RURAL GROUP LEADING SCHEMES WITH JOINT LIABILITY : RATIONAL, STRUCTURE AND PERFORMANCE
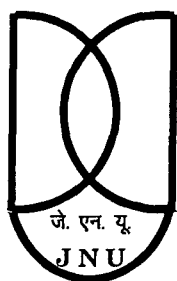
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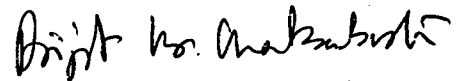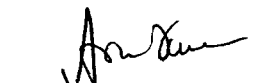NEW DELHI – 110 067**
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This is to certify that the dissertation entitled "RURAL GROUP LENDING SCHEMES WITH JOINT LIABILITY: RATIONALE, STRUCTURE, AND PERFORMANCE" submitted by me in partial fulfillment of the requirement for the award of **Master of Philosophy** has not been previously submitted for any other degree of this or any other University.

(Arijit Kumar Chakraborty)

We recommend that this dissertation be placed before the Examiners for evaluation.

Supervisor   Chairperson

(Prof. Arijit Sen)   (Prof. Arun Kumar)

To,
    Baba and Ma.

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Thanking you,

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RURAL GROUP LENDING SCHEMES WITH JOINT LIABILITY: RATIONALE, STRUCTURE, AND PERFORMANCE

ABSTRACT

In many developing countries, the rural poor are caught in a vicious circle of poverty where they need credit to escape poverty but such credit is not available as they are poor and do not have collateral. To break this vicious circle, governments have promoted rural banking. But these banks have been plagued by high default rates. The rural poor traditionally obtain small loans from informal sources that charge high interest rates and have limited coverage.

This recognition has lead to the formation of novel micro-finance institutions over the last two decades, which aim to substantially expand the provision of credit to the rural poor, while at the same time ensuring high rates of loan repayment. These institutions offer "group lending schemes with joint liability clauses." Under such a scheme, borrowers are asked to form joint-liability groups, where, within a group, borrowers with successful projects are required to contribute in repaying the loans of unsuccessful group members.

This dissertation explains the rationale behind group lending schemes, and explores to what extent such schemes have been successful in providing access to credit to the poorest sections of the rural population.

We begin by documenting the structure and operational features of five micro-finance institutions in five countries. We show that while there are some differences across these MFIs, there is a remarkable similarity in the kind of group lending programmes that they pursue.

We then present theoretical arguments showing how joint liability lending can reduce information and enforcement problems between creditors and debtors: problems of adverse selection, moral hazard and strategic default.

Finally, we look at the performance of the five micro-finance institutions between 1997 and 2002. We find that group lending schemes have been very successful in (a) increasing the total number of people who receive credit. (b) in targeting such credit to the people who value it the most, especially women, and (c) in increasing repayment rates.

1 INTRODUCTION

1.1 Poverty and Rural Credit

In less developed countries (LDCs) one of the chief causes of rural poverty is the fact that the poor lack of access to productive capital. These people who live at a subsistence level find it difficult to accumulate savings and/or other assets. On the one hand, this prevents them from generating their own funds to finance productive investments. On the other hand, it limits their access to the credit market, as they do not have sufficient collateral. In turn, this inability to make the necessary investments to enhance productivity perpetuates poverty. In this way, the rural poor in LDCs are entrenched in a vicious circle of poverty.

Recognizing this, there has been dramatic expansion in rural credit programmes in LDCs from the 1960s. Under these programmes, there has been an aggressive promotion of new rural banks and rural branches of existing banks. In India and Bangladesh, commercial banks have been forced to open a certain number of rural branches before they can receive permission to open additional urban branches. In Vietnam, Philippines and Ghana, donor and/or government funds are provided to new rural banks on concessionary terms (Adams and Vogel, 1986).

But the formal banking system covers a relatively small portion

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of the rural population – about 5% in Africa, and 10% in Asian and Latin American countries. Further, those who are covered tend to be the wealthier and more politically influential section of the rural population. It has been widely agreed that the formal financial institutions has had limited success in increasing access of affordable credit to the neediest sections of the rural population.

An important symptom of the poor performance of formal banks in many developing countries is the high rate of default. In principle, this can be because of two reasons: inability, and unwillingness to repay loans. Inability to repay a loan reflects a failure of the investment project that a borrower has undertaken. The fact that banks experience high default rates is to a large extent due to the inherently risky environment in which loans are given. Any economy wide shock such as poor weather or a change in commodity prices can lead to large default rates.

But defaults also occur due to "individual specific" circumstances of borrowers. To explain this aspect of default, many authors have emphasized the inherent asymmetry of information between borrowers and lenders. Specifically, lenders may be unable to identify good projects – giving rise to an adverse selection problem, and/or find it too costly to monitor project implementation – leading to a moral hazard problem. These problems arise mainly due to the

limited infrastructure available for information gathering in rural economies.

Further, borrowers may engage in "strategic default," *i.e.*, they may be unwilling to repay loans even if they have the resources to do so. There are many reasons for this type of strategic default. Firstly, the government may not be committed to loan repayment for political reasons. Thus, the political environment may make borrowers think that they can get away by not repaying their loans. This also undermines their incentives to use their funds wisely, thereby worsening the problem of the ability to repay. Secondly, in developing countries, due to the absence of proper legal infrastructure, there are high costs of forcing loan repayment by seizing collateral or by using other sanctions.

These information and enforcement issues explain the importance of the "informal credit market" in developing countries. Informal creditors like moneylenders enjoy certain advantages over formal lenders. They circumvent the information problems faced by formal creditors by knowing their clients well. Further, they can enforce repayment since they typically have access to sanctions not available to banks. However, these moneylenders charge very high interest rates (*e.g.*, 10% to 15% per month). Also, informal lenders do not lend enough funds for large productive investments. To a large

extent, they provide funds for conspicuous consumption, like marriages and festive spending. Another major drawback of informal lending is the problem of outreach. Informal lenders provide credit to a select few whom they know personally. As a result, a large section of the population stays outside the ambit of this kind of credit.

1.2 The Micro-finance Revolution and Group Lending

Over the past two decades, a new kind of creditor — the micro-finance institution — has started to become an important player in the rural credit market in many LDCs. In many cases, these micro-finance institutions (MFIs) have been set up by non-government organizations (NGOs) that, in pursuing their developmental work, have recognized the need for expanding rural credit and have noted the information and enforcement problems faced by formal credit institutions. To counter the ineptitude of the formal credit delivery system and to plug the loopholes of the informal credit system, most MFIs have adopted a scheme of "group lending with joint liability."

Under a group lending scheme, the MFIs ask borrowers to form joint-liability groups. "Joint liability" means that within a group, borrowers with successful projects are required to contribute in repaying loans of unsuccessful group members. This requirement is subject to the limited liability constraint that no individual is required to

pay more than the revenues that his project generates. The logic behind such group lending schemes is that, in principle, they can effectively deal with information problems among lenders, and also ensure loan repayment by improving enforcement mechanisms.

Group lending schemes can improve *ex ante* screening of borrowers. As borrowers choose their own groups, it is plausible to expect that they will choose to form a group with others whom they believe to be creditworthy and whom they can rely on to make timely repayments. This is the "peer-screening effect" – it reduces the adverse selection problem because community members have much better information about each other than an outside lender.

In addition, there is the "peer-monitoring effect" whereby group members try to ensure that each borrower uses his funds wisely and effectively, and puts in the optimal effort to raise the profitability of his investment. In this way, peer-monitoring can reduce moral hazard problems.

Peer-monitoring itself does not guarantee repayment, but it allows the lending organization to know whom to punish for not repaying. A group lending scheme provides incentives to the borrowers to monitor each other to see who can pay and who cannot. This can mitigate the problem of strategic default. Group lending schemes achieve this by taking advantage of people's desire to protect their

social capital and to avoid any possible social and economic repercussion such as loss of trading partners and friends, and the loss of self-esteem and reputation.

1.3 The Rationale and the Promise of Group Lending

The aim of this dissertation is to understand the rationale behind "group lending with joint liability," and to explore to what extent such schemes by the MFIs have been successful in providing access to credit to the poorest sections of the population in LDCs.

We proceed as follows. In Section 2, we document the structure and operational features of five MFIs in different parts of the world. We show that while there are some differences across these MFIs, there is a remarkable similarity in the kind of group lending programmes that they pursue.

Having documented the practice of group lending by the MFIs, we then present different theoretical arguments as to how such schemes can effectively reduce information and enforcement problems in a rural economy. This is done in Section 3, where we systematically present arguments as to how joint liability lending can alleviate the problems of adverse selection, moral hazard, and strategic default.

Then, in Section 4, we revisit the five MFIs described in Section 2, and look at their "performance" between 1997 and 2002. We do this

to assess whether the real-world group lending schemes do indeed satisfy their promise in making available affordable credit to the rural community.

In this regard, we study the data on (*a*) the total number of clients of the MFIs and how it has grown over time, (*b*) that fraction of clients that are women, (*c*) the average loan size of the MFIs. and (*d*) their loan repayment rates. While (*a*) provides the basic measure of expanding credit access, (*b*) and (*c*) tell us something about the *composition* of the beneficiaries; in particular, assuming that the poorest can only afford to take the smallest loans, the data on average loan size can tell us whether credit is made available to the poorest of the poor. Finally, (*d*) informs us as to whether group lending schemes achieve one of their primary objectives by lowering default rates.

We conclude in Section 5 by noting that in terms of outreach and repayment rates, the record of the MFIs has been impressive. Group lending with joint liability has turned out to be an effective means of improving the lot of the rural poor.

2 THE MICRO-FINANCE INSTITUTIONS

In past two decades, a diverse variety of micro-finance institutions (MFIs) have been set up in developing countries in Africa, Asia and Latin America. Globally there are now 100 million poor households served by these MFIs. Micro-finance not only helps to alleviate poverty by providing credit to the poor, but also has other social impacts through their support to women, their provision of incentives to work, etc..

In this section, we document five MFIs in five different countries that provide credit to the under-privileged through group lending schemes. We first describe the structure of these institutions, and then discuss their operational features in providing micro-credit. Some of the important attributes of these MFIs are summarized in Table 1.

2.1 The Structure of Five Micro-Finance Institutions

2.1.1 *BancoSol, Bolivia*

Banco Solidario of Bolivia, popularly known as BancoSol, is a private fully chartered commercial bank that began its operation in early 1992. BancoSol's ownership structure emerged from its NGO origins in PRODEM. This micro-finance organization began operations in 1987. By 1990, it was realized that the growth of PRODEM was constrained

by its NGO status and by its lack of access to sources of loanable funds. BancoSol was created as a response to anticipated constraints on the successful growth of PRODEM.

As a financial institution, BancoSol operates as a three-tier body and maintains a relatively decentralized decision making structure. The bank's head office in La Paz is responsible for overall policy-making and administration of the bank. In addition, there are regional offices in La Paz, Santa Cruz, Kochabamba and Orura, and 22 retail units. The retail units and shop-front establishments are directly responsible for client mobilization of deposits. The regional branches coordinate and oversee the retail units in their jurisdiction, and provide regular financial reports to the headquarters.

The head office lends funds to the regional branches. which in turn lend them to agencies for on-lending to the ultimate beneficiaries. These retail units retain a minimum amount of funds on hand at all times, only enough to cover the short-term operations of the retail unit, as surpluses are largely returned to the regional branches.

The highest decision-making body of BancoSol is the shareholder's assembly, which is comprised of the bank's seventeen shareholders.

2.1.2 Mibanco, Peru

The parent organization of Mibanco, Accion Comunitaria del Peru

(ACP) began with community development projects focusing on community organizations, education, urban infrastructure, and small business technical education. Since 1982, ACP has mainly focused on supporting micro-entrepreneurs. It started its micro-enterprise credit activities in 1982 under the Progreso Programme.

At the beginning of 1997, ACP started to transform its credit operations into a regulated financial institution. Thus, in August 1997 came the new private bank called Mibanco (my bank). With 60% share in Mibanco, ACP was its majority shareholder.

Mibanco has thirteen field agencies and a central management office. It is headed by an executive director. He works with a small number of central office executives, and reports to a board of directors. The manager of each of the field agencies reports to the central office. Each field agency has a manager, credit agents, credit assistance and clerical staff. A credit committee at each agency, composed of the agency's manager and the credit agent, meet daily to make loan decisions. Each credit agent serves approximately 270 borrowers.

2.1.3 K-REP Bank, Kenya

K-Rep was founded as an intermediary organization that addressed the financial, managerial, and technical needs of NGOs involved in small and micro-enterprise development in Kenya. As such, K-Rep began by providing loans to NGOs for subsequent on-lending to micro-

enterprises.

K-Rep Bank, a subsidiary of the K-Rep Group, was registered as a limited liability company in March 1997 and obtained its banking license in March 1999. The transformation allowed K-Rep Bank to access financial markets, providing a secure and sustainable funding source and financial independence.

2.1.4 *Grameen Bank, Bangladesh*

In 1983, the Grameen Bank was established as a specialized financial institution regulated by the Bangladesh Central Bank to provide financial services to the poor. The bank has a thirteen-member board of directors, three of whom are senior civil servants. Professor Yunus is a non-voting member appointed by the board. With the exception of Professor Yunus, board members serve a three-year term. Currently, the members hold 80% and the government holds 20% of the Grameen Bank's shares.

The Grameen Bank has three administrative levels below the head office. The lowest level is the branch (shakha), which typically contains a staff of ten − a branch manager, a senior assistant, seven bank workers and a watchman. The branch is responsible for 50 to 60 Kendras (centers), which in turn are a collection of 6 to 8 groups of borrowers of five members each. The branches are supervised by area offices, each of which is typically staffed by six people and cover 10 to

15 branches. The area offices are supervised by fourteen zonal offices.

2.1.5 *Bank for Agriculture and Agricultural Co-operatives, Thailand*

The BAAC was founded in 1966 as a specialized financial institution under government ownership. The Ministry of Finance holds 99.7% of the shares. BAAC's operations are highly decentralized in the form of an extensive rural network that comprises 657 branches and sub-branches in addition to 850 field offices. The branches are largely autonomous. Credit officers are responsible for farmer training, credit application, monitoring and repayment.

2.2 Operational Features of the MFIs

We now describe the operational features of the five MFIs with regard to loan disbursement, loan collection, and repayment incentives. See Table 1, which also shows the annual rates of interest that these MFIs charge, and indicates that over and above providing credit, the MFIs also provide some "savings" and "insurance" facilities.

2.2.1 *Loan Disbursement*

Even though structures of the five MFIs are different. the loan disbursement procedures are almost identical. All prospective clients seeking to obtain a loan first have to form a group. The sizes of these groups differ from institution to institution. For institutions like

BancoSol, Mibanco, and Grameen Bank, group size is around 5 individuals, whereas for BAAC and K-Rep group size is much larger – around 20 to 30 individuals form a group.

The procedure for distribution of loans varies among the MFIs. In the cases of BancoSol and Mibanco, loans are given to every individual in a group. On the other hand, in the cases of Grameen Bank, BAAC, and K-Rep, loans are given to a few individuals within a group rather than the whole group.

2.2.2 *Loan Collection*

Loan collection procedures of the MFIs are similar. Each week, an installment of the repayment is collected at some meeting place (generally at the house of the leader). In the case of BancoSol, loan collection happens fortnightly or monthly according to the group's choice.

The logic of the loan collection procedure is to minimize the borrowers' "transaction costs" – the cost of doing business with a lender. The aim of the intensive loan repayment schedule is to turn repayment into a regular, ritualized and public process. The regular ritual minimizes the perceived financial cost of repaying the loan and ingrains habits of "good practice." The fact that the ritual takes place in public maximizes the reputation cost of not repaying, and makes public the knowledge of repayment problems at an early stage so as to increase

the likelihood that such problems can be tackled.

2.2.3 *Repayment Incentives*

Incentives to repay extend the reach of the intensive loan collection system. Just as the method weekly public repayments combats strategic default by raising the reputation costs of default, so do repayment incentives by raising the financial cost of default. These incentives include offering discounts for consistent on-time repayment (*e.g.*, by the Grameen Bank) and charging higher interest rates on overdue amounts (*e.g.*, by BAAC). Many of the MFIs also provide repayment incentives by pursuing the following strategy − they increase the credit limits of the borrowers by a proportion that depends on their previous repayment record.

3 THE ECONOMICS OF JOINT LIABILITY LENDING

Joint liability lending can alleviate the three main problems faced by formal credit institutions that lend to poor borrowers who cannot offer much in the way of collateral: adverse selection, moral hazard, and enforcement problems. In this section, we theoretically demonstrate how this can be achieved by studying simple models of lending. The models show how joint liability lending (a) affects group formation, (b) induces group members to influence project selection by other members, and (c) encourages borrowers to repay their loans without the lender needing to impose costly sanctions.

3.1 The Adverse Selection Problem

In most credit markets, lenders cannot distinguish the risk characteristics of different potential borrowers (i.e., whether they are risky investors or safe investors). If a lender could distinguish a safe borrower from a risky one, he would prefer to lend to the safe borrower, thereby increasing the probability of loan repayment. But when such ex ante screening is not possible, a risky investor will be interested in borrowing at any loan terms under which a safe investor will borrow, and so each loan will have a high default probability. This is the adverse selection problem in the credit market.

In order to tackle this adverse selection problem, lenders can ask borrowers to pledge collateral. Unfortunately, the poor borrowers in

developing countries are unable to provide substantial collateral. This makes it virtually impossible for formal lending institutions (*e.g.*, commercial banks) to screen borrowers.

It is in this scenario that group lending schemes with joint liability clauses can provide effective *ex ante* screening of potential borrowers. Group lending schemes can use the joint-liability condition as a means to screen borrowers through a self-selection mechanism. In a group lending scheme, a bank lends money to a group rather than to an individual with the condition that each member of the group is liable for the default of the other members. If any member in the group defaults, then the entire group is deprived of future loans from the bank. As a result, when forming their groups, each borrower prefers to join the group with the safest borrowers, since in the case of his default, there is a greater possibility that his partners will repay the loan. Further, all safe borrowers also prefer to form a group with other safe borrowers rather than risky borrowers.

Thus, under such circumstances, potential borrowers of similar risk types will group together. Once the groups are distinct by risk types, the riskier the group the less it will prefer a joint-liability clause. Thus, the bank can then screen borrowers through offering a menu of joint-liability loan contracts. This intuition is formalized in Ghatak (1999) and van Tassel (1999), who show how the joint-liability

mechanism can be optimally designed to sort and screen borrowers.

3.1.1 *The Model*

Suppose that there are N risk-neutral investors, each endowed with a project that requires one unit of capital. Success of a project depends upon the investor's type. Let $p_i \in (0, 1)$ denote the type of investor i, which is also the probability of success of his project. Let there be two types of agents, "risky" and "safe." A safe investor has probability of success p_s and the return on his project (when successful) is Y_s. A risky agent has probability of success p_r, and the return on his project is Y_r. We assume that $p_s > p_r$ and $Y_r > Y_s$. If a project fails, then the return is zero for both types of investors.

Agents borrow capital from the bank to invest in their respective projects. The bank will lend if it expects to get back ρ, which is the opportunity cost of capital.

3.1.2 *Complete Information*

Under complete information, the bank is assumed to know the type of each borrower. In that case, the bank will charge different interest rates to the different borrowers such that $r_i = \rho/p_i$. The payoff to each borrower under such a loan contract is $(p_i Y_i - \rho/p_i)$. So the payoff to a safe borrower is greater than the payoff to a risky borrower.

3.1.3 *Incomplete Information*

Under incomplete information, the bank cannot distinguish the types of the borrowers. In this case, if it tries to charge type-specific interest rates, then the risky type will pretend to be the safe type and choose the contract meant for the safe borrower. Given that, the presence of risky borrowers will cause the bank to raise the interest rate, and that in turn will drive out the safe borrowers from the market. This is Akerlof's "lemons problem."

3.1.4 *Joint Liability Lending*

In the scenario of incomplete information, group lending with a joint-liability clause can be used to deal with the lemons problem. Let us assume that two borrowers voluntarily form a group among themselves. Under a joint-liability contract, each borrower pays nothing if his project fails and an amount r if his project is successful. In addition, a successful borrower pays a joint-liability amount c if the other member of the group fails in his project. Then the expected payoff of a borrower of type i when his partner is type j is:

(1) $$EU_{ij} = p_i p_j (Y_i - r) + p_i (1 - p_j)(Y_i - r - c).$$

The expected gain for a risky investor if he forms a group with a safe investor rather than a risky investor is:

(2) $EU_{rs} - EU_{rr} = p_r (p_s - p_r) c.$

Similarly, the expected loss for a safe investor if he forms a group with a risky investor rather than a safe investor is:

(3) $EU_{sr} - EU_{ss} = - p_s (p_s - p_r) c.$

Then, if a risky investor wants to form a group with a safe investor, he must compensate the latter. But given that $p_r < p_s$, a risky investor will never able to provide the required compensation to form a group with the safe type. This will lead to "assortative matching" during group formation, where safe investors will be paired with other safe investors and similarly for risky investors.

Now, if the bank offers two contracts: one with a high joint-liability payment c_H and a low interest rate r_L, and another with a low joint-liability payment c_L and a high interest rate r_H, the safe borrowers will select the former contract and the risky borrowers the latter.

Group lending with a joint-liability clause reduces the interest rate, which in turn improves the pool of borrowers. Given the presence of good borrowers, such group lending schemes increase expected aggregate surplus compared to individual lending schemes.

However, in a group lending scheme, it is not guaranteed that every

type of borrowers will be better off. Under group lending, the rate of interest falls, but each borrower has an addition cost of borrowing due to the joint-liability payment that he has to make if his partner defaults. This cost is relatively high for risky borrowers who end up with risky partners. Holding the borrower pool constant, a cut in the interest rate balanced by a rise in joint-liability payments make relatively risky borrowers worse off and the average borrower in the given pool exactly as well off as before. However, the surplus generated from the projects of the safe borrowers can be used to reduce the interest rate further. If enough number of safe borrowers can be attracted into the market by a cut in the interest rate, then all borrowers, including the riskier ones, will be better off.

3.2   The Moral Hazard Problem

Once a borrower has taken a loan, the outcome of the project in part will depend on the effort of the borrower. If the borrower invested his own money in the project, then he would have the incentive to try his best to make the project successful. But when the investor is borrowing the money without pledging any collateral, he is not at risk of losing money if the project fails. In that case the level of effort expended by the borrower may not be optimal.

In rural areas, due to the lack of a monitoring infrastructure, this

moral hazard problem is one of the chief causes of high rates of non-repayment of loans. Group lending can reduce the monitoring costs of the creditor by making peers monitor each other. Since each member of a group is jointly liable for the actions of the other members, each group member ensures that his partners expend optimal effort in their projects.

This basic idea of peer monitoring has been formalized by Varian (1990), Stiglitz (1990), and Banerjee *et. al.* (1994).

3.2.1 *The Model*

The basic framework of the model remains the same as before. There are identical risk-averse borrowers with utility function $u(x)$. A borrower can now *choose to invest* either in a safe project or in a risky project. If he had used his own funds, then he would have invested in the safe project. But when he is borrowing from a bank, he will prefer to invest in the risky project, as the success return is higher in the risky project, and his downside risk is limited.
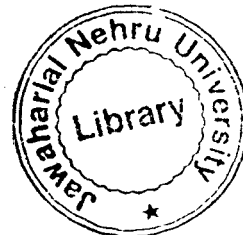
3.2.2 *Complete Information*

When there is complete information, the lender can observe the borrower's project choice. So, in his contract he can specify that the borrower has to choose the safe project. The expected utility that the borrower will get from choosing the safe project is $p_s \cdot u(Y_s - r_s)$, where

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$r_s = p/p_s.$

3.2.3 *Incomplete information*

Under incomplete information, the bank cannot observe the project choice of the borrower. In that case, suppose the bank charges r_s. Then, if the borrower chooses the risky project, his expected utility is $p_r.u(Y_r-r_s)$, which is greater than $p_s. u(Y_s-r_s)$. So the borrower will choose the risky project, and the bank will incur losses. Recognizing this, the bank will have to charge a higher interest rate. All borrowers will invest in risky projects at that higher rate, and each will be worse off.

3.2.4 *Joint Liability Lending*

Group lending with a joint liability clause can, through peer monitoring, induce the borrower to choose safe projects. This is possible when the borrowers in each group have the ability to enforce contracts between each other, and when they jointly decide which types of projects to undertake. They have to choose between doing either the safe project or the risky project. The expected utility of each group member if the group chooses the safe project is: $(p_s)^2.u(Y_s-r) + p_s (1-p_s)(Y_s-r-c)$. Alternatively, if they choose the risky project, the expected utility of each group member is: $(p_r)^2.u(Y_r-r) + p_r(1-p_r)(Y_r-r-c)$.

If the joint-liability payment c is set high enough, all borrower

groups will choose to do the safe project. While the borrowers now have to bear more risk (which is inefficient), the bank can lower the interest rate and still break even, and this can be done to the extent that all borrowers are better off.

Thus, through exploiting the ability of neighbours to enforce contracts and monitor each other − when the bank can do neither − the group-lending contract again offers a way to lower equilibrium interest rates, raise expected utility, and raise expected repayment rates.

3.3 The Enforcement Problem

The problem of enforcement is not an asymmetric information problem but arises because of lack of ability on the part of lender to enforce loan repayment. In this context, strategic default refers to the situation the borrower defaults even when he has the ability to repay his loan. As mentioned earlier, this is either because of political laxity or the lack of a proper legal infrastructure that prevents enforcement of loan contracts.

Besley and Coate (1995) show that group lending schemes increase repayment rates by improving the enforcement mechanism. In case of joint-liability, if a member of the group defaults, the burden of repaying the loan falls on the other members of the group. So every group member tries to prevent strategic default by all other members of

his group.

But in this context, group lending can create its own enforcement problem. Suppose that one group member fails to repay his loan. In that case, the burden of repayment falls on the other members of the group. It could be that absent this burden, the other members would have repaid their loans, but due to this excess burden the whole group defaults. In this way, group lending with joint liability may indeed increase default possibilities under certain circumstances.

Besley and Coate (1995) show that if the "social capital" is large enough, then group lending can improve repayment rates under all circumstances as compared to individual lending.

3.3.1 *The Model*

Assume that the borrowers are risk-averse. Suppose that there is only one project, which requires one unit of capital. The return from the project, when successful, is Y. The bank lends capital to the borrowers at the interest rate r, where $r > \rho$.

Consider a borrower who is successful in his project. He will then decide whether to repay the loan or to default. He will repay the loan only if the benefit from default, the interest cost, is less than the value $\hat{U}$ of continued access to credit: if and only if $u(Y) - u(Y - r) \leq \hat{U}$.

The value $\hat{U}$ reflects the present value of the net benefit to the

borrower from having continued access to bank credit. Let $Y(r)$ be the income at which the borrower is indifferent between repaying the loan and defaulting. Then, if $Y > Y(r)$ the borrower will repay the loan.

3.3.2 *Joint Liability Lending*

For simplicity, consider groups of two borrowers. Under a joint liability contract, both group members are considered to be in default unless every loan is repaid, and in the event of default no one gets loans in the future. In that case, a borrower can choose repay the total loan (given that he is able to repay, *i.e.*, $Y > 2r$) even when his partner engages in strategic default. This will be the case when $u(Y) - u(Y-2r) \leq \hat{U}$.

Now there is a critical income $Y(2r)$ such that if $Y > Y(2r)$ then an individual will make the joint-liability payment. Also, $Y(2r) > Y(r)$ since paying off both his own and his partner's debts is more costly than paying off just his own debt. Only when income is very high would borrowers want to repay under this contract. We assume that there is no co-ordination failure, *i.e.*, the group members know the level of income of each of the members and whether the member will repay his loan or not.

In this scenario, two distinct cases arise:

Case I: In the first case, one group member is unable or unwilling to repay his own debt (*i.e.*, he has an income realization $Y \leq Y(r)$), and the

other member is willing to repay both his and his partner's obligations (*i.e.*, he has income $Y > Y(2r)$). In this case, joint-liability lending is beneficial compared to individual-liability lending.

Case II: In the second case, one member is unable or unwilling to repay his own debt, while his partner is willing to repay his own debt but not both their debts. In that case, individual liability lending is better than joint liability lending.

So it cannot be determined *a priori* as to which scheme is better, as that depends on realized incomes, which in turn depend on chance.

However, if social sanctions are very effective, then in the case where one borrower engages in strategic default (*i.e.*, $r < Y < Y(r)$), joint-liability lending can be a better option. High social sanctions reduce the attractiveness of strategic default by raising the value of $\hat{U}$. In that case, the defaulting borrower prefers to repay his loan rather than loosing the future access to bank credit. In that scenario, repayment rates will be higher under joint-liability contracts.

4 PERFORMANCE OF MICRO-FINANCE INSTITUTIONS

As we have discussed in the Introduction, the rural poor can be caught in a vicious circle of poverty where they need credit to escape poverty but such credit is not forthcoming from the market precisely because they are poor and cannot pledge any collateral. To break this vicious circle, governments in different developing countries have opened rural branches of commercial banks. But these banks have been plagued by high default rates. The rural poor traditionally obtain small loans from informal sources, but these sources, among other problems, have limited coverage. This recognition has lead to the formation of novel micro-finance institutions over the last two decades in many developing countries, which aim to substantially expand the provision of credit to the rural poor, while at the same time ensuring high rates of loan repayment. The principal instruments that the MFIs have been using to achieve this two-fold objective have been group lending schemes with joint liability clauses.

In the previous section, we have explored through different theoretical models as to how joint liability lending can effectively deal with information and enforcement problems in the rural credit market. But is group lending as effective in reality in dealing with the problems of rural credit as the theory suggests? While it is important to find a comprehensive answer to this question, it is very hard to do so as it is

virtually impossible to find direct evidence regarding the "magnitude" to which joint liability lending reduces the problems of adverse selection, moral hazard, and strategic default.

In this section, we address the issue of effectiveness of joint liability lending by looking at some simple and obvious indicators. Specifically, we evaluate the performance of the five MFIs described in Section 2 in terms of their "outreach" − *i.e.*, the size and composition of their rural borrowers, and "repayment rates." Table 2 provides a summary of our findings.

4.1 Outreach of the MFIs

An obvious measure of the social benefits of group lending schemes is the extent to which it has increased the rural population's access to credit. This measure can, in turn, be broken down into two sub-measures: "breadth of outreach" which focuses just on the number of clients that an MFI serves, and "depth of outreach" which tries to determine whether the neediest of the rural population are served or not.

4.1.1 *Breadth of Outreach*

To the extent that no MFI (or even a government) has the resources to provide credit to the entire poor population of a country, it is important to determine the proportion of the population that receives such credit,

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and to see how this proportion has grown over time.

From Table 2, it is evident that the MFIs have expanded rapidly over the period 1997-2002 in terms of the number of clients that they serve. Specifically, BancoSol has become the third largest bank in Bolivia. The growth rate of Mibanco is the most impressive. This is quite expected, as Mibanco is the youngest of the five MFIs in our sample. The Grameen Bank has the largest number of active borrowers. This may be due to two reasons: firstly, Grameen Bank is the oldest MFI in our sample, and secondly, Grameen Bank covers most of the rural areas in Bangladesh.

4.1.2 Depth of Outreach

Beyond looking at the total number of clients of the MFIs, it is important to look at the *composition* of the clients to determine whether the poorest section of the rural population get credit from these institutions. Specifically, "depth of outreach" tries to measure the value that society attaches to the net gain of a given client. In the parlance of welfare economics, depth refers to the weight attached to a given client in the social welfare function (Schreiner, 2002).

Ideally, one would like to have data on the income profiles of the MFIs' clients and compare that with the aggregate rural income profile. But such detailed information is not available to us. Given that, we focus on the following indirect measures of the "depth of outreach" of

the MFIs.

Firstly, recognizing that women form an important segment of the rural population who would have a high marginal benefit from having access to credit, we look at the fraction of women clients of the MFIs. Secondly, we make the plausible assumption that the poorest of the poor, who will benefit the most from access to credit, can only afford to take "small" loans. Given that, we look at the average loan size of the different MFIs.

MFIs target women because women form the largest part of the poor population. The cultural set-up of most LDCs is such that women are considered inferior and subservient to men. Women are also marginalized in terms of education and consequent market opportunities.

Table 2 shows that for all MFIs in our study, the majority of the borrowers are women, with the Grameen Bank having the highest proportion of women borrowers. Rahman (1999) states that there are some strategic reasons for the Grameen Bank in catering to women borrowers. In Bangladesh, there has been increasing repayment problems with male-dominated Kendras. Also women are targeted because it is easy to put pressure on women clients for repayment. women clients are easily traceable, and working with women is easier than working with men.

As mentioned above, loan size is taken as a proxy for the depth of outreach because the poorest borrowers cannot afford to take large loans. So it is assumed that the smaller the average loan size of an MFI, the higher is the likelihood that it caters to the poorest sections of the population.

Table 2 shows that average loan size is quite small for all the five MFIs. It is the largest for Mibanco and BancoSol. This may be due to the fact that these two MFIs not only provide loans to the rural poor, but also to the urban poor. The Grameen Bank has the smallest average loan size.

4.2 Repayment Rates for MFI Loans

An important measure of success of the MFIs is the increase in repayment rates. As mentioned earlier, the major problem that plagues the formal credit system is the huge amount of loan default. Table 2 shows that the MFI repayment rates are very impressive. All of the MFIs have repayment rates above 85%. BancoSol has the highest repayment rate of 97%. The group lending mechanism seems to be very effective in ensuring repayment. But there are other factors too. The prominence of women borrowers increases the repayment rate. The small sizes of the loans also make it possible for timely repayment of loans. Finally, the "intensive loan repayment schedule" employed by

the MFIs also play a significant role in increasing repayment rates.

5 CONCLUSION

In our analysis of group-lending as an alternative means to provide rural credit, we have tried to evaluate the effectiveness of such mechanisms to counter information problems and loan default problems in rural areas.

The MFIs that we have surveyed have been shown to adopt similar "group lending with joint liability" schemes in the disbursement of loans. They require borrowers to form groups, and make group members jointly liable for individual loan repayment. The MFIs also provide repayment incentive in terms of promising larger future loan amounts when there has been timely repayment of past loans.

Peer-pressure along with repayment incentives has indeed improved loan repayment rates. The MFIs in our sample have repayment rates of around 90%. Targeting women borrowers has also helped in improving loan repayment rates.

The MFIs have also achieved an impressive outcome in terms of outreach. They have increased credit access for the rural population as a whole, and for rural women in particular. In this regard, the performance of the Grameen Bank is most impressive. It has acquired a monopoly position in the rural credit market in Bangladesh. It provides credit not only to rural poor but also to the beggars.

While it is not possible for us to quantify the extent to which the

group lending by the MFIs has reduced the problems of information asymmetry, it is clear that their loan programmes have been quite successful in helping to break the vicious circle of poverty in which the rural poor are trapped, and in providing a way for them to get on to a path of prosperity.

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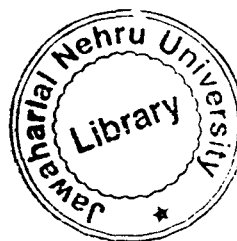
Table 1: Structure and Operational Features of MFIs

MFIs	BancoSol	Mibanco	K-Rep	BAAC	Grameen Bank
Type	NGO, now commercial bank	NGO, now commercial bank	NGO.	National agricultural bank.	Statutory financial institution (80% member owned, 20% government owned).
Political environment	No government influence.	No government influence.	No government influence on NGO lending policies.	Government influence.	Minimal government influence in the lending policies.
Loan collection method	Fortnightly or monthly at bank branch.	Weekly at the group meeting.	Weekly at the group meeting.	Weekly at the group meeting.	Weekly at the group meeting.
Saving or insurance arrangements	Compulsory 10% deposit + voluntary savings.	Voluntary savings.	Compulsory 20% + voluntary saving.	Voluntary saving.	Compulsory 25% contribution to 'emergency fund'.
Interest rate (annual)	24%	28%	26%	25%	20%

Table 2: The Performance of Micro-Finance Institutions

MFIs	Growth Rate (between 1997-2002)	Active Loan Portfolio ($ Millions)	Active Borrowers (Numbers)	% of women borrowers	Repay-ment Rate	Average Loan Size ($)
BancoSol	10%	8.1	42,290	57%	97%	571
Mibanco	22%	9.2	99,121	54%	93%	465
K-REP Bank	8%	1.5	38,739	52%	92%	300
Grameen Bank	12%	19	1,854,177	94%	95%	190
BAAC	4%	0.9	42,000	65%	86.5%	200

Source: Compiled by the author.