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Outreach and Mission Drift in Microfinance: An Interpretation of the New Trend

Maurizio Caserta
University of Catania

Francesco Reito
University of Catania

Abstract

This paper presents a theoretical description of some of the recent developments in the financial programs offered by microfinance institutions (MFIs). We show that even under for-profit MFIs, there is not necessarily a crowding out of the poorest microentrepreneurs, and that MFIs may optimally choose to offer both joint liability contracts (to poor borrowers) and individual liability contracts (to wealthier borrowers).

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Contact: Maurizio Caserta - caserta@unict.it, Francesco Reito - reito@unict.it.
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1. Introduction

This paper proposes a theoretical interpretation of some of the new tendencies in microfinance programs. Recently, a number of economists have pointed out the fact that many microfinance institutions (MFIs) have increased their attention towards financial sustainability and profitability[1]. Namely, there seems to be a shift, termed as "mission drift", from the classic outreach towards low-income people, to a new emphasis on wealthier clients[2] who need larger loans. More to the point, Armendariz de Aghion and Szafarz (2011) argue that the depth of mission drift is well described by the dynamics of the average loan size provided by MFIs. They relate mission drift to the increase on the loan size received by wealthier borrowers, when this increase is neither justified by cross-subsidization among different risk-type clients, nor by progressive lending, in which borrowers receive larger loans as they successfully repay initial small loans. They posit that this tendency is motivated by a profit-seeking behavior of MFIs which find it profitable to focus on richer clients who ask for larger loans. The reason may be the high cost differential of providing loans to poor or richer customers. Indeed, an extensive body of the literature on microfinance reports that small loans provided to the poor are relatively more costly, in terms of administration and monitoring costs, than larger loans designed for wealthier borrowers[3]. On the other hand, larger loans may be associated with lower unit costs, since richer borrowers may be better-known clients, or own some physical property to offer as collateral. Besides, perhaps due to lack of collateral, poorer borrowers are in general served by joint liability programs, while richer borrowers often receive individual loans. This empirical evidence is discussed in Madajewicz (2003) and Ahlin and Townsend (2007) who find that in microfinance the proportion of group loans declines with wealth in favor of individual loans.

The alleged departure from the more traditional goals of MFIs, in some cases, may raise a concern that there will be less interest in lending to the poorest of the poor. For instance, Yunus (2007) views the behavior of profit-maximizing MFIs as exploitative, and a major obstacle to a sustainable economic growth for less developed countries. However, the impact of for-profit MFIs on poverty is not uncontroversial. Commercial lenders, indeed, may provide financial services in contexts where people have no other regular access to the credit market. So, it is at least disputable whether we should care more about the access to microcredit, regardless of the financial conditions of poor entrepreneurs. This view is shared, for example, by Morduch (2000) and Cull et al. (2009).

In the present paper, we argue that MFIs, instead of crowding out the poorest borrowers, can optimally choose to offer a mixture of joint and individual liability contracts. Low-average loans received by the poor under group lending, and high-average individual loans received by wealthier clients, can both coexist as segments of the same credit market[4]. According to the empirical literature, we also show that individual lending always produces a larger net expected surplus with respect to group lending. Thus, we implicitly derive that both forms of contracts can actually coexist as long as MFIs are not restricted by limited loanable funds. We analyze a simple model where some potential firms/entrepreneurs have access to an investment project. The project's expected outcome depends on the level of effort exerted by the entrepreneur. If the effort applied is high, the project has a positive expected net product while, if the effort is low, the project is inefficient as the expected product does not cover the resources employed. Entrepreneurs are of two different wealth classes, the *poor*

[1] Some examples are Mosley (1996), Ahlin and Townsend (2007), Cull et al. (2009), and Hermes et al. (2011).
[2] Wealthier borrowers should be more properly seen as less-poor borrowers.
[3] See, for some examples, Moll (2005), Roodman and Qureshi (2006), and Hermes et al. (2011).
[4] This mixture of contracts is also explored and analyzed in Armendariz de Aghion and Morduch (2000), Navajas et al. (2001), and Burton (2011).

with no endowment, and the *rich* with some endowment which can be offered as collateral. Both types of entrepreneurs need outside financing, and loans are provided by a single MFI. We will consider the simplifying case of a for-profit monopolistic MFI, which is interested in maximizing its expected profit[5]. The MFI faces a moral-hazard problem since the effort level chosen by each entrepreneur is private information. To circumvent the information asymmetry, the MFI can offer two alternative forms of incentive compatibility contracts, individual liability and joint liability contract. The individual contract is a standard debt contract whereby the borrower repays the loan if the final outcome is positive, and loses the collateral (if any) if the project fails. Under a joint liability contract, instead, we assume that the bank asks borrowers to form groups of two, where a successful member must pay an additional joint liability component if the other member fails. To simplify, we also assume that the hazard problem does not depend on the contractual arrangement adopted by the MFI[6]. We show that there are, respectively, *i*) a critical threshold of collateral characterizing the individual contract, and *ii*) a threshold of joint liability payment characterizing the joint liability contract.

i) Under an individual contract, if a borrower's endowment is above the critical threshold of collateral, the bank is able to extract all the trade surplus, while if it is below the bank and the firm share the rent produced. The for-profit MFI will then choose to offer the individual contract to all borrowers who can post this amount of collateral.

ii) If the endowment is lower than the collateral needed for an individual contract, borrowers will receive joint liability contracts. In this case, the for-profit MFI will require a given threshold of joint liability payment in order again to extract the entire surplus from each group member.

Our paper is close to Madajewicz (2011), with some important differences in the model structure and conclusions. The main difference is that, in Madajewicz (2011), lenders are assumed in perfect competition. In this case, the financial contract is actually chosen by borrowers, who receive the entire surplus from trade. So, borrowers may prefer joint liability contracts if they are very poor, and then shift to individual contracts whenever they accumulate the collateral needed by banks to break even on larger loans. That is, the model by Madajewicz (2011) does not refer to a mission drift of MFIs, and seems to well describe the increase in average loan size due to the incentive mechanism of progressive lending. This is in contrast to the present paper where, under for-profit MFIs, borrowers do not obtain a share of the contractual rent and cannot accumulate the sum needed to be eligible for larger loans. In our paper, MFIs may decide to reach out to (already) wealthier borrowers as a result of their optimization programs.

Section 2 introduces the main features and assumptions of the model. Section 3 derives the equilibrium contractual terms under a for-profit MFI. Section 4 concludes.

2. The Setup

Consider a simple one-period economy. There is a large number of risk neutral potential firms/entrepreneurs, and each one has access to an investment project. The project's expected return is related to the level of effort chosen by the entrepreneur, and is equal to

[5] See the paper by Beck et al. (2006) on bank concentration. Empirical examples of monopolistic and for-profit behavior are reported in Roodman and Qureshi (2006), Armendariz de Aghion and Szafarz (2011), and de Quidt et al. (2011). For-profit MFIs are also analyzed from a pure theoretical perspective in Becchetti and Pisani (2010), and Gosh and van Tassel (2011).

[6] This is in line with the data analyzed by Giné and Karlan (2009), who show that repayment rates do not change when MFIs shift their focus from joint to individual programs.

$p_a y_a(L)$ if the entrepreneur exerts *high* effort, or
$p_b y_b(L)$ if the entrepreneur exerts *low* effort.

In words, under high effort the firm succeeds with probability p_a and gives a final return of $y_a(L)$, whereas with probability $1-p_a$ it fails and gives nothing. In the case of low effort, the project becomes riskier since it yields, in case of success, a return $y_b(L) > y_a(L)$, but with a probability $p_b < p_a$. Assume that the final returns $y_a(L)$ and $y_b(L)$ are net of effort costs, continuous and increasing functions of *L*, i.e. $y'_a(L) > 0$ and $y'_b(L) > 0$. Consider also strict concavity, $y''_a(L) < 0$ and $y''_b(L) < 0$.
Potential entrepreneurs are of two different observable wealth classes: the *poor* with no endowment, and the *rich* with an endowment $w \geq \overline{w}_3$ (to be defined below). The endowment of the rich cannot be used directly for the start up, but can be offered as collateral[7]. Thus, both types of firms need an outside loan to undertake their projects. Loans are provided by a single risk neutral lender/bank. We will consider the case of a for-profit bank which is interested in maximizing its expected profit. The lender can offer one of two alternative forms of contract: individual liability contract or joint liability contract. The individual liability contract is a standard debt contract $[L, R(L), C(L)]$, where L is the loan size to extend to each borrower, $R(L)$ is the (gross) repayment sum, and $C(L)$ is the collateral (if any). In a joint liability contract, the bank asks the borrowers to form groups of two. Under this arrangement, a successful borrower must pay an additional joint liability component, $D(L)$, if the other borrower does not obtain a positive outcome.

The bank has imperfect information about the effort chosen by the entrepreneur and, since this choice is not contractible, we have a moral-hazard problem. The final return, instead, is publicly observable. The bank bears also the administrative percentage cost, σ, of providing the loan and supervising the project procedure. In contrast to Madajewicz (2011), we do not consider a monitoring activity, neither among borrowers, nor performed by the lender[8].
Assume also that the entrepreneurial process is efficient from a social viewpoint only if high effort is applied, i.e.

$$p_b y_b(L) < (1+\sigma)L < p_a y_a(L) \quad \text{for each } L. \tag{1}$$

Namely, in contrast to the moral-hazard section of Stiglitz-Weiss (1981), the high-effort project produces a larger expected gross return independently of the loan size, but the low-effort outcome never covers the resources invested.
To simplify the notation in the following we consider (and use interchangeably) $y_a(L)$, $y_b(L)$, $R(L)$, $C(L)$ and $D(L)$ respectively as y_a, y_b, R, C and D.

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[7] The endowment can be interpreted as a physical asset that cannot be used directly in the productive project. We could also view the asset offered as "notional collateral", in the sense that, give the very low market value, the collateral is mainly used to motivate repayment and not to recover the lender's loss in case of project failure.
[8] It is recognized that a monitoring technology may alleviate the asymmetric-information problem in a moral-hazard setting.

3. For-Profit MFI

3.1 *Benchmark case*

As a benchmark, this section derives the individual liability contract terms for a firm with a generic endowment level of $w > 0$. The bank observes w and proposes the triple $[L,(R,C)]$. We first derive the equilibrium repayment sum and collateral, and then the equilibrium loan size.

Equilibrium *R* and *C*

Firm's payoff under the contract $[L,(R,C)]$ is

$$u[L,(R,C)] = \begin{cases} w + p_a(y_a - R) - (1-p_a)C & \text{for high effort,} \\ w + p_b(y_b - R) - (1-p_b)C & \text{for low effort.} \end{cases} \tag{2}$$

The entrepreneur chooses high effort only if its incentive compatibility constraint is satisfied, i.e. iff

$$p_a(y_a - R) - (1-p_a)C \geq p_b(y_b - R) - (1-p_b)C\,, \tag{IC}$$

or, equivalently, if $R \leq \overline{R} + C$, where $\overline{R} = (p_a y_a - p_b y_b)/(p_a - p_b)$. Low effort is chosen if (*IC*) does not hold. In both cases, the participation constraint must be satisfied, i.e.

$$u[L,(R,C)] \geq w. \tag{PC}$$

It is $\overline{R} < y_a$ (as this reduces to $p_b y_b > p_b y_a$) for each L, so the only way for the bank to extract all the rent is by means of the collateral.
The final payoffs depend on whether the borrower applies low or high effort.
In case of low effort, bank's payoff is

$$\pi[L,(R,C)] = p_b R + (1-p_b)C - (1+\sigma)L\,, \tag{3}$$

where $\overline{R} + C < R \leq y_b - (1-p_b)C/p_b$. The term $y_b - (1-p_b)C/p_b$ is the repayment sum such that the (*PC*) is binding and the firm obtains $u[L,(R,C)] = w$.
In the (hypothetical) low-effort equilibrium, the bank would set $R = y_b - (1-p_b)C/p_b$, and obtain $\pi[L,(R,C)] = p_b y_b - (1+\sigma)L$, where all the surplus is extracted. However, since low-effort is inefficient for (1), the bank will never promote this solution[9]. Bank's choice is then restricted to the contract promoting high effort.

In case of high effort, the bank obtains

$$\pi[L,(R,C)] = p_a R + (1-p_a)C - (1+\sigma)L\,, \tag{4}$$

where the following inequalities,

[9] This does not necessarily imply that it is never beneficial for the firm to choose the low-effort strategy.

$R \le \overline{R} + C$, and $C \le \min\{w, \overline{w}\}$

must hold. The term[10] $\overline{w}$ is equal to $p_a(y_a - \overline{R})$, i.e. is the level of collateral such that for the firm it is $u[L,(R,C)] = w$. Thus, the $\min\{w, \overline{w}\}$ is the highest collateral that the bank can ask in case of project failure. When $\overline{w} < w$, the bank is forced to require a collateral lower than the endowment, otherwise the firm would not accept the contract.
For the assumption of profit-maximizing behavior, in the high-effort equilibrium it is $R = \overline{R} + C$, and (4) can be rewritten as

$$\pi[L,(R,C)] = p_a \overline{R} + \min\{w, \overline{w}\} - (1+\sigma)L. \tag{4'}$$

Note that $y_a > \overline{R} + \overline{w}$ as this reduces to $(1-p_a)p_b(y_b - y_a)/(p_a - p_b) > 0$. The equilibrium payoffs will now depend on the $\min\{w, \overline{w}\}$.

If the bank provides a loan size, *L*, such that the $\min\{w, \overline{w}\} = \overline{w}$, we have that $C = \overline{w}$, the (*PC*) is binding, and the firm ends up with

$$u[L,(R,C)] = w, \tag{5}$$

while the bank receives

$$\pi[L,(R,C)] = p_a \overline{R} + \overline{w} - (1+\sigma)L = p_a y_a - (1+\sigma)L = \overline{\pi}(L), \tag{6}$$

that is the first-best profit. As a result, if the collateral is larger or equal to $\overline{w}$, all the contractual rent is extracted by the bank as in a full-information setting.

If, instead, the bank provides a loan such that the $\min\{w, \overline{w}\} = w$, $C = w$, and the final profits are

$$u[L,(R,C)] = \overline{w}, \tag{5'}$$

and

$$\pi[L,(R,C)] = p_a \overline{R} + w - (1+\sigma)L = \pi(L). \tag{6'}$$

This time, if the collateral is lower than $\overline{w}$, the entrepreneur obtains something above the outside option, and the bank is no longer able to gain all the surplus[11].

Equilibrium *L*
By inspection of (6) and (6'), we can distinguish the following three cases.

[10] We again use interchangeably $\overline{w}$ for $\overline{w}(L)$.
[11] In Reito (2011) the firm can strategically choose to offer the lowest possible amount of collateral in order to always receive a share of the rent.

case a: for L such that $\overline{w} = w$, it is $\overline{\pi}(L) = \pi(L)$;
case b: for L such that $\overline{w} < w$, it is $\overline{\pi}(L) < \pi(L)$;
case c: for L such that $\overline{w} > w$, it is $\overline{\pi}(L) > \pi(L)$.

Besides, for the remainder, denote by:

L_1 the loan such that $\overline{\pi}(L) = \pi(L)$;
L_2 the loan such that $\pi(L)$ is maximized;
L_3 the loan such that $\overline{\pi}(L)$ is maximized;
L_4 the loan such that $\pi(L) = 0$.

To restrict the analysis, in the remainder we will only consider the case where $\pi(L_2) \geq 0$, that is where the maximum of the second-best bank's profit function is weakly positive at L_2. Given the cases *a*, *b* and *c* above, we can derive the firm's profit as a function of L, i.e.

$$u[L,(R,C)] = \begin{cases} w, \text{ for } L \in [0,\ L_1) \quad \text{and} \\ \overline{w}, \text{ for } L \in [L_1,\ L_4]. \end{cases} \tag{7}$$

Indeed, for $L \in [0,\ L_1)$, the $\min\{w, \overline{w}\} = \overline{w}$ and the firm obtains w, while for $L \in [L_1,\ L_4]$, the $\min\{w, \overline{w}\} = w$ and the firm receives $\overline{w}$.
Similarly, for the bank, the profit function is

$$\pi[L,(R,C)] = \begin{cases} \overline{\pi}(L), \text{ for } L \in [0,\ L_1) \quad \text{and} \\ \pi(L), \text{ for } L \in [L_1,\ L_4]. \end{cases} \tag{8}$$

Again, because for $L \in [0,\ L_1)$, the $\min\{w, \overline{w}\} = \overline{w}$ and the bank receives $p_a y_a - (1+\sigma) L = \overline{\pi}(L)$, while for $L \in [L_1,\ L_4]$, the $\min\{w, \overline{w}\} = w$ and the bank gets $p_a \overline{R} + w - (1+\sigma) L = \pi(L)$.

The following proposition derives a general rule to determine the optimal L chosen by the bank.

Proposition 1. Given w*, the bank has three possible loan choices:*
1) If $d\pi(L)/dL > 0$ *in* $L = L_1$*, the bank chooses* L_2*, i.e. the loan that maximizes* $\pi(L)$.
2) If $d\pi(L)/dL \leq 0$ *in* $L = L_1$ and $L_1 \leq L_3$*, the bank chooses* L_1*, i.e. the loan such that* $\overline{\pi}(L) = \pi(L)$.
3) If $d\pi(L)/dL \leq 0$ *in* $L = L_1$ and $L_1 > L_3$*, the bank chooses* L_3*, i.e. the loan that maximizes* $\overline{\pi}(L)$.

Proof. First, we need to show that $L_2 < L_3$. The loan size which maximizes $\overline{\pi}(L)$, i.e. L_3, is the loan implicitly derived by $y_a'(L) = (1+\sigma)/p_a$. Since it is $\overline{R} < y_a$, we can write the second-best profit function $\pi(L) = p_a \overline{R} + w - (1+\sigma) L$ as $p_a \beta y_a + w - (1+\sigma) L$, where $\beta < 1$. The loan size which maximizes $\pi(L)$ is therefore implicitly defined by $y_a'(L)=(1+\sigma)/\beta p_a$. Thus, it is $L_2 < L_3$.

1) If $d\pi(L)/dL > 0$ in $L = L_1$, the profit function $\pi(L)$ is increasing in L after L_1. For all $L \le L_1$, i.e $\forall L$ such that $\overline{w} < w$, we have $\overline{\pi}(L) < \pi(L)$ for the case *b* above. For (8), in this case, the profit function to consider for the bank is $\overline{\pi}(L)$. Instead, for all $L > L_1$, i.e. $\forall L$ such that $\overline{w} > w$, we have $\overline{\pi}(L) > \pi(L)$ and, for (8), the profit function to consider is $\pi(L)$. This implies that for $L > L_1$, the bank cannot reach the maximum of $\overline{\pi}(L)$ and the relevant profit function is $\pi(L)$. Thus, the bank will choose the loan which maximizes $\pi(L)$. This solution does not depend on w (this is not a choice variable for the bank).

2) If $d\pi(L)/dL \le 0$ in $L = L_1$ and $L_1 \le L_3$, for all $L \le L_1$, i.e $\forall L$ such that $\overline{w} < w$, we have $\overline{\pi}(L) < \pi(L)$ for the case *b* above. For (8), the profit function to consider for the bank is $\overline{\pi}(L)$. Since this function is increasing for all $L < L_1$ when $L_1 \le L_3$, it is profitable to increase L until it is $\overline{\pi}(L) = \pi(L)$. On the other hand, for all $L > L_1$, i.e. $\forall L$ such that $\overline{w} > w$, we have $\overline{\pi}(L) > \pi(L)$ and, for (8), the relevant profit function is $\pi(L)$. Since that is decreasing for all $L > L_1$ if $d\pi(L)/dL \le 0$, it is better to lower L. As a result, the equilibrium loan is L_1.

3) If $d\pi(L)/dL \le 0$ in $L = L_1$ and $L_1 > L_3$, for all $L \le L_1$, i.e $\forall L$ such that $\overline{w} < w$, the only profit function to consider for the bank is $\overline{\pi}(L)$. Thus, the bank will choose L_3. ■

Note that in the second and third part of proposition 1, the firm receives a loan that is not directly corresponding to the collateral offered.

3.2 *Individual Liability Contract*

From the previous analysis, it is clear that the for-profit bank will offer the individual liability contract for all borrowers with an endowment $w \ge \overline{w}_3$. Thus, $\overline{w}_3$ can be defined as the level of collateral such that the bank is able to extract all potential surplus, and achieve the maximum of the profit function $\overline{\pi}(L)$. The following proposition characterizes the optimal choice of the bank under this arrangement.

Proposition 2: All borrowers with $w \ge \overline{w}_3$ receive the financial contract $[L_3, R(L_3), C(L_3)]$, where $\overline{w}_3 = p_a[y_a(L_3) - \overline{R}(L_3)]$, and L_3 is the loan size which maximizes the bank's expected (high-effort) profit function $p_a y_a(L) - (1+\sigma)L = \overline{\pi}(L)$.

3.3 *Joint Liability Contract*

In the benchmark case of subsection 3.1, we derived that for all $w < \overline{w}_3$, the firm and the bank share the surplus produced under individual liability lending. This would be also true for all borrowers with no endowment, so that the only way for the bank to extract all their project surplus is by means of an additional form of guarantee. This subsection will show that, for all borrowers with zero endowment, the bank may prefer to offer joint liability contracts. To simplify, we consider only groups of two members. In this case, each successful borrower, in addition to the repayment, R, must pay an additional sum, D, if the other borrower does not obtain a positive outcome.

In the following description of the joint liability scheme, it is convenient to make three additional assumptions. The first is that the bank's administrative costs of providing a loan under group lending are higher than those under individual lending, i.e. $\sigma_J > \sigma$. This cost differential may reflect the fact that it is more difficult to deal with poor borrowers, or that the lender internalizes the peer monitoring costs that group partners face under this type of contract. The second assumption is that borrowers are able to costless observe each other's effort level. This gives borrowers an informational advantage over the lender[12]. The third assumption is that the probabilities of success among borrowers are uncorrelated.

Under the joint contract $[L,(R,D)]$, the expected payoff of a borrower, when both group members choose the *same* effort level, is

$$u[L,(R,D)] = \begin{cases} p_a p_a (y_a - R) + p_a(1-p_a)(y_a - R - D) & \text{for high effort,} \\ p_b p_b (y_b - R) + p_b(1-p_b)(y_b - R - D) & \text{for low effort,} \end{cases}$$

or, simplifying,

$$u[L,(R,D)] = \begin{cases} p_a (y_a - R) - p_a(1-p_a)D & \text{for high effort,} \\ p_b (y_b - R) - p_b(1-p_b)D & \text{for low effort.} \end{cases} \tag{9}$$

We can show that both group members always choose the same effort level, even when ex-post side transfers among borrowers are possible[13]. The argument is as follows. Define the expected loss of a borrower who applies high effort, when the other member chooses low instead of high effort, as

$$[(p_a(y_a - R) - p_a(1-p_b)D) - (p_a(y_a - R) - p_a(1-p_a)D)] = -p_a(p_a - p_b)D .$$

Define also the expected gain of a borrower who exerts low effort, when the other member chooses high instead of low effort, as

$$[(p_b(y_b - R) - p_b(1-p_a)D) - (p_b(y_b - R) - p_b(1-p_b)D)] = p_b(p_a - p_b)D .$$

Since $-p_a(p_a - p_b)D > p_b(p_a - p_b)D$, members will never choose different effort levels. This property may be considered as the moral-hazard version of the positive assortative matching under adverse selection of Ghatak (1999) and Van Tassel (1999).

Incentive compatibility now requires that

$$p_a(y_a - R) - p_a(1-p_a)D \geq p_b(y_b - R) - p_b(1-p_b)D , \tag{IC_J}$$

or $R \leq \overline{R} + (p_a + p_b - 1)D$. In what follows, we will only consider the case where[14] $p_a + p_b - 1 > 0$.

[12] Had we assumed no informational advantage of group members over the bank, the analysis would be more complicated but qualitatively unaltered (see, in an adverse-selection setting, Armendariz de Aghion and Gollier, 2000).

[13] The transfer can be interpreted as a promise to pay the partner out of the final return produced, if positive.

[14] This assumption allows the bank to extract all the rent. If it is $p_a + p_b - 1 < 0$, the final surplus is always shared between the bank and the firm.

The borrowers' participation constraint under group lending is

$$u[L,(R,D)] \geq 0. \qquad (PC_J)$$

Equilibrium *R* and *D*

In a for-profit equilibrium, $R = \overline{R} + (p_a + p_b - 1)D$, and D derives from the binding (PC_J), i.e. from

$$u[L,(R,D)] = p_a(y_a - \overline{R} - (p_a + p_b - 1)D) - p_a(1 - p_a)D = 0,$$

which gives an equilibrium $D = (y_b - y_a)/(p_a - p_b) = \overline{D}$. It is $y_a > \overline{R} + (p_a + p_b - 1)D$ since this inequality can be rewritten as $[(1 - p_a)(y_b - y_a)]/(p_a - p_b) > 0$.

The final payoffs are

$$u[L,(R,D)] = 0, \qquad (10)$$

for each group member, and

$$\pi[L,(R,D)] = p_a y_a - (1+\sigma_J)L = \overline{\pi}_J(L), \qquad (11)$$

for the bank. As a result, through the additional guarantee provided by the mutual payment, the bank is again able to gain the whole surplus even under group lending.

Equilibrium *L*

Since the loan provided by the bank, L_J, is implicitly derived by the first-order condition $y_a'(L) = (1+\sigma_J)/p_a$, we can say that it is always $L_J < L_3$, i.e. the group loan is smaller than the individual loan derived in subsection 3.2.

It is important to point out that, even for very poor entrepreneurs, the bank may find it profitable to offer individual liability loans. This happens when the bank's expected profit under individual lending (with zero collateral), $p_a \overline{R} - (1+\sigma)L = \pi(L)$, is higher than $\overline{\pi}_J(L)$. We nevertheless have that the loan size which maximizes $\pi(L)$, i.e. L_2, is smaller than the loan which maximizes the bank's expected profit on the rich, $p_a y_a - (1+\sigma)L = \overline{\pi}(L)$, i.e. L_3. Therefore, we can state the following

Proposition 3: Poor entrepreneurs always receive a smaller loan than richer entrepreneurs.

Proposition 3 can explain why MFIs, as reported for example by Armendariz de Aghion and Szafarz (2011), tend to diversify their businesses by reaching out to wealthier clients through an increase on the average loan size.

Note that, in this group lending scheme, and under a for-profit lender, it is always $R = \overline{R} + (p_a + p_b - 1)D > D$, so that we do no derive the ex-post incentive compatibility problem pointed out by Gangopadhyay et al. (2005), namely the incentive for group members, when $R < D$, to declare that both had success when one of them actually failed, in order to reduce their joint payments.

An implication of the analysis developed so far is that, as emphasized by Cull et al. (2009), individual loans perform better in terms of profitability than joint liability loans.

Another implication is that, unless MFIs have limited access to loanable funds, the new focus on profitability does not necessarily imply less poverty reduction. Clearly, with a constraint on available funds, a for-profit MFI would first choose to lend to wealthier clients, and then to poor entrepreneurs, so that some of them may be credit rationed. As a result, we can state the following

Proposition 4: Even under a for-profit MFI, if investment funds are not constrained, there is not a crowding out of the poorest borrowers.

4. Conclusions

In this paper, we analyze the recent behavior of microfinance institutions to explore whether, under the pressure of economic profitability, there should necessarily be a crowding out of the poorest would-be entrepreneurs. In other words, whether there is a "mission drift" towards richer borrowers which are more profitable for lenders.

We show that MFIs can optimally choose to offer both joint and individual liability contracts: the very poor entrepreneurs may receive low-average loans under a group-lending arrangement, while wealthier entrepreneurs may receive high-average loans under an individual liability scheme. This implies that, as long as for-profit MFIs have no limited funds, a drift in the mission of MFIs should not necessarily be accompanied by a disruption of the classic forms of lending to the poor.

Future research may help to further define the optimal mixture of individual and joint contracts that a MFI would choose if loanable funds are constrained. In particular, while it is rather intuitive that a for-profit MFI would prefer to lend to wealthier clients, it is not so straightforward if MFIs are not-for-profit organizations.

References

Ahlin, C. and R. M. Townsend (2007) "Financial Performance and Outreach: A Global Analysis of Lending Microbanks" *Economic Journal* **117**, F107–F133.

Armendariz de Aghion, B. and R. Gollier (2000) "Peer Group Formation in an Adverse Selection Model" *Economics Journal* **110**, 632–643.

Armendariz de Aghion, B. and R. Morduch (2000) "Microfinance Beyond Group Lending" *Economics of Transition* **8**, 401–420.

Armendariz de Aghion, B. and A. Szafarz (2011) "On Mission Drift in Microfinance Institutions" in *The Handbook of Microfinance*, London-Singapore: World Scientific Publishing.

Becchetti, L. and F. Pisani (2010) "Microfinance, Subsidies and Local Externalities" *Small Business Economics* **34**, 309–321.

Beck, T. and A. Demirguc-Kunt and R. Levine (2006) "Bank Concentration, Competition and Crises: First Results" *Journal of Banking and Finance* **30**, 1581–1603.

Burton, J. C. (2011) "The Evolution Away from Joint Liability Lending" *Working Paper*.

Cull, R. and A. Demirguc-Kunt and J. Morduch (2009) "Microfinace Meets the Market" *Journal of Economic Perspectives* **23**, 167–192.

de Quidt, J. and T. Fetzer and M. Ghatak (2011) “Microfinance, Social Capital, and For-Profit Lending” *Workin Paper*.

Gangopadhyay, J. E. and M. Ghatak and R. Lensink (2005) “Joint Liability Lending and the Peer Selection Effect” *Economic Journal* **115**, 1005–1015.

Ghatak, M. (1999) “Group Lending, Local Information and Peer Selection” *Journal of Development Economics* **60**, 27–50.

Ghosh, S. and E. Van Tassel (2011) “Microfinance and Competition for External Funding” *Economics Letters* **112**, 168–170.

Giné, X. and D. Karlan (2009) “Group versus Individual Liability: Long Term Evidence from Philippine Microcredit Lending Groups” *Working Paper*.

Hermes, N. and R. Lensink and A. Meesters (2011) “Outreach and Efficiency of Microfinance Institutions” *World Development* **39**, 938–948.

Madajewicz, M. (2003) “Does the Credit Contract Matter? The impact of Lending Programs on Poverty in Bangladesh” *Working Paper*.

Madajewicz, M. (2011) “Joint Liability Versus Individual Liability in Credit Contracts” *Journal of Economic Behavior & Organization* **77**, 107–123.

Moll, H. A. J. (2005) “Microfinance and Rural Development A Long-Term Perspective” *Journal of Microfinance* **7**, 13–31.

Morduch, J. (2000) “The Microfinance Schism” *World Development* **28**, 617– 629.

Mosley, P. (1996) “Metamorphosis from NGO to commercial bank: The case of Bancosol in Bolivia” in *Finance Against Poverty*, London: Routledge.

Navajas, S. and J. Conning and C. Gonzalez-Vega (2003) “Lending Technologies, Competition and Consolidation in the Market for Microfinance in Bolivia” *Journal of International Development* **15**, 747–770.

Reito, F. (2011) “Unproductive Investment and Rent Extraction” *Bulletin of Economic Research* **63**, 213–230.

Roodman, D. and U. Qureshi (2006) “Microfinance as Business” *Working Paper*.

Stiglitz, J. E. and A. Weiss (1981) “Credit Rationing in Markets with Imperfect Information” *American Economic Review* **71**, 393–410.

Van Tassel, E. (1999) “Group Lending under Asymmetric Information” *Journal of Development Economics* **60**, 3–25.

Yunus, M. (2007) “Remarks by Muhammad Yunus, Managing Director, Grameen Bank” *Microcredit Summit E-News*.