

Chapter 2

Mobility Technology Solutions Can Reduce Interest Rates of Microfinance Loans

Abstract In recent years there is intense criticism of the exploitative interest rates charged to borrowers of microfinance institutions (MFIs). Development specialists and researchers have found incidences of usurious lending rates being levied upon the unbanked population, ironically in an attempt to lift them out of poverty. The borrowers suffer greater indebtedness and take extreme measures to repay while others just defaulted. One important reason for the high lending interest rates is the transaction cost or sometimes called administrative cost or operating expenses. It presupposes that high lending interest rates are necessary to cover the transaction and administrative expenses (TAE) of providing many small loans and monitoring many small borrowers. Thus this paper aims to identify the cost drivers and the cost of the MFI transactions and administration by using activity based costing (ABC). Thereafter a mobility solution is designed to replace the manual processes to lower the TAE, which in turn reduces lending rates charged to MFI borrowers. A pilot project has been started in Indonesia to test the hypothesis.

Keywords MFIs • Microfinance • Microcredit • ABC • Costing • Interest burden • Systems technology

2.1 Introduction

The principal function of banks is to provide their banking customers with access to reliable and affordable financial services such as savings, credit, payments, transfers, and insurance. These are important services that help any modern society and a healthy economy. However half of the world population is still unbanked.

In the last few decades, many MFIs have emerged to provide financial services and microcredit to the unbanked sector. For example, solidarity lending and village banking pioneered by Grameen Bank in Bangladesh (Yunus and Jolis 1999; Hughes and Lonie 2007) and KWFT (Microfinance) in Kenya, WING in Cambodia (WingMoney), and many others (KWFT 2014; Vong et al. 2012). It is believed that

microfinance is an effective instrument to alleviate poverty by providing financial service, particularly microcredit and savings accounts to the low-income individuals and microenterprises (Hammond and Prahalad 2002).

However research conducted by Chaia et al. (2009) and Ardic et al. (2011), suggests that as at end 2009, there are 2.75 billion people (56 % of the global population) who do not have access to formal financial services. A recent World Bank survey of 150,000 adults aged 15 and above in 148 different economies reported that over 50 % of the respondents do not bank with a financial institution. While 89 % of adults in developed countries have access to financial services, it is a paltry 41 % in developing countries.

The unbanked group, usually individuals living under US\$5 per day, is caught in a dilemma. Firstly, most banks do not want them as customers because they are not bankable, that is the bank cannot possibly see how they can make a profit from this group. A bank will need to cover the cost of funds (that is, cost of micro deposits or cost to obtain the capital), cost of loan default (when borrowers do not repay), and the cost of administration (staff cost, systems, premises and utilities).

Secondly, the unbanked may not pass the normal know-your-customer (KYC) process because of lack of identification papers and a permanent residence. Thirdly, the unbanked group will find the cost of financial services exorbitant. Imagine, this unbanked person walks into a bank to request for a money transfer of \$20 to a relative in another city, and the bank charges a transfer fee of \$5—a significant 25 % is deducted from the transfer.

Lastly, the distance of the nearest branch or ATM is far away from the place of residence such that the unbanked person takes a long time to access the financial services. Thus one-third of the unbanked population is in Asia, approximately 800 million people, who are in the lowest income category (that is, living on under \$5 per day), simply cannot afford the high costs of banking services. From the banks' point of view, it is a challenge to provide a self-sustainable business model to serve these markets.

2.2 Why Is MFI Interest Rates So High?

From the analysis of data of several countries from 2004 to 2011, the researchers have concluded that operating cost is the largest determinant of interest rate levels in microcredit institutions (Rosenberg et al. 2013).

There are huge challenges in delivering loans to low income households in developing countries. Banks and other financial institutions have failed to meet the financing needs of the poor in developing countries. The reasons for the neglect of this large group lie in the nature of traditional banking practices which are based on guarantees, reputation, and collateral. It is good banking practice for bankers to have an intimate knowledge of market conditions, which helps them to assess the initial loan applications and then continuously monitor the borrowers (Koveos and Randhawa 2004).

Collateral helps align borrowers' intentions with those of the bank and provides a security in case of loan defaults. Banks also need timely and accurate information and continued updating of accounting records. However the low-income households and individuals are the primary clients of microfinance institutions. They do not have financial resources of financial assets to offer as collateral to guarantee their loans. They do not normally have a credit history. As such they are excluded from the formal financial sector. Banks would regard these groups as having a high credit risk profile (Robinson 2001).

The case of adverse selection arises when banks, lacking credible information about the credit risk of borrowers, cannot differentiate between borrowers with varying degrees of credit risks, and resulting in charging high interest rates on all borrowers. Higher interest rates in turn drive creditworthy borrowers out of the credit market, leading to an inefficient outcome (Aghion and Morduch 2004).

Majority of existing microfinance solutions are operated on labour-intensive work processes that involve manually writing or transcribing transactions from pieces of papers to ledger cards. These will present both a challenge and risks the MFIs. They will find difficulty to increase their capacity to serve the huge demand of the unbanked population. The risks that they face are genuine mistakes in manually writing and transcribing accounting records and that of frauds. For certain, a substantial portion of transaction and administrative expenses (TAE) is attributed to manual labour.

MFIs that provided loans to low-income borrowers in developing and transition economies have charged high lending rates to cover their costs (Rosenberg et al. 2009). Most MFIs believe that this is the most appropriate approach to ensure financial sustainability and further growth. MFIs that are profitable may continue to serve their borrowers without ongoing donor contributions and may even fund growth by drawing on commercial sources of funds, including deposits from the public.

There is much evidence that the focus on financial profitability and efficiency have increased the borrowing cost to the poor. Moreover lending money to the low-income borrowers or the rural poor can be costly. MFI Agents have to maintain frequent contact and close relationships with customers to enforce loan contracts and to control lending risk. Thus the twin goals of social outreach and profitability are in conflict (Hermes and Lensink 2011). Their ability to provide collateral for their borrowing is also not easily available.

In a CGAP study, the lending rate of MFIs range from 17 % per annum (in Sri Lanka) to 80 % per annum (in Uzbekistan), with a global average of 35 % per annum (CGAP 2008). The high microcredit interest rates have been heavily criticized and a number of countries have tried to regulate an interest rate cap on microcredit lending (BBC 2013).

2.3 Reducing Operational Cost

Existing literature indicates that transaction costs are a major contributor to high interest rates on microcredit loans (Shankar 2007).

The limited resources and the sheer numbers of borrowers present a tremendous hurdle to process individual loan applications. To create a sustainable self-funding model for a growing MFI, is to design a system that lowers monitoring costs, create a committed and creditworthy client base, and help poverty alleviation (Koveos and Randhawa 2004).

Few studies have examined measures of MFI efficiency. The accounting variables to assess the efficiency of the MFIs are—administrative expense ratio, number of loans per loan officer, loan officers to total staff, portfolio size, loan size, lending methodology, source of funds, salary structure.

In Lafourcade et al. (2006)'s study that uses cost per borrower and cost per saver as measure of efficiency, it was found that African MFIs incur highest costs per borrower but lowest costs per saver. They also discovered that regulated MFIs maintain higher efficiency through low costs per borrower and per saver. In contrast, African cooperative-MFIs are the least efficient with the highest cost per borrower. Nevertheless, cooperative MFIs have the lowest cost per saver but unregulated MFIs have the highest. None of these studies use any parametric or non-parametric approach to evaluate the efficiency of MFI.

Intuitively, the approach is to identify the processes that increase TAE. Only then can the process be changed or reduced or to fully be replaced by low-cost processes.

For example, it is noted that it is costly to monitor borrowers. So microfinance experts have suggested social collateral. This approach works through reputational effects on their community in which repayment of loans is seen by group member. The borrowers are to pay their loans in a "ceremony" for all to see. In this way, the borrowers are able to maintain their social standing in the community (Woolcock 2001). Goldmark (2001) suggested other methods that may help build social collateral, thereby making loans even more secure. Van Tassel (1999) proposed a model with a one-period game to determine the optimal group-lending contract under asymmetric information. He concludes that agents will always form groups with agents of the same type. The agents' types can be differentiated by the level at which they are willing to trade-off increased joint liability commitments for lower interest rates.

Ghatak (1999) concluded that group lending not only increases repayment rates and welfare via social collateral, but also due to peer selection by members of the lending group. Many Indian MFIs, for example, reduce their staffing costs by lending to self-help groups rather than to the individual borrower. Yet another study show that bank-MFIs are the most efficient under intermediation approach while NGO-MFIs are the most efficient under production approach (Haq et al. 2010). Similar to Ghatak, the study by Islam (1995) concludes that lenders using

peer-monitoring systems can charge lower rates relative to conventional lenders. Furthermore, at the same interest rate, the expected rate of repayment is higher with lower risk (Islam 1995).

2.4 Monitoring Transaction Cost and Administrative Expenses Using Activity Based Costing (ABC)

Activity-based costing (ABC) was first propounded in 1987, but the dearth of the available data published (Gosselin 2006), suggested that ABC is not as widely understood and practiced in the financial service industry as one might be led to believe (Wegmann 2011; Rasiah 2011; Lee 2002). Two reasons account for this: firstly, financial institutions find it difficult to define their products (Schoute 2011) and secondly, banks think that the difficulty involved may not warrant the cost (Askarany and Yazdifar 2007; James 2013). In Asia, the first study of applying ABC to banking was undertaken by Vong (1994).

The concept of ABC presents a basis for understanding the behavioural patterns of all cost items within an organization, linking operating costs in a value chain in such a way that management can identify the factors that drive expenditure, focus on key cost items and manage them more effectively. ABC enables management to monitor the factors that drive costs and control the implications of organization's profitability (Hicks et al. 2009).

The primary function of ABC is to assist management in decision-making (Kee and Schmidt 2000). It is an approach in cost analysis that helps management to analyse its cost base in a more meaningful way. It analyses cost behaviour by activities, linking costs to factors that are responsible for the occurrence of those expenditures, and thus, focusing on the factors more effectively in order to manage costs (Bogdănoiu 2009).

As shown in Fig. 2.1, ABC draws information on the activities of all departments within an organization. It depicts a clearer picture of all inter-relationships among the activities and costs incurred. Management uses ABC to understand how and why certain costs were expended, thereby helping them to focus on the root problems, in the business (Qian and Ben-Arieh 2008).

Fig. 2.1 ABC model



Estrin et al. (1994) suggested that the basic premise of ABC was period cost. For example, indirect, variable and fixed costs were attributable to the activities required in making various products. The authors further reported that many non-manufacturing costs, such as marketing costs, were also a function of product activity and should be loaded into products responsible for their occurrence.

An early example of ABC applications in the banking and finance is the First Tennessee National Corporation. By its own admission, it had tried a sophisticated costing system developed for banks by a leading public accounting firm but it did not perform as required.

The corporation switched to ABC in 1989, which is the focus on certificate-of-deposit (CD) products. The costing system revealed that 30 % of the firm's customers accounted for 88 % of its profit. The system also revealed that the firm was losing money on the last 30 % of its customers. An analysis revealed that the loss was due to the fact that one could purchase a 90-day \$500 CD. Given a one percent spread, it was estimated that the bank generated revenue of only five dollars a year if they had reopened a \$500 CD four times a year, where the revenue obtained was considerably less than the processing cost of the transactions. By simply raising the minimum CD amount, the bank eliminated the loss, thus increasing the overall profitability of the CD product line.

Kantor and Maital (1999) built a method for measuring product-specific inefficiency in bank branches to facilitate precise measurement of waste and identify its causes. Their approach combines and integrates two separate, widely used models for measuring costs and efficiency performance: activity-based cost accounting (ABC) and data envelopment analysis (DEA) (Kantor and Maital 1999). The resulting method for activity-based management provides managers with detailed quantitative performance benchmarks for the specific business activities of their firms or divisions. One of the key issues in banks is that lending managers need to assess the profitability of a customer relationship (van Raaij et al. 2003). This would mean deducting the cost of servicing the account from the revenue obtained from that customer. Since banks provide a wide range of products to clients, especially in corporate banking, lending managers need to know the type and volume of products transacted and more importantly, the transaction costs of those products (Chea 2011). This would enable them to find an appropriate mix of banking facilities offered to the client, which would enable the bank to achieve a targeted level of profitability. This would mean that the transaction cost of each product type must be calculated (Nenovski et al. 2012). Three hurdles need to be overcome before that can be achieved: the products need to be defined, the cost structure agreed on and the process drivers determined (Heisinger and Hoyle 2014).

In the study by Vong (1994), he outlined a 4-step approach to build a simple ABC system to monitor costs.

Step 1: Define the Financial Products

Product costing can be regarded as basic form of activity-based costing, therefore forming the basis for product pricing and product profitability (Lee 2002). Kotler (1976) defined product as anything that could be offered for attention, acquisition or

consumption. This definition included physical objects, service, personalities, place, organizations and ideas. Hempel (1976) regarded bank products as customer satisfaction. Wills and Day (1984) suggested that bank products should be seen in the light of benefits derived, and that service products were those which produced a series of benefits which could not be stored. However, a bank product is not only a service offered to the customer, but also a measure of creating actual or potential income (Dietrich and Wanzenried 2014). Then there are some financial services, which may not attract income by themselves, but rather contribute towards the main product which does get (Colgate and Alexander 2001). Vong (1994) described them as “a series of benefits” and called them sub-products. He further defined a product as “a service offered directly to the customer that creates actual, notional or potential income”.

In our case, most MFIs have few products, namely microloans, deposits and insurance services. In order not to be fazed by the inconsistencies in numbers, the MFI should first survey the broad definitions of products that can be readily applied. Given the agreed definitions, bank products can then be identified and listed.

For example, a cash withdrawal transaction from a Loan Account is a cost and does not provide an income itself but the main product Loan Account attracts notional interest income. Transactions linked to a main product can be referred to as “sub-products” and sometimes defined as “the lowest level of a product where costs can be identified”. Thus, a main product may have a series of sub-products which incur cost but which contribute indirectly to the production of income at the main product level.

Table 2.1 shows the possible sub-products contained with the Current Account product.

Step 2: Decide on the Cost Structure of a Product

It is envisaged that the total costs incurred by the MFI can be devolved to all the bank products. This process is split into four three cost channels similar to the principles of Horngren and Foster (1987). Then each product costs have three components: direct cost, indirect cost and overheads.

Table 2.1 Loan product and sub-products

Product name	Product description
Main product: loan service	Loan account services offered to borrower
Sub-product 1: credit evaluation	Evaluating the credit proposal
Sub-product 2: borrower training	Training the borrower prior to loan release
Sub-product 3: loan cash withdrawal	Taking cash out from loan account
Sub-product 4: loan monitoring	Visiting the borrower
Sub-product 5: loan cash Repayment	Collecting the cash for repayment
Sub-product 6: loan account open	Process of opening a loan account

- Direct Costs

Direct costs are those that can be identified specifically with a single cost objective in an economically feasible manner. In an MFI, they would be those operational expenses incurred in processing products. For example, the Loans Department would have its entire administrative expenses routed to the loan transactions—account opening, loan cash withdrawal, and loan repayment. The cost allocated will be called direct costs.

- Indirect Costs

Indirect costs are those administrative expenses, which cannot be identified specifically to the actual loan traction processing but closely associated with it. For example, the Cash Section of the Loans Department. The cost of Cash Section will have their administrative expenses allocated to the Loan transactions as indirect cost.

- Overheads

Costs incurred by departments in providing supervisory/general services to other sections or departments. An example would be the cost of the CEO Office in MFI. This cost will be allocated to the Loan products as overheads.

Step 3: Determine the Process Drivers

ABC is linked to performance measurement (Dickinson and Lere 2003). Companies that have high costs associated with critical activities would want to identify process drivers for those activities and encourage employees to improve those processes. Kaplan and Anderson (2004) of Harvard Business School defined process drivers as factors that affect the efficiency of the activity.

ABC can be viewed as a two-step allocation process. The first allocation, using first-stage driver statistics as basis, distributes expenses to activity pools. The second allocation, using second-stage driver statistics, distributes activity costs to products (Khataie et al. 2011).

While many costing systems assume that the responsibility for costs falls neatly within organizational boundaries, process drivers recognize that this is not the case and instead, focus on decisions which give rise to cost being incurred to volume, quality, time and the level of service.

Process drivers should be easily measured and determined. This gives objectivity in the estimation of different types of cost structures (Homburg 2004). Table 2.2 shows the process drivers that can be adopted by a bank.

Time-based weighted transaction counts take into consideration the processing time for different transactions. The cost allocation is not only on the basis of the number of transactions but also the time taken to carry out those transactions.

In the MFI industry, productive staff count can be used as a basis to allocate indirect costs and overheads. Productive staff count is a summation of the number of direct staff (labour input that can be directly identified with the transaction) and indirect staff (labour input that can only be indirectly associated with transactions).

Table 2.2 Process drivers and cost assignment

Process drivers	Operating expenses to be assigned	Cost type
Time-weighted transaction count	Costs incurred at sections/departments which can be identified specifically with the cost objective	Direct cost
Productive staff count	Cost incurred at sections/departments which cannot be identified specifically with the cost objective but which are closely related to the processing activity	Indirect cost
Productive staff count	Overheads incurred by sections/departments which are distantly related to the processing activity	Overheads

The transactions that require a greater proportion of productive staff would have higher indirect costs and overheads allocated to them.

Step 4: Planned Implementation Phases

One of the most important steps is the implementation of the ABC concept without which all investments in time, manpower and money would be futile. It is necessary to decide on how sophisticated a system is needed to report the required information and how a realistic time frame can be put in place (Liu and Pan 2007). Depending on the nature of the MFI’s operations and the complexity of the reporting details, it may take between 6 and 12 months for the development, design and implementation of an ABC system for input to customer and product profitability analysis (Sena 2010).

The implementation activities include product definition and coding, product mapping (linking cost centres and general ledger items to products) and the development, design and testing of cost assignment programmes (Roztocki 2005).

Software solutions like SAP, PeopleSoft and Oracle have ABC components that help to assign overhead costs to customers and products. Push and pull approaches shown in Fig. 2.2 are used for assigning cost centre resources to business processes (via resource drivers) and allocating business processes to receiver (via process drivers).

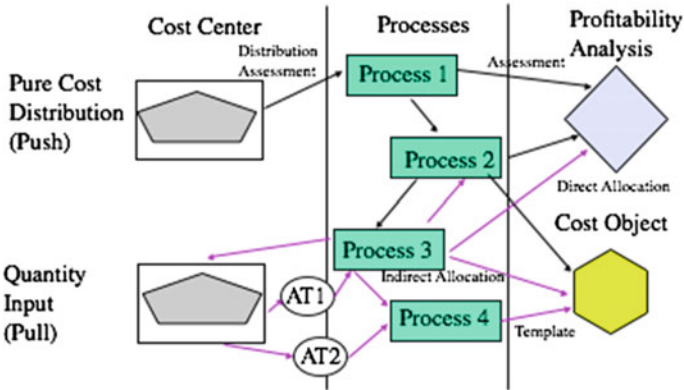


Fig. 2.2 Push and pull factors depiction

2.5 Pilot Project in Indonesia

After identifying the process cost and cost drivers, we may use mobility technology solutions to perform the processes that drive the operational costs. A pilot project has recently being designed and undertaken in Indonesia by the authors. In the pilot project, the entire process from borrower acquisition, loan monitoring, loan repayment, and even peer-to-peer payment is monitored and then to design mobility solution to replace time consuming and laborious processes that increase cost. Figure 2.3 illustrates the overall process.

2.5.1 Borrower/s Acquisition Process

The MFI agent takes a long journey from the city to a rural village to visit a potential borrower (or borrowers in the case of group lending). An interview is conducted, with a series of questions, to determine the loan amount and loan repayment ability. The agent returns to the MFI Office at the fringe of the city with the data collected from the potential borrower and of the potential borrower. The MFI Agent analyses the data. If the information from the analysis matches with the lending criteria of MFI, a loan proposal is written including the loan repayment schedule for submission to the MFI loan committee for approval. Not every loan proposal is approved. The usual duration of this process ranges from 5 to 15 days.

2.5.2 Training of Borrower/s

After the loan is approved, the MFI agent or another team makes the journey to village for the second time. The purpose of the visit is to present the loan details to the borrower, gets the borrower’s acceptance to repay the loan. Training is then conducted for borrower (or borrowers in the case of group lending) in running the

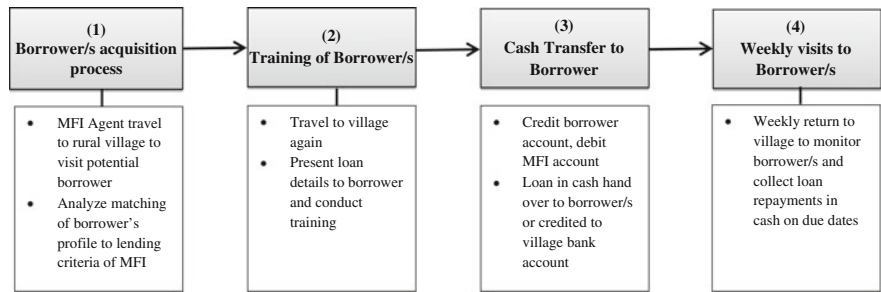


Fig. 2.3 The overall process of the pilot project

business, and matching the loan repayments to the business operations. The MFI agent writes a report of what has been done and the observations of the borrowers during the training. This process normally takes 5–7 days.

2.5.3 Cash Transfer to Borrower

The agent returns to the MFI Office to hand in the borrowers documents for safe keeping. There is also an accounting process to credit the borrower account and debit the MFI account. The MFI Agent will now return to the village with the cash. The loan in cash is handed over to the borrower/s, or in some rare cases the cash is credited to a village bank account of the borrower/s. This process takes 3–5 days.

2.5.4 Weekly Visits to Borrower/s

The MFI Agent returns to the village weekly to monitor the borrowers/s and collects the loan repayments in cash on due dates. The MFI agent writes a report on the ability of the borrower to run the business and also any observations on loan repayment ability. If cash is collected the MFI agent shall return to the city with the cash and pass the cash to the MFI Accountant to pass accounting entries to the borrower's loan account and MFI's accounts. This process takes 3–5 days or even longer depending on the loan repayment ability of the borrower/s. The weekly visits will be done repeatedly until the loan is fully paid off.

There are few omissions to the loan process described above. Firstly, it has not taken into account of loan default or cash pilferage or adverse collusions to cheat the system. Secondly, in addition to the lending there could be credit insurance provided to borrowers. In such cases, where the loan defaults, the credit insurance company shall investigate and repay the loan on behalf of the borrower. That has not been articulated. Lastly, there could be savings tied to the loan. In such cases, it appears that there is some measure of “comfort” provided to the MFIs by the borrower.

2.6 Conclusion

In summary, for MFIs to scale fast enough to serve the huge demand of unbanked population and maintain financial sustainability, they require new business models and technology innovations to lower the interest burden by (1) lowering the operating cost, (2) accounting for legitimate activities and frauds, (3) lowering or mitigating risks of microcredits.

It was identified that the following processes can be replaced, fully or partially, by mobile phone applications thereby lowering the transaction and administrative costs:

1. Loan evaluation (with a credit scoring application).
2. Training (self-paced learning application).
3. Cash transfer for repayment and cash withdrawal or cash deposit in case of savings (with a peer-to-peer application).
4. Loan monitoring (transactions of borrowers can be monitored daily from transaction data on the backend server).
5. Deposit Savings can be topped-up to a mobile account.
6. Purchasing an credit insurance can be transacted through a mobile application.

Thus mobility technology offers much hope to emerging markets. It provides a new approach to lowering the transaction and administrative expenses of MFIs, that in turns lower cost of borrowing for a large majority of the low income population. In the end, it is envisaged that this will expand the social outreach and provide a broader range of financial services to the vast rural populations.

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