

## Supplementary Material

Table S1: Comparison of current study with the study ‘Liability Structure in Small-Scale Finance: Evidence from a Natural Experiment’ by Carpena et al., 2013.

	Carpena et al. (2013)	This study
<i>Comparable study setting with a much larger sample</i>		
Country	Ahmedabad, India	Lahore, Pakistan
Sample of borrowers	276	2,048
No. of branches	2	13
Group meetings	No	No
Switch direction	Individual to joint	Individual to joint
<i>Key improvements</i>		
Improved measure of borrower performance	Using an accounting dataset with limited information: <ul style="list-style-type: none"> <li>i. does not contain information on maturity dates, instalment amounts, and outstanding loan amounts.</li> <li>ii. Can only observe whether a payment was made – don’t know if payment made is on overdue loan amount or a prepayment.</li> </ul>	A database with rich information: <ul style="list-style-type: none"> <li>i. contains information on loan amount, maturity date and instalment amount paid each month.</li> <li>ii. Can construct an accurate measure of a borrower missing a payment, accounting for any over payment in the past (as detailed in Section 4.1.).</li> </ul>
Contract change does not threaten identification	Changes to the contract with switch to joint liability: <ul style="list-style-type: none"> <li>i. The instalment amount to be paid every month became fixed.</li> <li>ii. Interest rate increased from 18 to 24 percent.</li> <li>iii. All members to maintain compulsory savings accounts.</li> </ul>	No change to the loan contract with the switch from individual to joint liability.
Can comment on mechanism of change	Study did not provide any empirical evidence on why borrower performance improves with a switch to joint liability.	Use primary data and instrumental variable strategy, to show that pre-existing group social connection could explain why borrower performance improves

Table S2: A comparison of the borrower characteristics of all borrowers with an ongoing individual liability loan at the time of the announcement of the switch to joint liability who take out another loan under joint liability with those who do not borrow again from the organisation.

	<b>Borrowed under joint liability</b>	<b>Did not borrow under joint liability</b>	<b>Difference:</b>
	<b>(1)</b>	<b>(2)</b>	<b>(1) – (2)</b>
			<b>(p-value)</b>
Gender (male=1)	0.632	0.769	-0.095
			(0.010)
Age <sup>†</sup>	39.29	38.76	0.327
			(0.416)
Personal loan (=1)	10.8%	14.3%	-0.034
			(0.008)
Number of previous loans	1.79	1.60	0.200
			(0.000)
Loan amount (PKR)	12,674	12,475	199
			(0.352)
Loan duration (months)	11.44	11.33	0.088
			(0.344)
Borrower discipline (%)	72.60	61.86	-0.086
			(0.065)
Joint F-test			118.38
			(0.000)
# of observations	2,048	4,894	

<sup>†</sup>Age data is only available for 4,186 (86%) of those who did not borrow under JL and 1,821 (89%) of those who did borrow under JL. Note: The table reports summary statistics for the sample of borrowers who had an outstanding individual liability loan at the time of the announcement of the switch, separately for those who also took another loan under joint liability (1) and those who did not borrow under joint liability (2). Borrower discipline is measured as the average number of months the borrower was on time in paying instalments.

Table S3: Logit and OLS estimates for performance of borrowers with completed loans

	(1)	(2)	(3)	(4)
	Logit	OLS	OLS	OLS
Group dummy	0.569*** (0.026)	-0.023*** (0.002)	-0.023*** (0.003)	-0.023*** (0.003)
Loan age	1.33*** (0.031)	0.013*** (0.001)	0.013*** (0.001)	0.013*** (0.001)
Loan age squared	0.990*** (0.002)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Mean of dependent var. for individual liability loans		0.062	0.062	0.062
Number of borrowers	1105	1693	1693	1693
Number of observation months	25,210	38,106	38,106	38,106

Note: Column (1) reports odds ratio from estimation of a logit model with dependent variable equal to one if the borrower has missed installment payment in that month making the borrower behind schedule, zero otherwise. A value of less than one for the odds ratio for the group dummy means individuals in groups are less likely to miss a payment. The sample includes all loans irrespective of whether the loan had matured or not by the end of the sample period but drops observations where there is no variation. In columns (2) – (4), are results from an OLS regression with the same dependent variable but with the sample restricted to loans that have been completed (i.e. the sample of borrowers who have fully paid their joint liability loan). Group dummy is equal to 1 if the loan is joint liability and 0 if individual liability. Loan age is the number of months since loan was issued. All regression includes control for individual fixed effects and calendar month. Standard errors clustered by the borrower in column (3) and by the group in column (4). Standard errors are in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$ .

Table S4: Factor weights for characteristics used in Principal Component Analysis

Knew from before	0.515
Meet weekly	0.564
Same caste	0.147
Would have borrowed	0.324
Neighbour	0.469
Had done business together before	0.265

Note: The table reports the weighting assigned to each factor by PCA. The factors are indicator variables for if all group members met each of the following criteria: knew from before is a measure for if the borrower knew group members from before the group was formed, met weekly is if they met at least once a week, same caste is if they belong to the same caste, borrowed refers to if the borrower would have borrowed from the group member in time of need, neighbour refers to if the group member is a neighbour and had done business together before the group was formed.

Table S5: 2SLS estimates for each group characteristic shown separately. Second stage results are only showed when the first stage is significant.

<b>Dependent variable</b>	Knew each other	Met weekly	Neighbours	Did business together	Same caste	Would borrow in time of need
	(1)	(2)	(3)	(4)	(5)	(6)
<i>First Stage</i>						
No. of months	0.013*** (0.005)	0.011* (0.006)	0.017*** (0.006)	0.007* (0.004)	0.001 (0.004)	0.010* (0.006)
<i>Second Stage</i>						
	-0.176* (0.091)		-0.134* (0.073)			
IV F statistic	7.37	3.63	7.77	2.92	0.128	2.92
Pr> F	0.007	0.057	0.005	0.088	0.720	0.088
Observations	755	755	755	755	755	755

Note: Instrument 'No. of months' is the number of months till the expiry of the individual liability loan at the time of the announcement of the switch to joint liability. Knew before is a measure for if the borrower knew group member from before the group was formed, met weekly is if they met at least once a week, same caste is if they belong to the same caste, borrowed refers to if the borrower would have borrowed from the group member in time of need and neighbour refers to if the group member is a neighbour. Robust standard errors clustered by the group in parenthesis. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$