Microfinance, Group Structure and Repayment: Evidence from Sierra Leone

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Introduction

Microfinance makes use of the provision of credit to small-scale (poor) entrepreneurs and households, who lack access to capital markets, as a means to raise incomes and to broaden financial markets of developing countries (Armendáriz and Morduch 2000). Generally speaking, there are two ways of providing such credit; group lending and individual lending. In this paper we will focus on the first method; group lending. Group lending has been often highlighted in the literature where its focus lays mainly on explaining joint liability group lending and its implications in terms of repayment and information asymmetries (Van Tassel 1999, Hermes and Lensink 2007, Giné and Karlan 2014). The group lending structure is, because of accessibility of local information, expected to be more effective in these activities than the microfinance lending organisation, due to group members who live close to each other and/or have social ties. These social and geographical ties make sure borrowers are informed about each other and therefore have perfect information (Van Eijkel *et al*, 2007), which eventually lead to higher repayment rates. Furthermore, the existence of homogeneous groups, where borrowers self select themselves by risk-type due to a positive assortative process (Ahlin, 2009, Guttman, 2008), have a positive effect on group performance (Cassar *et al*, 2007). So, a clear connection is seen between the structure of the group (homogeneity and social ties within a group), information asymmetry within a group and the repayment rate of such a group. But models of group structure and information asymmetry are all fairly theoretical, and criticized in recent literature. Van Eijkel *et al* (2007) state in their article that due to different future prospects of group members, incentives may differ and therefore information asymmetries between group members can arise. Also Marr (2002) questions the theoretical models of adverse selection and moral hazard which assumme perfect information, because in reality group members do not have perfect information about one another, and/or they cannot raise this information without any costs being made, due to the embeddedness of social, economic and cultural factors. The process through which group members interact, can therefore not be assumed to be neutral and perfect in regard to impact effects of group lending on repayment of the loans. The aim of this paper is therefore (i) to assess the structures of group members in terms of homogeneity and risk behaviour within the groups and (ii) in terms of the level of information asymmetry in these groups and (iii)

to investigate the repayment behaviour of these microfinance group members. These three aims are interlinked and together lead to the main question of this paper; How does group structure affect repayment behaviour?

The research has been conducted in Sierra Leone, a post-conflict country in the West of Africa, in cooperation with BRAC Sierra Leone. Twenty groups of between five to twenty women were randomly selected from one of BRAC Sierra Leone's branches. This branch lies in a rural town, in the south of Sierra Leone. In total 329 women have been surveyed. In addition to a survey which has been conducted with all the women, a network survey and a coordination game has been implemented.

Background

Founded in 1972 in Bangladesh, BRAC, formerly known as Bangladesh Rural Advancement Committee (BRAC), is now one of the largest non-governmental organisations in the global south. The principal activity of BRAC is the provision of microfinance services. In Sierra Leone, BRAC has been providing microfinance services since 2009. Currently, they have 29 branches throughout Sierra Leone and their customers' base grew with 7 per cent between 2011 and 2012 (BRAC, 2012).

BRAC works in Sierra Leone with a group lending scheme with joint liability. This scheme entails that women are grouped together in small groups of around five persons, which together form a big group of 20-30 people who meet once a week. These small groups consist of females who already knew each other before entering the BRAC's group lending program. They have jointly formed the group and therefore we can assume that certain levels of trust and knowledge already exist within this small group. The group members all live without a range of one kilometre of where the group meeting is held and five kilometres of the branch. The female borrowers each have their own loan, but are jointly accountable for the repayment of their loans.

After the establishment of a branch, clientele has to be found. The potential female borrowers, who are interested and eligible, form groups of four to five females and apply for an individual loan, but as a group. The loan officer decides if they are eligible for the loan and if they can enter the program. The criteria of becoming a borrower are:

- The member must be a female
- The member must be aged between 18-50 years
- Only one member from each household is selected
- The member must have lived in the area for three to five years
- The member most not belong to other MFIs
- Prospects should live within five km from the branch office location
- The member should be living within the boundary of the village/community
- Member should have a business

When everyone is accepted and the big group is constituted, a committee of five people is chosen by all members of the big group. This committee consists of a president, secretary, treasurer and two executive members. Each original small group also has a president. Every year, the committee is being re-chosen if necessary. In most cases, the president is one of the oldest members of the big group. An overview of the committee and the composition of the group can be seen in Figure 1.

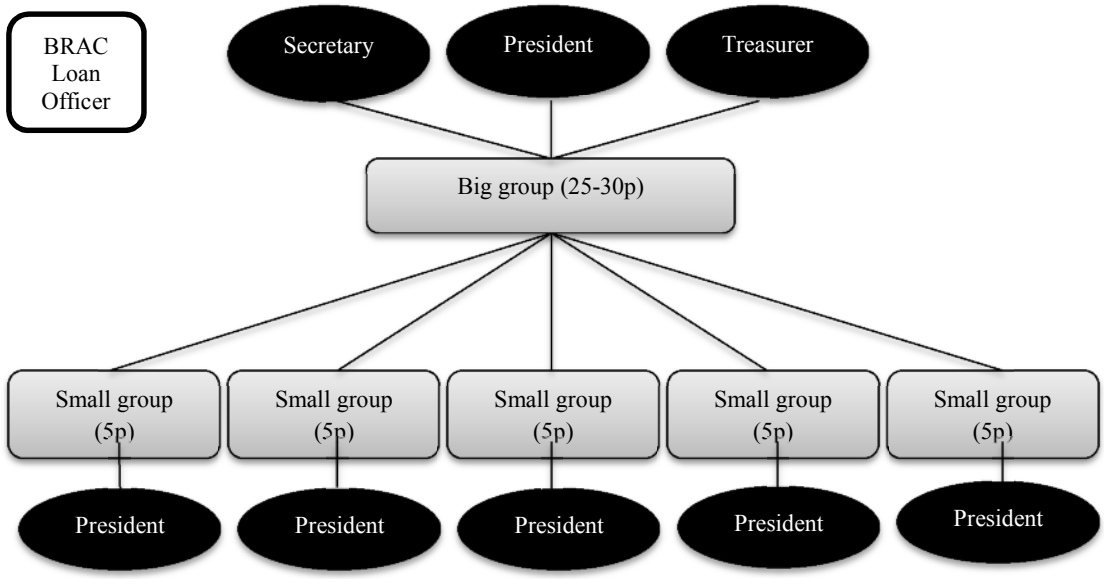


Figure 1 BRAC SL Microfinance Group Set-up

Every two weeks two group members receive a loan. This is based on their behaviour, as in defaults of repayment and commitment to the meetings, and on their income performance. The size of the loan differs per member. When a member receives a loan of 20 weeks, the interest rate is 13 per cent and when the loan which is received last for 40 weeks, the interest rate is 25 per cent. When a group member is unable to pay their weekly repayment, consequences will occur. The first time this happens, the other members will pay for the defaulting member. But if it happens frequently, the member will be thrown out of the group and therefore out of the group lending scheme. The loan officer will then choose a new eligible female in the area and this new member will join the small group.

Design

We conducted a series of surveys and behavioural games in May 2014, using a sample of 20 microfinance groups, consisting of 329 microfinance members of BRAC Sierra Leone. Our sample suffers from an attrition bias, due to nonresponse of some of the microfinance members. These microfinance members were not present at the time of the survey and therefore could not be surveyed, which can cause biased results. The microfinance groups were randomly selected from a set of 35 microfinance groups,

using block randomization. To learn about the effect of group structure on repayment behaviour we surveyed all groups in their entirety. Our study takes place in one of the 29 branches of BRAC Sierra Leone, in a rural town located in the south of Sierra Leone. This rural town is built around one of the main highways of Sierra Leone and can be seen as a key hub. Many of the inhabitants are therefore involved in trading or similar occupations. Other common occupations are farmering or owning a shop.

The key variable of interest is measure of group homogeneity in terms of socio-demographic characteristics and risk behaviour. We created a Herfindahl index (HHI), which is commonly used to measure homogeneity, based on various variables. A second key variable of interest are the outcomes of the behavioural game. Here a coordination game, where we tried to measure the coordination level within a group, assuming that a high coordination within a group means less information asymmetry as the group members have more information about each other.

To measure information asymmetry we make use of a modified coordination game, based on the Assurance game, where players want to match strategies in order to receive the best outcome (McAdams, 2009). The amount of matched strategies, and therefore coordination, within a group is seen as the level of information asymmetry within a group. Of each group all subjects participated in the game. They were asked four questions; 'Who is most likely to be the new group leader, if one should be chosen', 'Who is most likely to show up early at a meeting', 'Who is the best singer' and 'Who is best dressed'. Per question, the answer most given was the winning answer and all subjects who answered correctly won the payment of 1500 SLL. This payment was in each of the four question the same. A subject's ability to coordinate is reflected by the total amount allocated to herself. A group's ability to coordinate, and therefore the amount of information asymmetry, is reflected by the total amount allocated to the group.

Model

We consider the following probability model;

$$Y_i = \beta' x_i + u_i$$

where

Y_i = repayment indicator (=1 if perfect repayment, =0 otherwise)

x_{1i} = tribe indicator

x_{2i} = religion indicator

x_{3i} = HHI indicator (ranges between 1 = homogeneity to 0 = heterogeneity)

x_{4i} = average payout per microfinance member of a group of the coordination game (higher payout indicate less information asymmetry)

x_{5i} = Amount of links of friends (higher values indicate more (links of) friends)

x_{6i} = Outstanding balance of loan

x_{7i} = Attending weekly meeting (where higher values indicate better attendance)

x_{8i} = Groupmember unable to repay (=1 if groupmember are unable to repay, =0 otherwise)

Results

Table 1 reports the descriptives of the variables used. Average age of the subjects is 35.5. Main education received is primary school. 86.44 per cent of the subjects' income is earned being a petty trader, and also 86.44 per cent is Temne. As for religion, it seems most microfinance members are Muslim as the mean is 1.86. For all subjects, the Herfindahl index varies between 0.05 and 0.21. These numbers, which all are very close to zero, imply that the groups are all heterogeneous groups in terms of socio-demographic profile, distance to the branch and group meeting and risk behavior. Average payout of the microfinance members varies between 950 SLL and 5437.5 SSL, with the mean being 2601 SLL. On average, a subject has about two links of friends within their microfinance group. Outstanding balance seems to vary a lot, with the lowest outstanding balance 12500 SLL and the highest 2.062.500 SLL. Table 1 reports that the mean of attending meetings is 1.4, which suggests the majority of members attending the meetings. When asking the subjects whether they have group members which are unable to repay their loan, it seems the majority does not experience this. Lastly, we see that group size varies between 6 and 33 group members, with average being 19 members in a group.

Table 1 Descriptives

Variable	Obs	Mean	Std. Dev	Min	Max
Age	316	35.5	9.578	18	65
Education	279	2.368	2.073	1	9
Occupation	317	2.399	1.994	1	12
Tribe	317	2.199	1.170	1	10
Religion	317	1.862	0.343	1	2
HHI	323	0.103	0.045	0.051	0.215
Payout MFM	323	2601.2	1129.8	950	5437.5
Links Friends	320	2.034	1.901	0	17
Outstanding Balance	277	512190.6	401707.6	12500	2062500

Attending Meetings	308	1.471	0.763	1	4
Member Unable to Repay	299	1.859	0.357	0	2
Group Size	323	19.5	8.075	6	33

More importantly are the results obtained from the probability regression. These are depicted in Table 2. Here we see that three variables are of significance. These are *religion, HHI* and *outstanding balance*. *Religion* stands for the type of religion a member holds. This can be Muslim, Christian, or other religions. *HHI* stands for the Herfindahl index made with the socio-demographic characteristics and risk behaviour of microfinance members. The *HHI* is a group-based variable. *Outstanding balance* stands for the outstanding amount a members still has to pay off. We see that *religion* has a positive effect on the repayment of the member, and that its marginal effect is 0.215. Which means that when *religion* increased with one unit, holding all other variables constant, *repayment* increases with 0.215. *HHI* also has a positive influence on *repayment.* The marginal effect of *HHI*, saying when *HHI* increases with one unit holding all other variables constant*, repayment* increases with 1.679. Thus, the more homogeneous a group is, the better the repayment. The effect of *HHI* on *repayment* is also depicted on Table 3. *Outstanding balance* is the final variable which is significant, but has a marginal effect of 0.00. This means that the higher the *outstanding balance* the better the *repayment,* even though this difference is very small.

Table 2 Coefficients and Marginal Effects

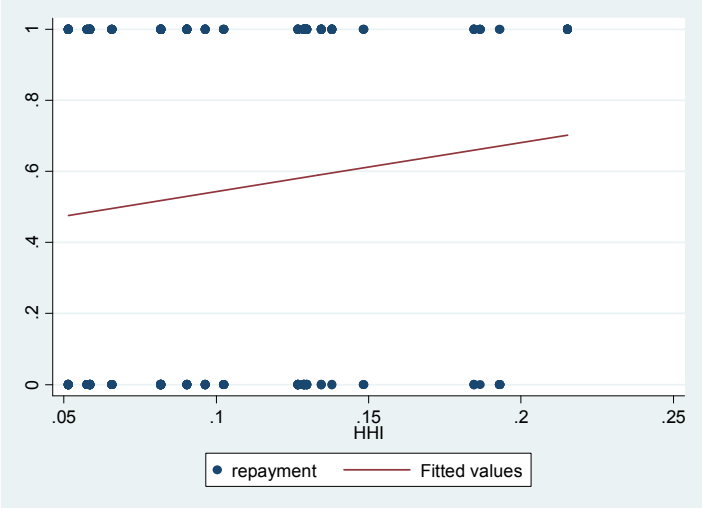
Variable	**Probalistic regression**	**Marginal Effects**
Tribe	0.112	0.044
	(0.077)	(0.03)
Religion	0.542*	0.215*
	(0.259)	(0.103)
HHI	4.230*	1.679*
	(1.955)	(0.776)
Payout MFM	-0.00	-0.00
	(0.00)	(0.00)
Links Friends	0.00	0.00
	(0.045)	(0.019)
Outstanding Balance	0.00	0.00*
	(0.00)	(0.00)
Attending Meetings	-0.163	-0.065
	(0.112)	(0.044)
Member Unable to Repay	0.316	0.125

	(0.254)	(0.1)
N	234	
χ	21.41	
p	0.0061	
Pseudo R^2	0.0663	

Standard errors in parentheses

* p-value < 0.05

Table 3 HHI - Repayment



Conclusion

The literature on group lending often highlights the effectiveness of group lending due to social and geographical ties which make sure borrowers are informed about each other, have perfect information (Van Eijkel *et al*, 2007) and therefore are effective in terms of repayment and information asymmetries asymmetries (Van Tassel 1999, Hermes and Lensink 2007, Giné and Karlan 2014). But where Ahlin (2009), Guttman, (2008) and Cassar *et al* (2007) state that, due to the existence of homogeneous groups, group lending has a positive effect on repayment, Van Eijkel *et al* (2007) and Marr (2002) remain critical. Van Eijkel *et al* (2007) state that due to different future prospects of group members informaton asymmetries can arise and Marr (2002) argues that group members do not have perfect information about each other and that due to the embeddedness of social, economic and cultural factors, group members cannot raise any information without any costs being made.

In this paper we set out to investigate whether group structure, in terms of homogeneity and information asymmetry, affects repayment behaviour. We use data from a series of surveys and a coordination game using 20 randomly selected microfinance groups from BRAC Sierra Leone, which together account for 329

respondents. We are aware of the potential bias in our results due to attrition bias when surveying the subjects, due to correlation between the variables and due to intra-group correlation. We find that the microfinance groups of BRAC Sierra Leone are more heterogeneous than homogeneous, but that the more a group leans towards homogeneity, the better the repayment is. Concluding, in terms of better repayment and better economic performance of the groups and of the individual microfinance members, it seems more effective for groups to constist of more homogeneous members in terms of socio-demographic and risk characteristic. In the end this will hopefully push towards more economic sustainability.

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