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When is the optimal lending contract in microfinance state non-contingent?

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ABSTRACT

Whether a microfinance institution should use a state-contingent repayment or not is very important since a state-contingent loan can provide insurance for borrowers. However, the classic Grameen bank used state non-contingent repayment, which is puzzling since it forces poor borrowers to make their payments even under hard circumstances. This paper provides an explanation to this puzzle. We consider two modes of lending, group and individual lending, and for each mode we characterize the optimal lending and supervisory contracts when a staff member (a supervisor) can embezzle borrowers' repayments by misrepresenting realized returns. We identify the main trade-off between the insurance gain and the cost of controlling the supervisor's misbehavior. We also find that group lending dominates individual lending either by providing more insurance or by saving audit costs.

1. Introduction

The remarkable success of microfinance programs in making loans to (and recovering them from) poor people has received world-wide attention and generated a global microfinance movement which has been growing rapidly. According to the report from the Microcredit Summit Campaign, as of December 31, 2007, 3552 microcredit institutions reported reaching 154,825,825 clients, 106,584,679 of whom were among the poorest when they took their first loan.[1] The original ideas of microfinance are from Muhammad Yunus, the founder of the Grameen bank and Nobel peace prize laureate in 2006, who started making small loans to groups of poor people in rural areas in Bangladesh in the 1970s. Today the Grameen bank is a large financial organization: according to the monthly report of February 2009, it disbursed a total of \$ 7,776.55 million since inception to about 7.51 millions borrowers with a loan recovery rate of approximately 97.93%.[2]

There exists a large economic literature on microfinance and most of it focuses on how group lending affects adverse selection (Ghatak, 1999; Armendáriz de Aghion and Gollier, 2000; Laffont and N'Guessan, 2000; Laffont, 2003), moral hazard in terms of loan repayment (Besley and Coate, 1995; Armendáriz de Aghion, 1999; Sadoulet, 2000; Rai and Sjöström, 2004), and moral hazard before return realization in terms of work incentives (Stiglitz, 1990; Varian, 1990;

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[1] See https://promujer.org/empowerment/dynamic/our_publications_5_Pdf_EN_SOCR2009%20English.pdf accessed on February 8, 2010.
[2] See http://www.grameen-info.org/index.php?option=com_content&task=view&id=453&Itemid=527.

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Conning, 1999; Che, 2002; Laffont and Rey, 2003).[3] Despite the variety of the issues that these papers examine, most of them, with a few exceptions mentioned later on, consider only borrowers' incentives and do not study the incentive issues of the bank staff managing the loans. Furthermore, all papers studying the optimal lending contracts find that state-contingent repayments are optimal, where a state refers to a realized return of a borrower's project. This finding is in stark contrast with the practice of the classic Grameen bank, which specifies a rigid repayment schedule that does not depend on the realization of the state of nature.[4] The Grameen bank's practice is very puzzling since it means that poor borrowers make their payments even under the difficult circumstances following a failed project. This paper tries to explain the puzzle.

Whether a microfinance institution should use a state-contingent loan or not is an extremely important issue since a state-contingent loan can provide insurance to borrowers by linking repayments to the success or failure of their projects.[5] However, the spectacular growth of microfinance institutions raises the issue of staff's quality and their misbehavior.[6] In particular, when a loan is state-contingent, a staff member managing the loan might manipulate his[7] report to the lender in order to embezzle some repayments. In this paper, we study the optimal lending contract and the optimal supervisory contract when a staff member (called a supervisor) can embezzle repayments by misrepresenting the realized state. More precisely, we identify the condition determining whether the optimal repayment is state-contingent or not and analyze how the mode of lending (group versus individual lending) affects the condition.

Given that embezzlement and corruption are very frequent in most organizations in underdeveloped countries,[8] incentive schemes in microfinance institutions should be designed to reduce the scope for such misconduct of staff. In particular, in the case of microfinancing programs in poor countries, most borrowers are illiterate and means of transportation are primitive; therefore, they get informed about the loan conditions exclusively through the bank staff member who visits their villages to collect repayments. This creates significant scope for the staff's misconduct and embezzlement, as is documented by Bornstein (1996) and MkNelly and Kevane (2002).[9]

We consider a simple model of hierarchy: there are a lender, a supervisor and two borrowers. The lender maximizes the borrowers' payoffs subject to her own break-even constraint. The supervisor must check the success or failure of the project undertaken by each borrower and collect the repayments. We assume that the supervisor can discover the return realization by visiting the borrowers' village and can enforce repayments.[10] In other words, we assume that a borrower is able to repay the loan even when the project fails: although this is a significant departure from the standard assumption in the microfinance literature, we would like to emphasize that it is consistent with the 98% repayment rate in the Grameen bank. In addition, we suppose that a borrower's marginal cost of paying back one unit of money is higher when his project fails than when it succeeds. Therefore, if the supervisor were honest, the lender would provide full insurance to the borrowers by recovering all financing cost only through repayments upon success.

The lender can design either a state non-contingent lending contract in which a borrower makes the same payment regardless of the realization of project returns, or a state-contingent contract in which the repayment depends on the realization of the return(s): in the case of individual lending, a borrower's repayment depends only on his own return while in the case of group lending, a borrower's repayment can depend also on the return of the other borrower. If the lender uses a state-contingent loan, the supervisor has some discretion in that, for instance, when a project succeeded, he can report that the project failed and embezzle the difference between the payment upon success and the payment upon failure. The lender can use incentive pay and/or audit to induce the supervisor to behave well, but the supervisor is protected by limited liability: in case auditing reveals that embezzlement occurred, the lender can recover the stolen money and fire the supervisor without paying any wage, but the supervisor is not liable for a further fine.[11]

We first consider group lending. In this case, the optimal lending contract always provides some insurance by requiring that only the successful borrower pays when only one project succeeds. Furthermore, the aggregate repayment is constant (i.e., no discretion of the supervisor) as long as at least one project succeeds. Let the supervisor's discretion refer to the difference between the aggregate repayment when there is at least one successful project and the one when both projects fail. The optimal supervisory contract for a given level of discretion is such that it is optimal to use incentive pay

[3] See Ghatak and Guinnane (1999) and Morduch (1999) for surveys. The book written by Armendáriz de Aghion and Morduch (2005) also reviews some recent papers that focus on other issues such as dynamic incentives, competition, the use of collateral, etc.

[4] Yunus (1998, p. 110) describes the repayment mechanism of the Grameen bank as: (i) one year loan, (ii) equal weekly installments, (iii) repayment starts one week after the loan, etc. In Section 7, we discuss the transition from Grameen I (the classic Grameen) to Grameen II.

[5] For instance, the Bank for Agriculture and Agricultural Cooperatives (BAAC) in Thailand uses state-contingent repayments: a nonrepayment can be rescheduled if it is due to *force majeur*, but is penalized otherwise (Townsend and Yaron, 2001, p. 36). See also the discussion of Grameen II in Section 7.

[6] Bazoberry (2001, p. 13) describes six unauthorized activities that staff members of some microfinance organizations in Bolivia engaged in, such as creation of "ghost" loans to hide the fact that goals are not met, utilization of inactive saving accounts to pay for outstanding debts, etc. Bond and Rai (2002) give several examples of supervisor frauds around the world.

[7] We use "she" for the lender, and "he" for the staff member (i.e., the supervisor) and for a borrower.

[8] For instance, Angolan officials are accused of embezzling 10% of the country's GDP (Fantaye, 2004, p. 173).

[9] Bornstein writes about embezzlement in the early period of the Grameen bank (pp. 169–174). According to MkNelly and Kevane (2002), embezzlement occurs because illiterate borrowers cannot maintain their account books.

[10] The enforcement can be done through (i) pecuniary punishment such as denial of future loan (Armendáriz de Aghion and Morduch, 2005, Chapter 5.2) and seizure of income or assets (Besley and Coate, 1995) or (ii) non-pecuniary punishment of being "hassled" by the bank (Besley and Coate, 1995).

[11] Note that with unlimited liability, the agency problem can be solved at almost zero cost either by imposing a fine large enough when embezzlement is discovered, or by "selling the firm to the supervisor" and making the supervisor a residual claimant. We do not think that any of the two is a realistic solution to the problem.