Does Group Lending Increase Social Capital? Evidence from a Field Experiment in India

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Abstract

Exploiting experimental variation in repayment meeting frequency across microfinance groups, we show that mandating more frequent interaction reduces social distance between group members in the short run and enhances their social capital in the long run: Relative to groups which meet monthly, members of groups that meet weekly exhibit greater pro-social behavior towards each other as measured by willingness to cooperate in trust games one year after the end of the loan cycle. Expectations of reciprocal behavior by group members rather than altruism appear to drive this result.

1 Introduction

It is widely held that social interactions yield significant economic returns by facilitating cooperation and thereby enabling individuals to reap gains from trade when commitment is

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not possible (Carter and Castillo, 2003; Grootaert, 2000; Krishna, 2001; Knaff and Keefer, 1997; Temple and Johnson, 1998). This idea has a long-standing theoretical foundation in the literature on repeated games (Kreps et al., 1982) and is supported by numerous empirical studies which show a positive correlation between membership in community organizations and economic well-being (Putnam, 1993; Alesina and Ferrara, 2002). More recently, beliefs about the economic importance of social interaction have led scholars to express concern over the substantial decline in community membership that has taken place over the past half century in the U.S. (Putnam, 1995) and been associated with modernization in the developing world (Olken, 2008). Understanding the returns to group interactions is key to determining the economic implications of such trends. However, empirical evidence on this issue remains scarce largely due to the notorious difficulty of measuring the causal effect of interaction when social ties are endogenous (Manski, 1993, 2000).

A number of laboratory and field experiments show a robust positive association between social distance and cooperative behavior (people are more pro-social with friends of lower social distance). However, given that some of this association is likely to reflect sorting of cooperative types into social networks, a fundamental ambiguity in the literature is the degree to which decreasing social distance yields economic returns. Without randomly varying the extent of such interactions, it is near impossible to validate the basic economic model of social capital.

The central contribution of this paper is to undertake precisely this exercise. Specifically, in a field experiment conducted with a large microfinance institution (MFI) in Kolkata, India we randomly varied whether microfinance client groups met once per week (now on, weekly groups) or once per month (monthly groups) over their loan cycle (Field and Pande, 2008). We measure the degree of social interaction outside of meetings between clients in the same group throughout their loan cycle and again one year after their loan had been fully repaid. Our experimental manipulation, in effect, lowered the marginal cost of interaction between a randomly chosen set of MFI clients. By varying social distance holding network

characteristics constant, we are able to isolate the causal influence of interaction that is generally confounded by endogenous selection into networks.

Gathering rigorous empirical evidence on the returns to social interaction is especially relevant given the theoretical case for government intervention in social capital investment (especially in the presence of weak institutions, a situation which typifies many low income countries).[1] As Glaeser et al. (2002) argue the combination of positive externalities and inherent complementarities in social capital creates the possibility for multiple equilibria and, as a result, underinvestment in social capital. This suggests potentially large gains from policies which facilitate interaction and help coordinate investment. However, if the existing evidence largely reflects sorting of types into networks (rather than the causal effect of social capital), then the empirical justification for policy interventions aimed at increasing social capital is weaker.

Perhaps in no policy arena is the need for such evidence more pertinent than microfinance. The most common model of micro-lending - that pioneered by the Grameen Bank - seeks to capitalize on group level trust and network externalities in order to increase the viability of lending to the poor. Yet, by increasing social interaction among clients through regular group meetings, the standard microfinance contract has the potential to strengthen social ties and increase the overall social capital of group members. In particular, a key feature of the Grameen Bank model is repayment in a group setting at weekly intervals (Armendariz and Morduch, 2005).[2] Here, we investigate whether regular interaction in weekly meetings generates social capital among microfinance clients.

Consistent with the multiple equilibria story, we find that a relatively small change

[1] Fafchamps and Lund (2003); Fafchamps and B.Minten (2002) provide empirical evidence on the importance of social interactions for trade in developing countries; also see Durlauf and Fafchamps (2004)

[2] Regular repayment is argued to promote fiscal discipline and help loan officers of microfinance institutions (MFIs) monitor clients who are at risk of default, while group meetings simply lower the MFI's transactions costs involved in collecting weekly payments.

in meeting frequency produces large changes in social capital investment within a short time period: After five months, relative to a client in a monthly group, a client in a weekly group was 90% more likely to know her group members' family (by name) and to have visited them in their homes. She was also 16% more likely to know about social activities at another group member's house. One year after completing the loan cycle weekly clients remain 50% more likely to attend social events together and 29% more likely to say that they would help one another in the event of a health emergency.[3] These findings demonstrate the potential for policy interventions such as micro-lending to fundamentally alter the shape of social networks, at least among women in urban areas of the developing world.

Since the economic value of spending time with neighbors is unclear, we link our results on social interactions to the broader notion of social capital by experimentally measuring cooperative behavior among clients. Collier (1998) describes social capital as a persistent externality resulting from social interactions that has the potential to increase trust and reciprocity.[4] To gauge whether our experiment generated such long-term externalities, we measured the difference between weekly and monthly clients' pro-social behavior with respect to other group members in a field experiment analogous to a trust game approximately one year after their loans were repaid.

In the experiment, clients were given the opportunity to enter fellow group members into a lottery; in doing so, they increased the expected earnings of the group at the expense of their individual expected earnings. As in the standard laboratory investment game (Berg et al., 1995), there are potential gains from trade but contractual pre-commitment is not possible, so an individual's generosity towards other group members arguably measures "the resource potential of personal networks," the definition of social capital favored

[3]At this point she may have continued to a second loan group. This group would have met less often and would typically have some, but rarely all, the same group members as in the previous loan.

[4]Alternatively, Putnam (1993) defines social capital broadly as "features of social organization, such as trust, norms and networks, that can improve the efficiency of society by facilitating coordinated actions".

by Sampson et al. (1999). As in related lab experiments, we minimize the potential role of implicit enforcement mechanisms that arise from repeated interaction (such as punishment or reputation effects) by guaranteeing anonymity and playing the game only once.

We find that, relative to clients who met on a monthly basis, clients who were randomly assigned to meet every week were also more likely to engage in pro-social behavior with members of their group more than a year after having repaid their loan. On average, weekly clients were 30% more likely to send a lottery ticket to a fellow group member.

As is widely recognized in the experimental literature on trust, motivations for giving in trust games are ambiguous. In our case, greater pro-social behavior among clients who meet more frequently may reflect either a higher degree of altruism or greater trust and reciprocity among clients that know each other better. To disentangle these two motivations, we randomly varied the divisibility of the transfer, which constrained the receiver's ability to share earnings with the sender. We find that experimentally generated social interactions increase giving only when the prize is easily divisible, indicating that more frequent interaction leads to higher levels of trust rather than pure altruism. This finding is consistent with a number of laboratory experiments, which reject that sending behavior in trust games reflects pure altruism (Carter and Castillo, 2003; Gneezy et al., 2000; Cox, 2000; Do et al., 2009).

We interpret this as evidence that greater social interaction among microfinance clients in our experiment produced individual financial returns. Hence, our intervention can be viewed as a persistent and economically meaningful expansion of social capital. Consistent with this interpretation, weekly clients state that their average group member is more trustworthy, and that they are more likely to rely on a group member in a health emergency.[5]

[5]Our findings are consistent with qualitative evidence from microfinance clients in Bangladesh, which indicated that weekly meetings expanded members' networks, and that these networks, in turn, facilitated economic and non-economic transactions.L.Y.Larance (2001) conducted in-depth interviews at two Grameen Bank centers in Bangladesh on the role of group meetings in expanding members' social capital.

From a policy perspective, our study reveals that small changes in the degree of interaction among women in poor urban neighborhoods of developing countries can significantly enhance their social capital. Hence, by broadening and deepening social networks, MFIs may have an important influence on the growth potential of poor communities and the empowerment of women above and beyond the role of credit provision. Not only are social externalities of regular group interaction an important component of the value of microfinance lending, but the endogeneity of social capital has potentially important implications for default and delinquency in group lending.

The rest of this paper is structured as follows. Section 2 describes the related literature and Section 3 the setting of our study. Section 4 describes the experimental design and data. Section 5 provides experimental evidence on how meeting frequency affects social capital formation and Section 6 concludes.

2 Related Literature

Our study bridges two parallel but relatively unconnected literatures on the determinants of social capital.[6] First, a number of papers on social capital formation examine the relationship between survey measures of trust or civic engagement and miscellaneous personal and community characteristics, such as race and income heterogeneity (Costa and Kahn, 2003; Alesina and Ferrara, 2002), home ownership (DiPasquale and Glaeser, 1999), industrialization (Miguel et al., 2005), media access (Olken, 2008) and political institutions (Rahn and Rudolph, 2002). The general pattern of findings is that community characteristics that imply more frequent or steady interaction among individuals are associated with greater trust

[6] An important exception is the seminal paper by Glaeser et al. (2000) who explicitly link these two literatures by analyzing individual determinants of social capital as measured by both survey and experimentally-generated trust measures.

and civic engagement.[7] However, this type of analysis is largely unable to isolate the social interaction channel from other channels through which community characteristics such as political institutions arguably influence attitudes and beliefs. A second shortcoming is the reliance on survey-generated measures of trust, which are often inconsistent with incentivized trust measures (Glaeser et al., 2000).

More recently, a number of papers explore the determinants of social capital using experimental trust measures generated from laboratory games (see, for instance Glaeser et al., 2000; Carter and Castillo, 2004; Karlan, 2005; Ligon and Schecter, 2008). Such measures are considered more reliable and meaningful indicators of the cooperative behavior implied by theory. Typically, these studies compare trust outcomes between pairs of individuals at varying degrees of social distance. However, the endogeneity of social distance makes differences in trust patterns difficult to interpret. While greater cooperation among friends is consistent with a model of economically gainful social interaction, pro-social behavior could, in theory, decrease with social distance when interaction is endogenous simply because more cooperative individuals are more likely to join networks.[8]

Here, we use a field experiment not only to measure trust, as in the aforementioned papers, but also to generate random variation in social interactions. This allows us to establish a causal association between social interaction and experimental measures of trust. To the best of our knowledge, ours is the first paper to experimentally manipulate the social interaction of individuals outside of the laboratory and then examine its effect on pro-social behavior.[9] Given the notorious difficulty of addressing the endogeneity of social networks,

[7]Studies such as Brehm and Rahn (1997) verify that the outcomes are strongly related: community participation is highly correlated with survey measures of trust.

[8]Put simply, there may exist pro-social and non-pro-social types, with pro-social types ("people" people) are also more likely to form networks. In this case, we would observe pro-social behavior increasing as social distance falls, as has been shown in numerous laboratory experiments, even if, contrary to theoretical models of social capital, repeated interaction does not facilitate cooperation.

[9]In this sense, our paper is related to the handful of peer effects studies that exploit random variation

the advantage of this approach cannot be understated.

Our paper is also related to the, largely laboratory-based, experimental literature that seeks to disentangle incentives to cooperate. A number of papers use different variations of the classic investment game of Berg et al. (1995) to parse out motives for giving (Carter and Castillo, 2004; Forsythe et al., 1994). Perhaps closest to our approach is Gneezy et al. (2000), who use a sequence of trust games with varying constraints on the amount that can be repaid in the second round to show that individuals contribute more when large repayments are feasible. Our setting is arguably an improvement over the stylized laboratory game since it mimics a real world choice over risk-sharing. A related paper by Do et al. (2009) distinguishes altruistic giving from reciprocity in a series of experiments with Harvard undergraduates by varying the condition of anonymity. Since giving to friends increases when the sender's identity is made known to the receiver, they conclude that reciprocity is an important motivation for generosity to friends. In a highly related field experiment in Paraguay, Ligon and Schecter (2008) attempt to disentangle four motives for giving to others - benevolence, altruism, sanctions, and reciprocity within a social network - by varying information and anonymity in a standard dictator game, and find evidence of all four.

Our trust game falls in the category of "natural field experiment". That is, it is designed so that clients are unlikely to be aware that they are participants in an experiment, maximizing the external validity of our findings. In contrast, all the above studies are "framed" or "artefactual" field experiments, in which subjects understand that they are taking part in an experiment, with their behavior subsequently recorded and scrutinized. As discussed in Harrison and List (2004), this is a key dimension in which field experiments are potentially superior to laboratory experiments and which has not previously been achieved

in living arrangements to study the effects of social interactions on behavior (Sacerdote, 2001; Kremer and Levy, 2008; Kling et al., 2007). However, these experiments are not ideal for examining the effect of group interaction on trust since randomly assigning living arrangements need not encourage more frequent social interaction. To our knowledge, none of these papers look explicitly at peer effects on trust.

in the experimental literature on trust. As shown in List (2006) and Benz and Meier (2008), moving a field experiment from the realm of framed to natural can lead to significantly different outcomes.

3 MFI Setting

Our partner micro-finance institution 'Village Welfare Society' (VWS) started operations in the Indian state of West Bengal in 1982. In 2006 (when we initiated our field experiments), it had eighteen branches spread across five districts in West Bengal and roughly 6.75 million dollars in outstanding loans to over 56,000 clients. Its end-year financial statement for 2006 reported a repayment rate of 99%.

The VWS client base reflects typical MFI lending practices: it only lends to women (most of whom are married), and targets those with a household income below two dollars a day. Most clients are in the informal sector: less than 10% of households in our experiment have any member who earns a fixed salary. However, like most MFIs, VWS targets entrepreneurial clients: Over 70% of households in our experimental sample own some type of micro-enterprise and over 80% of the women are literate (Table 1).

VWS protocol for client selection is as follows: first, a loan officer visits a potential neighborhood and conducts an "Eye Survey" to identify whether the neighborhood has a sufficient number of individuals with appropriate demographic characteristics. Having ascertained this to be the case, the loan officer conducts a large meeting in which he informs potential clients about the VWS loan product and invites interested individuals to a five-day Continuous Group Training (CGT) program. This program runs for an hour each day, and introduces clients to the benefits and responsibilities associated with the loan product. Each potential loan group (with a minimum group size of 10 individuals) is assigned a separate CGT program. At the end of the five-day training, the loan officer forms women in the CGT who were considered sufficiently informed and interested into a group, identifies (with group

members) a group leader and offers each member of the group a loan.[10]

The neighborhood-based approach that characterizes all group lending implies that group members usually know each other even before they join the group. In our sample, roughly 70% of the clients stated that they were acquainted with each other before joining the loan group, which is unsurprising since most group members live in the same neighborhood. That said, the level of interaction between group members prior to taking out a loan is relatively low: At the time of their first group meeting only 17% of our clients report either having visited all their group members or having been visited by them in their homes.[11]

After the loan is disbursed, the group meets on a weekly basis in the group leader's house. The first two weeks are for group nurturing and training. Loan repayment starts in the third week. The repayment meetings are conducted by the loan officer in a client's house. During each meeting, which lasts between 15 and 30 minutes, clients take an oath (in which they promise to repay regularly and observe joint liability), the loan officer collects payment from each member and marks their passbooks.[12] While women wait their turn they are free to socialize. The loan officer may also take the opportunity to discuss with clients any new initiatives or procedural changes at the bank, or answer questions from clients.

At any point after twenty weeks, clients can repay the remaining balance in one installment and graduate to a larger loan. There are no "late fees" for delayed installments, so clients' incentive to repay according to the assigned schedule is driven entirely by fear of losing access to future VWS loans. Typically clients finish repaying at different points in time; in our sample the median weekly VWS group met 37 times during a single loan cycle.[13]

[10]Groupleader selection criteria include: (i) communicates well with group members and VWS staff; (ii) responsible and well accepted by group members; (iii)has a house or place to organize group meeting.

[11]Baseline levels of client interaction is presumably higher in rural settings where mobility is lower.

[12]If a client is unable to make it to a meeting then she could repay at a center. This occurred very rarely.

[13]VWS does not have an explicit policy on the minimum number of clients per group for group meetings to continue but their general guideline is: if a majority of clients in a group have repaid their loan, then they no longer hold group meetings and ask clients to come to the branch to make payments.

4 Experimental Design and Data

We created variation in the extent of social interaction among MFI group members by randomizing the frequency of group meeting among a hundred first-time VWS borrower groups in peri-urban Kolkata. Roughly one year after these clients had repaid their loan, we conducted a field experiment with a random subsample of 450 clients to examine whether differences in social interactions translated into economically meaningful differences in pro-social behavior. In this section we describe our experimental design and data.

4.1 Repayment Frequency

Between April and September 2006, five VWS loan officers formed the groups that enter our sample following the protocol described in Section 3.[14] The loan officers aimed to form ten-member groups; in practice, group size ranged between eight and thirteen members, with 77% of the groups consisting of ten members.

In line with VWS policy, clients received a uniform Rs. 4000 (˜$100) loan. After finalizing the groups and loan terms (but before the loan was disbursed), we randomly assigned thirty groups to the standard VWS repayment schedule of weekly repayment and seventy groups to a monthly repayment schedule.[15] No clients dropped out after the repayment schedule was announced. This is unsurprising since potential clients were told from

[14]Between November 2006 and February 2007 we expanded our sample to an additional fifty groups through a separate randomization. At this point, VWS had moved to five-member groups. Our social capital analysis excludes these five-member groups due to the changed nature of group formation: these clients were significantly more likely to interact with each other beforehand.

[15]The number of monthly groups is twice the number of weekly groups on account of our initial intention to divide the monthly repayment groups into two arms which differed in meeting frequency: one that met weekly and one that met monthly. However, in practice, weekly meetings among clients required to repay monthly broke down almost immediately, and these clients ended up meeting on a monthly basis for the most of their loan cycles.

the onset the odds of being assigned weekly versus monthly repayment schedules so those with strong preferences for weekly would have been screened out of our experiment early on.

Clients repaid their Rs. 4000 loan through 44 weekly installments of Rs. 100 if they were on the weekly repayment schedule (starting two weeks after loan disbursal) and eleven Rs. 400 installments (starting the second month after the loan was disbursed) if they were on a monthly repayment schedule.

We administered a baseline survey to 99% of clients as soon as group formation was completed. In Table 1 we use these data to provide a randomization check. On average, both monthly and weekly groups had ten members and income dispersion is similar across groups. Panel B provides a client-level randomization check. The co-variates are jointly insignificantly different across weekly and monthly groups. There are significant client level differences on two co-variates. First, none of the weekly clients but 7% of the monthly clients are Muslim. Second, monthly clients have lived in their current neighborhoods for slightly longer. While the latter is potentially worrisome, it is important to note that monthly clients were not more likely to know each other before joining the group. Given these differences, throughout we report regressions with and without the group and individual controls included in this Table. We also verify that all of our results are robust to excluding Muslim clients.

Starting in late May 2006 loan officers administered a short client survey during every group meeting. After collecting payments, loan officers were instructed to pull each client aside (to maximize privacy of survey responses) to ask a few questions on their interactions with fellow clients outside of group meetings and their knowledge of other group members. Since complete privacy could not be guaranteed, we did not ask clients about their relationships with individual group members in this survey, but instead asked them to aggregate their interactions across group members to maintain some degree of anonymity. Hence, for almost all clients we have regular measures of group interactions from the beginning to the end of their loan cycle. There are two exceptions. First, we started collecting these data only two months after the first set of groups had been formed. Second, clients often complete

repayment early.[16] As a robustness check, we therefore also ran all regressions only using group meeting data for months 3-5 of a group's loan cycle.[17]

4.2 Pro-Social Behavior

To examine whether more frequent interaction in meetings increases pro-social behavior we conducted a field experiment analogous to a laboratory trust game with a random sample of 450 clients between eight and twenty months after they had repaid (on average, fifteen months after repayment). Clients were given the opportunity to share expected earnings from a lucky draw with each member of their loan group. We piloted the lottery among 128 clients and then randomly drew a sample of 450 clients from the remaining 900 in which to conduct the final lottery. Of these, we were able to contact 432 clients (two clients had died and the other sixteen were away from Kolkata). These 432 clients were spread across 98 groups, yielding a final sample of 129 weekly and 321 monthly clients.

The lottery protocol was as follows: A client was approached in her home and told that her name had been selected for inclusion in a random draw for 200 Rupees of gift vouchers that could be redeemed at a local retailer affiliated with VWS.[18] The lucky draw was framed as a promotion for the new VWS retail store. It was explained to her that the pool of names entered into the lucky draw includes ten other clients from another bank branch outside of their neighborhood (such that they are unlikely to know her). If she agreed to have her name entered into the draw (all clients agreed), she was then given the opportunity to also enter the name of each client from her first VWS group into the draw, thereby potentially

[16]Delay in when we started the survey implies that 1.9% of clients (20 clients) are missing two months of data, 4.8%(49 clients) are missing data for 45 days and 7.8% (80 clients) are missing data for one month. In addition, we have 17 clients who repaid within six months of their first meeting (1.7%) and another 45 who repaid in the first seven months (4.4%).

[17]By the third month all groups had at least one month of meetings and no client had repaid her loans. These results are available from the authors.

[18]The amount reflected VWS managers' view of what constituted an "appropriate" sized prize.

increasing the number of lottery participants from 11 to as many as 20, and increasing the fraction of group members in the draw from 9% to 50%, while decreasing her own probability of winning from 9% to 5%. The client was told that the ten other lottery participants would not have the opportunity to enter other individuals into the lottery. Hence, she was the only lottery participant who could influence the odds of winning. In the Appendix we provide the script used. An important aspect of our experimental design is that we provided detailed payoff matrices to participants before they are asked to make a choice. Charness et al. (2004) demonstrates that providing such information is important in trust games. Figure 1 shows the picture used to explain how changes in ticket giving will influence winning probabilities.

We are interested in whether more frequent interaction with group members influenced the likelihood that a client entered some of her fellow group members into the lottery. The idea is that, if group meetings increase social capital in an economically meaningful way, then clients should be more willing to share the odds of winning with members of their group. This could happen either because of greater altruism among clients who meet more regularly and therefore know each other better, or because regular interaction increases trust between clients which facilitates their ability to form risk-sharing arrangements when commitment is not possible.

The field experiment is analogous to a standard laboratory trust game (Fehr et al., 1993): Pairs of individuals are separated, and one member of the pair (the sender) has the opportunity to send a lottery ticket to her partner (the receiver). Doing so increases the pair's pool of potential earnings since their joint chances of winning the lottery rise from 9% to 17%. If the receiver wins the lottery and, hence, the transfer, she has the option of sending money back to the sender. Hence, there are mutual gains from cooperation (if the receiver always sends back half her earnings, the sender's expected lottery earnings rise from 18 to 25 Rupees and the receiver's expected earnings rise from 0 to 8.3 Rupees), but costs to the individual if the gift is not reciprocated (if the receiver does not share her earnings with the sender, then giving a ticket to the receiver reduces the sender's expected lottery earnings

since her individual probability of winning the lottery falls from 9% to 8% as the pool of lottery entrants rises to twelve). Hence, an individual's decision to enter a group member into the lottery is a measure of either trust (since enforceability of the exchange relies on trust and reciprocity and may be hindered by coordination problems) or altruism.

To disentangle these two possible channels, we introduce a second level of variation in the experimental protocol. In particular, among a randomly chosen half of the 450 participants, the lottery prize takes the form of one 200-rupee voucher while the other half is awarded four 50-rupee vouchers. Clients were instructed that a voucher can only be used by one client (see Appendix for Text). The idea is to introduce barriers to the divisibility of the lottery earnings that make coordinating on the cooperative strategy more difficult. Figure 2 shows the vouchers which were given to the winner in the two lotteries.

In Table 2 we use the baseline data to report a randomization check for the sample entering the lottery. We consider group-level (Panel A), client-level (Panel B) and pair-level (Panel C) variables. Comparing across columns (1) and (2) in Tables 1 and 2 shows that the lottery sample is representative of the experimental population. Columns (6) and (9) show that our separate group and voucher randomizations are balanced, and column (10) shows that the cross-randomization (group and voucher) is balanced at the individual level (the voucher randomization was done at the individual level).

For each client in a participant's loan group, we record whether the participant chose to enter her into the lottery. Hence, our lottery analysis sample contains an average of 8.9 observations per client for a total of 4020 observations. At the time of the lottery we also conducted a short survey in which we asked the client about her current interactions with members of her first VWS group. The questions were similar to those asked during the group meetings, and provide a long-run measure of social capital among group members.

At the end of the lottery survey, we elicited perceptions of the trustworthiness of the average group member for comparison with the experimentally-generated trust measure.

[19] We also asked clients the widely used General Social Survey (GSS) questions on trust, fairness and helping others (see, for instance, Knack and Keefer, 1997; Glaeser et al., 2000; Karlan, 2005).

5 Experimental Results

Randomization of loan repayment schedule across VWS groups induced exogenous variation in how frequently the groups met. On average, clients on the weekly repayment schedule met thrice as often as monthly clients (35.1 times versus 9.8 times).

In this section we first show that variation in the frequency of group meetings influenced the extent of social interactions among group members outside of meetings, both during the loan cycle and one year after the loan cycle ended. We then exploit the exogenous and persistent nature of these differences to obtain causal evidence on the long run implications of social interactions for pro-social behavior among group members.

5.1 Meeting Frequency and Social Interactions

Figure 3 shows how over the loan cycle, members of a VWS loan group increase interactions with each other outside of required group meetings. Over the first five months of the loan cycle, the fraction of clients who have visited all group members in their homes increased gradually from 35% to 43% (the statistics are very similar for the fraction of clients who had

[19] To gauge her perceptions of trustworthiness, the client was described the following scenario: "Imagine that a person is walking down the street and sees someone in front of him/her drop their purse. Upon inspection, this person finds that the purse contains Rs 200 and the name and phone number of the owner. The person who has found the purse must decide whether to keep it and its contents or return it to its owner." She was then asked to rank (on a scale of 1 to 5, where 1 is will not return and 5 is will definitely return) the likelihood that her average group member would return the wallet. The full 1-5 scale was described as follows: "1-Would not return the money. 2- Unless someone knows she has got the wallet, would not return it. 3-As likely to return as not. 4- Will return, but might take up to a week. 5- Will return immediately."

been visited by all group members, and knowledge of the names of family members of other group members). The fraction of clients who knew whether their group members had been visited by relatives increased five-fold from 2% to 10%.

The gradual nature of the change in interaction suggests a "dose response" to mandatory meetings. Hence, the increase in social interactions should be greater among clients on the weekly repayment schedule, who have more opportunity to form friendships with fellow clients. We examine this possibility in a regression framework. For client i in group g, we estimate the following regression specification using Ordinary Least Square (OLS):

$$y_{ig} = \beta_1 W_g + X_g\gamma_1 + X_i\gamma_2 + \delta M_g + \alpha_g + \epsilon_{ig} \quad (1)$$

W_g is an indicator variable for whether the client's group meets on a weekly schedule, M_g is the month of group formation and α_g is a loan officer fixed effect. Standard errors are clustered at the group level. We report specifications without and with group-level and individual controls (X_g and X_i) reported in Table 1.

Our outcome measures come from self reported data collected by loan officers during group meetings. At each group meeting clients were asked whether they had been visited by all group members in their home, and whether they had visited all other group members in their homes. For both outcomes, we construct an indicator variable which equals one if the client responded in the affirmative at any group meeting during the first five months. As expected, these two outcomes are highly correlated. Panel A reports the results, and we observe a large difference in social interactions between weekly and monthly clients. Close to 100% of weekly clients but only 12% of monthly clients had visited the homes of all other clients in their group.

In Panel B we consider two measures of the knowledge of group members. The first is an indicator variable for whether the client said she knew the names of family members of all her group members at any group meeting during the first five months. Unsurprisingly, this knowledge measure is very correlated with the interaction measures, and the observed

difference between weekly and monthly clients is similar in magnitude to the measures in Panel A. Our second measure comes from the question on whether the client knew if any of her group members had relatives visit in the last thirty days. Here, we consider the average response for each client, where we average across all responses in the first five months. Twenty percent of the weekly, but only one percent of monthly, clients report such knowledge.

In Appendix Table 2 we show that these patterns in the data hold up for the lottery sub-sample.

Next we examine whether these differences in social interactions persisted more than a year after clients repaid their loan and stopped meeting as a group. Our data comes from the short survey conducted at the time of our lottery intervention. We, therefore, have these data only for the lottery sub-sample. For each lottery client belonging to a ten-member group, we have nine observations on her interactions with each of her group members.[20] Overall, we have 4020 observations. The outcome of interest y_{gmi} for lottery client i belonging to group g is her reported interaction with group-member m. We estimate regressions of the form

$$y_{gmi} = \beta_1 W_g + X_g\gamma_1 + X_{im}\gamma_2 + X_i\gamma_3 + \delta_1 M_g + \delta_2 D_{gr} + \alpha_g + \epsilon_{gmi} \quad (2)$$

where the variables are as defined in equation (1). We include a control for number of days between loan disbursement and survey (D_{gr}) and report specifications with and without the set of additional controls. Our additional controls are defined at the group-, pair- and individual- level (X_g, X_{im} and X_i respectively). We cluster standard errors at the level of randomization, i.e group-level. However, errors may also be correlated at the respondent level: conditional, on interacting with one group member we may expect the likelihood that she interacts with a second group member to be lower. Therefore, we cluster standard errors along two dimensions – across groups and individuals – using the multi-way clustering

[20] Our regression framework shares similarities with dyadic regressions, Fafchamp and Gubert (2007). The main difference is that we do not observe interactions as reported by both sides of a pair, since we conducted the lottery for a random subsample of clients.

approach suggested by Cameron et al. (2006) and Thompson (2006).[21]

In our survey we asked respondents multiple questions on social interactions. For the family of outcomes, we expect the coefficients on the variables of interest to go in the same direction. To avoid drawing inferences based on selected outcomes, we report effects which average across outcomes within a family (Kling et al., 2007). Specifically, for each outcome we construct a normalized transformation by subtracting the mean for clients on the monthly repayment schedule and dividing by the standard deviation for these clients. We obtain an average effect for the family of outcomes by estimating the effect for the average across these normalized outcomes. We term this average the Social Interactions Index.

The results are in Table 4. In columns (1) and (2) the outcome of interest is the Social Interaction Index. Roughly one year after the clients have graduated from their loan group, clients that were on a weekly repayment schedule remain significantly more likely to interact with their group members. In columns (3)-(8) we examine the different components of the index. Two measures are directly comparable to the group meeting questions – the number of times the client has visited the group member in her house and been visited by her (over the last thirty days). We also asked whether the client still talks to the group member about her family and whether they celebrated the main Bengali festival (Durga Puja) together.[22] Across all measures we see greater social interactions among weekly clients (relative to monthly clients), though the individual estimates are often noisier. Finally, in columns (11) and (12) we consider a hypothetical question: if the client had a sick family member but had to leave the house would she ask this group member to look after the sick family member. Weekly clients are significantly more likely to respond in the affirmative.

[21] Clustering standard errors at the pair rather than the individual level has little effect on the results.

[22] The last social capital measure was determined after numerous focus groups in which we asked clients the most important events for socializing in the community.

5.2 Meeting Frequency and Pro-Social Behavior

Client ticket giving behavior in the lottery provides an experimental measure of pro-social behavior. Figure 4 shows the overall distribution of lottery tickets across clients. Roughly 40% of the clients in our sample chose not to give any tickets, roughly 10% of the clients gave one ticket, and we observe similar percentages up to four tickets. After this, the number of tickets declines significantly. There is a slight increase right at the end – roughly 5% of the clients gave tickets to all group members.

In Appendix Table 1 we use our baseline survey data to examine the basic determinants of ticket giving. Clients who had spent time (over the last 24 hours) participating in community and political activities were more likely to give tickets. Clients were also significantly more likely to give tickets to group members they knew before joining the VWS group and to their group leader. In so far as the group leader coordinates payment by group members, it is unsurprising that she is perceived as more trustworthy. Interestingly, the group leader does not reciprocate by giving more tickets to her group members.

We now examine the relationship between meeting frequency and ticket giving in a regression framework. Our lottery regressions are conducted at the level of a client and her group-member pair, and are of the form given by equation (2).

We start by considering the reduced form relationship between the frequency of group meeting and ticket giving behavior. Columns (1) and (2) of Table 5 show that, relative to her monthly counterpart, the likelihood that a client in a weekly group gives a group member a ticket is 6 percentage points higher. In column (2) we include the set of controls. As discussed above, an important predictor of who receives tickets is being the group-leader. In column (3) we include an additional control for whether the client knew her pair member before the lottery, and its interaction with being on the weekly schedule. Roughly 70% of pairs knew one another before they took out their first VWS loan (2812/4020 observations).[23]

[23]Breaking it down by repayment type, 70.73% of weekly pairs knew one another (829/1172) and 69.63%

Further, a client only gives lottery tickets to group members she knew before the lottery. This suggests that more frequent meetings work to deepen ties between group members who already know each other rather than to expand social networks - or, in the language of Putnam (1993), to create "bonding capital" rather than "bridging capital". In column (4) we break up this effect by how the client knew her pair member. Reassuringly, there is no apparent effect of meeting frequency on the small set of client pairs who co-reside in the same household, for whom meeting frequency presumably can have very little influence on social proximity. This also provides evidence that our experimental results in the lottery are not driven by an alternative channel through which repayment frequency influences generosity. The main beneficiaries of trust built by more frequent meetings are more distant family members and neighbors. Neighbors constituted the largest group of those who knew one another (roughly 78%). It is also likely that this is the group with which it is easiest to increase social interactions outside of group meetings. Moving from a monthly to weekly repayment schedule doubles the likelihood that the client's neighbor receives a lottery ticket.

In columns (5) and (6) we turn to IV estimates. As we show in Table 4 meeting in a weekly setting increased social interactions among group members, and this effect persists more than a year later. We instrument for the incidence of social interactions among a client and her group members by whether she is on a weekly schedule. Column (6) shows that a one standard deviation increase in social interactions between the client and a group member leads to 3 percentage point increase in the likelihood that the client gives her a ticket.

An increase in social interactions between two group members could increase altruism between them or strengthen norms of reciprocal behavior. In Table 6 we provide some evidence on which channel is more important by examining whether divisibility of the lottery gift matters. The higher incidence of lottery ticket giving among weekly clients is concentrated in divisible prize lotteries (i.e. four 50 Rs. voucher option), which is suggestive of

of monthly pairs knew one another (1983/2848).

reciprocal ties being strengthened by more frequent interaction. It does not appear that more frequent meetings increased altruism (if it had, ticket giving should be independent of voucher divisibility). Importantly, in Appendix Table 2 we show that the social interaction effects are similar in magnitude for the group that received the one 200 Rupee lottery voucher offer and the group that received that four 50 Rupee voucher offer, verifying that the results across prize types are not driven by random variation in the composition of subgroups.

5.3 Meeting Frequency and Trust Formation

An alternative measure of social capital often discussed in the literature is perceptions of trustworthiness. We, therefore, also examine whether higher frequency of group meetings increased perceptions of group member trustworthiness and whether there are any spillovers in terms of general trust in the population.

We asked trust questions while administering the lottery protocol. Our estimating equation is similar in form to equation (1). All specifications include a control for time lapsed between group formation and lottery survey date.

Columns (1)-(2) in Table 7 examine client perceptions of the trustworthiness of her average group member. As discussed earlier, trustworthiness is measured by the likelihood that the average group member would return a wallet containing money to the owner. Moving from a monthly to a weekly meeting schedule increases the perceived trustworthiness of the average group member by 0.15-0.20 points. In columns (3)-(8) we consider the three GSS questions on general perceptions of trust, fairness and helpfulness in the population at large. Between forty percent to half the clients (depending on the measure) agree that, generally speaking, most people can be trusted, that most people try to be helpful and would try to be fair. However, these trust attitudes are unaffected by the frequency of client interaction with group members.

Taken together, the evidence in Table 7 suggests that more frequent interaction leads

to higher perceptions of trustworthiness of group members but this does not spill over into greater trust of society at large (or even the average neighbor).

Our final set of results in Table 8 examine whether the significant impact of weekly meeting on ticket giving is consistent with the channel of influence being greater trust among group members. Such trust could lead to the belief that group members would share the prize and also reciprocate by giving back tickets (if they have a chance to enter the lottery independently). We continue to estimate regressions at the pair level (see equation 2). We examine whether clients who believe their average group member to be more trustworthy are also more likely to give tickets to their group members. In column (1) we see that a 1 point increase in the average member trustworthiness (on a scale of 1-5) leads to a 10% increase in the likelihood that the client gives a randomly drawn group member a ticket. Column (2) shows that this effect is robust to introducing individual, pair and group-level controls. In columns (3) and (4) we consider the effects separately for clients who received the 4-50 rupee voucher and the one 200 Rupee voucher variation. We see the average member trust only predicts ticket giving in the 4-50 Rs. voucher (more divisible) experiment. Finally, in column (5) we examine whether the average member trust effect is restricted to members known to the client prior to the intervention. Consistent with the results in Table 5 we find that it is.

6 Conclusions

A key assumption in the social capital literature has been that social interactions encourage norms of reciprocity and trustworthiness. In fact, participation in groups is often used to measure an individual's or a community's social capital (see, for instance Narayan and Pritchett, 1999). However, in this literature whether the observed correlation between social distance and trust reflects the causal effect of interaction on cooperative behavior is unclear. Even if we take for granted that narrowing social distance increases trust, the ability of public

policy to generate and influence social capital is not known. In this paper we provide causal evidence that small policy-induced variations in community participation increase trust in a strikingly short amount of time.

Aside from the general value of social capital for these communities, our findings have potentially important implications for micro-finance and the design of microcredit contracts. In addition to improving individual economic well-being for repayment prospects, greater within-group trust could help them to better insure each other against default, or more frequent interaction could help members monitor each other's investment behavior. It is certainly the case that numerous claims have been made that social capital improves the financial performance of micro-finance clients. For instance, Karlan (2005) shows that micro-finance clients who are more trustworthy in a trust game are also better financial clients. Furthermore, we find evidence in our experimental data that clients assigned to meet more frequently find it easier to pay off their loans early(Field and Pande, 2008).[24] However, since repayment frequency may influence delinquency through several channels, it is impossible to isolate the role of trust on loan outcomes in this experiment.

In light of our findings, an important question is in what settings can we expect MFI lending activity to enhance social capital formation? One striking finding is the low initial level of social capital among women in our study - a large number of neighbors from similar socio-economic backgrounds get to know each other well enough to cooperate only with the outside stimulus of microfinance. Previous work on the determinants of social capital formation suggests low network density in settings characterized by high mobility, ethnic or linguistic fractionalization and low social status (Alesina and Ferrara, 2002; Glaeser et al., 2002, 2000; Sampson et al., 1999). Hence, our findings are likely to be most readily applicable to the fast-growing urban and peri-urban areas of cities in developing countries (such as Kolkata), where there is an increasing microfinance presence.

[24]In particular, we find that monthly clients are less likely to repay their loans early, and are more likely to work extra hours the day before their loan is due

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7 Appendix

7.1 Probability Script for Main Lottery

In the lottery, you and ten other VWS clients will receive a ticket. Additionally, you have the option of selecting additional members of your VWS loan group that you would like us to give tickets to. You can tell us not to give anybody else in your VWS loan group a ticket, you can tell us to give each person in your group a ticket, or you can tell us which specific members you would like us to give tickets to.

Now, we will quickly review what effect giving out tickets may have on chances of winning. In picture 1 in which you dont give out any tickets to members of your VWS group, you would have a 1 in 11 chance of winning. In picture 2, you choose to have us give a ticket to four other members of your VWS group and there are 15 tickets total. In that case, you would have a 1 in 15 chance of winning and each of the members of your VWS group you

gave a ticket to would have a 1 in 15 chance of winning. In picture 3, you choose to have us give a ticket to nine other members of your VWS group and there are 20 tickets total. In that case, you would have a 1 in 20 chance of winning and each of the members of your VWS group you gave a ticket to would have a 1 in 20 chance of winning.

These are only a few examples of what odds of winning you may have after you decide how many tickets to give out. Remember that whether or not you give out tickets to other members of your first VWS loan group, you still get to keep the lottery ticket we have given you. Now, before we continue, do you have any questions about how the lottery will work?

7.1.1 Script for one 200 Rs. voucher

If you win the lottery, you will receive a single 200 Rs. voucher that is redeemable at the VWS village bazaar at Nimta branch. You can choose to use the voucher yourself or to give the voucher to someone in your first VWS group. Either way, the voucher must be used within two weeks or it is no longer valid. Additionally, only one person can redeem the voucher at the VWS store and the entire value of the voucher must be used when the voucher is redeemed (so, for example, you cannot use 100 Rs. one day and save 100 Rs. for another day). To summarize, if you win the lottery, you will be asked to sign the 200 Rs. voucher when you receive it. However, you are still free to decide whether to keep or give away the voucher that you receive.

7.1.2 Script for four 50 Rs. vouchers

If you win the lottery, you will receive four 50 Rs. vouchers that are redeemable at the VWS village bazaar at Nimta branch. You may choose to use all four vouchers yourself, to give away 1-3 of the vouchers to members of your first VWS group and keep the rest for yourself, or to give away all of the vouchers to members of your first VWS group. In any case, the vouchers must be used within two weeks or they are no longer valid. Additionally, the entire

value of each of the vouchers must be used when the voucher is redeemed (so, for example, you cannot use 25 Rs. of a 50 Rs. voucher one day and save 25 Rs. for another day). To summarize, if you win the lottery, you will be asked to sign each of the 50 Rs. vouchers when you receive them. However, you are still free to decide whether to give away or keep each of the four vouchers that you receive.

Table 1. Group and Client-level Randomization Check

	Weekly	Monthly	Diff: (1) and (2)
	(1)	(2)	(3)
Panel A: Group-level			
Number of Clients	10.230	10.300	-0.063
	[0.679]	[0.709]	(0.136)
Income Dispersion	1.366	1.340	0.007
	[0.807]	[0.515]	(0.135)
Overall Effect: F stat			*0.120*
Overall Effect: p value			*0.731*
N	30	70	
Panel B: Client-level			
Age	33.38	33.46	0.280
	[8.33]	[8.39]	(0.683)
Literate	0.853	0.838	0.000
	[0.355]	[0.369]	(0.033)
Married	0.876	0.865	0.006
	[0.330]	[0.342]	(0.026)
Household Size	3.974	3.915	0.061
	[1.148]	[1.41]	(0.100)
Household Enterprise	0.755	0.680	-0.005
	[0.431]	[0.467]	(0.036)
Log of Household Income	10.43	10.12	0.139
	[1.48]	[1.48]	(0.131)
Fixed Salary	0.072	0.137	-0.040
	[0.259]	[0.259]	(0.026)
Muslim	0.000	0.077	-0.089
	[0.000]	[0.268]	(0.036)
Can Visit Parents	0.880	0.868	0.027
	[0.326]	[0.338]	(0.025)
Years in Neighborhood	15.33	17.00	-1.786
	[10.27]	[10.15]	(0.703)
Overall Effect: F stat			*1.450*
Overall Effect: p value			*0.229*
N	306	710	

Notes:

1 "Number of clients" is the number of clients in each loan group. "Income dispersion" is the group-level standard deviation of "Log of household income." "Fixed salary" is an indicator variable for whether the client earns a fixed salary. "Can visit parents" is an indicator variable equal to "1" if client can go unescorted top her parents' house. "Years in neighborhood" is the number of years that the client has been living in her current neighborhood.

2 Columns (1)-(2) report means with standard deviations in brackets. Column (3) reports tests of differences of means across columns (1) and (2). Standard errors are in parentheses. Tests are based on regressions with loan officer and month of loan group formation fixed effects, and Panel B tests include group-level clustering.

Table 2. Group and Client-level Randomization Check for Lottery Clients

				4-50 Rs. Voucher Prize		Diff: (4) and (5)	1-200 Rs. Voucher Prize		Diff: (7) and (8)	DID
	Weekly	Monthly	Diff: (1) and (2)	Weekly	Monthly		Weekly	Monthly		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Group-level										
Number of Clients	10.241	10.304	-0.066							
	[0.689]	[0.713]	(0.141)							
Income Dispersion	1.393	1.331	-0.026							
	[0.834]	[0.521]	(0.138)							
Overall Effect: F stat			*0.040*							
Overall Effect: p value			*0.849*							
N	29	69								
Panel B: Client-level										
Age	32.736	33.792	-0.567	31.844	33.594	-1.836	33.672	34.000	-0.127	-1.319
	(7.789)	(8.421)	(0.742)	(8.074)	(8.210)	(1.281)	(7.429)	(8.658)	(1.312)	(1.759)
Literate	0.872	0.851	0.001	0.875	0.845	0.012	0.869	0.858	-0.008	0.017
	(0.335)	(0.356)	(0.047)	(0.333)	(0.363)	(0.055)	(0.340)	(0.350)	(0.055)	(0.075)
Married	0.880	0.891	-0.017	0.859	0.877	-0.035	0.902	0.905	-0.022	-0.0221
	(0.326)	(0.312)	(0.034)	(0.350)	(0.329)	(0.052)	(0.300)	(0.294)	(0.047)	(0.067)
Household Size	4.072	4.013	0.114	4.266	4.032	0.320	3.869	3.993	-0.081	0.407
	(1.144)	(1.474)	(0.145)	(1.185)	(1.531)	(0.222)	(1.072)	(1.417)	(0.206)	(0.291)
Household Enterprise	0.800	0.653	0.054	0.797	0.645	0.057	0.803	0.662	0.076	0.007
	(0.402)	(0.477)	(0.054)	(0.406)	(0.480)	(0.068)	(0.401)	(0.475)	(0.069)	(0.093)
Log of Household Income	10.539	10.074	0.210	10.518	10.010	0.253	10.563	10.141	0.272	0.048
	(1.411)	(1.541)	(0.523)	(1.574)	(1.560)	(0.295)	(1.218)	(1.526)	(0.228)	(0.356)
Fixed Salary	0.064	0.129	-0.024	0.063	0.116	-0.005	0.066	0.142	-0.041	0.026
	(0.246)	(0.335)	(0.029)	(0.244)	(0.321)	(0.046)	(0.250)	(0.350)	(0.050)	(0.065)
Muslim	0.000	0.109	-0.092	0.000	0.123	-0.111	0.000	0.095	-0.074	-0.031
	(0.000)	(0.312)	(0.040)	(0.000)	(0.329)	(0.040)	(0.000)	(0.294)	(0.038)	(0.053)

Can Visit Parents	0.810	0.862	-0.039	0.827	0.844	-0.004	0.792	0.880	-0.072	0.084
	[0.394]	[0.345]	(0.044)	[0.382]	[0.364]	(0.064)	[0.410]	[0.326]	(0.067)	(0.084)
Years in Neighborhood	14.840	17.475	-2.472	13.906	17.232	-3.633	15.820	17.730	-1.252	-1.508
	[10.17]	[10.38]	(0.993)	[9.05]	[10.17]	(1.309)	[11.23]	[10.63]	(1.660)	(2.198)
Overall Effect: F stat			*0.480*			*0.68*			*0.010*	
Overall Effect: p value			*0.487*			*0.409*			*0.927*	
N	125	303		64	155		61	148		
Panel C: Pair-level										
Age Difference	8.058	8.352	-0.391	8.349	8.459	-0.289	7.756	8.244	-0.593	0.381
	(6.883)	(7.101)	(0.510)	(7.000)	(7.121)	(0.544)	(6.752)	(7.082)	(0.617)	(0.611)
Income Difference	0.806	0.806	-0.055	0.827	0.841	-0.076	0.784	0.771	-0.055	-0.025
	(1.143)	(1.182)	(0.091)	(1.143)	(1.209)	(0.115)	(1.143)	(1.154)	(0.099)	(0.106)
Education Level Difference	0.381	0.384	-0.019	0.363	0.388	-0.039	0.399	0.380	-0.016	-0.005
	(0.486)	(0.486)	(0.031)	(0.481)	(0.487)	(0.040)	(0.490)	(0.486)	(0.036)	(0.038)
Religion Difference	0.000	0.029	-0.029	0.000	0.033	-0.047	0.000	0.026	-0.017	-0.021
	(0.000)	(0.169)	(0.014)	(0.000)	(0.180)	(0.024)	(0.000)	(0.158)	(0.010)	(0.012)
Overall Effect: F stat			*0.840*			*0.61*			*1.080*	
Overall Effect: p value			*0.360*			*0.435*			*0.299*	
N	1172	2848		598	1431`		574	1417		

Notes

1 The variables are as defined in the notes to Table 1. Panel B and Panel C also control for "Days to Lottery" which is the number of days between the date of loan disbursement and the date of lottery survey for each client.The differences in differences statistics presented are the coefficients and standard errors on the interaction terms from regressions that interact "weekly" with an indicator variable equal to "1" if the lottery client was entered into a lottery in which the prize was 4-50 Rs. vouchers, and include the corresponding randomization check variable as the dependent variable. The Pair-level variables are the absolute values of the respective differences between the surveyed lottery client and each of her group members.

Table 3. Meeting Frequency and Social Interaction: Short Run

	All Members Visited Me in My Home		I Visited All Members in Their Homes		Know Names of Family Members		Know if Relatives Visited	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Weekly	0.878	0.911	0.862	0.898	0.867	0.906	0.136	0.137
	(0.037)	(0.029)	(0.037)	(0.029)	(0.037)	(0.029)	(0.032)	(0.023)
Mean of Monthly	0.110		0.128		0.121		0.019	
	[0.313]		[0.334]		[0.326]		[0.138]	
Additional Controls	N	Y	N	Y	N	Y	N	Y
N	1027	1027	1027	1027	1027	1027	1027	1027

Notes:

1 For each dependent variable we consider observations from months 1-5 of the loan cycle. "All members visited me in my home" is the max of the indicator variable “Have all of your group members visited your house?”. "I visited all members in their homes" is the max of the indicator variable “Have you ever visited houses of all group members?”. "Know names of family members" is the max of the indicator variable “Do you know the names of the family members of your group members?” for each client. "Know if relatives visited" is the mean of the indicator variable “Do you know if any of your group members had relatives come over in last 30 days?”

2 Mean of monthly is the average value of the dependent variable for monthly clients with standard deviations in brackets.

3 We report OLS regression results derived using loan officer fixed effects and group-level clustering. The even-numbered columns include as additional controls the variables included in Table 1.

Table 4. Meeting Frequency and Social Interaction: Long Run

	Social Interaction Index		Number of Times Met				Talk Family		Attend Durga Puja Together		Will Help if Sick	
			Her House		My House							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Weekly	0.107	0.175	0.129	0.164	0.079	0.113	0.105	0.167	0.058	0.208	0.094	0.148
	(0.079)	(0.074)	(0.094)	(0.095)	(0.090)	(0.092)	(0.094)	(0.089)	(0.116)	(0.094)	(0.089)	(0.082)
Additional Controls	N	Y	N	Y	N	Y	N	Y	N	Y	N	Y
N	4020	4020	4020	4020	4020	4020	4020	4020	4020	4020	4020	4020

Notes

1 For each client in the sample we have (on average) nine observations for each of her nine group members. Number Times Met in Her House and Number of Times Met in My House refer to the past 30 days and have all values greater than "30" recoded to equal "30". Talk Family is the indicator variable "Do you still talk to ____ about her family." Attend Durga Puja Together is the indicator variable "During the most recent Durga Puja, did you attend any part of the festival with your group members?" Will Help if Sick is the indicator variable "If you had a sick family member and had to leave your house for a few hours for an emergency, would you ask _____ to come to your home and look after him/her?" The coefficients presented for these five variables are generated using normalized versions of the variables (constructed by subtracting away the mean of the variable within the monthly population and dividing by the standard deviation within the monthly population). Social Interaction Index is equal to the mean of four normalized variables: Number Times Met Her House, Number Times Met My House, Talk Family, and Attend Durga Puja Together. "Additional Controls" refers to the inclusion of the same set of variables included in Table 2 Lottery Randomization Check as well as a control for loan group leader.

2 We report OLS regression results derived using loan officer fixed effects and two-way clustering at the group level and client level.

Table 5. Meeting Frequency and Pro-Social Behavior

	Gave Ticket					
	Reduced Form				IV	
	(1)	(2)	(3)	(4)	(5)	(6)
Weekly	0.064	0.067	0.002	0.003		
	(0.039)	(0.038)	(0.042)	(0.042)		
Social Interaction Index					5.127	3.282
					(3.067)	(1.287)
Knew Member			0.145			
			(0.024)			
Weekly*Knew Member			0.079			
			(0.050)			
Immediate Family				0.492		
				(0.080)		
Weekly*Immediate Family				-0.069		
				(0.121)		
Other Family				0.313		
				(0.048)		
Weekly*Other Family				0.185		
				(0.079)		
Friend				0.198		
				(0.046)		
Weekly*Friend				-0.021		
				(0.089)		
Neighbor				0.102		
				(0.027)		
Weekly*Neighbor				0.086		
				(0.054)		
Group Member is Leader		0.098	0.084	0.077		
		(0.019)	(0.019)	(0.018)		
Mean of monthly	0.219					
	[0.414]					
Additional Controls	N	Y	Y	Y	N	Y
N	4020	4020	4020	4020	4020	4020

Notes

1 For each client in the sample we have (on average) nine observations for the nine group members she could choose to give a ticket. The dependent variable "Gave Ticket" equals one for a group member if the client chose to give her a ticket in the lottery. "Knew Member" is an indicator variable for whether client knew group member before the start of loan cycle. "Immediate Family", "Other Family", "Friend", and "Neighbor" are indicator variables for pairwise relationship type before the start of the loan cycle. "Additional Controls" refers to the inclusion of the same set of variables included in Table 2 Lottery Randomization Check as well as a control for loan group leader.

2 Columns (1)-(4) report OLS regressions which include loan officer fixed effects. Columns (5)-(6) report IV regressions in which the social interaction index is instrumented by a weekly dummy [the first stage regression is given by Columns (1)-(2) in Table 4]. All regressions include two-way clustering at the group level and client level. We also report means of monthly clients with standard deviations in brackets.

Table 6. Meeting Frequency and Pro-Social Behavior: By Voucher Type

	Gave Ticket			
	Four 50 Rs. Vouchers		One 200 Rs. Voucher	
	(1)	(2)	(3)	(4)
Weekly	0.109	0.126	0.020	0.026
	(0.056)	(0.053)	(0.057)	(0.059)
Mean of Monthly	0.198		0.243	
	[0.437]		[0.429]	
Additional Controls	N	Y	N	Y
N	2029	2029	1991	1991

Notes

1 Gave Ticket is as defined in Table 5. "Additional Controls" refers to the inclusion of the same set of variables included in Table 2 Lottery Randomization Check as well as a control for loan group leader.

2 We report OLS regression results derived using loan officer fixed effects and both group-level and client-level clustering.

Table 7. Meeting Frequency and Trust Measures

	Trustworthiness		General Trust Measures					
	Average Group Member		Most People Can be Trusted		Most People Try To Be Helpful		Most People Would Try To Be Fair	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Weekly	0.171	0.208	0.0001	-0.010	-0.044	-0.037	-0.079	-0.077
	(0.107)	(0.115)	(0.052)	(0.053)	(0.053)	(0.052)	(0.055)	(0.052)
Mean of monthly	4.327		0.408		0.490		0.461	
	[1.130]		[0.492]		[0.500]		[0.499]	
Additional Controls	N	Y	N	Y	N	Y	N	Y
N	432	432	432	432	432	432	432	432

Notes

1 Average Group Member Trustworthiness is the client response on a scale of 1 and 5 (1 is the minimum and 5 is the maximum) regarding the likliehood that the average group member would return a wallet with 200 Rs. that was found on the street. Columns (3)-(8) use the following three GSS questions: on trust, "Generally speaking, would you say that most people can be trusted or that you can't be too careful in dealing with people?", on being helpful, "Would you say that most of the time people try to be helpful, or that they are mostly just looking out for themselves?" and on fairness, "Do you think most people would try to take advantage of you if they got a chance, or would they try to be fair?" "Additional Controls" refers to the variables included in Table 2. All regressions also include an indicator variable for whether client was loan group leader.

2 We report OLS regression results which include loan officer fixed effects and group-level clustering.

Table 8. Group Member Social Trust Measures on Ticket Giving

	Gave Ticket				
	All Vouchers		Four 50 Rs. Vouchers	One 200 Rs. Vouchers	All Vouchers
	(1)	(2)	(3)	(4)	(5)
Avg. Group Member Trust	0.024	0.023	0.030	0.022	-0.008
	(0.009)	(0.009)	(0.012)	(0.015)	(0.013)
Knew Member					-0.015
					(0.077)
Avg. Member Trust*Knew Member					0.043
					(0.018)
Group Member is Leader		0.097	0.113	0.081	0.083
		(0.019)	(0.029)	(0.024)	(0.019)
Mean Ticket Giving	0.235	0.235	0.224	0.246	0.235
	[0.424]	[0.424]	[0.417]	[0.431]	[0.424]
Additional Controls	N	Y	Y	Y	Y
N	4020	4020	2029	1991	4020

Notes

1 "Gave Ticket" and "Knew Member" are as defined in Table 5. "Avg. Group Member Trust" is as defined in Table 7. "Additional Controls" refers to the inclusion of the same set of variables included in Table 2 Lottery Randomization Check as well as a control for loan group leader.

2 We report OLS regression results derived using loan officer fixed effects and both group-level and client-level clustering.

Appendix Table 1. Determinants of Ticket Giving and Trust

	Pairwise Ticket	Total Tickets	Avg Member Trust
	(1)	(2)	(3)
Age	0.001	0.027	-0.010
	(0.015)	(0.143)	(0.060)
Age^2	-0.000	-0.000	0.000
	(0.000)	(0.002)	(0.001)
Literate	0.048	0.470	0.245
	(0.037)	(0.365)	(0.157)
Owns Enterprise	0.026	0.247	0.094
	(0.036)	(0.344)	(0.138)
Log Income	-0.002	-0.014	-0.024
	(0.010)	(0.100)	(0.044)
Muslim	0.026	0.584	0.286
	(0.061)	(0.553)	(0.211)
Can Visit Parents	0.021	0.329	0.145
	(0.043)	(0.430)	(0.176)
Years in Residence	-0.002	-0.012	0.003
	(0.002)	(0.016)	(0.006)
Distance between Households less than .25 km	0.026		
	(0.022)		
Avg. Distance between Group Members less than .25 km		0.140	0.003
		(0.298)	(0.124)
Watches TV/ Listens to Radio	0.039	0.331	-0.061
	(0.028)	(0.280)	(0.129)
Time Spent on Political Activity/ Community Meetings	0.206	2.059	-0.104
	(0.086)	(0.860)	(0.323)
Owns Home	0.001	-0.013	0.207
	(0.038)	(0.381)	(0.152)
Group-level Income Dispersion	0.012	0.034	-0.089
	(0.034)	(0.303)	(0.144)
I am Group Leader	-0.006	-0.077	0.326
	(0.055)	(0.544)	(0.173)
Other Group Member is Leader	0.084		
	(0.019)		
Member Knew	0.160		
	(0.022)		
Fraction of Members Known		1.287	0.212
		(0.438)	(0.192)
Age Diff	-0.000		
	(0.001)		

Income Diff	0.002		
	(0.008)		
Religion Diff	-0.017		
	(0.017)		
Education Diff	-0.013		
	(0.070)		
N	4020	432	432

Notes

1 Watches TV/ Listens to Radio is the indicator variable "Did you spend any time watching TV / listening to the radio in the last 24 hours?" Time Spent on Political Activity/ Community Meetings is the indicator variable "Did you spend any time on political activities / attending community meetings in the last 24 hours?" The remaining variables are as defined in Table 2 Lottery Randomization Check.

2 We report OLS regression results derived using loan officer fixed effects. Column (1) includes two-way clustering at the group level and client level, and Columns (2)-(3) cluster at the group level.

Appendix Table 2. Meeting Frequency and Social Interaction: Short Run (Lottery Clients)

	All Members Visited Me in My Home			I Visited All Members in Their Homes			Know Names of Family Members			Know if Relatives Visited		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Weekly	0.828	0.871	0.900	0.831	0.883	0.896	0.842	0.888	0.913	0.188	0.182	0.136
	(0.046)	(0.035)	(0.035)	(0.047)	(0.036)	(0.036)	(0.048)	(0.038)	(0.036)	(0.046)	(0.045)	(0.039)
Voucher 50			0.042			0.018			0.030			-0.010
			(0.022)			(0.022)			(0.021)			(0.007)
Weekly* Voucher50			-0.046			-0.025			-0.037			-0.044
			(0.027)			(0.028)			(0.027)			(0.049)
Mean of Monthly	0.145			0.154			0.138			0.026		
	[.352]			[0.361]			[0.346]			[0.160]		
Additional Controls	N	Y	Y	N	Y	Y	N	Y	Y	N	Y	Y
N	432	432	432	432	432	432	432	432	432	432	432	432

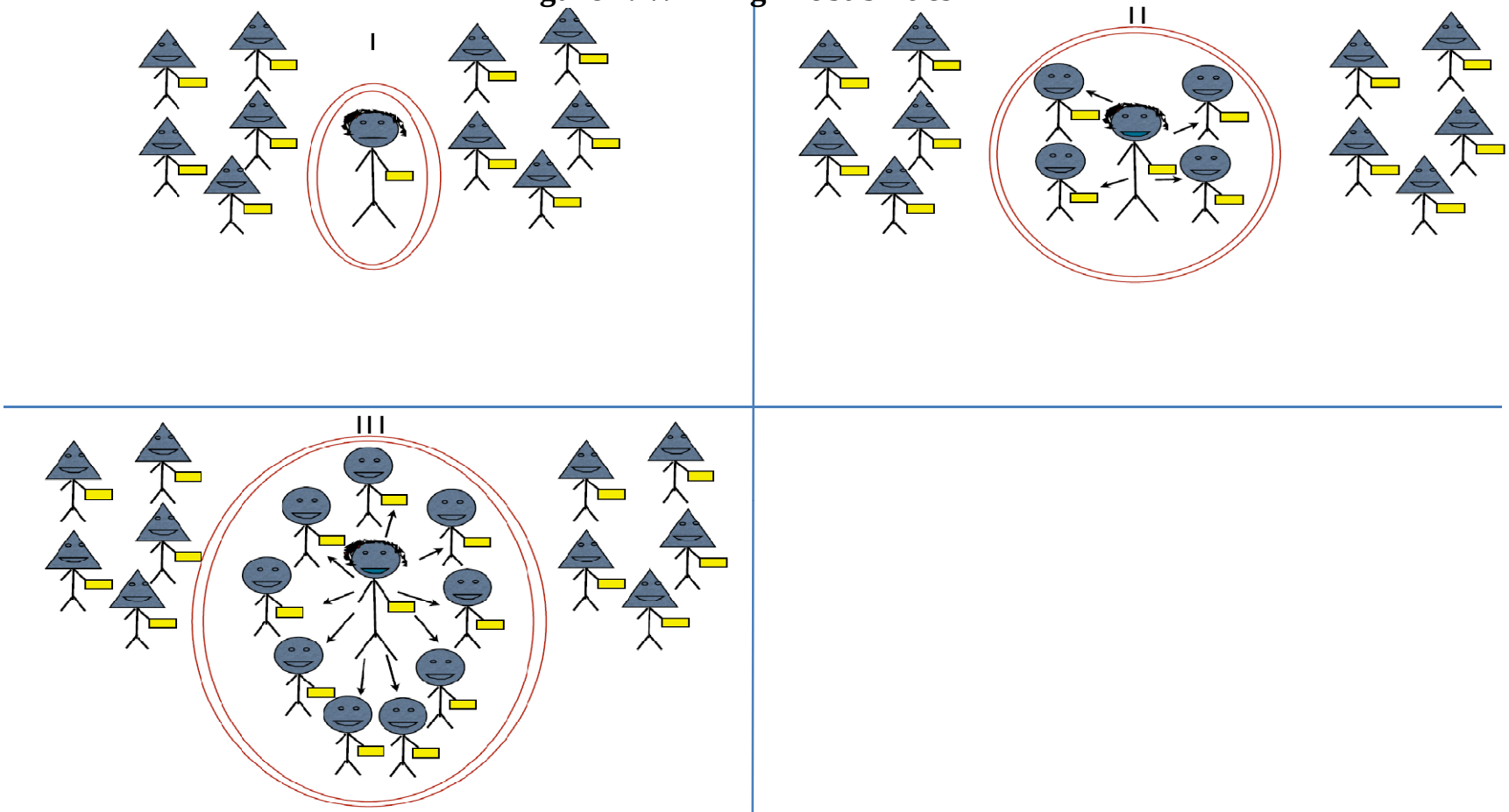
Notes:

1 Variables are as defined in Table 3.

2 Mean of monthly is the average value of the dependent variable for monthly clients with standard deviations in brackets.

3 We report OLS regression results derived using loan officer fixed effects and group-level clustering. The even-numbered columns include as additional controls the variables included in Table 2.

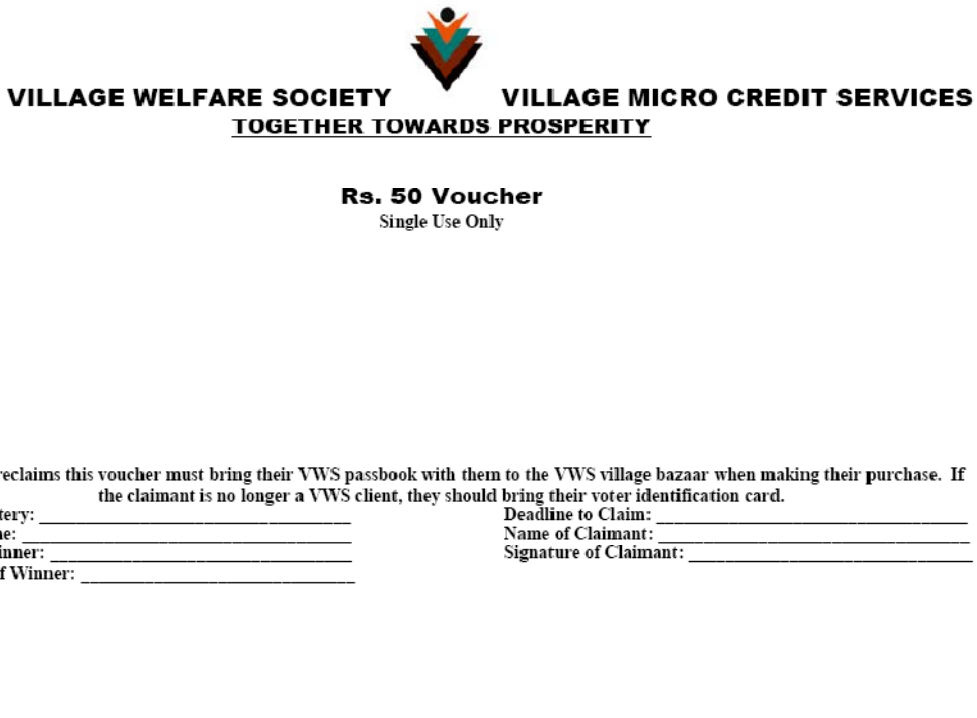
Figure 1. Winning Probabilities



Notes

This picture was used to explain how ticket-giving affected lottery probabilities. The explanation provided was `In picture 1 in which you don't give out any tickets to members of your VWS group, you would have a 1 in 11 chance of winning. In picture 2, you choose to have us give a ticket to four other members of your VWS group and there are 15 tickets total. In that case, you would have a 1 in 15 chance of winning and each of the members of your VWS group you gave a ticket to would have a 1 in 15 chance of winning. In picture 3, you choose to have us give a ticket to nine other members of your VWS group and there are 20 tickets total. In that case, you would have a 1 in 20 chance of winning and each of the members of your VWS group you gave a ticket to would have a 1 in 20 chance of winning.'

Figure 2. Lottery Vouchers



VILLAGE WELFARE SOCIETY VILLAGE MICRO CREDIT SERVICES

TOGETHER TOWARDS PROSPERITY

Rs. 50 Voucher

Single Use Only

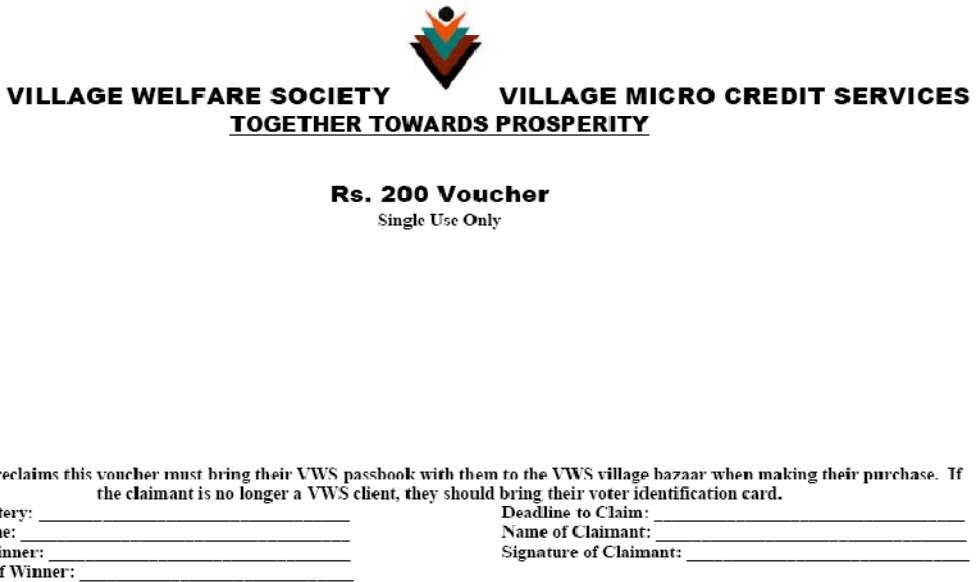
Whoever reclaims this voucher must bring their VWS passbook with them to the VWS village bazaar when making their purchase. If the claimant is no longer a VWS client, they should bring their voter identification card.

Date of Lottery: _____ Deadline to Claim: _____

Group Name: _____ Name of Claimant: _____

Name of Winner: _____ Signature of Claimant: _____

Signature of Winner: _____



VILLAGE WELFARE SOCIETY VILLAGE MICRO CREDIT SERVICES

TOGETHER TOWARDS PROSPERITY

Rs. 200 Voucher

Single Use Only

Whoever reclaims this voucher must bring their VWS passbook with them to the VWS village bazaar when making their purchase. If the claimant is no longer a VWS client, they should bring their voter identification card.

Date of Lottery: _____ Deadline to Claim: _____

Group Name: _____ Name of Claimant: _____

Name of Winner: _____ Signature of Claimant: _____

Signature of Winner: _____

Notes

Clients were randomly offered the choice of joining the 200 Rs. Voucher or the 4-50 Rs. voucher lottery. This figure shows the final vouchers which were given to the winner of the two lotteries.

Figure 3, Panel A. Loan Group Social Capital Development by Number of Months after Initial Meeting

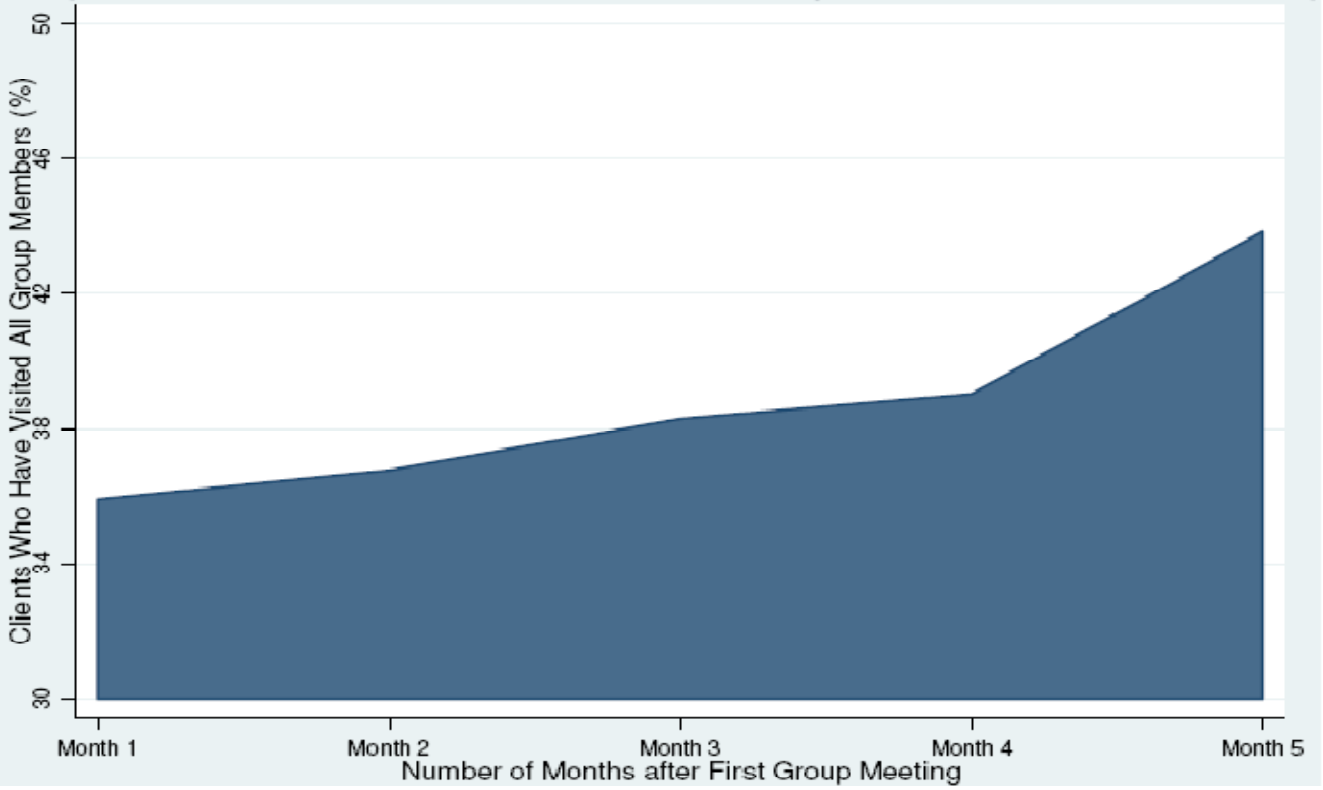
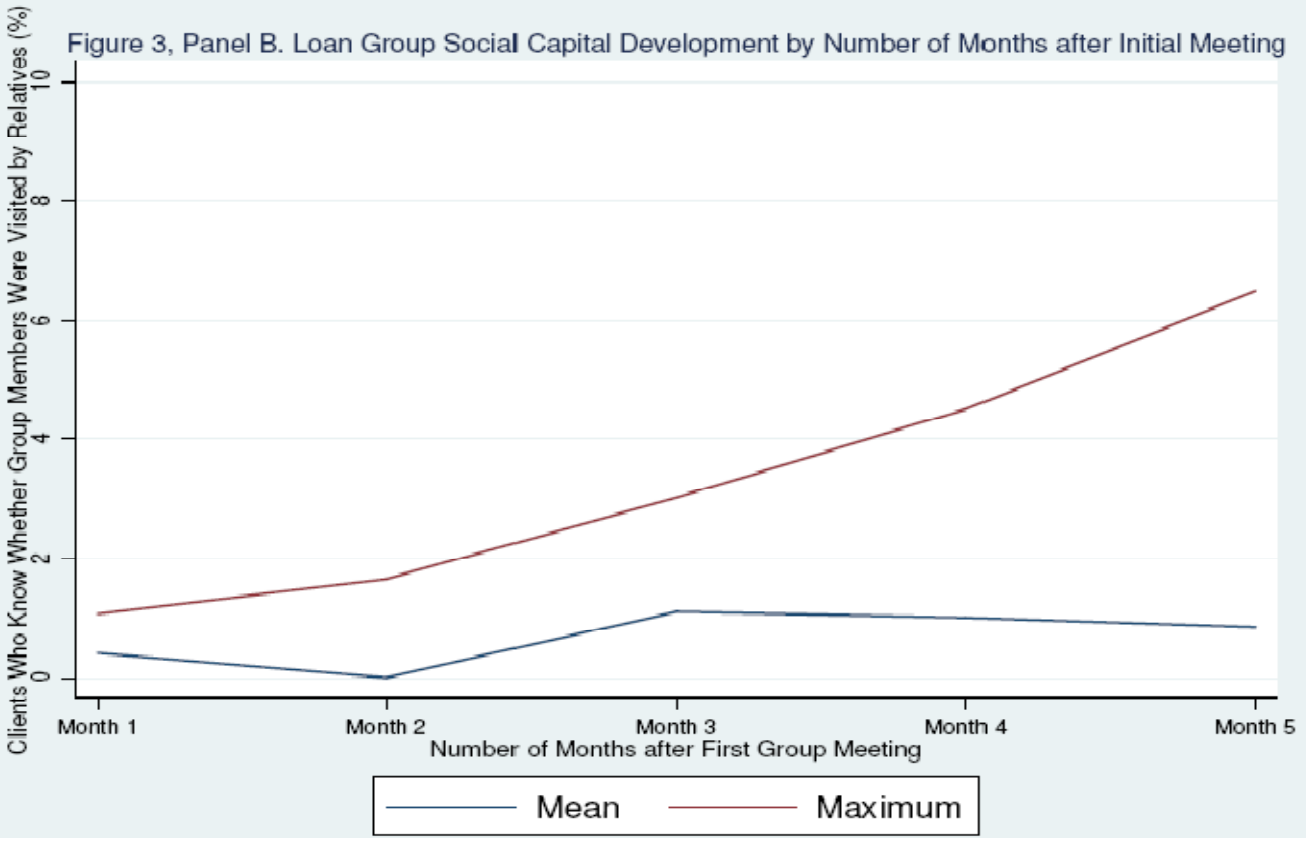
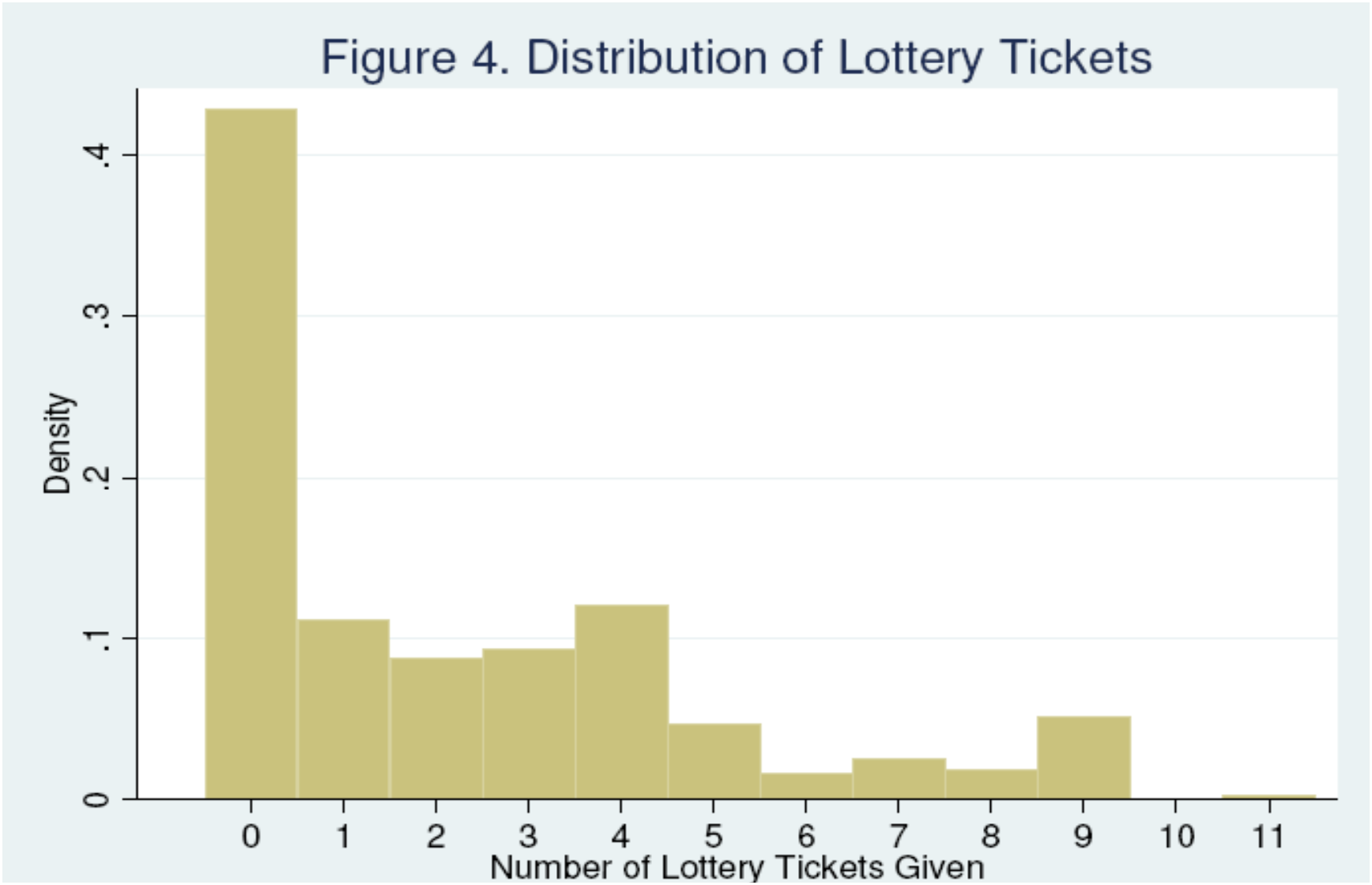


Figure 3, Panel B. Loan Group Social Capital Development by Number of Months after Initial Meeting





Notes:

The figure shows the distribution of the number of lottery tickets given by clients.