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Repayment incentives and the distribution of gains from group lending[☆]

Jean-Marie Baland [a,*], Rohini Somanathan [b], Zaki Wahhaj [c,1]

[a] University of Namur, Belgium
[b] Delhi School of Economics, Delhi University, India
[c] University of Oxford, United Kingdom

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ABSTRACT

Group loans with joint liability are a distinguishing feature of many microfinance programs. While such lending benefits millions of borrowers, major lending institutions acknowledge its limited impact among the very poor and have shifted towards individual loans. This paper attempts to explain this trend by exploring the relationship between borrower wealth and the benefits from group lending when access to credit is limited by strategic default. In our model, individuals of heterogeneous wealth face a given investment opportunity so poor investors demand larger loans. We show that the largest loan offered as an individual contract cannot be supported as a group loan. Joint liability cannot therefore extend credit outreach in the absence of additional social sanctions within groups. We also find that the benefits from group loans are increasing in borrower wealth and that optimal group size depends on project characteristics. By allowing for multi-person groups and wealth heterogeneity in the population, the paper extends the standard framework to analyze joint liability and contributes to an understanding of the conditions under which microcredit can reduce poverty.

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1. Introduction

The ideology and practice of poverty alleviation have been deeply influenced by the idea that access to credit can empower the poor. Microfinance programs around the world cover millions of borrowers and are provided under a variety of different institutional arrangements. The overall gains from such lending are widely acknowledged but there is growing concern about their capacity to reach those at the bottom of the income distribution. This has resulted in a lively debate, but little consensus on how credit contracts can be better designed to improve credit access and the welfare of poor borrowers. A recurring question within this debate is whether group loans with joint liability can effectively achieve these objectives.

Group loans were first popularized by the Grameen Bank of Bangladesh in the 1970s. It was believed that joint liability would generate social pressure on borrowers to repay loans and create a financially sustainable model of lending. This approach was questioned in the late nineties when natural disasters triggered widespread default and borrowers protested against rigidities in the lending program. The Grameen Bank responded by introducing Grameen II which made all members individually liable for their loans (Kalpana, 2006; Yunus, 2004). Within a couple of years, membership doubled, suggesting that individual loans catered to a previously unmet demand for credit.[2] A similar switch to individual contracts was made by Banco Sol of Bolivia, another pioneer in group lending.

This trend towards individual contracts is far from universal. A majority of the 663 institutions reporting to the Microfinance Information Exchange (MIX) in 2009 relied on some form of joint liability and many large microfinance institutions offer a combination of group and individual loans.[3] An interesting contrast to the Grameen case is provided by the microfinance sector in India which is dominated by village-based groups that strictly adhere to joint liability.[4]

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[*] Corresponding author. Tel.: +32 81 724866; fax: +32 81 724840.
E-mail addresses: jean-marie.baland@fundp.ac.be (J.-M. Baland), rohini@econdse.org (R. Somanathan), Z.Wahhaj@kent.ac.uk (Z. Wahhaj).
[1] University of Kent, United Kingdom.

[2] Wright et al. (2006) report that "Grameen took 27 years to reach 2.5 million members and then doubled that in the full establishment of Grameen II".

[3] De Quidt et al. (2012b) classify institutions reporting to MIX by the types of contracts used and Ghate (2008) does this for 129 recognized microfinance institutions in India. Many of these organizations use both individual and joint liability contracts. The Bank for Agriculture and Agricultural Cooperatives (BAAC) in Thailand also allows its members to choose between group and individual loans (Ahlin and Townsend, 2007).

[4] There are currently an estimated 77 million microfinance clients in India and over two-thirds of these are in what are called Self-Help Groups or more popularly, SHGs. (Srinivasan (2012), p 3, Table 1.1).

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In this paper, we attempt to explain some of these patterns by modeling the relationship between borrower wealth and the benefits from group lending. We allow individuals to be in groups of arbitrary size and characterize loan contracts available to them as a function of their initial wealth. To focus on the role of wealth heterogeneity, we assume that all borrowers face identical investment opportunities and the poorest investors therefore need the largest loans. Our first set of results compares joint liability contracts with individual loans assuming that groups have no additional social sanctions to discipline their members into repayment. We show that the largest loan available under a group lending contract with joint liability is strictly smaller than the largest individual loan. For borrowers with access to both types of contracts, the benefits from group loans are increasing in wealth.

We next ask whether social sanctions within groups can increase borrower benefits from group loans and also whether they can extend credit to unbanked households. We show that social sanctions always improve welfare for those who already have access to group loans. This is because, unlike bank sanctions, they are not imposed in equilibrium. They do not necessarily extend credit outreach. For a reasonable set of parameter values, individual contracts support larger loans than joint liability contracts even when social sanctions are arbitrarily large.

Our analysis reveals that the two-person groups that have dominated the theoretical literature on group lending are quite particular and many of our results on the interaction of wealth and welfare are obtained by generalizing this framework. When groups have only two members, the fraction contributing to loan repayment is at least one half. This fraction can vary more in large groups and this variation generates a positive relationship between the wealth of borrowers and their benefits from investment. Our last result explores optimal group size. We find that two-member groups are never optimal for small loan sizes but that the benefits from group lending are not generally monotonic in the number of members. We illustrate this non-monotonicity with a numerical example.

Our work contributes to a well-established theoretical literature on the mechanisms through which joint liability can affect investment decisions and borrower welfare.[5] It is most closely related to Besley and Coate (1995) who were the first to demonstrate its ambiguous effects on repayment rates. Several subsequent papers have shown how relaxing the informational or contractual assumptions of the traditional joint liability model can be welfare improving. Rai and Sjostrom (2004) assume that borrowers with unsuccessful projects can report the project outcomes of other members to the bank. Bhole and Ogden (2010) allow co-payments for defaulting projects to be asymmetric. Bond and Rai (2008) and De Quidt et al. (2012a) both leverage social sanctions within groups without joint liability. Our work is also related to models of income dynamics in which the poor have either no access to credit or face unfavorable interest rates (Banerjee and Newman, 1993; Galor and Zeira, 1993; Matsuyama, 2000). These papers use individual credit contracts while we show that the relative disadvantage to poor borrowers may be heightened when banks also offer group loans.

Taking models such as ours to the data on group lending programs is a challenge. Microfinance institutions operate in many different environments and their objectives vary from pure profit-maximization to broader social missions. Besides, empirical work on lending contracts typically estimates average impact whereas we are concerned with the relationship between benefits and loan size. Our theoretical results are however broadly consistent with patterns found in experimental and observational data.

Several studies have highlighted targeting deficiencies in microfinance programs. Morduch (1998) shows that eligibility criteria for membership in the Grameen Bank were frequently violated and the non-poor were admitted as members. With the introduction of Grameen II in 2002, the Grameen Bank explicitly acknowledged that the poor are often best served outside groups.[6] Dewan and Somanathan (2011) and Coleman (2006) find participation rates rising in income in very different regional contexts.[7] Hermes and Lensink (2011) and Sebstad and Cohen (2001) survey programs in multiple countries and emphasize the trade-off between the financial sustainability of microfinance institutions and their outreach among the poor.

In our model, larger bank sanctions allow groups to achieve higher repayment rates. These sanctions could take the form of a rise in the future cost of credit. Karlan and Zinman (2009) collaborate with a South-African bank in an unusual field experiment and show that commitments of lower future interest rates improve repayment on current loans. Abbink et al. (2006) and Cassar et al. (2007) provide experimental evidence on the importance of social ties in repayment decisions. Giné and Karlan (2009) study a microfinance institution in the Philippines that randomly assigned new areas to either joint or individual liability. As in the Grameen case, the introduction of individual liability attracted many more clients. There was no significant difference in repayment rates across the two types of contracts but it is hard to interpret this finding since repayment rates were close to 100% under both regimes.

This empirical literature suggests that the benefits from microfinance do vary with household wealth. We hope this paper encourages more specific tests of the mechanisms underlying this relationship. The rest of the paper is organized as follows. The next section describes our model and derives optimal contracts for individual and group loans. Section 3 compares credit outreach and borrower welfare under the two types of loans in the absence of social sanctions. Section 4 extends the model to explore the effect of social sanctions on group contracts. Section 5 discusses optimal group size and Section 6 concludes.

2. The model

Our principal unit of analysis is a set of risk neutral households, each of whom can choose to invest in a project. The project requires one unit of capital and no other inputs.[8] It returns ρ with probability π and zero otherwise. Wealth, which we denote by w, varies continuously over the $(0, 1)$ interval and is used for investment whenever a loan of $(1 - w)$ can be obtained. We are interested in characterizing the set of wealth levels over which households are eligible for individual and group loans and the benefits from these two types of contracts as a function of initial wealth.

The banking system is competitive and offers depositors a gross return r, equal to the opportunity cost of bank funds. Banks lend either to individuals or to groups of size n under joint liability. We assume that groups are homogeneous in the wealth of their members. This allows us to abstract from questions of redistribution within groups and focus on the risk-pooling function of joint liability contracts. In practice, many successful group lending programs have encouraged the creation of groups with similar members.[9] Interest rates for each contract vary with repayment rates to equate the expected return from all lending to r. Project returns are never observed by the bank. Under group lending they are observed by members of the group.

The assumption of a single indivisible investment project requires some justification. One might expect poorer borrowers to invest in

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[5] Useful surveys of this literature can be found in Armendariz de Aghion and Morduch (2005) and Ghatak and Guinnane (1999).

[6] According to their website (Grameen Bank, 2009):A destitute person does not have to belong to a group…Bringing a destitute woman to a level where she can become a regular member of a group will be considered as a great achievement of a group.

[7] Dewan and Somanathan (2011) study membership in newly formed Self-Help Groups in India while Coleman (2006) examines selection into village banks in Thailand.

[8] While we have in mind the self-employment projects financed by many microfinance organizations, we do not explicitly model effort decisions. The returns to the project in our model can be interpreted as net of effort costs.

[9] For example, when promoting micro credit through the commercial banking system, India's central bank explicitly recommended that savings and credit groups be formed with households of "homogeneous background and interest" (National Bank for Agriculture and Rural Development, 1992).

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