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## Research Report

# Progress with flexible microfinance products: A review of evidence and a proposal

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## Progress with flexible microfinance products: A review of evidence and a proposal

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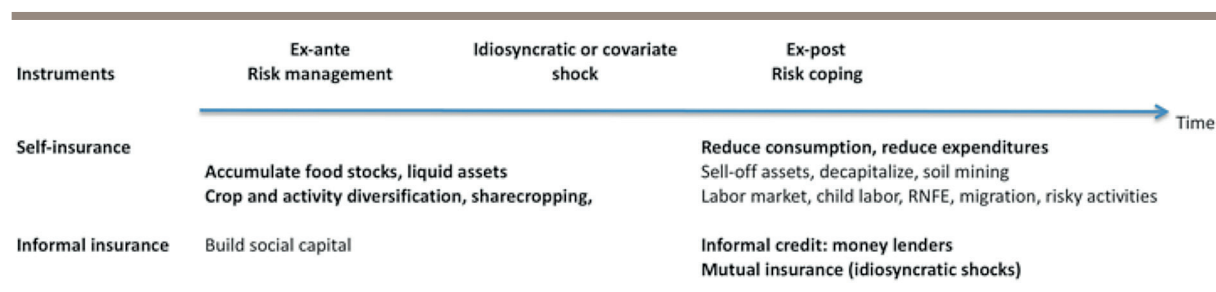
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### Abstract

We review in both theory and practice how flexible savings and credit can be combined to deal with risk as a complement to insurance. We show that both savings and credit must be used sequentially according to the occurrence of income shocks. Incentives to save are necessary to induce behavior consistent with the desired optimum savings plan, and these incentives can be made compatible with the use of savings for shock response. Several microfinance institutions have taken steps toward offering flexible savings-credit services to respond to risk while preserving borrower and depositor discipline. They however still fall short of a design that would optimize the provision of financial services to deal with risk.

## ► I. Introduction: From standardized to customized micro-financial products

The permanence of uninsured risks for small-holder farmers remains an important issue. When they lack access to formal financial services, risk management (ex-ante relative to shocks) and risk coping (ex-post relative to shock) must be achieved through self-insurance and informal insurance (Figure 1).



**Figure 1.** Self-insurance and informal insurance for risk management and risk coping  
(In bold is the action taken to deal with risk)

These responses to risk are costly and inefficient: they have been shown to restrain investment, income growth, and welfare, perpetuating poverty.

Significant progress has been made in micro-finance to design new financial products that give access to financial services to the poor, although with priority on building assets more than in dealing with risk. Services include transfers, savings, credit, and insurance.

**In a first phase**, initiated with group lending introduced by the Grameen Bank, **rigid** micro-finance services have been offered to secure repayment and induce good performance of clients in spite of lack of collateral and under the precarious conditions characterizing the livelihoods of the poor.

**In a second phase**, increased access to financial products is being sought by **customizing** prod-

ucts to clients' needs and capacities. This includes in particular the following financial products:

- **Transfers:** Transaction costs on money transfers have been sharply reduced in a growing number of countries by use of mobile phone-based transfers wherever people are located and without fixed time schedule.
- **Savings:** Secure and convenient savings accounts have been made more accessible. Disciplinary devices to help motivate savings such as frequent reminders, visits by deposit collectors, dedicated savings accounts, higher

interests on time bound deposits, and self-selected default options in pledging to save predetermined amounts have been introduced.

- **Credit:** Efforts have been made to better customize credit contracts to the needs and capacities of clients. This includes individual as opposed to group loans; less frequent repayments; loans based on past repayment performance and accumulated savings as opposed to collateralizable assets; repayment calendars adapted to anticipated individual cash flows and crop cycles; and interest paid only on personal outstanding balances.
- **Insurance:** Index-based schemes have helped extend insurance to smallholder farmers that could not be covered with assessed loss-based indemnity insurance. However, uptake has been limited as basis risk remains high, insurance premiums are costly due to high loading cost, and uninsured background risks remain

large. In addition, the poor may be liquidity constrained in paying premiums, there may be lack of trust in the insurance provider, and it is difficult to understand how an index-based insurance contract works.

While much progress has thus been made to adapt microfinance services to the needs and capacities of specific clients, efforts remain to be made to provide financial services that can help them manage and cope with risk, in part substituting for insurance that has met with low uptake or complementing it to make its use more appealing. We analyze here how flexible financial products, particularly combining saving and credit, can be designed to help microfinance clients deal with risk, thereby reducing the extent of uninsured risks.

## ► II. Toward more flexible microfinance products to deal with risk

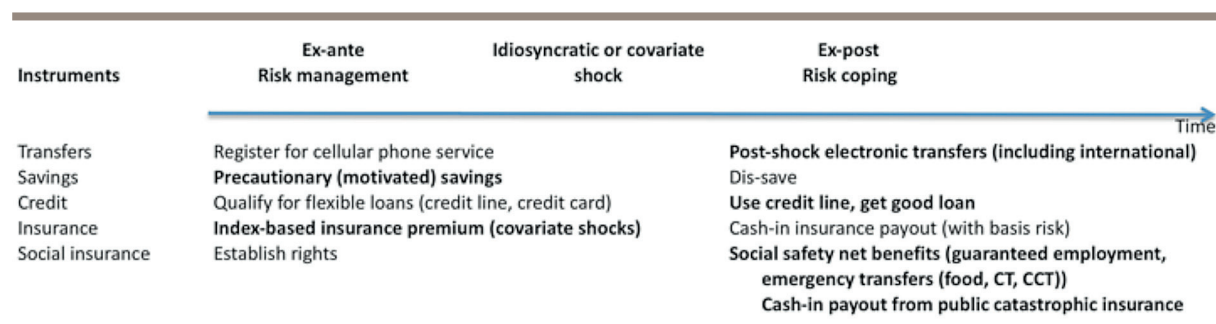
A third phase in the development of microfinance services thus consists in (1) seeking greater flexibility in the services provided so they can help clients manage and cope with risk, and (2) seeking to package financial services into composite financial products to build on complementarities and allow risk-layering.

Flexibility features include the following (Figure 2):

- **Transfers:** Electronic transfers such as M-Pesa allow immediate transfers in response to shocks. Transfers can be international (remittances, international solidarity), allowing to mobilize mutual insurance to cope with nationally covariate shocks (e.g., earthquake in Rwanda, Blumenstock et al., 2012).

- **Savings:** Passbook accounts allow instant unlimited withdrawal. Accounts with no minimum balance allow full withdrawal of accumulated savings in coping with shocks. Difficulty here is to use motivational/commitment devices to help people save without reducing flexible access to accumulated balances for risk response. Motivational devices must be orthogonal to flexibility. One option is to link the right to dis-save to the motivation to save. This is the case when saving is for an emergency health expenditure that can be verified by the deposit holder (Dupas and Robinson, 2011). Saving withdrawal can also be indexed on observable triggers similar to index-based insurance. Commitments through default options can be fully renegaded at any time (CHN experiment in Guatemala described in Atkinson et al., 2012).

- **Credit:** Major progress has been made in introducing more flexible loans. This includes credit lines, credit cards, good loans (BRAC), payday loans, contingent loans (flexible duration, borrower chooses when to repay), early repayment options without penalty. Difficulty here is to maintain discipline in repayment while



**Figure 2.** Formal flexible financial products for risk management and coping  
(In bold is the action taken to deal with risk)

allowing greater flexibility. Options are stricter selection, closer monitoring, and heavier sanctions on defaults (Laureti and Hamp, 2011).

**Composite financial products** to manage risk have also been used. This includes:

- Combining index-based insurance with savings: basis risk in index-based weather insurance can be reduced by accumulating precautionary savings. Savings can also help protect a farmer from uninsured idiosyncratic risks such as a health shock that cannot be covered by an index-based instrument. In this case, there is complementarity between index insurance and precautionary savings, and they could be jointly offered to farmers (de Nicola, Vargas Hill, and Robles, 2012). Saving can be under the form of liquid productive assets such as live-stock (Janzen and Carter, 2013).
- When index-based insurance is used to insure loans at the bank level, insurance then serves as a complement to credit, inducing farmers to borrow and invest more (Ethiopia I4 experiment by McIntosh and Sarris).

### ► III. Savings and credit as instruments to deal with risk: what theory tells us

#### 1. Basic theory with perfect financial markets

The basic theory of the interplay between saving, risk, and insurance has been developed by Deaton (1991) and Besley (1995). Consider a two-period model, with current wealth  $y_1$  and future stochastic income  $y_2$ . Let  $r = 1+i$  be the return on savings, with  $i$  the interest rate. Optimal savings  $s$  (borrowing if negative) is obtained from maximization of the utility of consumption  $c_1 = y_1 - s$  in period 1 and  $c_2 = y_2 + rs$  in period 2 aggregated with a discount factor  $\delta$ :

$$\max_s (u(y_1 - s) + \delta Eu(y_2 + rs))$$

Optimal savings/borrowing solves  $u'_1 = \delta r Eu'_2$ , where  $u'$  is the marginal utility of consumption. Perfect neutralization of risk is achieved if  $\delta r = 1$ . If  $\delta r < 1$ , there is saving motivated by income variability/uncertainty.

If the marginal utility of consumption is decreasing in income and convex, there is precautionary savings, i.e., saving increases (borrowing decreases) with the variability of future income. Convexity of marginal utility can be due to preferences ( $u''' > 0$ ) or to the likelihood of facing a credit constraint in the future, even with a quadratic utility function.

#### 2. Adding a price band in the credit market

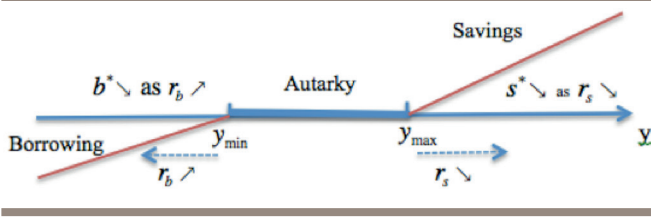
Suppose that interest rates on savings ( $r_s$ ) are low and on borrowing ( $r_b$ ) high, creating a price band  $r_s < 1/\delta < r_b$ . At SafeSave, for example, annual interest rates are 6% on deposits and 36% on loans. The optimal saving ( $s$ ) and borrowing ( $b$ ) are solution of:

$$\max_{s,b} (u(y_1 - s + b) + \delta Eu(y_2 + r_s s - r_b b))$$

Note that we never observe savings and borrowing at the same time. There is also a range of income over which it is optimal to neither save nor borrow.

$$\begin{cases} y_1 < y_{min} & \text{Borrowing } b^* \\ y_{min} < y_1 < y_{max} & \text{Autarky} \\ y_{max} < y_1 & \text{Savings } s^* \end{cases}$$

The income thresholds  $y_{min}$  ( $y_{max}$ ) that trigger borrowing (savings) are decreasing function of  $\delta r_b$  ( $\delta r_s$ ). The optimum saving  $s^*$  increases with the deposit rate  $r_s$ . The optimum amount borrowed  $b^*$  decreases with the interest rate  $r_b$  (Figure 3).



**Figure 3.** Optimum saving and borrowing to deal with risk under capital market failure

Hence, the **quality** of the saving and credit instruments for insurance purposes is directly function of the difference  $1 - \delta r_s$  and the difference  $\delta r_b - 1$ .

The **monetary costs** of the savings and credit instruments for insurance purposes are also directly function of the differences  $1 - \delta r_s$  and  $\delta r_b - 1$ .

Optimal use of savings and credit, by definition, brings in an increase in utility. But this is potentially at a *monetary cost*, defined as the discounted value of transfer of resources over time. Total consumption  $C$  over the two periods is equal to:

$$C = c_1 + \delta c_2 = y_1 + \delta y_2 - [(1 - \delta r_s)s^*]$$

if savings

$$C = c_1 + \delta c_2 = y_1 + \delta y_2 - [(\delta r_b - 1)b^*]$$

if borrowing

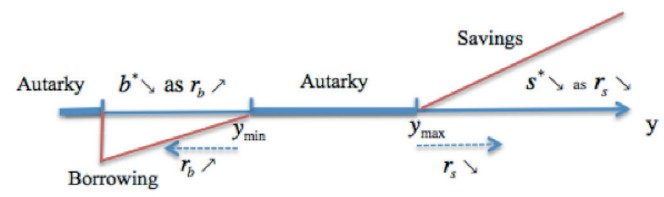
with  $s^*$  and  $b^*$  defined as above, i.e., themselves decreasing functions of their respective cost. Hence the expected cost of the savings and credit instruments is a weighted average of the two costs, with the weights proportional to the expected transactions.

In conclusion, without constraint on credit, the savings-credit instrument is only triggered by large (positive or negative) shocks, leaving consumption to adjust for smaller shocks. The cost of the instrument is function of the difference between the interest rate and the discount factor. Using credit for insurance is costly when the interest rate is above the discount factor; using

savings for insurance is costly when the deposit rate is below the discount factor.

### 3. Adding a constraint in borrowing

In contrast to the above result, adding a limit to the amount that can be borrowed makes the savings/credit instrument fail for the worst shocks (Figure 4).



**Figure 4.** Optimum saving and borrowing to deal with risk under a borrowing constraint

This constraint further affects the borrowing/savings behavior in inducing precautionary savings, i.e., a higher level of savings and a lower level of credit when those instruments are used, and (most likely) a shift in the space of autarky towards lower income. When transactions cost on the credit market are ignored, this is the result obtained from basic theory (section 1 above).

With a credit constraint, the savings/credit instrument no longer insures the worst negative shocks. The credit constraint also tilts the solution towards more savings and less credit, and reduces the utility benefits of the savings/credit instruments. Changes in monetary costs come from increasing the costs associated with savings but decreasing those associated with credit.

### 4. Adding limitations on savings

While constraints on borrowing are imposed by the lender, because of contract enforcement issues, limitations on savings are on the borrower's side. They come from aspects of "behavioral economics": households have difficulty to save because of pressures from others to share or from oneself to consume.



Introducing commitment devices to induce precautionary savings is tricky because these savings are meant to be for discretionary expenditures in periods of negative shocks, and not for a pre-defined planned expense such as schooling or retirement that can be specified in the commitment. Inducements to save must thus come either from motivations unrelated to flexible access to savings (such as reminders, collectors, or lottery tickets), or from commitments that are related to shocks for which savings mobilization will be needed such as health emergencies (Dupas and Robinson, 2011)

### 5. Policy implications derived from theory

With a large spread between low deposit and high borrowing interest rates, the savings-credit instrument is expensive and leaves a large range of shocks unprotected that must be covered with other instruments (Figure 1). A credit constraint further limits the value of the instrument as it leaves the worse negative shocks unprotected. On the savings side, low interest rate and lack of commitment mechanisms reduce use of the savings instrument to cope with risk. Policy implications derived from theory to make the savings-credit instrument more effective to deal with risk are thus the following:

- Savings and credit are **both** needed to deal with risk, but their use is **sequential** according to the occurrence of positive and negative shocks relative to expected income. Households should be observed in either state, not both. MFIs must thus offer both flexible savings and flexible credit, with the possibility of quick transitions between the two states in response to shocks.

- Reducing the typically very large **spread** in interest rates between saving and borrowing (30 percentage points at SafeSave) will help reduce the range of uninsured risks, where self and informal insurance must prevail.

- **Access to loans** to cope with emergencies should be related to **past** precautionary saving behavior, not to the current level of saving, and savings should not be held as collateral on emergency borrowing. To match theory, a depositor should be allowed to fully withdraw savings in response to a negative shock before borrowing if necessary due to the size of the shock.

- Helping people help themselves to save should be applied to incentives to **reconstitute precautionary savings** as a loan is being repaid. CHN-type incentives (Atkinson et al., 2012) with default options toward saving with regularity a selected percentage of loan repayment can be a useful approach for this.

## ► IV. Some flexible financial products to address risk

We give here a few illustrations of recently introduced flexible financial products. More complete coverage of these products is available in the background paper prepared for this workshop (de Janvry et al., 2013) as well as in Laureti and Hamp (2011). We assess in each case the advantages and disadvantages of the financial product in providing an instrument to deal with risk.

## 1. SafeSave in Bangladesh

SafeSave (1996, Bangladesh)

	Savings	Credit
Product type	Passbook account Long term saving account?	Loan linked to passbook saving balance as collateral (1/3) i = 36% annual
Flexibility features	Passbook w min limitations on withdrawals (daily max) Limits on withdrawal if outstanding loan (1/3 collateral) Long-term saving account?	Flexible duration Flexible repayment schedule
Incentive features	Daily visits collectors i = 6% annual on passbook	
Disciplinary features		Daily visits collectors Dynamic incentives

Advantages: flexibility in savings and loans, with incentives to save and discipline in repayment

Disadvantages: limits on savings withdrawal if serves as collateral on outstanding loan

## 2. Kisan Credit Card in India

Kisan credit card (1999, NBARD Undia)

	Savings	Credit
Product type	Passbook account	Credit card
Flexibility features		Maximum borrowing linked to minimum saving & collateral Credit limit with flexible use Flexible repayment within 12 months of drawing
Disciplinary features		3 to 5 year card renewal Distributed by local and regional banks

Advantages: flexibility in borrowing

Disadvantages: needs collateral, lacks evaluation

## 3. Confianza (Peru) and ProCredit (El Salvador) agricultural lending

Confianza (Peru) and Banco ProCredit (El Salvador)

	Savings	Credit
Product type		Seasonal agricultural loans customized to client cash flows
Flexibility features		Credit line (Confianza), rapid response loans (ProCredit) Discretionary use of funds for emergencies
Disciplinary features		Good clients, diversified sources of income, some collateral Rigorous monitoring, penalties for late payments

Advantages: flexible access to credit for emergencies

Disadvantages: no attention given to role of savings

## 4. Barclays Bank and Susu collectors in Ghana

Kisan credit card (1999, NBARD Undia)

	Savings	Credit
Product type	Passbook account	Credit card
Flexibility features		Maximum borrowing linked to minimum saving & collateral Credit limit with flexible use Flexible repayment within 12 months of drawing
Disciplinary features		3 to 5 year card renewal Distributed by local and regional banks

Advantages: flexibility in borrowing

Disadvantages: needs collateral, lacks evaluation



Zidisha peer-to-peer e-lending	
Savings	Credit
Product type	Direct e-loan between lender and borrower
Flexibility features	Can reschedule payments at own initiative w/o consent of lender
Disciplinary features	Requires verifiable credit history Cannot reschedule more than twice and for more than 60 months
Advantages: low transaction cost as no bank involved and low interest rate (9.6%)	
Disadvantage: No attention to savings; risky for lender	

M-Pesa and M-Kesho, Kenya		
	Savings	Credit
Product type	Savings account accessible through M-Pesa	Emergency credit on demand through M-Pesa
	Serves to qualify for emergency loans	
Flexibility features	Fee for withdrawal	
Disciplinary features		Credit scoring
	Advantages: real time transfers into savings and access to emergency loans	
	Disadvantages: fee to withdraw from savings limits flexibility	

BRAC Good Loan to ultra-poor in Bangladesh	
Savings	Credit
Product type	Emergency loan to current borrower with good record on past loans
Flexibility features	Quick disbursement Flexible repayment in 5-9 months for a current 1 year loan
Disciplinary features	Savings in excess of 20% of last outstanding loan Loan amount between 25 and 50% of current loan
Advantages: links credit to savings	
Disadvantages: Limit on withdrawal of savings, no assistance to save	

VSSU, West Bengal, India		
	Savings	Credit
Product type	Savings account (saving up)	Loan based on saving deposits (saving down) Customized emergency loan to good clients
Flexibility features	Early withdrawal with a penalty	
Disciplinary features	Door-to-door fund collectors Constraints on withdrawal	
Advantages: use savings (saving up) for access to loans (saving down), including customized emergency loans for good clients		
Disadvantages: Incentives to save create rigidity in using savings for emergencies		

## 9. Self-Employed Women's Association (SEWA) in India

SEWA savings-linked integrated insurance India

	Savings	Insurance
Product type	Savings account	Insurance for life, hospitalization, accident, and assets
Disciplinary features	Pledged monthly installments	Payment of premium from interest on fixed deposits Door-to-door premium collectors, SMS reminders

Advantages: Links savings to insurance with assistance to save and pay premiums

Disadvantages: need link to flexible loans to reduce dependence on insurance

## ► V. Conclusions

Flexible financial products for transfers, savings, and credit and composite financial products offer promising complements to index-based insurance in risk management and risk coping. Lessons derived from both theory and practice are the following:

- While theory tells us that **savings and credit** must **both** be used to reduce uninsured risks, complemented by index-based insurance as protection for extreme events and for cases where credit constraints apply, there are still few MFIs that offer these products in a flexible and complementary fashion. Innovative partial solutions have been introduced in the case studies reviewed. Exploring the saving-credit-insurance relation and the design of corresponding composite products is needed to reduce exposure of the poor to uninsured risks. Relying on index insurance alone will not suffice.
- **Incentives to save**, and not to dis-save, can be provided without compromising **flexible access** to savings for risk response. This includes motivational devices such as frequent reminders, visits of deposit collectors, peer pressure, lottery, and pledged savings plans with renegotiable (default) options that do not interfere with flexibility. It also includes dedicated savings accounts related to shocks, and indexation of withdrawals on observable shocks.
- **Flexible loans** can be extended without com-

promising on repayment discipline. This includes credit lines, credit cards, and demand-driven rapid access to emergency loans. Implementation requires introducing disciplinary practices by the providing MFI such as careful selection (collateral, credit scoring from past experience with the MFI or based on credit bureau information servicing MFIs, established reputation), careful monitoring (frequent visits by credit officers), and enhanced sanctions on defaults (fines, ostracization). Difficulty is to design these disciplinary practices in such a fashion that they do not introduce participation constraints that selectively exclude the poor.

- **Composite products** can be constructed to build on complementarities between financial products in handling risk. Most important is a combined saving-credit instrument, with SafeSave the closest approximation to lessons derived from theory. This also includes savings to reduce basis risk in index-based insurance and institutional-level insurance to encourage borrowing.
- **Customization** of micro-finance services can be applied to flexible products. This is all the more important that market failures are idiosyncratic and determine the optimal combination of financial products to deal with risk.
- Based on what we have seen in this note derived from theory and practice, the **design** of a

financial product to reduce uninsured risks for the poor would have the following features: (1) Motivated flexible savings options are offered for the purpose of coping with shocks. Motivation is orthogonal to or dedicated to risk. Depositors can draw on savings in response to shocks either freely or conditional on verification of the shock in accordance with the dedicated purpose of saving. (2) Flexible credit lines are offered to respond to shocks as pre-

cautionary savings are being decapitalized. Assistance is provided to reconstitute savings with pledged savings plans linked to the repayment of debt. (3) Index-based insurance is provided at the institutional level to cope with extreme events. This can take the form of social protection as a club good for members of associations or of administrative entities.

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