Strategic Default in joint liability groups: Evidence from a natural experiment in India*

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Abstract

Despite the high repayment rates claimed by microcredit programs around the world, some groups of borrowers eventually default and are subsequently disbanded. Exposure to common shocks and strategic default are reasons for the deterioration in group repayment but identification of the precise mechanism is difficult. In this paper we exploit an announcement issued by the Anjuman Committee of a town in southern India banning all Muslims from repaying their microfinance loans. Using administrative data we find that borrowers in Muslim-dominated groups have higher default rates after the announcement compared to the same borrowers with loans in Hindu-dominated groups. We conclude that strict adherence to joint liability rules may have triggered strategic default that might have been avoided if lenders had allowed more flexibility in repayment.

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1. Introduction

In the last 25 years, microcredit has arguably become one of the most popular tools among governments, NGOs and multilateral institutions to make credit available to low-income households who lack access to formal credit markets. In 2009, the Microcredit Summit estimated that there were more than 3,500 microfinance institutions around the world with 150 million clients (Daley-Harris 2009). One unique feature of micro loans, pioneered by Nobel laureate Muhammed Yunnus and the Grameen Bank, is "group lending", defined as the provision of loans to individual clients who are part of a small group (typically comprised of 5 to 20 members) and meet regularly to repay their loans.

Group lending has been credited for the high repayment rates claimed by programs around the world. Group lending loans contracts often include a joint liability clause but this is not always the case.[1] Joint liability conditions future loans to group members to the repayment of the group as a whole by requiring that all members in a group be responsible for the loans of each other. If one member cannot meet his or her repayment obligation, other members must bear the repayment of the defaulter if they want to continue borrowing from the lender.

Theorists have been particularly interested in the repayment incentives induced by joint liability.[2] The main advantage is that it solves informational asymmetries by shifting the burden from the lender to the clients resulting in lower transaction costs for the institution (Ghatak and Guinnane, 1999), thus providing a way around the common problems of adverse selection (screening and sorting) and moral hazard (ex-ante and ex-post).[3] In theory, joint liability contracts can lead to higher repayment because borrowers have better information about each other's types, can better monitor each other's investment, and may be able to impose social sanctions at low cost. Joint

[1] Grameen Bank has recently introduced a new product, Grameen II that removes joint liability (Dowla and Barua, 2006). The Association for Social Advancement (ASA), one of Grameen's main competitors in Bangladesh has also abandoned joint liability while retaining the practice of meeting with clients in public groups. See Giné and Karlan (2011) for more details on the recent trends.

[2] The theory on joint liability builds on the contract theory literature from the early 1990s that studies when a principal should contract with a group of agents rather than individually with each agent. See for example Holmstrom and Milgrom (1990), Varian (1990) and Arnott and Stiglitz (1991).

[3] See for example Ghatak (1999; 2000), N'Guessan and Laffont (2000), Sadoulet (2000) and Armendariz de Aghion and Gollier (2000) for models of adverse selection, Stiglitz (1990) and Laffont and Rey (2000) for models of ex-ante moral hazard and Besley and Coate (1995) for a model of ex-post moral hazard. For reviews see Morduch, 1999 and Armendariz de Aghion and Morduch, 2005.

liability, however, has its own pitfalls.[4] Attendance in group meetings and monitoring group members can be costly, especially in areas with low population density.[5] More importantly, Besley and Coate (1995) argue that the whole group may default, even when some members would have repaid under individual liability. This happens when the number of defaulting clients in the group is so large that the remaining members cannot afford the repayment of defaulters, along with their own repayment. In this situation, borrowers that could repay their loans have little incentive to do so because access to future loans will be denied. As a result, they will strategically decide to default.

Because joint liability is embedded in group lending schemes, we have little evidence on its relative importance for repayment *vis à vis* other features, such as the regular meetings where repayment is public. In one of the two field experiments reported in Giné and Karlan (2011), the lender removed joint liability from pre-existing groups while maintaining the weekly meetings. After three years, they find no increase in short-run or long-run default perhaps because the group meetings were still encouraging some monitoring and enforcement due to reputation or shame. Indeed, Rai and Sjöström (2000, 2010) and Feigenberg et al., (2010) provide evidence that group meetings may be helpful beyond joint liability.[6]

More generally, while some groups do default and disband, we have little evidence about the actual reasons for the deterioration in repayment. Groups may default for various reasons, most notably because they are exposed to common shocks and for the strategic reasons argued in Besley and Coate (1995). Understanding the actual mechanism is important for the design of microcredit products that minimize the occurrence of group default.

In this paper we provide evidence of strategic default using a natural experiment in southern India. In particular, we study whether members of a joint liability group are more likely to default on their loans when the proportion of defaulting members in a

[4] On anecdotal evidence on the limits to joint liability, see Matin (1997), Woolcock (1999) Montgomery (1996) and Rahman (1999).

[5] Park and Ren (2001) find that 7% of microfinance clients in some programs in China have to travel more than one hour to attend the group meeting.

[6] First, public repayments at group meetings can strengthen the strategic use of social stigma in aid of the programs' bottom lines, even without a formal joint liability contract. Second, the group is often a useful resource through which staff can directly elicit information about errant borrowers and create pressure as needed (Rai and Sjöström, 2000). Finally, Feigenberg et al., (2010) find that an increase in the frequency of meetings leads to increased risk sharing and social interaction outside of meetings.

group increases. Despite the simplicity of this hypothesis, in the absence of an exogenous source of variation it becomes difficult to identify this mechanism, since repayment rates are the result of selection, incentive effects and correlated observed and unobserved shocks. Our identification strategy overcomes these concerns by exploiting two facts of the data. The first is an unexpected event that increased the default rate among Muslims but not Hindus. On Jan 28th, 2009, the Anjuman Committee of the town of Kolar in the state of Karnataka, India, issued a *fatwa* banning all Muslims from repaying their microfinance loans claiming that charging interest was "haram" (forbidden). The ban led to immediate non-repayment by Muslims clients. As a result, borrowers in Muslim-dominated groups faced, after the ban, a greater repayment burden compared to borrowers in Hindu-dominated groups. The second fact is that in our setting many borrowers had loans from several groups, which differed in the density of Muslims. Because borrowers from Muslim-dominated groups may be inherently different those in Hindu-dominated groups, we also focus on borrowers with multiple loans. Identification in this case comes from the variation in the behavior of the same individual across multiple groups of differing density of Muslims.

Using matched administrative records of 7 of the largest MFIs operating in the state of Karnataka, India, we find that the after the ban, the likelihood of default at maturity for Hindus *and* Muslims in mixed religion groups increases with the percentage of Muslims in the group. In particular, a one percentage point increase in the share of Muslims contributes to a 0.5 percentage point increase in the likelihood of default after the ban. This result is robust to alternative measures of default, such as the balance outstanding at maturity or the percentage of the loan due at maturity.

Using survey data we can rule out several other explanations for the observed mass defaults. First, one could argue that borrowers and specially Muslims wanted to pay but that they were physically unable to do so. Interviews with credit officers suggest that the meetings took place and that they were always willing to meet to collect repayment. Second, it could be also argued that the *fatwa* lowered the non-pecuniary cost of defaulting by turning it into a less shameful act. Similarly, the *fatwa* may have provided individuals with an idea about the diminished consequences of defaulting. Put differently, individuals may have realized that default is more acceptable or has little negative consequences. But if this were the case, then borrowers with multiple loans would default in all groups, and not only those with high density of Muslims, which is what we find. Survey data provides one last piece of evidence in support of the strategic

motive for default. Individuals that had missed at least a payment were asked for the reason and most of the respondents, irrespective of the religion mentioned that they had the money to repay the loan but chose not to.

These findings contribute to the broader literature on peer effects and in particular to the literature that studies the causal impact of peer's behavior on own repayment behavior. In this sense, this paper is closest to Breza (2011) who study an earlier episode of mass defaults in the Krishna district of Andhra Pradesh, India.

The remainder of this paper is organized as follows. Section 2 provides the context of the natural experiment. Section 3 describes the data. Section 4 describes the identification strategy for our analysis and its results. Section 5 concludes.

2. Context

2.1. Institutional Setting

The state of Karnataka in South India is home to a competitive microfinance industry that implements the Grameen-style model. At the time of the *fatwa,* there were 27 registered and many unregistered microfinance institutions operating in rural and urban areas (EADA, 2010).

Institutions typically open a branch office in an urban or semi-urban location and serve approximately 3,000 to 5,000 clients. Clients are almost entirely women and reside in town and in adjoining villages and smaller towns. Clients of a branch are organized into groups and centers. Loan officers form and train groups of between 5 and 15 borrowers. Members in a group typically reside in the same neighbourhood or street and know each other so that they can verify appropriate loan utilization and monitor effort into the member's chosen project. Members of a group meet weekly at a center, at a public location in the colony. The center meeting is managed by the loan officer, called a center manager. A center has approximately 40 members formed by groups residing in the same colony. The center manager disburses loans and collects weekly instalments at the center meeting. Attendance and repayment are strictly enforced. Typically none of the members is allowed to leave the meeting until all the collections have been made.

Three types of loan products are typically offered: an income generation loan used for investment, a supplementary or top-up loan four to six months after the disbursement of the income generation loan and an emergency loan given on the spot and of smaller size for consumption purposes. Loans range from Rs. 500 to Rs. 30,000 depending on the loan cycle, and repayment starts one week after the date of loan disbursal and is spread over 50 weekly instalments. Interest rates vary from 12.5% to 30% and are charged on a declining balance. All loans are guaranteed by joint liability and none of the microfinance institutions can collect savings that could be used as collateral. Loans are transacted and recorded on an individual basis, but an outstanding default by any group members renders the entire group ineligible for future loans.

2.2. A natural experiment

By 2008, the explosive growth of MFIs in southern Karnataka started to overheat. In the quest to meet their growth targets, loan officers often disbursed loans to clients already indebted to other organizations. When conditions in the silk reeling industry deteriorated (partly on account of the global crisis), the strain of repaying large sums of money on a weekly basis became excessive for some households.[7]

The situation took a religious turn when friends and relatives of affected women complained to the local religious establishment about the "trouble" caused by MFIs. The local Anjuman Committee –irked by months of complaints about women "neglecting" family duties, families led into crippling debt by a culture of "easy money", and oath taking at meetings invoking Hindu goddesses– intervened in the only way it knew: interaction between MFIs and Muslims in the town was prohibited by religious edict. On Jan 28th, 2009, triggered by the attempted suicide of a prominent member of a member community in Kolar whose wife had become over-indebted, the Anjuman Committee of Kolar issued a statement banning all Muslims from repaying their MFI loans claiming that charging interest was "haram". The ban lead to immediate non-repayment by Muslims clients. The situation eventually led to a complete breakdown of interaction between MFIs and their clients in Kolar. Repayment issues extended shortly to the towns of Ramanagaram and Mysore.

[7] Discussion with clients in the four main affected towns shows that, in many cases, they were running from one MFI meeting to another spending 1-2 hours on a daily basis.

The resulting delinquency crisis amongst Muslim clients spread to other towns as a variety of vested interests came into play. In nearby Sidlaghatta, the religious ban of Kolar was sufficient to provide a breather from the daily round of financial juggling that went into repaying multiple microfinance loans without an adequate income from their household reeling enterprises. In Ramanagaram, reeling factory owners faced with a labor shortage on account of the increasing independence of women with microfinance loans, appear to have influenced the local Anjuman to follow the Kolar example and ban the interaction of Muslims with MFIs. In Mysore, an unrelated communal clash resulted in business losses that enabled a local political organization to pose as a savior of the community by urging microfinance borrowers not to repay and by raising the possibility of a loan waiver.

The situation was compounded by a zero delinquency policy, which did not give MFI staff the flexibility to negotiate or reschedule payments when clients got into trouble. MFI staff required invariably to collect installments on time, which put pressure on clients to repay. Equally importantly, the mass default having occurred, the group liability mechanism had unintended consequences. Even those members of a group willing to pay did not see any point in doing so as they were branded as defaulters along with other members of their group, with no prospect of persuading MFI staff to consider their case separately. Members of mixed groups not otherwise defaulting were particularly affected by this phenomenon.

The fatwa provides us with exogenous variation, as it is arguably unrelated to the unobservable factors that drive default. It caused an unanticipated default of the majority Muslims members without affecting Hindu clients

3. Data

We use two sources of data. First, the administrative records from seven out of the eight largest microfinance institutions operating in the towns of Kolar and Ramanagara in the state of Karnataka, India.[8] Four institutions provided all the loans taken since 2007 until December 2009 while three provided data since 2008 until December 2009. Second, we use survey data collected in Kolar and Ramanagara from a stratified sample of about 800 households. The data include information on borrowers'

[8] We obtained data from Grameen Koota, SKS, Ujjivan, RORES, FFSL, Asmitha and Spandana. We do not have data from Bharati Swamukthi Samsthe (BSS).

behavior and the lenders' practices. The stratified sample was drawn from the administrative data set.

Since many customers borrow from multiple institutions, we matched the administrative records across institutions by name and husband name using a phonetic algorithm given that there is no credit bureau and the spelling of names may be different in different databases. Although ID checks are part of the enrolment process, the algorithm is not perfect because clients sometimes use nicknames and other short forms that will not be matched.[9]

An observation is the master administrative data is a loan with maturity between August 2008 and December 2009 granted by one of the institutions to an individual. The information available includes (i) branch, group and center identifiers of each client; (ii) loan characteristics such as amount, interest rate, frequency of repayments, disbursement date, and date of maturity; (iii) whether the loan fully repaid at maturity and if not the amount remaining to be repaid and; (iv) basic socio-economic information about the borrower such as name, husband name, age, colony, town or village, religion and caste. The information collected varies slightly from one institution to another. In our analysis, we use only variables reported by all institutions. It is important to note that defaults are recorded on an individual loan basis although joint liability is enforced at the center level. A closer inspection of the data provides many examples of some members of the group defaulting while the rest do not.

Our sample contains information about 47,794 clients. In our analysis, however, we use loans disbursed only before Anjuman *fatwa*. This leaves us with 54,435 loans among 33,862 borrowers in 2,531 groups.

Table 1 provides the main descriptive statistics for our sample of loans and individuals. We report different three subgroups of Hindus and Muslims in addition to the full sample in columns 1-3. Columns 4-6 report only borrowers (both Hindu and Muslims) that borrow at least once from a group with religious diversity (mixed center). Columns 7-9 report the subset of borrowers with multiple loans and columns 10-12

[9] We evaluated the effectiveness of our algorithm by comparing the results obtained by a manual match on 1,000 random individuals. In approximately 95 percent of the cases, the algorithm provided a correct match.

report the intersection of the previous sets of borrowers, namely, the subset of clients that borrow from mixed centers and that have multiple outstanding loans at some point in time between August 2008 and December 2009.

Table 1 shows that a little more than half of all clients are Hindus (53 percent) while the remaining 47 percent are Muslims. Approximately 42 percent of all loans are disbursed to clients in mixed religion groups and a bit less than a quarter of all loans are issued to individuals with multiple loans. These borrowers have more than 3 outstanding loans on average during the study period. Finally, around 13 percent of loans are issued to individuals with multiple loans in mixed centers. The average loan size in the sample is 8,500 Rs (around USD 177 at the time of the ban) and the average duration is approximately 330 days. These figures vary little from one sample to another.

4. Empirical Strategy and Results

4.1 Validity checks

We first verify that our differences in differences approach is valid. First, we rule out possible alternative explanations for the surge in defaults among Muslims observed after the *fatwa.* One key concern is that Muslims face a larger debt burden after the fatwa compared to Hindus. The higher burden could be the result of more loans, higher loan sizes, higher interest rates, lower number of installments or a combination of any of these reasons.

Figures 1, 2, 3, and 4 show that the number of loans, the average loan size, the interest rate, and the number of installments, respectively, do not vary significantly before and after the announcement, suggesting that indeed, the Anjuman Committee ban is responsible for the surge in loan defaults.

Second, we need to ensure that joint liability at the center level, and in particular the threat of future credit denial, is actually enforced. To this end we check whether there is a drop in loan disbursement after the fatwa, following the increase in defaults. Figure 5 shows that this is indeed the case. Similarly, Figure 6 shows that there is a steep decline in the size of the loans disbursed after the fatwa.

4.2 Regression specification

In our analysis we use the following regression differences in differences specification with standard errors clustered at the center level. For loan *l* of individual *i* in center *c* at time *t*:

$$Y_{lict} = aP_t + bS_c + d\,P_t \text{ x } S_c + D_{ic} + \varepsilon_{lict}$$

where Y_{lict} is the outcome of interest, P_t is an indicator for the Post announcement period, S_c is the share of Muslims in center and D_{ic} are individual fixed effects.

We focus on three repayment outcome variables, namely, a dummy for default at maturity, the balance outstanding at maturity, the percentage of loan due at maturity. We also include the loan amount to verify that there were no differences in disbursement.

One possible concern with the repayment variables is that after maturity the loan could have been repaid. Although we do not have direct data, credit officers have told us, that very few loans were repaid after maturity.

4.3 Main results

We report the results separately for Hindu and Muslim borrowers. Within each group of borrowers, we use four different subsamples to better distinguish the extent of strategic default among our population. Table 2 shows the results of our main regressions with default at maturity as the dependent variable, for the subsample of Hindus. The first column includes all loans held by Hindus, column 2 only those loans from Hindus in mixed groups (hence excluding loans from Hindus in groups with no Muslims). The sample in column 3 is that of loans given to Hindus with more than one loan and, finally, column 4 provides the cleanest evidence of strategic default by using only loans extended to Hindus who have loans in more than one (mixed) center. As mentioned before, this last approach offers a good way to overcome the consequences of likely differences among groups beyond the variation in the density of Muslims. For all subsamples, loans maturing after the fatwa (recall that the regressions in this table use only loans extended to Hindus) experience a significantly higher default rates than those maturing before. The size of this effect ranges from 10 to more than 20 percentage points. What's more, the restricted sample of those Hindus who hold multiple loans in more than one group (with mixed membership) yields a still higher point estimate of

this parameter. Those are the observations that capture in a cleaner way the effect we are trying to establish. Still more important for our purposes, our regressions show a strong, positive and significant effect for the interaction of the variable post (loan maturing after the fatwa) and the share of Muslims in the group. This can be understood as evidence for strategic default, since even after the fatwa those groups with a higher share of Muslims are also those where Hindus default in greater proportion. Our results indicate that a one percentage point increase in the share of Muslims in a given group contributes, after the fatwa, to a 0.5 percentage point increase in the likelihood of default for a loan to a Hindu borrower in that group. The results hold for Muslim borrowers as well (Table 3): the larger the share of Muslims in a given group, *ceteris paribus*, the larger the default rate after the fatwa. Shifting to the balance outstanding at maturity as our dependent variable (Table 4 and Table 5), the story remains exactly the same: for Hindu borrowers, the higher the share of Muslims in a group, the higher this balance is after the fatwa. The effect holds, albeit at a slightly less strong pace, for the class of Hindu borrowers with multiple loans outstanding in groups with mixed membership. For Muslim borrowers, the effect is also present, but ceased to be statistically significant for the categories of borrowers with multiple loans and those with multiple loans in mixed groups.

4.4 Alternative specification

In the spirit of Besley and Coate (1995) we now run a specification to estimate the critical mass of defaulting members in a group that triggers strategic default among members that could otherwise repay. An estimation of this parameter is valuable for the design of microfinance schemes in general.

We use an alternative specification that relies on the use of categorical variables for the density level of Muslims in the different groups. We define four Muslim-density dummy variables: *Dens1-Dens4*. *Dens 1* takes value 1 if the group has no Muslim presence. *Dens2* identifies those groups with a Muslim density below 6.25%, *Dens2* between 6.25 and 25% and *Dens4* above 25%. As before, the econometric specification is the following, replacing the variable standing for the density of Muslims with the new density dummies:

$$Y_{lict} = aP_t + bdens2_c + cdens3_c + ddens4_c + e\,P_t \text{ x } dens2_c + f\,P_t \text{ x } dens3_c + g\,P_t \text{ x } dens4_c + D_{ic} + \varepsilon_{lict}$$

Also as before, we split the sample by loans belonging to Muslims and to Hindus, but we only use the subsample of loans from borrowers with multiple loans in mixed groups. We use as dependent variables whether the loan was in default at maturity, the balance outstanding at maturity, the percentage of the loan due at maturity, and the loan principal amount.

We report the results in Table 6. Our findings point to a strong and significant effect on loan repayment among Hindus for the two categories of groups with the highest density of Muslims. In particular, a loan from a Hindu belonging to a group in the third category (Muslim density between 6.25% and 25%), with a maturity date after the fatwa, was 17.7 percentage points more likely to be in default at maturity than the average loan in the same situation in other groups. Equally, those in the fourth category (Muslim density above 25%) were 28.5 points more likely to be in default. Similarly significant effects are found for balance outstanding at maturity, with loans of Hindus in groups of high Muslim-density showing significantly higher balances than the rest.

4.5 Summary of results

To sum up, our analysis shows convincing evidence that microfinance customers in joint liability schemes do in fact engage in some measure of strategic default, hence providing some corroboration for the Besley-Coate hypothesis. Both Hindus and Muslims in Muslim-dominated groups show higher default rates. For all the outcomes studied, the evidence suggests that borrowers are more likely to default on their loans when the fraction of defaulters in their group rises.

Our exercise identified large differences in default rates for borrowers in Muslim-dominated centers relative to borrowers in Hindu-dominated groups. But the question remains, what are the precise mechanisms through which this effect takes place?

To complement our analysis of administrative records of loan performance with a better picture of the fundamental reasons behind the phenomenon, we draw from a survey (more details of survey) conducted in the area around the same time. In that, borrowers were asked the reason of their missing payments. 95 per cent of Muslims and

89 per cent of Hindus answered that they actually had the money to repay the loan, but chose not to. This is precisely the strategic behavior we are concerned about. Strategic default seems to be the leading explanation for the surge in loan default, as opposed to shocks or institutional constraints.

6. Conclusion (to be completed)

The benefits of joint liability schemes have been well documented for long (references). Joint liability, however, is not a panacea and it does not come without its share of problems. As suggested by Besley and Coate, and reinforced by our analysis, strict adherence to joint liability rules can have unintended consequences that should be taken into consideration when choosing among alternative schemes to help the poor overcome their lack of access to credit. Among them, the possibility of strategic default seems likely to merit close attention.

Evidence of strategic default has already triggered some changes for MFIs. According to Dowla and Barua (2006), suche evidence in Grameen group liability groups triggered conversion to invididual liability under Grameen II.

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Figures and Tables

Figure 1: Number of loans by date of maturity

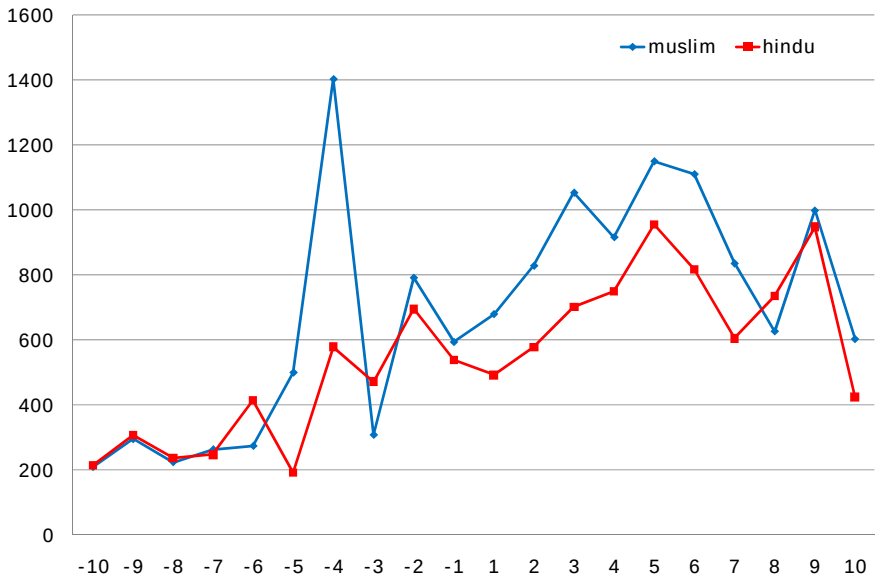

Figure 2: Average loan size by date of maturity

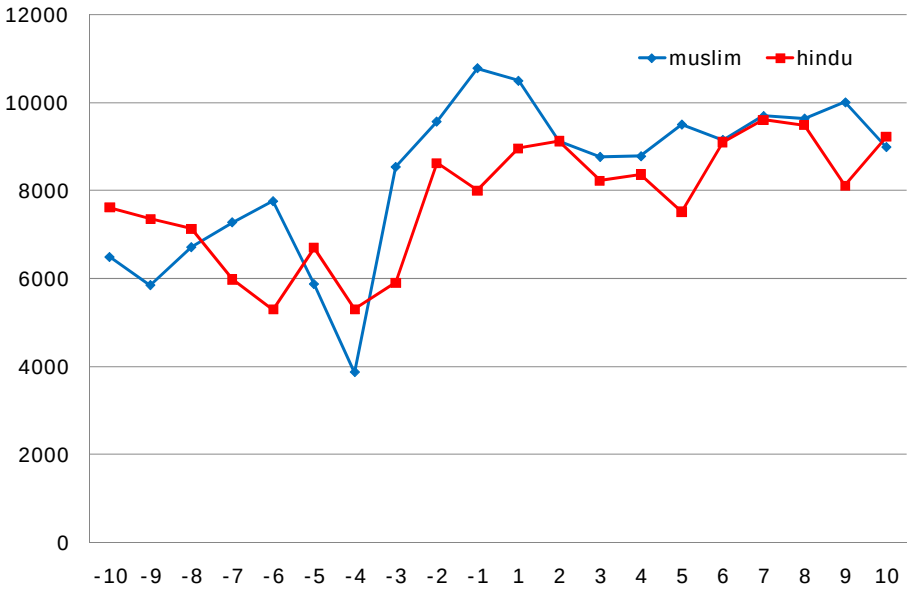

Figure 3: Average interest rate by date of maturity

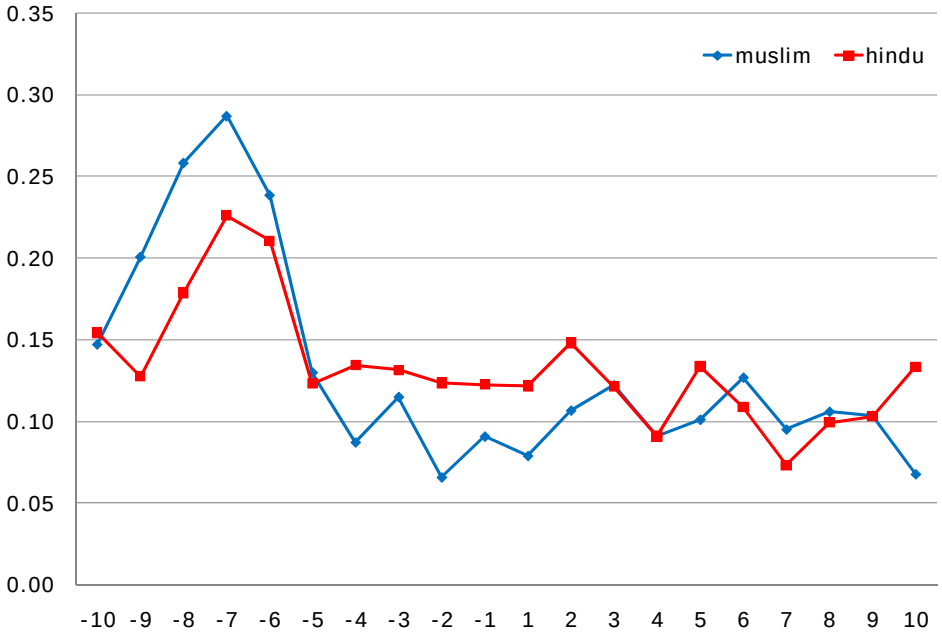

Figure 4: Average number of installments by date of maturity

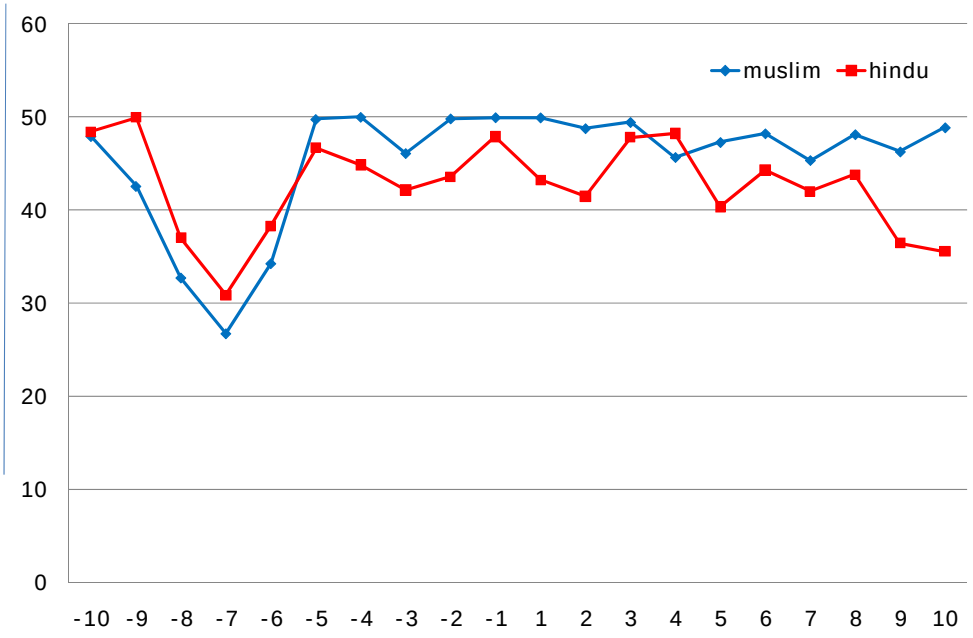

Figure 5: Number of loans by date of disbursement (Kolar)

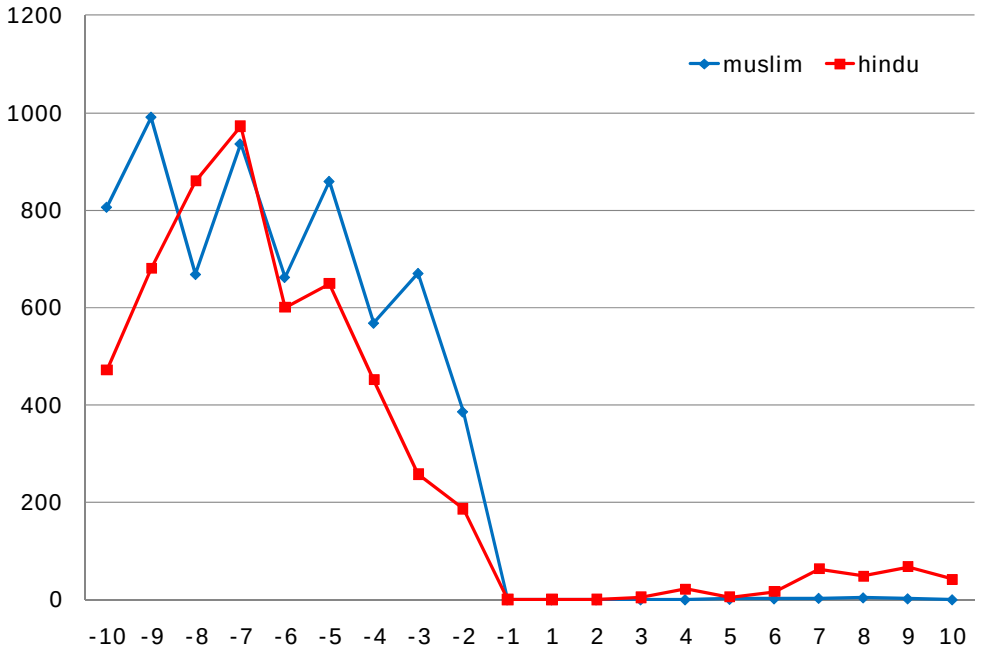

Figure 6: Average loan size by date of disbursement (Kolar)

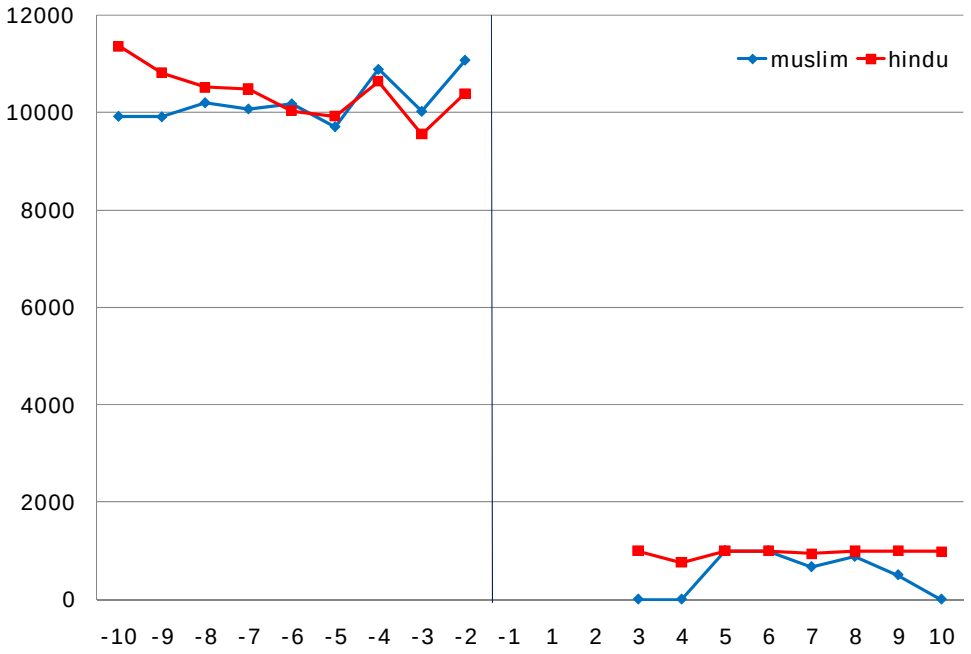

Table 1: Comparison of baseline characteristics

	All Borrowers			Borrowers in Mixed Centers			Borrowers with Multiple Loans			Borrowers with Multiple Loans in Mixed Centers		
	Hindus	Muslims	p-val of t-test of (1)-(2)	Hindus	Muslims	p-val of t-test of (4)-(5)	Hindus	Muslims	p-val of t-test of (7)-(8)	Hindus	Muslims	p-val of t-test of (7)-(8)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Panel A: Center Characteristics												
Proportion of Muslims per center	0.25	0.82	-	0.42	0.63	-	0.23	0.92	-	0.40	0.70	-
Members per center	18.5	23.9	-	20.1	23.6	-	31.1	20.7	-	32.9	32.0	-
Number of centers	1,008	1,523	-	609	738	-	495	1023	-	279	277	-
Panel B: Borrower Characteristics												
Number of centers per borrower	1.11	1.16	0.000	1.16	1.22	0.000	2.17	2.25	0.000	2.19	2.30	0.000
Number of loans per borrower	1.55	1.64	0.016	1.61	1.76	0.011	3.31	3.35	0.467	3.35	3.51	0.017
Number of borrowers	15728	18134	-	6807	6759	-	1488	2300	-	926	1133	-
Panel C: Loan Characteristics												
Interest rate	0.140	0.130	0.030	0.121	0.126	0.461	0.144	0.136	0.000	0.14	0.13	0.095
Loan duration (days)	335	336	0.771	338	334	0.143	323	333	0.000	327	332	0.002
Loan principal amount (Rs)	8579.7	8804.0	0.046	8650.1	8594.7	0.790	8002.5	8502.2	0.000	8021.8	8346.0	0.000
Number of installments	43.1	47.6	0.000	46	47	0.083	42	47	0.000	44	47	0.000
Number of loans	24,403	30,032	-	10,991	12,083	-	4931	7704	-	3101	3978	-

Table 2: Default at maturity (Hindu loans)

	All Hindus	Hindus in mixed centers	Hindus with multiple loans	Hindus in mixed centers with multiple loans
	(1)	(2)	(3)	(4)
Post	0.101***	0.192***	0.154***	0.224***
	[0.032]	[0.071]	[0.034]	[0.054]
Pct Muslims in Center	-0.002	-0.001	-0.002	-0.001
	[0.002]	[0.002]	[0.001]	[0.001]
Pct Muslims x Post	0.005***	0.004*	0.005***	0.004***
	[0.002]	[0.002]	[0.001]	[0.001]
Mean Dep. Var	0.057	0.101	0.114	0.153
Observations	24,403	10,991	4,931	3,101
R-squared	0.702	0.717	0.571	0.593
Borrower FE included				

Table 3: Default at maturity (Muslims loans)

	All Muslims	Muslims in mixed centers	Muslims with multiple loans	Muslims in mixed centers with multiple loans
	(1)	(2)	(3)	(4)
Post	0.320**	0.275**	0.399***	0.424***
	[0.149]	[0.139]	[0.120]	[0.118]
Pct Muslims in Center	0.001	0.000	0.000	0.001
	[0.001]	[0.001]	[0.001]	[0.001]
Pct Muslims x Post	0.003*	0.004**	0.003**	0.003**
	[0.002]	[0.002]	[0.001]	[0.001]
Mean Dep. Var	0.486	0.408	0.531	0.487
Observations	29,808	11,911	7,704	3,978
R-squared	0.804	0.772	0.659	0.619
Borrower FE included				

Table 4: Balance outstanding at maturity (Hindu loans)

	All Hindus	Hindus in mixed centers	Hindus with multiple loans	Hindus in mixed centers with multiple loans
	(1)	(2)	(3)	(4)
Post	241.8**	517.3**	378.4***	609.7***
	[99.12]	[235.8]	[105.6]	[178.5]
Pct Muslims in Center	-6.517	-3.148	-5.174	-2.557
	[5.707]	[5.902]	[3.884]	[4.048]
Pct Muslims x Post	23.54***	17.76**	21.16***	16.61***
	[6.354]	[7.216]	[4.888]	[5.423]
Mean Dep. Var	146.1	291.6	265.3	390
Observations	24,403	10,991	4,931	3,101
R-squared	0.671	0.673	0.447	0.447

Borrower FE included

Table 5: Balance outstanding at maturity (Muslim loans)

	All Hindus	Hindus in mixed centers	Hindus with multiple loans	Hindus in mixed centers with multiple loans
	(1)	(2)	(3)	(4)
Post	1,183	1,081	2,133***	2,240***
	[752.3]	[696.0]	[799.2]	[780.2]
Pct Muslims in Center	-9.761	-10.5	-3.447	-1.792
	[8.034]	[7.517]	[5.871]	[5.623]
Pct Muslims x Post	20.73**	22.80***	10.05	7.801
	[8.584]	[8.531]	[8.600]	[8.482]
Mean Dep. Var	2433	1849	2550	2157
Observations	29,808	11,911	7,704	3,978
R-squared	0.771	0.713	0.543	0.523

Borrower FE included

Table 6: Impact by density category

	Loan Principal Amount		Was loan in default at maturity?		Balance outstanding at maturity		Pct. Loan due at maturity	
	Hindus	Muslims	Hindus	Muslims	Hindus	Muslims	Hindus	Muslims
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post	2,133***	2,328***	0.142***	0.574***	289.2**	2,804***	0.0528**	0.278***
	(655.3)	(582.8)	(0.0389)	(0.0629)	(115.1)	(361.4)	(0.0245)	(0.0292)
Quartile 2	1,712**	-819.3	-0.0928	-0.0343	-217.7	-851.8*	-0.0488	-0.0529
	(734.0)	(832.6)	(0.0855)	(0.0655)	(207.4)	(455.1)	(0.0363)	(0.0326)
Quartile 3	1,657*	-919.9	-0.0683	-0.120*	-183.9	-459.6	-0.02	-0.0504*
	(921.1)	(677.0)	(0.0839)	(0.0626)	(276.1)	(360.0)	(0.0299)	(0.0273)
Quartile 4	596.2	-303.5	-0.130*	-0.0359	-427.8*	-182.7	-0.0527*	-0.0253
	(738.1)	(662.5)	(0.0680)	(0.0538)	(248.0)	(311.7)	(0.0311)	(0.0263)
Post x Quartile 2	165.1	99.61	0.144	0.0786	541.0*	201.9	0.0709	0.0348
	(852.5)	(983.1)	(0.101)	(0.0917)	(314.0)	(575.1)	(0.0517)	(0.0418)
Post x Quartile 3	432.3	672.4	0.177*	0.0541	704.9**	-354.6	0.0479	0.000261
	(961.3)	(709.4)	(0.0973)	(0.106)	(346.2)	(534.7)	(0.0397)	(0.0394)
Post x Quartile 4	263.1	250.9	0.285***	0.174**	1,226***	560.4	0.132***	0.0721**
	(873.0)	(699.2)	(0.0770)	(0.0718)	(300.9)	(421.0)	(0.0433)	(0.0350)
Observations	3.101	3.978	3.101	3.978	3.101	3.978	3.101	3.978
R-squared	0.37	0.382	0.595	0.628	0.448	0.535	0.477	0.535
Mean Dep. Var.	8022	8346	0.153	0.487	390	2157	0.0468	0.226

We use the sample of borrowers with multiple loans in different centers. Standard errors in parentheses (*** p<0.01, ** p<0.05, * p<0.1)