

Enforcement with Costly Group Formation

Prabirendra Chatterjee
Louisiana State University

Sudipta Sarangi
Louisiana State University

Abstract

The joint liability literature claims that positive assortative matching, or risk homogeneity, is always the first best solution. We examine this claim in presence of group formation costs and find that the assertion is not always true.

We would like to thank Aditi Roy, David Li and an anonymous referee for helpful suggestions. All remaining errors are ours.

Citation: Chatterjee, Prabirendra and Sudipta Sarangi, (2005) "Enforcement with Costly Group Formation." *Economics Bulletin*, Vol. 15, No. 9 pp. 1–8

Submitted: June 2, 2004. **Accepted:** February 13, 2005.

URL: <http://www.economicbulletin.com/2005/volume15/EB-04O10003A.pdf>

1. Introduction

In recent years economists have spent a considerable amount of time demonstrating the advantages of joint liability lending over individual liability lending. This literature finds that due to the joint liability clause, members of endogeneously formed groups know each other well and hence are able to overcome the information asymmetry faced by the lender. Thus, the mechanism alleviates the major problems associated with individual liability lending, resulting in high repayment rates. For an excellent overview of theoretical and empirical work in this area we refer the reader to Ghatak and Guinane (1999) and Morduch (1999).

Relatively less work has been done on the issue of enforcement in group lending programs and our note focuses on this issue. Unlike the evil trioka of adverse selection, moral hazard and costly state verification that arise due to asymmetric information between lenders and borrowers, the enforcement problem occurs primarily because of the limited ability of lenders to apply any sort of sanctions against borrowers who do not repay.¹ For example, lenders cannot force a borrower to repay if she officially announces that her income is below the subsistence level, especially if the lenders are interested in poverty alleviation. Thus there are strong incentives for borrowers to be deliberately delinquent.

Economists argue that joint liability lending is better because a (highly) successful borrower has the ability to repay the default amount of her unsuccessful partner. More importantly, each borrower can monitor her partner and ensure that the partner does not misrepresent facts. Besley and Coate (1995) from whom this insight is derived further mention that there is also a negative effect under joint liability lending – a moderately successful borrower who does not intend to cheat may be pushed into default by the debt burden of her partner. However, when social ties are strong, given the possibility of sanctions from both the group, as well as the bank, it is argued that the net effect on joint liability lending is positive. Thus, willful default is lower under joint liability lending. In this paper we examine the enforcement problem in the group lending context by requiring borrowers to incur group formation costs.

Formation of an effective group for the purpose of borrowing through a joint liability scheme is a costly affair. Given that each group member is jointly liable and must also be able to monitor and sanction other group members, the ties between group members have to be very strong. We argue that forming and

¹Note that clients of group lending programs are usually too impoverished to have any collateral.

keeping such strong ties requires costly time and effort. In the context of Chicago's Full Circle Fund, Balkin (1993) claims it takes more than 6 to 8 months for groups to form and explains this by noting that in a setting where potential members do not have prior interactions, it takes considerable time for members to assess the honesty and trustworthiness of the others. Similarly, in two of the three Chinese programs studied by Park and Ren (2001), travel costs were a major obstacle for group lending programs.

Further, it may be easier to form groups with some people than others, regardless of the risk characteristics of these individuals. This could be for reasons like the person's proximity in terms of the work place, language, religion, ethnicity, or just plain neighborhood. Simply put it might be easier for me to communicate with someone who speaks the same language while communicating in another tongue will require greater effort. The repayment performance of a low cost group will differ from that of a high cost group even if we assume symmetric project outcomes for both groups. This model explains how and under what conditions a safe-risky combination may outperform a safe-safe combination in the context of loan repayment.

The fact that varying degree of social ties can affect group formation has been empirically documented in the literature, though its significance has not really been formally analyzed. A case in example is the attempt to clone the *Grameen Bank* in Arkansas under the name of the *Good Faith Fund*. Arkansas has significant racial and social heterogeneity as well as low population density. Due to this members experienced difficulty in finding four other group members in their vicinity. Forming groups with those who lived further away was prohibitively expensive (Taub (1998)). Similarly, Ghatak and Guinnane (1999) note that some of *BancoSol*'s lending groups were reconstituted from older Rosca groups. Van Tassel (1999) mentions a *BancoSol* survey where 38 of the 40 members interviewed knew their group members for more than 3 years. Similarly, the majority of *Grameen*'s borrowers are women. One reason for this could be that in a traditional society it is easier to form same sex groups. Wydick (1999) in the context of Guatemala shows that groups often tend to be composed of members who are closer professionally and these groups also have higher repayment rates. Olomola's (2000) study using Nigerian data finds that the degree of acquaintance within fellow group members has a positive effect on repayment since it easier for such groups to form and also have better interaction among the members. Similarly, Lensink and Mehrteab (2003) who find evidence of risk heterogeneity in Eritrea also find that 287 of the 351 individuals in their sample already knew each other.

Thus we see that group formation is not a random process but occurs primarily among individuals who have closer social ties.

The paper is organized as follows. Section 2 develops the basic model of group lending. Section 3 formulates and analyzes the model of enforcement in the context of group lending, and finally, in Section 4 there are some concluding remarks.

2. A simple model of group lending

The model developed here follows Ghatak and Guinnane (1999) but introduces two groups of borrowers. The pool of borrowers in a community either belong to Group A or to Group B . Borrowers in both groups can either be safe or risky. Each individual borrower thus is denoted by an ordered pair $ij \in \{A, B\} \times \{R, S\}$, where the first element describes their group membership and the second their risk attribute with R and S being risky and safe respectively. We assume that a borrowing group consists of two risk-averse individuals who are jointly liable for the loan.² Since the borrowers are jointly liable we denote by $c = r$ the cost incurred by an individual if her partner's project does not succeed, where $r > 0$ is the repayment amount of each borrower. Therefore, a successful borrower has to repay $2r$ if her partner's project does not succeed.

All borrowers engage in an economic activity using their loan. Let Y denote the outcome of a successful project, while the value of a failed project is normalized to zero. A safe agent of either group has the same probability of project success which is higher than the success probability of a risky agent. Similarly, risky agents from both group also have the same project success probability.

Next we introduce the group formation costs. We assume that it is costly to form groups where the group formation cost (C) depends on the choice of the partner. For simplicity we assume that agents in Group A incur a lower cost (normalized to zero) to form a group amongst themselves. Hence $C_{AR}^A = C_{AS}^A = 0$ but $C_{BR}^A = C_{BS}^A = C > 0$, where the subscript denotes the partner's identity.³ The same cost structure holds for members in Group B , i.e., inter-group formation costs are identical for all agents in the community. Relaxing this assumption will

²As in Ghatak and Guinnane (1999) relaxing this assumption does not alter results.

³This is a simple way to model the group formation costs. We are assuming that all individuals in Group A for instance, live on *Sesame Street* and can form a group with each other very easily. On the other hand, those in Group B live in a far away part of the village called *Elm Street* and hence getting to know them is costly. This relationship is of course symmetric.

not alter results (for more on this see Chatterjee and Sarangi (2004)).

We assume that while the lending party does not have information regarding the risk characteristic of a borrower, this attribute is common knowledge among the borrowers. Also, as in Ghatak and Guinnane (1999) we assume that borrowers can receive loans in the future as well, and take the opportunity cost of these loans into account when choosing to default willfully. From the above formulation it is clear that we can have both homogeneous (same group pairings) and heterogeneous ($A - B$ pairings) groups. Consequently, with group formation costs, safe partners may not always be better than risky partners, especially if the safe partner is from a different group.

Observation: A homogeneous group may or may not be risk heterogeneous. In other words, both safe-safe and safe-risky pairings can occur in a homogeneous group. *However, given that safe partners are always better than risky partners, and forming of heterogeneous group is costly, heterogeneous groups, when formed, will always be risk homogeneous.*

3. Enforcement issues

A successful borrower's project yields output Y and the participation constraint requires that $Y > r + C_{ij}^k$. Now, a borrower will repay her loan only if the discounted net benefit of continued future access to credit denoted by FB is greater than the gain from not repaying, i.e.,

$$U(Y - C_{ij}^k) - U(Y - C_{ij}^k - r) < FB \quad (3.1)$$

where $U(\cdot)$ denotes a standard utility function. Like Ghatak and Guinnane (1999) we assume that a borrower who defaults can never get a loan in the future. Similarly it is easy to see that a borrower will choose to repay the entire loan amount if her partner defaults only when the following condition holds:

$$U(Y - C_{ij}^k) - U(Y - C_{ij}^k - 2r) < FB. \quad (3.2)$$

If k and i belong to the same group then $C_{ij}^k = 0$, and the analysis is identical to Ghatak and Guinnane (1999). For every r let $Y(r)$ denote the threshold r such that the borrower can repay her own debt if $Y \geq Y(r)$ and the entire group's debt if $Y \geq Y(2r)$. There are just two possibilities here:

(i) $Y(r) < Y < Y(2r)$: In this instance the borrower can repay her own debt but not her partner's loan.

(ii) $Y(r) < Y(2r) < Y$: The borrower is able to repay the debts of the whole group.

In the first case individual liability is better, while joint liability is preferable in the second case. Standard analysis then claims that the threat of social sanctions under joint liability makes it unattractive for the borrowers to deliberately default in the first scenario. Consequently, the group structure tips the scale in favor of joint liability lending.

With group formation costs however, we get a richer set of possibilities. If $Y(2r) < Y - C < Y$ all groups regardless of their composition can repay their debts. Similarly, if $Y - C < Y < Y(r)$, then nobody is in a position to repay debts. We now focus on the more interesting intermediate scenarios.

- *Low costs of group formation:* $Y(r) < Y - C < Y < Y(2r)$. In this situation all agents regardless of whether they belong to a homogeneous or heterogeneous group, can repay their own debt but will be unable to pay for their partner's loan.
- *High costs of group formation:* $Y - C < Y(r) < Y < Y(2r)$. In this case members of a homogeneous group can repay their own debts but not those of their partners. Members of heterogeneous groups cannot repay even their own loan. Recall that heterogeneous groups consist of safe-safe pairings only, while homogeneous groups can also be risk heterogeneous. Hence with high group formation costs, risk heterogeneity may outperform groups that are risk homogeneous.

Of course, high group formation costs can be associated with high project returns: $Y - C < Y(r) < Y(2r) < Y$. In this case the homogenous groups have the ability to repay the loan for their partner as well. This model explains the so-called paradoxical situation when safe-risky combinations can do better than safe-safe combinations. We summarize this in the following proposition.

Proposition 1. *In the presence of group formation costs the repayment performance of a homogeneous group is either at par or better than that of a heterogeneous group. Hence, a safe-risky combination is not necessarily a second best outcome as a homogeneous borrowing group can exhibit heterogeneity in terms of risk characteristics.*

Finally, consider the repayment performance of both groups when group partners behave *cooperatively*. Here the incentives of group members are aligned and there will be no deliberate delinquency. Thus for homogeneous groups there will be no difference between joint liability and individual liability. For a heterogeneous group, the group formation costs will shift the threshold income required for repayment. Hence there will be situations when the homogeneous group can repay but the heterogeneous group cannot. *Moreover, members of the heterogeneous group would have been able to repay under individual liability since they would avoid the group formation costs.* So we conclude that with group formation costs, risk heterogeneous pairings may be preferable to risk homogeneous pairings in the context of loan repayment.

4. Conclusion

We reexamine the enforcement problem for group lending programs by explicitly modeling group formation costs. Contrary to most theoretical predictions, papers like Sadoulet and Carpenter (2001), and Lensink and Mehrteab (2001) find risk heterogeneity among borrowing groups in Guatemala and Eritrea respectively. Despite the risk heterogeneity, these programs have high repayment rates. Our paper provides an explanation for the repayment performance of such groups. We show that a homogeneous group (which may be risk heterogeneous) always does at least as well as a heterogeneous group: although the heterogeneous group consists of safe agents, it has to incur group formation costs making repayment more difficult. In other words, the lender will have to provide loans to heterogeneous groups at lower rates to offset the group formation costs. Thus we conclude that though group formation costs do not affect lending parties explicitly, since they have a direct effect on the repayment performance of borrowers, they do affect lending parties indirectly.

References

- [1] Balkin, S. 1993. A Grameen Bank replication: The Full Circle Fund of the Women's Self Employment Project of Chicago, in A.N.M. Wahid (Ed.) 1993, *The Grameen Bank: Poverty relief in Bangladesh*, Westview Press, San Francisco.

- [2] Besley, T., and S. Coate, 1995. Group lending, repayment incentives and social collateral. *Journal of Development Economics*, vol. 46, 1-18.
- [3] Chatterjee, P., and S. Sarangi, 2004. Social identity and group lending. *Working Paper 2004-01*, Louisiana State University.
- [4] Ghatak, M., and W.T. Guinnane, 1999. The economics of lending with joint liability : Theory and practice. *Journal of Development Economics*, vol. 60, 195-228.
- [5] Lensink, R., and H.T. Mehrteab, 2003. Risk behaviour and group formation in microcredit groups in Eritrea. *CREDIT Working Paper*, University of Nottingham.
- [6] Morduch, J., 1999. The microfinance promise. *Journal of Economic Literature*, vol. 37, 1569-1614.
- [7] Olomola, A., 2000. Determinants of the smallholder loan repayment performance: Evidence from the Nigerian microfinance system, *Working Paper*, NISER Ibadan.
- [8] Park, A. and C. Ren, 2001. Microfinance with Chinese characteristics, *World Development*, vol. 29, 39-62.
- [9] Sadoulet, L., and S. Carpenter, 2001. Endogeneous matching and risk heterogeneity : Evidence on microcredit group formation in Guatemala. *ECARES Working Paper*.
- [10] Taub, R., 1998. Making the adaptation across cultures and societies: A report on an attempt to clone the Grameen Bank in Southern Arkansas, *Journal of Developmental Entrepreneurship*, vol. 3, 53-69.
- [11] Van Tassel, E., 1999. Group lending under asymmetric information, *Journal of Development Economics*, vol. 60, 3-25.
- [12] Wydick, B., 1999. Can social cohesion be harnessed to repair market failures? Evidence from group lending in Guatemala, *The Economic Journal*, vol. 109, 463-475.