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THE EMPIRICS OF MICROFINANCE: WHAT DO WE KNOW?

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Microfinance has received a lot of attention recently, both from policy makers as well as in academic circles. Two of the main topics that have been hotly debated are explaining joint liability group lending and its implications for reducing information asymmetries, and the trade-off between the financial sustainability and outreach of microfinance programmes. This Feature contains three novel empirical contributions providing new insights with respect to why and how joint liability group lending works. It also contains the first large-scale systematic analysis of the trade-off between financial performance and outreach of microfinance institutions.

Lack of access to credit is generally seen as one of the main reasons why many people in developing economies remain poor. Usually, the poor have no access to loans from the banking system, because they cannot put up acceptable collateral and/or because the costs for banks of screening and monitoring the activities of the poor, and of enforcing their contracts, are too high to make lending to this group profitable. Since the late 1970s, however, the poor in developing economies have increasingly gained access to small loans with the help of so-called microfinance programmes. Especially during the past ten years, these programmes have been introduced in many developing economies. Well-known examples are the Grameen Bank in Bangladesh, Banco Sol in Bolivia and Bank Rakyat in Indonesia. The Grameen Bank system of group lending (established in 1976 by Mohammad Yunus, a Bengal banker and economist), in particular, has been widely copied in other developing countries. Between December 1997 and December 2005 the number of microfinance institutions increased from 618 to 3,133. The number of people who received credit from these institutions rose from 13.5 million to 113.3 million (84% of them being women) during the same period (Daley-Harris, 2006).

According to the United Nations (UN), in 2002 almost one fifth of the world population (i.e. 1.3 billion people) were living in extreme poverty, earning less than one dollar a day. In recent public debates microfinance has been mentioned as an important instrument to combat extreme poverty. To support this view the UN declared 2005 to be the International Year of Microcredit. According to the UN, microfinance can contribute significantly to the achievement of the United Nations Millennium Development Goals, as agreed upon by world leaders at the UN Millennium Summit in September 2000, and which aim at halving extreme poverty by 2015. In October 2006, the attention for microfinance and its role in reducing poverty was further increased when Mohammad Yunus received the Nobel peace prize. According to the Nobel Committee microfinance can help people to break out of poverty, which in turn is seen as an important prerequisite to establish long lasting peace (Norwegian Nobel Committee, 2006).

Next to the growing attention from policy makers, the academic world has also shown increased interest in microfinance, especially during the last ten or so years. Several questions have been addressed in the literature. One major strand of literature focuses on explaining how and why microfinance works from a theoretical perspective.

In this context, most models focus on explaining so-called joint liability group lending and its implications for reducing information asymmetries. Yet, there are only a few empirical studies investigating whether and how microfinance helps to reduce existing information asymmetries. A second important and related issue discussed in the literature deals with the trade-off between the financial sustainability and outreach of microfinance programmes. Although this issue is the subject of a heated debate, there is a lack of systematic empirical analyses on the nature and determinants of the trade-off.

This Feature aims to provide new empirical evidence on several important questions related to microfinance. In particular, the feature contains four novel empirical contributions to the literature. Three of them (Ahlin and Townsend, 2007; Karlan, 2007 and Cassar *et al.*, 2007) deal with joint liability group lending. They provide new insights with respect to why and how this type of lending works in enhancing repayment rates, which may contribute to improving the sustainability of these programmes. The fourth article addresses the issues of financial performance and outreach of microfinance programmes (Cull *et al.*, 2007).

The remainder of this introduction consists of a short review of the existing literature on the two topics to which the articles in this Feature are related.

1. The Economics of Joint Liability Group Lending

Generally speaking, microfinance programmes provide credit to the poor, either through joint liability group lending or through individual-based lending. While the latter comes close to traditional banking, involving a direct relationship between the programme and an individual, the joint liability lending approach uses groups of borrowers to which loans are made. Currently, the majority of microfinance borrowers have access to loans through group lending programmes. According to one recent survey of a sample of microfinance programmes, only 16% of these made use of so-called group lending to provide credit to the poor; yet, they served more than two thirds of all borrowers from the microfinance programmes included in the survey (Lapenu and Zeller, 2001).

With joint liability lending the group of borrowers is made responsible for the repayment of the loan, i.e. all group members are jointly liable. Thus, if one group member does not repay her loan, others may have to contribute so as to ensure repayment. Non-repayment by the group means that all group members will be denied future access to loans from the programme. In this way, group lending creates incentives for individual group members to screen and monitor other members of the group and to enforce repayment in order to reduce the risk of having to contribute to the repayment of loans of others and to ensure access to future loans. Thus, joint liability group lending stimulates screening, monitoring and enforcement of contracts among borrowers, reducing or erasing the agency costs of the lender. Moreover, the group lending structure is also expected to be more effective in providing such activities as compared to the lender, because group members usually live close to each other and/or have social ties (also referred to as social capital in the existing literature). They are therefore better informed about each other's activities. Since joint liability group lending stimulates screening, monitoring and enforcement within the group, and since

it improves the effectiveness of these activities due to geographical proximity and close social ties, repayment performance of group loans is expected to be high.

Several theoretical models confirm that joint liability group lending leads to more and more effective screening, monitoring and enforcement among group members. Some of these models explicitly focus on the properties of joint liability lending related to mitigating information asymmetries. For example, models by Stiglitz (1990) and Varian (1990), Banerjee *et al.* (1994), Armendáriz de Aghion (1999) and Chowdury (2005) explicitly deal with moral hazard and monitoring problems, showing how joint liability may help to solve these problems. Ghatak (1999; 2000) and Gangopadhyay *et al.* (2005), among others, provide models focusing on adverse selection and screening. Some other models specifically discuss the role of social ties within group lending in improving repayment performance of groups. The work of Besley and Coate (1995) and Wydick (2001) fall into this category of models.

In spite of the abundance of theoretical literature, there has been surprisingly little empirical evidence of whether and how microfinance actually helps to reduce existing information asymmetries. This is, at least partly, due to the difficulty of obtaining reliable data on the working of these programmes and the behaviour of their participants. Most of the available empirical studies address the general question of whether joint liability group lending improves repayment performance of groups, using different types of proxies for screening, monitoring and enforcement behaviour taking place within groups.

Wenner (1995) provides one of the first empirical studies on the determinants of repayment of groups, using information of 25 groups from a lending programme in Costa Rica. His analysis indicates that repayment performance of groups improves when groups have written (formal) rules stating how members should behave. This variable implicitly measures screening, monitoring and enforcement activities that take place within the groups. Another variable that is found to determine repayment is the location of groups: if groups are located in remote areas this reduces their possibilities for access to alternative sources of credit, which stimulates them to ensure group repayment as much as possible in order to have future access to loans.

Sharma and Zeller (1997), using data of 128 groups from four group lending programmes in Bangladesh, show that repayment problems increase when there are more relatives in the same group. This supports the hypothesis that screening, monitoring and enforcement among relatives does not take place or at least is less effective, since relatives may more easily collude against the programme and delay repayment. Second, the results indicate that if borrowers are more credit rationed this increases repayment performance. This result can be taken as evidence for the fact that group members have more incentives to screen, monitor and enforce if they have no alternative credit sources. Third, Sharma and Zeller (1997) find that groups that were formed using a self-selection (screening) process show a better repayment performance.

Zeller (1998), based on information from 146 groups in Madagascar, focuses on the role of social ties and finds evidence that groups with stronger ties show higher repayment rates. Moreover, he shows that groups with internal rules and regulations demonstrate better repayment rates, a result that was also reported in Wenner (1995).

An influential study is carried out by Wydick (1999), who uses data of 137 groups from a group-based lending programme in Guatemala. This paper uses the most

extensive list of variables to measure screening, monitoring and enforcement within groups. Wydick finds evidence for the fact that the average distance between group members negatively influences repayment performance, whereas the knowledge one member has of the weekly sales of other members is positively related to repayment performance. Both variables are assumed to measure monitoring activities within groups. However, he also finds evidence that social ties within groups reduces the pressure members put on each other to repay loans.

Paxton *et al.* (2000) use data of 140 groups from a group-based lending programme in Burkina Faso. They show that the homogeneity of the group in terms of their ethnicity, occupation, income etc., reduces its repayment performance. This may indicate that if members are more homogeneous they have lower incentives to screen, monitor and enforce each other and/or may start to collude against the programme. They also show that social pressure within groups is positively related to repayment performance. Finally, they find that the quality of the group leader in running the group is positively related to repayment performance, which may be seen as evidence for the fact that the group leader plays a prominent role in screening, monitoring and enforcement within the group.

Hermes *et al.* (2005) elaborate on this last result and investigate the role of the group leader in reducing moral hazard behaviour, using data of 102 groups from two Eritrean group lending programmes. They find evidence that monitoring and social ties of the group leader reduce moral hazard behaviour of group members. This result is not found for the other group members. In a related paper they also find evidence that the role of the group leader is most important in improving repayment performance of the group (Hermes *et al.*, 2006).

The empirical studies mentioned above present interesting results on how and why joint liability group lending works. However, they also suffer from a number of potential weaknesses. First, in most papers the link between theory and empirics is rather implicit. Many of the variables used to measure group member behaviour in terms of screening, monitoring and enforcement are only indirectly related to the contents of these concepts from a theoretical perspective. Moreover, in several cases crude, or at least one-dimensional, measures are used to proxy for complex constructs such as social ties. Finally, the empirical analyses may suffer from endogeneity problems. This may be especially problematic for studies investigating the role of social ties in mitigating information asymmetries and improving repayment rates (Karlan, 2007).

Three of the four articles in this Feature address the potential weaknesses of previous empirical work. Ahlin and Townsend (2007) explicitly derive direct empirical tests from four well-known theoretical models of adverse selection, moral hazard and social sanctions. Karlan focuses on the role of social ties in group lending and uses an empirical setting, which allows the solving of the endogeneity problem other papers suffer from when investigating this issue. Cassar *et al.* (2007) take a novel approach by carrying out microfinance experiments. In this way, they are able to analyse several different components of social ties and their influence on the working of groups. All three articles provide important contributions to a better understanding of how joint liability group lending works.

In their article, Ahlin and Townsend (2007) focus on the empirical implications of four well-known theoretical models of joint liability group lending. In particular, they

take the models Stiglitz (1990) and Banerjee *et al.* (1994) that explain how joint liability may solve moral hazard problems; they use the Besley and Coate (1995) model which describes how group lending may solve problems of limited contract enforcement by using social sanctions; and they use the Ghatak (1999) explaining how joint liability contracts help to solve adverse selection problems.

Based on these models they generate theoretical predictions regarding the determinants of the repayment performance of groups. Since the models assume different economic environments and focus on different types of problems joint liability group lending should solve, predictions regarding determinants of repayment performance may differ between models, and this is what they indeed find. In particular, they show that conflicting predictions can be found for the role of cooperation (or social cohesion) between group members, the correlation between borrower returns and the degree of joint liability in explaining repayment performance.

Using a very rich dataset containing detailed information on 262 groups of the Bank for Agricultural Copperatives (BAAC) in Thailand, Ahlin and Townsend (2007) empirically test the predictions of the four different models. They find empirical support for the fact that repayment performance is negatively associated with higher levels of relatedness and sharing within groups and with higher levels of joint liability. Their results also support the suggestion that repayment performance is positively associated with the strength of local sanctions and with higher correlations between borrower returns. Their most interesting result is that social ties between group members are not necessarily positive in promoting group repayment, which contrasts the generally accepted view in the literature.

Karlan's article investigates the role of social ties, or social connections in his terminology, in group lending by explicitly testing whether groups with stronger connections outperform those with weaker connections. As was mentioned above, most of the earlier studies on the role of social connections in group lending suffer from an endogeneity problem. It may well be that the nature of social connections correlates with other economic or social characteristics that may independently influence repayment performance. If this is the case, one cannot draw conclusions on the causal nature of the relationship between higher repayment performance and stronger social connections. Karlan (2007) is able to circumvent this endogeneity problem by making use of a natural experiment, which allows him to rule out the possibility that the nature social connections correlates with other group characteristics influencing repayment.

The empirical setting of the article focuses on the microfinance organisation FINCA-Peru. This organisation randomly creates groups: if a person wants to obtain a loan, she is put on a list, without taking into account where she lives or whether she knows the other persons who are already on the list. Once the list contains 30 persons the group can start. This process of group formation exogenously creates groups with different levels of initial social ties, which enables the actual measurement of the impact of these social ties on monitoring and enforcement efforts within the group.

The empirical analysis is based on a large dataset containing information of over 2,000 individual group members. The most important empirical result is that individual group members who have stronger social connections to other group members are more likely to repay their loans and to save more. Karlan shows that this is due to the fact that these members are better able to monitor each other and to enforce each

other's repayment. He also shows that members with stronger connections are better able to distinguish between strategic default and default due to negative external shocks, as well to distinguish between who should and who should not be punished for her behaviour. The results of the article strongly support the view that monitoring and enforcement are positively related to group performance and that social connections are important in assisting monitoring and enforcement efforts within groups.

Cassar *et al.* (2007) also focus on the importance of social ties (the authors use the term *social capital*) in explaining repayment performance of groups. Yet, they take an innovative approach to analyse this issue by using microfinance experiments. The main advantage of this approach *vis-à-vis* other approaches in the literature is that it permits the disentangling of different aspects of social capital within groups and their effects on group performance.

The authors argue that repayment by individual members depends on their belief that other members will do the same, since this will determine whether or not credit will be available to them in the next loan cycle. This belief depends, at least partially, on the existence of social capital within the group. Social capital may consist of aspects such as general trust of individual group members in the society as a whole, specific trust of one individual towards one or more group members, acquaintanceship among group members, and trust based on (positive) experiences with other group members in the past related to repayment of loans.

Cassar *et al.* (2007) use a microfinance game at two different locations: Nyanga, South Africa and Berd, Armenia. Their total sample consists of 36 microfinance groups, which include 498 individual group members. The results of their experiments provide clear evidence for the fact that different aspects of social capital have a different impact on group performance. Most importantly, they find that specific trust between group members is more important for group performance than trust in society as a whole. Moreover, social and cultural homogeneity of group members improves performance. They also find that past (positive) experience with other members helping an individual to repay her loan provides incentives to this individual to help others repaying their loans in the future. Finally, the fact that people merely know each other does not help to improve group performance. These results clearly indicate that it is really important to disentangle different aspects of social capital when explaining group repayment performance.

2. Financial Performance and Outreach

A second important issue raised in the literature on microfinance deals with the sustainability of microfinance programmes. Providing microfinance is a costly business due to high transaction and information costs. At present, a large number of microfinance programmes still depend on donor subsidies to meet the high costs, i.e. they are not financially sustainable. In the 1990s, the importance of financial sustainability of microfinance institutions gave rise to an important debate between the *financial systems* approach and the *poverty lending* approach (Robinson, 2001). If both approaches agree on the ultimate goal, which is to serve as many poor people as possible in a sustainable way, the means by which these goals should be reached differ fundamentally. The *financial systems* approach, on the one hand, emphasises the importance

of financial sustainable microfinance programmess. On the other hand, the *poverty lending* approach concentrates on using credit to help overcome poverty, primarily by providing credit with subsidised interest rates. Ultimately, the debate comes down to the question whether subsidising interest rates is justified. The advocates of the poverty reduction approach would argue that the poor cannot afford higher interest rates; hence that financial sustainability ultimately goes against the aim of serving large groups of poor borrowers. The financial services camp, however, claims that empirical evidence neither shows that the poor cannot afford higher interest rates nor that there is a negative correlation between the financial sustainability of the institution and the poverty level of the clients.

The debate between the two approaches has not been concluded yet, although the most recent microfinance paradigm seems to favour the financial systems approach. The main argument to support this view is that large-scale outreach to the poor on a long-term basis cannot be guaranteed if microfinance institutions are incapable of standing on their own feet. Nonetheless, there remains a huge variety in microfinance institutions, some of which can be characterised as subsidised credit institutions, whereas others are becoming sustainable commercial financial institutions.

This new microfinance paradigm has stimulated research on financial performance and financial efficiency of microfinance institutions. Hulme and Mosley (1996), for instance, provide alternative measures of financial performance of some microfinance institutions. By using the Subsidy Dependence Index (SDI) devised in Yaron (1992), indicating how much higher the interest rates charged to borrowers would have to be in order for the institution to cover all operating costs, Hulme and Mosley show that almost all institutes in their sample are still subsidy dependent. Morduch (1999*a*) provides a similar calculation for the Grameen Bank. He shows that, in order to become subsidy independent, the Grameen Bank would have needed to increase the lending rates by some 75% between 1985 and 1996.

Calculations of the SDI to determine financial sustainability are useful. Yet, there are also some major drawbacks. First, the SDI assumes that a rise in lending rates automatically leads to higher profits. This, however, need not be the case since higher lending rates could lead to lower profits of banks in case of adverse selection and moral hazard effects. Cull *et al.* (2007) in this Feature explicitly deal with this possibility (see below). A more general problem with focusing on SDIs is that it puts too much emphasis on financial sustainability of microfinance institutions (Morduch, 1999*a*). SDIs do not indicate to what extent subsidies are justified. A more accurate assessment of the microfinance institutions would have to compare the costs and benefits of subsidies. Unfortunately, there are only a few studies that attempt to do this. Examples of such studies are Townsend and Yaron (2001) for the BAAC in Thailand, and Khandker (2005) for the Grameen Bank in Bangladesh. These studies, although based on some far reaching assumptions, suggest that the social benefits of these microfinance institutions exceed the costs.

The greater emphasis on financial sustainability and the trend toward commercialisation of microfinance has raised concerns about the effects of this shift on outreach, or more specifically on the number (breadth) and socioeconomic level (depth) of the clients that are served by microfinance institutions. There is some discussion in the literature on the outreach of microfinance programmes. For an overall survey of recent

evidence on this issue, see Goldberg (2005). Useful overviews are also given by Weiss and Montgomery (2004), who summarise the evidence for the microfinance industry in Asia and Latin America, and Lafourcade *et al.* (2005) who focus on microfinance institutions in Africa. This literature provides mixed evidence, especially regarding depth of outreach. Some studies indicate that it is the 'better off' poor rather than the 'starkly' poor who stand to benefit most. Evidence for this is given in e.g. Hulme and Mosley (1996) and Copestake *et al.* (2005). Other studies, e.g. Khandker (2005) and EDA Rural Systems (2004), find that the extremely poor benefit more from microfinance than the moderately poor. However, most of the evidence on the depth of outreach of microfinance institutions suffers from being anecdotal and case study driven. The existing studies do not systematically explain differences in depth of outreach of microfinance institutions, nor do they explicitly explore whether there is a trade-off between the depth of outreach versus the strife for financial sustainability.

The study by Cull *et al.* (2007) provides a new dimension to the existing literature on financial performance of microfinance institutions. This study attempts to examine financial performance and outreach systematically for the first time in a large comparative study based on a new extensive data set of 124 microfinance institutions in 49 countries. The authors explicitly explore whether there is empirical evidence for a trade-off between the depth of outreach and profitability. They examine this issue by examining whether more profitability is associated with a lower depth of outreach to the poor, and whether there is a deliberate move away from serving poor clients to wealthier clients in order to achieve higher financial sustainability (mission drift). They also test whether a rise in lending rates causes a deterioration of the loan portfolio due to adverse selection and moral hazard.

A special feature of the study by Cull *et al.* (2007) is that an explicit distinction has been made between three types of microfinance institutions, i.e. group lending systems, village banking, and individual-based lending. Their dataset contains 56 individual-based lenders, 48 group-based lenders and 20 village banks. This enables them to examine the relevance of institutional design with respect to the trade-off between financial performance and depth of outreach of microfinance institutions.

The existing literature on microfinance focuses almost entirely on group lending, while hardly paying attention to other approaches to microfinance lending, e.g. individual-based lending. In the light of the current move to individual-based lending systems (even the most well-known examples of group-based lending, the Grameen Bank of Bangladesh and BancoSol of Bolivia now use individual-based models) this is a bit surprising. There is a general descriptive discussion in the literature on the advantages of group loans over individual loans (Conning, 1999; Morduch, 1999*b*). Some authors prefer individual loans because they are assumed to be more flexible, whereas others are in favour of group loans. However, until now there has been no systematic and rigorous comparison of group-based versus individual-based microfinance institutions. Cull *et al.* (2007) are the first to provide such a systematic comparison.

The results of the analyses are extremely interesting and highly policy relevant. Individual-based microfinance institutions seem to perform better in terms of profitability, but the fraction of poor borrowers and female borrowers in the loan portfolio is lower than for group-based institutions. The study also shows that a rise in interest

rates, above a certain threshold, leads to a worsening of portfolio quality in case of individual-based lending, whereas this relation does not exist for the group-based microfinance institutions. This confirms the hypothesis that screening and monitoring by peers in group-based systems helps to overcome problems of moral hazard and adverse selection. The study also suggests that individual-based microfinance institutions, especially if they grow larger, focus increasingly on wealthier clients (mission drift), whereas this is less so for the group-based microfinance institutions. Most importantly, the study strongly underlines the importance of institutional design in considering trade-offs in microfinance.

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