (193.5)	237.8** (109.1)	-74.7 (347.7)
LargeGrace	1835.7 (1544.1)	1437.4 (1647.4)	987.4 (1629.1)	3371.9 (3028.2)	-62.7 (96.1)	54.9 (159.0)	-7.2 (107.8)	-36.8 (253.1)
Cow	1508.8 (1585.9)	1861.9 (1943.0)	1574.1 (1811.9)	3433.5 (3463.6)	135.1 (91.2)	148.4 (137.9)	165.9* (95.7)	254.5 (194.7)
rd 2 - 3		2530.7 (1940.5)	2533.2 (1950.4)			-265.4 (295.6)		
Large × rd 2 - 3		4774.1 (4892.3)	4820.3 (4899.8)			-823.6 (928.4)		
LargeGrace × rd 2 - 3		4650.6 (5183.8)	4689.1 (5183.9)			-276.5 (653.7)		
Cow × rd 2 - 3		3499.1 (6180.8)	3422.5 (6229.7)			152.6 (507.3)		
rd 3 - 4		-6539.4*** (1680.9)	-6510.9*** (1676.2)	-8994.6*** (2232.8)		-488.7** (227.2)	-356.1** (140.8)	-228.7 (180.4)
Large × rd 3 - 4		2022.6 (2561.2)	2037.1 (2562.8)	-2570.8 (4975.3)		-1479.2** (628.5)	-1067.3*** (384.2)	-656.1 (583.4)
LargeGrace × rd 3 - 4		-242.7 (3642.9)	-269.3 (3645.0)	-4849.0 (4974.5)		-909.3 (608.7)	-773.0** (370.8)	-651.6* (345.0)
Cow × rd 3 - 4		-6742.5 (5364.1)	-6688.8 (5343.6)	-10145.0 (7392.4)		-275.1 (286.9)	-353.5** (150.4)	-432.9 (307.0)
FloodInRd1			-3003.2*** (1069.5)	-2863.5** (1450.0)			-114.7 (70.6)	247.4 (160.5)
Head literate			2259.9 (1974.6)	1365.8 (3283.9)			-122.7** (58.7)	-43.2 (258.5)
$T = 2$	21	21	21	43	21	21	21	43
$T = 3$	47	47	44	1161	47	47	44	1161
$T = 4$	1160	1160	1160	0	1160	1160	1160	0
$\bar{R}^2$	-0.001	0.013	0.014	0.015	-0.001	0.001	0	0
$\hat{\rho}$	0.062	0.104	0.091	-0.018	-0.091	-0.077	-0.039	0.616
$\Pr[\hat{\rho} = 0]$	0.006	0.000	0.000	0.307	0.000	0.000	0.007	0.000
$N$	3595	3595	3589	2365	3595	3595	3589	2365

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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.

TABLE 70: 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)	14353.5*** (2934.7)	-107.1 (84.5)	99.5 (259.7)	66.2 (137.4)	-148.6 (149.3)
UltraPoor	-412.7 (736.6)	-473.4 (818.6)	-407.2 (837.8)	-1518.9 (2330.8)	-72.9 (92.1)	1.0 (181.2)	-49.9 (110.8)	-184.6 (196.9)
rd 2 - 3		3013.1 (2202.6)	3010.1 (2218.7)			-250.9 (300.4)		
UltraPoor × rd 2 - 3		-2097.3 (4635.3)	-2054.8 (4683.0)			-338.6 (628.8)		
rd 3 - 4		-6884.0*** (1987.6)	-6846.1*** (1977.8)	-9801.1*** (2710.4)		-507.3** (249.4)	-382.4** (149.4)	-262.9 (167.9)
UltraPoor × rd 3 - 4		2198.9 (2579.2)	2092.0 (2540.4)	4155.7 (5310.6)		-444.7 (516.4)	-277.2 (293.7)	-98.8 (330.0)
FloodInRd1			-3076.3*** (997.0)	-2932.4** (1336.4)			-96.8 (67.4)	252.2 (164.0)
Head literate			2251.9 (1916.0)	1291.2 (3193.0)			-109.1* (61.8)	-38.7 (259.5)
$T = 2$	21	21	21	43	21	21	21	43
$T = 3$	47	47	44	1161	47	47	44	1161
$T = 4$	1160	1160	1160	0	1160	1160	1160	0
$\bar{R}^2$	0	0.012	0.014	0.015	0	0.001	0	0
$\hat{\rho}$	0.061	0.106	0.088	-0.006	-0.088	-0.072	-0.029	0.611
$\Pr[\hat{\rho} = 0]$	0.007	0.000	0.000	0.748	0.000	0.000	0.034	0.000
$N$	3595	3595	3589	2365	3595	3595	3589	2365

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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.

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

TABLE 71: FD ESTIMATION OF ASSETS, SMALL VS. LARGE SIZE LOANS

	Household asset amount (Tk)				Productive asset amount (Tk)			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	7322.4*** (879.1)	8303.9*** (966.6)	9670.2*** (1369.0)	12225.1*** (2224.9)	-129.2** (59.2)	207.5 (239.4)	87.0 (107.9)	-379.5 (318.2)
WithGrace	983.2 (1247.2)	1390.5 (1286.6)	1068.4 (1204.2)	1569.8 (2424.6)	-50.7 (80.2)	-136.3 (149.6)	-79.2 (90.0)	161.2 (251.5)
rd 2 - 3		2785.2 (1949.9)	2789.1 (1959.9)			-309.6 (330.9)		
WithGrace × rd 2 - 3		848.6 (3877.2)	800.3 (3895.5)			491.4 (671.7)		
rd 3 - 4		-6410.9*** (1717.5)	-6382.7*** (1711.9)	-9108.5*** (2255.8)		-568.8** (258.2)	-414.4** (162.7)	-264.4 (204.6)
WithGrace × rd 3 - 4		-4857.5 (3373.7)	-4853.7 (3366.6)	-5759.9 (4470.4)		403.7 (520.8)	155.7 (328.1)	-99.3 (415.7)
FloodInRd1			-3010.3*** (1038.0)	-2944.6** (1435.2)			-103.4 (70.9)	267.1 (167.1)
Head literate			2277.3 (1909.8)	1316.1 (3204.0)			-105.8* (58.9)	-24.4 (258.5)
$T = 2$	21	21	21	43	21	21	21	43
$T = 3$	47	47	44	1161	47	47	44	1161
$T = 4$	1160	1160	1160	0	1160	1160	1160	0
$\bar{R}^2$	0	0.013	0.015	0.015	0	0.001	0	0
$\hat{\rho}$	0.061	0.102	0.089	-0.010	-0.091	-0.083	-0.025	0.569
$\Pr[\hat{\rho} = 0]$	0.007	0.000	0.000	0.550	0.000	0.000	0.063	0.000
$N$	3595	3595	3589	2365	3595	3595	3589	2365

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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.

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

TABLE 72: FD ESTIMATION OF ASSETS, WITH VS. WITHOUT A GRACE PERIOD

	Household asset amount (Tk)				Productive asset amount (Tk)			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	6633.5*** (940.3)	8144.1*** (1339.6)	9571.5*** (1604.3)	10345.0*** (2446.5)	-216.2*** (58.7)	2.5 (166.1)	-91.8 (86.3)	-326.3 (211.3)
LargeSize	1455.4 (1182.8)	1231.6 (1299.8)	960.6 (1242.2)	3162.7 (2442.8)	67.2 (74.3)	178.7 (117.0)	133.5 (81.8)	46.6 (202.3)
rd 2 - 3		2523.4 (1945.8)	2525.2 (1956.1)			-258.1 (293.8)		
LargeSize × rd 2 - 3		4303.7 (4417.3)	4306.0 (4431.0)			-316.0 (516.7)		
rd 3 - 4		-6581.6*** (1746.8)	-6553.7*** (1741.2)	-9023.2*** (2466.9)		-481.8** (232.2)	-351.9** (143.5)	-227.6 (177.7)
LargeSize × rd 3 - 4		-1655.5 (2758.6)	-1642.2 (2757.6)	-5842.3 (4546.8)		-890.4** (360.1)	-731.4*** (206.3)	-579.5* (302.9)
FloodInRd1			-3029.6*** (994.2)	-2872.7** (1342.9)		-94.9 (67.0)	-95.0 (67.1)	247.4 (162.9)
Head literate			2258.1 (1896.9)	1300.5 (3183.1)		-107.1* (60.3)	-106.4* (60.2)	-26.0 (261.0)
$T = 2$	21	21	21	43	21	21	21	43
$T = 3$	47	47	44	1161	47	44	44	1161
$T = 4$	1160	1160	1160	0	1160	1160	1160	0
$\bar{R}^2$	0	0.012	0.014	0.015	0	0	0	0
$\hat{\rho}$	0.063	0.115	0.097	-0.007	-0.087	-0.060	-0.034	0.533
$\Pr[\hat{\rho} = 0]$	0.006	0.000	0.000	0.701	0.000	0.000	0.012	0.000
$N$	3595	3595	3589	2365	3595	3589	3589	2365

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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.

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

TABLE 73: FD ESTIMATION OF ASSETS, ROUND 2 AND 4 COMPARISON

	Household asset amount (Tk)				Productive asset amount (Tk)			
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	11278.8*** (2441.3)	14311.5*** (3199.6)	14311.5*** (3199.6)	14311.5*** (3199.6)	-366.5* (203.8)	-637.4** (301.9)	-637.4** (301.9)	-637.4** (301.9)
Large	4182.6 (4208.9)	4020.4 (3959.7)	4020.4 (3959.7)	4020.4 (3959.7)	-509.9 (486.9)	-499.0 (470.5)	-499.0 (470.5)	-499.0 (470.5)
LargeGrace	5448.6 (4212.5)	4472.7 (4482.6)	4472.7 (4482.6)	4472.7 (4482.6)	-532.9 (447.8)	-448.3 (436.1)	-448.3 (436.1)	-448.3 (436.1)
Cow	1777.3 (4181.1)	1225.8 (3931.4)	1225.8 (3931.4)	1225.8 (3931.4)	241.4 (254.4)	284.0 (264.8)	284.0 (264.8)	284.0 (264.8)
FloodInRd1		-5927.5** (2960.2)	-5927.5** (2960.2)	-5927.5** (2960.2)		497.1 (327.1)	497.1 (327.1)	497.1 (327.1)
Head literate		2684.2 (6714.2)	2684.2 (6714.2)	2684.2 (6714.2)		-83.3 (526.8)	-83.3 (526.8)	-83.3 (526.8)
$\bar{R}^2$	-0.001	0.003	0.003	0.003	0	0	0	0
$N$	1161	1161	1161	1161	1161	1161	1161	1161

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.

TABLE 74: FD ESTIMATION OF ASSETS, ROUND 2 AND 4 COMPARISON, GRACE PERIOD

covariates	Household asset amount (Tk)				Productive asset amount (Tk)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(Intercept)	14103.3*** (2471.7)	17155.7*** (3597.5)	17155.7*** (3597.5)	17155.7*** (3597.5)	-710.9** (308.5)	-1002.8** (432.7)	-1002.8** (432.7)	-1002.8** (432.7)
WithGrace	791.2 (3465.4)	112.1 (3556.8)	112.1 (3556.8)	112.1 (3556.8)	198.0 (380.5)	259.5 (378.2)	259.5 (378.2)	259.5 (378.2)
FloodInRd1		-6130.6** (2940.7)	-6130.6** (2940.7)	-6130.6** (2940.7)		540.0 (341.0)	540.0 (341.0)	540.0 (341.0)
Head literate		2551.2 (6549.8)	2551.2 (6549.8)	2551.2 (6549.8)		-46.6 (526.9)	-46.6 (526.9)	-46.6 (526.9)
$\bar{R}^2$	-0.001	0.003	0.003	0.003	-0.001	0	0	0
N	1161	1161	1161	1161	1161	1161	1161	1161

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.

**Finding VI.2** TABLE 69 (1) shows household assets increase after receiving the loans in all arms. Total increment is largest among the large grace arm as indicated in (2). In (3), increments are positive in rd 2 - 3, suggesting substantial purchase after receiving a loan. Significant decreases in rd 3 - 4 for all arms indicate liquidation of assets for repayment. Productive assets of large size loan arms decrease in rd 3 - 4 in TABLE 71 (6). These may indicate forced liquidation for repayment, which can entail efficiency losses.

## VI.4 Livestock

```
Dropped 2807 obs due to NA.
Dropped 2807 obs due to NA.
Dropped 2041 obs due to NA.
Dropped 2041 obs due to NA.
```

```
source(paste0(pathprogram, "LivestockCovariateSelection.R"))
```



TABLE 75: FD ESTIMATION OF LIVESTOCK HOLDING VALUES

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	4987.3*** (635.6)	11699.8*** (1224.3)	11713.0*** (1270.2)	11713.0*** (1270.2)	12003.6*** (1265.7)	11713.0*** (1270.2)
Large	3959.4*** (982.5)	4004.0*** (1318.1)	4037.8*** (1327.4)	4037.8*** (1327.4)	4760.9*** (1191.4)	4037.8*** (1327.4)
LargeGrace	2702.5*** (957.7)	2664.8* (1397.3)	2676.7* (1436.2)	2676.7* (1436.2)	4752.6*** (1276.8)	2676.7* (1436.2)
Cow	3320.2*** (772.8)	3654.3*** (1140.2)	3709.8*** (1149.3)	3709.8*** (1149.3)	4674.4*** (1194.9)	3709.8*** (1149.3)
rd 2 - 3		-8577.3*** (1326.6)	-8504.9*** (1329.4)	-8504.9*** (1329.4)	-8875.3*** (1246.7)	-8504.9*** (1329.4)
Large × rd 2 - 3		1097.2 (4095.4)	1347.5 (4104.9)	1347.5 (4104.9)	1064.5 (4109.5)	1347.5 (4104.9)
LargeGrace × rd 2 - 3		614.3 (4658.7)	614.1 (4660.9)	614.1 (4660.9)	547.8 (4229.8)	614.1 (4660.9)
Cow × rd 2 - 3		-2738.7 (4257.8)	-2724.2 (4259.0)	-2724.2 (4259.0)	-3783.7 (4319.4)	-2724.2 (4259.0)
rd 3 - 4		-11817.2*** (978.7)	-11875.4*** (981.7)	-11875.4*** (981.7)	-13077.9*** (914.3)	-11875.4*** (981.7)
Large × rd 3 - 4		-1192.0 (2631.1)	-1419.7 (2642.7)	-1419.7 (2642.7)	-2870.5 (2588.1)	-1419.7 (2642.7)
LargeGrace × rd 3 - 4		252.4 (2930.3)	262.8 (2931.0)	262.8 (2931.0)	-1444.6 (2609.9)	262.8 (2931.0)
Cow × rd 3 - 4		-622.7 (2650.3)	-617.2 (2650.8)	-617.2 (2650.8)	-2040.3 (2677.7)	-617.2 (2650.8)
Large × HadCows					-6188.0 (4441.1)	
LargeGrace × HadCows					-5474.7 (6241.9)	
Cow × HadCows					-10724.0*** (3542.1)	
Large × HadCows × rd 2 - 3					1508.2 (4532.4)	
LargeGrace × HadCows × rd 2 - 3					-1273.6 (8591.3)	
Cow × HadCows × rd 2 - 3					7252.8* (4148.6)	
Large × HadCows × rd 3 - 4					7904.1* (4595.0)	
LargeGrace × HadCows × rd 3 - 4					235.4 (7174.1)	
Cow × HadCows × rd 3 - 4					9800.4** (4619.8)	
FloodInRd1			180.1 (594.2)	180.1 (594.2)	239.4 (563.1)	180.1 (594.2)
Head literate			-1033.5 (694.7)	-1033.5 (694.7)	-640.0 (676.2)	-1033.5 (694.7)
$T = 2$	22	22	21	21	21	21
$T = 3$	47	47	45	45	45	45
$T = 4$	1159	1159	1159	1159	1159	1159
$\bar{R}^2$	0.003	0.068	0.069	0.069	0.084	0.069
$\hat{\rho}$	-0.233	-0.226	-0.233	-0.233	-0.250	-0.233
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000
$N$	3593	3593	3588	3588	3588	3588

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. 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 76: FD ESTIMATION OF LIVESTOCK HOLDING VALUES, WITH VS. WITHOUT A GRACE PERIOD

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	7473.2*** (471.7)	14776.6*** (1021.2)	14828.5*** (990.3)	14828.5*** (990.3)	14828.5*** (990.3)	14828.5*** (990.3)
UltraPoor	540.5 (433.2)	0.9 (559.1)	-25.1 (561.4)	-25.1 (561.4)	-25.1 (561.4)	-25.1 (561.4)
rd 2 - 3		-8802.5*** (1327.3)	-8735.3*** (1332.3)	-8735.3*** (1332.3)	-8735.3*** (1332.3)	-8735.3*** (1332.3)
UltraPoor × rd 2 - 3		2227.2 (2433.3)	2315.3 (2428.8)	2315.3 (2428.8)	2315.3 (2428.8)	2315.3 (2428.8)
rd 3 - 4		-12056.1*** (1037.8)	-12110.5*** (1040.5)	-12110.5*** (1040.5)	-12110.5*** (1040.5)	-12110.5*** (1040.5)
UltraPoor × rd 3 - 4		2589.4* (1503.3)	2497.8* (1513.9)	2497.8* (1513.9)	2497.8* (1513.9)	2497.8* (1513.9)
FloodInRd1			164.0 (551.2)	164.0 (551.2)	164.0 (551.2)	164.0 (551.2)
Head literate			-904.4 (713.8)	-904.4 (713.8)	-904.4 (713.8)	-904.4 (713.8)
$T = 2$	22	22	21	21	21	21
$T = 3$	47	47	45	45	45	45
$T = 4$	1159	1159	1159	1159	1159	1159
$\bar{R}^2$	0	0.064	0.065	0.065	0.065	0.065
$\hat{\rho}$	-0.211	-0.182	-0.211	-0.211	-0.211	-0.211
Pr[ $\hat{\rho} = 0$ ]	0.000	0.000	0.000	0.000	0.000	0.000
$N$	3593	3593	3588	3588	3588	3588

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. 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 77: FD ESTIMATION OF LIVESTOCK HOLDING VALUES, RD 1 VS. RD 4 COMPARISON

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	3077.8* (1821.1)	3077.8* (1821.1)	3283.7 (2077.3)	3283.7 (2077.3)	3117.0 (2066.6)	3283.7 (2077.3)
Large	8059.5*** (2366.7)	8059.5*** (2366.7)	8008.6*** (2368.4)	8008.6*** (2368.4)	8517.8*** (2325.8)	8008.6*** (2368.4)
LargeGrace	5922.8*** (2234.5)	5922.8*** (2234.5)	5828.4*** (2251.8)	5828.4*** (2251.8)	8986.8*** (2235.0)	5828.4*** (2251.8)
Cow	5168.0** (2176.2)	5168.0** (2176.2)	5056.4** (2162.3)	5056.4** (2162.3)	5588.0** (2120.6)	5056.4** (2162.3)
Large × HadCows					-2785.4 (3397.6)	
LargeGrace × HadCows					-11702.7** (5627.9)	
Cow × HadCows					-3569.7 (2356.4)	
FloodInRd1			-760.6 (1388.8)	-760.6 (1388.8)	-591.4 (1377.2)	-760.6 (1388.8)
Head literate			1916.2 (2087.0)	1916.2 (2087.0)	2526.5 (2074.6)	1916.2 (2087.0)
$\bar{R}^2$	0.009	0.009	0.009	0.009	0.027	0.009
$N$	1159	1159	1159	1159	1159	1159

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. 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	2	16000
7: 7020614	large	grace	2015	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
45:	80000
46:	300000
47:	240000
48:	200000

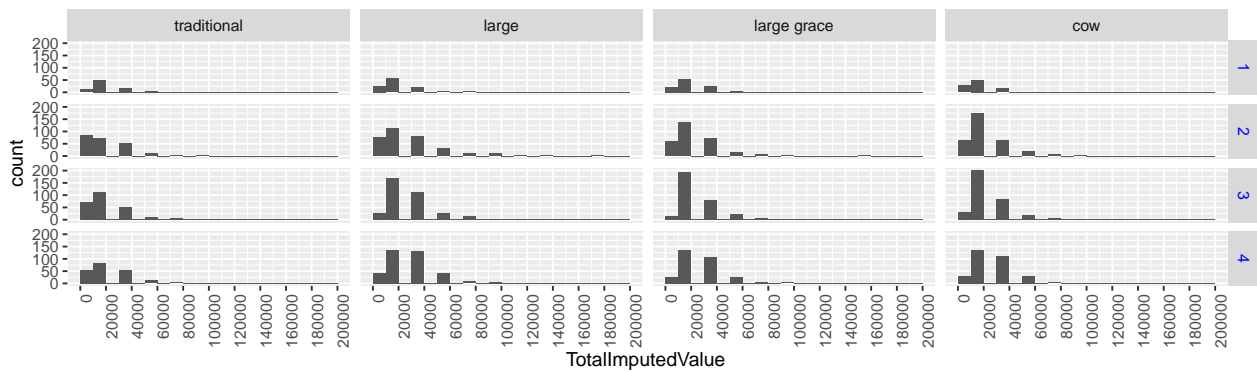


Figure 22: Total imputed value of livestock holding  
Livestock holding values are computed by using respective median prices of each year.

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	

- Why does cow report below 1000 holding in rds 2-4?

	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
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

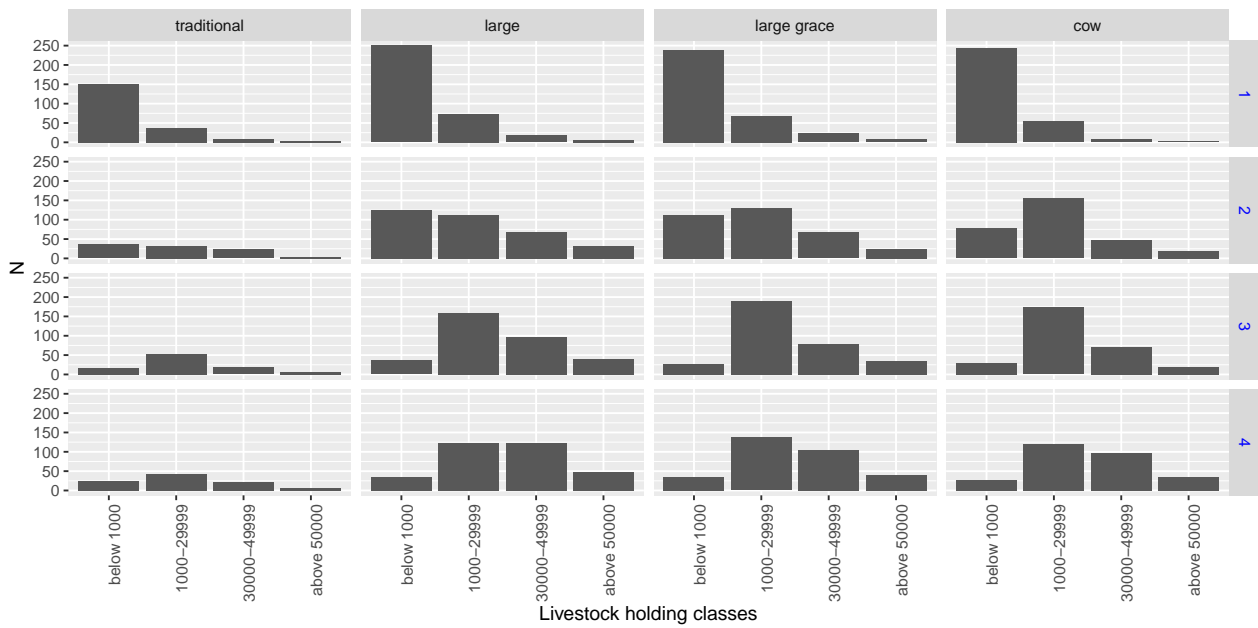


Figure 23: Histogram of livestock holding classes  
Livestock holding values are computed by using respective median prices of each year.

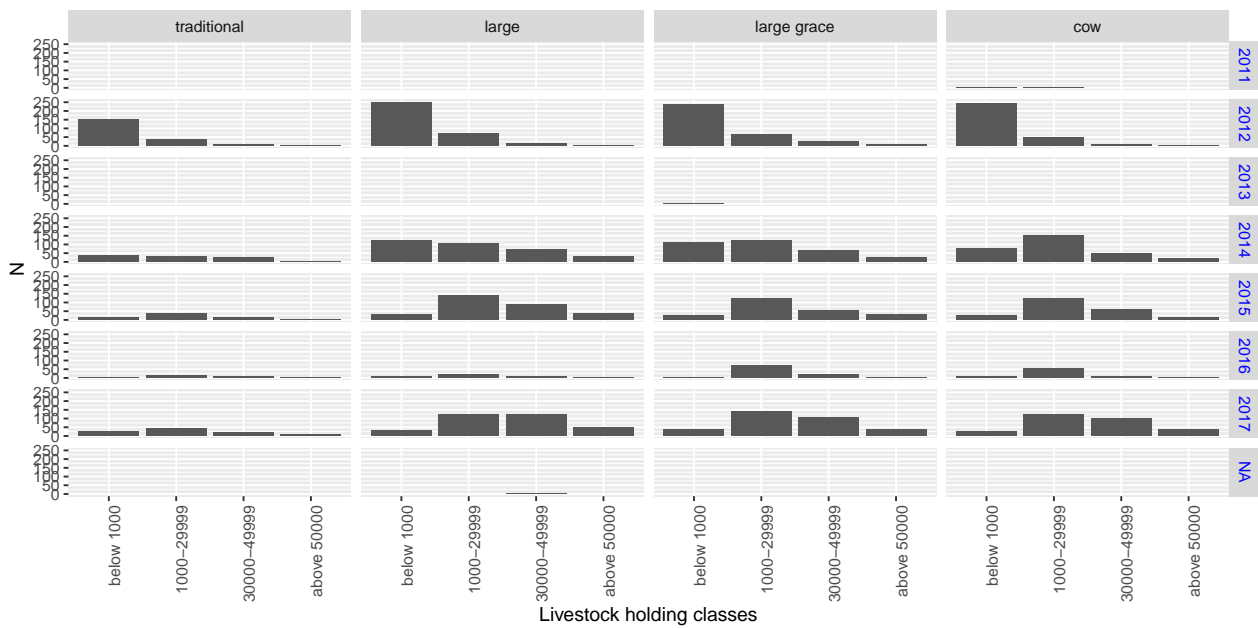


Figure 24: Histogram of livestock holding classes by year  
Livestock holding values are computed by using respective median prices of each year.

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
16:	cow	4	28700.23	1.436950	342

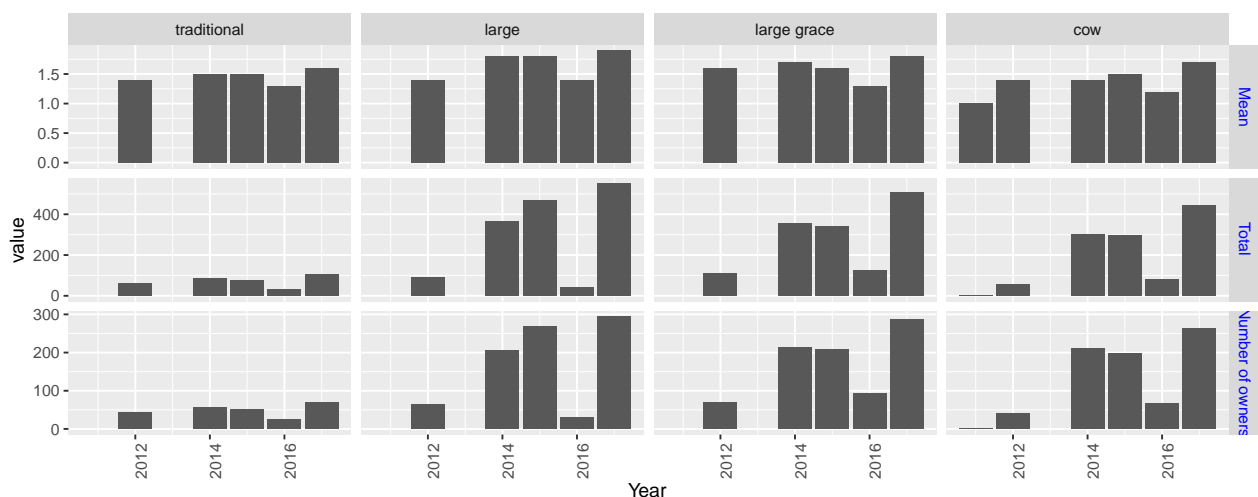


Figure 25: Number of cows/oxen by year

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.

**Finding VI.3** FIGURE 5 shows general increase in upper holding classes round 3 and further upper holding classes in round 4. FIGURE 10 shows livestock type is not entered (yet collected) in rd3. At this moment, one needs to omit rd 3. All estimation results by far are subject to this omission.

## VI.5 Assets+Livestock

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

Mstatus	creditstatus	
	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 1402 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 1402 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 1274 obs due to NA.

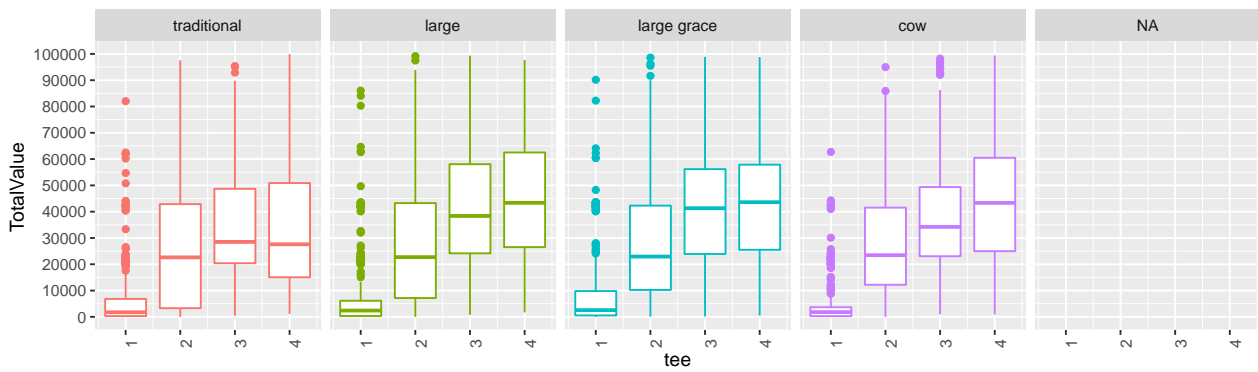


Figure 26: Total asset values  
Sum of assets and livestock holding values. Original 1600 HHs.

Dropped 130 obs due to T<2.  
Dropped 1274 obs due to NA.  
Dropped 130 obs due to T<2.  
Dropped 1274 obs due to NA.

Arm					
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

Arm					
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 1402 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 1272 obs due to NA.

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

```
source(paste0(pathprogram, "AssetLivestockCovariateSelection.R"))
```



TABLE 78: 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)	21220.8*** (1869.8)	21220.8*** (1869.8)	21081.9*** (2138.4)
Large	5104.6*** (1607.4)	4735.4*** (1742.9)	4703.6*** (1586.1)	4703.6*** (1586.1)	4703.6*** (1586.1)	4732.4*** (1595.8)
LargeGrace	4487.9** (1882.2)	4162.1** (2096.7)	3707.6* (2115.7)	3707.6* (2115.7)	3707.6* (2115.7)	3694.6* (2092.1)
Cow	4867.7*** (1712.9)	5528.9** (2194.3)	5300.5*** (2042.2)	5300.5*** (2042.2)	5300.5*** (2042.2)	5364.9*** (2070.9)
rd 2 - 3		-6257.7*** (2257.5)	-6188.8*** (2255.6)	-6188.8*** (2255.6)	-6188.8*** (2255.6)	-6188.3*** (2256.1)
Large × rd 2 - 3		5066.2 (5917.0)	5357.9 (5877.8)	5357.9 (5877.8)	5357.9 (5877.8)	5358.9 (5879.1)
LargeGrace × rd 2 - 3		5009.0 (5663.8)	5026.6 (5664.7)	5026.6 (5664.7)	5026.6 (5664.7)	5027.4 (5665.6)
Cow × rd 2 - 3		1083.7 (6448.4)	1023.6 (6484.5)	1023.6 (6484.5)	1023.6 (6484.5)	1023.8 (6485.6)
rd 3 - 4		-18818.5*** (1810.6)	-18849.6*** (1812.3)	-18849.6*** (1812.3)	-18849.6*** (1812.3)	-18850.7*** (1812.4)
Large × rd 3 - 4		-630.0 (4012.9)	-850.0 (4048.5)	-850.0 (4048.5)	-850.0 (4048.5)	-851.7 (4050.0)
LargeGrace × rd 3 - 4		-900.0 (4236.3)	-918.7 (4241.7)	-918.7 (4241.7)	-918.7 (4241.7)	-923.2 (4240.2)
Cow × rd 3 - 4		-7556.5 (5850.3)	-7494.5 (5824.0)	-7494.5 (5824.0)	-7494.5 (5824.0)	-7497.4 (5825.0)
NumCowsOwnedAtRd1						487.1 (2133.7)
FloodInRd1			-2878.7** (1237.8)	-2878.7** (1237.8)	-2878.7** (1237.8)	-2903.5** (1175.5)
Head literate			1146.7 (1926.6)	1146.7 (1926.6)	1146.7 (1926.6)	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	0.039	0.039
$\hat{\rho}$	-0.162	-0.137	-0.141	-0.141	-0.141	-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. 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.

TABLE 79: 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. 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.

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

TABLE 80: FD ESTIMATION OF TOTAL ASSETS, SMALL VS. LARGE SIZE LOANS, ORIGINAL HHs

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	11404.6*** (1117.7)	19760.6*** (1693.1)	21163.1*** (1851.5)	21163.1*** (1851.5)	21163.1*** (1851.5)	21031.4*** (2116.1)
LargeSize	4820.4*** (1356.3)	4812.4*** (1587.6)	4581.9*** (1472.4)	4581.9*** (1472.4)	4581.9*** (1472.4)	4607.1*** (1514.4)
rd 2 - 3		-6270.2*** (2256.4)	-6205.3*** (2255.4)	-6205.3*** (2255.4)	-6205.3*** (2255.4)	-6205.0*** (2255.9)
LargeSize × rd 2 - 3		3715.8 (4690.2)	3798.1 (4693.6)	3798.1 (4693.6)	3798.1 (4693.6)	3798.5 (4694.3)
rd 3 - 4		-18835.5*** (1849.0)	-18864.2*** (1847.8)	-18864.2*** (1847.8)	-18864.2*** (1847.8)	-18865.4*** (1847.7)
LargeSize × rd 3 - 4		-3027.5 (3679.1)	-3085.6 (3678.0)	-3085.6 (3678.0)	-3085.6 (3678.0)	-3088.5 (3677.8)
NumCowsOwnedAtRd1						452.0 (2176.9)
FloodInRd1			-2776.5** (1131.3)	-2776.5** (1131.3)	-2776.5** (1131.3)	-2795.3** (1084.7)
Head literate			1216.6 (1844.2)	1216.6 (1844.2)	1216.6 (1844.2)	1186.0 (1746.0)
$T = 2$	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	0.039	0.04	0.04	0.04	0.04
$\hat{\rho}$	-0.166	-0.135	-0.140	-0.140	-0.140	-0.139
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. 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.

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

TABLE 81: FD ESTIMATION OF TOTAL ASSETS, WITH VS. WITHOUT A GRACE PERIOD, ORIGINAL HHs

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	14846.6*** (954.2)	22877.6*** (1368.0)	24291.4*** (1633.3)	24291.4*** (1633.3)	24291.4*** (1633.3)	24193.5*** (1862.9)
WithGrace	1235.8 (1380.3)	1658.9 (1533.8)	1344.3 (1512.5)	1344.3 (1512.5)	1344.3 (1512.5)	1349.8 (1522.5)
rd 2 - 3		-5971.7** (2338.9)	-5889.9** (2334.2)	-5889.9** (2334.2)	-5889.9** (2334.2)	-5889.6** (2334.7)
WithGrace × rd 2 - 3		-391.6 (4675.4)	-605.0 (4663.0)	-605.0 (4663.0)	-605.0 (4663.0)	-605.5 (4663.7)
rd 3 - 4		-18825.7*** (1841.4)	-18869.1*** (1844.5)	-18869.1*** (1844.5)	-18869.1*** (1844.5)	-18870.1*** (1844.4)
WithGrace × rd 3 - 4		-3816.9 (3645.6)	-3643.6 (3655.8)	-3643.6 (3655.8)	-3643.6 (3655.8)	-3645.9 (3654.9)
NumCowsOwnedAtRd1						389.3 (2189.8)
FloodInRd1			-2857.5** (1194.9)	-2857.5** (1194.9)	-2857.5** (1194.9)	-2874.0** (1146.1)
Head literate			1288.4 (1865.9)	1288.4 (1865.9)	1288.4 (1865.9)	1262.4 (1768.4)
$T = 2$	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
$\hat{\rho}$	-0.163	-0.142	-0.143	-0.143	-0.143	-0.143
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. 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.

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

TABLE 82: FD ESTIMATION OF TOTAL ASSETS, ROUND 2 AND 4 COMPARISON, ORIGINAL HHs

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	13990.0*** (2761.8)	13437.3*** (2782.1)	16940.3*** (3603.1)	16940.3*** (3603.1)	16940.3*** (3603.1)	14253.3*** (4406.3)
Large	11732.2*** (4504.0)	11641.5*** (4474.0)	11530.2*** (4345.3)	11530.2*** (4345.3)	11530.2*** (4345.3)	12066.3*** (4051.3)
LargeGrace	10838.4** (4608.0)	10931.3** (4614.5)	9857.8** (4916.2)	9857.8** (4916.2)	9857.8** (4916.2)	9567.5** (4530.2)
Cow	7124.8* (4261.9)	6996.0* (4179.6)	6519.7 (3980.6)	6519.7 (3980.6)	6519.7 (3980.6)	7713.9** (3790.6)
NumCowsOwnedAtRd1						9378.1 (6129.6)
Head literate		4741.4 (7090.2)	4535.9 (7095.7)	4535.9 (7095.7)	4535.9 (7095.7)	3831.3 (6664.1)
FloodInRd1			-6163.9* (3263.4)	-6163.9* (3263.4)	-6163.9* (3263.4)	-6660.4** (2941.1)
$\bar{R}^2$	0.004	0.004	0.008	0.008	0.008	0.024
$N$	1159	1159	1159	1159	1159	1159

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.

TABLE 83: FD ESTIMATION OF TOTAL ASSETS, ROUND 2 AND 4 COMPARISON, GRACE PERIOD, ORIGINAL HHs

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	21912.7*** (2729.9)	21304.7*** (2923.2)	24875.8*** (4053.7)	24875.8*** (4053.7)	24875.8*** (4053.7)	22508.0*** (4566.4)
WithGrace	1067.4 (3683.7)	1110.8 (3708.2)	379.7 (3811.8)	379.7 (3811.8)	379.7 (3811.8)	475.5 (3653.3)
NumCowsOwnedAtRd1						9323.9 (6257.1)
Head literate		4696.0 (6965.8)	4517.7 (6945.7)	4517.7 (6945.7)	4517.7 (6945.7)	3918.2 (6580.2)
FloodInRd1			-6429.9* (3286.6)	-6429.9* (3286.6)	-6429.9* (3286.6)	-6845.4** (3018.3)
$\bar{R}^2$	-0.001	-0.001	0.003	0.003	0.003	0.019
N	1159	1159	1159	1159	1159	1159

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.

TABLE 84: FD ESTIMATION OF TOTAL ASSETS, ROUND 2 AND 4 COMPARISON, ULTRA POOR VS. MODERATELY POOR, ORIGINAL HHs

covariates	(1)	(2)	(3)	(4)	(5)	(6)
(Intercept)	21583.3*** (2784.3)	20885.1*** (2709.4)	24060.0*** (3307.6)	24060.0*** (3307.6)	24060.0*** (3307.6)	21059.4*** (4538.7)
UltraPoor	1324.0 (3112.7)	1475.0 (3138.7)	1476.1 (3123.9)	1476.1 (3123.9)	1476.1 (3123.9)	2409.8 (3526.3)
NumCowsOwnedAtRd1						9432.0 (6367.8)
Head literate		4762.2 (6937.7)	4598.1 (6909.5)	4598.1 (6909.5)	4598.1 (6909.5)	4045.8 (6548.9)
FloodInRd1			-6472.5** (3047.9)	-6472.5** (3047.9)	-6472.5** (3047.9)	-6903.8** (2813.6)
$\bar{R}^2$	-0.001	0	0.003	0.003	0.003	0.02
N	1159	1159	1159	1159	1159	1159

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.

## VI.6 Incomes

```
Warning in `[.data.table`(lab, , `:=`(grepout("RM", colnames(lab)), NULL)): length(LHS)==0
```

```
Warning in `[.data.table`(far, , `:=`(grepout("RM", colnames(far)), NULL)): length(LHS)==0
```

```
Dropped 4546 obs due to T<2.  
Dropped 1133 obs due to NA.  
Dropped 4546 obs due to T<2.  
Dropped 1133 obs due to NA.  
Dropped 6242 obs due to NA.  
Dropped 6242 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  
128 46
```

```
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
```

```
source(paste0(pathprogram, "IncomeCovariateSelection.R"))
```

TABLE 85: FD ESTIMATION OF INCOMES

	Labour income (Tk)				Farm income (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	5.8** (2.9)	1.8 (3.7)	-2.0 (4.1)	-6.9 (16.9)	-8.3 (6.9)	-12.1 (7.9)	-12.3 (8.2)
Large	-1.5 (4.1)	0.1 (4.5)	0.7 (4.2)	3.8 (16.1)	10.0 (7.0)	11.7 (7.5)	11.7 (7.5)
LargeGrace	-5.6 (4.5)	-3.2 (5.1)	-2.3 (4.6)	4.4 (16.2)	9.8 (7.0)	4.9 (8.9)	5.1 (8.9)
Cow	-7.6 (5.0)	-6.4 (5.4)	-5.6 (4.9)	11.9 (18.5)	6.9 (7.1)	7.5 (7.8)	7.4 (7.8)
rd 2 - 3		10.5*** (3.6)	10.4*** (3.7)	13.6** (6.8)		7.1 (8.7)	7.1 (8.8)
Large × rd 2 - 3		-2.1 (10.6)	-4.2 (10.9)	-7.0 (26.1)		10.0 (11.8)	9.5 (11.8)
LargeGrace × rd 2 - 3		-9.1 (11.8)	-8.7 (12.0)	-19.9 (26.1)		58.0 (35.8)	57.5 (36.1)
Cow × rd 2 - 3		1.7 (12.1)	1.5 (12.5)	-22.8 (28.4)		18.4 (12.2)	17.8 (12.3)
rd 3 - 4		-2.4 (6.2)	-2.0 (6.9)				
Large × rd 3 - 4		4.2 (20.9)	1.7 (22.2)				
LargeGrace × rd 3 - 4		10.9 (21.0)	10.3 (22.0)				
Cow × rd 3 - 4		22.4 (25.3)	22.8 (26.9)				
FloodInRd1			8.5*** (3.2)	-1.5 (2.7)			-0.2 (1.6)
Head literate			-10.7 (7.4)	-11.7** (5.5)			1.9 (1.5)
$T = 2$	240	240	239	95	56	56	56
$T = 3$	78	78	76	37	47	47	47
$T = 4$	30	30	30	0	0	0	0
$\bar{R}^2$	0	0.008	0.026	0.052	-0.018	0.027	0.014
$\hat{\rho}$	0.141	0.117	0.049	-0.020	-0.575	-0.675	-0.693
$\Pr[\hat{\rho} = 0]$	0.003	0.013	0.302	0.804	0.000	0.000	0.000
$N$	486	486	481	169	150	150	150

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. 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 86: FD ESTIMATION OF INCOMES, MODERATELY POOR VS. ULTRA POOR

	Labour income (Tk)				Farm income (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	0.6 (3.4)	-2.5 (4.1)	-4.9 (4.1)	3.5 (3.6)	0.3 (1.4)	-2.6 (4.0)	-2.9 (4.5)
UltraPoor	1.6 (3.5)	1.7 (3.7)	0.7 (3.8)	-7.2 (5.6)	0.3 (1.2)	-2.2 (2.2)	-2.2 (2.2)
rd 2 - 3		11.4*** (3.6)	11.4*** (3.6)	11.9** (5.1)		8.4 (9.2)	8.4 (9.3)
UltraPoor × rd 2 - 3		-6.8 (7.4)	-8.1 (7.6)	4.1 (9.0)		19.0 (14.9)	19.3 (15.1)
rd 3 - 4		0.0 (4.7)	0.5 (5.4)				
UltraPoor × rd 3 - 4		-12.7 (8.7)	-14.0 (9.0)				
FloodInRd1			8.6*** (3.0)	0.2 (2.9)			0.0 (1.7)
Head literate			-10.7 (7.2)	-10.5* (5.8)			2.3 (1.8)
$T = 2$	240	240	239	95	56	56	56
$T = 3$	78	78	76	37	47	47	47
$T = 4$	30	30	30	0	0	0	0
$\bar{R}^2$	-0.002	0.01	0.029	0.043	-0.007	0.003	-0.011
$\hat{\rho}$	0.152	0.128	0.026	-0.021	-0.801	-0.860	-0.868
$\Pr[\hat{\rho} = 0]$	0.001	0.007	0.586	0.800	0.000	0.000	0.000
$N$	486	486	481	169	150	150	150

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. 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 87: FD ESTIMATION OF INCOMES, LOAN SIZE

	Labour income (Tk)				Farm income (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	5.8** (2.9)	1.9 (3.7)	-1.8 (4.0)	-7.3 (16.9)	-8.3 (6.8)	-13.0 (8.4)	-13.0 (8.4)
LoanSize	-4.8 (3.6)	-3.0 (4.1)	-2.3 (3.7)	6.2 (16.2)	9.1 (6.9)	8.7 (7.7)	8.7 (7.7)
rd 2 - 3		10.4*** (3.6)	10.3*** (3.6)	13.7** (6.8)		8.5 (10.2)	8.5 (10.2)
LoanSize × rd 2 - 3		-3.2 (10.1)	-4.0 (10.4)	-15.8 (25.9)		26.3* (15.7)	26.3* (15.7)
rd 3 - 4		-2.8 (6.1)	-2.5 (6.8)				
LoanSize × rd 3 - 4		11.9 (20.9)	10.8 (22.1)				
FloodInRd1			8.3*** (3.0)	-0.5 (2.8)		0.4 (1.8)	0.4 (1.8)
Head literate			-10.6 (7.3)	-10.4* (5.7)		0.6 (1.9)	0.6 (1.9)
$T = 2$	240	240	239	95	56	56	56
$T = 3$	78	78	76	37	47	47	47
$T = 4$	30	30	30	0	0	0	0
$\bar{R}^2$	0	0.011	0.028	0.049	-0.005	-0.017	-0.017
$\hat{\rho}$	0.164	0.129	0.028	0.009	-0.731	-0.668	-0.668
$\Pr[\hat{\rho} = 0]$	0.000	0.006	0.552	0.915	0.000	0.000	0.000
$N$	486	486	481	169	150	150	150

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. 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 88: FD ESTIMATION OF INCOMES, WITH VS. WITHOUT A GRACE PERIOD

	Labour income (Tk)				Farm income (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	4.8** (2.1)	1.8 (2.7)	-1.2 (3.6)	-4.4 (5.5)	0.8 (1.4)	-1.8 (3.7)	-1.4 (3.8)
WithGrace	-5.6* (3.4)	-4.7 (3.6)	-4.3 (3.1)	5.4 (6.6)	-0.6 (2.0)	-4.8 (3.3)	-4.9 (3.3)
rd 2 - 3		10.5*** (3.5)	10.3*** (3.6)	13.1** (5.4)		8.4 (9.1)	8.3 (9.2)
WithGrace × rd 2 - 3		-2.4 (7.0)	-1.1 (7.1)	-16.4 (10.6)		29.5 (18.5)	29.6 (18.6)
rd 3 - 4		-2.2 (5.1)	-2.0 (5.8)				
WithGrace × rd 3 - 4		13.5 (10.2)	15.2 (11.1)				
FloodInRd1			8.2*** (3.0)	-1.0 (2.7)			-1.0 (1.7)
Head literate			-11.3 (7.3)	-11.1* (5.8)			0.5 (2.3)
$T = 2$	240	240	239	95	56	56	56
$T = 3$	78	78	76	37	47	47	47
$T = 4$	30	30	30	0	0	0	0
$\bar{R}^2$	0.004	0.017	0.034	0.066	-0.007	0.022	0.008
$\hat{\rho}$	0.143	0.120	0.108	0.041	-0.787	-0.948	-0.956
$\Pr[\hat{\rho} = 0]$	0.002	0.010	0.021	0.613	0.000	0.000	0.000
$N$	486	486	481	169	150	150	150

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. 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.

**Finding VI.4** TABLE 85 (1) and (3) show a general decrease in rd 1 - 2 period and a general increase in rd 2 - 4 periods for labour incomes. (2) and (4) suggest Large grace arm saw a greater swing (decrease and increases) which resulted in overall significant mean increase of -5.55 (at  $p$  value of 21.66%), yet not statistically different from traditional, while other arms have estimates closer to traditional. This labour income response can be due to the flood in rd 1 which reduced the labour incomes while repayment burden in later rounds prompted households to earn more labour incomes. Strong positive correlation with other members' previous 6 month repayment in (4) may be due to concerted peer efforts in repayment. Farm revenues do not show any systematic trend.

## VI.7 Consumption

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

```
Warning in `[.data.table`(con, , `:=`(grepout("RM", colnames(con)), NULL)): length(LHS)==0;
```

```
Dropped 4028 obs due to NA.
Dropped 4028 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.

```
source ( paste0 ( pathprogram , " ConsumptionCovariateSelection.R " ) )
```

TABLE 89: FD ESTIMATION OF CONSUMPTION

	Per capita consumption (Tk)				Per capita hygiene consumption (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	336.8*** (37.7)	571.9*** (60.1)	569.1*** (61.6)	569.1*** (61.6)	171.7*** (21.3)	214.9*** (32.2)	211.0*** (34.7)
Large	8.9 (50.7)	8.6 (68.8)	7.5 (68.6)	7.5 (68.6)	28.4 (26.7)	46.9 (36.6)	46.5 (36.4)
LargeGrace	-36.8 (50.1)	-82.0 (60.3)	-82.5 (60.5)	-82.5 (60.5)	13.6 (27.6)	4.1 (32.0)	4.4 (32.5)
Cow	-40.6 (46.4)	-9.1 (58.8)	-20.5 (57.9)	-20.5 (57.9)	1.2 (28.0)	35.5 (35.0)	29.4 (34.1)
rd 3 - 4		-461.2*** (70.8)	-448.9*** (70.7)	-448.9*** (70.7)		-109.5*** (35.1)	-104.1*** (34.6)
Large × rd 3 - 4		3.5 (222.4)	8.2 (222.9)	8.2 (222.9)		-103.3 (103.7)	-102.8 (103.9)
LargeGrace × rd 3 - 4		260.1 (220.6)	261.7 (220.7)	261.7 (220.7)		53.1 (110.9)	54.8 (110.9)
Cow × rd 3 - 4		-158.3 (209.6)	-118.6 (208.6)	-118.6 (208.6)		-186.2* (100.7)	-168.0* (98.5)
FloodInRd1			-9.3 (27.6)	-9.3 (27.6)			-2.2 (16.8)
Head literate			35.8 (37.5)	35.8 (37.5)			29.5 (24.6)
$T = 2$	42	42	42	42	42	42	42
$T = 3$	1165	1165	1162	1162	1165	1165	1162
$\bar{R}^2$	-0.001	0.072	0.07	0.07	-0.001	0.019	0.017
$\hat{\rho}$	-0.456	-0.374	-0.370	-0.370	-0.319	-0.266	-0.265
Pr[ $\hat{\rho} = 0$ ]	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	2372	2372	2366	2366	2372	2372	2366

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. Consumption is annualised values.

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

TABLE 90: FD ESTIMATION OF CONSUMPTION, MODERATELY POOR VS. ULTRA POOR

	Per capita consumption (Tk)				Per capita hygiene consumption (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	335.3*** (25.4)	565.2*** (47.1)	547.9*** (45.4)	547.9*** (45.4)	195.7*** (14.4)	255.0*** (24.5)	244.5*** (24.9)
UltraPoor	-25.5 (24.2)	-26.8 (29.2)	-16.3 (28.0)	-16.3 (28.0)	-16.3 (16.3)	-19.9 (17.2)	-14.0 (17.5)
rd 3 - 4		-454.9*** (75.1)	-438.8*** (74.2)	-438.8*** (74.2)		-113.3*** (38.2)	-106.1*** (37.4)
UltraPoor × rd 3 - 4		-20.0 (89.1)	-56.7 (82.5)	-56.7 (82.5)		12.7 (54.9)	-4.4 (54.3)
FloodInRd1			-4.9 (28.0)	-4.9 (28.0)			-1.8 (16.8)
Head literate			35.5 (35.9)	35.5 (35.9)			28.7 (23.6)
$T = 2$	42	42	42	42	42	42	42
$T = 3$	1165	1165	1162	1162	1165	1165	1162
$\bar{R}^2$	0	0.065	0.064	0.064	0	0.011	0.01
$\hat{\rho}$	-0.458	-0.375	-0.369	-0.369	-0.322	-0.298	-0.301
Pr[ $\hat{\rho} = 0$ ]	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	2372	2372	2366	2366	2372	2372	2366

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. Consumption is annualised values.

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

TABLE 91: FD ESTIMATION OF CONSUMPTION, LARGE VS. SMALL SIZE LOANS

	Per capita consumption (Tk)				Per capita hygiene consumption (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	336.8*** (37.7)	571.0*** (60.4)	566.0*** (61.7)	566.0*** (61.7)	171.7*** (21.3)	209.9*** (34.5)	209.9*** (34.5)
rd 3 - 4		-458.2*** (73.2)	-445.9*** (72.8)	-445.9*** (72.8)		-102.2*** (36.2)	-102.2*** (36.2)
LargeSize × rd 3 - 4		35.1 (189.6)	50.4 (189.4)	50.4 (189.4)		-72.0 (90.0)	-72.0 (90.0)
FloodInRd1			-5.8 (28.5)	-5.8 (28.5)		-1.3 (17.0)	-1.3 (17.0)
Head literate			37.1 (36.0)	37.1 (36.0)		29.4 (23.7)	29.4 (23.7)
SizeLargeSize	-22.7 (41.9)	-27.4 (54.3)	-31.4 (54.3)	-31.4 (54.3)	14.5 (23.6)	26.9 (29.9)	26.9 (29.9)
$T = 2$	42	42	42	42	42	42	42
$T = 3$	1165	1165	1162	1162	1165	1162	1162
$\bar{R}^2$	0	0.065	0.064	0.064	0	0.01	0.01
$\hat{\rho}$	-0.462	-0.380	-0.373	-0.373	-0.318	-0.300	-0.300
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	2372	2372	2366	2366	2372	2366	2366

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. Consumption is annualised values.

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

TABLE 92: FD ESTIMATION OF CONSUMPTION, WITH VS. WITHOUT A GRACE PERIOD

	Per capita consumption (Tk)				Per capita hygiene consumption (Tk)		
covariates	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(Intercept)	342.8*** (25.9)	576.9*** (52.6)	573.5*** (53.1)	573.5*** (53.1)	190.9*** (13.0)	247.4*** (27.4)	243.8*** (28.8)
WithGrace	-44.7 (33.6)	-51.5 (43.9)	-56.7 (43.4)	-56.7 (43.4)	-11.8 (18.2)	-11.9 (23.8)	-14.6 (23.5)
rd 3 - 4		-458.6*** (73.7)	-446.3*** (73.3)	-446.3*** (73.3)		-112.3*** (36.9)	-106.9*** (36.4)
WithGrace × rd 3 - 4		48.9 (148.0)	66.4 (147.3)	66.4 (147.3)		3.4 (73.7)	13.0 (72.8)
FloodInRd1			-9.8 (27.5)	-9.8 (27.5)			-3.2 (16.9)
Head literate			36.0 (36.2)	36.0 (36.2)			29.3 (23.8)
$T = 2$	42	42	42	42	42	42	42
$T = 3$	1165	1165	1162	1162	1165	1165	1162
$\bar{R}^2$	0	0.066	0.065	0.065	0	0.011	0.01
$\hat{\rho}$	-0.456	-0.379	-0.372	-0.372	-0.317	-0.292	-0.299
$\Pr[\hat{\rho} = 0]$	0.000	0.000	0.000	0.000	0.000	0.000	0.000
$N$	2372	2372	2366	2366	2372	2372	2366

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. A first-difference is defined as  $\Delta x_{t+1} \equiv x_{t+1} - x_t$ . 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. Consumption is annualised values.

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

**Finding VI.5** TABLE 89 uses rd 2 - 4 data and shows an increase in per member consumption in rd 2 - 3 period. The estimates are imprecise for all interaction terms. Continued increases in consumption hints welfare gains, but do not differ by arms. Per member food consumption increases in rd 2- 3 period but decreases in rd 3 - 4 period.

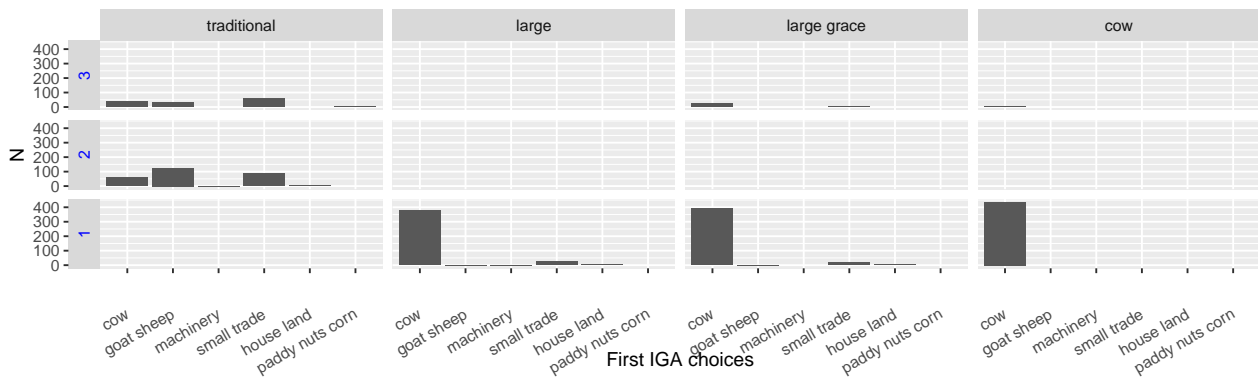


Figure 27: Income generating activity choices  
The first income generating activity choices are plotted.

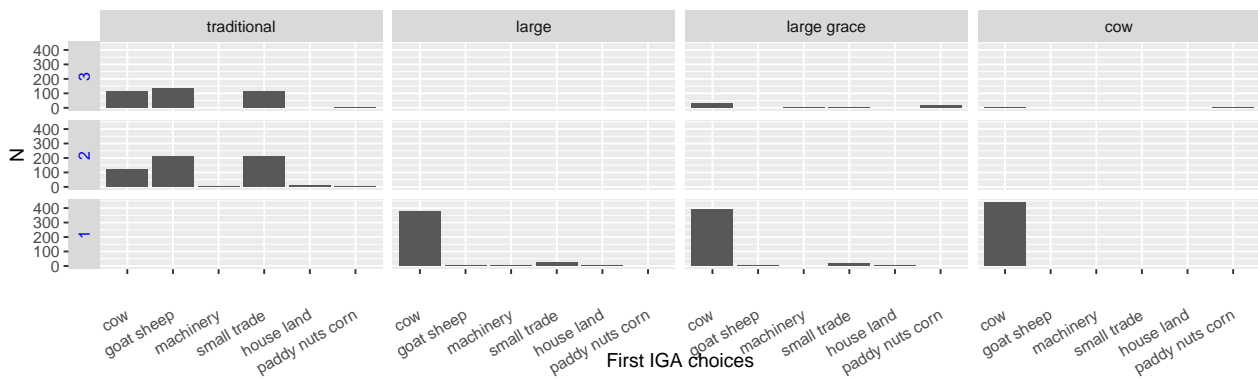


Figure 28: All income generating activity choices  
All of multiple investment choices are summed by arms and the number of IGAs and plotted as bars.

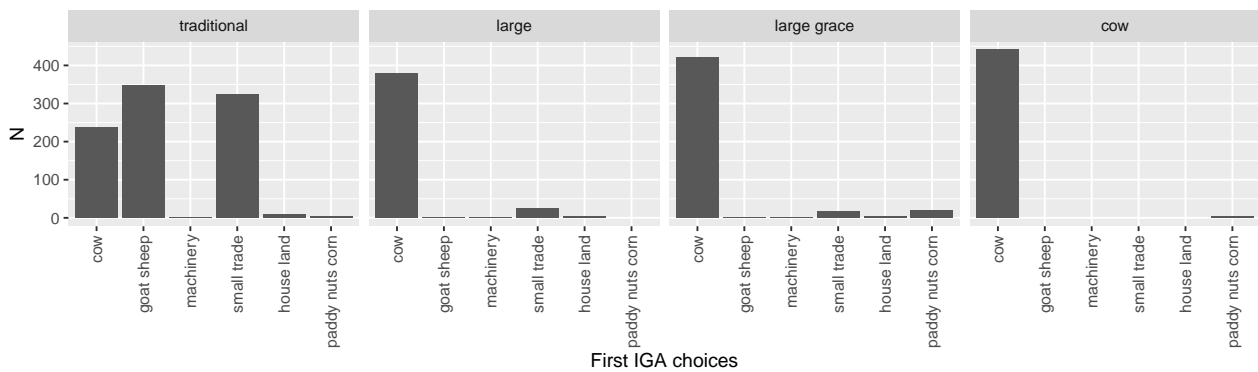


Figure 29: All income generating activity choices collapsed over different number of IGAs  
All of multiple investment choices are summed by arms and plotted as bars.

## VI.8 IGA

Finding VI.6 FIGURE ??, 14 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 investment choice by forcing to receive a cow. FIGURE 15 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 19 showing smaller net saving and repayment among traditional, the restriction on a project choice induced by a smaller loaned sum resulted in smaller returns. Between with or no grace period loans, cumulative net saving and repayment are both larger with loans with a grace period. No such difference is found between cow and other arms.