





Group-lending: Sequential financing, lender monitoring and joint liability

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Abstract

We develop a simple model of group-lending based on peer monitoring and moral hazard. We find that, in the absence of sequential financing or lender monitoring, group-lending schemes may involve under-monitoring with the borrowers investing in undesirable projects. Moreover, under certain parameter configurations, group-lending schemes involving either sequential financing, or a combination of lender monitoring and joint liability are feasible. In fact, group-lending schemes with sequential financing may succeed even in the absence of joint liability, though the repayment rate will be lower. In the absence of joint liability, however, group-lending with lender monitoring is unlikely to be feasible.

Introduction

Formal sector lending to the poor, especially the rural poor is plagued by severe problems of inadequate coverage, very low rates of repayment and imprecise targeting. Most of these problems can be traced to two underlying factors, lack of information and inadequate collateral. Given the linkage between finance and growth,¹ such poor performance of formal sector lending is cause for serious concern. In the last few decades, however, there have been attempts at introducing some innovative forms of formal credit, in particular group-lending schemes.² In fact the recent success of the Grameen Bank in Bangladesh has raised hopes that group lending schemes might be used as a conduit for channelling formal sector credit to the rural poor. Grameen Bank has a high rate of repayment compared to other schemes that lend to the poor. In fact Hossein (1998) argues that the Grameen Bank has a repayment rate in excess of 95%.³ This has prompted other countries and NGOs to try out similar schemes.⁴ In fact there are around 8–10 million households under similar lending programs in the world (see Ghatak, 2000).

There have been several important contributions that seek to explain the success of such schemes.⁵ Stiglitz (1990) and Varian (1990) provide explanations based on peer monitoring. They argue that since group

members have better information compared to the lenders, peer monitoring would be relatively cheaper compared to bank monitoring, leading to greater monitoring and greater rates of repayment. Banerjee et al. (1994), in fact, argue that compared to other explanations, arguments based on peer monitoring are relatively more successful in explaining the success of group lending schemes. Besley and Coate (1995) analyze a strategic repayment game with joint liability and demonstrate that successful group members may have an incentive to repay the loans of the less successful ones. They also highlight the effect of social collateral in ensuring repayment. Ghatak, 1999, Ghatak, 2000 argue that with joint liability and self-selection, safe borrowers will club together to form credit cooperatives and risky borrowers will be screened out. Another paper that develops a similar idea is Van Tassel (1999). Ghatak and Guinnane (1999), on the other hand, analyze moral hazard problems in group-lending. In a model with moral hazard and monitoring they find that if the social sanctions are effective enough, or monitoring costs are low enough, joint-liability lending will improve repayment rates through peer-monitoring even when monitoring is costly.

Clearly the existing literature goes a long way towards explaining the success of some of the group lending schemes, in particular the Grameen Bank. There are, however, quite a few features of group lending schemes that have not attracted as much attention as they, perhaps, deserve.

First, there is possibly too much emphasis on the positive aspects of such schemes, and too little on the possible negative ones. This is somewhat surprising in view of the fact that several of these schemes performed poorly.⁶

Second, group-lending schemes sometimes involve sequential lending.⁷ In the Grameen Bank, for example, the groups have five members each. Loans are initially given to only two of the members (to be repaid over a period of 1 year). If they manage to pay the initial installments then, after about a month or so, another two borrowers receive loans and so on. While Ray (1999) provides an explanation based on coordination failures in case of voluntary default, the incentive implications of such sequential financing are not very well understood.

Third, group-lending schemes often involve active monitoring by the lenders. In case of the Grameen Bank, for example, group members receive training from Bank employees. There are weekly meetings where Grameen Bank employees participate (see Khandker et al., 1995).⁸ Given the argument that group-lending schemes are attractive precisely because they replace costly lender monitoring with peer monitoring, such intensive monitoring by the lenders is somewhat surprising.

Finally, most of the theoretical literature has focussed on joint liability, to the relative neglect of the other features described above, namely sequential financing and bank monitoring (see Aghion and de Morduch, 1998). While empirical studies do suggest the importance of joint liability (see Wenner, 1995, Wydick, 1999), there is nothing to suggest that the other features are any less important.

In this paper we seek to develop a framework capable of explaining all these aspects of group-lending schemes. We build a simple model of group lending based on peer monitoring and moral hazard where we demonstrate that, in the absence of sequential financing or lender monitoring, group-lending schemes involve a severe under-monitoring problem. We then argue that both sequential financing, as well as a combination of lender monitoring and joint liability can help in mitigating this problem. Inter alia, we also discuss the relative contribution of these various factors towards the success of group-lending schemes.

The model comprises two potential borrowers who require one unit of capital (say 1 dollar) each for investing in some project. A bank, which advances these loans, can either make the loans individually, or it can loan the amount to the borrowers as a group. In case of group lending there is joint liability for the

repayment of the loan. Thus in case one member of the group does not repay her loan, then the other member has to make up the deficit.

The essential tension in the model arises because while one of the projects has a large verifiable income and no non-verifiable private benefit, the other one has a large non-verifiable private benefit and no verifiable income. The bank prefers the first project (when it can recoup its initial investment), while the borrowers prefer the second one. Thus in the absence of monitoring the borrowers want to invest in the second project. The bank, knowing this, may be unwilling to lend at all.

While borrower i , say, knows the identity of its own projects, neither the bank, nor borrower j have this knowledge. They can, however, spend some non-verifiable amount in gathering this information. Under individual lending the bank can monitor the borrower when, with some probability, it can get to know the identity of the projects. Under group lending the borrowers can monitor each other. If monitoring is successful, then the successful monitor can enforce which one of the projects is to be implemented. Bank monitoring, however, is relatively costly compared to group lending, where the two borrowers can monitor each other at a lower cost.

We first demonstrate that individual lending is feasible if and only if the costs of bank monitoring are not too large. Under group lending, however, there is zero monitoring in equilibrium and group lending is never feasible. This follows since the monitoring levels of the two borrowers are strategic complements. If borrower j monitors then borrower i has an incentive to monitor herself, since, by doing so, she can increase her expected payoff from the first project. If, however, borrower j does not monitor, then borrower i can always invest in the second project itself and has no incentive to monitor herself. Hence both the borrowers choose the second project and the bank makes a loss. Thus the fact that peer monitoring is cheaper, does not necessarily ensure that it will be undertaken at an appropriate level.

We then demonstrate that group-lending schemes involving either sequential financing, or a combination of joint liability and active monitoring by the bank may solve the under-monitoring problem discussed above.

First consider a sequential financing scheme where initially the bank only lends 1 dollar to the group which then randomly allocates the dollar to one of the borrowers. In case the assigned borrower invests in her first project, the bank gets its money back and also lends the group a further 1 dollar in the next period. However, if the money is invested in the second project, then the bank cannot be repaid and there is no further loan later on. We show that such a sequential financing scheme generates a positive level of monitoring by the borrowers. The result is quite intuitive. If initially borrower 1 does not monitor and borrower 2 receives the loan, then borrower 2 would invest in the second project and borrower 1 would have a payoff of zero. By monitoring, however, she may force borrower 2 to invest in the first project, so that the bank is repaid and borrower 1 receives a loan in the second period. This in turn creates a greater incentive to monitor by borrower 2 herself, etc.

We then demonstrate that sequential financing may succeed even if there is no joint liability. However, the repayment rates are higher if sequential financing schemes also involve joint liability. Given that joint liability generates an additional incentive for monitoring this is quite intuitive. This shows that while joint liability by itself is not sufficient to solve the moral hazard problem, in the presence of sequential financing it leads to an increased rate of monitoring.

Finally we consider schemes where there is active monitoring by the lender, both with and without joint liability. With joint liability we find that there is a positive level of monitoring by the borrowers. In this case bank monitoring has a pump-priming effect, so that the bank by indulging in relatively costly monitoring

itself, induces relatively less costly monitoring by the borrowers. In the absence of joint liability, however, bank monitoring is not very effective (in a sense made precise later).

The rest of the paper is organized as follows. Section 2 describes the basic model in case of individual, as well as group lending. In Section 3, we examine group lending with sequential financing, both with and without joint liability. While in Section 4 we examine group lending with active lender monitoring, again both with and without joint liability. Section 5 discusses some robustness issues. Finally, Section 6 concludes.

Section snippets

Basic model

There are two borrowers, borrower 1 and borrower 2 (denoted B_1 and B_2 respectively). Borrower 1 can invest in one of two projects, P_1^1 or P_2^1 , and borrower 2 can invest in one of two projects, P_1^2 or P_2^2 .⁹ The project income can be of two kinds, verifiable and non-verifiable. Both P_1^1 and P_1^2 have a verifiable income of H , and no non-verifiable income, whereas both P_2^1 and P_2^2 have no verifiable income, ...

Group-lending with sequential financing

In this section we consider a group-lending scheme with sequential financing where initially only one of the group members receive a loan. Depending on whether this loan is repaid or not, the bank decides on whether to make further advances....

Group-lending with bank monitoring

We now consider group-lending schemes with active bank monitoring. For simplicity, in this section we assume that $H-r < 1$.²⁶...

Discussion

In this section we discuss the robustness of our analysis to renegotiation and side-contracting.²⁷

Recall that in this paper we do not allow for post-monitoring renegotiation by the borrowers. However, we have earlier argued (in particular in Remark 1, Remark 5, Remark 6, Remark 7, Remark 8) that the results are not...

Conclusion

The recent success of the Grameen Bank has led to the adoption of group-lending schemes by many NGOs and governments. Given this fact we need to have a clear understanding of the various aspects of such schemes, including possible problems with such schemes. In this paper we focus on one such possible pitfall, that of under-monitoring. Thus under group lending, while monitoring may be relatively cheap (because of peer monitoring), there is too little of it. This makes ordinary group lending...

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...In Section 5.5 we discuss individual loans and show that, in our setting, they are dominated by group lending – that is, no group of borrowers would be better off by switching to individual loans. There is a large literature on joint liability microfinance and the comparison between group lending and individual lending (Ghatak, 2000; Chowdhury, 2005; Gangopadhyay et al., 2005; Banerjee et al., 1994; Rai and Sjostrom, 2004) among many others). In both theory and practice, the main advantage of joint liability group lending is that it can create a substitute for asset collateral by using the social capital embedded in the borrowers' networks and relationships to mitigate moral hazard, adverse selection, costly state verification or debt enforcement problems (Mosley, 1986; Udry, 1990; Besley and Coate, 1995; Morduch, 1999; Ghatak, 1999; Ahlin and Waters, 2016)...

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...First, there is a very scarce literature on external monitoring in joint-liability credit groups. To the best of our knowledge, the only paper that explicitly addresses this question is Chowdhury (2005) who shows that external monitoring helps crowd-in cheaper peer monitoring. Strategic complementarity in monitoring efforts drives this result: a group member disciplined by monitoring has greater incentive to monitor his peers because more is at stake in case they default....

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