Estimating lending impacts using membership == 1, 4

June 12, 2018
10:01

Seiro Ito

# Contents

# I 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.

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 statitically meaningful difference is found for cumulative repayment plus cumulative net saving.

Traditional chose multiple small projects IGA is more diversified in the traditional than in other arms. With almost all the members in large-sized loan arms choosing cows, it suggests the presence of a poverty trap induced by a liquidity constraint and convexity in livestock production technology.

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.

Boys' junior high schooling suffered, but not girls' (Using original panel) Schooling was negatively affected for boys attending a junior high school, but such an effect was mitigated for girls under arms with a grace period. A weaker but similar pattern is also found for high school aged children. It hints increased labour demand for boys but the mechanism is unclear.

No concern for entrepreneurship No difference in project choices between cow and large, large grace. Members who participated do not seem to show concerns for (lack of) entrepreneurship.

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 difffer between arms. A greater swing in labour incomes for large.

# II Read files

Description of data:

ad Administrative data: Up to [-24, 48] months after first loan disbursement.

X1 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.

X2 Schooling panel after augmenting attrited children to X1. 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.

How I combined between pages: First, merge admin data ad with roster data ros with hhid, Year, Month as keys. Keep only dates when survey data match. Second, merge ad+ros with other data X1, X2, ass, ...

There are 4029 non-matching cases if we merge using Year, Month of IntDate in survey data and 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 2012-10-18. Below gives Year, Month in roster data with no match in admin data.

```
                YearMonthOfIntDate
AssignRegression 2011-October 2011-November 2012-January 2012-October
  traditional               0              0            0           108
  large                     0              1            0           222
  largeGrace                1              0           17           216
  cow                       4              0            0           248
  dropOuts                  1              0            0           173
  forcedDropOuts            0              0            0            35
                YearMonthOfIntDate
AssignRegression 2012-November 2012-December 2013-September 2013-October
  traditional              79             12               6            13
  large                    72              7               0             0
  largeGrace               36             35               0             0
  cow                      19              7               0             0
  dropOuts                 43             12               0             2
  forcedDropOuts           34              0               0             0
                YearMonthOfIntDate
AssignRegression 2014-January 2014-October 2014-November 2014-December
  traditional              5            26              2              8
  large                    0             0              0              0
  largeGrace               0             0              0              0
  cow                      0             0              0              0
  dropOuts                 6            39             35             22
  forcedDropOuts           0             0              2              0
                YearMonthOfIntDate
AssignRegression 2015-November 2015-December 2016-January 2017-January
  traditional              28              9             5            16
  large                     0              0             0             0
  largeGrace                0              0             0             0
  cow                       0              0             0             0
  dropOuts                 65             23            17            20
  forcedDropOuts            1              0             0             0
                YearMonthOfIntDate
AssignRegression 2017-February 2017-March 2017-April NA-NA
  traditional              19          0           5     1
  large                     0          0           0     0
  largeGrace                0          0           0     0
  cow                       0          0           0     0
  dropOuts                 61         14           8    18
  forcedDropOuts            0          0           0     0
```

No additional match if matching only with Year.

| | FALSE | TRUE |
|---|---|---|
| YearMonthMatch | 4029 | 12396 |
| YearMatch | 4029 | 12396 |

In roster + admin (base: roster): Tabulate hhid observations by survey round and Arm.

| survey | Arm traditional | large | large grace | cow | forcedDropOuts | dropOuts |
|---|---|---|---|---|---|---|
| 1 | 419 | 405 | 411 | 423 | 69 | 142 |
| 2 | 419 | 408 | 402 | 408 | 48 | 109 |
| 3 | 422 | 411 | 410 | 412 | 47 | 103 |
| 4 | 408 | 403 | 403 | 400 | 0 | 103 |

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 or dou.

| survey | Arm traditional | large | large grace | cow |
|---|---|---|---|---|
| 1 | 149 | 251 | 248 | 219 |
| 2 | 88 | 261 | 249 | 221 |
| 3 | 88 | 263 | 249 | 219 |
| 4 | 86 | 259 | 244 | 213 |

In roster + admin 2: If we keep Mstatus includes strings old, iRej, gEro, gRej, & TradGroup does not include strings tw or dou (relaxing DisDate1 is before 2015-01-01). This the data used in this note.

| survey | Arm traditional | large | large grace | cow | forcedDropOuts | dropOuts |
|---|---|---|---|---|---|---|
| 1 | 235 | 310 | 320 | 326 | 69 | 142 |
| 2 | 147 | 313 | 312 | 313 | 48 | 109 |
| 3 | 146 | 317 | 318 | 313 | 47 | 103 |
| 4 | 143 | 310 | 311 | 306 | 0 | 103 |

Its summation over arms in each round.

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| 1402 | 1242 | 1244 | 1173 |

This tabulation of survey vs. Arm shows addition from roster+admin 1 is mostly in round 1 for traditional but in all rds for other arms. FirstDisPeriod gives the period of first disbursement, and all credit reeceivers received loans by the end of 2015.

| DisDate1 | creditstatus No | <NA> |
|---|---|---|
| <NA> | 146 | 235 |

See the breakdown of first disbursement by Arm at rd 1.

| FirstDisPeriod | Arm traditional | large | large grace | cow | forcedDropOuts | dropOuts |
|---|---|---|---|---|---|---|
| BeforeJan2015 | 149 | 251 | 248 | 219 | 0 | 0 |
| Year2015 | 26 | 41 | 55 | 51 | 0 | 0 |
| Year2016 | 0 | 0 | 0 | 0 | 0 | 0 |
| AfterJan2017 | 0 | 0 | 0 | 0 | 0 | 0 |
| <NA> | 60 | 18 | 17 | 56 | 69 | 142 |

Schooling pattern in X1.

```
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
```

Save roster-admin data.

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

A snippet of admin + roster data:

```
      Arm    hhid mid survey    IntDate       Date CumRepaid AgeComputed
 1: large 7010101   3      1 2011-11-06       <NA>        NA           15
 2: large 7010101   3      2 2014-10-11 2014-10-01      7000           17
 3: large 7010101   3      3 2015-11-21 2015-11-01      9500           18
 4: large 7010101   3      4 2017-02-14 2017-02-01     15970           20
 5: large 7010102   5      1 2012-11-06       <NA>        NA            1
 6: large 7010102   5      2 2014-10-11 2014-10-01      8000            3
 7: large 7010102   5      3 2015-11-22 2015-11-01     12225            4
 8: large 7010102   5      4 2017-02-14 2017-02-01     16000            6
 9: large 7010105   3      1 2012-11-07       <NA>        NA            8
10: large 7010105   3      2 2014-10-11 2014-10-01      4925           10
11: large 7010105   3      3 2015-11-19 2015-11-01      8050           11
12: large 7010105   3      4 2017-02-14 2017-02-01     10050           13
```

In X1: Number of unique hhids by year (original entry) or Year (extracted from IntDate).

```
             year
NumberOfHHids 2012 2013 2014 2015 2017
         1542 2098  806 2282 2024 1797
```

```
             Year
NumberOfHHids 2011 2012 2013 2014 2015 2016 2017 <NA>
         1542    7 2030  691 2182 1366  575 1695  461
```

In X1: Number of observations tabulated by year (original entry) and round (survey).

```
      survey
year      1    2    3    4
  2012 2071    0    0    0
  2013  689    0    0    0
  2014    0 2179    0    0
  2015    0    0 1943    0
  2017    0    0    0 1697
```

In X1: 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 X2: Number of observations tabulated by year and round (survey).

```
      survey
year      1    2    3    4
```

```
  2012 2071    0    0    0
  2013  689    0    0    0
  2014    0 2598    0    0
  2015    0    0 2451    0
  2017    0    0    0 2203
```

In X2: RoundOrder.

```
      RoundOrder
year     1    2    3    4    5
  2012 2901    0    0    0    0
  2013    0 2901    0    0    0
  2014    0    0 2901    0    0
  2015    0    0    0 2901    0
  2017    0    0    0    0 2901
```

In X1: Number of observations tabulated by year 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 X2: Number of observations tabulated by year and age (AgeComputed).

```
      AgeComputed
year     5   6   7   8   9  10  11  12  13  14  15  16  17  18  19  20  21  22
  2012  48 261 354 340 232 393 156 291 155 161 219 116  81  94   0   0   0   0
  2013   0  48 261 354 340 232 393 156 291 155 161 219 116  81  94   0   0   0
  2014   0   0  48 261 354 340 232 393 156 291 155 161 219 116  81  94   0   0
  2015   0   0   0  48 261 354 340 232 393 156 291 155 161 219 116  81  94   0
  2017   0   0   0   0   0  48 261 354 340 232 393 156 291 155 161 219 116  81
      AgeComputed
year    23
  2012   0
  2013   0
  2014   0
  2015   0
  2017  94
```

```
                MonthsElapsedNA
Arm              FALSE TRUE
  traditional     2676 1127
  large           3015  778
  large grace     2884  813
  cow             2739 1071
  forcedDropOuts     0  359
  dropOuts           0  963
```

Save all data.

```
fwrite(x1, paste0(pathsavemembership1or4, "RosterAdminSchoolingData.prn"), sep = "\t", qu
fwrite(x2, paste0(pathsavemembership1or4, "RosterAdminSchoolingAugmentedData.prn"), sep =
fwrite(ass, paste0(pathsavemembership1or4, "AssetAdminData.prn"), sep = "\t", quote = F)
fwrite(lvo, paste0(pathsavemembership1or4, "LivestockAdminData.prn"), sep = "\t", quote =
fwrite(lab, paste0(pathsavemembership1or4, "LabourIncomeAdminData.prn"), sep = "\t", quote
fwrite(far, paste0(pathsavemembership1or4, "FarmRevenueAdminData.prn"), sep = "\t", quote
fwrite(con, paste0(pathsavemembership1or4, "ConsumptionAdminData.prn"), sep = "\t", quote
```

Further data preparations (trimming, round numbering, creating dummy vectors, interaction terms) for estimation. We keep observations if: Mstatus includes strings old, iRej, gEro, gRej, & TradGroup does not include strings tw or dou (relaxing DisDate1 is before 2015-01-01). Produces files: RosterAdminDataUsedForEstimation.prn, AssetAdminDataUsedForEstimation.prn, LivestockAdminDataUsedForEstimation.prn, LabourIncomeAdminDataUsedForEstimation.prn, FarmRevenueAdminDataUsedForEstimation.prn, ConsumptionAdminDataUsedForEstimation.prn.

| | file | tee | large | cow | large grace | traditional | dropOuts |
|---|---|---|---|---|---|---|---|
| 1: | x1 | 1 | 477 | 492 | 476 | 325 | 201 |
| 2: | x1 | 2 | 377 | 384 | 374 | 176 | 120 |
| 3: | x1 | 3 | 344 | 330 | 342 | 152 | 103 |
| 4: | x1 | 4 | 302 | 300 | 304 | 137 | 95 |
| 5: | x2 | 1 | 477 | 492 | 476 | 325 | 201 |
| 6: | x2 | 2 | 461 | 467 | 458 | 209 | 147 |
| 7: | x2 | 3 | 445 | 421 | 441 | 199 | 128 |
| 8: | x2 | 4 | 413 | 383 | 404 | 186 | 117 |
| 9: | ar | 1 | 721 | 753 | 715 | 515 | 293 |
| 10: | ar | 2 | 761 | 761 | 738 | 355 | 240 |
| 11: | ar | 3 | 768 | 750 | 763 | 359 | 222 |
| 12: | ar | 4 | 721 | 699 | 709 | 347 | 208 |
| 13: | ass | 2 | 313 | 313 | 311 | 147 | 109 |
| 14: | ass | 3 | 318 | 312 | 318 | 146 | 103 |
| 15: | ass | 4 | 309 | 306 | 311 | 143 | 103 |
| 16: | ass | 1 | 309 | 326 | 319 | 233 | 142 |
| 17: | lvo | 2 | 312 | 312 | 311 | 147 | 108 |
| 18: | lvo | 3 | 318 | 311 | 318 | 146 | 103 |
| 19: | lvo | 4 | 309 | 305 | 311 | 143 | 103 |
| 20: | lvo | 1 | 309 | 326 | 319 | 233 | 142 |
| 21: | lab | 2 | 399 | 378 | 382 | 172 | 132 |
| 22: | lab | 3 | 417 | 381 | 404 | 175 | 128 |
| 23: | lab | 4 | 404 | 377 | 391 | 178 | 128 |
| 24: | lab | 1 | 1432 | 1466 | 1422 | 1039 | 607 |
| 25: | far | 3 | 49 | 41 | 40 | 6 | 11 |
| 26: | far | 2 | 53 | 29 | 31 | 4 | 8 |
| 27: | far | 4 | 30 | 16 | 20 | 6 | 5 |
| 28: | far | 1 | 11 | 5 | 1 | 3 | NA |
| 29: | con | 2 | 313 | 314 | 311 | 147 | 107 |
| 30: | con | 3 | 318 | 312 | 318 | 146 | 102 |
| 31: | con | 4 | 309 | 306 | 311 | 143 | 102 |
| | file | tee | large | cow | large grace | traditional | dropOuts |

# III Descriptive statistics

```
             Arm           hhid             IntDate
 traditional   :  2   Min.   : 7010103   Min.   :2012-10-05 00:00:00
 large         : 10   1st Qu.: 7031905   1st Qu.:2012-10-21 00:00:00
 large grace   :  4   Median : 7064604   Median :2014-11-22 00:00:00
 cow           :  8   Mean   : 7553956   Mean   :2014-12-16 04:02:35
 forcedDropOuts:  0   3rd Qu.: 8148309   3rd Qu.:2016-01-26 00:00:00
 dropOuts      :457   Max.   :81710316   Max.   :2017-03-25 00:00:00
                                         NA's   :18
    DisDate1           Mstatus
 Min.   :NA    gErosion    :  0
 1st Qu.:NA    gRejection  :338
 Median :NA    iRejection  :119
 Mean   :NA    iReplacement:  0
 3rd Qu.:NA    newGroup    :  0
 Max.   :NA    oldMember   : 24
```


Figure 1: Household asset holding


Figure 2: Household asset holding

```
NA's   :481
```

```
             Arm           hhid             IntDate
traditional    : 2   Min.   :7010103   Min.   :2012-10-05 00:00:00
large          :10   1st Qu.:7020916   1st Qu.:2012-10-14 18:00:00
large grace    : 4   Median :7048754   Median :2012-10-19 12:00:00
cow            : 8   Mean   :7193491   Mean   :2012-10-25 16:00:00
forcedDropOuts: 0   3rd Qu.:7103865   3rd Qu.:2012-11-06 00:00:00
dropOuts       : 0   Max.   :8169815   Max.   :2012-12-11 00:00:00

   DisDate1        Date
Min.   :NA   Min.   :NA
1st Qu.:NA   1st Qu.:NA
Median :NA   Median :NA
Mean   :NA   Mean   :NA
3rd Qu.:NA   3rd Qu.:NA
Max.   :NA   Max.   :NA
NA's   :24   NA's   :24
```

# IV Estimation

## IV.1 Schooling

If using x1, retain only the complete portion of panel.

TABLE 1: OLS ESTIMATION OF SCHOOL ENROLLMENT

| covariates | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | x1 | | | x2 (Augmented data) | |
| UltraPoor | 0.936*** (0.011) | | | | |
| ModeratelyPoor | 0.939*** (0.016) | | | | |
| primary0512 | | 0.533*** (0.018) | 1.032*** (0.022) | 0.690*** (0.015) | 1.148*** (0.029) |
| junior1315 | | 0.584*** (0.016) | 1.007*** (0.027) | 0.611*** (0.011) | 0.999*** (0.044) |
| high1618 | | 0.467*** (0.018) | 0.918*** (0.061) | 0.354*** (0.019) | 0.729*** (0.052) |
| primary0512:UltraPoor | | 0.044 (0.030) | −0.029 (0.021) | 0.030 (0.036) | −0.046* (0.024) |
| junior1315:UltraPoor | | −0.031 (0.025) | −0.038 (0.029) | −0.043 (0.033) | −0.074 (0.046) |
| high1618:UltraPoor | | 0.036 (0.041) | −0.032 (0.060) | 0.004 (0.041) | −0.020 (0.055) |
| 6M repayment | | | 0.010 (0.024) | | −0.038 (0.033) |
| 6M net saving | | | −0.049 (0.105) | | −0.146 (0.137) |
| 6M other member Repaid | | | 0.000 (0.033) | | 0.099 (0.060) |
| primary0512:Female | | | −0.021 (0.021) | | −0.032 (0.031) |
| junior1315:Female | | | 0.030 (0.023) | | 0.034 (0.045) |
| high1618:Female | | | 0.090 (0.062) | | 0.144** (0.064) |
| primary0512:UltraPoor:Female | | | 0.048** (0.024) | | 0.059 (0.039) |
| junior1315:UltraPoor:Female | | | 0.020 (0.033) | | 0.048 (0.059) |
| high1618:UltraPoor:Female | | | 0.055 (0.067) | | −0.004 (0.078) |
| number of clusters | 75 | 75 | 68 | 76 | 68 |
| $\bar{R}^2$ | 0.668 | 0.895 | 0.944 | 0.764 | 0.802 |
| $N$ | 4336 | 4234 | 2828 | 6217 | 3917 |

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). x1 is complete portion of panel. x2 is a panel data augmenting attrited members in x1 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%, respetively. Standard errors are clustered at group (village) level.

Check number of observations in each cell:

TABLE 2: NUMBER OF OBSERVATIONS IN EACH CELLS OF SCHOOLING REGRESSION IN TABLE 1

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | x1 | | | x2 (Augmented data) | | |
| Traditional | | | | | | |
| × Male | 192 | 192 | 192 | 272 | 272 | 272 |
| × Female | 181 | 181 | 181 | 233 | 233 | 233 |
| × Primary0512 | 174 | 174 | 174 | 208 | 208 | 208 |
| × Male × Primary0512 | 80 | 80 | 80 | 97 | 97 | 97 |
| × Female × Primary0512 | 94 | 94 | 94 | 111 | 111 | 111 |
| × Junior1315 | 148 | 148 | 148 | 191 | 191 | 191 |
| × Male × Junior1315 | 87 | 87 | 87 | 105 | 105 | 105 |
| × Female × Junior1315 | 61 | 61 | 61 | 86 | 86 | 86 |
| × High1618 | 51 | 51 | 51 | 106 | 106 | 106 |
| × Male × High1618 | 25 | 25 | 25 | 70 | 70 | 70 |
| × Female × High1618 | 26 | 26 | 26 | 36 | 36 | 36 |
| Large | | | | | | |
| × Male | 482 | 482 | 482 | 669 | 669 | 669 |
| × Female | 352 | 352 | 352 | 496 | 496 | 496 |
| × Primary0512 | 438 | 438 | 438 | 534 | 534 | 534 |
| × Male × Primary0512 | 247 | 247 | 247 | 280 | 280 | 280 |
| × Female × Primary0512 | 191 | 191 | 191 | 254 | 254 | 254 |
| × Junior1315 | 270 | 270 | 270 | 378 | 378 | 378 |
| × Male × Junior1315 | 152 | 152 | 152 | 212 | 212 | 212 |
| × Female × Junior1315 | 118 | 118 | 118 | 166 | 166 | 166 |
| × High1618 | 126 | 126 | 126 | 253 | 253 | 253 |
| × Male × High1618 | 83 | 83 | 83 | 177 | 177 | 177 |
| × Female × High1618 | 43 | 43 | 43 | 76 | 76 | 76 |
| Large grace | | | | | | |
| × Male | 382 | 382 | 382 | 568 | 568 | 568 |
| × Female | 433 | 433 | 433 | 562 | 562 | 562 |
| × Primary0512 | 433 | 433 | 433 | 522 | 522 | 522 |
| × Male × Primary0512 | 197 | 197 | 197 | 235 | 235 | 235 |
| × Female × Primary0512 | 236 | 236 | 236 | 287 | 287 | 287 |
| × Junior1315 | 271 | 271 | 271 | 365 | 365 | 365 |
| × Male × Junior1315 | 125 | 125 | 125 | 182 | 182 | 182 |
| × Female × Junior1315 | 146 | 146 | 146 | 183 | 183 | 183 |
| × High1618 | 111 | 111 | 111 | 243 | 243 | 243 |
| × Male × High1618 | 60 | 60 | 60 | 151 | 151 | 151 |
| × Female × High1618 | 51 | 51 | 51 | 92 | 92 | 92 |
| Cow | | | | | | |
| × Male | 413 | 413 | 413 | 574 | 574 | 574 |
| × Female | 393 | 393 | 393 | 543 | 543 | 543 |
| × Primary0512 | 453 | 453 | 453 | 554 | 554 | 554 |
| × Male × Primary0512 | 212 | 212 | 212 | 254 | 254 | 254 |
| × Female × Primary0512 | 241 | 241 | 241 | 300 | 300 | 300 |
| × Junior1315 | 259 | 259 | 259 | 364 | 364 | 364 |
| × Male × Junior1315 | 138 | 138 | 138 | 189 | 189 | 189 |
| × Female × Junior1315 | 121 | 121 | 121 | 175 | 175 | 175 |
| × High1618 | 94 | 94 | 94 | 199 | 199 | 199 |
| × Male × High1618 | 63 | 63 | 63 | 131 | 131 | 131 |
| × Female × High1618 | 31 | 31 | 31 | 68 | 68 | 68 |
| total | 2828 | 2828 | 2828 | 3917 | 3917 | 3917 |

Source: GUK administrative and survey data.

Notes: 1.

2.

TABLE 3: OLS ESTIMATION OF SCHOOL ENROLLMENT, DIFFERENT GROUPING

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | x1 | | x2 (Augmented data) | | x1 | | x2 (Augmented data) | |
| primary0512 | 0.993*** | 1.038*** | 1.085*** | 1.118*** | 1.005*** | 1.008*** | 1.089*** | 1.131*** |
| | (0.032) | (0.026) | (0.038) | (0.052) | (0.017) | (0.020) | (0.024) | (0.033) |
| junior1315 | 1.029*** | 1.036*** | 1.007*** | 1.038*** | 1.019*** | 1.032*** | 0.967*** | 1.010*** |
| | (0.012) | (0.016) | (0.053) | (0.060) | (0.016) | (0.016) | (0.039) | (0.048) |
| high1618 | 0.994*** | 0.966*** | 0.786*** | 0.746*** | 0.949*** | 0.920*** | 0.755*** | 0.758*** |
| | (0.037) | (0.075) | (0.054) | (0.069) | (0.032) | (0.045) | (0.044) | (0.049) |
| primary0512:Female | | −0.063* | | −0.019 | | 0.010 | | −0.008 |
| | | (0.037) | | (0.056) | | (0.023) | | (0.030) |
| junior1315:Female | | 0.012 | | −0.015 | | −0.012 | | −0.007 |
| | | (0.012) | | (0.072) | | (0.017) | | (0.036) |
| high1618:Female | | 0.078 | | 0.188 | | 0.095** | | 0.116* |
| | | (0.075) | | (0.132) | | (0.044) | | (0.068) |
| primary0512:LargeSize | 0.008 | −0.037 | −0.001 | −0.017 | | | | |
| | (0.032) | (0.026) | (0.037) | (0.052) | | | | |
| junior1315:LargeSize | −0.054*** | −0.073*** | −0.076 | −0.121* | | | | |
| | (0.013) | (0.024) | (0.055) | (0.064) | | | | |
| high1618:LargeSize | −0.076* | −0.086 | −0.069 | −0.051 | | | | |
| | (0.044) | (0.082) | (0.059) | (0.074) | | | | |
| primary0512:LargeSize:Female | | 0.085** | | 0.032 | | | | |
| | | (0.039) | | (0.059) | | | | |
| junior1315:LargeSize:Female | | 0.038 | | 0.097 | | | | |
| | | (0.027) | | (0.079) | | | | |
| high1618:LargeSize:Female | | 0.053 | | −0.053 | | | | |
| | | (0.085) | | (0.139) | | | | |
| primary0512:WithGrace | | | | | −0.003 | −0.005 | 0.002 | −0.013 |
| | | | | | (0.018) | (0.021) | (0.023) | (0.031) |
| junior1315:WithGrace | | | | | −0.058*** | −0.110*** | −0.034 | −0.099* |
| | | | | | (0.017) | (0.030) | (0.041) | (0.055) |
| high1618:WithGrace | | | | | −0.034 | −0.059 | −0.043 | −0.066 |
| | | | | | (0.045) | (0.069) | (0.053) | (0.063) |
| primary0512:WithGrace:Female | | | | | | 0.004 | | 0.028 |
| | | | | | | (0.026) | | (0.035) |
| junior1315:WithGrace:Female | | | | | | 0.105*** | | 0.134** |
| | | | | | | (0.036) | | (0.056) |
| high1618:WithGrace:Female | | | | | | 0.060 | | 0.050 |
| | | | | | | (0.071) | | (0.087) |
| 6M repayment | 0.016 | 0.011 | −0.036 | −0.039 | 0.015 | 0.008 | −0.038 | −0.041 |
| | (0.025) | (0.025) | (0.033) | (0.033) | (0.025) | (0.024) | (0.033) | (0.032) |
| 6M net saving | −0.018 | −0.025 | −0.086 | −0.097 | −0.041 | −0.048 | −0.128 | −0.159 |
| | (0.110) | (0.108) | (0.133) | (0.129) | (0.111) | (0.108) | (0.140) | (0.136) |
| 6M other member Repaid | −0.002 | 0.001 | 0.111* | 0.109** | 0.002 | 0.003 | 0.105* | 0.104* |
| | (0.031) | (0.030) | (0.058) | (0.056) | (0.030) | (0.029) | (0.060) | (0.058) |
| number of clusters | 68 | 68 | 68 | 68 | 68 | 68 | 68 | 68 |
| $\bar{R}^2$ | 0.943 | 0.944 | 0.801 | 0.803 | 0.943 | 0.944 | 0.801 | 0.803 |
| $N$ | 2828 | 2828 | 3917 | 3917 | 2828 | 2828 | 3917 | 3917 |

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). x1 is complete portion of panel. x2 is a panel data augmenting attrited members in x1 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%, respetively. Standard errors are clustered at group (village) level.

TABLE 4: NUMBER OF OBSERVATIONS IN EACH CELLS OF SCHOOLING REGRESSION IN TABLE 3

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| Small Size | | | | |
| × Male | 192 | 192 | 272 | 272 |
| × Female | 181 | 181 | 233 | 233 |
| × Primary0512 | 174 | 174 | 208 | 208 |
| × Male × Primary0512 | 80 | 80 | 97 | 97 |
| × Female × Primary0512 | 94 | 94 | 111 | 111 |
| × Junior1315 | 148 | 148 | 191 | 191 |
| × Male × Junior1315 | 87 | 87 | 105 | 105 |
| × Female × Junior1315 | 61 | 61 | 86 | 86 |
| × High1618 | 51 | 51 | 106 | 106 |
| × Male × High1618 | 25 | 25 | 70 | 70 |
| × Female × High1618 | 26 | 26 | 36 | 36 |
| Large Size | | | | |
| × Male | 1277 | 1277 | 1811 | 1811 |
| × Female | 1178 | 1178 | 1601 | 1601 |
| × Primary0512 | 1324 | 1324 | 1610 | 1610 |
| × Male × Primary0512 | 656 | 656 | 769 | 769 |
| × Female × Primary0512 | 668 | 668 | 841 | 841 |
| × Junior1315 | 800 | 800 | 1107 | 1107 |
| × Male × Junior1315 | 415 | 415 | 583 | 583 |
| × Female × Junior1315 | 385 | 385 | 524 | 524 |
| × High1618 | 331 | 331 | 695 | 695 |
| × Male × High1618 | 206 | 206 | 459 | 459 |
| × Female × High1618 | 125 | 125 | 236 | 236 |
| total | 2828 | 2828 | 3917 | 3917 |

| | (1) | (2) | (3) | (4) |
|---|---|---|---|---|
| No Grace | | | | |
| × Male | 674 | 674 | 941 | 941 |
| × Female | 533 | 533 | 729 | 729 |
| × Primary0512 | 612 | 612 | 742 | 742 |
| × Male × Primary0512 | 327 | 327 | 377 | 377 |
| × Female × Primary0512 | 285 | 285 | 365 | 365 |
| × Junior1315 | 418 | 418 | 569 | 569 |
| × Male × Junior1315 | 239 | 239 | 317 | 317 |
| × Female × Junior1315 | 179 | 179 | 252 | 252 |
| × High1618 | 177 | 177 | 359 | 359 |
| × Male × High1618 | 108 | 108 | 247 | 247 |
| × Female × High1618 | 69 | 69 | 112 | 112 |
| Grace | | | | |
| × Male | 795 | 795 | 1142 | 1142 |
| × Female | 826 | 826 | 1105 | 1105 |
| × Primary0512 | 886 | 886 | 1076 | 1076 |
| × Male × Primary0512 | 409 | 409 | 489 | 489 |
| × Female × Primary0512 | 477 | 477 | 587 | 587 |
| × Junior1315 | 530 | 530 | 729 | 729 |
| × Male × Junior1315 | 263 | 263 | 371 | 371 |
| × Female × Junior1315 | 267 | 267 | 358 | 358 |
| × High1618 | 205 | 205 | 442 | 442 |
| × Male × High1618 | 123 | 123 | 282 | 282 |
| × Female × High1618 | 82 | 82 | 160 | 160 |
| total | 2828 | 2828 | 3917 | 3917 |

Source: GUK administrative and survey data.

Notes: 1.

2.

TABLE 5: OLS ESTIMATION OF SCHOOL ENROLLMENT, ULTRA POOR VS. MODERATELY POOR

| covariates | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| | x1 | | | x2 (Augmented data) | |
| UltraPoor | 0.936*** (0.011) | | | | |
| ModeratelyPoor | 0.939*** (0.016) | | | | |
| primary0512 | | 0.533*** (0.018) | 1.032*** (0.022) | 0.690*** (0.015) | 1.148*** (0.029) |
| junior1315 | | 0.584*** (0.016) | 1.007*** (0.027) | 0.611*** (0.011) | 0.999*** (0.044) |
| high1618 | | 0.467*** (0.018) | 0.918*** (0.061) | 0.354*** (0.019) | 0.729*** (0.052) |
| primary0512:UltraPoor | | 0.044 (0.030) | −0.029 (0.021) | 0.030 (0.036) | −0.046* (0.024) |
| junior1315:UltraPoor | | −0.031 (0.025) | −0.038 (0.029) | −0.043 (0.033) | −0.074 (0.046) |
| high1618:UltraPoor | | 0.036 (0.041) | −0.032 (0.060) | 0.004 (0.041) | −0.020 (0.055) |
| 6M repayment | | | 0.010 (0.024) | | −0.038 (0.033) |
| 6M net saving | | | −0.049 (0.105) | | −0.146 (0.137) |
| 6M other member Repaid | | | 0.000 (0.033) | | 0.099 (0.060) |
| primary0512:Female | | | −0.021 (0.021) | | −0.032 (0.031) |
| junior1315:Female | | | 0.030 (0.023) | | 0.034 (0.045) |
| high1618:Female | | | 0.090 (0.062) | | 0.144** (0.064) |
| primary0512:UltraPoor:Female | | | 0.048** (0.024) | | 0.059 (0.039) |
| junior1315:UltraPoor:Female | | | 0.020 (0.033) | | 0.048 (0.059) |
| high1618:UltraPoor:Female | | | 0.055 (0.067) | | −0.004 (0.078) |
| number of clusters | 75 | 75 | 68 | 76 | 68 |
| $\bar{R}^2$ | 0.668 | 0.895 | 0.944 | 0.764 | 0.802 |
| $N$ | 4336 | 4234 | 2828 | 6217 | 3917 |

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). x1 is complete portion of panel. x2 is a panel data augmenting attrited members in x1 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%, respetively. Standard errors are clustered at group (village) level.

Finding IV.1 TABLE 1 shows school enrollment is higher for x1 than x2, indicating nonattriting members are school goers. When using x1 data, cow and large grace show negative impacts for older children, yet not for girls in junior high schools. In fact, (1) shows that girles in high school have higher enrollment in x1 and both junior and high schools for x2 in (4). This may be due to increased labour demand within a family for boys. Similar patterns are found in x2 data, yet not statistically significant, probably because data augmentation introduces more school dropouts among older girls. In TABLE 3 when using with grace/without grace grouping, the pattern becomes statistically significant for both x1 and x2. 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 5.

Individuals with NAs in Schooling. Mostly older children (14.9 in x1, 16.5 in x2) but with a high reported enrollment rate (0.8 for x1, 0.2 for x2) at rd 4. We will substitute relevant schooling levels to Schooling.

```
   1
4336
```

```
   0    1
 371 3965
```

Obs for x1.

```
   2    3    4
1070 1065 1066
```

Obs for x1 and admin repayment data.

```
  2   3   4
  1 636 634
```

```
  2   3   4
  2 992 924
```

Obs for survey x2.

```
   2    3    4
1732 1633 1503
```

Obs for survey x2 and admin repayment data.

```
  2   3   4
  2 992 924
```

```
excl.base ← "Time.?2|Poor|Size|With|Pri.*[FTLC]"
excl.1 ← "RM|Time|Head|Eldest|dummy[PJH].*[TLC]|Fem"
excl.2 ← "RM|Head|Time|Eldest|dummy[PJH].*Tr"
excl.3 ← "RM|Time|dummy[PJH].*Tr"
excl.4 ← "Time|dummy[PJH].*Tr"
excl.5 ← "RM|Time|Head|Eldest|dummy[PJH].*[TLC]|Fem"
excl.6 ← "RM|Time|dummy[PJH].*Tr"
excl.7 ← "Time|dummy[PJH].*Tr"
exclg.base ← "dummy[TLC]|Time.?2|Poor|Size|Witho|Pri.*WithG|Pri.*F"
exclg.1 ← "RM|Time|Head|Eldest|Fem"
exclg.2 ← "RM|Head|Time|Eldest"
exclg.3 ← "RM|Time"
exclg.4 ← "Time"
exclg.5 ← "RM|Time|Head|Eldest|Fem"
exclg.6 ← "RM|Time"
exclg.7 ← "Time"
exclp.base ← "dummy[TLC]|Time.?2|Size|With|Mod|Pri.*U"
exclp.1 ← "RM|Time|Head|Eldest|Fem"
exclp.2 ← "RM|Time|Head|Eldest"
exclp.3 ← "RM|Time"
exclp.4 ← "Time"
exclp.5 ← "RM|Time|Head|Eldest|Fem"
exclp.6 ← "RM|Time"
exclp.7 ← "Time"
excls.base ← "dummy[TC]|Grace|^dummyLargeS|Sma|Large\\.|Large$|Time.?2|Poor|With|Pri.*La
excls.1 ← "RM|Time|Head|Eldest|Fem"
excls.2 ← "RM|Time|Head|Eldest"
```

```
excls.3 ← "RM|Time"
excls.4 ← "Time"
excls.5 ← "RM|Time|Head|Eldest|Fem"
excls.6 ← "RM|Time"
excls.7 ← "Time"
```

TABLE 6: FD ESTIMATION OF SCHOOL ENROLLMENT

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | x1 | | | | x2 | | |
| Primary | 0.12*** | 0.13*** | 0.14*** | 0.15*** | 0.11*** | 0.16*** | 0.19*** |
| | (0.01) | (0.01) | (0.02) | (0.06) | (0.01) | (0.03) | (0.07) |
| Junior | 0.02*** | 0.03** | 0.04** | 0.06* | −0.03** | 0.02 | 0.04 |
| | (0.01) | (0.01) | (0.02) | (0.03) | (0.01) | (0.03) | (0.06) |
| High | 0.00 | −0.01 | 0.00 | | −0.07*** | −0.04 | |
| | (0.01) | (0.02) | (0.03) | | (0.02) | (0.04) | |
| Traditional | 0.01 | 0.01 | 0.01 | −0.05 | −0.01 | −0.01 | −0.06 |
| | (0.02) | (0.02) | (0.02) | (0.03) | (0.02) | (0.03) | (0.05) |
| Large | −0.02** | −0.02** | −0.02** | −0.10** | −0.04** | −0.05*** | −0.11* |
| | (0.01) | (0.01) | (0.01) | (0.04) | (0.02) | (0.02) | (0.06) |
| LargeGrace | −0.02* | −0.02* | −0.02 | −0.10** | −0.04*** | −0.05** | −0.12* |
| | (0.01) | (0.01) | (0.01) | (0.04) | (0.02) | (0.02) | (0.06) |
| Cow | −0.02 | −0.02 | −0.02 | −0.10** | −0.04** | −0.04** | −0.11 |
| | (0.02) | (0.02) | (0.02) | (0.05) | (0.02) | (0.02) | (0.06) |
| Female | | −0.01 | −0.01 | 0.03** | | −0.03*** | 0.01 |
| | | (0.01) | (0.01) | (0.01) | | (0.01) | (0.02) |
| Junior × Female | | −0.01 | −0.02 | −0.06 | | 0.04 | −0.00 |
| | | (0.03) | (0.03) | (0.05) | | (0.05) | (0.09) |
| High × Female | | 0.04 | 0.04 | −0.02 | | 0.06 | −0.08 |
| | | (0.03) | (0.03) | (0.10) | | (0.05) | (0.13) |
| Junior × Large | | 0.02 | 0.01 | 0.08* | | −0.02 | 0.05 |
| | | (0.03) | (0.03) | (0.05) | | (0.03) | (0.06) |
| High × Large | | 0.03 | 0.03 | 0.12** | | 0.04 | 0.11 |
| | | (0.03) | (0.03) | (0.06) | | (0.04) | (0.08) |
| Junior × LargeGrace | | 0.00 | 0.00 | 0.07 | | −0.02 | 0.09 |
| | | (0.03) | (0.03) | (0.05) | | (0.03) | (0.06) |
| High × LargeGrace | | 0.05 | 0.04 | 0.13** | | 0.04 | 0.14* |
| | | (0.03) | (0.03) | (0.06) | | (0.03) | (0.08) |
| Junior × Cow | | 0.01 | 0.01 | 0.06 | | 0.02 | 0.08 |
| | | (0.03) | (0.03) | (0.06) | | (0.03) | (0.08) |
| High × Cow | | 0.04 | 0.04 | 0.14* | | 0.00 | 0.07 |
| | | (0.03) | (0.03) | (0.07) | | (0.04) | (0.10) |
| Junior × Large × Female | | 0.02 | 0.01 | 0.03 | | −0.08 | −0.06 |
| | | (0.04) | (0.04) | (0.04) | | (0.06) | (0.09) |
| High × Large × Female | | 0.01 | 0.01 | 0.04 | | −0.03 | 0.01 |
| | | (0.04) | (0.04) | (0.09) | | (0.07) | (0.13) |
| Junior × LargeGrace × Female | | 0.07* | 0.07* | 0.08 | | −0.01 | −0.02 |
| | | (0.04) | (0.04) | (0.06) | | (0.06) | (0.10) |
| High × LargeGrace × Female | | −0.01 | −0.01 | 0.02 | | −0.06 | 0.05 |
| | | (0.04) | (0.04) | (0.09) | | (0.07) | (0.13) |
| Junior × Cow × Female | | 0.03 | 0.03 | 0.05 | | −0.01 | 0.01 |
| | | (0.05) | (0.05) | (0.06) | | (0.06) | (0.10) |
| High × Cow × Female | | 0.09* | 0.10* | 0.11 | | −0.13** | −0.04 |
| | | (0.05) | (0.06) | (0.12) | | (0.06) | (0.17) |
| Head literate | | | −0.01 | −0.02 | | −0.01 | −0.00 |
| | | | (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 | | | −0.01 | 0.01 | | −0.01 | −0.01 |
| | | | (0.01) | (0.02) | | (0.01) | (0.02) |
| EldestDaughter | | | −0.01 | −0.00 | | −0.01 | −0.00 |
| | | | (0.01) | (0.01) | | (0.01) | (0.02) |
| 6M missw | | | | −0.00 | | | 0.01 |
| | | | | (0.01) | | | (0.01) |
| 6M repayment | | | | −0.02 | | | −0.04 |
| | | | | (0.02) | | | (0.03) |
| 6M net saving | | | | −0.16 | | | −0.28* |
| | | | | (0.11) | | | (0.15) |
| 6M other member net saving | | | | 0.35** | | | 0.17 |
| | | | | (0.17) | | | (0.29) |
| 6M other member Repaid | | | | 0.01 | | | 0.03 |
| | | | | (0.04) | | | (0.05) |
| $T = 2$ | 0 | 0 | 0 | 3 | 134 | 134 | 116 |
| $T = 3$ | 3 | 3 | 3 | 634 | 183 | 183 | 900 |
| $T = 4$ | 1065 | 1065 | 1065 | 0 | 1456 | 1456 | 0 |
| $\bar{R}^2$ | 0.071 | 0.069 | 0.069 | 0.016 | 0.047 | 0.047 | 0.03 |
| $N$ | 3201 | 3201 | 3186 | 1269 | 4868 | 4827 | 1906 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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%, respetively. Standard errors are clustered at group (village) level.

TABLE 7: FD ESTIMATION OF NET SCHOOL ENROLLMENT, ULTRA POOR VS. MODERATELY POOR

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | x1 | | | | x2 | | |
| Primary | 0.11*** | 0.12*** | 0.14*** | 0.05** | 0.09*** | 0.14*** | 0.05 |
| | (0.01) | (0.01) | (0.02) | (0.02) | (0.01) | (0.03) | (0.04) |
| Junior | 0.02*** | 0.02*** | 0.04** | 0.01 | −0.05*** | 0.01 | −0.02 |
| | (0.01) | (0.01) | (0.02) | (0.02) | (0.01) | (0.03) | (0.04) |
| High | −0.02 | −0.01 | 0.01 | −0.02 | −0.09*** | −0.04 | −0.06 |
| | (0.01) | (0.01) | (0.02) | (0.02) | (0.01) | (0.03) | (0.05) |
| UltraPoor | −0.01* | −0.01* | −0.01* | −0.02* | −0.02** | −0.02** | −0.01 |
| | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.01) | (0.02) |
| Female | | −0.01 | −0.01 | 0.03** | | −0.03*** | 0.01 |
| | | (0.01) | (0.01) | (0.01) | | (0.01) | (0.02) |
| Primary × Female | | −0.08*** | −0.08*** | 0.02 | | −0.01 | 0.11* |
| | | (0.03) | (0.03) | (0.04) | | (0.04) | (0.06) |
| Junior × Female | | −0.08*** | −0.08*** | −0.05* | | − 0.00 | 0.05 |
| | | (0.03) | (0.03) | (0.03) | | (0.04) | (0.06) |
| Junior × UltraPoor | − 0.00 | − 0.00 | − 0.00 | 0.01 | −0.02 | −0.02 | −0.03 |
| | (0.02) | (0.02) | (0.02) | (0.02) | (0.02) | (0.02) | (0.03) |
| High × UltraPoor | 0.02 | 0.02 | 0.02 | 0.03 | −0.01 | −0.01 | 0.01 |
| | (0.02) | (0.02) | (0.02) | (0.03) | (0.02) | (0.03) | (0.04) |
| Junior × UltraPoor × Female | | 0.02 | 0.02 | 0.07** | | 0.01 | 0.05 |
| | | (0.04) | (0.04) | (0.04) | | (0.05) | (0.06) |
| High × UltraPoor × Female | | −0.03 | −0.03 | 0.05 | | −0.01 | 0.08 |
| | | (0.04) | (0.04) | (0.04) | | (0.06) | (0.08) |
| Head literate | | | −0.01 | −0.01 | | −0.02 | − 0.00 |
| | | | (0.02) | (0.01) | | (0.02) | (0.02) |
| 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 |
| | | | (0.01) | (0.01) | | (0.01) | (0.02) |
| EldestDaughter | | | − 0.00 | 0.00 | | − 0.00 | 0.00 |
| | | | (0.01) | (0.01) | | (0.01) | (0.02) |
| 6M missw | | | | − 0.00 | | | 0.01 |
| | | | | (0.01) | | | (0.01) |
| 6M repayment | | | | −0.01 | | | −0.04 |
| | | | | (0.02) | | | (0.03) |
| 6M net saving | | | | −0.16 | | | −0.27* |
| | | | | (0.11) | | | (0.15) |
| 6M other member net saving | | | | 0.34** | | | 0.18 |
| | | | | (0.16) | | | (0.29) |
| 6M other member Repaid | | | | − 0.00 | | | 0.03 |
| | | | | (0.04) | | | (0.05) |
| $T = 2$ | 0 | 0 | 0 | 3 | 134 | 134 | 116 |
| $T = 3$ | 3 | 3 | 3 | 634 | 183 | 183 | 900 |
| $T = 4$ | 1065 | 1065 | 1065 | 0 | 1456 | 1456 | 0 |
| $\bar{R}^2$ | 0.07 | 0.07 | 0.07 | 0.016 | 0.047 | 0.047 | 0.031 |
| $N$ | 3201 | 3201 | 3186 | 1269 | 4868 | 4827 | 1906 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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%, respetively. Standard errors are clustered at group (village) level.

TABLE 8: FD ESTIMATION OF SCHOOL ENROLLMENT, WITH VS. WITHOUT A GRACE PERIOD

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | x1 | | | | x2 | | |
| Primary | 0.11*** | 0.11*** | 0.13*** | 0.04* | 0.09*** | 0.13*** | 0.06 |
| | (0.01) | (0.01) | (0.02) | (0.02) | (0.01) | (0.03) | (0.04) |
| Junior | 0.02** | 0.02*** | 0.04* | 0.01 | −0.06*** | −0.02 | −0.05 |
| | (0.01) | (0.01) | (0.02) | (0.02) | (0.02) | (0.03) | (0.04) |
| High | −0.02** | −0.01 | 0.00 | −0.02 | −0.10*** | −0.05* | −0.05 |
| | (0.01) | (0.01) | (0.02) | (0.02) | (0.01) | (0.03) | (0.04) |
| 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) | (0.02) |
| Female | | −0.01 | −0.01 | 0.03** | | −0.03*** | 0.01 |
| | | (0.01) | (0.01) | (0.01) | | (0.01) | (0.02) |
| Junior × Female | | −0.01 | −0.01 | −0.04** | | −0.01 | −0.05 |
| | | (0.02) | (0.02) | (0.02) | | (0.03) | (0.04) |
| High × Female | | 0.04* | 0.04 | 0.00 | | 0.04 | −0.07 |
| | | (0.02) | (0.03) | (0.03) | | (0.04) | (0.05) |
| Junior × WithGrace | − 0.00 | −0.01 | −0.01 | − 0.00 | 0.01 | 0.01 | 0.04 |
| | (0.02) | (0.02) | (0.02) | (0.03) | (0.02) | (0.02) | (0.04) |
| High × WithGrace | 0.02 | 0.02 | 0.02 | 0.04 | 0.01 | 0.00 | 0.02 |
| | (0.02) | (0.02) | (0.02) | (0.03) | (0.03) | (0.03) | (0.04) |
| Junior × WithGrace × Female | | 0.04 | 0.04 | 0.04 | | 0.03 | 0.04 |
| | | (0.03) | (0.03) | (0.03) | | (0.04) | (0.05) |
| High × WithGrace × Female | | 0.03 | 0.04 | 0.02 | | −0.07 | 0.02 |
| | | (0.04) | (0.04) | (0.04) | | (0.05) | (0.07) |
| Head literate | | | −0.01 | −0.01 | | −0.02 | − 0.00 |
| | | | (0.02) | (0.01) | | (0.02) | (0.02) |
| 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 |
| | | | (0.01) | (0.01) | | (0.01) | (0.02) |
| EldestDaughter | | | − 0.00 | − 0.00 | | − 0.00 | 0.00 |
| | | | (0.01) | (0.01) | | (0.01) | (0.02) |
| 6M missw | | | | − 0.00 | | | 0.01 |
| | | | | (0.01) | | | (0.01) |
| 6M repayment | | | | −0.02 | | | −0.04 |
| | | | | (0.02) | | | (0.03) |
| 6M net saving | | | | −0.15 | | | −0.27* |
| | | | | (0.11) | | | (0.15) |
| 6M other member net saving | | | | 0.31* | | | 0.15 |
| | | | | (0.18) | | | (0.30) |
| 6M other member Repaid | | | | 0.01 | | | 0.03 |
| | | | | (0.04) | | | (0.05) |
| $T = 2$ | 0 | 0 | 0 | 3 | 134 | 134 | 116 |
| $T = 3$ | 3 | 3 | 3 | 634 | 183 | 183 | 900 |
| $T = 4$ | 1065 | 1065 | 1065 | 0 | 1456 | 1456 | 0 |
| $\bar{R}^2$ | 0.07 | 0.07 | 0.07 | 0.013 | 0.046 | 0.047 | 0.03 |
| $N$ | 3201 | 3201 | 3186 | 1269 | 4868 | 4827 | 1906 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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%, respetively. Standard errors are clustered at group (village) level.

TABLE 9: FD ESTIMATION OF SCHOOL ENROLLMENT, SMALL SIZE VS. LARGE SIZE

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | x1 | | | | x2 | | |
| Primary | 0.10*** | 0.11*** | 0.12*** | 0.04** | 0.08*** | 0.13*** | 0.06 |
| | (0.01) | (0.01) | (0.02) | (0.02) | (0.01) | (0.03) | (0.05) |
| Junior | 0.02* | 0.03* | 0.04* | −0.01 | −0.05** | −0.01 | −0.04 |
| | (0.01) | (0.01) | (0.02) | (0.02) | (0.02) | (0.03) | (0.04) |
| High | −0.03* | −0.03 | −0.02 | −0.06* | −0.12*** | −0.08* | −0.09 |
| | (0.02) | (0.02) | (0.03) | (0.03) | (0.02) | (0.04) | (0.06) |
| Female | | −0.01 | −0.01 | 0.03** | | −0.03*** | 0.01 |
| | | (0.01) | (0.01) | (0.01) | | (0.01) | (0.02) |
| Primary × Female | | −0.05 | −0.05 | 0.03 | | 0.02 | 0.12 |
| | | (0.05) | (0.05) | (0.10) | | (0.07) | (0.13) |
| Junior × Female | | −0.06 | −0.06 | −0.04 | | 0.02 | 0.09 |
| | | (0.05) | (0.05) | (0.07) | | (0.09) | (0.09) |
| Junior × LargeSize | −0.02 | −0.02 | −0.02 | 0.02 | −0.02 | −0.02 | 0.02 |
| | (0.02) | (0.02) | (0.02) | (0.02) | (0.03) | (0.03) | (0.05) |
| High × LargeSize | 0.02 | 0.03 | 0.03 | 0.07** | 0.02 | 0.02 | 0.07 |
| | (0.03) | (0.03) | (0.03) | (0.04) | (0.03) | (0.04) | (0.06) |
| Junior × LargeSize × Female | | 0.03 | 0.03 | 0.06 | | 0.02 | − 0.00 |
| | | (0.04) | (0.04) | (0.05) | | (0.06) | (0.09) |
| High × LargeSize × Female | | 0.01 | 0.02 | 0.06 | | 0.02 | 0.06 |
| | | (0.05) | (0.05) | (0.09) | | (0.07) | (0.13) |
| Head literate | | | −0.01 | −0.01 | | −0.02 | − 0.00 |
| | | | (0.02) | (0.01) | | (0.02) | (0.02) |
| 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 |
| | | | (0.01) | (0.01) | | (0.01) | (0.02) |
| EldestDaughter | | | −0.01 | − 0.00 | | − 0.00 | 0.00 |
| | | | (0.01) | (0.01) | | (0.01) | (0.02) |
| 6M missw | | | | − 0.00 | | | 0.01 |
| | | | | (0.01) | | | (0.01) |
| 6M repayment | | | | −0.02 | | | −0.04 |
| | | | | (0.02) | | | (0.03) |
| 6M net saving | | | | −0.15 | | | −0.26* |
| | | | | (0.11) | | | (0.15) |
| 6M other member net saving | | | | 0.35** | | | 0.18 |
| | | | | (0.17) | | | (0.30) |
| 6M other member Repaid | | | | 0.01 | | | 0.03 |
| | | | | (0.04) | | | (0.05) |
| $T = 2$ | 0 | 0 | 0 | 3 | 134 | 134 | 116 |
| $T = 3$ | 3 | 3 | 3 | 634 | 183 | 183 | 900 |
| $T = 4$ | 1065 | 1065 | 1065 | 0 | 1456 | 1456 | 0 |
| $\bar{R}^2$ | 0.07 | 0.07 | 0.07 | 0.014 | 0.046 | 0.046 | 0.03 |
| $N$ | 3201 | 3201 | 3186 | 1269 | 4868 | 4827 | 1906 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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%, respetively. Standard errors are clustered at group (village) level.

## IV.2 Repayment and net saving

Note all binary interaction terms are demeaned and then interacted.

```
   Arm
tee traditional large large grace cow dropOuts
  1         235   310         320 326       142
  2         147   313         312 314       109
  3         146   318         318 312       103
  4         143   309         311 306       103
```

NAs in CumRepaid.

```
   Arm
tee traditional large large grace cow dropOuts
  1         233   310         318 326       142
  2           0     0           0   1       109
```

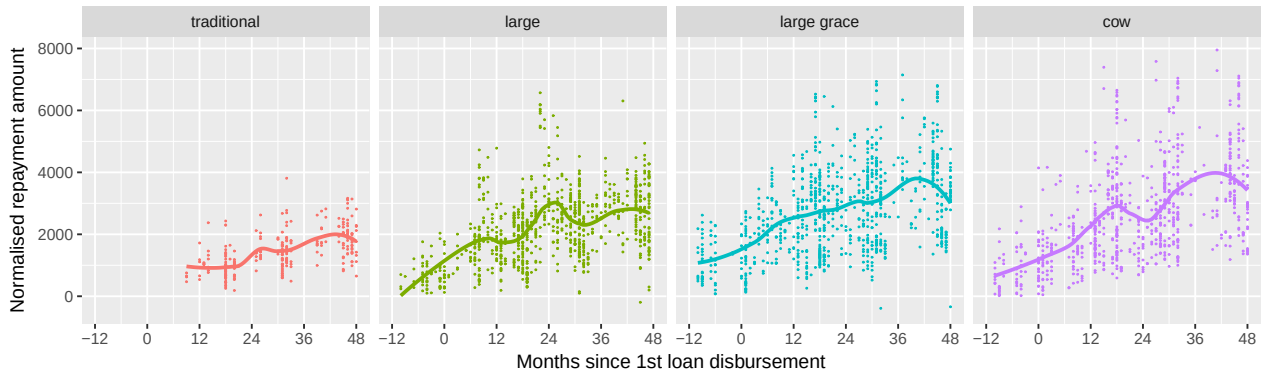


Figure 3: Cumulative weekly net saving

```
  3            0      0            0    0       103
  4            0      0            0    0       103
```

Tabulation at rd 1:

```
               Arm
Mstatus         traditional large large grace cow dropOuts
  gErosion                0     0           0   0        0
  gRejection              0     0           0   0      126
  iRejection             38     8          13  48       16
  iReplacement            0     0           0   0        0
  newGroup                0     0           0   0        0
  oldMember             197   302         307 278        0
```

```
   1    2    3    4
1333 1195 1197 1172
```

```
   2    3    4
   2 1056 1064
```

```
   1    2
  66 1027
```

```
excl.base ← "Poor|Cum|Size|Trad"
excl.1 ← "RM|Eff|Head|Tim"
excl.2 ← "^dummy.*[a-z]$|RM|Eff|Time.?2|Head"
excl.3 ← "RM|Eff|Head|Tim"
excl.4 ← "^dummy.*[a-z]$|RM|Eff|Time.?2"
excl.5 ← "^dummy.*[a-z]$|Eff|Time.?2"
excl.6 ← "RM|Head|Tim"
excl.7 ← "^dummy.*[a-z]$|RM|Time.?2"
excl.8 ← "^dummy.*[a-z]$|Time.?2"
exclg.base ← "dummy[TLC]|Cum|Poo|Size|Witho"
exclg.1 ← "RM|Eff|Head|Tim"
exclg.2 ← "^dummy.*[a-z]$|RM|Eff|Time.?2|Witho"
exclg.3 ← "RM|Eff|Head|Tim"
exclg.4 ← "^dummy.*[a-z]$|RM|Eff|Time.?2|Witho"
exclg.5 ← "^dummy.*[a-z]$|Eff|Time.?2|Witho"
exclg.6 ← "RM|Head|Tim"
exclg.7 ← "^dummy.*[a-z]$|RM|Time.?2|Witho"
```

```
exclg.8 ← "^dummy.*[a-z]$|Time.?2|Witho"
exclp.base ← "dummy[TLC]|Cum|With|Size"
exclp.1 ← "RM|Eff|Head|Tim"
exclp.2 ← "^dummy.*[a-z]$|RM|Eff|Time.?2|Mode"
exclp.3 ← "RM|Eff|Head|Tim"
exclp.4 ← "^dummy.*[a-z]$|RM|Eff|Time.?2|Mode"
exclp.5 ← "^dummy.*[a-z]$|Eff|Time.?2|Mode"
exclp.6 ← "RM|Head|Tim"
exclp.7 ← "^dummy.*[a-z]$|RM|Time.?2|Mode"
exclp.8 ← "^dummy.*[a-z]$|Time.?2|Mode"
excls.base ← "dummy[TC]|Cum|Poo|Large$|Large\\.|Gra|Smal"
excls.1 ← "RM|Eff|Head|Tim"
excls.2 ← "^dummy.*[a-z]$|RM|Eff|Time.?2|Small"
excls.3 ← "RM|Eff|Head|Tim"
excls.4 ← "^dummy.*[a-z]$|RM|Eff|Time.?2|Small"
excls.5 ← "^dummy.*[a-z]$|Eff|Time.?2|Small"
excls.6 ← "RM|Head|Tim"
excls.7 ← "^dummy.*[a-z]$|RM|Time.?2|Small"
excls.8 ← "^dummy.*[a-z]$|Time.?2|Small"
```

Table 10: FD estimation of cumulative net saving and repayment

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Cumulative net saving | | Cumulative repayment | | | Cumulative net saving + cumulative repayment | | |
| (Intercept) | 251.4*** (49.6) | | 1867.0*** (364.6) | | | 2118.4*** (383.7) | | |
| Large | 490.2*** (70.0) | | 2255.9*** (388.6) | | | 2746.1*** (413.9) | | |
| LargeGrace | 232.3*** (55.8) | | 2704.4*** (422.0) | | | 2936.6*** (446.1) | | |
| Cow | 152.6** (61.2) | | 2163.3*** (473.4) | | | 2315.9*** (499.3) | | |
| round 2 - 3 | | 576.8*** (29.7) | | 2782.0*** (279.9) | 2359.4*** (290.2) | | 3293.4*** (305.0) | 2857.5*** (312.5) |
| Large × round 2 - 3 | | 1013.3*** (157.3) | | 3860.7*** (533.8) | 4143.6*** (529.9) | | 4870.6*** (600.1) | 5102.8*** (599.9) |
| LargeGrace × round 2 - 3 | | 603.8*** (131.9) | | 5165.6*** (660.8) | 4873.0*** (647.5) | | 5775.2*** (727.6) | 5454.8*** (732.9) |
| Cow × round 2 - 3 | | 386.0*** (145.2) | | 3786.9*** (706.5) | 3361.5*** (676.3) | | 4167.4*** (782.8) | 3707.2*** (756.6) |
| round 3 - 4 | | 381.2*** (17.7) | | 4015.1*** (336.9) | 3814.7*** (285.7) | | 4330.1*** (363.0) | 4138.5*** (310.5) |
| Large × round 3 - 4 | | 899.8*** (125.1) | | 4863.3*** (1032.7) | 5280.9*** (516.6) | | 5757.1*** (1077.3) | 6222.8*** (604.7) |
| LargeGrace × round 3 - 4 | | 313.7*** (96.7) | | 5437.6*** (1048.6) | 5891.7*** (609.5) | | 5754.0*** (1083.8) | 6267.0*** (688.9) |
| Cow × round 3 - 4 | | 219.6** (105.6) | | 4515.3*** (1211.5) | 4645.9*** (689.1) | | 4728.4*** (1250.7) | 4889.3*** (769.7) |
| Head literate | | | | 149.8 (185.3) | 151.2 (195.8) | | 185.7 (189.7) | 187.7 (200.8) |
| Head age | | | | 8.0 (5.7) | 7.7 (5.9) | | 9.6 (6.2) | 9.6 (6.4) |
| 6M repayment | | | | | 2599.0*** (495.4) | | | 2931.5*** (451.3) |
| 6M net saving | | | | | −5386.5*** (1614.2) | | | −3105.8* (1642.3) |
| 6M other member net saving | | | | | 1415.7 (3296.9) | | | 109.0 (3491.3) |
| 6M other member Repaid | | | | | 1716.4*** (473.0) | | | 1518.6*** (451.6) |
| $T = 2$ | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 |
| $T = 3$ | 1027 | 1027 | 1027 | 1027 | 1027 | 1027 | 1027 | 1027 |
| $\bar{R}^2$ | 0.11 | 0.584 | 0.096 | 0.731 | 0.773 | 0.114 | 0.764 | 0.801 |
| $N$ | 2120 | 2120 | 2120 | 2108 | 2108 | 2120 | 2108 | 2108 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using rd 2 - rd 4 data. 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%, respetively. Standard errors are clustered at group (village) level.

TABLE 11: FD ESTIMATION OF NET CUMULATIVE SAVING AND REPAYMENT, ULTRA POOR VS. MODERATELY POOR

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Cumulative net saving | | Cumulative repayment | | | Cumulative net saving + cumulative repayment | | |
| (Intercept) | 495.3*** | | 3773.5*** | | | 4268.8*** | | |
| | (39.9) | | (183.0) | | | (204.1) | | |
| UltraPoor | 14.1 | | 214.0* | | | 228.0* | | |
| | (25.9) | | (116.0) | | | (129.3) | | |
| Head literate | | 41.0 | | 160.0 | 153.7 | | 201.0 | 193.8 |
| | | (46.5) | | (217.8) | (224.5) | | (228.2) | (235.4) |
| Head age | | 2.1 | | 11.5 | 11.2 | | 13.6* | 13.5* |
| | | (1.5) | | (7.0) | (7.1) | | (7.8) | (7.8) |
| round 2 - 3 | | 522.9*** | | 2809.5*** | 2384.5*** | | 3332.3*** | 2903.1*** |
| | | (71.6) | | (357.4) | (362.4) | | (397.7) | (402.6) |
| UltraPoor × round 2 - 3 | | 37.8 | | 308.8 | 318.1 | | 346.6 | 351.2 |
| | | (62.6) | | (228.5) | (220.9) | | (255.9) | (245.8) |
| round 3 - 4 | | 311.8*** | | 4031.6*** | 3809.0*** | | 4343.5*** | 4143.6*** |
| | | (71.3) | | (396.2) | (372.3) | | (434.8) | (414.2) |
| UltraPoor × round 3 - 4 | | 24.1 | | 653.7** | 553.1** | | 677.7** | 571.2** |
| | | (45.5) | | (265.4) | (240.0) | | (292.1) | (264.4) |
| 6M repayment | | | | | 2657.4*** | | | 2996.1*** |
| | | | | | (486.7) | | | (441.7) |
| 6M net saving | | | | | −5692.1*** | | | −3383.3** |
| | | | | | (1625.9) | | | (1653.0) |
| 6M other member net saving | | | | | −1528.2 | | | −2637.7 |
| | | | | | (3254.7) | | | (3544.6) |
| 6M other member Repaid | | | | | 1234.1 | | | 952.0 |
| | | | | | (785.4) | | | (780.4) |
| $T = 2$ | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 |
| $T = 3$ | 1027 | 1027 | 1027 | 1027 | 1027 | 1027 | 1027 | 1027 |
| $\bar{R}^2$ | 0 | 0.525 | 0.001 | 0.699 | 0.74 | 0.001 | 0.731 | 0.766 |
| $N$ | 2120 | 2108 | 2120 | 2108 | 2108 | 2120 | 2108 | 2108 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using rd 2 - rd 4 data. 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%, respetively. Standard errors are clustered at group (village) level.

TABLE 12: FD ESTIMATION OF NET CUMULATIVE SAVING AND REPAYMENT, WITH VS. WITHOUT A GRACE PERIOD

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Cumulative net saving | | Cumulative repayment | | | Cumulative net saving + cumulative repayment | | |
| (Intercept) | 587.5*** | | 3413.4*** | | | 4000.9*** | | |
| | (54.7) | | (232.8) | | | (273.0) | | |
| WithGrace | −143.3** | | 889.4*** | | | 746.1** | | |
| | (59.4) | | (300.5) | | | (340.2) | | |
| Head literate | | 38.6 | | 152.0 | 145.1 | | 190.6 | 182.9 |
| | | (45.0) | | (210.1) | (217.6) | | (222.4) | (230.1) |
| Head age | | 2.2 | | 10.6 | 10.2 | | 12.8* | 12.6* |
| | | (1.5) | | (6.5) | (6.7) | | (7.3) | (7.5) |
| round 2 - 3 | | 528.0*** | | 2805.8*** | 2440.4*** | | 3333.8*** | 2963.7*** |
| | | (67.6) | | (330.2) | (342.7) | | (374.6) | (385.8) |
| WithGrace × round 2 - 3 | | −192.9 | | 1846.4*** | 1283.8** | | 1653.4*** | 1106.3* |
| | | (132.1) | | (527.8) | (556.5) | | (613.5) | (646.6) |
| round 3 - 4 | | 323.6*** | | 4108.8*** | 3912.6*** | | 4432.4*** | 4255.2*** |
| | | (67.7) | | (383.7) | (355.5) | | (426.1) | (401.8) |
| WithGrace × round 3 - 4 | | −346.0*** | | 1652.5** | 1623.7*** | | 1306.5* | 1287.8* |
| | | (105.8) | | (682.1) | (597.6) | | (752.1) | (681.4) |
| 6M repayment | | | | | 2641.2*** | | | 2983.9*** |
| | | | | | (491.0) | | | (446.8) |
| 6M net saving | | | | | −5606.7*** | | | −3317.9** |
| | | | | | (1633.7) | | | (1662.8) |
| 6M other member net saving | | | | | 254.3 | | | −979.3 |
| | | | | | (3280.9) | | | (3567.3) |
| 6M other member Repaid | | | | | 1155.7 | | | 855.6 |
| | | | | | (714.7) | | | (750.2) |
| $T = 2$ | 66 | 66 | 66 | 66 | 66 | 66 | 66 | 66 |
| $T = 3$ | 1027 | 1027 | 1027 | 1027 | 1027 | 1027 | 1027 | 1027 |
| $\bar{R}^2$ | 0.02 | 0.538 | 0.026 | 0.707 | 0.746 | 0.017 | 0.736 | 0.769 |
| $N$ | 2120 | 2108 | 2120 | 2108 | 2108 | 2120 | 2108 | 2108 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using rd 2 - rd 4 data. 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%, respetively. Standard errors are clustered at group (village) level.

TABLE 13: FD ESTIMATION OF NET CUMULATIVE SAVING AND REPAYMENT, SMALL SIZE VS. LARGE SIZE

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|---|---|---|---|---|---|---|---|---|
| | Cumulative net saving | | Cumulative repayment | | | Cumulative net saving + cumulative repayment | | |
| (Intercept) | 251.4*** (49.6) | | 1867.0*** (364.4) | | | 2118.4*** (383.5) | | |
| LargeSize | 293.0*** (57.9) | | 2375.2*** (388.5) | | | 2668.2*** (409.8) | | |
| Head literate | | 35.8 (45.8) | | 110.9 (184.3) | 105.3 (194.1) | | 146.7 (190.8) | 140.1 (201.0) |
| Head age | | 1.7 (1.5) | | 7.5 (5.8) | 7.2 (5.9) | | 9.2 (6.3) | 9.1 (6.4) |
| round 2 - 3 | | 543.9*** (64.3) | | 2978.9*** (298.0) | 2553.5*** (297.5) | | 3522.8*** (326.7) | 3094.9*** (320.9) |
| LargeSize × round 2 - 3 | | 668.5*** (129.4) | | 4273.3*** (546.5) | 4132.5*** (506.0) | | 4941.9*** (609.4) | 4770.2*** (580.2) |
| round 3 - 4 | | 329.4*** (66.5) | | 4266.4*** (325.5) | 4093.8*** (280.9) | | 4595.8*** (353.7) | 4452.2*** (306.2) |
| LargeSize × round 3 - 4 | | 474.7*** (105.4) | | 4940.7*** (1022.1) | 5258.2*** (508.3) | | 5415.4*** (1056.4) | 5786.2*** (590.1) |
| 6M repayment | | | | | 2599.1*** (490.0) | | | 2925.3*** (444.4) |
| 6M net saving | | | | | −5439.3*** (1606.5) | | | −3144.4* (1632.5) |
| 6M other member net saving | | | | | 1401.0 (2988.4) | | | 580.0 (3223.3) |
| 6M other member Repaid | | | | | 1614.7*** (440.4) | | | 1353.7*** (428.4) |
| $T = 2$<br>$T = 3$ | 66<br>1027 | 66<br>1027 | 66<br>1027 | 66<br>1027 | 66<br>1027 | 66<br>1027 | 66<br>1027 | 66<br>1027 |
| $\bar{R}^2$<br>$N$ | 0.039<br>2120 | 0.547<br>2108 | 0.09<br>2120 | 0.728<br>2108 | 0.771<br>2108 | 0.107<br>2120 | 0.761<br>2108 | 0.798<br>2108 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates using rd 2 - rd 4 data. 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%, respetively. Standard errors are clustered at group (village) level.

**Finding IV.2** TABLE 10 shows net saving increases, but decreases in the later rounds. This reflects 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 11. TABLE 12 shows having a grace period increases the repayment amount.

## IV.3 Assets

```
   2    3    4
1152 1184 1167
```

```
   2    3    4
   2 1054 1063
```

```
Warning in `[.data.table`(das1d, , `:=`(grepout("Time$", colnames(das1d)), : length(LHS)==
```

```
Warning in `[.data.table`(das2d, , `:=`(grepout("Time$", colnames(das2d)), : length(LHS)==
```

```
Warning in `[.data.table`(das1Rd, , `:=`(grepout("Time$", colnames(das1Rd)), : length(LHS
```

```
Warning in `[.data.table`(das2Rd, , `:=`(grepout("Time$", colnames(das2Rd)), : length(LHS
```

```
excl.base ← "With|.Size|Poo"
excl.1 ← "RM|Time|Head|Trad" # RM is actually redundant because das1d does not have RMx..
excl.2 ← "RM|Time|Head"
excl.3 ← "RM|Time.?2|Trad"
excl.4 ← "^dummy.*[a-z]$|Time.?2|Trad"
excl.5 ← "RM|Time|Head|Trad"
excl.6 ← "RM|Time.?2|Trad"
excl.7 ← "^dummy.*[a-z]$|Time.?2|Trad"
exclg.base ← "^dummy[FTLCS]|Poo|.Size"
exclg.1 ← "RM|Time|Head|Withou"
exclg.2 ← "RM|Time|Head"
exclg.3 ← "RM|Time.?2|Witho"
exclg.4 ← "^dummy.*[a-z]$|Time.?2|Witho"
exclg.5 ← "RM|Time|Head"
exclg.6 ← "RM|Time.?2|Witho"
exclg.7 ← "^dummy.*[a-z]$|Time.?2|Witho"
exclp.base ← "^dummy[FTLCS]|With|.Size"
exclp.1 ← "RM|Time|Head|Modera"
exclp.2 ← "RM|Time|Head"
exclp.3 ← "RM|Time.?2|Modera"
exclp.4 ← "^dummy.*[a-z]$|Time.?2|Mode"
exclp.5 ← "RM|Time|Head"
exclp.6 ← "RM|Time.?2|Modera"
exclp.7 ← "^dummy.*[a-z]$|Time.?2|Mode"
excls.base ← "^dummy[FTC]|Large\\.|Large$|Poo|Grac"
excls.1 ← "RM|Time|Head|Small"
excls.2 ← "RM|Time|Head"
excls.3 ← "RM|Time.?2|Sma"
excls.4 ← "^dummy.*[a-z]$|Time.?2|Sma"
excls.5 ← "RM|Time|Head"
excls.6 ← "RM|Time.?2|Small"
excls.7 ← "^dummy.*[a-z]$|Time.?2|Small"
#for (j in 1:4)
#  print0(colnames(das1d[, -grep(paste(exclg.base, "groupid|tee|^hhid$",
#    get(paste0("exclg.", j)), sep = "|"), colnames(das1d)), with = F]))
```

## Table 14: FD estimation of assets

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Household asset amount (Tk) | | | | Productive asset amount (Tk) | | |
| (Intercept) | 7432.1*** | | 3877.9 | | −221.9*** | 219.8 | |
| | (1591.3) | | (2815.5) | | (59.0) | (227.8) | |
| Large | 472.7 | 7904.8*** | −475.8 | | 134.2 | 292.0 | |
| | (2036.4) | (1270.6) | (1878.5) | | (108.6) | (225.5) | |
| LargeGrace | 1335.5 | 8767.5*** | 796.4 | | −76.5 | −58.6 | |
| | (2072.0) | (1326.9) | (2065.0) | | (102.0) | (178.3) | |
| Cow | 737.3 | 8169.4*** | 493.2 | | 140.1 | 21.7 | |
| | (2117.6) | (1397.1) | (2110.6) | | (98.2) | (152.1) | |
| Traditional | | 7304.4*** | | | | | |
| | | (1034.4) | | | | | |
| Head age | | | 128.4*** | 173.7*** | | −2.2 | −4.7 |
| | | | (45.6) | (57.4) | | (2.9) | (8.4) |
| Head literate | | | 1540.0 | 2289.3 | | −80.1 | −75.1 |
| | | | (2401.3) | (3598.6) | | (53.4) | (258.1) |
| round 2 - 3 | | | 3928.9** | 5388.5** | | −364.5 | −91.0 |
| | | | (1781.3) | (2192.1) | | (317.8) | (232.5) |
| Large × round 2 - 3 | | | 1613.5 | 4188.8 | | −633.4 | 43.9 |
| | | | (4683.0) | (6318.5) | | (1058.8) | (739.2) |
| LargeGrace × round 2 - 3 | | | 1126.6 | 5981.1 | | 32.0 | −320.1 |
| | | | (4660.7) | (5973.3) | | (723.8) | (571.7) |
| Cow × round 2 - 3 | | | 2062.1 | 6389.4 | | 723.7 | 458.7 |
| | | | (5331.4) | (7538.1) | | (507.3) | (375.6) |
| round 3 - 4 | | | −7168.0*** | −4295.9 | | −718.4** | −414.6 |
| | | | (1881.3) | (3044.1) | | (280.0) | (349.4) |
| Large × round 3 - 4 | | | 5918.6 | 159.9 | | −906.0 | −1120.3** |
| | | | (4526.6) | (3723.0) | | (913.2) | (476.9) |
| LargeGrace × round 3 - 4 | | | 3840.1 | 401.4 | | −218.5 | −1218.1** |
| | | | (5349.5) | (4284.6) | | (866.5) | (480.0) |
| Cow × round 3 - 4 | | | −1522.1 | −5055.0 | | 632.2 | −52.6 |
| | | | (6385.8) | (3584.1) | | (611.1) | (202.6) |
| 6M repayment | | | | 1914.1 | | | −12.4 |
| | | | | (1865.9) | | | (465.2) |
| 6M net saving | | | | −8658.8 | | | −913.2 |
| | | | | (10865.6) | | | (1023.8) |
| 6M other member net saving | | | | −7099.3 | | | −6605.2 |
| | | | | (42652.2) | | | (4106.4) |
| 6M other member Repaid | | | | −3791.4 | | | 316.5 |
| | | | | (4190.0) | | | (562.3) |
| $T = 2$ | 50 | 50 | 50 | 67 | 50 | 50 | 67 |
| $T = 3$ | 90 | 90 | 90 | 1025 | 90 | 90 | 1025 |
| $T = 4$ | 1091 | 1091 | 1091 | 0 | 1091 | 1091 | 0 |
| $\bar{R}^2$ | −0.001 | 0.044 | 0.016 | 0.046 | −0.001 | 0.001 | 0.004 |
| $N$ | 3503 | 3503 | 3484 | 2105 | 3503 | 3484 | 2105 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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 Janunary. 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%, respetively. Standard errors are clustered at group (village) level.

TABLE 15: FD ESTIMATION OF ASSETS, MODERATELY POOR VS. ULTRA POOR

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Household asset amount (Tk) | | | | Productive asset amount (Tk) | | |
| (Intercept) | 7823.4*** | | 3466.4 | | −243.6** | 272.4 | |
| | (1131.7) | | (2486.0) | | (111.9) | (291.5) | |
| UltraPoor | 437.8 | 8261.3*** | 760.3 | | 54.2 | −31.2 | |
| | (1218.8) | (754.1) | (1193.6) | | (121.6) | (168.7) | |
| ModeratelyPoor | | 7955.3*** | | | 142.8 | | |
| | | (972.2) | | | (146.5) | | |
| Head age | | | 129.6*** | 173.5*** | | −1.8 | −5.0 |
| | | | (47.0) | (57.6) | | (3.0) | (8.4) |
| Head literate | | | 1526.2 | 2251.1 | | −58.4 | −63.0 |
| | | | (2380.6) | (3531.1) | | (54.5) | (259.4) |
| round 2 - 3 | | | 4703.4** | 6027.9** | | −333.0 | −25.1 |
| | | | (2000.3) | (2411.0) | | (305.5) | (250.4) |
| UltraPoor × round 2 - 3 | | | −4360.4 | −1993.7 | | −142.8 | −332.2 |
| | | | (3697.8) | (4955.2) | | (646.9) | (429.8) |
| round 3 - 4 | | | −7491.0*** | −5335.9 | | −689.3** | −350.2 |
| | | | (2165.0) | (3492.1) | | (305.0) | (307.1) |
| UltraPoor × round 3 - 4 | | | 2122.4 | 1991.8 | | −150.8 | −504.8* |
| | | | (2950.4) | (2988.9) | | (599.9) | (303.7) |
| 6M repayment | | | | 1893.7 | | | 9.7 |
| | | | | (1899.1) | | | (469.1) |
| 6M net saving | | | | −7726.0 | | | −681.2 |
| | | | | (10756.9) | | | (1051.5) |
| 6M other member net saving | | | | −20995.8 | | | −4934.2 |
| | | | | (30121.8) | | | (3428.8) |
| 6M other member Repaid | | | | −2331.8 | | | 435.6 |
| | | | | (4609.3) | | | (521.9) |
| $T = 2$ | 50 | 50 | 50 | 67 | 50 | 50 | 67 |
| $T = 3$ | 90 | 90 | 90 | 1025 | 90 | 90 | 1025 |
| $T = 4$ | 1091 | 1091 | 1091 | 0 | 1091 | 1091 | 0 |
| $\bar{R}^2$ | 0 | 0.045 | 0.017 | 0.046 | −0.001 | 0.001 | 0.003 |
| $N$ | 3503 | 3503 | 3484 | 2105 | 3503 | 3484 | 2105 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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 Janunary. Household assets do not include livestock.

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

## Table 16: FD estimation of assets, small vs. large size loans

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Household asset amount (Tk) | | | | Productive asset amount (Tk) | | |
| (Intercept) | 7304.4*** (1034.1) | | 3694.0 (2365.3) | | −165.0*** (47.3) | 122.8 (195.4) | |
| LargeSize | 909.9 (1294.2) | 8214.3*** (778.2) | 483.9 (1357.5) | | | 152.4 (124.5) | |
| SmallSize | | 7304.4*** (1034.1) | | | −41.8 (76.8) | | |
| Head age | | | 128.1*** (46.3) | 173.3*** (57.4) | | −1.7 (3.0) | −4.4 (8.2) |
| Head literate | | | 1526.9 (2378.8) | 2247.3 (3527.1) | | −57.6 (55.1) | −48.1 (261.9) |
| round 2 - 3 | | | 3866.2** (1768.3) | 5634.7*** (2109.8) | | −355.2 (321.8) | −76.4 (211.7) |
| LargeSize × round 2 - 3 | | | 5295.4 (4769.4) | 5318.8 (5018.6) | | −206.4 (557.9) | 72.9 (427.1) |
| round 3 - 4 | | | −7098.7*** (1905.0) | −4887.8 (3196.2) | | −701.2** (278.9) | −458.1 (320.3) |
| LargeSize × round 3 - 4 | | | −2094.7 (2832.2) | −1965.5 (2274.5) | | −964.7** (391.6) | −749.7*** (284.4) |
| 6M repayment | | | | 1904.7 (1876.8) | | | −8.5 (467.2) |
| 6M net saving | | | | −9403.6 (11084.4) | | | −825.7 (1049.1) |
| 6M other member net saving | | | | −21891.2 (30225.5) | | | −5410.1 (3508.9) |
| 6M other member Repaid | | | | −3248.7 (4314.2) | | | 339.9 (505.4) |
| $T = 2$ | 50 | 50 | 50 | 67 | 50 | 50 | 67 |
| $T = 3$ | 90 | 90 | 90 | 1025 | 90 | 90 | 1025 |
| $T = 4$ | 1091 | 1091 | 1091 | 0 | 1091 | 1091 | 0 |
| $\bar{R}^2$ | 0 | 0.048 | 0.017 | 0.047 | 0 | 0.001 | 0.003 |
| $N$ | 3503 | 3503 | 3484 | 2105 | 3503 | 3484 | 2105 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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 Janunary. Household assets do not include livestock.

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

TABLE 17: FD ESTIMATION OF ASSETS, WITH VS. WITHOUT A GRACE PERIOD

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Household asset amount (Tk) | | | | Productive asset amount (Tk) | | |
| (Intercept) | 7694.5*** (999.5) | | 3605.5 (2408.4) | | −147.4** (58.6) | 368.2 (261.4) | |
| WithGrace | 774.8 (1387.5) | 8469.3*** (962.4) | 896.1 (1328.3) | | −42.9 (84.0) | −178.2 (150.5) | |
| WithoutGrace | | 7694.5*** (999.5) | | | | | |
| Head age | | | 128.6*** (46.0) | 173.5*** (57.2) | | −1.9 (3.0) | −4.8 (8.4) |
| Head literate | | | 1512.0 (2363.9) | 2220.0 (3525.8) | | −56.9 (54.2) | −49.9 (259.7) |
| round 2 - 3 | | | 3931.9** (1778.7) | 5660.6*** (2144.8) | | −369.8 (327.7) | −69.9 (218.4) |
| WithGrace × round 2 - 3 | | | 714.7 (3534.4) | 3258.7 (5437.3) | | 721.4 (664.3) | 109.7 (538.9) |
| round 3 - 4 | | | −7099.0*** (1911.7) | −4389.9 (3120.8) | | −726.6** (284.4) | −436.4 (350.1) |
| WithGrace × round 3 - 4 | | | −2106.6 (3805.6) | −2472.3 (3440.4) | | 704.0 (573.9) | 162.2 (366.8) |
| 6M repayment | | | | 1906.0 (1841.0) | | | −7.5 (464.2) |
| 6M net saving | | | | −8018.5 (10621.7) | | | −649.7 (1050.4) |
| 6M other member net saving | | | | −9872.8 (37335.9) | | | −4878.0 (3748.1) |
| 6M other member Repaid | | | | −4171.1 (4077.5) | | | 455.7 (574.9) |
| $T = 2$ | 50 | 50 | 50 | 67 | 50 | 50 | 67 |
| $T = 3$ | 90 | 90 | 90 | 1025 | 90 | 90 | 1025 |
| $T = 4$ | 1091 | 1091 | 1091 | 0 | 1091 | 1091 | 0 |
| $\bar{R}^2$ | 0 | 0.048 | 0.016 | 0.047 | 0 | 0.001 | 0.002 |
| $N$ | 3503 | 3503 | 3484 | 2105 | 3503 | 3484 | 2105 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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 Janunary. Household assets do not include livestock.

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

Finding IV.3 TABLE 14 shows household assets increase after receiving the loans. Total increment is largest among the large grace arm. 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 16. These may indicate forced liquidation for repayment, which can entail efficiency losses.

## IV.4 Livestock

TABLE 18: FD ESTIMATION OF LIVESTOCK HOLDING VALUES

| covariates | (1) | (2) | (3) |
|---|---|---|---|
| Traditional | 768.0<br>(1019.3) | 5742.0***<br>(1902.1) | 5460.8***<br>(1935.8) |
| Large | 4248.0***<br>(1014.4) | 9902.7***<br>(1706.2) | 9434.8***<br>(1553.8) |
| LargeGrace | 2069.9**<br>(872.2) | 5779.8***<br>(1142.5) | 5186.3***<br>(1249.4) |
| Cow | 2959.9***<br>(663.5) | 7918.1***<br>(1026.6) | 7450.9***<br>(1069.6) |
| round 1 - 2 | | 5263.5***<br>(1377.1) | 5351.5***<br>(1382.4) |
| round 2 - 3 | | −9682.6***<br>(1453.5) | −9570.8***<br>(1380.6) |
| Large × round 2 - 3 | | −2805.8<br>(5090.6) | −1899.9<br>(5076.2) |
| LargeGrace × round 2 - 3 | | 4643.5<br>(4184.6) | 4748.7<br>(4258.1) |
| Cow × round 2 - 3 | | −384.3<br>(4090.6) | −658.9<br>(4174.7) |
| 6M repayment | | | 1332.8<br>(1887.3) |
| 6M net saving | | | −8330.0<br>(11127.8) |
| 6M other member net saving | | | −10013.0<br>(18092.8) |
| 6M other member Repaid | | | 766.7<br>(2417.3) |
| $T = 2$<br>$T = 3$ | 71<br>1019 | 71<br>1019 | 71<br>1019 |
| $T = 4$<br>$\bar{R}^2$ | 2<br>0.015 | 2<br>0.062 | 2<br>0.061 |
| $N$ | 2115 | 2115 | 2115 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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 Janunary. 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%, respetively. Standard errors are clustered at group (village) level.

Check quickly if the estimated results make sense.

```
       hhid          Arm Year livestock_code number_owned mrkt_value
 1: 7020601 large grace 2012            Cow            7          0
 2: 7020601 large grace 2014            Hen            2        150
 3: 7020601 large grace 2015           <NA>            1      15000
 4: 7020601 large grace 2017            Hen            4        250
 5: 7020606 large grace 2012            Cow            7          0
 6: 7020606 large grace 2014            Cow            1      25000
 7: 7020606 large grace 2015           <NA>           NA         NA
 8: 7020606 large grace 2017            Cow            1      30000
 9: 7020614 large grace 2012           <NA>            0          0
10: 7020614 large grace 2014            Cow            2      16000
11: 7020614 large grace 2015           <NA>            5      16000
12: 7020614 large grace 2017            Cow            6      24000
13: 7020918       large 2012            Cow            7          0
14: 7020918       large 2014          Sheep            1       1800
15: 7020918       large 2015           <NA>            4       2000
16: 7020918       large 2017            Cow            1      30000
17: 7021004 large grace 2012            Cow            7          0
18: 7021004 large grace 2014            Cow            4      24000
19: 7021004 large grace 2016           <NA>            2      25000
20: 7021004 large grace 2017           Goat            6       4000
21: 7021216         cow 2012            Cow            6          0
22: 7021216         cow 2014           Goat            4       1500
```

```
23: 7021216          cow 2015           <NA>             3       18000
24: 7021216          cow 2017            Cow             3       30000
25: 7021307        large 2012            Cow             7           0
26: 7021307        large 2014            Hen             5         150
27: 7021307        large 2015           <NA>             1         200
28: 7021307        large 2017            Cow             3       38000
29: 7054012 large grace 2012           Goat             8           0
30: 7054012 large grace 2014            Cow            15       20000
31: 7054012 large grace 2015           <NA>            12       16000
32: 7054012 large grace 2017           Goat             5        2800
33: 7096202        large 2012            Cow             8           0
34: 7096202        large 2014            Hen             4         150
35: 7096202        large 2015           <NA>             4         200
36: 7096202        large 2017            Cow             9       20000
37: 7096207        large 2012            Cow             4           0
38: 7096207        large 2014            Hen            12         100
39: 7096207        large 2015           <NA>             7       22000
40: 7096207        large 2017            Cow             6       16000
41: 7096218        large 2012            Cow             1           0
42: 7096218        large 2014            Cow             9       16000
43: 7096218        large 2015           <NA>             7       16000
44: 7096218        large 2017            Cow             6       20000
45: 8169316 traditional 2012            Cow             6           0
46: 8169316 traditional 2014            Hen             4         200
47: 8169316 traditional 2016           <NA>             2       25000
48: 8169316 traditional 2017            Cow             2       30000
49: 8169619        large 2012           <NA>             0           0
50: 8169619        large 2014          Sheep             2        1400
51: 8169619        large 2016           <NA>             2        1800
52: 8169619        large 2017            Cow             6       38000
       hhid          Arm Year livestock_code number_owned mrkt_value
    TotalImputedValue
 1:             140000
 2:                150
 3:              15000
 4:                250
 5:             140000
 6:              20000
 7:                  0
 8:              20000
 9:                  0
10:              40000
11:              16000
12:             120000
13:             140000
14:               1800
15:               2000
16:              20000
17:             140000
18:              80000
19:              25000
20:               8400
21:             120000
22:               5600
23:              18000
24:              60000
25:             140000
26:                150
27:                200
28:              60000
29:              11200
```

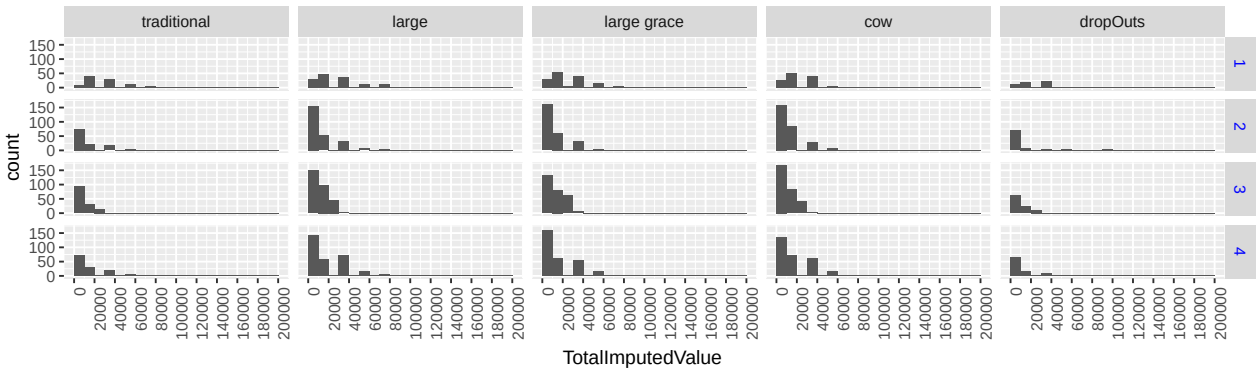


Figure 4: Total imputed value of livestock holding
Livestock holding values are computed by using respective median prices of each year.

```
30:              300000
31:               16000
32:                7000
33:              160000
34:                 150
35:                 200
36:              180000
37:               80000
38:                 100
39:               22000
40:              120000
41:               20000
42:              180000
43:               16000
44:              120000
45:              120000
46:                 200
47:               25000
48:               40000
49:                   0
50:                1400
51:                1800
52:              120000
    TotalImputedValue
```

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

```
             Arm survey MeanImputedVal MeanNumCows   N
 1: traditional      1        15317.74    0.686695 233
 2: traditional      2        10760.88    0.510204 147
 3: traditional      3         6636.79    0.000000 146
 4: traditional      4        12658.39    0.594406 143
 5:       large      1        15743.47    0.715210 309
 6:       large      2        11909.52    0.583062 312
 7:       large      3         9773.06    0.000000 317
 8:       large      4        20459.61    0.987097 310
 9: large grace      1        16408.10    0.717868 319
10: large grace      2        11012.67    0.539474 311
11: large grace      3        10590.95    0.000000 318
12: large grace      4        15395.02    0.737013 311
13:         cow      1        11859.97    0.518405 326
14:         cow      2        11394.52    0.564356 311
15:         cow      3         8955.93    0.000000 312
```

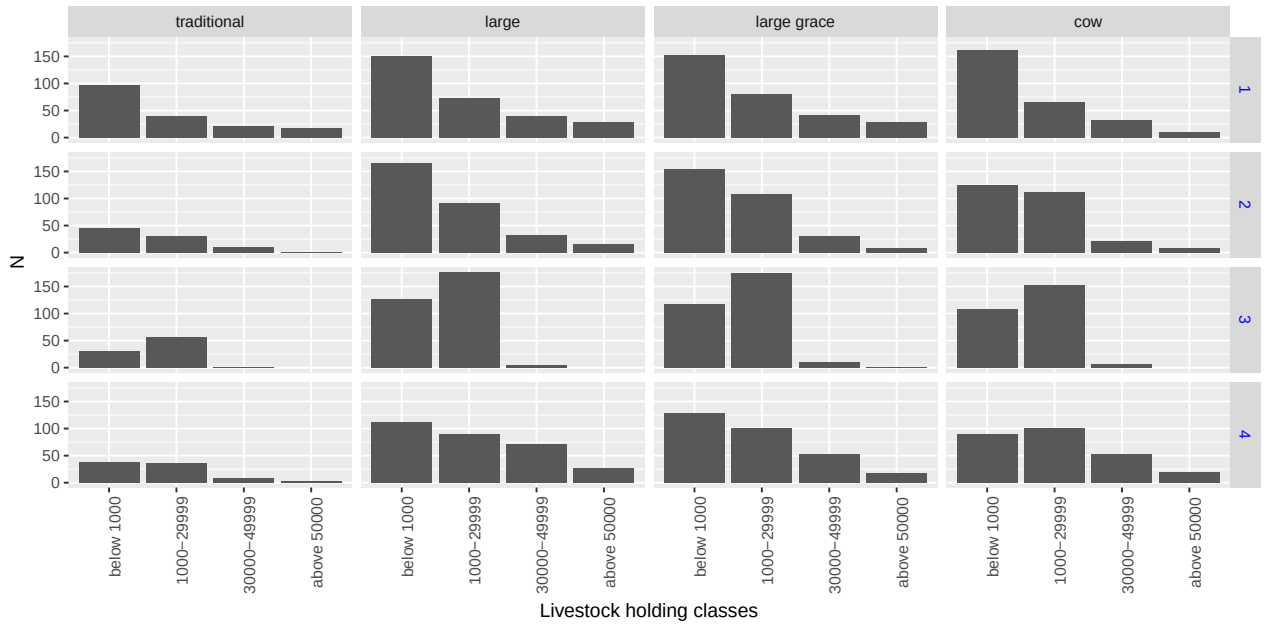


Figure 5: Histogram of livestock holding classes
Livestock holding values are computed by using respective median prices of each year.

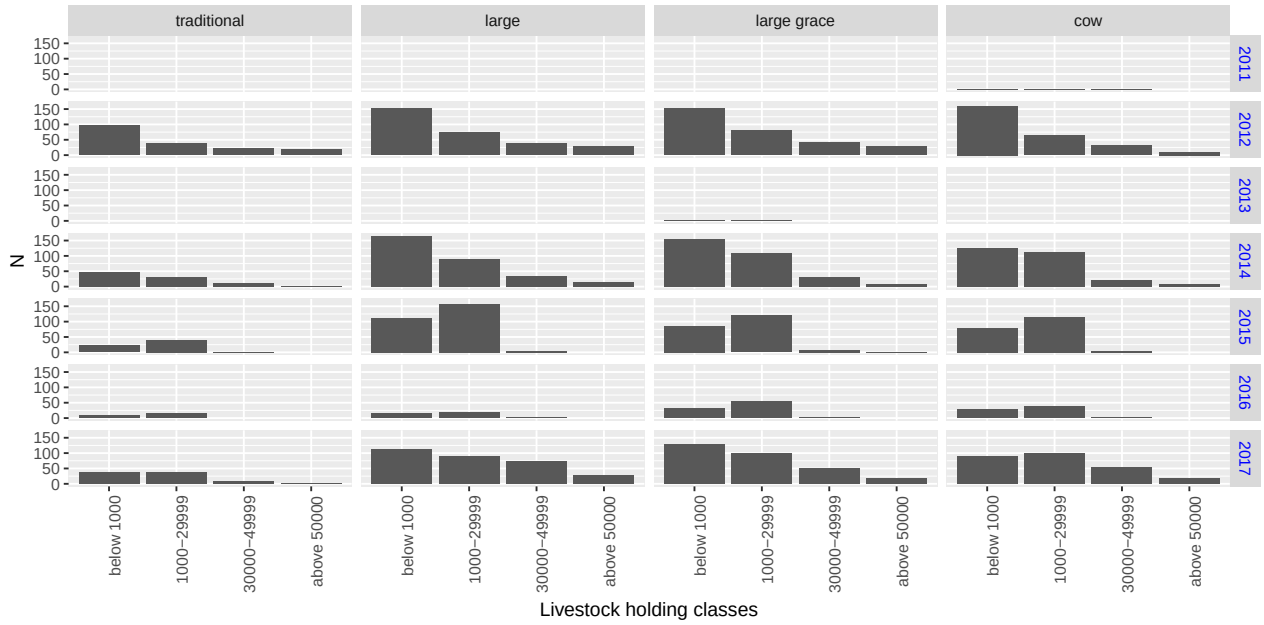


Figure 6: Histogram of livestock holding classes by year
Livestock holding values are computed by using respective median prices of each year.

```
16:          cow       4       17219.67     0.832237  305
17:     dropOuts       1       11917.96     0.507042  142
18:     dropOuts       2       11215.28     0.528302  108
19:     dropOuts       3        7237.86     0.000000  103
20:     dropOuts       4       11490.97     0.524272  103
```

**Finding IV.4** FIGURE 4 shows general increase in upper holding classes round 3 and further upper holding classes in round 4. FIGURE 7 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.

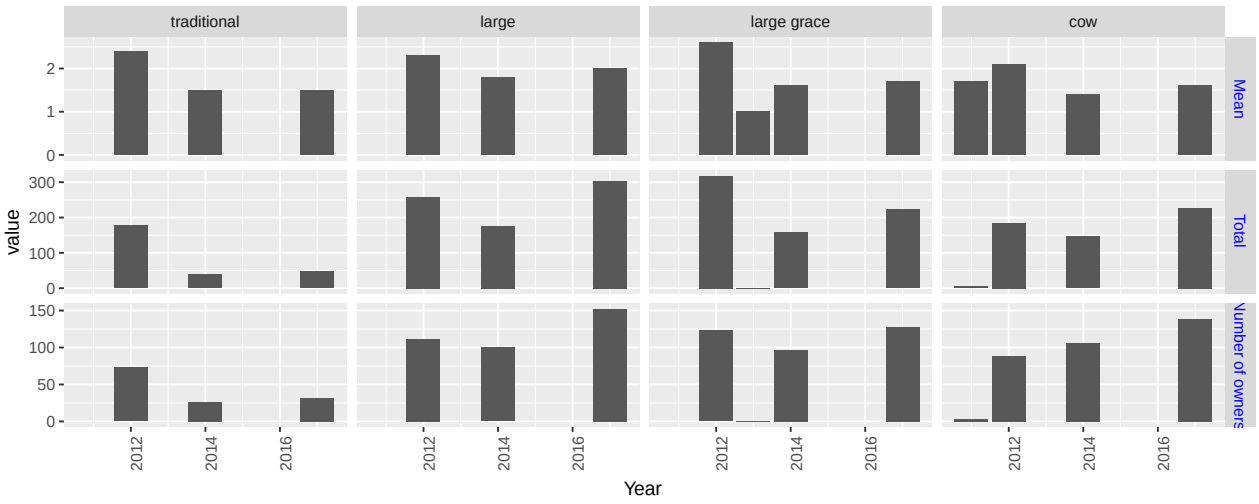


Figure 7: Number of cows/oxen by year

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.

## IV.5 Incomes

Obs for survey labour income.

```
   2    3    4
1152 1184 1167
```

Obs for survey labour income and admin repayment data.

```
   2    3    4
   2 1055 1063
```

```
 3  4
73 69
```

Obs for survey farm revenue.

```
 2  3  4
 8 77 71
```

Obs for survey farm revenue and admin repayment data.

```
 3  4
73 69
```

```
excl.base ← "Time.?[2]|Poor|Size|With"
excl.1 ← "RM|Time|Head|Trad"
excl.2 ← "RM|Head|Time"
excl.3 ← "Other|dummyTr.*T"
excl.4 ← "^dummy.*[a-z]$|dummyTr.*T"
excl.5 ← "RM|Time|Head|Trad"
excl.6 ← "^dummy.*[a-z]$|Other|dummyTr.*T"
excl.7 ← "^dummy.*[a-z]$|dummyTr.*T"
exclg.base ← "dummy[TLC]|Time.?2|Poor|Size"
exclg.1 ← "RM|Time|Head|Witho"
exclg.2 ← "RM|Head|Time"
exclg.3 ← "Other|dummyWitho.*T"
exclg.4 ← "^dummy.*[a-z]$|dummyWitho.*Tim"
exclg.5 ← "RM|Time.2|Head|dummyWitho.*Tim"
exclg.6 ← "^dummy.*[a-z]$|Other|Time.2|dummyWitho.*Tim"
exclg.7 ← "^dummy.*[a-z]$|Time.2|dummyWitho.*Tim"
exclp.base ← "dummy[TLC]|Time.?2|With|Size"
exclp.1 ← "RM|Time|Head|Moder"
exclp.2 ← "RM|Time|Head"
exclp.3 ← "Other|dummyM.*Tim"
exclp.4 ← "^dummy.*[a-z]$|dummyM.*Tim"
exclp.5 ← "RM|Time|Head|Mod"
exclp.6 ← "^dummy.*[a-z]$|Other|Time.2|dummyM.*Tim"
exclp.7 ← "^dummy.*[a-z]$|Time.2|dummyM.*Tim"
excls.base ← "dummy[TC]|Large$|Large\\.|LargeG|Time.?2|With|Poor"
excls.1 ← "RM|Time|Head|Small"
excls.2 ← "RM|Time|Head"
```

```
excls.3 ← "Other|dummyS.*Tim"
excls.4 ← "^dummy.*[a-z]$|dummyS.*Tim"
excls.5 ← "RM|Time|Head|Sma"
excls.6 ← "^dummy.*[a-z]$|Other|Time.2|dummyS.*Tim"
excls.7 ← "^dummy.*[a-z]$|Time.2|dummyS.*Tim"
```

TABLE 19: FD ESTIMATION OF INCOMES

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Labour income (Tk) | | | | Farm revenue (Tk) | | |
| (Intercept) | 5.02*** | | | | −3.61 | | |
| | (1.21) | | | | (4.39) | | |
| Large | 2.43 | 7.45** | −0.40 | | 5.43 | | |
| | (3.65) | (3.44) | (3.19) | | (4.60) | | |
| LargeGrace | −4.54 | 0.48 | −11.23* | | 5.01 | | |
| | (3.06) | (2.82) | (6.18) | | (4.64) | | |
| Cow | −1.58 | 3.44 | −3.89 | | 2.08 | | |
| | (2.49) | (2.18) | (3.55) | | (4.80) | | |
| Traditional | | 6.62*** | 1.84 | | | | |
| | | (1.44) | (2.28) | | | | |
| Head age | | | −0.06 | 0.13 | | −0.01 | −0.03 |
| | | | (0.07) | (0.10) | | (0.07) | (0.12) |
| Head literate | | | −2.56 | −2.65 | | 2.44 | 1.12 |
| | | | (1.82) | (2.31) | | (1.54) | (2.66) |
| round 2 - 3 | | | 17.47*** | 5.01 | | 4.75 | 3.65 |
| | | | (3.84) | (3.71) | | (5.00) | (6.57) |
| Large × round 2 - 3 | | | 13.73 | 9.98 | | 9.86 | 26.78 |
| | | | (8.38) | (9.65) | | (17.40) | (48.00) |
| LargeGrace × round 2 - 3 | | | 18.10 | −2.89 | | 43.89 | 18.85 |
| | | | (11.22) | (5.11) | | (29.50) | (55.52) |
| Cow × round 2 - 3 | | | 9.23 | −2.83 | | 6.93 | −14.09 |
| | | | (6.58) | (6.97) | | (17.31) | (63.70) |
| round 3 - 4 | | | 13.38*** | 1.50 | | −4.55 | −12.52 |
| | | | (3.60) | (4.27) | | (5.89) | (13.18) |
| Large × round 3 - 4 | | | 2.17 | 5.05 | | 16.33 | 26.64 |
| | | | (5.06) | (7.02) | | (10.36) | (23.05) |
| LargeGrace × round 3 - 4 | | | 17.31 | 5.86 | | −0.24 | −21.13 |
| | | | (10.71) | (5.55) | | (15.82) | (47.58) |
| Cow × round 3 - 4 | | | 5.24 | 2.29 | | 4.55 | −0.91 |
| | | | (7.41) | (6.71) | | (11.56) | (28.70) |
| 6M repayment | | | | −4.85 | | | 17.09 |
| | | | | (7.41) | | | (15.84) |
| 6M net saving | | | | 40.41 | | | 63.78 |
| | | | | (38.49) | | | (64.63) |
| 6M other member net saving | | | | −44.46 | | | −417.36 |
| | | | | (40.37) | | | (366.00) |
| 6M other member Repaid | | | | 28.65*** | | | −23.39 |
| | | | | (9.67) | | | (28.43) |
| $T = 2$ | 49 | 49 | 49 | 66 | 56 | 56 | 54 |
| $T = 3$ | 89 | 89 | 89 | 1026 | 46 | 46 | 44 |
| $T = 4$ | 1092 | 1092 | 1092 | 0 | 0 | 0 | 0 |
| $\bar{R}^2$ | 0 | 0.002 | 0.009 | 0.009 | −0.019 | 0.007 | 0.022 |
| $N$ | 3503 | 3503 | 3484 | 2106 | 148 | 148 | 142 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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 Janunary. Labour income is in 1000 Tk unit andis sum of all earned labour incomes. Farm revenue is total of agricultural produce sales.

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

TABLE 20: FD ESTIMATION OF INCOMES, MODERATELY POOR VS. ULTRA POOR

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Labour income (Tk) | | | | Farm revenue (Tk) | | |
| (Intercept) | 3.61*** | | | | 0.44 | | |
| | (0.83) | | | | (1.42) | | |
| UltraPoor | 0.67 | 4.28** | −4.56* | | 0.02 | | |
| | (1.78) | (1.91) | (2.39) | | (1.22) | | |
| ModeratelyPoor | | 3.89*** | −0.76 | | | | |
| | | (0.94) | (2.03) | | | | |
| Head age | | | −0.05 | 0.13 | | −0.03 | −0.08 |
| | | | (0.07) | (0.09) | | (0.06) | (0.12) |
| Head literate | | | −2.29 | −2.56 | | 2.58 | 1.23 |
| | | | (1.70) | (2.16) | | (1.98) | (2.84) |
| round 2 - 3 | | | 15.99*** | 7.75 | | 5.65 | 3.88 |
| | | | (4.64) | (5.44) | | (5.30) | (6.35) |
| UltraPoor × round 2 - 3 | | | 5.49 | −3.59 | | 13.18 | 13.41 |
| | | | (7.49) | (7.95) | | (11.92) | (11.38) |
| round 3 - 4 | | | 7.84* | −2.89 | | −3.29 | −7.31 |
| | | | (4.30) | (6.05) | | (5.49) | (11.09) |
| UltraPoor × round 3 - 4 | | | 16.19 | 14.08 | | −4.96 | −1.60 |
| | | | (9.98) | (11.28) | | (5.23) | (4.53) |
| 6M repayment | | | | −5.88 | | | 16.58 |
| | | | | (6.94) | | | (13.44) |
| 6M net saving | | | | 43.10 | | | 60.67 |
| | | | | (40.80) | | | (60.31) |
| 6M other member net saving | | | | −17.84 | | | −275.27 |
| | | | | (27.90) | | | (239.31) |
| 6M other member Repaid | | | | 24.99*** | | | −2.18 |
| | | | | (9.58) | | | (11.94) |
| $T = 2$ | 49 | 49 | 49 | 66 | 56 | 56 | 54 |
| $T = 3$ | 89 | 89 | 89 | 1026 | 46 | 46 | 44 |
| $T = 4$ | 1092 | 1092 | 1092 | 0 | 0 | 0 | 0 |
| $\bar{R}^2$ | 0 | 0.002 | 0.009 | 0.011 | −0.007 | −0.018 | −0.013 |
| $N$ | 3503 | 3503 | 3484 | 2106 | 148 | 148 | 142 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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 Janunary. Labour income is in 1000 Tk unit andis sum of all earned labour incomes. Farm revenue is total of agricultural produce sales.

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

## Table 21: FD estimation of incomes, loan size

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Labour income (Tk) | | | | Farm revenue (Tk) | | |
| (Intercept) | 6.62*** | | | | −8.30 | | |
| | (1.44) | | | | (6.83) | | |
| LargeSize | −2.93 | 3.68** | −7.88*** | | 9.12 | | |
| | (2.10) | (1.54) | (2.72) | | (6.89) | | |
| SmallSize | | 6.62*** | −0.48 | | | | |
| | | (1.44) | (4.33) | | | | |
| Head age | | | 0.01 | 0.12 | | −0.01 | −0.07 |
| | | | (0.11) | (0.09) | | (0.06) | (0.12) |
| Head literate | | | −1.92 | −2.76 | | 1.34 | 0.21 |
| | | | (1.59) | (2.22) | | (1.81) | (3.10) |
| round 2 - 3 | | | 18.12*** | 5.89 | | 4.89 | 4.20 |
| | | | (3.79) | (3.65) | | (5.14) | (6.61) |
| LargeSize × round 2 - 3 | | | 11.57 | 1.79 | | 48.85 | 23.59 |
| | | | (7.71) | (5.00) | | (30.74) | (41.72) |
| round 3 - 4 | | | 13.87*** | 2.84 | | −4.46 | −8.28 |
| | | | (3.51) | (4.28) | | (6.42) | (12.11) |
| LargeSize × round 3 - 4 | | | 11.63* | 4.83 | | 22.36 | 10.28 |
| | | | (6.57) | (5.41) | | (19.39) | (25.01) |
| 6M repayment | | | | −5.18 | | | 15.85 |
| | | | | (7.30) | | | (13.04) |
| 6M net saving | | | | 42.38 | | | 57.57 |
| | | | | (39.89) | | | (61.01) |
| 6M other member net saving | | | | −12.64 | | | −286.32 |
| | | | | (28.02) | | | (261.86) |
| 6M other member Repaid | | | | 24.63*** | | | −2.51 |
| | | | | (9.50) | | | (12.72) |
| $T = 2$ | 49 | 49 | 49 | 66 | 56 | 56 | 54 |
| $T = 3$ | 89 | 89 | 89 | 1026 | 46 | 46 | 44 |
| $T = 4$ | 1092 | 1092 | 1092 | 0 | 0 | 0 | 0 |
| $\bar{R}^2$ | 0 | 0.002 | 0.009 | 0.009 | −0.005 | −0.024 | −0.018 |
| $N$ | 3503 | 3503 | 3484 | 2106 | 148 | 148 | 142 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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 Janunary. Labour income is in 1000 Tk unit andis sum of all earned labour incomes. Farm revenue is total of agricultural produce sales.

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

TABLE 22: FD ESTIMATION OF INCOMES, WITH VS. WITHOUT A GRACE PERIOD

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Labour income (Tk) | | | | Farm revenue (Tk) | | |
| (Intercept) | 6.37*** (2.00) | | | | −2.35 (3.96) | | |
| WithGrace | −4.41 (2.69) | 1.96 (1.80) | −10.33*** (3.26) | | −4.91 (3.35) | | |
| WithoutGrace | | 6.37*** (2.00) | −3.07 (3.69) | | | | |
| Head age | | | 0.01 (0.11) | 0.13 (0.10) | | −0.09 (0.08) | −0.11 (0.11) |
| Head literate | | | −1.86 (1.64) | −2.66 (2.19) | | 0.28 (2.33) | −0.05 (3.17) |
| round 2 - 3 | | | 18.24*** (3.80) | 5.61 (3.63) | 9.54 (9.67) | 7.90 (6.53) | 6.19 (6.21) |
| WithGrace × round 2 - 3 | | | 5.36 (7.63) | −9.54 (7.84) | 29.89 (19.49) | 17.73 (14.14) | −16.71 (23.12) |
| round 3 - 4 | | | 13.88*** (3.42) | 1.63 (4.29) | | −1.61 (4.42) | −8.12 (11.51) |
| WithGrace × round 3 - 4 | | | 9.43 (6.93) | 0.59 (4.20) | | −12.44 (8.59) | −32.02 (25.61) |
| 6M repayment | | | | −4.75 (7.49) | | | 15.54 (13.38) |
| 6M net saving | | | | 41.35 (39.26) | | | 57.16 (60.61) |
| 6M other member net saving | | | | −44.17 (39.04) | | | −340.39 (316.44) |
| 6M other member Repaid | | | | 27.52*** (9.57) | | | −8.01 (15.96) |
| $T = 2$ | 49 | 49 | 49 | 66 | 56 | 56 | 54 |
| $T = 3$ | 89 | 89 | 89 | 1026 | 46 | 46 | 44 |
| $T = 4$ | 1092 | 1092 | 1092 | 0 | 0 | 0 | 0 |
| $\bar{R}^2$ | 0 | 0.002 | 0.009 | 0.01 | 0.023 | 0.003 | 0.003 |
| $N$ | 3503 | 3503 | 3484 | 2106 | 148 | 148 | 142 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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 Janunary. Labour income is in 1000 Tk unit andis sum of all earned labour incomes. Farm revenue is total of agricultural produce sales.

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

**Finding IV.5** TABLE 19 shows a general decrease in rd 1 - 2 period and a general increase in rd 2 - 4 periods for labour incomes. Large arm saw a greater swing (decrease and increases) which resulted in overall significant mean increase of 2.43 (at $p$ value of 50.55%), yet not statistically different from traditional, while other arms are similar to traditional. Farm revenues do not show any systematic trend.

## IV.6 Consumption

Number of HHs with consumption before the loan is disbursed (ConsumptionBaseline == 1) is small.

```
                ConsumptionBaseline
Arm                   0   1
  traditional       436   0
  large             710 230
  large grace       737 203
  cow               705 227
  forcedDropOuts      0   0
  dropOuts          311   0
```

```
excl.base ← "With|Size|Poor|HH|Exp"
```

```
excl.1 ← "RM|Time|Head|Trad"
excl.2 ← "RM|Time|Head|dummyT.*Tim"
excl.3 ← "^dummy.*[a-z]$|RM|Time.?2|dummyT.*Tim"
excl.4 ← "^dummy.*[a-z]$|Time.?2|dummyT.*Tim"
excl.5 ← "RM|Time|Head|Trad"
excl.6 ← "^dummy.*[a-z]$|RM|Time.?2|dummyT.*Tim"
excl.7 ← "^dummy.*[a-z]$|Time.?2|dummyT.*Tim"
exclg.base ← "dummy[TLC]|Poor|Size|HH|Exp"
exclg.1 ← "RM|Time|Head|Witho"
exclg.2 ← "RM|Time|Head|dummyWitho.*Tim"
exclg.3 ← "^dummy.*[a-z]$|RM|Time.?2|dummyWitho.*Tim"
exclg.4 ← "^dummy.*[a-z]$|Time.?2|dummyWitho.*Tim"
exclg.5 ← "RM|Time|Head|dummyWitho.*Tim"
exclg.6 ← "^dummy.*[a-z]$|RM|Time.?2|dummyWitho.*Tim"
exclg.7 ← "^dummy.*[a-z]$|Time.?2|dummyWitho.*Tim"
exclp.base ← "dummy[TLC]|With|Size|HH|Exp"
exclp.1 ← "RM|Time|Head|Mo"
exclp.2 ← "RM|Time|Head"
exclp.3 ← "^dummy.*[a-z]$|RM|Time.?2|dummyMo.*Tim"
exclp.4 ← "^dummy.*[a-z]$|Time.?2|dummyMo.*Tim"
exclp.5 ← "RM|Time|Head|Mo"
exclp.6 ← "^dummy.*[a-z]$|RM|Time.?2|dummyMo.*Tim"
exclp.7 ← "^dummy.*[a-z]$|Time.?2|dummyMo.*Tim"
excls.base ← "dummy[TC]|Large$|Large\\.T|LargeG|With|Poor|HH|Exp"
excls.1 ← "RM|Time|Head|Sm"
excls.2 ← "RM|Time|Head|dummySm.*Tim"
excls.3 ← "^dummy.*[a-z]$|RM|Time.?2|dummySm.*Tim"
excls.4 ← "^dummy.*[a-z]$|Time.?2|dummySm.*Tim"
excls.5 ← "RM|Time|Head|Sm"
excls.6 ← "^dummy.*[a-z]$|RM|Time.?2|dummySm.*Tim"
excls.7 ← "^dummy.*[a-z]$|Time.?2|dummySm.*Tim"
```

## Table 23: FD estimation of consumption

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Per capita cnsumption (Tk) | | | | Per capita food cnsumption (Tk) | | |
| (Intercept) | 315.66*** | | | | −8.54 | | |
| | (26.89) | | | | (9.34) | | |
| Large | −26.87 | 288.79*** | | | 8.13 | | |
| | (41.77) | (31.97) | | | (9.43) | | |
| LargeGrace | −46.35 | 269.31*** | | | 6.97 | | |
| | (40.09) | (29.74) | | | (9.46) | | |
| Cow | −21.65 | 294.01*** | | | 8.54 | | |
| | (36.73) | (25.02) | | | (9.34) | | |
| Traditional | | 287.67*** | | | | | |
| | | (33.12) | | | | | |
| Head age | | | 1.32 | 1.18 | | 0.06 | −0.06 |
| | | | (1.27) | (1.31) | | (0.16) | (0.09) |
| Head literate | | | 24.49 | 17.07 | | 2.39 | 0.47 |
| | | | (36.88) | (38.03) | | (2.54) | (1.16) |
| round 2 - 3 | | | 431.61*** | 445.73*** | | 50.64*** | 54.93*** |
| | | | (62.79) | (69.64) | | (15.13) | (12.48) |
| Large × round 2 - 3 | | | −58.79 | −49.68 | | 13.21 | 0.58 |
| | | | (169.91) | (193.74) | | (50.89) | (31.80) |
| LargeGrace × round 2 - 3 | | | −205.70 | −193.46 | | 14.41 | −9.33 |
| | | | (144.08) | (163.63) | | (50.38) | (32.50) |
| Cow × round 2 - 3 | | | 56.13 | 62.92 | | 43.15 | 20.26 |
| | | | (137.11) | (171.40) | | (53.27) | (31.29) |
| round 3 - 4 | | | 45.76 | 29.08 | | −59.85*** | −56.62*** |
| | | | (61.34) | (70.78) | | (10.36) | (15.22) |
| Large × round 3 - 4 | | | −133.20 | 59.59 | | 32.40 | −1.26 |
| | | | (141.44) | (168.02) | | (28.58) | (35.02) |
| LargeGrace × round 3 - 4 | | | −81.18 | 115.32 | | 27.27 | −12.52 |
| | | | (153.29) | (180.21) | | (29.85) | (38.97) |
| Cow × round 3 - 4 | | | −180.08 | 4.03 | | 11.83 | −21.96 |
| | | | (140.94) | (168.95) | | (31.08) | (39.49) |
| 6M repayment | | | | −14.33 | | | −0.19 |
| | | | | (63.23) | | | (16.73) |
| 6M net saving | | | | 217.03 | | | −98.86 |
| | | | | (221.59) | | | (73.40) |
| 6M other member net saving | | | | −67.78 | | | −85.15 |
| | | | | (974.22) | | | (377.50) |
| 6M other member Repaid | | | | 54.18 | | | −4.28 |
| | | | | (154.29) | | | (37.31) |
| $T = 2$ | 74 | 74 | 74 | 66 | 74 | 74 | 66 |
| $T = 3$ | 1123 | 1123 | 1123 | 1026 | 1123 | 1123 | 1026 |
| $\bar{R}^2$ | −0.001 | 0.122 | 0.207 | 0.212 | −0.001 | 0.056 | 0.067 |
| $N$ | 2320 | 2320 | 2307 | 2106 | 2320 | 2307 | 2106 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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 Janunary. Consumption is annualised values.

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

TABLE 24: FD ESTIMATION OF CONSUMPTION, MODERATELY POOR VS. ULTRA POOR

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Per capita cnsumption (Tk) | | | | Per capita food cnsumption (Tk) | | |
| (Intercept) | 305.41*** | | | | −5.65 | | |
| | (20.97) | | | | (5.66) | | |
| UltraPoor | −23.03 | 282.39*** | | | 5.21 | | |
| | (23.11) | (16.55) | | | (5.67) | | |
| ModeratelyPoor | | 289.51*** | | | | | |
| | | (23.60) | | | | | |
| Head age | | | 1.23 | 1.19 | | 0.07 | −0.06 |
| | | | (1.26) | (1.30) | | (0.17) | (0.08) |
| Head literate | | | 23.82 | 18.29 | | 3.04 | 0.81 |
| | | | (35.72) | (36.87) | | (3.14) | (1.22) |
| round 2 - 3 | | | 435.13*** | 443.03*** | | 50.13*** | 54.94*** |
| | | | (63.96) | (69.89) | | (15.89) | (11.79) |
| UltraPoor × round 2 - 3 | | | −54.34 | −44.70 | | 2.11 | −10.31 |
| | | | (82.01) | (81.16) | | (30.22) | (14.94) |
| round 3 - 4 | | | 49.05 | 24.29 | | −60.35*** | −59.57*** |
| | | | (60.37) | (70.89) | | (10.61) | (15.92) |
| UltraPoor × round 3 - 4 | | | −87.86 | 10.40 | | 22.02 | 9.22 |
| | | | (77.79) | (80.33) | | (16.57) | (15.94) |
| 6M repayment | | | | −21.19 | | | −0.89 |
| | | | | (64.78) | | | (17.04) |
| 6M net saving | | | | 197.92 | | | −96.78 |
| | | | | (220.85) | | | (78.54) |
| 6M other member net saving | | | | −394.29 | | | −151.88 |
| | | | | (841.00) | | | (350.67) |
| 6M other member Repaid | | | | 34.75 | | | 2.05 |
| | | | | (138.99) | | | (34.85) |
| $T = 2$ | 74 | 74 | 74 | 66 | 74 | 74 | 66 |
| $T = 3$ | 1123 | 1123 | 1123 | 1026 | 1123 | 1123 | 1026 |
| $\bar{R}^2$ | 0 | 0.122 | 0.201 | 0.205 | 0 | 0.056 | 0.068 |
| $N$ | 2320 | 2320 | 2307 | 2106 | 2320 | 2307 | 2106 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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 Janunary. Consumption is annualised values.

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

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

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Per capita cnsumption (Tk) | | | | Per capita food cnsumption (Tk) | | |
| (Intercept) | 287.67*** | | | | −0.67 | | |
| | (33.11) | | | | (0.67) | | |
| LargeSize | 3.36 | 291.04*** | | | −1.86 | | |
| | (36.76) | (15.99) | | | (2.45) | | |
| SmallSize | | 287.67*** | | | | | |
| | | (33.11) | | | | | |
| Head age | | | 1.22 | 1.20 | | 0.07 | −0.05 |
| | | | (1.27) | (1.31) | | (0.16) | (0.08) |
| Head literate | | | 24.20 | 18.89 | | 3.04 | 0.90 |
| | | | (35.70) | (37.04) | | (2.93) | (1.19) |
| round 2 - 3 | | | 435.08*** | 438.59*** | | 50.05*** | 54.28*** |
| | | | (64.14) | (69.85) | | (15.55) | (11.59) |
| LargeSize × round 2 - 3 | | | −55.31 | −68.38 | | 1.64 | 1.91 |
| | | | (145.87) | (149.07) | | (28.18) | (26.17) |
| round 3 - 4 | | | 49.20 | 26.62 | | −60.41*** | −59.57*** |
| | | | (60.99) | (72.45) | | (10.55) | (16.22) |
| LargeSize × round 3 - 4 | | | 81.10 | 42.94 | | −8.58 | −15.01 |
| | | | (129.69) | (148.05) | | (26.66) | (34.13) |
| 6M repayment | | | | −17.98 | | | −0.36 |
| | | | | (63.84) | | | (16.72) |
| 6M net saving | | | | 216.04 | | | −101.50 |
| | | | | (225.02) | | | (77.87) |
| 6M other member net saving | | | | −367.06 | | | −157.88 |
| | | | | (881.15) | | | (356.91) |
| 6M other member Repaid | | | | 44.97 | | | −1.02 |
| | | | | (137.45) | | | (34.33) |
| $T = 2$ | 74 | 74 | 74 | 66 | 74 | 74 | 66 |
| $T = 3$ | 1123 | 1123 | 1123 | 1026 | 1123 | 1123 | 1026 |
| $\bar{R}^2$ | 0 | 0.14 | 0.202 | 0.206 | 0 | 0.055 | 0.067 |
| $N$ | 2320 | 2320 | 2307 | 2106 | 2320 | 2307 | 2106 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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 Janunary. Consumption is annualised values.

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

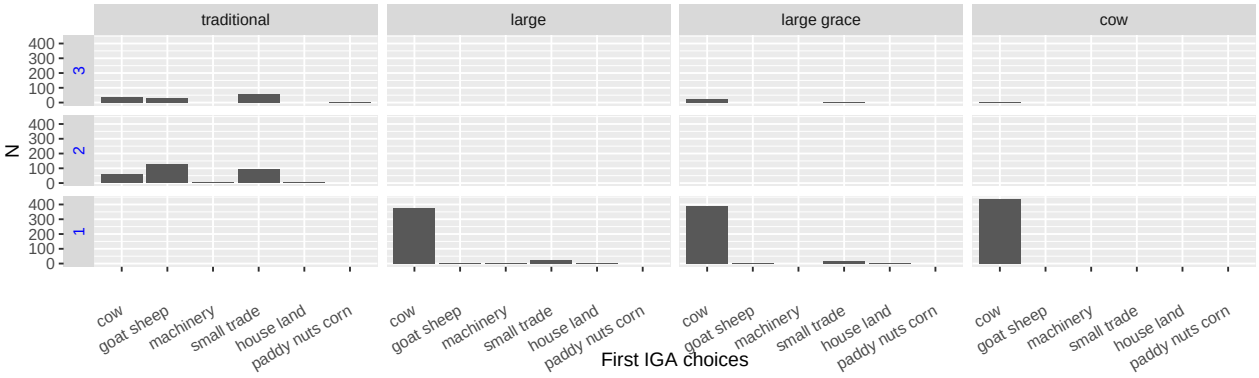


Figure 8: Income generatng activity choices
The first income generating activity choices are plotted.

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

| covariates | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---|---|---|---|---|---|---|---|
| | Per capita cnsumption (Tk) | | | | Per capita food cnsumption (Tk) | | |
| (Intercept) | 300.59*** (21.58) | | | | −3.98 (4.24) | | |
| WithGrace | −19.01 (29.15) | 281.58*** (19.59) | | | 3.19 (4.31) | | |
| WithoutGrace | | 300.59*** (21.58) | | | | | |
| Head age | | | 1.27 (1.25) | 1.21 (1.30) | | 0.07 (0.16) | −0.06 (0.08) |
| Head literate | | | 24.56 (35.70) | 19.27 (37.05) | | 2.91 (2.83) | 0.72 (1.12) |
| round 2 - 3 | | | 433.45*** (63.36) | 438.27*** (68.33) | | 50.17*** (15.29) | 54.63*** (11.76) |
| WithGrace × round 2 - 3 | | | −43.44 (109.26) | −61.56 (128.58) | | 21.26 (27.68) | 2.75 (25.19) |
| round 3 - 4 | | | 47.57 (60.02) | 19.34 (71.27) | | −60.33*** (10.60) | −57.66*** (15.83) |
| WithGrace × round 3 - 4 | | | −57.15 (106.02) | 3.75 (115.06) | | 1.42 (20.53) | −17.51 (24.31) |
| 6M repayment | | | | −17.74 (64.40) | | | −0.49 (17.05) |
| 6M net saving | | | | 193.50 (222.21) | | | −98.67 (77.82) |
| 6M other member net saving | | | | −540.46 (869.48) | | | −122.22 (369.76) |
| 6M other member Repaid | | | | 53.02 (136.94) | | | −4.05 (35.66) |
| $T = 2$<br>$T = 3$ | 74<br>1123 | 74<br>1123 | 74<br>1123 | 66<br>1026 | 74<br>1123 | 74<br>1123 | 66<br>1026 |
| $\bar{R}^2$<br>$N$ | 0<br>2320 | 0.14<br>2320 | 0.201<br>2307 | 0.205<br>2106 | 0<br>2320 | 0.056<br>2307 | 0.068<br>2106 |

Source: Estimated with GUK administrative and survey data.

Notes: 1. First-difference estimates. 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 Janunary. Consumption is annualised values.

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

Finding IV.6 TABLE 23 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. Per member food consumption increases in rd 2- 3 period but decreases in rd 3 - 4 period.

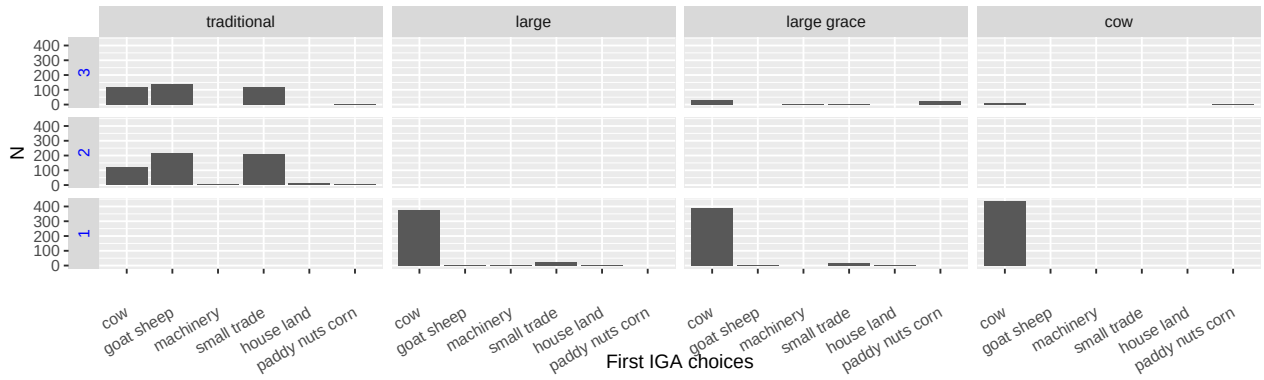


Figure 9: All income generatng activity choices
All of multiple investment choices are summed by arms and the number of IGAs and plotted as bars.

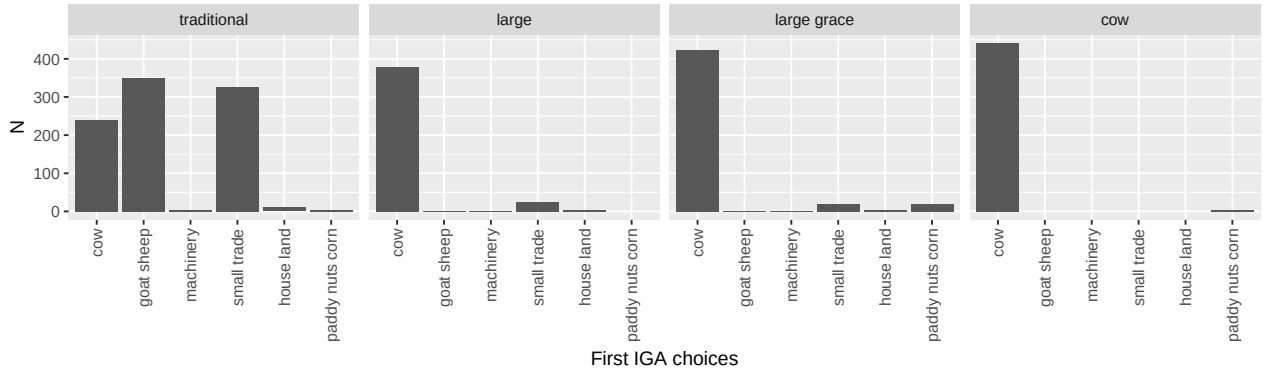


Figure 10: All income generatng activity choices collapsed over different number of IGAs
All of multiple investment choices are summed by arms and plotted as bars.

## IV.7 IGA

Finding IV.7 Figure 8, 9 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 exitence 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 10 shows there are a significant number of cases in the traditional arm that members reporting to raise cows, yet they are also accompanied 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 10 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.8 Marriage

```
Error in gzfile(file, "rb"): cannot open the connection
```

```
                 TradGroup
creditstatus      <NA>
  Yes             1040
  No               127
  Replaced Member    0
  <NA>             166
```

```
           Arm NumEligible.1 NumEligible.2 NumEligible.3 NumEligible.4
1: traditional            37             0             0            30
2:       large            58             2             0            76
3: large grace            71             0             0            90
4:         cow            67             0             0            94
5:    dropOuts            38             0             0            33
```

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 (296 individuals), or,
- 2 years (175 individuals), or,
- 3 years (135 individuals).

```
           Arm AttritedBefore NumEligible Married MarriageRate
 1: traditional       year 1          36      13         0.36
 2: traditional       year 3           3       2         0.67
 3: traditional        never          28       5         0.18
 4:       large       year 1           8       3         0.38
 5:       large       year 2          12       1         0.08
 6:       large       year 3          26       4         0.15
 7:       large        never          90      14         0.16
 8: large grace       year 1          11       4         0.36
 9: large grace       year 2          32       6         0.19
10: large grace       year 3          26       3         0.12
11: large grace        never          92      10         0.11
12:         cow       year 1          22       4         0.18
13:         cow       year 2          21       4         0.19
14:         cow       year 3          39       6         0.15
15:         cow        never          79      12         0.15
16:    dropOuts       year 1          71      15         0.21
```

**Finding IV.8** There is very small difference in marriage rates between arms with grace and without grace.