Centre Emile Bernheim
Research Institute in Management Sciences

Solvay Brussels School
Economics & Management

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Marc Labie, Carolina Laureti and Ariane Szafarz

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JEL Classifications: D03, D82, D91, G21, O12.

CEB Working Paper N° 13/044
December 2013

Université Libre de Bruxelles - Solvay Brussels School of Economics and Management
Centre Emile Bernheim
ULB CP114/03 50, avenue F.D. Roosevelt 1050 Brussels BELGIUM
e-mail: ceb@admin.ulb.ac.be Tel. : +32 (0)2/650.48.64 Fax: +32 (0)2/650.41.88

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Marc Labie
Université de Mons (UMONS), HumanOrg, and CERMi
marc.labie@umons.ac.be

Carolina Laureti
Université de Mons (UMONS), HumanOrg, and CERMi
carolina.laureti@umons.ac.be

Ariane Szafarz
Université Libre de Bruxelles (ULB), SBS-EM, CEB and CERMi
aszafarz@ulb.ac.be

December 7, 2013

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* The authors thank Christina Czura, Michael Hamp, Hugues Pirotte, the participants in the Second European Conference on Microfinance in Groningen (June 2011), and the participants in the CERMI Research Day in Brussels (March 2012) for helpful comments on previous versions of the paper. Carolina Laureti and Marc Labie acknowledge the support of an Action de Recherche Concertée (ARC) research grant from UMONS. Ariane Szafarz benefited from the financial support of the Interuniversity Attraction Pole on social enterprise, funded by the Belgian Science Policy Office.

Abstract

The success of microfinance rests upon product simplicity, standardization, and the capacity to stimulate client discipline. However, poor people desperately need flexible financial products to improve their day-to-day money management and cope with shocks. This paper discusses how microfinance institutions could design flexible products efficiently. First, we clarify the concept of financial flexibility. Second, based on literature in microfinance, banking, and behavioral economics, we summarize the state of knowledge on the trade-off between flexibility and client discipline. Last, we weigh the advantages and disadvantages of the few flexible products already implemented by microfinance institutions worldwide.

1. Introduction

The success of the microfinance industry largely rests upon product simplicity, standardization, and the capacity to stimulate client discipline (Armendariz and Morduch, 2010). The typical features of microcredit, the most widespread product, include short-term duration, small regular installments–weekly, biweekly, or monthly–starting right after loan disbursement, progressive lending, and zero tolerance toward default. Over the years, these features have proven to stimulate clients' repayment conduct and create economies of scale. However, they have also resulted in a lack of flexibility.

Nevertheless, poor people desperately need flexible financial products to improve their day-to-day money management and cope with shocks, such as drought, flood, loss of assets, loss of employment, and health emergencies (Collins *et al.*, 2009). The challenge is thus finding how microfinance institutions (MFIs) can offer flexible financial products in the most cost-efficient way. This paper opens avenues in that direction.

Why are most MFIs reluctant to supply flexible products to the poor? The reasons are threefold. First, many MFIs still believe that flexibility and client discipline are incompatible. In fact, however, financial products can be designed to combine flexibility and discipline. For instance, flexible products can embed harsh penalties for default and/or high rewards for timely repayment. In practice, MFIs exert disciplinary leverage through social collateral, reputational incentives, and psychological sanctions. In addition, moral hazard may be mitigated through prior information (Boucher and Guirkinger, 2007), close monitoring, and real-time verification of the client's situation. These mechanisms, however, have limitations and increase operational costs. An alternative is relationship banking, which allows MFIs to collect client-specific information through multiple interactions (Boot, 2000).

The second reason is that specific financial risks can make MFIs steer clear of flexible products. The main risk associated with flexibility is liquidity risk. When clients have the option to delay payments or interrupt savings, an MFI needs to hedge against cash shortages. In practice, it does so by means of low-yield liquid reserves (Czura *et al.*, 2011; Karlan and Mullainathan, 2006). A major risk, however, is the occurrence of aggregate shocks (Acharya *et al.*, 2013), which lead to sudden increases in deposit withdrawals, loan renegotiations, and takedowns under revolving credit agreements. In this regard, the microfinance industry is worse-off than banks in developed countries because poor people have little access to efficient insurance contracts. The provision of flexible microfinance products is threatened not only by human panic, but also by exceptional circumstances such as climatic disasters and epidemics.

The third factor dissuading MFIs from supplying flexible products relates to staff fraud. When repayment schedules are not predetermined, credit officers in charge of collecting cash from clients may be tempted to under-report repayments and withhold a significant amount of money (Aubert *et al.*, 2009; Jeon and Menicucci, 2011).[1] Standard wage incentive schemes based on portfolio quality are insufficient to discipline credit officers and avoid shirking.

To challenge the common wisdom that flexibility and discipline are not reconcilable in a single financial product, this paper summarizes the state of knowledge on designing flexible products and suggests avenues to put them into practice in microfinance. It also draws on the few successful examples of flexible products already implemented by MFIs worldwide. From a theoretical standpoint, the paper unifies contributions from different literature streams and extends the flexibility-versus-commitment debate to microfinance. A practical addition is an improvement in the design of financial products supplied by MFIs.

[1] Lack of monitoring can result in an increase in discriminatory loan granting (Agier and Szafarz, 2013a). If credit officers have the power to (re)negotiate the terms of credit with their clients, they may be tempted to abuse this power and exert unfair discretion in decision making.

The rest of the paper is organized as follows. Section 2 clarifies the concept of financial flexibility and explains why the poor need flexible products. Section 3 concentrates on the trade-off between flexibility and client discipline. Section 4 discusses the design of flexible microfinance products. Section 5 concludes.

2. Flexible Products for the Poor

According to Collins *et al.* (2009, p. 181), product flexibility refers to the "ease with which transactions can be reconciled with cash-flows".[2] In this section, we explain why flexible financial products are important to poor people. Next, we refine the general definition of flexible products by distinguishing three types of flexibility: *ex-ante*, *ex-post*, and full flexibility. Each type is illustrated by means of existing microfinance contracts. That said, these contracts are the exception to the rule of highly rigid contracts in the microfinance industry.

Flexible financial products are important to poor people for day-to-day money management and also for coping with adverse shocks. Poor people's income is mostly irregular and unpredictable. They are vulnerable both to collective shocks, such as floods or seasonal famines (Shoji, 2010, 2012; Khandker *et al.*, 2012), and to the individual shock of sickness, theft, and loss of assets. Hedging against these risks is mostly impossible. Formal insurance is rare and informal mechanisms are inefficient and costly. Collins *et al.* (2009) state that poor households in India, Bangladesh, and South Africa use imperfect devices to cope with risks. They mostly rely on easy-to-access loans from family and friends, and postpone repayments of existing loans. Robinson

[2] In the banking literature, "financial flexibility represents the ability of a firm to access and restructure its financing at a low cost. Financially flexible firms are able to avoid financial distress in the face of negative shocks, and to readily fund investment when profitable opportunities arise. While a firm's financial flexibility depends on external financing costs that may reflect firm characteristics such as size, it is also a result of strategic decisions made by the firm related to capital structure, liquidity, and investment" (Gamba and Triantis, 2008, p. 2263).

(2012) shows that even intra-household risk-sharing arrangements are inefficient. In sum, the poor desperately need tools for consumption smoothing under adverse circumstances. In this context, flexible financial products are particularly needed (de Janvry *et al.*, 2013).

Risk hedging aside, flexibility brings benefits to clients. Holding flexible financial instruments improves the poor's ability to pay (Karlan and Mullainathan, 2006; Czura *et al.*, 2011). In contrast, excessively rigid products trigger over-indebtedness and loan delinquency (Chaudhury and Matin, 2002; Schicks, 2013). Flexible repayment schedules encourage investment in high-return business opportunities, and enhance profits (Field *et al.*, 2013). In addition, Shoji (2012) and Mallick (2012) argue that flexible microfinance products mitigate the attractiveness of moneylenders. Flexibility also reduces financial stress and, consequently, improves health condition (Field *et al.*, 2012). Overall, flexible financial products are valuable to microfinance clients because they improve poor people's livelihoods and, ultimately, alleviate poverty (Shoji, 2010).

While the need for flexible microfinance products is clearly established, the way to implement them practically is understudied. To clarify the discussion, we classify pro-poor flexible products in three categories depending on the type of options they leave to clients. More precisely, we consider *ex-ante, ex-post,* and full flexibility. With *ex-ante* flexibility, financial transactions are adapted to clients' expected cash-flows before uncertainty is resolved. With *ex-post* flexibility, deviations from a pre-established transaction plan are allowed after an unfavorable outcome. Last, full flexibility excludes any predetermined transaction plan and authorizes any transaction at any time. In theory, since flexible products respond to clients' needs, they could also have a positive impact on MFI performance (Woller, 2002; Wright, 2001). However, few MFIs offer flexible products worldwide (de Janvry *et al.*, 2013). In the remainder of this section, we present actual examples of the three types of flexibility, and discuss why most MFIs refrain from offering them.

Ex-ante flexibility adapts transactions to each client's expected future cash-flows.[3] For example, *Confianza* in Peru and *Banco Los Andes ProCredit* in Bolivia offer seasonal loans to farmers (Laureti and Hamp, 2011). These loans pre-set a series of disbursements and payments matching the (expected) crop cycle of each borrower. *Ex-ante* flexibility also characterizes savings plans in which the frequency of the deposit schedule–daily, weekly or monthly payments–and its duration are customized to the client. Contracts with *ex-ante* flexibility determine transactions to be executed in the future. These contracts are not contingent on the future states of the world. The transactions do not adapt to unexpected income losses or health emergencies. Whichever state of the world occurs, clients should stick to a single transaction path.

Contracts with *ex-post* flexibility include the possibility of transactions contingent on the state of the world. Future transactions can be adapted to actual cash-flows, in case of unexpected events such as shocks and emergencies. For example, the *Bank for Agriculture and Agricultural Cooperative* (BAAC) in Thailand offers agricultural loans with various maturities (Laureti and Hamp, 2011). In case of *force majeure*, BAAC accepts to reschedule existing loans according to the farmers' new repayment capabilities (Townsend and Yaron, 2002). The Indian MFI *Vivekananda Sevakendra Sishu Uddyon* (VSSU) offers savings plans with fixed deposits that can be made daily, weekly, or monthly. The maturity varies from one to six years (Laureti and Hamp, 2011). The savings products offered by VSSU exhibit *ex-ante* flexibility because the client may choose the savings plan that best suits her in the first place. However, these products also have *ex-post* flexibility features since the client is allowed to withdraw money from her savings account before

[3] Karlan and Mullainathan (2006) and Czura *et al.* (2011) talk of "rigid" or "structured" flexibility, while de Janvry *et al.* (2013) prefer the term "product customization." By "*ex-ante* flexibility" we mean transaction customization only, not the customization of other features, such as the interest rate.

maturity. She may even decide to exit the savings plan prematurely. However, VSSU charges a fee for early withdrawals and premature account closure.[4]

Both *ex-ante* and *ex-post* flexible contracts predetermine transactions either as fixed in advance, or contingent on the future state of the world. In contrast, fully flexible contracts leave transactions open. Fully flexible loan contracts might, for instance, fix a maximum credit line without imposing a repayment schedule, a maturity, or other conditions. In each period, the client freely chooses her transaction, if any. For example, she may decide to reimburse or top-up the loan. Two examples of fully flexible products are the loan-and-savings account offered by *SafeSave* in Bangladesh, and *Mamakiba*, a non-binding savings plan for pregnant women in Kenya (Laureti and Hamp, 2011). Like *ex-post* flexibility, full flexibility allows clients to match transactions with their actual cash-flows, whereas this is impossible with *ex-ante* flexibility.

Despite the multiple possibilities for designing flexible products, standard microcredit contracts remain rigid (Meyer, 2002; Guirkinger, 2008). Typically, the client has no say on the features of her contract (no *ex-ante* flexibility). Repayments of micro-loans start right after loan disbursement and are made in equal and regular installments. The non-refinancing threat excludes contingent contract renegotiation (i.e. there is no *ex-post* flexibility). Loan refinancing happens only at the end of each round. Savings services in microfinance–when they exist–are often linked to loans, notably in the case of savings and credit cooperatives (Armendariz and Morduch, 2010). Deposits are then compulsory and clients cannot withdraw money in case of liquidity needs (no *ex-post* flexibility). The next section discusses the disincentives that keep MFIs away from flexible products.

[4] Similarly, in Bangladesh SafeSave's long-term savings plan penalizes clients who skip deposits or exit the plan prematurely (Laureti and Hamp, 2011).

3. Flexibility versus Discipline

The client's trade-off between flexibility and discipline materializes in the payment incentive problem arising in loan reimbursement and deposit making.[5] In this section, we expose this problem, describe devices for mitigating it, and discuss how it interacts with product flexibility.

The payment incentive problem can occur in two situations: borrowing and compulsory saving. In borrowing, the problem results from asymmetric information and moral hazard (Bester, 1994; Wong, 1992). In the case of *ex-ante* moral hazard, the borrower puts little effort into realizing her business project and so compromises its success and the subsequent reimbursement of the loan. In the case of *ex-post* moral hazard, the borrower makes a strategic default, meaning she does not repay her loan even though she has enough cash to do so.

Regarding compulsory saving, the nature of the incentive problem is different. It is rooted in behavioral anomalies, grouped under the name of "difficulty to save." The problem concerns both the difficulty to save up (for savings accumulation) and the difficulty to save down (for loan repayment) (Rutherford, 2000). Difficulty to save has several causes. First, pressure can be exerted by family members, friends and neighbors, whose claims for money are hard to refuse (Platteau, 2012; Schaner, 2012). Second, savers might be inattentive and unable to plan. For instance, Karlan *et al.* (2010) and Cadena and Schoar (2011) found that some clients forget when payments are due. Last, difficulty to save can result from poor self-control, rationalized in economic theory by the concept of time-inconsistency and quasi-hyperbolic discounting, as opposed to standard exponential discounting (Strotz, 1955; Laibson, 1997; O'Donoghue and Rabin, 1999).[6] Time-inconsistent agents procrastinate, and thus under-save. In principle, time-inconsistency may affect agents with any

[5] A similar trade-off occurs in savings withdrawal and loan taking (Ashraf *et al.*, 2003). To simplify the presentation, we focus on the payment incentive problem.

[6] Alternative behavioral approaches are proposed by Gul and Pesendorfer (2001), Fudenberg and Levine (2006) and Banerjee and Mullainathan (2010).

income level. However, Banerjee and Mullainathan (2010) show that compulsive temptation declines as income increases. In addition, adverse temptation is more harmful to poor people, who have less capacity to absorb financial loss.

Regardless of the nature of the incentive problem, disciplining devices can be used to alleviate its negative consequences and impose discipline on clients. We classify these devices in two broad categories. First, screening and monitoring mechanisms help select clients and control their financial behavior. For instance, information-intensive procedures soften the incentive problem (Boucher and Guirkinger, 2007). Second, sanctions and rewards ("carrot and stick") systems act as incentives. Sanctions can be material (e.g. loss of collateral), social (e.g. loss of reputation), or psychological (e.g. personal shame).

Let us now review some disciplining devices used in microfinance. Microcredit and micro-savings contracts typically involve commitment. For example, a rigid payment schedule encourages client discipline. Other disciplining mechanisms include joint liability, compulsory saving, and progressive lending. Group lending consists in delivering loans to a group with joint liability (Stiglitz, 1990).[7] Compulsory saving improves loan repayment because clients get used to meeting deadlines. Starting from very small loans, progressive lending permits the MFI to assess its borrowers' creditworthiness.

In microcredit, regular payments–weekly, bi-weekly or monthly–without any grace period are standard practice. Regularity imposes discipline and partly addresses the problem of moral hazard (Jain and Mansuri, 2003). Frequent transactions and meetings act as a close monitoring system to detect problems early on. MFIs can thus react promptly before delinquency worsens (Armendariz and Morduch, 2000 and 2010). Moreover, frequent and regular repayment schedules introduce

[7] Carpena *et al.* (2013) show that group lending improves loan repayment and compulsory savings deposits.

routines and mitigate borrowers' behavioral anomalies, such as inattention and lack of self-control (Karlan and Morduch, 2010). Small payments are also easier to manage by clients with self-control problems (Fisher and Ghatak, 2010). [8]

In essence, micro-savings plans work as commitments, since the timing and amounts of deposits are fixed in advance. Withdrawals are restricted until either the savings target or the date of maturity is reached (Ashraf *et al.*, 2003; Ashraf *et al.*, 2006b). Any deviation from the plan generates fees (for early withdrawal) or social sanctions, such as loss of reputation. In addition, deposit collectors act as reminders and inflict some sort of moral imperative to save (Rutherford, 2000; Ashraf *et al.*, 2006a).

Alternatively, *Bank Rakyat Indonesia* (BRI) uses two original mechanisms to encourage savings and timely repayments by its clients. On the savings side, it proposes prize-linked savings accounts, with rewards that depend on the amount saved. On the credit side, BRI stimulates reimbursement track records by waiving part of the interest when installments are made on time (Brihaye *et al*., 2013)

Undeniably, introducing flexibility into microcredit and micro-savings contracts can undermine the effectiveness of payment incentives. We illustrate the issue through two realistic examples relating to *ex-ante* and *ex-post* flexibility, respectively.

In the first example, we compare weekly and monthly installments in microcredit. Diminishing the frequency of payments increases the temptation to default. Fisher and Ghatak (2010) have modeled this trade-off between (*ex-ante*) flexibility and clients' discipline. In their model, the borrowers are time-inconsistent, and safe behavior is rewarded through a continuation value. The incentive-compatible loan size is such that the temptation to default is not superior to the

[8] Feigenberg *et al.* (2013) argue that frequency of meetings—as opposed to frequency of payments—matters as well.

reward for repaying successfully. The authors show that, for a given continuation value, the incentive-compatible loan size is related to the frequency at which payments occur. Lower frequencies require higher rewards to meet the incentive-compatibility constraint.

The second example concerns *ex-post* flexibility, and the impact of relaxing the policy of zero-tolerance for default. Barring access to credit is common punishment for default. The punishment is particularly efficient with poor borrowers, who are strongly credit constrained (Johnston and Morduch, 2008). Therefore, accepting *ex-post* loan renegotiation can exacerbate a borrower's incentive problem. According to the banking literature, e*x-post* loan rescheduling aggravates moral hazard problems (Boot, 2000) as it makes the bank's threat to call the loan non credible. The borrower may react by making little effort to avoid default (*ex-ante* moral hazard) or by strategically declaring default (*ex-post* moral hazard) (Wong, 1992; Bester, 1994). In addition, the possibility for *ex-post* renegotiation might hurt *ex-ante* efficiency. Lax punishment for default is insufficient to discourage the entry of borrowers with inefficient projects (Bolton, 1990).[9]

Empirically, the trade-off between flexibility and discipline is harder to identify (Fisher and Ghatak, 2010). Experimental studies of payment rescheduling on delinquency deliver mixed results. The randomized control trials by Field *et al.* (2013) show that introducing a two-month grace period increases the rate of default, but increases the clients' business investments and profits. Field and Pande (2008) find that relaxing the frequency of the repayment schedule from weekly to monthly does not affect the default rate. According to Field *et al.* (2012), monthly installments, as opposed to weekly ones, encourage borrowers to invest their loans more profitably and ultimately reduce financial stress. Moving from a monthly to a bi-monthly schedule, McIntosh (2008) finds a slight improvement in repayment and a large increase in client retention.

[9] Behavioral economists use similar arguments against *ex-post* renegotiation of commitment contracts (Amador *et al.*, 2006; Bryan *et al.*, 2010). Time-inconsistent clients need credible and binding commitments.

Existing evidence is restricted to *ex-ante* flexibility. However, the features of *ex-post* and full flexibility are needed to protect clients against unexpected shocks. These features remain mostly unexplored empirically. Accordingly, the empirical microfinance literature provides little guidance for designing efficient flexible microfinance products. The next section draws on theoretical arguments and real-life cases.

4. Design of Flexible Products

Being profitable to clients, flexibility could also benefit MFIs and strengthen the financial relationship for at least two reasons. The first is linked to the social mission claimed by the microfinance industry as being poverty alleviation and client satisfaction (Armendariz and Szafarz, 2011). In line with this, Khandker *et al.* (2012) show that flexible microcredit helps in reaching the ultra-poor in Bangladesh. The second reason stems from quality of service and fairness of treatment, which can generate reciprocity from clients (Cornée and Szafarz, 2013). In addition, client satisfaction is valued by socially-minded donors, who play a significant role in financing the microfinance sector (Armendáriz and Morduch, 2010; Hudon and Traça, 2011). Social mission aside, properly designed financial products enhance financial performance. Flexibility increases the number of clients (Wright, 2001; Woller, 2002) and reduces client turnover (McIntosh, 2008). Flexible loans improve access to capital for farmers with seasonal production (Weber and Musshoff, 2013).

To address the industry's legitimate reluctance, the design of flexible microfinance products should pay special attention to disciplining devices. The role of discipline relates to the clients' willingness to pay—i.e. make a loan repayment or savings deposit—while flexibility addresses their ability to pay. Hence, the optimal combination of flexibility and discipline would force clients to

pay when they are able to do so, but allow them to reschedule when they are not. This section suggests designs for mechanism that reconcile flexibility and discipline.

The key principle is to combine disciplining devices with flexible contract features. Flexibility may deteriorate payment incentives and increase credit risk and liquidity risk. To compensate for these financial disadvantages, the MFI can use sanctions and rewards, and collect detailed information on its clients. To illustrate the practical possibilities, we borrow real-life examples of microfinance flexible products from Menning (1993), Laureti and Hamp (2011), and de Janvry *et al.* (2013). We start by presenting designs that use sanctions and rewards. Then, we discuss the mechanisms based on reducing information asymmetries.

Banco Los Andes ProCredit in Bolivia and *Confianza* in Peru offer *ex-ante* flexible loans to rural farmers. The repayment schedule is client-specific and fixed when the contract is signed. Installments match the expected cash-flows deriving from agricultural activities. In times of expected peak income, such as the harvest season, payments are high. When expected income is low, such as during the planting season, payments too are low. To encourage client discipline, the MFI adopts a severe policy on default. Skipping repayments is not allowed and harsh penalties apply, such as imposing penalizing interest rates and capturing valuable collateral, i.e. assets pledged by the borrowers for their intrinsic value, not their market value.

The case of *Monte di Pietà* provides an interesting historical example of fully flexible contracts originating in Italy in the fifteenth century. People bring an item they care for, and therefore do not wish to sell or lose, as collateral for a loan. Typically, the loan amounts to two-thirds of the market value of the borrower's item. Flexibility is high because borrowers can pledge anything they want and get it back as soon as the debt is fully repaid. The cashed-in interest covers operational costs, including the cost of managing–and sometimes selling–the items put up as collateral (Menning, 1993; Ito, 2011).

SafeSave in Bangladesh offers current savings accounts linked to loans. The loan contracts are fully flexible. They do not fix the repayment schedule or maturity. The disciplining device is a loan-size ceiling based on the savings balance. In case of delinquency, savings are seized. Financial collateral gives more flexibility than physical collateral because, in case of need, clients can withdraw their savings (Collins *et al.*, 2009). In addition, good credit history increases loan size ceiling. Payment collectors pay frequent visits to clients at home or in the workplace, which makes transactions convenient and enhances client discipline.

Flexible contracts can be associated with psychological sanctions, also known as "soft commitment" (Bryan *et al.*, 2010). Short Message Service (SMS) reminders sent by mobile phone have a similar effect (Karlan *et al.*, 2010; Cadena and Schoar, 2011). The *M-Pesa* platform in Kenya helps women save money for pre-maternal healthcare. The *Mamakiba* program supports pregnant women through financial planning. By setting financial deadlines and organizing resources, the program manages to reduces inattention problems, and generate reciprocity based on guilt in case of failure. More generally, dedicated savings accounts rely on soft commitment (Ashraf *et al.*, 2003). Savers are dissuaded from withdrawing money for purposes other than the specified one because this would create shame. This product design is inspired by mental accounting (Thaler, 1985), a well-known principle in behavioral economics.

Reducing information asymmetries is an alternative to sanctions and rewards. In a complete information environment, the states of the world are observable and verifiable, so that any contingent contract is enforceable (Stiglitz and Weiss, 1981; Amador *et al.*, 2006). In contrast, incomplete information limits the range of feasible contingent contracts (Arrow, 1974). This limitation is especially relevant for *ex-post* flexibility, meant to hedge borrowers against idiosyncratic shocks. But it does not interfere with contracts contingent on collective shocks, such as flooding or drought, which are easily verifiable. In Bangladesh, some MFIs accept to renegotiate

loans during floods (Shoji, 2010 and 2012). Still, the *Bank for Agriculture and Agricultural Cooperative* (BAAC) in Thailand allows farmers to renegotiate loans in case of idiosyncratic emergencies (Townsend and Yaron, 2002). To assess the cause of delinquency, BAAC sends staff into the field.

The designs presented up to now all have limitations. For instance, strong punishments can trigger credit rationing. Poor people who lack collateral may be banned from flexible loans; others could refrain from applying for flexible microcredit because the loss in case of default is too high (Boucher and Guirkinger, 2007; Arnold and Booker, 2013). While information-intensive designs generate high operational costs for MFIs, alternative practices can bring remedies. For example, in Ghana *Barclays Bank* cooperates with *Susu* (deposit) collectors (Laureti and Hamp, 2011). Through this formal-informal linkage, the bank manages to obtain local information from informal financial circuit at reasonable costs.[10] Likewise, *SafeSave* hires payment collectors living close to the clients they visit. Proximity facilitates screening and monitoring and also mitigates moral hazard problems.

In addition, relationship banking is an efficient way to address information asymmetries. Boot (2000) argues that it favors special contractual features, including flexibility and discretion. MFIs can obtain client-specific information through multiple interactions. Cornée and Masclet (2013) stress the reputational incentive embedded in long-term lending relationships. Ultimately, relationship banking reduces the credit risk associated with provision of flexible loans.

Full flexibility can also be achieved by mimicking the credit-card model. Specifically, the client receives a credit line and pays periodic interest on the actual amount she is borrowing. The MFI charges interest as long as the principal has not been reimbursed in full. This model can be

[10] Informal financial channels have an information advantage with respect to formal institutions (Udry, 1990; Guirkinger, 2008). *Susu* collectors know the local economy and can easily verify if shirking is justified or not (Laureti and Hamp, 2011). More generally, formal-informal financial linkages are discussed by Pagura (2008).

easily used to build the client's credit history over time. It is currently implemented with the Kisan Card, promoted by *Nabard* in India (Chanda, 2012), and with *Banco Ademi* in the Dominican Republic (Campion and Halpern, 2001). Card-free lines of credit are offered by *Angkor Mikroheranhvatho Kampuchea* (AMK), the largest MFI in Cambodia, and by *First MicroFinance Bank* (FMFB) in Tajikistan. In Bangladesh, *Grameen Bank* and *SafeSave* offer the possibility to "top-up" loans, i.e. to re-borrow the repaid amounts (Laureti and Hamp, 2011).

Inevitably, product flexibility affects operational costs. In microfinance, field staff play a key role. In particular, credit officers collect field data, meet with credit applicants, and make recommendations to the credit committee. Once loans are disbursed, the officers are in charge of enforcing contracts and sometimes collect payments, even though this is not considered as best practice by the industry. In decision-making, credit officers have ample discretionary power (Agier and Szafarz, 2013b; Labie *et al.*, 2011). When repayments are predetermined, i.e. the terms of contract are either rigid or *ex-ante* flexible, wage-incentive schemes based on portfolio quality and collected repayments efficiently align the staff's objectives with those of the MFI (Aubert *et al.*, 2009). In contrast, *ex-post* and fully flexible products exacerbate the agency problem for two reasons. First, credit officers may be tempted to under-report actual payments, and withhold the difference. Second, when a client is hit by an emergency and wishes to postpone reimbursement, a credit officer may apply extra pressure to convince her to repay, thus making flexibility ineffective.

Extra audit costs for monitoring field staff are inevitable with state-contingent loan contracts (Jeon and Menicucci, 2011).[11] However, well-designed internal control mechanisms can minimize audit costs. The development of low-cost technological equipment could enable the client to obtain real-time confirmation that loan renegotiation has been arranged with the credit officer. More generally, phone banking can limit the risks associated with cash transfers. Alternatively, the MFI

[11] Audit costs are lower for group lending than for individual lending (Jeon and Menicucci, 2011).

could ask its clients to visit an MFI branch for renegotiation. This would obviously reduce flexibility, but it would also testify to the client's real need for rescheduling.

The provision of flexible products can also make liquidity management more complex. Like banks, MFIs should be ready to respond to unexpected liquidity demands such as withdrawals from flexible deposit accounts and *ex-post* loan rescheduling (Laureti and Szafarz, 2013). Aggregate risks create the highest liquidity costs (Acharya *et al.*, 2013). While the issue of risk management in microfinance goes beyond the scope of this paper (see Fernando, 2007), the banking literature nevertheless suggests that synergies between deposit-taking and lending activities can reduce the cost of supplying liquidity when sector liquidity rises (Kashyap *et al.*, 2002; Gatev and Strahan, 2006). The synergy exists as long as deposit withdrawals and loan renegotiation (or loan takedowns in case of a credit line) are imperfectly correlated. In this case, the two activities can share the costs of the liquid-asset stockpile and provide MFIs with a natural hedge. As a result, deposit-taking MFIs hold a buffer stock of cash as a hedge against a state of the world with large deposit outflows. However, in the states of the world without deposit outflows, the buffer stock sits idle. If, instead, it can be used to accommodate loan term renegotiation, then efficiency is enhanced. Alternatively, if the total amount of savings deposits held by MFIs is much higher than the volume of credit, this constitutes a natural hedge against liquidity shortages.[12]

To sum up, this section suggests several ways to promote flexible microfinance products. While disciplining devices can successfully address strategic default, they are insufficient against liquidity shortages that can arise from aggregate shocks. However, MFIs confined to in rigid

[12] A recent report from the MixMarket (Gaul, 2011) shows that five out of 23 countries in Africa have an average deposit-to-loan ratio larger than 2. Zimbabwe has the highest ratio, with deposits equal to 66.08 times the volume of loans; in Ivory Coast, deposits are 4.00 times the volume of loans; in Congo, the deposit-to-loan ratio is 2.88; in Burkina Faso, 2.18; and in Cameroon 2.13. In this case, the amount of savings not used for microcredit should have other productive uses, after the minimum reserve requirement has been met. A high deposit-to-loan ratio is, however, not frequent in the microfinance industry. In Latin America, the top 10 MFIs have a deposit to loan ratio varying between 0.62 and 1.21 (Miller and Martinez, 2006). In 2009, the global average for Asia was 0.31. In 2005, the average deposit-to-loan ratio for MFIs in Bangladesh was 0.13 (Microfinance Information Exchange, 2006; 2010). Finally, among listed MFIs, Bank Rakyat Indonesia has a deposit-to-loan ratio of 1.33 (Rodriguez Monroy and Huerga, 2012).

products are not immune from accidents triggering their clients' inability to pay. Well-designed *ex-post* flexible products simply make this problem less dramatic for the client. By making MFIs aware of the problem, flexible products might prompt the implementation of suitable risk management practices.

5. Conclusion

Mainstream microfinance products are standardized and rigid. The main reasons invoked by the industry are cost and client discipline. However, poor people need flexibility to smooth consumption and cope with shocks. The objective of this paper is to highlight how the design of flexible products could allay the concerns of MFIs. Our contribution is twofold.

First, we emphasize that flexibility can take different forms. To better organize the discussion, we propose a three-way classification that distinguishes among *ex-ante, ex-post* and full flexibility. Risk-averse MFIs could start by implementing *ex-ante* flexible products, which are immune to aggregate risks. In contrast, *ex-post* and fully flexible products require specific instruments to hedge against events that generate non payment. To some extent, combining the two sides of financial intermediation–lending and deposit collection–can help. However, as the recent financial crisis has documented on a large scale, mimicking banks is no magic bullet against liquidity shortages. Moreover, consumer protection concerns make it necessary to regulate MFIs offering savings opportunities (Shicks, 2013).

The second output of this paper relates to comparing the advantages and disadvantages of different flexible features embedded in microfinance products. We also distinguish two types of disciplining devices based on sanctions/rewards and information, respectively. To face agents' time-inconsistency, widespread in poor populations, we argue that disciplining devices are a

necessary complement to flexible products. To make our case, we provide a collection of successful real-life examples.

On the social side, product flexibility can have undesirable effects. First, MFIs could make clients pay higher interest rates to compensate for increased credit risk and operational costs.[13] For example, SafeSave charges an interest rate 50 percent higher than the average rate charged by MFIs in Bangladesh (36% p.a., versus an average 24% p.a.).[14] Second, disciplining clients may require high, and therefore socially-questionable, sanctions for default. This in turn could exclude from the market for households that cannot afford the risk of sanction. Although similar in nature, products framed in terms of rewards are probably more socially acceptable. Further work could explore the cost structure associated with flexibility, not only from the supply side (i.e. the MFI) but also the demand side (i.e. the clients) including transaction costs, which are often disregarded by scholars and even the industry itself.

Up to now, most MFIs have continued to ignore the demand for flexible financial products. At the same time, observers mention the increased competition emerging within the industry, as well as from conventional banks (Cull *et al.*, 2013). These developments may radically change product design. Competition can push MFIs into paying more attention to clients' needs. Regardless of their motivations, we hope this paper will help MFIs to design flexible products efficiently.

[13] In contrast, product flexibility might reduce transactions costs, which are relatively low compared the interest charged (Dehem and Hudon, 2013).
[14] www.safesave.org.

References

Acharya, V.V., H. Almeida, and M. Campello. 2013. "Aggregate Risk and the Choice between Cash and Lines of Credit." *Journal of Finance* 68(5): 2059-2116.

Agier, I., and A. Szafarz. 2013a. "Microfinance and Gender: Is There a Glass Ceiling on Loan Size?" *World Development* 42: 165-181.

Agier, I., and A. Szafarz. 2013b. "Subjectivity in Credit Allocation to Micro-Entrepreneurs: Evidence from Brazil." *Small Business Economics* 41(1): 263-275.

Amador, M., I. Werning, and G.M. Angeletos. 2006. "Commitment vs. Flexibility." *Econometrica* 74(2): 365-396.

Armendariz, B., and A. Szafarz. 2011. "On Mission Drift in Microfinance Institutions." In B. Armendariz and M. Labie (Eds.) *The Handbook of Microfinance*. London-Singapore: World Scientific Publishing. 341-366.

Armendariz, B., and J. Morduch. 2000. "Microfinance Beyond Group Lending." *Economics of Transition* 8(2): 401-420.

Armendariz, B., and J. Morduch. 2010. *The Economics of Microfinance.* Cambridge, MA: MIT Press.

Arnold, L.G., and B. Booker. 2013. "Good Intention Pave the Way to… the Local Moneylender." *Economics Letters* 118(3): 466-469.

Arrow, K.J. 1974. "Limited Knowledge and Economic Analysis." *American Economic Review* 64(1): 1-10.

Ashraf, N., D. Karlan, and W. Yin. 2006a. "Deposit Collectors." *Advances in Economic Analysis & Policy* 6(2), Article 5.

Ashraf, N., D. Karlan, and W. Yin. 2006b. "Tying Odysseus to the Mast: Evidence from a Commitment Savings Product in the Philippines." *Quarterly Journal of Economics* 121(2): 635-672.

Ashraf, N., N. Gons, D. Karlan, and W. Yin. 2003. "A Review of Commitment Savings Products in Developing Countries." ERD Working Paper 45, Asian Development Bank, Manila.

Aubert, C., A. de Janvry, and E. Sadoulet. 2009. “Designing Credit Agent Incentives to Prevent Mission Drift in Pro-Poor Microfinance Institutions.” *Journal of Development Economics* 90(1): 153-162.

Banerjee, A., and S. Mullainathan. 2010. “The Shape of Temptation: Implications for the Economic Lives of the Poor.” NBER Working Paper 15973, Washington, DC.

Bester, H. 1994. “The Role of Collateral in a Model of Debt Renegotiation.” *Journal of Money, Credit and Banking* 26(1): 72-86.

Bolton, P. 1990. “Renegotiation and the Dynamics of Contract Design.” *European Economic Review* 34(2): 303-310.

Boot, A.W.A. 2000. “Relationship Banking: What Do We Know?” *Journal of Financial Intermediation* 9(1): 7-25.

Boucher, S., and C. Guirkinger. 2007. “Risk, Wealth, and Sectoral Choice in Rural Credit Markets.” *American Journal Agricultural Economics* 89(4): 991-1004.

Brihaye, T., J. de Pril, M. Labie, and A. Perilleux. 2013. “Positive Incentive in Microfinance: A Game Theory Approach.” UMONS Working Paper, presented at the Third European Research Conference on Microfinance (Kristiansand).

Bryan, G., D. Karlan, and S. Nelson. 2010. “Commitment Devices.” *Annual Review of Economics* 2: 671-698.

Cadena, X., and A. Schoar. 2011. “Remembering to Pay? Reminders vs. Financial Incentives for Loan Repayment.” NBER Working Paper 17020, National Bureau of Economic Research, Washington, DC.

Campion, A., and S. Halpern. 2001. “Automating Microfinance, Experience in Latin America, Asia and Africa.” MicroFinance Network Occasional Paper 5, Washington, DC.

Carpena, F., S. Cole, J. Shapiro, and B. Zia. 2013. “Liability Structure in Small-Scale Finance: Evidence from a Natural Experiment.” *World Bank Economic Review* 27(3): 437-469.

Chanda, A. 2012. “Evaluating the Kisan Credit Card Scheme.” IGC Working Paper 12-0345, International Growth Center, London School of Economics and Political Science, London.

Chaudhury, I.A., and I. Matin. 2002. "Dimension and Dynamics of Microfinance Membership Overlap – A Micro Study from Bangladesh." *Small Enterprise Development* 13(2): 46-55.

Collins, D., J. Morduch, S. Rutherford and O. Ruthven. 2009. *Portfolios of the Poor. How the World's Poor Live on 2$ a Day*. Princeton: Princeton University Press.

Cornée, S., and A. Szafarz. 2013. "Vive la Différence: Social Banks and Reciprocity in the Credit Market." *Journal of Business Ethics*, forthcoming.

Cornée, S., and D. Masclet. 2013. "Long-Term Relationships, Group Lending and Peer Sanctioning in Microfinance: New Experimental Evidence." CEB Working Paper 13-026, Université Libre de Bruxelles.

Cull, R., A. Demirgüç-Kunt, and J. Morduch. 2013. "Banks and Microbanks." *Journal of Financial Services Research*, forthcoming.

Czura, C., D. Karlan, and S. Mullainathan. 2011. "Does Flexibility in Microfinance Pay Off? Evidence from a Randomized Evaluation in Rural India." Goethe University Frankfurt, Paper presented at the Second European Research Conference on Microfinance (Groningen).

de Janvry, A., E. Sadoulet, A. Coulibaly, and A. Abordonado. 2013. "Progress with Flexible Microfinance Products." University of California at Berkeley, Paper presented at the FERDI Workshop on Flexible Financial Products in Microfinance to Address Risk (Clermont-Ferrand).

Dehem, T., and M. Hudon. 2013. "Microfinance from the Clients' Perspective: An Empirical Enquiry into Transaction Costs in Urban and Rural India." *Oxford Development Studies* 41(1): S117-S132.

Feigenberg, B., E. Field, and R. Pande. 2013. "The Economic Returns to Social Interaction: Experimental Evidence from Microfinance." *Review of Economic Studies*, forthcoming.

Fernando, N. 2007. "Managing Microfinance Risks: Some Observations and Suggestions." *Asian Journal of Agriculture and Development*, 4(2), 1-22.

Field, E., and R. Pande. 2008. "Repayment Frequency and Default in Microfinance: Evidence from India." *Journal of the European Economic Association* 6(3): 501-509.

Field, E., R. Pande, J. Papp, and N. Rigol. 2013. “Does the Classic Microfinance Model Discourage Entrepreneurship Among the Poor? Experimental Evidence from India.” *American Economic Review*, forthcoming.

Field, E., R. Pande, J. Papp, and Y.J. Park. 2012. “Repayment Flexibility Can Reduce Financial Stress: A Randomized Control Trial with Microfinance Clients in India.” *PLoS One* 7(9): e45679.

Fischer, G., and M. Ghatak. 2010. “Repayment Frequency in Microfinance Contracts with Present-Biased Borrowers.” Economic Organisation and Public Policy Discussion Paper 21, London School of Economics and Political Science.

Fudenberg, D., and D.K. Levine. 2006. “A Dual-Self Model of Impulse Control.” *American Economic Review* 96(5): 1449-1476.

Gamba, A., and A. Triantis. 2008. “The Value of Financial Flexibility.” *Journal of Finance* 63(5): 2263-2296.

Gatev, E., and P.E. Strahan. 2006. “Banks' Advantage in Hedging Liquidity Risk: Theory and Evidence from the Commercial Paper Market.” *Journal of Finance* 61(2): 867-892.

Gaul, S. 2011. “MIX Microfinance World: Mapping Africa Financial Inclusion - Results Review and Next Steps.” MixMarket, Washington, DC.

Guirkinger, C. 2008. “Understanding the Coexistence of Formal and Informal Credit Markets in Piura Peru.” *World Development* 36(8): 1436-1452.

Gul, F., and W. Pesendorfer. 2001. “Temptation and Self-Control.” *Econometrica* 69(6): 1403-1436.

Hudon, M., and D. Traca. 2011. “On the Efficiency Effects of Subsidies in Microfinance: An Empirical Inquiry.” *World Development* 39(6): 966-973.

Ito, S. 2011. “The Making of Institutional Credit in England, 1600 to 1688.” *European Journal of the History of Economic Thought* 18(4): 487-519.

Jain, S., and G. Mansuri. 2003. “A Little at a Time: The Use of Regularly Scheduled Repayment in Microfinance Programs.” *Journal of Development Economics* 72: 253-279.

Jeon, D.-S., and D. Menicucci. 2011. “When is the Optimal Lending Contract in Microfinance State Non-Contingent?” *European Economic Review* 55(5): 720-731.

Johnston, D., and J. Morduch. 2008. “The Unbanked: Evidence from Indonesia.” *World Bank Economic Review* 22(3): 517-537.

Karlan, D., and J. Morduch. 2010. “Access to Finance.” In D. Rodrik and M. Rosenzweig (Eds.) *Handbook of Development Economics*. Amsterdam: Elsevier. 4704-4784.

Karlan, D., and S. Mullainathan. 2006. “Is Microfinance too Rigid?” Centre for Micro Finance, Institute for Financial Management and Research, Chennai.

Karlan, D., M. McConnel, S. Mullainathan, and J. Zinman. 2010. “Getting to the Top of Mind: How Reminders Increase Saving.” NBER Working Paper 16205, Washington, DC.

Kashyap, A.K., R. Rajan, and J.C. Stein. 2002. “Banks as Liquidity Providers: An Explanation for the Coexistence of Lending and Deposit-Taking.” *Journal of Finance* 57(1): 33-73.

Khandker, S.R., M.B. Khalily, and H.A. Samad. 2012. “Seasonal Hunger and Its Mitigation in North-West Bangladesh.” *Journal of Development Studies* 48(12): 1750-1764.

Labie, M., P.G. Méon, R. Mersland, and A. Szafarz. 2011. “Discrimination by Microcredit Officers: Theory and Evidence on Disability in Uganda.” DULBEA Working Paper 11-06, Université Libre de Bruxelles.

Laibson, D. 1997. “Golden Eggs and Hyperbolic Discounting.” *Quarterly Journal of Economics* 112(2): 443-477.

Laureti, C., and A. Szafarz. 2013. “The Time-inconsistency Factor: How Banks Adapt to their Mix of Savers.” CEB Working Paper 12-035, Université Libre de Bruxelles.

Laureti, C., and M. Hamp. 2011. “Innovative Flexible Products in Microfinance.” *Savings and Development* 35(1): 97-129.

Mallick, D. 2012. “Microfinance and Moneylender Interest Rate: Evidence from Bangladesh. *World Development* 40(6): 1181-1189.

McIntosh, C. 2008. “Estimating Treatment Effects form Spatial Policy Experiments - An Application to Ugandan Microfinance.” *Review of Economics and Statistics* 90(1): 15-28.

Menning, C.B. 1993. *Charity and State in Late Renaissance Italy: The Monte di Pieta of Florence*. New York: Cornell University Press.

Meyer, R.L. 2002. "The Demand for Flexible Microfinance Products: Evidence from Bangladesh." *Journal of International Development* 14: 351-368.

Microfinance Information Exchange. 2006. "Benchmarking Asian Microfinance 2005." MixMarket, Washington, DC.

Microfinance Information Exchange. 2010. "Asia 2009: Microfinance Analysis and Benchmarking Report." MixMarket, Washington, DC.

Miller, J., and R. Martinez. 2006. "Championship League: An Overview of 80 Leading Latin American Providers of Microfinance." *MicroBanking Bulletin* 12: 15-21.

O'Donoghue, T., and M. Rabin. 1999. "Doing It Now or Later." *American Economic Review* 89(1): 103-124.

Pagura, M. 2008. "Expanding the Frontier in Rural Finance – Financial Linkages and Strategic Alliances." Food and Agriculture Organization, Rome.

Platteau, J.-P. 2012. "Redistributive Pressure in Sub-Saharan Africa: Causes, Consequences, and Coping Strategies." In E. Akyeampong, E. Bates, N. Nunn, and J. Robinson (Eds.) *The Historical Roots of Africa's Underdevelopment*. Cambridge: Cambridge University Press.

Robinson, J. 2012. "Limited Insurance within the Household: Evidence from a Field Experiment in Kenya." *American Economic Journal: Applied Economics* 4(4): 140-164.

Rodriguez Monroy, C., and A. Huerga. 2012. "A Study of Four Listed Micro Finance Institutions." Sixth International Conference on Industrial Engineering and Industrial Management (Vigo).

Rutherford, S. 2000. *The Poor and their Money*. New Delhi: Oxford University Press.

Schaner, S. 2012. "Intrahousehold Preference Heterogeneity, Commitment, and Strategic Savings." Working Paper, Dartmouth College.

Schicks, J. 2013. "The Sacrifices of Micro-Borrowers in Ghana – A Customer-Protection Perspective on Measuring Over-Indebtedness." *Journal of Development Studies* 49(9): 1238-1255.

Shoji, M. 2010. “Does Contingency Repayment in Microfinance Help the Poor During Natural Disaster?” *Journal of Development Studies* 46(2): 191–210.

Shoji, M. 2012. “Does Evaluation of Contingent Repayment in Microfinance?” *Developing Economies* 50(2): 116-140.

Stiglitz, J.E. 1990. “Peer Monitoring and Credit Markets.” *World Bank Economic Review* 4(3): 351-366.

Stiglitz, J.E., and A. Weiss. 1981. “Credit Rationing in Markets with Imperfect Information.” *American Economic Review* 71(3): 393-410.

Strotz, R.H. 1955. “Myopia and Inconsistency in Dynamic Utility Maximization.” *Review of Economic Studies* 23(3): 165-180.

Thaler, R.H. 1985. “Mental Accounting and Consumer Choice.” *Marketing Science* 4(3): 199–214.

Townsend, R.M., and J. Yaron. 2002. “An Asian Development Bank: Credit Risk-Contingency and Subsidy Dependent Index.” *Savings and Development* 26(3): 227-258.

Udry, C. 1990. “Credit Markets in Northern Nigeria: Credit as Insurance in a Rural Economy.” *World Bank Economic Review* 4(3): 251-269.

Weber, R., and O. Musshoff. 2013. “Can Flexible Microfinance Loans Improve Credit Access for Farmers?” *Agricultural Finance Review* 73(2): 255-271.

Woller, G. 2002. “From Market Failure to Marketing Failure: Market Orientation as the Key to Deep Outreach in Microfinance.” *Journal of International Development* 4: 305-324.

Wong, K.P. 1992. “Debt Collateral and Renegotiation under Moral Hazard.” *Economics Letters* 40: 465-471.

Wright, G.A.N. 2001. “Dropouts and Graduates: Lessons from Bangladesh.” *Microbanking Bulletin* 6: 14-16.