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SOCIALLY DISADVANTAGED GROUPS AND MICROFINANCE IN INDIA

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Socially Disadvantaged Groups and Microfinance in India*

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Abstract

In this paper we provide an empirical analysis of the performance of microfinance groups, known as Self-Help groups, based on an original census we carried out in a poor area of Northern India. We examine whether traditionally disadvantaged villagers, such as members of lower castes or landless farmers, are less likely to have access to groups. We also analyze their performance in terms of access to bank loans, which is an important benefit of the groups. We find evidence of the attrition process being selective against lower castes: they have a lower probability of becoming a permanent member of a group. The net effects in terms of their expected access to a bank loan remain however relatively limited. By contrast, even though landless farmers are more likely to fail or leave the groups, they tend to benefit disproportionately. In expected terms, they receive more than two times the amounts of bank loans given to farmers owning more than one acre. Overall, the program therefore has positive and important distributional implications.

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1 Introduction

Microfinance is often advocated as a solution to multiple social problems. Poor households with access to credit can make investments that bring them out of poverty, household and regional income and wealth disparities are reduced, and group meetings provide forums for collective action that improve gender relations and local governance. Over the last few years, savings and credit groups have also helped in managing some important social programs of the Indian government, such as the distribution of food grains and school meals in state primary schools.

The number of organizations involved in the microfinance sector is very large and organizational forms vary considerably. Most loans involve some form of group lending with members sharing responsibility for repayment. It is useful to distinguish between two principal institutional forms through which lending takes place. In the first, microfinance institutions organize potential lenders into groups. Group composition may be determined by random factors, as in the case of FINCA in Peru, or the matching preferences of members as in the Grameen Bank model.[1] In all these cases, microfinance institutions are intimately involved in all stages of the group lending process: group formation, rules that govern member interactions, and the provision of credit. Bank representatives are often present at group meetings.

An alternative setting is one in which group interactions, group loans and the institutions involved with group formation are much more loosely connected. Government and non-government agencies are involved in the formation of groups, which determine their own rules for savings and lending. Some of these groups subsequently borrow from commercial banks. This is the dominant model in Indian microfinance, in terms of both outreach and total loan disbursements. The present structure of the microfinance sector in India emerged in the early nineties when the Reserve Bank of India issued guidelines to all nationalized commercial banks encouraging them to lend to informal groups which came to be called Self-Help Groups (SHGs). Since then, such groups have been actively promoted by a number of different agencies and the National Bank for Agriculture and Rural Development (NABARD) has provided banks with subsidized credit for SHG lending.[2] Government statistics currently report over 6,9 million groups and 97 millions households covered by the program (NABARD, 2011).

This paper reports findings from a study of 1,679 SHGs with a total of 26,971 women

[1] See Karlan (2006) for a description of group operations in FINCA and Armendariz de Aghion and Morduch (2005), chapter 4 for details on Grameen Bank group lending practices.

[2] See Reserve Bank of India (1991) and NABARD (1992) for the original policy statements.

members in selected regions of rural Northern India. The groups were formed during the period 1992-2007 by PRADAN, a non-government organization working in these areas. Entry into the groups is voluntary. The extent of the coverage offered by the program is impressive, as about 42% of the households in the villages we surveyed have a member participating in an SHG. The performance of the groups and their members vary however. Thus, we find that 12% of all groups created over this period are no longer active and that 12% of members left groups while it was still functioning. Some women who leave groups join other SHGs. Taking them into account, we find that about 17% of the members who joined a group had left the SHG network. Groups also differ in their access to bank loans, the major motive behind their creation. Thus, about 30% of the groups and of the members do not have a bank loan.

We are interested in the factors underlying these measures of performance. In particular, we shall focus on two groups of villagers that are traditionally at a disadvantage in terms of village life and economic activities. The first of these consists in the lower caste groups, the scheduled tribes and the scheduled castes, who lie at the bottom of the social hierarchy. The second disadvantaged group we focus on concerns the landless households. Given that these villages are still predominantly rural, landlessness remains a critical determinant of poverty and economic exclusion. We examine to what extent, being of a lower caste group or being landless, matters for participating actively to these groups and drawing benefits from them.

In terms of participation into the groups, we find some evidence of scheduled tribes being less likely to have access, but this is mainly due to a bias in the placement of the program, as fewer groups are created in tribal dominated villages. Groups composed of scheduled tribes and scheduled castes members are less likely to survive and obtain bank loans unless they also include members of higher castes. However, these socially mixed groups also display larger departure rates by lower castes members. By contrast, landless villagers are much more likely to participate to groups than other villagers, and even though they also tend to fail and leave more often, they still remain over-represented in the surviving groups. Within groups, we find no differences in terms of access to bank loans.

These results suggest that, even though the attrition process is selective against weaker segments of the population, these processes ultimately do not lead to large differences in terms of participation and access to loans against lower castes members. Moreover, the overall impact of these groups is, if anything, biased in favor of landless farmers. As a whole, these programs are, on average, rather progressive in terms of their distributional implications.

We provide a brief institutional history of the microfinance sector in India and a description of our survey data in Section 2. In Section 3, we analyze the composition of the groups in terms of castes and landownership. Section 4 analyzes the process of survival of groups and members,

using duration models. Section 5 analyzes the determinants of their financial performance in terms of access to bank loans. A brief section concludes.

2 Microfinance in India and our survey data

2.1 Microfinance institutions in India

Many detailed accounts on the characteristics of rural credit markets in India and the spread of rural banking in the post independence period are available. A number of studies, starting with the All India Rural Credit Survey in 1954, found that the rural poor had high levels of indebtedness and very limited bank access.[3] As part of a process of providing banking services to this population, the State Bank of India was set up in 1955, the 14 largest commercial banks were nationalized in 1969, and the National Bank for Agriculture and Rural Development (NABARD) was created in 1982. Each of the nationalized banks were assigned the role of lead banks in particular parts of the country and they were required to maintain specific ratios of urban to rural branches. A vast network comprising thousands of cooperative banks and regional rural banks was created primarily to provide credit to the agricultural sector. These efforts created a vast system for credit delivery with high default rates and operating costs.[4]

In the early nineties central bankers tried to revitalize the elaborate and largely inefficient banking system through which rural credit came to be provided after Indian Independence. The start of institutionalized microfinance in India is often attributed to the circular that was issued by the Reserve Bank to all nationalized commercial banks in 1991, announcing the objective of linking informal groups of rural poor with the existing banking system. Some non-government organizations at the time had organized women into informal groups that used their pooled savings for mutual insurance and small credit needs. Based on studies of these informal groups, it was believed that they had the "potential to bring together the formal banking structure and the rural poor for mutual benefit" (Reserve Bank of India, 1991). The following year NABARD launched a pilot project which linked 500 groups with commercial banks. The banks were offered finance from NABARD for such lending at the rate of 6.5% per annum. It was recommended that banks either lend directly to groups at 11.5% per annum

[3]See for example, Bell (1990) for summary statistics on rural borrowing and indebtedness based on rural credit surveys and Karmakar (1999) for recent figures on the numbers of different types of rural banking institutions.

[4]The extent to which this system reached the poor is unclear, but there is evidence that they influenced regional poverty rates (Burgess and Pande, 2005).

or route their loans through voluntary agencies at the lower rate of 8.5% in order to cover the transaction costs of these organizations (NABARD, 1992). Banks were also permitted to classify such lending under Advances to Weaker Sections, and this category formerly accounted for a large fraction of their unprofitable loans.

Another major change came in April 1999, with the launching of the Swarnajayanti Gram Swarozgar Yojana, popularly known as the SGSY (Reserve Bank of India, 1999). The program was introduced to increase the penetration of SHGs among families below the poverty line. This reflected a significant change in state policy: It provided direct subsidies to borrowers as only part of the initial loan had to be repaid. It also restricted the composition of a group to families below the poverty line. Subject to caps, rates of subsidy were 50% for borrowers from the scheduled castes and tribes and 30% for other poor households. A proper evaluation of the changes that the SGSY brought about in the composition and performance of SHGs is yet to be undertaken.[5]

The NABARD pilot program of 1992 was widely regarded as successful and the number of SHGs linked to the banking system has been rising rapidly over the last 19 years. The total number of groups linked in 2010 was reported to be over 4.9 million. There is considerable variance in the distribution of SHGs across states and an overwhelming fraction is in the 4 southern states. Alternative models of lending have been growing in the last few years and private banks have also entered the sector. The combined coverage of institutions in this class remains small relative to SHG lending. This contrasts sharply with countries such as Bangladesh and Indonesia, where each of the major specialized microfinance institutions is larger than the combined non-SHG sector in India. (Reserve Bank of India, 2005 (chapter 2) and Basu, 2005).

It appears that the institutions that came to dominate the Indian microfinance sector resulted from the combined presence of a vibrant non-government sector engaged in rural development and an extensive but unprofitable network of rural banks and agricultural co-operatives that were created with the explicit purpose of providing small loans to the rural poor.[6] Policy makers could observe the phenomenal expansions in outreach of microfinance

[5]Our own surveys indicate that the combination of restrictions of group composition and subsidies may have been a factor causing the dissolution of some groups. Surveyed groups were asked about whether or not they received a subsidy. Although very few of the subsidized groups failed, other groups sometimes cited their exclusion from state subsidies as a reason for group dissolution. In some cases, a few members were excluded from the group by the others because they were not on government poverty lists.

[6]Harper (2002) provides some additional reasons for why SHGs rather than Grameen type institutions are more successful in the Indian context.

institutions like the Grameen Bank in Bangladesh and other countries. The Grameen Bank alone, starting from humble beginnings had reached almost a quarter of all Bangladeshi villages by 1991.[7] The linking of banks with SHGs seemed a natural step to take and it gave India its own particular brand of microfinance.

2.2 The PRADAN SHG program

Our data is based on surveys of SHGs created by PRADAN (Professional Assistance for Development Action), one of the earliest NGOs in the Indian microfinance sector. The NGO is active in 44 districts, spread over 8 states. It aims to promote and strengthen the livelihoods of socio-economically disadvantaged communities.

The SHG program operates by first targeting administrative blocks with high levels of rural poverty within particular districts. The groups themselves consist entirely of women and follow the guidelines issued by NABARD and the Reserve Bank of India. PRADAN professionals begin the process of group formation by calling a meeting in some public space in the village. They discuss the benefits of membership and some general principles followed by successful groups (compulsory attendance, weekly savings, typical interest rates, bookkeeping). Interested women are enlisted, a regular meeting time is set and the professional is usually present at meetings until membership becomes fairly stable and all members are familiar with group practices. Each group is provided with a register for keeping accounts and a cash box, and either designates one of the members to keep accounts or hires an accountant. The register, cash box and keys are usually rotated across the members. Smoothly functioning groups typically open a savings account with a nearby commercial bank within a year of their inception. After this stage, PRADAN professionals discuss possible self-employment projects with the group, some members decide on particular projects and the group then applies to a commercial bank for a loan. This loan constitutes their first bank linkage. Bank funds usually come into the group which then lends to individual members at interest rates determined by the group. Payments are made to the group which then repays the bank on the stipulated date.

As the group gains confidence and shows that it can manage its functioning independently, PRADAN professionals withdraw and their direct interactions with group members increasingly take place on occasions when they visit the village to initiate other livelihood projects. As a result of the growing independence of these groups over time, the organizations promoting

[7]Figures for the total number of villages are from the Bangladesh Bureau of Statistics (www.bbs.gov.bd) and those for the number covered by the Grameen Bank are available at www.grameen-info.org.

SHGs are not always informed about groups that are no longer active. Survey data is therefore required to correctly estimate rates of group survival and to study group performance.

2.3 The survey

We ran a census of all the 1,679 SHGs created by PRADAN in five of its field locations, two in northern Orissa, one in central Chhattisgarh and two in northern Jharkhand. The field teams are close, but not contiguous, as can be seen from Figure 7 in the appendix. Running a census was particularly appropriate as we focus on groups' disappearance and members' departure, which a traditional random survey is more likely to miss. The observations therefore included every group that has been formed since the start of the program in these areas. In addition to group level data, we collected information on the backgrounds and SHG activities of 26,971 women who, at any stage, had been members of these groups.

Table 1 overviews the number of SHGs and members in the data set, divided by state, district and survey period.[8]

Table 1: Overview data set

State	District	Number of SHGs	Number of Members	Survey Period
Orissa	Mayurbhanj and Keonjhar	532	8,599	May - June 2006
Chhattisgarh	Raigarh	570	8,312	January - February 2007
Jharkhand	Koderma and Hazaribagh	577	10,060	March - April 2008

[8]We miss some observations because of three reasons: **(1)** In the Hazaribagh district, a small number of inactive groups refused to sit with the research team. We asked them a minimal number of questions at the group level, but did not receive any member level information. Therefore, we had to drop the 17 villages (out of 95) in which these SHGs are located. We retain information on 1,637 groups and their 26,817 members. **(2)** We do not have the village level information for 5 SHGs and their 88 members. **(3)** A first analysis of the Orissa and Chhattisgarh data revealed that some important information, like the allocation of bank loans within the group, was missing. Hence, before moving to the final state, the Orissa (September - October 2007) and Chhattisgarh (November - December 2007) SHGs have been revisited with a complementary questionnaire. Due to problems with a private firm in Orissa, it was not possible to re-survey 63 groups. In Chhattisgarh one SHG is not revisited. The complementary questions are available for all SHGs in Jharkhand. This reduces our dataset in Section 5, where we study the group performance.

3 Group composition

3.1 Group composition at the village level

We first examine the composition of the groups, focusing on the caste status of their members. The caste status we consider here is defined by the four main categories of castes: scheduled tribes (ST), schedules castes (SC), other backward castes (OBC) and forward castes (FC).[9] These categories are hierarchically organized, with the ST and SC at the bottom and the FC at the top of the social ladder.

The caste composition of the villages and the groups surveyed is given in Table 2. The first two columns report the average caste composition of villagers and group members across all villages. As villages vary in terms of population as well as in terms of the number of groups they have, we also report in the last two columns the composition across individuals. To investigate whether, at the time of their creation, particular castes are less likely to participate, we report here the composition of the group at the time of its creation and thereby ignore those members who left or who joined the group after its creation. We return to this issue later.

Table 2: Caste composition of the villages and the groups

	Average across all villages		Across individuals	
	Share of population in the villages (%)	Share of population in the groups (%)	Share of households in the villages (%)	Share of members in the groups (%)
Scheduled tribes	42.3	41.3	37.6	33.6
	(34.9)	(37.8)		
Scheduled castes	15.3	17.3	16.3	19.0
	(18.4)	(24.9)		
Other backward castes	39.5	38.9	43.4	44.8
	(29.0)	(32.9)		
Forward castes	2.9	2.5	2.7	2.6
	(9.3)	(8.9)		
Observations (#)	404	404	59,497	24,057

Standard deviations are given in parentheses.

On average, the share of different castes in the group reflects quite closely the distribution of castes within the villages. Across the whole population however, scheduled tribes are under-

[9] As is well known, within each of these categories, there are a large number of different sub-castes and tribes. Moreover, some mobility across categories has been observed in the past, whereby some tribes and sub-castes succeeded in moving upwards in the social hierarchy (for more details, see, e.g., Somanathan, 2007 and Cassan, 2011).

represented in the groups, while scheduled castes are over-represented. In particular, while the scheduled tribes represent 37.6% of the total population, they represent only 33.6% of the members in the groups. In Table 3, we report the share of caste categories in the villages and the groups, conditional on having households belonging to the caste category in the village. It appears that there exists a placement bias. SHGs tend to be created more in villages where tribal households are less present, with an average participation rate (defined as the ratio of average number of group members to the average number of households in those village) between 38.2 and 39.7%. By contrast, the participation rate in villages in which scheduled tribes exist is lower and equal to 35.8%. It should also be noted that, on average, scheduled tribes tend to live in smaller villages (column 3).

Table 3: Share of caste categories in the villages and the groups, conditional on having households belonging to the caste category in the village

	Average across all villages				Across individuals	
	Share of population in the villages (%)	Share of population in the groups (%)	Number of households in village	Number of members in village	Share of households in the villages (%)	Share of members in the groups (%)
Scheduled tribes	57.4 (28.0)	55.9 (33.4)	148 (155)	53 (46)	50.7	51.0
Observations (#)	298	298	298	298	44,249	15,860
Scheduled castes	20.0 (18.7)	22.4 (26.5)	171 (154)	67 (58)	18.4	22.0
Observations (#)	309	309	309	309	52,759	20,584
Other backward castes	43.3 (27.5)	42.5 (32.2)	156 (147)	62 (56)	45.0	47.2
Observations (#)	368	368	368	368	57,325	22,798
Forward castes	8.1 (14.1)	6.5 (13.8)	191 (194)	73 (68)	5.6	5.3
Observations (#)	147	147	147	147	28,041	10,773

Standard deviations are given in parentheses.

This being said, within the same village, the caste composition of the group is unbiased. This is confirmed by the following regressions, where we regress the proportion of group members belonging to a particular caste on its share in the village population. Given the constraint that these proportions add to 100%, the equations cannot be estimated independently, and we therefore use the Zellner seemingly unrelated regressions estimation technique. The results of these regressions are given in Table 4.

In column (1), we report the regression results when one uses all the villages in our sample. With the exception of the forward castes, the coefficients for all the other groups are very close to one, which indicates that, on average, the proportion of each caste in the groups is equal to the share of that caste in the village. These results fully support the idea that, at the time of

Table 4: Caste composition of the groups at the village level

	Over all villages (1)	Villages with at least 20% of two castes (2)	First group created (3)	Second group created (4)	Third group created (5)
Dependent variable: Share of ST in group					
Share of ST in village	0.9984***	0.9961***	1.0001***	0.9985***	0.9998***
	(0.0037)	(0.0084)	(0.0063)	(0.0063)	(0.0029)
Dependent variable: Share of SC in group					
Share of SC in village	1.0122***	1.0221*** 1.0277***	1.0196***	1.0016***	
	(0.0095)	(0.0156)	(0.0164)	(0.0164)	(0.0070)
Dependent variable: Share of OBC in group					
Share of OBC in village	0.9999***	1.0005***	0.9916***	0.9986***	1.0001***
	(0.0047)	(0.0097)	(0.0081)	(0.0075)	(0.0033)
Dependent variable: Share of FC in group					
Share of FC in village	0.9111***	0.8685***	0.8910***	0.8756***	0.9888***
	(0.0176)	(0.0226)	(0.0291)	(0.0295)	(0.0126)
N	404	248	404	330	240

Standard errors are given in parentheses. *** p<0.01, ** p<0.05, * p<0.1

their creation, the caste composition of the groups, on average, is not biased and reflects closely the social composition of the villages. As we may be comparing villages that are homogenous in terms of castes and therefore report an inter-village composition effect, we report in column (2) the results obtained when we select only those villages where at least two castes represent at least 20% of villagers. The results are strikingly similar. Finally, in the columns (3), (4) and (5), we report the results obtained when we compare the caste composition of the first, second and third group created to the caste composition in the village. Indeed, in the creation of the group, there might exist a particular pattern whereby the first group selects the most advanced caste-wise members of the village and rejects members of other castes who then tend to be over-represented in the subsequent groups. We find little evidence of this, as the coefficients obtained remain quite stable across the different categories. They are also very robust across all the regressions.

Another important source of bias may be related to wealth. Given that these villages are all located in remote rural areas, where the major occupation is farming, we also looked at the landownership status of group members. In particular, landless households are vulnerable, as they mostly rely on casual labour as their main occupation.[10] Unfortunately, the information available to us at the village level is rather coarse, as landownership in the village surveys was defined in terms of categories instead of actual land size. The first two columns in Table 5 report the average land ownership composition of groups and villages across all villages, the third and fourth column across individuals. The last column reports the coefficients estimated by regressing the fraction of group members of a particular land category to the fraction of households in that category in the village, using again Zellner estimators.[11]

A very interesting pattern emerges from Table 5, as group composition tends to be biased in favor of the households in the lowest land ownership category. In particular, landless households in a village are twice more likely to be a member of a group than wealthier households who own at least one acre of land. As the regression indicates, group membership decreases with landownership, so that poorer households are always more likely to be a member of a group than richer households. This finding partly contrasts with the earlier finding by Somanathan and Dewan (2004) based on a cross-sectional survey on some of the households included in our sample. Using a wealth index, they find that the bottom 5% of the village population were less likely to be part of a group. It is possible that, in our sample, the very poor incur more difficulties in becoming members of a group. However, given that we do not have detailed information on income, consumption expenditures or ownership of durable goods, we cannot investigate this issue and replicate the non-parametric approach used there.[12]

The results given above do not control for households and village level variables that may

[10] Among landless households, only 5.8% declare themselves as farmers. Their main occupation is casual labour (52.1%), housewives (29.5%) and traditional handicraft (7.0%). Only 2.6% of them have a permanent salaried position. For non-landless households, the main occupations are farming (26.1%), casual labour (29.1%), housewives (32.32%), traditional handicraft (7.0%) and permanent salaried position (2.3%). They also seem to be more educated, as the correlation between landownership and education is positive and equal to 0.125.

[11] As we did for the caste composition, we also ran separate regressions for villages where at least two land categories each represent at least 20% of the village population, as well as by distinguishing between the first, second and third group created in the village. The results are very similar to the ones reported above and are therefore omitted.

[12] It should be noted that Somanathan and Dewan (2004) find that, on average, group members tend to be poorer in terms of income or consumption expenditures, but own slightly more land than non-members. None of these differences were significant, however.

Table 5: Land ownership composition of the villages and the groups

	Average across all villages		Across individuals		Zellner estimators
	Share of population in villages (%)	Share of population in groups (%)	Share of households in villages (%)	Share of members in groups (%)	Dependent variable: Share of a particular land category in group
Landless	11.9	20.7	11.8	19.6	1.2328***
	(15.4)	(23.2)			(0.0484)
$0 <$ acre ≤ 1	39.4	43.1	40.5	48.2	1.0643***
	(24.4)	(27.3)			(0.0241)
$1 <$ acre ≤ 2	23.0	16.4	22.7	15.0	0.6579***
	(15.5)	(13.4)			(0.0244)
> 2 acres	25.7	19.8	25.0	17.2	0.7344***
	(21.5)	(18.3)			(0.0244)
Observations (#)	404	404	59,346	23,980	404

Standard deviations are given in parentheses. In the last column standard errors are given. *** p<0.01, ** p<0.05, * p<0.1

influence membership. A natural approach would have been to investigate group membership as a function of household characteristics using village fixed effects. Unfortunately, our data do not allow us to do this, as we do not have the required information for the households in the village that are not member of a group. At the village level, we only know the share of households endowed with a particular characteristic (caste and land ownership category).

3.2 Group composition at the group level

We now examine the composition of the groups within villages, as most of the villages (81.7%) surveyed exhibit more than one group, and some sorting process may take place between groups within the same village. In order to explore this, we first visualize in Figure 1 the relation between the share of households of a particular caste in a village and in all the groups of that village (404 observations).

Figure 1 replicates the results obtained in the previous section. Within a village, on average, there is no selection of members based on their caste. This result is obtained using averages at the village level. In Figure 2, we now represent the same information, but measuring on the vertical axis the percentage of members of a given caste that are members of a

particular group. In other terms, we now use the information at the group level instead of at the village level (1,632 observations).

Figure 1: Caste selection at the village level

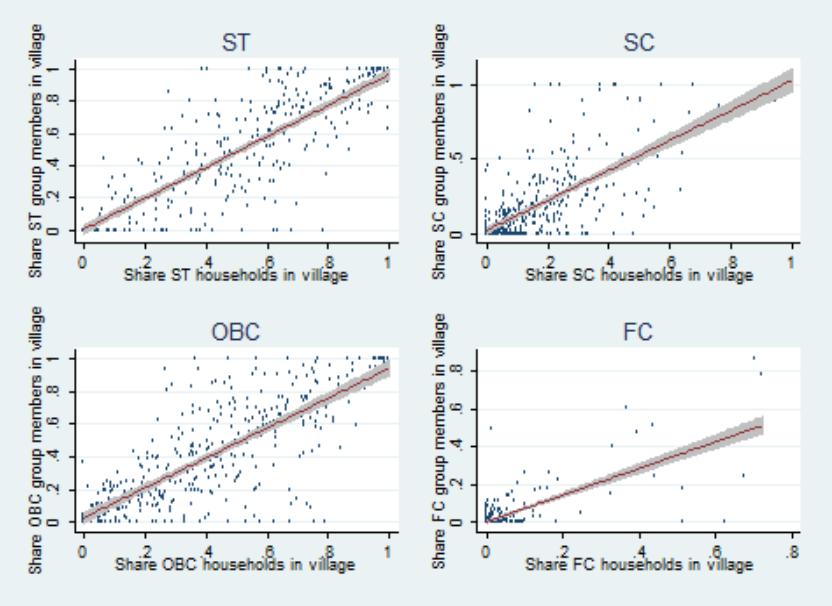
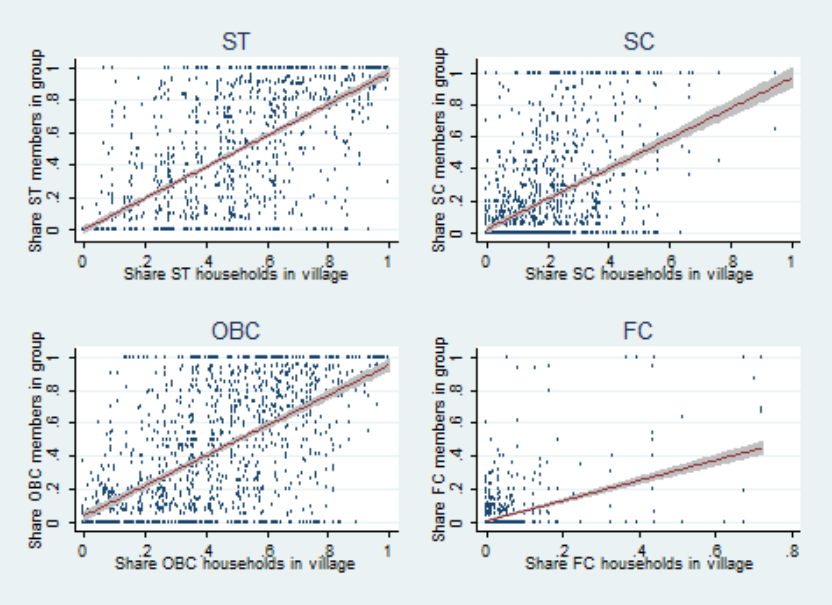


Figure 2: Caste selection at the group level

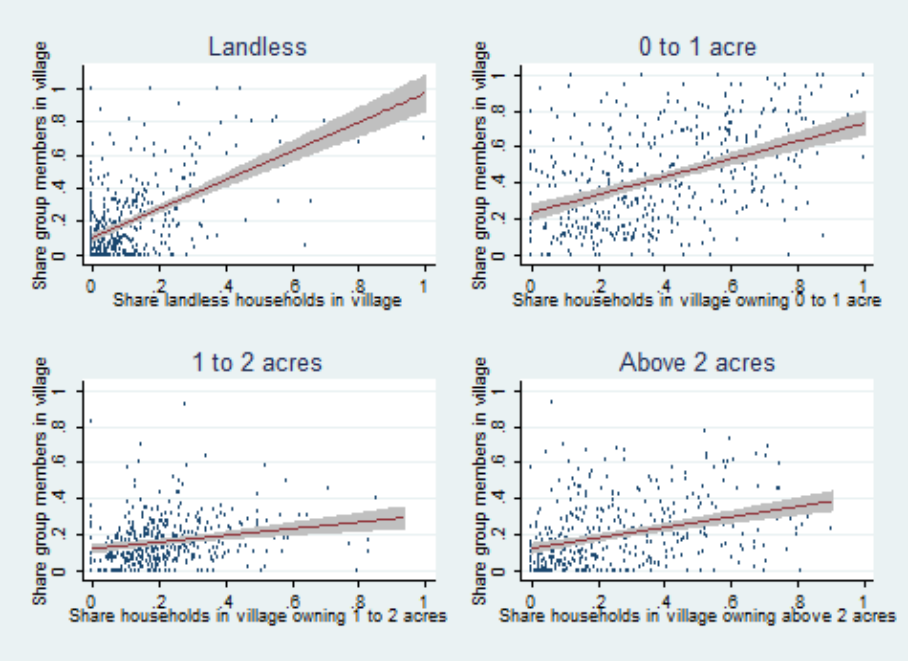


The contrast between the two figures is particularly striking: there is a lot of heterogeneity across groups within the same village, as indicated by the much larger dispersion of the

observations around the straight line. Moreover, we observe a significant number of groups that are homogenous, as evidenced by the accumulation of points at the maximal value of 1. This suggests that while on average groups are representative of the caste composition within their community, group composition varies a lot within the same village.

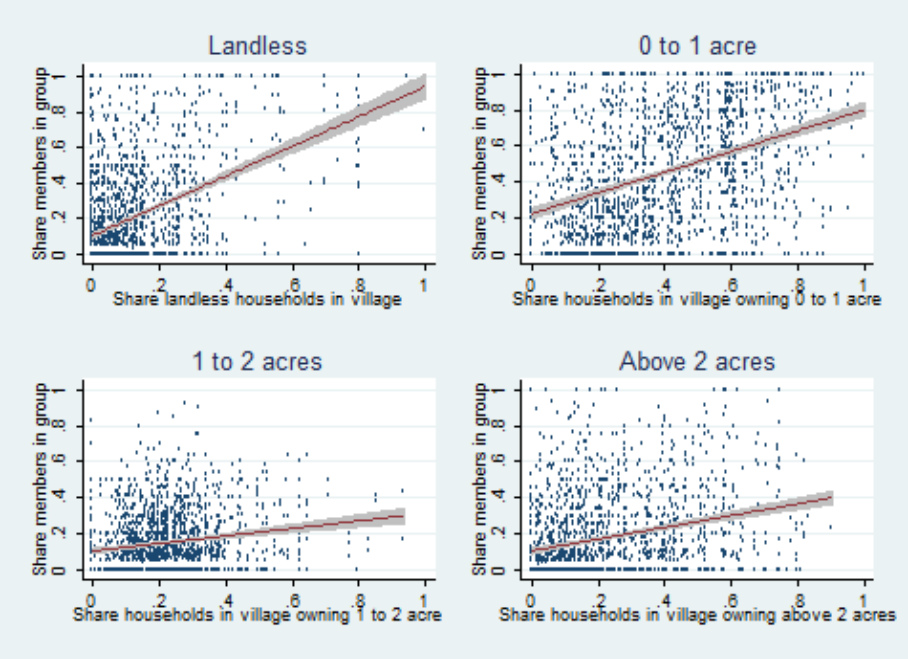
We do the same exercise for land selection at the village level in Figure 3 and at the group level in Figure 4. Figure 3 replicates the results obtained in the previous section. Within a village, on average, landless households are more likely to be a member of a group than wealthier households who own at least one acre of land. Again, there is a contrast between the two figures: there is a lot of heterogeneity across groups within the same village and we observe a significant number of groups that consist mostly of landless members.

Figure 3: Land selection at the village level



To further illustrate the importance of sorting across groups based on caste identity and landownership, we first compare caste fragmentation within groups with the fragmentation over all members in the village. The fragmentation index used is the usual one, and measures the probability that two randomly drawn members of the same set (group or village) belong to a different caste. For our measure to be meaningful, we restrict ourselves to villages where more than one group has been created, which represent 1,558 groups in 330 villages. We also compute the same measure for land ownership categories. The results are reported in Table 6.

Figure 4: Land selection at the group level



In terms of castes, the fragmentation index over the village population is much larger than among group members. SHGs are therefore much more homogenous in terms of their social composition. The same phenomenon is also observed for land categories. These results are robust to different alternatives, such as including the villages that have only one group, or focusing on the first groups created within the villages.

Table 6: Fragmentation of caste and land at the group and at the village level

	Caste category		Land ownership category	
	At village level	At group level	At village level	At group level
Fragmentation Index	0.36	0.23	0.55	0.43
	(0.21)	(0.22)	(0.16)	(0.22)
Observations (#)	330	1,558	330	1,558

Standard deviations are given in parentheses.

To illustrate this further, we construct an index of dissimilarity which captures the average differences in terms of caste composition and landownership across groups within the same village. This index is based on the dis-proportionality of different castes across groups, and more precisely measures the difference between the relative share of a particular caste and the

relative shares of the other castes in all groups of the same village. We first have to define dissimilarity at the village level, which is given by:

$$D_{jv} = \frac{1}{2} \sum_i |\frac{P_{ijv}}{P_{jv}} - \frac{P_{ikv}}{P_{kv}}|$$

where P_{ijv} is the number of members of caste j in group i in village v, P_{ikv} is the number of members of caste k, with $k \neq j$, in group i in village v, $P_{jv} = \sum_i P_{ijv}$ and $P_{kv} = \sum_i P_{ikv}, k \neq j$. This measure can be interpreted as the percentage of group members of a particular caste that have to be changed across groups so that their shares in each group within a village are the same. The same measure is also constructed for land categories.

Across villages, one can then define the caste-wise dissimilarity index, D_j, which is the population-weighted average across villages of the same measure:

$$D_j = \frac{1}{\sum_v P_{jv}} \sum_v P_{jv} D_{jv}$$

D_j therefore represents, on average across all villages, the proportion of members of a particular caste or land category who should change groups for their members to be uniformly represented in all groups of the same village. Finally, across all groups, one can also define the aggregate dissimilarity index, which is defined as the weighted average of caste-wise or land-wise dissimilarity index, with a similar interpretation. These measures, while relatively unfamiliar to economists (for some exceptions and alternative measures, see Echenique and Fryer, 2006; and Sethi and Somanathan, 2009), have been used extensively in social sciences, for instance to measure the extent of racial segregation across neighborhoods in American cities (see in particular Duncan and Duncan, 1955; Cortese et al., 1976; and the discussions in Reardon and Firebaugh, 2002; and Alonso-Villar and Del Río, 2010).

Finally, we also computed a generalized Gini index of segregation, which is based on the proportion of members of a particular caste or land category in each group existing in one village. It can be interpreted in the usual way as the area below the Lorenz curve of proportional representation of each caste or land category across groups in the village (see in particular Reardon and Firebaugh, 2002). Over all villages and castes, it is defined as follows:

$$G_v = \frac{\sum_j \sum_i \sum_l \frac{P_{iv} P_{lv}}{P_v^2} |\pi_{ijv} - \pi_{ljv}|}{2 \sum_j \pi_{jv}(1 - \pi_{jv})}, \text{with } l \neq i$$

with $\pi_{ijv} = \frac{P_{ijv}}{P_{iv}}$ and $\pi_{jv} = \frac{P_{jv}}{P_v}$

Table 7 reports the dissimilarity index for each caste and land group as well as the generalized Gini index and the generalized dissimilarity index across all groups.

Table 7: Segregation indices of castes and land across groups

Caste category		**Land ownership category**	
Dissimilarity index scheduled tribes	0.54	Dissimilarity index landless	0.50
Dissimilarity index scheduled castes	0.64	Dissimilarity index $0 <$ acre ≤ 1	0.45
Dissimilarity index other backward castes	0.54	Dissimilarity index $1 <$ acre ≤ 2	0.41
Dissimilarity index forward castes	0.70	Dissimilarity index > 2 acres	0.47
Generalized dissimilarity	0.57	Generalized dissimilarity	0.44
	(0.23)		(0.16)
Generalized Gini index	0.64	Generalized Gini index	0.50
	(0.24)		(0.19)

Standard deviations are given in parentheses.

The measured indices are very large, which implies that a large proportion of members should be exchanged across groups within the same village to achieve a proportional representation of each caste or land category in those groups: on average, about half of the members should change groups within the village.[13] This reflects the fact that groups are much more homogenous in terms of caste and landownership than the population of group members in a village.

In Figure 5, we present the distribution of the aggregate dissimilarity across the villages. The distribution of the dissimilarity index for the caste categories is concentrated between 0.4 and 0.9, which indicates a high degree of fragmentation across SHGs in almost all villages. The distribution of the dissimilarity index for land is more concentrated around its mean.

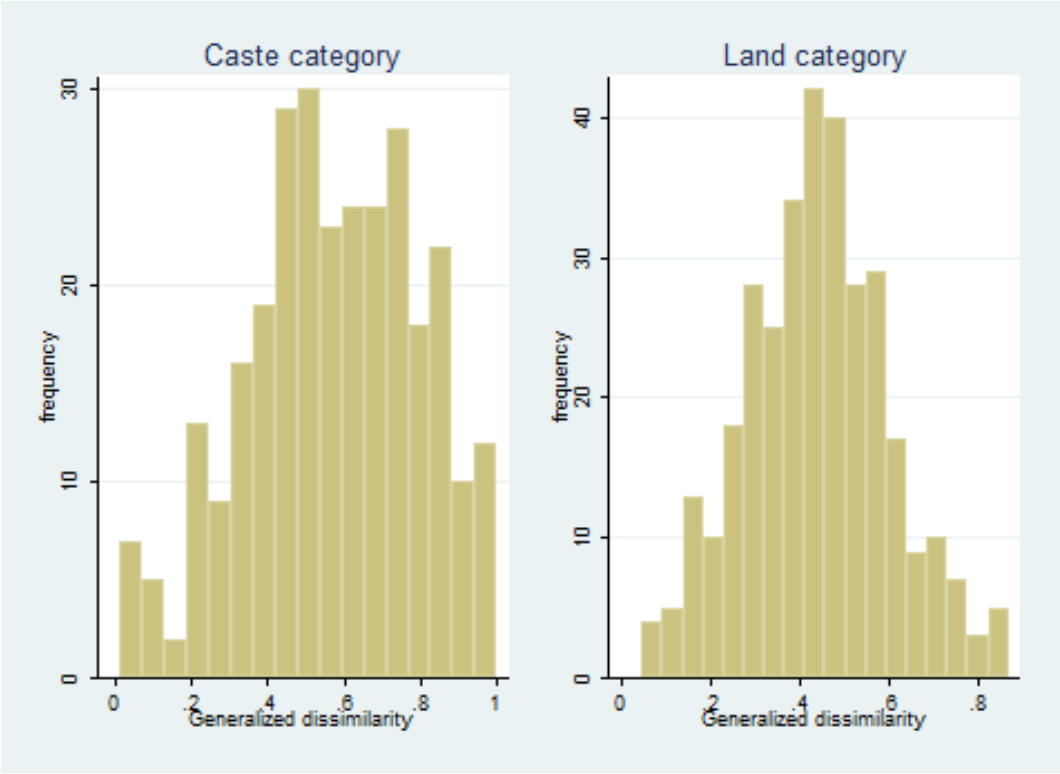
4 Group and member duration

4.1 Descriptive statistics about group failure and member departure

In the preceding section, we have highlighted the fact that, within the same village, the composition of SHGs varies a lot in terms of caste and landownership. Potential members tend to sort themselves out, and are therefore more likely to belong to a group composed

[13]The figures obtained are very similar to those obtained for the indices relative to African-American residential or school segregation (see e.g. Cortese et al., 1976; and Sparks et al., 2010).

Figure 5: The distribution of the caste-wide and land-wide aggregate index of dissimilarity across the villages



of members of the same caste or landownership category. We also saw that membership in groups, if anything, tends to be biased in favor of villagers with no or little landholding.

These observations naturally lead to the following questions. First, given that some groups disappear, is the survival of the group related to its composition in terms of castes and landownership? Second, are some members more likely to leave groups while others are more likely to stay? In other words, is the process of disappearance of some groups and some members selective? Third, to what extent the achievements of the groups, and of its members, are related to the characteristics of the groups and its members in terms of caste, landownership and other relevant characteristics? We focus on the two first issues in this section and address the third question in Section 5.

In the following, we describe a group as 'inactive' if the group does not have any more meetings at present and declares that they have no plans to meet in the future. A group is considered as 'active' if they held meetings at the time of the survey or intended to meet in the future. A member is considered as 'departed' if she abandoned a group which is still active, or if she left an inactive group before the last meeting. A member is considered as 'present'

if she still participates in an active group or if she belonged to an inactive group up to its last meeting day. We first present some descriptive statistics on departure rates by caste and landownership status in Table 8. For each individual of a particular caste or land category, we compute the probability that she becomes a member of a group, that the group she belongs to fails, that she leaves an existing group and, finally, that she enters a group and remains a member of a group.

Table 8: Failure rates of groups and members by caste and landownership status

	Probability of entering a group	Number of members	Probability of group failure	Probability of leaving the group	Probability of entering **and** remaining in an existing group
Scheduled tribes	41.1	9,278	10.5	14.6	30.9
Scheduled castes	52.3	5,069	10.1	13.4	40.0
Other backward castes	45.6	11,795	5.5	10.1	38.5
Forward castes	42.5	673	6.1	10.6	35.4
Landless	75.0	5,266	9.3	15.6	56.4
$0 <$ acre ≤ 1	53.3	12,864	6.8	10.5	44.1
$1 <$ acre ≤ 2	29.6	3,996	8.6	12.2	23.4
> 2 acres	31.0	4,600	9.6	12.5	24.1

Three interesting patterns emerge from these figures. First, as we already emphasized before, while initial membership is slightly biased against scheduled tribes and in favor of scheduled castes, it clearly favors villagers with little or no land. Second, group failures are more frequent among scheduled tribes and scheduled castes compared to the other two caste categories. Members of the scheduled tribes and scheduled castes are also much more likely to leave groups. A similar pattern holds for landless members. The result of these processes is that, compared to the other caste categories, the initial disadvantage of scheduled tribes gets amplified by the failure rates both at the group and at the member levels. The initial advantage of scheduled castes in terms of membership gets eroded by higher group failure and departure rates, so that ultimately, their chances of remaining a member of an existing group are similar to those of an other backward caste.

Third, in terms of land categories, entry into groups is very progressive, with landless villagers about two times more likely to enter a group than other villagers. For instance, compared to a small farmer owning less than one acre, they are 40% more likely to become a

member of a group (and 2.5 times more likely than farmers owning more than one acre). They however face higher failure rates, both in terms of group and members, so that their initial advantage falls in the process. The probability that a landless farmer enters and remains a member of an existing group falls from 75% to 56%, while that of a small farmer from 53% to 44%. As a whole, failures in terms of groups and members seem to affect disproportionately scheduled tribes, scheduled castes and landless farmers.

In Table 9 we present caste-wise the departure rate for each landownership status. As we do not have the distribution of land within each caste at the village level, we cannot compute the probability an individual becomes a member of a group. We do present the probability that the group she belongs to fails, that she leaves an existing group and, finally, that she remains a member of a group, conditional on having entered one. The table shows that landless villagers face higher failure rates within each caste. This process is mainly driven by members leaving their group. Only for backward castes group failures are more frequent as compared to members who own land.

We provide descriptive statistics on the group characteristics by survival status in Table 10 and on the characteristics of present and past members in Table 11.

A comparison of the two types of groups shows some interesting patterns. First, active and currently inactive groups are both reasonably long-lived with inactive groups operating for an average of three years after they are formed. Second, homogenous scheduled tribe groups have a lower survival rate. The opposite holds for homogenous other backward caste groups. Third, the groups with landless farmers are slightly more likely to fail. Finally, in terms of their demographic characteristics, members of active groups are, on average, more educated and more likely to have relatives in the group. There is no difference in group size and in the amount of land owned.[14]

Table 11 compares present and past members. Scheduled tribes, scheduled castes and landless members are more likely to leave groups. The demographic characteristics of past and present members are similar but they do differ in terms of their relationships within the group: 45% of present members have another relative in the group, while this holds for only 30% of the past members.

Table 12 gives the characteristics of members by caste. Scheduled castes are most disadvantaged, both in terms of land holdings and education.

[14]Average member characteristics for both types of groups are calculated for the initial members of the group.

Table 9: Failure rates of groups and members by caste and landownership status combinations

	Number of members	% of caste	Probability of group failure	Probability of leaving the group	Probability of remaining in existing group	Significance of the difference relative to baseline category
Scheduled tribes:	9,244	100.0				
Landless	1,661	18.0	10.5	17.5	72.1	N.A.
$0 <$ acre ≤ 1	3,701	40.0	8.9	13.5	77.6	5.5*** (1.3)
$1 <$ acre ≤ 2	1,748	18.9	12.0	14.5	73.6	1.5 (1.5)
> 2 acres	2,134	23.1	12.0	13.3	74.8	2.7* (1.4)
Scheduled castes	5,055	100.0				
Landless	1,732	34.3	10.0	16.1	74.0	N.A.
$0 <$ acre ≤ 1	2,614	51.7	10.5	10.3	79.2	5.2*** (1.3)
$1 <$ acre ≤ 2	375	7.4	8.3	17.9	73.9	-0.1 (2.5)
> 2 acres	334	6.6	9.9	16.8	73.3	-0.7 (2.6)
Other backward castes	11,753	100.0				
Landless	1,746	14.9	7.6	13.3	79.0	N.A.
$0 <$ acre ≤ 1	6,231	53.0	4.2	8.8	86.9	7.9*** (1.0)
$1 <$ acre ≤ 2	1,800	15.3	5.4	8.9	85.7	6.7*** (1.3)
> 2 acres	1,976	16.8	6.7	11.4	81.8	2.8** (1.3)
Forward castes	673	100.0				
Landless	127	18.9	5.5	15.8	78.7	N.A.
$0 <$ acre ≤ 1	318	47.3	3.1	10.4	86.5	7.8** (3.8)
$1 <$ acre ≤ 2	72	10.7	5.6	9.7	84.7	6.0 (5.8)
> 2 acres	156	23.1	12.8	7.1	80.1	1.4 (4.8)

The asterisks indicate the statistical significance of the difference relative to the baseline category. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 10: Group characteristics by survival status

	Active	Inactive	All	Difference
Number of groups (%)	1,474 (90.0)	163 (10.0)	1,637 (100.0)	
Average duration (years)	4.1	3.2	4.0	0.9***
	(3.0)	(2.8)	(3.0)	(0.2)
Homogeneous group (%)	38.3	43.6	38.8	-5.3
	(48.6)	(49.7)	(48.7)	(4.0)
ST (% of homogeneous)	38.5	54.9	40.3	-16.4***
	(48.7)	(50.1)	(49.1)	(6.2)
SC (% of homogeneous)	17.9	23.9	18.6	-6.0
	(38.4)	(43.0)	(38.9)	(4.9)
OBC (% of homogeneous)	42.7	18.4	40.0	24.3***
	(49.5)	(39.0)	(49.0)	(6.1)
FC (% of homogeneous)	0.9	2.8	1.1	-1.9
	(9.4)	(16.7)	(10.4)	(1.3)
Caste fragmentation	0.23	0.20	0.23	0.03
	(0.22)	(0.21)	(0.22)	(0.02)
Mean land (acres)	1.5	1.5	1.5	0.03
	(2.0)	(1.4)	(1.9)	(0.2)
Fraction of landless members	20.6	23.9	20.9	-3.3
	(27.2)	(29.0)	(27.4)	(2.3)
Mean education (years)	1.8	1.1	1.8	0.7***
	(1.8)	(1.3)	(1.7)	(0.1)
Average age	37.2	38.4	37.3	-1.2***
	(5.6)	(5.5)	(5.6)	(0.5)
Fraction of members who	45.8	39.7	45.2	6.1***
have relative in group	(27.1)	(28.6)	(27.3)	(2.3)
Fraction separated of husband	9.6	11.8	9.9	-2.2***
	(9.7)	(11.3)	(9.9)	(0.8)
Mean number of children	3.0	3.1	3.0	-0.1*
	(0.83)	(0.87)	(0.83)	(0.07)
Number of members	14.7	14.6	14.7	0.1
	(3.9)	(3.9)	(3.9)	(0.3)
Number of other SHGs in the village	5.6	3.2	5.4	2.4***
	(4.5)	(3.7)	(4.5)	(0.4)
Village caste fragmentation	0.44	0.39	0.43	0.05***
	(0.18)	(0.19)	(0.18)	(0.02)
Fraction of village households	64.9	62.1	64.6	2.8
with member who can read/write	(21.1)	(23.0)	(21.3)	(1.8)
Distance to the bank	6.6	7.5	6.7	-0.9*
	(5.6)	(5.1)	(5.6)	(0.5)

The table reports means (standard deviations in parentheses) of the indicated variable in the two samples and in the whole sample.
The asterisks indicate the statistical significance of the difference in the means across the two samples. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 11: Characteristics of present and past members

	Present	Past	All	Difference
Number of women (%)	23,531 (87.7)	3,292 (12.3)	26,823 (100.0)	
Average duration (years)	4.1	2.0	3.8	2.1***
	(3.1)	(2.1)	(3.1)	(0.06)
Caste ST (%)	33.7	41.1	34.6	-7.4***
	(47.3)	(49.2)	(47.6)	(0.9)
Caste SC (%)	18.7	20.7	18.9	-2.0***
	(39.0)	(40.5)	(39.2)	(0.7)
Caste OBC (%)	45.0	36.0	44.0	9.0***
	(49.8)	(48.0)	(49.6)	(0.9)
Caste FC (%)	2.6	2.2	2.5	0.4
	(15.8)	(14.6)	(15.6)	(0.3)
Fraction of members with same caste	77.8	73.1	77.2	4.7***
	(26.9)	(29.9)	(27.4)	(0.5)
Land (acres)	1.5	1.5	1.5	-0.02
	(2.8)	(2.9)	(2.8)	(0.05)
Landless (%)	18.9	25.4	19.7	-6.5***
	(39.2)	(43.6)	(39.8)	(0.7)
Education (years)	1.7	1.7	1.7	0.08
	(3.3)	(3.3)	(3.3)	(0.06)
Age	37.3	37.2	37.3	0.1
	(10.6)	(11.6)	(10.7)	(0.2)
Relative in group (%)	44.8	30.2	43.0	14.6***
	(49.7)	(45.9)	(49.5)	(0.9)
Separated of husband (%)	9.7	10.0	9.7	-0.3
	(29.6)	(30.0)	(29.6)	(0.6)
Number of children	3.1	2.7	3.0	0.4***
	(1.8)	(1.8)	(1.8)	(0.03)

The table reports means (standard deviations in parentheses) of the indicated variable in the two samples and in the whole sample.
The asterisks indicate the statistical significance of the difference in the means across the two samples. * significant at 10%; ** significant at 5%; *** significant at 1%

Table 12: Characteristics of members by caste

	ST	SC	OBC	FC
Number of women (%)	9,276 (34.6)	5,068 (18.9)	11,790 (44.0)	673 (2.5)
Land (acres)	1.9	0.7	1.5	1.8
	(3.0)	(1.6)	(3.0)	(3.0)
Landless (%)	18.0	34.3	14.9	18.9
	(38.4)	(47.5)	(35.6)	(39.2)
Education (years)	1.6	1.2	1.9	3.8
	(3.1)	(2.8)	(3.5)	(4.2)
Age	36.7	37.6	37.7	38.0
	(10.6)	(10.9)	(10.7)	(11.0)
Relative in group (%)	43.0	44.2	42.5	44.4
	(49.5)	(49.7)	(49.4)	(49.7)
Separated of husband (%)	9.4	10.8	9.3	12.8
	(29.2)	(31.1)	(29.1)	(33.4)
Number of children	2.7	3.3	3.2	3.1
	(1.7)	(1.8)	(1.8)	(1.7)

Standard deviations are given in parentheses.

4.2 Survival analysis: empirical methods

Many of the more standard regression techniques that are used in economic analysis are not appropriate to the questions that we are interested in. We would like to estimate the causal effect of particular covariates on the time until events occur; in our case, the events being either group dissolution or member exit. In a linear regression, the residuals are assumed to be distributed normally. However, the distribution of time to an event is typically asymmetric and may have different modes, which makes the use of linear regressions inappropriate.[15] We therefore use parametric and semi-parametric survival analyses. Semiparametric modeling does not require a distributional assumption, as it exclusively uses the ordering of the survival times, but is inefficient as compared to parametric modeling.[16]

We begin with some standard definitions of functions. Denote by the nonnegative random variable T, the time until the event of interest. In our context, this is the time until the dissolution of the group or until a member departs in the member level analysis. The distribution of T can be represented in several ways. The *survival function* $S_T(t)$ gives the probability of surviving beyond a time t or, in other words, the probability that the random variable $T \geq t$. The *hazard rate* $h_T(t)$ reflects the chance of experiencing the event in the next instant in time. For a continuous random variable T with a probability density function $f(t)$, we have $S(t) = \int_t^\infty f(t)dt$ and the hazard function is given by $h(t) = \frac{f(t)}{S(t)} = \frac{-d\log(S(t))}{dt}$.

We will estimate the hazard function using parametric and semiparametric methods. A variety of different parametric models is available. We use the Weibull model for reasons that are made clear below. For the semiparametric analysis, the Cox regression model is used.[17]

4.2.1 Semiparametric methods: The Cox proportional hazards model

The Cox model asserts that the hazard rate for the jth person in the data is given by:

$$h(t|x_j) = h_0(t)\exp(x_j\beta_x)$$

where the regression coefficients, β_x, are to be estimated from the data. The baseline hazard $h_0(t)$, which provides an estimate of the hazard rate for a group/member with a zero value

[15] The discussion in this section is based on Klein and Moeschberger (2003); and Cleves et al. (2008).

[16] The method is called *semiparametric*, because as far as time is concerned, it is nonparametric, but it still parameterizes the effect of the covariate, so there exists a parametric component to the analysis.

[17] Nonparametric estimators are also a possibility, especially when dealing with a homogeneous population because of the flexibility they offer. Though our population is far from homogeneous, some results using nonparametric estimates are given in our previous work (Baland et al., 2008).

for all covariates, is given no particular parameterization and can be left unestimated. The model makes no assumption about the shape of the hazard over time, except that it is identical for all individuals. The main advantage is that we do not need to make assumptions about $h_0(t)$. The cost is a loss in efficiency. In the tables, we report the exponentiated coefficients, which represent the change in the ratio of the hazards for a 1 unit change in the corresponding covariate. A hazard ratio of 1 therefore implies that the covariate has no effect on the risk of failure. $\exp(\beta_j) < 1$ implies that the covariate increases the time until the event occurs.

4.2.2 Parametric methods: The Weibull Model

The parametric model we use is based on the Weibull distribution. The hazard function in its proportional hazard (PH) representation is given by

$$\begin{aligned} h(t|x_j) &= h_0(t)\exp(x_j\beta_x) \\ &= \alpha t^{\alpha-1}\exp(\beta_0 + x_j\beta_x) \end{aligned} \tag{1}$$

In this model, the baseline hazard rate $h_0(t)$ is restricted to vary monotonically over time, but it can be either increasing, decreasing or constant, depending on the value of the parameter α. If $\alpha = 1$ this model reduces to an exponential model which has a constant hazard rate, if $\alpha > 1$, the hazard rates are increasing and if $\alpha < 1$, they are decreasing. As we discuss in the appendix (Section 7.2), the Weibull model fits well our data. One particular test compares the estimated coefficients, $\hat{\beta}_x$, with those from a Cox model. In the appendix, we report the results obtained using the Cox model, which prove to be very similar.

4.3 Group duration

In our sample, 163 out of 1,637 groups became inactive and are no longer operating. This represents a gross failure rate of 10%. For the analysis of group duration, we analyze group survival as a function of a number of group characteristics. Caste composition is investigated in various ways: (1) whether the group is homogenous or not, (2) the proportion of different castes in the group, (3) the caste fragmentation index of the group, (4) whether the group is homogenous in each particular caste separately, using homogenous scheduled tribe groups as a baseline. For the members' characteristics, we measure the effect of the members' mean education level, the average land owned by members, the fraction of members who are landless, the average age of the members, the proportion of members who have a family relation in the group, the fraction of members who are widows, divorced or separated, and the members'

average number of children. We also control for the size of the group. At the village level, we control for the number of other SHGs in the village, the village caste fragmentation index, the fraction of village households having a member who can read and write, the distance to the nearest bank, as well as block fixed effects. Blocks are administrative divisions, which comprise 8 to 10 villages. Our survey covers 5 blocks in Orissa, 4 in Chhattisgarh and 3 in Jharkhand.

The hazard ratios from estimating the Weibull model for the group survival are presented in Table 13. On average, the caste composition of the group does not appear as a significant determinant of group survival. Interestingly, however, groups composed exclusively of other backward castes, and, for the scheduled tribes and scheduled castes, heterogenous groups, present higher chances of survival. In other words, while other backward caste groups tend in general to survive longer, for scheduled tribes and scheduled castes, group survival is more likely if other castes are also present in the group. For the latter, the increase in the probability of survival is equal to 35%.[18]

Turning to the other members' characteristics, the education level of the group and family relationships in the groups both have a strong positive and robust impact on group survival. On average, an additional year of education of all group members increases the chances of survival by about 20%. Compared to a situation where no member has another family member in the group, having all members of the group being connected by a family relationship doubles the chances of group survival. The optimal group size is 18 members and the presence of other SHGs in the village significantly reduces the chances of group failure. Other groups in the village may help either through the sharing of information, through the emulation they provide or by making it more likely that PRADAN professionals frequently visit them. We have not looked directly at these particular mechanisms as yet, and these remain conjectures based on anecdotal evidence. Finally, the proportion of landless members in the group may be associated with lower chances of survival. Column (3) shows that a group composed exclusively of landless members is twice more likely to become inactive than a group with no such members. The results are quantitatively not different from the results using the Cox proportional hazards model, which are given in the appendix (Section 7.3).

We also ran similar regressions on each caste separately. The results in terms of caste composition are consistent with the ones above, but often non significant. The results in terms of members' characteristics are very robust, and fully in line with those discussed above.

[18] These probabilities are computed by subtracting the estimated coefficient from 1.

Table 13: Group Survival (Weibull model)

	(1)	(2)	(3)	(4)
Homogenous SHG	1.3035			
	(0.2700)			
Fraction of SC members		1.2266	1.2685	
		(0.4762)	(0.4778)	
Fraction of OBC members		0.5964	0.6305	
		(0.2056)	(0.2108)	
Fraction of FC members		2.9615	3.2657	
		(2.7215)	(2.8927)	
Caste fragmentation			0.7050	
			(0.3241)	
Heterogenous SHG				0.6450*
				(0.1683)
Homogenous SHG, SC				1.1133
				(0.4240)
Homogenous SHG, OBC				0.4472**
				(0.1580)
Homogenous SHG, FC				3.7988
				(3.0994)
Mean education (years)	0.8086**	0.8103**	0.8120**	0.8111**
	(0.0719)	(0.0741)	(0.0748)	(0.0732)
Mean land (acres)	0.9717	0.9715	0.9694	0.9728
	(0.0516)	(0.0517)	(0.0512)	(0.0490)
Fraction of landless members	1.9216*	1.5604	1.5917	1.7355
	(0.7510)	(0.6540)	(0.6653)	(0.7016)
Average age	0.9598**	0.9626*	0.9626*	0.9612**
	(0.0198)	(0.0199)	(0.0198)	(0.0192)
Fraction of members who have	0.4507**	0.4280***	0.4156***	0.4155***
relative in group	(0.1445)	(0.1382)	(0.1350)	(0.1342)
Fraction separated of husband	2.7240	2.5273	2.6204	2.7960
	(2.4033)	(2.2229)	(2.2987)	(2.4427)
Mean number of children	0.7936	0.7711	0.7713	0.7726
	(0.1440)	(0.1379)	(0.1377)	(0.1377)
Number of members	0.5243***	0.5048***	0.5025***	0.5106***
	(0.0561)	(0.0528)	(0.0531)	(0.0539)
Squared number of members	1.0179***	1.0192***	1.0194***	1.0189***
	(0.0037)	(0.0036)	(0.0037)	(0.0037)
Number of other SHGs	0.8910***	0.8937***	0.8927***	0.8903***
in the village	(0.0273)	(0.0267)	(0.0267)	(0.0271)
Village caste fragmentation	0.9445	0.7485	0.8001	0.8930
	(0.5016)	(0.4003)	(0.4366)	(0.4886)
Fraction of village households with	0.9011	0.8692	0.8763	0.8661
member who can read/write	(0.3540)	(0.3408)	(0.3423)	(0.3305)
Distance to the bank	0.9745*	0.9703**	0.9710**	0.9725*
	(0.0139)	(0.0142)	(0.0141)	(0.0144)
Block fixed effects	yes	yes	yes	yes
N	1,632	1,632	1,632	1,632
α	1.3520	1.3482	1.3480	1.3592

Robust standard errors are given in parentheses. *** p<0.01, ** p<0.05, * p<0.1

4.4 Member duration in groups

We now investigate the determinants of the duration of members in existing groups. In our sample, out of the 26,817 members surveyed, 3,285 left an existing group, which represents a departure rate of 12.3%. We refine the model described in (1) to a Weibull model with shared frailty. A frailty is a latent random effect that enters multiplicatively on the hazard function. We do so, as members j might be correlated within groups i because of some overall group characteristic (a frailty) that is not being measured. Shared frailty models are the survival-data analogue to random-effects models. The frailties are shared across groups of observations, thus causing those observations within the same group to be correlated. If a frailty γ is assumed to be shared across groups i, the hazard function (1) becomes:

$$h(t_{ij}|x_{ij}, \gamma_i) = \gamma_i h(t_{ij}|x_{ij})$$

The frailties are assumed to have a gamma distribution with mean 1 and variance θ, to be estimated from data. When $\theta = 0$, the model simply reduces to the standard Weibull model. In the regressions that follow, we reject the hypothesis that $\theta = 0$ and hence include a frailty.

The member characteristics considered parallel those used in the analysis of group duration and include the caste of the member, her level of education, her landownership status, her age, the existence of a family member in the group, her marital status and the number of children she has. At the group level, we use similar controls as for the group duration. The results are displayed in Table 14.

On average, across all members, other backward castes are less likely to leave groups as compared to scheduled tribes. The homogeneity or the fragmentation of the group do not seem to matter. More importantly however, having other members of the same caste matters a lot in increasing a particular member's duration within the group. Landless members are more likely to leave: being landless increases the probability of departure by about 15%. Finally, members who are educated, separated, have children, and, most importantly, are connected by family ties with another member of the group stay longer in groups. At the group level, education is positively related to survival.

These estimations assume that all members are affected in the same way by the caste composition of the group. To consider the effects of heterogeneity more carefully, we also ran the same regression separately for each caste. The results are reported in Table 15.

The results point to a very interesting pattern: with the exception of the forward castes, a member is much more likely to remain in the group if a large fraction of members of the same caste are in the group. She is much less likely to stay if a large part of the group is composed of members of another caste. This process is uniform across the three main caste groups. The

Table 14: Member Survival (Weibull model with shared frailty)

	(1)	(2)	(3)	(4)
Caste SC	1.0838	1.0796	0.9795	0.9606
	(0.0752)	(0.0747)	(0.0793)	(0.0645)
Caste OBC	0.9458	0.9428	0.8702**	0.8996*
	(0.0549)	(0.0546)	(0.0579)	(0.0497)
Caste FC	1.0500	1.0439	0.8694	0.7839*
	(0.1565)	(0.1551)	(0.1496)	(0.1151)
Homogenous SHG		0.9004		
		(0.0578)		
Fraction of SC members			1.5287***	
			(0.2408)	
Fraction of OBC members			1.4537***	
			(0.1923)	
Fraction of FC members			2.3882**	
			(0.8357)	
Caste fragmentation			1.1977	
			(0.1752)	
Fraction of members with same caste				0.4551***
				(0.0361)
Education (years)	0.9716***	0.9717***	0.9729***	0.9712***
	(0.0069)	(0.0069)	(0.0069)	(0.0069)
Land (acres)	1.0083	1.0083	1.0082	1.0082
	(0.0075)	(0.0075)	(0.0075)	(0.0075)
Landless	1.1536**	1.1538**	1.1613**	1.1309**
	(0.0670)	(0.0670)	(0.0675)	(0.0653)
Age	0.9156***	0.9158***	0.9157***	0.9154***
	(0.0081)	(0.0081)	(0.0081)	(0.0082)
Squared age	1.0010***	1.0010***	1.0010***	1.0010***
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Relative in group	0.5363***	0.5368***	0.5374***	0.5631***
	(0.0243)	(0.0243)	(0.0243)	(0.0256)
Separated of husband	0.8664**	0.8662**	0.8651**	0.8595**
	(0.0564)	(0.0564)	(0.0564)	(0.0561)
Number of children	0.9051***	0.9051***	0.9051***	0.9030***
	(0.0113)	(0.0113)	(0.0113)	(0.0113)
Mean education (years)	0.9494**	0.9480**	0.9178***	0.9485**
	(0.0231)	(0.0231)	(0.0242)	(0.0231)
Mean land (acres)	0.9931	0.9939	0.9968	0.9967
	(0.0209)	(0.0210)	(0.0211)	(0.0212)
Fraction of landless members	1.0670	1.0542	0.9873	1.0189
	(0.1624)	(0.1606)	(0.1540)	(0.1555)
Fraction of members who have relative in group	0.8893	0.9070	0.8683	0.9225
	(0.1017)	(0.1043)	(0.1011)	(0.1059)
Fraction separated of husband	1.3116	1.2834	1.2969	1.2563
	(0.4028)	(0.3945)	(0.3986)	(0.3882)
Mean number of children	1.0259	1.0297	1.0344	1.0344
	(0.0540)	(0.0543)	(0.0544)	(0.0548)
Block fixed effects	yes	yes	yes	yes
N	26,597	26,597	26,597	26,597
α	0.8500	0.8496	0.8510	0.8504

Standard errors are given in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Other group controls are average age, total number of members and squared total number of members. Other village controls are the number of PRADAN SHGs in the village, the distance to the bank, the village caste fragmentation and the fraction of households having an adult member who can read and write.

Table 15: Member survival by caste (Weibull model with shared frailty)

	(ST)	(SC)	(OBC)	(FC)
Fraction of ST members	0.3036***			
	(0.0542)			
Fraction of SC members		0.5093***		
		(0.1004)		
Fraction of OBC members			0.4761***	
			(0.0763)	
Fraction of FC members				0.5140
				(0.3486)
Education (years)	0.9624***	1.0100	0.9740**	0.8897***
	(0.0113)	(0.0178)	(0.0110)	(0.0332)
Land (acres)	0.9986	1.0245	1.0263**	1.0277
	(0.0111)	(0.0276)	(0.0123)	(0.0761)
Landless	1.0862	1.1658	1.2284**	2.2372
	(0.1032)	(0.1457)	(0.1269)	(1.1112)
Age	0.9034***	0.9233***	0.9250***	0.8191***
	(0.0126)	(0.0187)	(0.0140)	(0.0585)
Squared age	1.0012***	1.0009***	1.0008***	1.0022***
	(0.0002)	(0.0002)	(0.0002)	(0.0008)
Relative in group	0.5414***	0.5122***	0.6150***	0.3908***
	(0.0408)	(0.0512)	(0.0459)	(0.1244)
Separated of husband	0.6931***	1.0910	1.0362	0.2470**
	(0.0766)	(0.1503)	(0.1110)	(0.1374)
Number of children	0.8908***	0.9034***	0.9243***	0.8236**
	(0.0171)	(0.0248)	(0.0205)	(0.0769)
Mean education (years)	0.9173**	0.9077*	0.9441	1.3171**
	(0.0354)	(0.0523)	(0.0350)	(0.1689)
Mean land (acres)	1.0476	1.0041	0.9486	0.8183
	(0.0332)	(0.0666)	(0.0327)	(0.1061)
Fraction of landless members	1.3451	0.7486	0.9183	0.1869*
	(0.3181)	(0.2224)	(0.2181)	(0.1650)
Average age	0.9942	1.0136	1.0064	1.0812*
	(0.0103)	(0.0145)	(0.0108)	(0.0452)
Fraction of members who have relative in group	0.8316	1.3946	0.9311	0.5894
	(0.1359)	(0.3477)	(0.1682)	(0.3786)
Fraction separated of husband	1.5893	0.9004	1.0214	18.0224*
	(0.6897)	(0.5578)	(0.4737)	(30.3446)
Mean number of children	1.2052**	0.9679	0.9111	0.9507
	(0.0933)	(0.1058)	(0.0738)	(0.3388)
Number of members	0.7071***	0.7201***	0.8441**	0.8270
	(0.0510)	(0.0688)	(0.0586)	(0.2213)
Squared number of members	1.0069***	1.0051	1.0000	1.0018
	(0.0026)	(0.0032)	(0.0023)	(0.0087)
Block fixed effects	yes	yes	yes	yes
N	9,140	5,049	11,722	673
α	0.8100	0.8580	0.9163	1.0876

Standard errors are given in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Other village controls are the number of PRADAN SHGs in the village, the distance to the bank, the village caste fragmentation and the fraction of households having an adult member who can read and write.

magnitude of the effect is not negligible: an increase by 10% of the proportion of members of one's own caste in the group increases the chances of survival by about 5% ((1-0.50)*10%). We ran several alternative estimates, using a quadratic specification in the proportion of each caste, or the proportion of members of the other castes, with very similar results.

5 Group and members performance

5.1 Descriptive statistics about group and members performance

In this section, we focus on the performance of the group and of the members. The basic measure of this performance is the ability of the group and its members to have access to bank loans. Being 'linked' to a bank and obtaining a bank loan is indeed the major motive behind the creation of those groups. Table 16 summarizes this information at the group and at the member level.

Table 16 suggests a number of interesting patterns.[19] In terms of castes, it appears that while scheduled tribes, scheduled castes and other backward castes have a similar access to bank loans, forward castes members are much more likely to obtain a bank loan, and the amounts they receive are also much larger. By contrast, landownership does not seem related to the probability of obtaining a bank loan. The amounts received by landless members are higher than those received by members who own some land and less than those received by members who own more than one acre. But it is remarkable that landless scheduled tribes receive more than wealthier scheduled tribes.

In the Tables 17 and 18, we present the descriptive statistics on the characteristics of groups and members, conditional on receiving a bank loan. On average, groups that are heterogenous in terms of castes and which operated for a longer time are more likely to receive a bank loan. In terms of the other characteristics however, groups are very similar.

From Table 18, we see that scheduled tribe members and landless women are more likely to receive part of the bank loan, while the opposite holds true for the other backward castes. Educated members are also more likely to receive a bank loan, as well as members with relatives in the group. In Figure 6 we visualize the relation between the average bank loan amount received per year and the land owned by the member's household. Although landless women are more likely to receive part of the bank loan, it seems they do not receive more than members who own more land.

[19]The figures presented are potentially misleading as we are averaging over groups and members of different duration, as well as over groups that became inactive and groups that are still active.

Table 16: Performance of groups and members in bank loans

	Number of observations	Proportion with at least one bank linkage	Amount of the bank loans received per year, if received	Share of the bank loan received, if the group received a bank loan
GROUP LEVEL	1,637	68.5	1,271	N.A.
MEMBER LEVEL:				
Scheduled tribes	9,278	69.3	1,240	7.1
Scheduled castes	5,069	71.0	1,126	6.5
Other backward castes	11,795	70.7	1,227	6.4
Forward castes	673	76.7	1,838	7.5
Landless	5,266	72.2	1,261	7.1
$0 <$ acre ≤ 1	12,864	70.1	1,136	6.2
$1 <$ acre ≤ 2	3,996	72.7	1,299	6.6
> 2 acres	4,600	67.4	1,407	7.5
Scheduled tribes:				
Landless	1,661	72.8	1,303	7.4
$0 <$ acre ≤ 1	3,701	68.9	1,266	6.9
$1 <$ acre ≤ 2	1,748	69.6	1,148	6.7
> 2 acres	2,134	66.9	1,226	7.5
Scheduled castes:				
Landless	1,732	70.0	1,101	6.6
$0 <$ acre ≤ 1	2,614	71.2	1,066	6.2
$1 <$ acre ≤ 2	375	75.5	1,290	7.3
> 2 acres	334	71.0	1,625	7.8
Other backward castes:				
Landless	1,746	73.0	1,313	7.0
$0 <$ acre ≤ 1	6,231	70.4	1,085	5.9
$1 <$ acre ≤ 2	1,800	74.7	1,360	6.5
> 2 acres	1,976	66.4	1,500	7.4
Forward castes:				
Landless	127	81.1	2,133	10.2
$0 <$ acre ≤ 1	318	71.7	1,395	6.0
$1 <$ acre ≤ 2	72	87.5	2,768	6.4
> 2 acres	156	78.2	1,998	9.0

Table 17: Group characteristics depending on whether the group received a bank loan or not

	Did not receive	Received	All	Difference
Number of groups (%)	516 (31.5)	1,121 (68.5)	1,637 (100.0)	
Average duration (years)	2.6	4.6	4.0	-2.0***
	(2.5)	(3.0)	(3.0)	(0.2)
Homogeneous group (%)	42.4	35.4	37.6	7.0***
	(49.5)	(47.8)	(48.5)	(2.6)
ST (% of homogeneous)	40.2	40.1	40.1	0.1
	(49.1)	(49.1)	(49.0)	(4.1)
SC (% of homogeneous)	18.3	17.6	17.9	0.7
	(38.7)	(38.2)	(38.3)	(3.2)
OBC (% of homogeneous)	41.1	40.8	40.9	0.3
	(49.3)	(49.2)	(49.2)	(4.1)
FC (% of homogeneous)	0.4	1.5	1.1	-1.1
	(6.8)	(12.2)	(10.6)	(0.9)
Caste fragmentation	0.20	0.24	0.23	-0.04***
	(0.21)	(0.22)	(0.22)	(0.01)
Mean land (acres)	1.6	1.5	1.5	0.1
	(1.6)	(2.0)	(1.9)	(0.1)
Fraction of landless members	19.3	21.4	20.7	-2.1
	(26.3)	(27.7)	(27.3)	(1.4)
Mean education (years)	1.8	1.8	1.8	0.004
	(1.7)	(1.7)	(1.7)	(0.09)
Average age	35.7	38.0	37.3	-2.3***
	(5.4)	(5.4)	(5.5)	(0.3)
Fraction of members who	45.2	45.7	45.5	-0.5
have relative in group	(27.7)	(26.7)	(27.0)	(1.4)
Fraction separated of husband	9.0	10.1	9.7	-1.1**
	(9.6)	(9.8)	(9.8)	(0.5)
Mean number of children	2.9	3.1	3.0	-0.2***
	(0.86)	(0.82)	(0.83)	(4.4)
Number of members	13.8	15.0	14.6	-1.2***
	(3.8)	(3.7)	(3.8)	(0.2)
Number of other SHGs in the village	4.6	5.7	5.4	-1.1***
	(4.4)	(4.5)	(4.5)	(0.24)
Village caste fragmentation	0.42	0.44	0.43	-0.02**
	(0.18)	(0.19)	(0.18)	(0.01)
Fraction of village households	63.7	65.0	64.6	-1.3
with member who can read/write	(21.9)	(21.0)	(21.3)	(1.1)
Distance to the bank	7.3	6.5	6.7	0.8***
	(5.8)	(5.4)	(5.6)	(0.3)

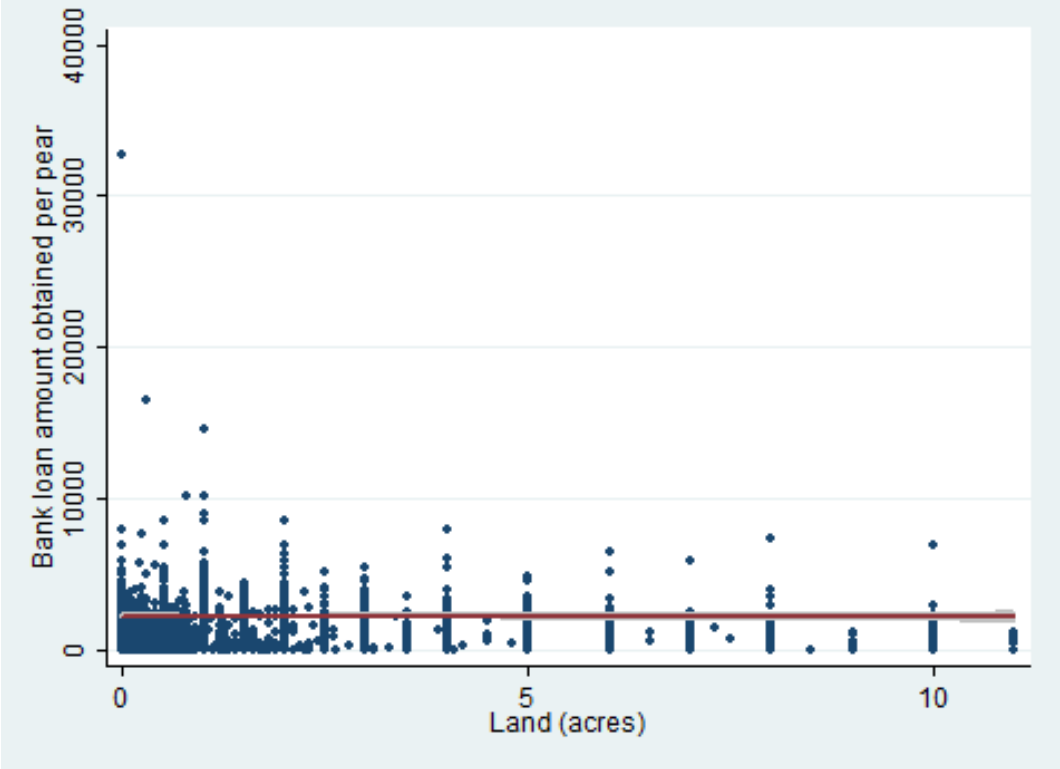
The table reports means (standard deviations in parentheses) of the indicated variable in the two samples and in the whole sample.
The asterisks indicate the statistical significance of the difference in the means across the two samples.
* significant at 10%; ** significant at 5%; *** significant at 1%

Table 18: Member characteristics depending on whether the member received part of the bank loan or not

	Did not receive	Received	All	Difference
Number of women (%)	3,941 (25.2)	11,697 (74.8)	15,638 (100.0)	
Average duration (years)	5.6	4.5	4.8	1.1***
	(3.4)	(3.0)	(3.2)	(0.06)
Caste ST (%)	16.6	37.5	32.2	-20.9***
	(37.2)	(48.4)	(46.7)	(0.8)
Caste SC (%)	19.7	19.4	19.5	0.3
	(39.8)	(39.5)	(39.6)	(0.7)
Caste OBC (%)	59.5	40.6	45.4	18.9***
	(49.1)	(49.1)	(49.8)	(0.9)
Caste FC (%)	4.2	2.5	2.9	1.7***
	(20.1)	(15.5)	(16.8)	(0.3)
Land (acres)	1.3	1.5	1.5	-0.2***
	(2.6)	(2.9)	(2.9)	(0.05)
Landless (%)	12.8	22.9	20.4	-10.1***
	(33.4)	(42.0)	(40.3)	(0.7)
Education (years)	1.3	1.7	1.6	-0.4***
	(3.1)	(3.2)	(3.2)	(0.06)
Age	38.0	38.4	38.3	-0.4
	(11.0)	(10.3)	(10.5)	(0.2)
Relative in group (%)	38.2	46.7	44.6	-8.5***
	(48.6)	(49.9)	(49.7)	(0.9)
Separated of husband (%)	10.8	10.0	10.2	0.8
	(31.1)	(30.1)	(30.3)	(0.6)
Number of children	3.3	3.1	3.2	0.2***
	(1.8)	(1.7)	(1.8)	(0.03)

The table reports means (standard deviations in parentheses) of the indicated variable in the two samples and in the whole sample.
The asterisks indicate the statistical significance of the difference in the means across the two samples. * significant at 10%; ** significant at 5%; *** significant at 1%

Figure 6: Relation between average bank loan amount received per year and land owned



5.2 Group access to bank loans

We first investigate performance at the group level, through various indicators. The first indicator is the amount of time the group had to wait till it received its first bank loan. Given the censored nature of the data, this indicator actually reflects the probability that a group with a given set of characteristics succeeds in obtaining a loan. We again use the Weibull model of survival analysis, where the first loan is the event considered. The results are given in Table 19.

The results are particularly striking. In terms of castes, groups composed of other backward castes and forward castes have to wait a shorter period of time before obtaining a first loan. Forward caste groups do exceptionally well when they are homogenous. By contrast, scheduled tribes and scheduled castes groups perform better when they are heterogeneous, mixed with members of higher castes. Although not reported here, the results obtained by carrying out the analysis for each caste separately fully supports the above trends. The participation of landless members in the group does not significantly influence the length of time spent before obtaining the first bank loan. Among the other factors of importance, groups with more educated members and fewer separated women are also more successful. The presence of other groups in the village also improves the performance of the group.

In Table 20 we turn to the number of bank loans received per year of activity, controlling for whether the group is still active or not. Given the large number of groups that did not receive a bank loan, we use a Tobit estimator. (Similar results were obtained when using a Poisson or a simple OLS model.)

The results are very similar to the ones obtained in the duration model. In terms of castes, scheduled tribes are much more successful when they are mixed with members of upper castes. Scheduled castes and other backward castes perform in a similar way: they do better than scheduled tribe groups and they benefit from the presence of forward caste members in the group. Forward caste groups perform very well, particularly when they are not mixed with other castes. Landlessness does not seem to matter. The level of education of the members and the presence of other SHGs in the village also improve the performance of the group.

Finally, we investigate the main measure of success, which is the amount of bank loans received by the group per year of activity. We again use a Tobit estimator given the censored nature of our data. The results are given in Table 21.

The results are in line with our previous discussion.[20] The major factor behind the amounts received by the group is the caste composition of the group. Again, the success of the groups is

[20] All these results also obtain when the analysis is carried out for each caste separately.

Table 19: Duration till the first bank loan at the group level

	(1)	(2)	(3)	(4)
Homogenous SHG	0.9288			
	(0.0699)			
Fraction of SC members		1.1444	1.1299	
		(0.1948)	(0.1934)	
Fraction of OBC members		1.5895***	1.5786***	
		(0.2171)	(0.2170)	
Fraction of FC members		3.5838***	3.3903***	
		(1.0432)	(0.9990)	
Caste fragmentation			1.2055	
			(0.2078)	
Heterogenous SHG				1.2094*
				(0.1356)
Homogenous SHG, SC				1.0630
				(0.1850)
Homogenous SHG, OBC				1.2302
				(0.1801)
Homogenous SHG, FC				3.1093***
				(1.1958)
Mean education (years)	1.1416***	1.0847***	1.0845***	1.1245***
	(0.0284)	(0.0303)	(0.0302)	(0.0295)
Mean land (acres)	0.9660	0.9582	0.9593	0.9612
	(0.0296)	(0.0319)	(0.0318)	(0.0310)
Fraction of landless members	1.2650	1.3010	1.2855	1.2692
	(0.2127)	(0.2307)	(0.2296)	(0.2179)
Average age	0.9919	0.9877*	0.9876*	0.9908
	(0.0074)	(0.0073)	(0.0074)	(0.0074)
Fraction of members who have	1.0798	1.0338	1.0537	1.0822
relative in group	(0.1425)	(0.1373)	(0.1410)	(0.1430)
Fraction separated of husband	0.4865*	0.5065*	0.5051*	0.4905*
	(0.1796)	(0.1833)	(0.1834)	(0.1818)
Mean number of children	0.9437	0.9615	0.9615	0.9558
	(0.0561)	(0.0575)	(0.0574)	(0.0567)
Number of members	1.1444**	1.1785**	1.1768**	1.1459**
	(0.0777)	(0.0840)	(0.0834)	(0.0783)
Squared number of members	0.9974	0.9966	0.9966	0.9974
	(0.0022)	(0.0024)	(0.0023)	(0.0022)
Number of other SHGs	1.0250***	1.0252***	1.0258***	1.0255***
in the village	(0.0082)	(0.0081)	(0.0082)	(0.0082)
Village caste fragmentation	1.3232	1.1664	1.1109	1.2490
	(0.3220)	(0.2775)	(0.2694)	(0.3094)
Fraction of village households with	1.0651	1.0320	1.0210	1.0702
member who can read/write	(0.1967)	(0.1888)	(0.1878)	(0.1974)
Distance to the bank	0.9857**	0.9876*	0.9872**	0.9864**
	(0.0065)	(0.0063)	(0.0063)	(0.0064)
Block fixed effects	yes	yes	yes	yes
N	1,629	1,629	1,629	1,629
α	1.4736	1.4894	1.4901	1.4755

Robust standard errors are given in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 20: Number of bank loans received by the group per year of activity, Tobit model

	(1)	(2)	(3)	(4)
Homogenous SHG	-0.0386			
	(0.0260)			
Fraction of SC members		0.1122**	0.1060*	
		(0.0551)	(0.0552)	
Fraction of OBC members		0.1085**	0.1039**	
		(0.0471)	(0.0473)	
Fraction of FC members		0.3574***	0.3351***	
		(0.1111)	(0.1123)	
Caste fragmentation			0.0603	
			(0.0582)	
Heterogenous SHG				0.0803*
				(0.0439)
Homogenous SHG, SC				0.0779
				(0.0595)
Homogenous SHG, OBC				0.0488
				(0.0505)
Homogenous SHG, FC				0.3862**
				(0.1691)
Mean education (years)	0.0219**	0.0093	0.0094	0.0176*
	(0.0097)	(0.0108)	(0.0108)	(0.0101)
Mean land (acres)	-0.0119	-0.0122	-0.0119	-0.0124
	(0.0094)	(0.0091)	(0.0091)	(0.0096)
Fraction of landless members	0.0039	-0.0092	-0.0152	-0.0050
	(0.0574)	(0.0592)	(0.0595)	(0.0584)
Average age	0.0085***	0.0073***	0.0074***	0.0080***
	(0.0028)	(0.0027)	(0.0027)	(0.0027)
Fraction of members who have	0.0321	0.0150	0.0218	0.0285
relative in group	(0.0454)	(0.0458)	(0.0463)	(0.0460)
Fraction separated of husband	-0.1846	-0.1726	-0.1760	-0.1842
	(0.1290)	(0.1284)	(0.1284)	(0.1287)
Mean number of children	0.0381*	0.0361*	0.0367*	0.0412*
	(0.0213)	(0.0211)	(0.0211)	(0.0212)
Number of members	0.0621***	0.0662***	0.0660***	0.0623***
	(0.0204)	(0.0207)	(0.0206)	(0.0204)
Squared number of members	-0.0014**	-0.0015**	-0.0015**	-0.0014**
	(0.0006)	(0.0006)	(0.0006)	(0.0006)
Group is inactive	-0.3604***	-0.3609***	-0.3594***	-0.3643***
	(0.0516)	(0.0519)	(0.0519)	(0.0514)
Number of other SHGs	0.0108***	0.0109***	0.0110***	0.0113***
in the village	(0.0028)	(0.0028)	(0.0028)	(0.0028)
Village caste fragmentation	0.0062	-0.0350	-0.0490	-0.0248
	(0.0825)	(0.0829)	(0.0848)	(0.0832)
Fraction of village households with	0.0094	0.0014	0.0000	0.0119
member who can read/write	(0.0578)	(0.0577)	(0.0578)	(0.0580)
Distance to the bank	-0.0007	-0.0005	-0.0006	-0.0006
	(0.0022)	(0.0023)	(0.0023)	(0.0022)
Constant	-1.1239***	-1.2148***	-1.2137***	-1.1985***
	(0.2033)	(0.2077)	(0.2073)	(0.2065)
	(0.0150)	(0.0151)	(0.0151)	(0.0151)
N	1,632	1,632	1,632	1,632

Robust standard errors are given in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 21: Amounts of bank loans received per year by the group, Tobit model

	(1)	(2)	(3)	(4)
Homogenous SHG	-164.8498*			
	(91.4462)			
Fraction of SC members		598.0332***	560.8242***	
		(188.3008)	(191.1290)	
Fraction of OBC members		500.0334***	471.9919***	
		(164.6996)	(166.4300)	
Fraction of FC members		1794.8249***	1659.3462***	
		(502.0265)	(499.1926)	
Caste fragmentation			370.7494*	
			(212.3841)	
Heterogenous SHG				357.8130***
				(134.0929)
Homogenous SHG, SC				458.4725**
				(214.8200)
Homogenous SHG, OBC				198.5611
				(166.7899)
Homogenous SHG, FC				1311.0451**
				(649.7645)
Mean education (years)	95.5852***	35.7783	36.7363	80.9507**
	(31.9266)	(34.9711)	(34.9090)	(32.9018)
Mean land (acres)	-33.6116	-34.2132	-32.3912	-34.0337
	(27.5910)	(26.0045)	(26.1477)	(27.9901)
Fraction of landless members	-12.1045	-98.4304	-135.7251	-73.7196
	(207.3230)	(210.0731)	(209.2287)	(207.6248)
Average age	39.9911***	34.0329***	34.1396***	38.1508***
	(9.3361)	(9.0952)	(9.1043)	(9.1955)
Fraction of members who have	227.3131	142.8203	184.5654	198.1368
relative in group	(149.1223)	(147.1196)	(150.1628)	(150.1988)
Fraction separated of husband	-407.6730	-361.6835	-381.3139	-406.4597
	(431.1474)	(429.4332)	(429.8677)	(430.9286)
Mean number of children	187.8205**	178.9368**	182.2968**	197.9122***
	(75.5665)	(73.9996)	(73.7853)	(75.1876)
Number of members	108.8919	127.0271	125.7229	108.2595
	(80.1276)	(79.9353)	(79.3854)	(79.6460)
Squared number of members	-2.3780	-2.6947	-2.7250	-2.2404
	(2.5253)	(2.5220)	(2.5028)	(2.5093)
Group is inactive	-1259.2223***	-1264.1927***	-1254.6398***	-1278.0025***
	(147.7536)	(147.9766)	(147.5177)	(146.0210)
Number of other SHGs	33.8960***	34.5716***	34.9621***	35.9535***
in the village	(9.5053)	(9.3702)	(9.3504)	(9.4919)
Village caste fragmentation	-20.8144	-259.1736	-345.3124	-168.3731
	(280.3353)	(269.9247)	(278.2989)	(276.4474)
Fraction of village households with	28.8481	-7.7145	-16.7497	37.7161
member who can read/write	(198.8639)	(198.1195)	(198.3193)	(198.4949)
Distance to the bank	0.4310	0.7953	0.6777	0.6506
	(7.4643)	(7.5274)	(7.5131)	(7.4607)
Constant	-3572.0448***	-3976.3775***	-3966.3479***	-3907.8669***
	(751.2166)	(754.4013)	(750.5695)	(763.0711)
	(67.7777)	(67.6129)	(67.4154)	(67.8678)
N	1,632	1,632	1,632	1,632

Robust standard errors are given in parentheses. *** p<0.01, ** p<0.05, * p<0.1

strongly related to the proportion of upper caste members. The best performance is achieved by groups composed exclusively of forward castes. Lower caste groups, and particularly scheduled tribes, perform much better when they are heterogeneous. Again, the fraction of landless members does not affect the performance of the group. Finally, the average education of the members and the presence of other SHGs in the village are also positively related to the amounts of the bank loans received by the groups.

5.3 Members' access to bank loans

In the following, we focus on groups that have received at least one bank loan, and investigate how these bank loans are distributed across members.[21] We shall focus on four measures: an indicator variable measuring whether the member received a positive amount of the loan or not, the share a member obtains in all the bank loans taken by the group (controlling for the member's duration within the group), the share she obtains in the amount per year received by the group (we also run this regression for permanent members only, i.e. members who belonged to the group from the start till the day of our survey) and finally the amount she obtained per year. In all estimations, we use a group fixed effect, so that we effectively measure, within the group, how the loan is distributed across its members as a function of their characteristics. We use ordinary least squares in all the regressions. For the indicator variable, we do this because we use a group fixed effect, for the analysis of the shares, we do this because a share of zero really means that the member received nothing, so that our data is not effectively censored. The results are given in Table 22.

On average, with the possible exception of forward castes, the caste of the member does not seem to matter for her access to the bank loans within the group. Similarly, the landownership status does not matter. More educated members receive a larger fraction of the bank loans, and the effect is potentially important, as 5 more years of education (which corresponds to the completion of primary school), increases the share of the member by about 2 percentage points, which corresponds to a 30% increase in a member's average share, and the amount received per year by about 370 Rs. Separated women receive on average 1 percentage point less than the share of other members in the group.

Groups collect savings from their members, and provide loans out of the group funds to their members. We collected information on these loans, focusing on the last year of activity of the group, but the information collected is imprecise, as we do not know the length of the

[21] The members considered in the regressions belonged to the group at the moment of the first bank loan, so members who left before the first bank loan and who joined after are not included.

Table 22: Member's access to bank loans (share)

	Received a bank loan or not	Share of the total bank loans of the group	Share of the bank loans received per year by the group	Share of the bank loans received per year by the group (permanent members)	Amount received of the total bank loans per year of the group
	(1)	(2)	(3)	(4)	(5)
Caste SC	-0.0064	-0.0015	-0.0012	-0.0010	-25.6875
	(0.0144)	(0.0028)	(0.0030)	(0.0030)	(74.9572)
Caste OBC	-0.0110	0.0016	0.0017	0.0011	26.3326
	(0.0111)	(0.0020)	(0.0022)	(0.0020)	(69.8413)
Caste FC	-0.0360	0.0140*	0.0145*	0.0149	311.0472
	(0.0245)	(0.0081)	(0.0082)	(0.0093)	(287.9331)
Education (years)	0.0077***	0.0039***	0.0040***	0.0037***	73.4188***
	(0.0011)	(0.0003)	(0.0004)	(0.0004)	(8.3697)
Land (acres)	-0.0013	0.0005	0.0005	0.0005	19.5759**
	(0.0012)	(0.0003)	(0.0004)	(0.0004)	(9.2743)
Landless	-0.0136	-0.0003	-0.0003	-0.0008	-0.4285
	(0.0097)	(0.0021)	(0.0021)	(0.0023)	(46.7659)
Age	0.0097***	0.0016***	0.0016***	0.0013***	27.1407***
	(0.0018)	(0.0004)	(0.0004)	(0.0004)	(7.4620)
Squared age	-0.0001***	-0.0000***	-0.0000***	-0.0000**	-0.2739***
	(0.0000)	(0.0000)	(0.0000)	(0.0000)	(0.0833)
Relative in group	0.0187***	0.0009	0.0005	0.0013	34.6912
	(0.0068)	(0.0016)	(0.0017)	(0.0017)	(31.2900)
Separated of husband	-0.0315***	-0.0097***	-0.0098***	-0.0098***	-159.9224***
	(0.0093)	(0.0021)	(0.0021)	(0.0022)	(35.7948)
Number of children	0.0098***	0.0020***	0.0019***	0.0019***	36.4246***
	(0.0018)	(0.0005)	(0.0005)	(0.0005)	(9.9242)
Duration in the group		0.0107***			
		(0.0010)			
Constant	0.5010***	-0.1020***	-0.0496***	-0.0443***	346.0803**
	(0.0383)	(0.0092)	(0.0090)	(0.0095)	(174.6867)
Group fixed effects	yes	yes	yes	yes	yes
N	15,604	15,604	15,604	13,593	15,604

Robust standard errors are given in parentheses. *** p<0.01, ** p<0.05, * p<0.1

loan and a large fraction of members took several loans over that period. We ran similar regressions to the ones above on the amounts of such loans given to members. The results suggest that upper castes members on average receive larger amounts, as do members who are better educated.

6 Concluding comments

In this paper, we provided an empirical analysis of the performance of microfinance groups, known as Self-Help groups, based on an original census we carried out in a poor area of Northern India. Given the pro-poor orientation of the program, the main question explored in this paper was whether traditionally disadvantaged groups, such as lower castes villagers or landless farmers, were less likely to have access to the groups and their benefits.

The coverage of the program across villages is extensive, as about 42% of the households in the village have at least one member participating in a group. Within villages, we did not find evidence of a bias in membership based on caste identity. On average in our sample, scheduled tribes are less likely to be a member of a group, but this is solely due to a placement bias, whereby groups are more likely to be created in villages with less tribes. We however find that the groups are much more socially homogenous than the villages where they are created, suggesting a process of fragmentation of groups within villages based on caste identity. In terms of landownership, membership strongly favors landless villagers, who are two times more likely to enter a group than others.

We showed that exclusionary processes against lower castes and landless individuals are mostly operating in terms of the higher probability of group failure and member's departure. In particular, lower castes villagers are much more likely to belong to groups which fail and disappear: the probability of group failure for a scheduled tribe or scheduled caste member is twice as large as for a member of another caste. Moreover, their probability of leaving the group is also substantially larger. The survival analysis carried out at the level of the groups and at the level of the members highlighted an interesting trade-off in the process. While, at the group level, having members of other castes in the group significantly increases the chances of survival of the group (by about 35%), at the individual level, it increases the chances of departure by low caste members. In terms of landownership, groups composed of landless members are more likely to fail, and landless members are also more likely to leave the group (by about 15%) compared to other landownership categories. Their initial advantage in terms of participation gets therefore partially eroded in the process.

We also analyzed the performance of groups and members in terms of access to bank loans,

which is the major objective of these groups. We again find that lower castes groups, and particularly scheduled tribes, perform much better when they are heterogeneous. At the member level, however, we find no evidence of differences within the group. In terms of landownership, we find that, on average, group and member performance does not depend on landlessness. This suggests that, once a villager remains a member of a group, and given the performance of the group, caste identity and landownership do not play a role in benefiting from group activities. Overall, we find evidence that members of lower caste groups have a lower probability of becoming a permanent member of a group. The net effects in terms of their expected access to a bank loan remain however relatively limited. By contrast, even though landless farmers are more likely to fail or leave the groups, they tend to benefit disproportionately from the existence of SHGs. In expected terms, they receive more than two times the amounts of bank loans given to farmers owning more than one acre. Overall, the program therefore has positive and important distributional implications.

These findings are summarized in Table 23, where we report the amount of bank loans that a given villager can expect every year, by caste and landownership category.[22]

[22] As we cannot use information on groups that received a bank loan, but for which the bank loan distribution is missing (Section 2.3), the numbers do not fully match those of the Tables 8 and 16 above. The number of observations in column (1) includes all households in the village (both with and without an SHG member). Column (2) does no longer represent the probability of entering and remaining in an existing group, but the probability of entering and remaining till the group received a bank loan or till the day we conducted our survey. The numbers displayed in the table are simple averages, and therefore ignore the temporal aspect of the process whereby groups in the early times of their creation have to wait several months before qualifying for a linkage. Given the interval of time used for the observations, the amount of the bank loans received are therefore under-estimated.

Table 23: Expected amount of bank loans per year per caste and land category

	Number of observations	Probability of entering and remaining till group received bank loan or till day of survey	Probability of having at least one bank linkage	Amount of bank loans received per year, if received	Expected amount of bank loans received per year	Significance of the difference relative to the baseline category
Scheduled tribes	18,955	34.4	67.6	1,269	295	N.A.
		(47.5)	(46.8)	(1,893)	(1,058)	
Scheduled castes	8,506	45.9	67.9	1,153	359	64***
		(49.8)	(46.7)	(1,811)	(1,143)	(14.2)
Other backward castes	22,654	39.9	68.5	1,178	322	27**
		(49.0)	(46.4)	(2,033)	(1,186)	(11.1)
Forward castes	1,507	37.4	75.0	1,624	455	160***
		(48.4)	(43.4)	(2,581)	(1,547)	(29.5)
Landless	6,136	65.0	70.3	1,260	575	N.A.
		(47.7)	(45.7)	(1,656)	(1,283)	
$0 <$ acre ≤ 1	21,058	45.5	68.0	1,120	346	-229***
		(49.8)	(46.7)	(1,914)	(1,184)	(17.5)
$1 <$ acre ≤ 2	11,186	26.8	70.5	1,311	247	-328***
		(44.3)	(45.6)	(1,961)	(994)	(17.6)
> 2 acres	13,093	26.0	65.2	1,363	231	-344***
		(43.9)	(47.6)	(2,431)	(1,125)	(18.2)

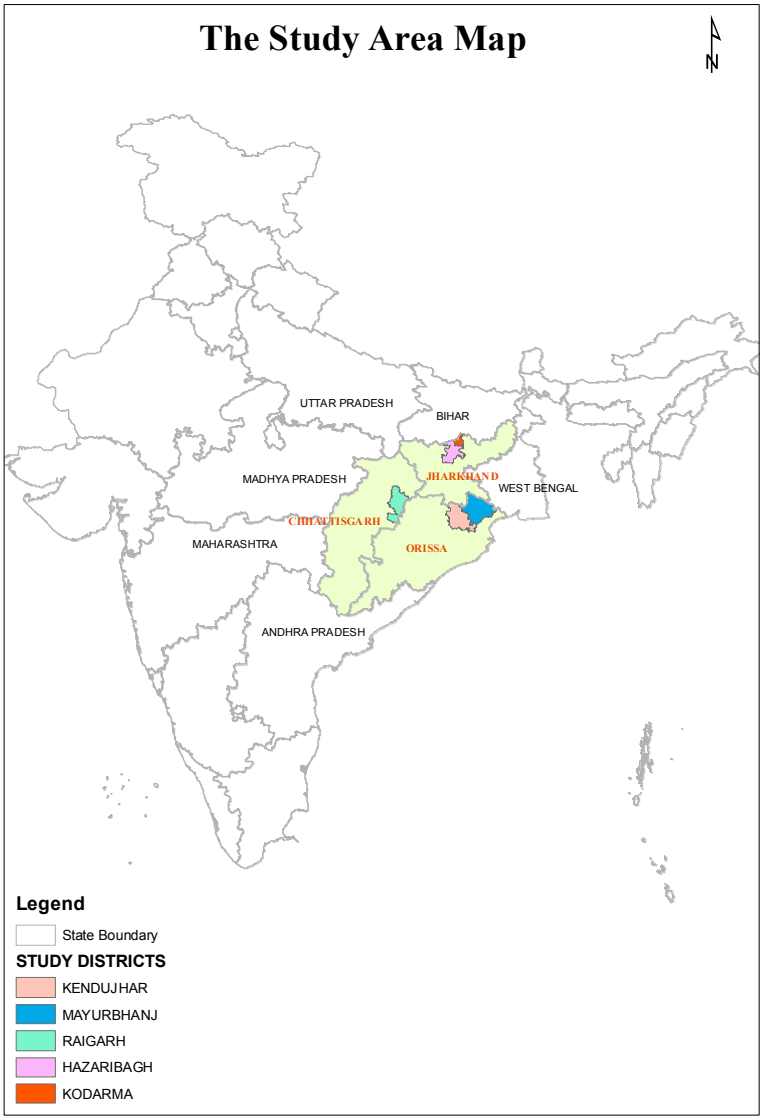
Standard deviations are given in parentheses. In the last column standard errors are given. *** p<0.01, ** p<0.05, * p<0.1

The analysis also highlighted the major role played by education in the performance of the groups and its members. An increase in the average education of the members by one year reduces the probability of group failure by 20%, and increases its chances of obtaining a bank loan by about 12%. For a particular member, completing the 5 years of primary education as compared to no education increases her chances of remaining in the group by 15%, and her share in the bank loans obtained by the group by 2 percentage points (which represents a 30% increase compared to a member with no education). Education thus plays a pivotal role in terms of the survival of the group and its members, as well as in the benefits generated by the group.

7 Appendix

7.1 Study area

Figure 7: Study Area

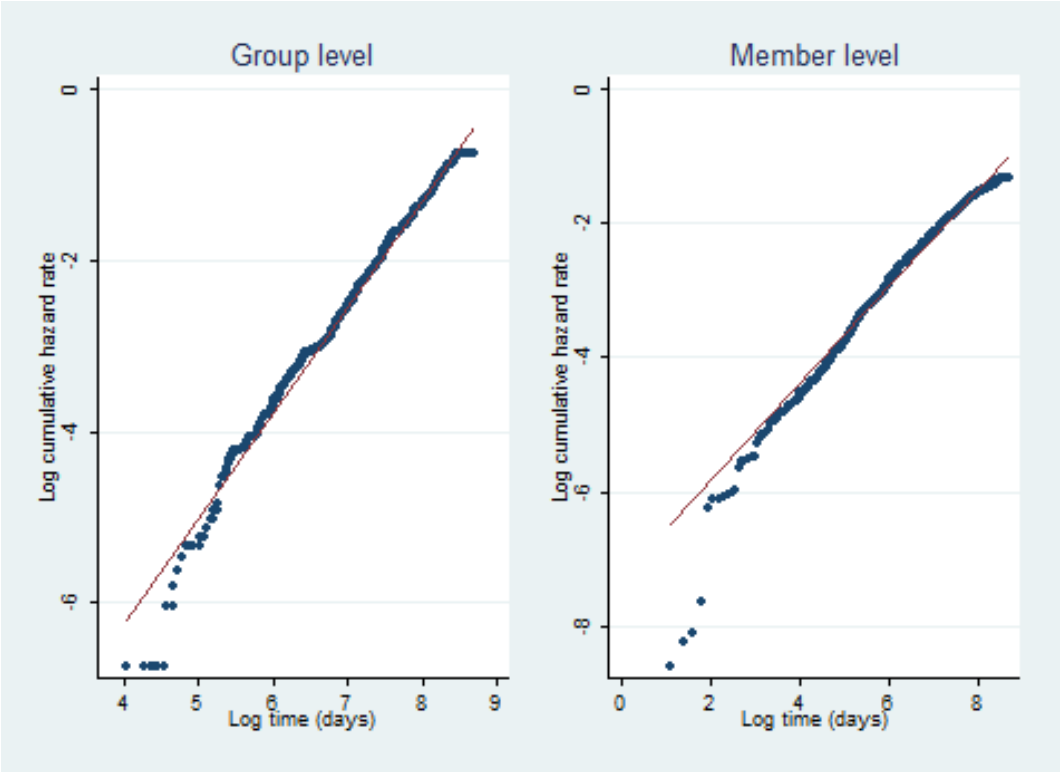


7.2 The appropriateness of the Weibull Model

Several methods are available to judge the appropriateness of a particular parametric model. As mentioned in Section 4.2.2, one possibility is to compare the results using the Weibull model with the results of the Cox proportional hazards model.[23]

Another possibility is a graphical test. In the Weibull model, the natural log of the cumulative hazard function, which is the accumulation of the hazard rates over time, is linear as a function of the log of the time till the event. We plot these two variables in Figure 8.[24] The model seems to fit the data very well except for groups with short durations and members with short durations within groups.

Figure 8: Appropriateness of the Weibull model



7.3 Robustness check: the Cox proportional hazards model

[23]This is possible only because the Weibull model has a proportional hazard representation, what is not the case for all parametric models.

[24]For more details, see Klein and Moeschberger (2003), chapter 10; and Baland et al. (2008).

Table 24: Group survival using Cox proportional hazards model

	(1)	(2)	(3)	(4)
Homogenous SHG	1.2802			
	(0.2650)			
Fraction of SC members		1.1795	1.2162	
		(0.4549)	(0.4555)	
Fraction of OBC members		0.5897	0.6180	
		(0.2017)	(0.2053)	
Fraction of FC members		3.4804	3.7560	
		(3.1933)	(3.3458)	
Caste fragmentation			0.7465	
			(0.3422)	
Heterogenous SHG				0.6534*
				(0.1676)
Homogenous SHG, SC				1.0955
				(0.4116)
Homogenous SHG, OBC				0.4365**
				(0.1564)
Homogenous SHG, FC				4.3692*
				(3.6234)
Mean education (years)	0.8106**	0.8087**	0.8104**	0.8099**
	(0.0719)	(0.0732)	(0.0740)	(0.0722)
Mean land (acres)	0.9744	0.9744	0.9726	0.9772
	(0.0506)	(0.0513)	(0.0509)	(0.0483)
Fraction of landless members	1.8962*	1.5486	1.5755	1.7058
	(0.7472)	(0.6528)	(0.6639)	(0.6932)
Average age	0.9580**	0.9603*	0.9604*	0.9588**
	(0.0201)	(0.0202)	(0.0200)	(0.0194)
Fraction of members who have	0.4597**	0.4331***	0.4230***	0.4187***
relative in group	(0.1470)	(0.1400)	(0.1375)	(0.1355)
Fraction separated of husband	2.4876	2.2920	2.3590	2.5440
	(2.2065)	(2.0307)	(2.0874)	(2.2338)
Mean number of children	0.7881	0.7629	0.7632	0.7605
	(0.1423)	(0.1358)	(0.1357)	(0.1351)
Number of members	0.5253***	0.5046***	0.5028***	0.5122***
	(0.0562)	(0.0523)	(0.0528)	(0.0540)
Squared number of members	1.0179***	1.0192***	1.0194***	1.0188***
	(0.0037)	(0.0036)	(0.0037)	(0.0037)
Number of other SHGs	0.8926***	0.8945***	0.8936***	0.8912***
in the village	(0.0268)	(0.0264)	(0.0263)	(0.0268)
Village caste fragmentation	0.9725	0.7846	0.8296	0.9208
	(0.5160)	(0.4193)	(0.4529)	(0.5018)
Fraction of village households with	0.9179	0.8797	0.8860	0.8817
member who can read/write	(0.3613)	(0.3452)	(0.3466)	(0.3369)
Distance to the bank	0.9737*	0.9697**	0.9702**	0.9716*
	(0.0139)	(0.0142)	(0.0141)	(0.0144)
Block fixed effects	yes	yes	yes	yes
N	1,632	1,632	1,632	1,632
α	1.3520	1.3482	1.3480	1.3592

Robust standard errors are given in parentheses. *** p<0.01, ** p<0.05, * p<0.1

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