

Sustainable microfinance and technology

Ford Motor Company Fellowship

Natalie Kulik

Patrice Molinari

January 2004

Abstract

This paper analyzes the role of technology to achieve financial sustainability and stronger impact of Microfinance Institutions (MFIs). The effects of technological solutions are assessed within the developed framework encompassing major stakeholders and industry drivers. In particular, we examine how technology can solve problems of MFIs and the microfinance industry, decrease information asymmetry between stakeholders and alleviate poverty by increasing microfinance impact and outreach.

The results demonstrate that technology is only one of the determinants for MFIs' sustainability and impact. The paper supports this argument through the analysis of industry trends, risks and opportunities and evidence from selected examples.

We argue that the way forward to implement cost-effective technological solutions is a collaborative effort of stakeholders: the establishment of a global entity facilitating not only the technological development of microfinance, but also its institutional strengthening and a broader impact.

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1. Introduction

1.1. Boom in Microfinance

The term microfinance refers to the provision of financial services such as small collateral-free loans, deposits, pension and retirement, and insurance to low-income groups and their micro enterprises. Microfinance institutions also frequently add to their portfolio of financial services the provision of social services such as healthcare, literacy training or business development consulting services.

Although this model of financing originated in the 1970s, at that time with an exclusive focus on credit for income generating activities, its successful adoption and worldwide spread happened only recently. The main focus of first lending programs was to prove that the poor were creditworthy, and the success of such MFIs as the Grameen bank, and later ACCION, BRI/Unit Desa, or BancoSol not only demonstrated it, but also proved that this model could be financially sustainable. As a consequence, it was replicated throughout the developing world from Asia to Latin America and Africa at such a pace that the World Bank characterized it as the “microfinance revolution”.

The combination of social impact and commercial viability prompted not only international organizations and NGOs to include microfinance in their services, but recently attracted traditional commercial banks to enter the sector. In 2001, according to the World Bank, the sector had grown to 10.000 MFIs and 50 million customers worldwide, while the potential market is estimated as large as 600 million customers.

1.2. Social importance

Abundant studies have demonstrated the effectiveness of microfinance to alleviate poverty in various regions of the world. An important reason put forward is that its impact goes far beyond business loans since access to financial services is a fundamental basis for the other interventions to alleviate poverty. Improvements in health care, nutritional advice and education can be sustained only when households have increased earnings and greater control over financial resources.

Moreover, microfinance is unique among development models because as programs approach financial sustainability, they are reaching far beyond the limits of scarce donor and charitable resources, delivering social benefits on an ongoing basis and a larger scale. As a result, microfinance provides a novel and promising approach to achieve the United Nations Millennium Development Goals: improving the wealth of the world’s neediest people.

1.3. Industry challenges

For the microfinance sector to expand in line with the need and demand, it is critical that MFIs achieve financial self-sustainability and reduce their dependence on donor funding. Despite the excellent prospects of the sector, with low loan default rates and untapped demand for financial services by low-income groups, only 1% of MFIs are self-sustainable and average Adjusted Return on Assets (AROA) is still negative across all continents.

Among the major reasons for such poor performance are the MFIs’ lack of access to recent technologies, their limited financial muscle and reliance on government funds, the higher costs of servicing a larger number of clients, each of them making use of very little financial services and the cost of outreaching customers in remote and rural areas.

Though, the successful MFIs have proved that there are solutions to these problems - by reaching large numbers of clients, offering innovative financial methodologies and by continuously increasing institutional capacity and efficiencies, possible only with application of adequate technologies.

1.4. Assumptions, objective and method

The assumptions underlying this study are that profit-making and minimal market imperfections are the key to the sustainable development of the industry which itself is instrumental to alleviate poverty. In other terms, development objectives will be better served if the industry becomes profitable worldwide, suffers from minimal market imperfections and therefore attracts the largest number possible of profit seeking, professional, and socially conscious microfinance entrepreneurs competing fairly between each other.

The objective of this study is to progress in an area still under-covered by research in microfinance: demonstrating how technology can circumvent market imperfections and ensure financial sustainability taking into account risks and opportunities of the available and suggested solutions.

2. Analysis of the microfinance environment

2.1. Structure and stakeholders

2.1.1. Framework

The microfinance environment is still new and has grown extremely fast in the last decades. As a result, it is rather complex, very fragmented and encompasses about 70.000 organizations worldwide (50).

The following drawing (Fig. 1) provides a concise description of the structure of the microfinance environment. It is centered on a given MFI that operates locally to a country, or to a limited geographical area of this country, serving a specific group of borrowers. This MFI functions in an environment where five factors are in action: the national regulation to which the MFI is subjected (Internal Regulation), the ensemble of other MFIs local to the country with which the MFI competes or may collaborate (Industry), the assistance it can receive, generally from international NGOs or intergovernmental organizations (International Collaboration), the money injected in the industry by donors or investors (Investment). The fifth factor is the impact on society that the microfinance industry must have as a result of its operations (Impact).

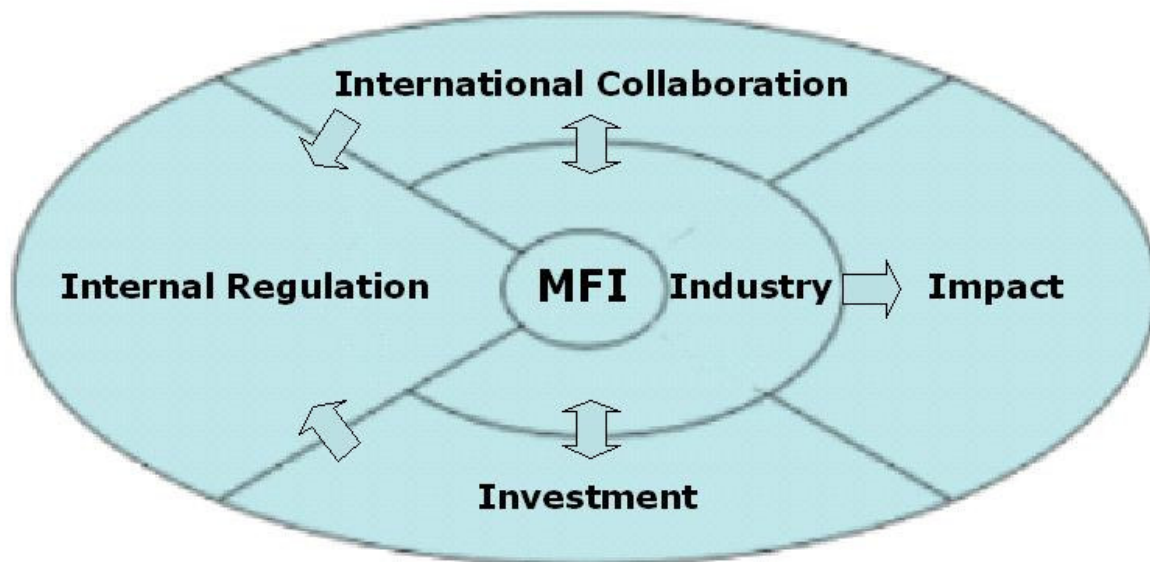


Fig. 1. Microfinance environment in a given country

2.1.2. The four input factors

The industry comprises of MFIs ranging from very small nonprofit organizations to large and diversified commercial banks. The institutions differ in many ways, including their legal form, strategy, clients, services and sources of funding, but they all contribute to serving the region's micro-entrepreneurs (34). MFIs can be formal institutions, such as the handful of commercial banks that operate in microfinance with BRI Unit Banking System as one of the most successful examples. MFIs can also be informal institutions, such as cooperatives and NGOs, which account for the largest segment of the industry and are generally subsidized by

donors and multilateral institutions. The Table 1 provides the general typology of institutions operating in microfinance.

	Multipurpose Financial Institutions	Specialized Financial Institutions	Specialized Non-Governmental Organizations	General Non-Governmental Organizations
Legal form	<ul style="list-style-type: none"> •Banks •Finance companies •Cooperatives 	<ul style="list-style-type: none"> •Banks •Finance Companies 	<ul style="list-style-type: none"> •Foundations •Associations 	<ul style="list-style-type: none"> •Foundations •Associations
Purpose of microfinance activities	<ul style="list-style-type: none"> •New market •Image •Philanthropy 	<ul style="list-style-type: none"> •Social Impact •Profitability 	<ul style="list-style-type: none"> •Social impact •Sustainability and growth 	<ul style="list-style-type: none"> •Social impact •Sustainability
Clients	Various; microenterprises are small share of the portfolio	Small and microenterprises	Microenterprises	Microenterprises
Services	Various and targeted to the specific market segment; Individual credit; Savings	Individual credit; Group loans; Limited offerings of leasing; factoring; Savings	Individual credit; Solidarity loans; Village banking	Individual credit; Solidarity loans; Village banking
Sources of funding	<ul style="list-style-type: none"> •Savings •Shares •Bonds •Commercial loans 	<ul style="list-style-type: none"> •Commercial loans •Shares •Savings 	<ul style="list-style-type: none"> •Commercial and soft loans •Guarantees •Donations 	<ul style="list-style-type: none"> •Donations •Soft loans •Guarantees
Examples	<ul style="list-style-type: none"> •Banco del Comercio (Costa Rica) •Banco Solidario (Ecuador) •MultiCreditBank (Panama) 	<ul style="list-style-type: none"> •Fin. Calpia (El Salvador) •Caja Los Andes (Bolivia) •CMAC Arequipa (Peru) •FinSol (Honduras), •Fin. Vision (Paraguay) •Ademi (Dominican republic) 	<ul style="list-style-type: none"> •WWB Cali, Bogota, Popayan, Medellin (Colombia) •FED (Ecuador) •Adopem (Dominican Republic) 	<ul style="list-style-type: none"> •Fundasol (Uruguay) •Fundación Carvajal Colombia)

Source : 'Tipología de Instituciones Financieras para la Microempresa en America Latina y el Caribe', Fernando Lacano and Miguel Tabora, IDB, 1998

Table 1. Typology of institutions serving the microenterprise sector

Internal Regulators are local governments and institutions that set the microcredit programs standards governing loan collaterals and approvals, the savings policy, the legal forms of national enterprises and any other regulation relevant to MFIs. It is an important factor that drives the development (or non-development) of the industry in the country. Regulators in countries such as Indonesia, Bolivia, for example, have been able to define regulatory frameworks that resulted in the fast development of efficient microfinance services. In many other countries, national regulation still appears inadequate. MFIs are fragmented and generally appear to have little bargaining power to push regulators decisions.

International Collaboration is driven by development agencies, NGOs, researchers, intergovernmental organizations. Their aim is to provide assistance to MFIs, develop systems and methods that will support the development of the industry, create networks that disseminate best practices and provide communication platforms, provide training, monitor the industry, carry out research about the industry's sustainability and impact on poverty. Their work is generally not financed by MFIs themselves but often from government funds and private donorship. International collaboration is a crucial component of the

microfinance environment, especially at the current stage, since they can have a direct influence on both the microfinance industry practices, and on the local governments' regulatory activities. Examples include US Agency for International Development (USAID), United Nations (UN), Ford Foundation, Rockefeller Foundation, GTZ, the World Bank (WB) and PlanetFinance.

Investment is provided by entities that range from donors to financially-oriented investors. Donors expect a return in terms of development impact, whereas investors anticipate a financial return in addition to the impact. A wide group of investing entities is likely to lie in between, looking for a balance between the impact and the returns. In other words, some investors would finance a MFI even though returns are low provided that the impact is consequent to their investment. At one end of the spectrum, one finds governmental or private donors, at the other end - commercial and retail banks, international development banks such as the International Financing Corporation (IFC), individual investors and private equity funds. Another type of investor is the APEX, second-tier lending institutions created to channel funding and which can be governmental or not. Investors, like international collaborators, can have a direct influence on both the microfinance industry practices, and on the local governments' regulatory activities

2.1.3. Major international collaborators - investors

Many institutions have activities that can be classified as both collaborative and investing. It is the case of APEX that also provide consultancy and advice. It is also the case of a majority of development agencies, multilateral and regional development banks, and consortia of bilateral and multilateral donors, as described below. The paper will carry out the analysis by considering these collaborative and investment activities as two separate lines of business.

Development agencies, such as USAID, UN, the Ford Foundation. USAID, for instance, in addition to its assistance activities, is one of the leading donors with over \$1 billion investments in MFIs between 1988 and 1998. As another example, the UN supports microfinance under the leadership of UN Development Program (UNDP), and in collaboration with UN Capital Development Fund (UNCDF) established the Special Unit for Microfinance (SUM). The latter supports UNCDF microfinance activities and manages an active portfolio of \$40 million as well as the MicroStart Program.

Multilateral and regional development banks like the WB, the Inter-American Development Bank (IDB), the Asian Development Bank (ADB) and the African Development Bank (AFDB). For example, ADB's portfolio allocated to microfinance programs totaled \$469 million, AFDB \$193 million and IDB \$500 million respectively (1997-2001) (134). The UNDP MicroStart program has mobilized \$50 million since 1997. In total from 1998 to 2000 WB provided \$580 million in loans to MFIs (134).

Consortiums of bilateral and multilateral donors, such as the Consultative Group to Assist the Poorest (CGAP). Established in 1995, CGAP's role is to strengthen MFIs and accelerate their growth and impact as financial service providers, but the funds of this donor are limited to \$6-7 million per year.

2.1.4. Other stakeholders

The microfinance environment also includes private players that provide solutions to the different groups analyzed in our framework. These players can be management and IT consulting companies working directly with MFIs, government consulting agencies and consulting firms working with international collaborators, and rating agencies working to smooth the information channel between investors and MFIs.

Credit Bureaus are another important component of the environment. They are often created either by the local regulators, or by a network of MFIs that operate in the country. As a result, credit bureaus could be classified both in the Internal regulation and in the Industry. This paper considers them as a part of the Industry since their role is mainly to alleviate information asymmetry between MFIs in a given country.

Microfinance Networks can be local, regional and global. They disseminate best practices, foster regulatory changes and provide consultancy and communication platform. The suggested framework classifies them in the International Collaboration category, since they have maximum impact in terms of information exchange when they are established on a transnational basis.

2.1.5. The Impact

The final goal of the whole microfinance environment is to result in a sustainable impact on the social welfare improvement, poverty alleviation and women empowerment. Microfinance has had a proven beneficial social impact in developing nations. However, this impact still appears unbalanced with what it could be, given the resources injected in the mechanism. The Figure 2 summarizes the stakeholders of microfinance in each category.

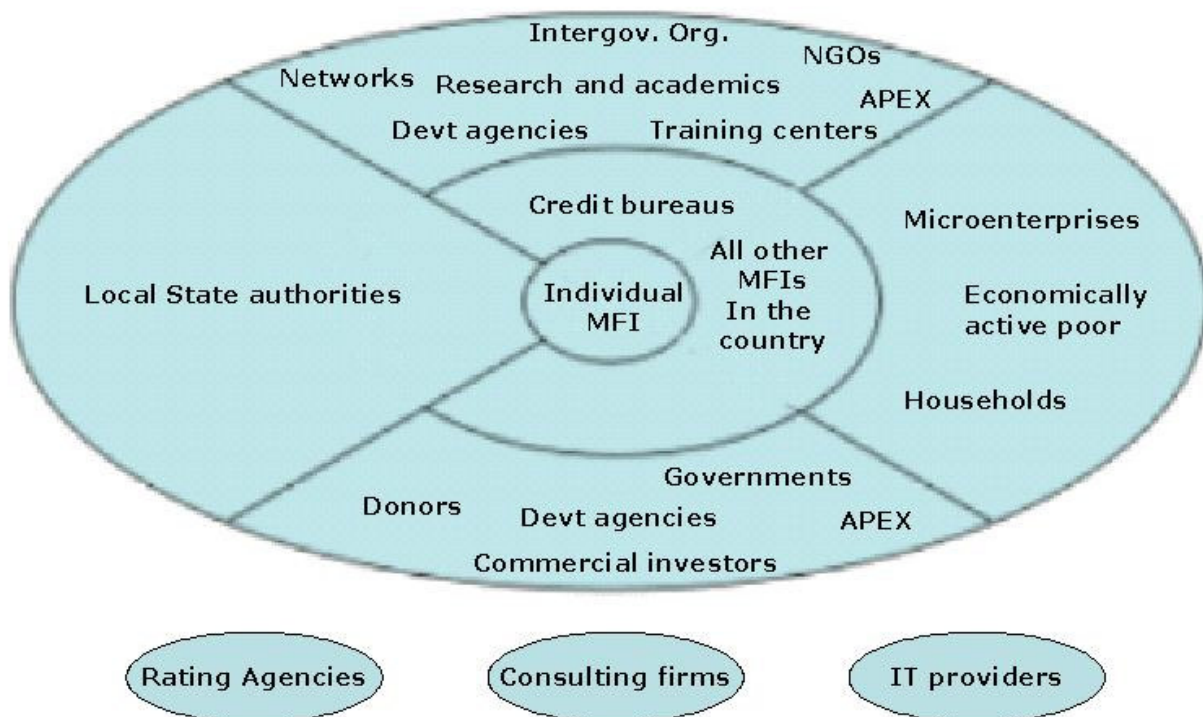


Fig. 2. Stakeholders of microfinance

2.2. Evolution of the paradigm

2.2.1. The paradigm shift : commercialization of microfinance

Microfinance started as a movement to provide financial services access to the poor in the form of grants and subsidies. Since then it has reached more than 137 countries, and in

1995 Microcredit Summit set goal to provide financing for 100 million poor families by 2005. (83)

Development and scalability of microfinance made it possible that several large MFIs reached financial sustainability having laid the foundation for “institutional commercial microfinance” (13). The examples of Grameen in India and Bank Rakyat in Indonesia demonstrated a large untapped demand for microfinance in developing countries, substantial social impact of such programs and the potential profitability of credit services to the poor.

In the nineties a huge market demand (12), limited donor funds (33) and increasing competition in traditional financial markets making players move down-market (122) as well as high returns on equity in microfinance (20-40%) (136) created conditions favorable for “The Paradigm Shift”. Microfinance evolved from subsidized credit to sustainable financial intermediation (13). The new model replaced subsidies by commercial microfinance providing substantial savings to governments and donors that could be available for poverty alleviation programs. This shift had a marked effect especially in countries such as Bolivia, Chile and Bangladesh. In many other countries such as Sri Lanka and Philippines, commercialization is still in its early development.

As a result of the demonstration effect of profitable players, a number of commercial microfinance programs entered the industry: consumer credit institutions, state-owned and private banks and global financial institutions such as Citibank (microfinance bond issue handling, credit facilities and letters of credit to successful MFIs, 113) and Deutsche Bank.

As commercial players were entering the industry and MFIs previously operating as NGOs switched to commercial models, subsidized credit programs of many MFIs consistently underperformed and in some cases undermined MFIs’ incentives to become self-sustainable, to outreach the poor and meet the growing demand for microcredit.

New commercial entrants are changing the microfinance industry making it more competitive than ever before. The number of financial service providers is increasing and they are now in direct competition with one another. Market forces have substantially increased pressure on operational efficiency of many small MFIs and NGOs that are currently in immediate need to improve services, develop new products and introduce cost-saving technologies to remain competitive.

2.2.2. Possible evolution of the industry

Commercialization of microfinance is now a “relatively accepted prerequisite” (34) to sustainable expansion of outreach commensurate with the demand by the poor in the developing countries for financial services. There is also a growing realization in the microfinance community that commercialization allows MFIs “greater opportunity to fulfill their social objectives” of providing the poor with financial products and free resources for other social objectives (34).

It is likely that microfinance will evolve towards gradual convergence of microfinance industry and the mainstream financial sector. A positive scenario could well be the development of an efficient industry, with fewer or no further public and donor subsidies, and attracting sufficient funds to fulfill the poor’s demand for financial services, demand-driven services and a wider selection of financial products at a lower cost for the low-income customers. Money saved could then be re-injected to serve the non-economically active poor, infrastructure development, health or schooling.

However, a number of obstacles may divert the evolution of microfinance onto a more pessimistic scenario. Government policy environment, such as low interest rates caps, inadequate regulation of enterprises' legal status and of the savings collection may jeopardize MFIs' efforts to become profitable. Local or international subsidies, which result in unfair competition between subsidized and non-subsidized MFIs, may prevent commercial microfinance providers to enter the market and hamper overall self-sustainability initiatives. In addition, the complex structure, high segmentation, lack of leadership and of consensus-based decision making of international collaborators may not result in timely and effective evolution of the industry toward efficiency. Finally, the current lack of transparency of MFIs, and in particular the lack of credit information collection bureaus and rating agencies, may deflate investor confidence in smaller MFIs.

As a result, the speed of commercialization will vary significantly by country and market segment. But more importantly, an uncontrolled rush to commercialization may also divert the current paradigm to a purely for-profit service offered by a few consolidated strong players, who would not necessarily have social impact as their first priority.

Commercial organizations may become fierce competitors for small MFIs. They are in a position to leverage their financial know-how, geographic reach, and operational/managerial excellence to capture the most profitable customers. The resulting competition may eliminate smaller players, including the profitable ones and those that have strong social impact. This would increase the barriers to entry in the industry that may result in inadequate consolidation where fringes of the population would not be reached because deemed unprofitable.

Also, an uncontrolled trend to commercialization may well result in customers' over-indebtedness. Large players may adopt the strategy to promote credit services to the low-income groups, thus increasing considerably their debt burden. This strategy would also undermine social goals of microfinance and may negatively impact the image of the whole industry.

As a result of this extreme commercialization in the direction of profit seeking, one may observe a drift of the social mission of microfinance.

In order to avoid this pessimistic scenario, it is important that stakeholders implement the tools to have an industry where big and small player cohabit and serve their specific customer segments. It is also important that MFIs can benefit from the supporting networks, regulation and information that will enable them to compete in an efficient industry. This is the challenge that governments, international collaborators, investors and MFIs will have to face.

2.3. Balancing financial sustainability and social impact

2.3.1. Challenge

The challenge of microfinance is to be both financially sustainable and have an impact on poverty alleviation. MFIs must be sustainable to attract money from capital markets. MFI sustainability would also result in stronger competitive means against incoming players such as big commercial groups and would ensure that microfinance be served by a wide variety of institutions, differing in size, target clients, geographical reach, financial products, and development objectives - and therefore would ensure maximum outreach of the microfinance industry.

Financial sustainability. This paper defines sustainability as “financial sustainability”, the ability to operate according to the credit market rules, and in particular to provide a return to investors adequate with the risk they take. Only financial sustainability can attract sufficient investors’ money to make the industry viable in the long run. Operational sustainability (i.e. the ability to operate in the long run with a constant amount of money – no loss) would require subsidy to initiate the activity.

Due to the small size and low liquidity of investments in MFIs, investors are likely to take into account both business and market risk (and not only market risk, as a diversified investor, who invests in liquid securities would). As a result, the expected return would likely be much higher than the one the CAPM predicts, and would greatly depend on the perceived business risk of the MFI (similar to private equity financing).

The challenges to assess financial sustainability are the absence of commonly agreed methods and a lack of data from MFIs (137).

Whatever the methods used, MFIs in their great majority, and especially the smaller ones, appear not to be sustainable. Studies by John Morduch (86, 87) have shown that sustainable MFIs generally share the following criteria:

- they have achieved a dimension, in terms of assets and number of borrowers, that enables them to benefit from economies of scale;
- they charge higher interest rates;
- they serve the “better-off” among the poor;
- they disburse larger loans.

This suggests that there is a strong incentive for MFIs, if they want to be sustainable, to divert from poor customers to those who are better-off and to divert from rural to urban markets. Thus, focusing only on financial profitability may result in a shift of microfinance from social to for-profit finance. To mitigate such risk, one always needs to consider the impact.

Social impact. This paper defines impact as the capacity of the MFI to alleviate poverty effectively in its zone of influence and in the long term. It results from the MFI’s ability to reach the right client segment and effectively improve its livelihood. Impact, like financial sustainability, is not straightforward to assess and much research is currently done about the issue. For example Ford Foundation started in 1999 a program to assess the impact on poverty of development finance organizations that classifies impact at four levels: enterprise, individual, household and community (114).

But, as for financial sustainability, the needed data are often unavailable. Some models propose a simplified way to assess impact. One example is to assess community impact by using the minimum requirements approach (level of employment in the industry necessary to maintain the viability of the regional economy – uses minimum employment requirement for the local community and calculates the income multiplier, which is the induced economic impact) (114).

For the microfinance industry to move to the right direction, it will be critical that stakeholders agree upon a method to assess both financial sustainability and impact, applying it on a worldwide basis. It would clearly need to be refined in time and adapted to local environments. But agreeing on such a core method as soon as possible and promoting

and applying it worldwide, will provide the industry with a indispensable tool to start monitor the progress.

2.3.2. Problems of the microfinance industry

Balancing financial sustainability and impact is not easy a task for MFIs. The microfinance industry suffers from the market imperfections relevant to the credit industry, in a more critically acute way. Imperfect information about clients is all the more problematic that the poor lack credit history, track record and sometimes identification papers. Fighting loan delinquency is also a problem since the poor often lack collateral, are dispersed and remotely located.

In addition to the classical problems of credit agencies, MFIs also suffer from other difficulties specific to the microfinance model. MFIs have limited financial and human resources, they often operate in urgency and lack the skills and resources to cope with their initial skyrocketing growth, and their management may lack the skills or the incentive to operate efficiently.

In addition, they have a great number of customers, remotely located in rural areas, sometimes uneducated and illiterate. This results in important operational costs. Also, MFIs are diverse, lack credibility in capital markets, and lack collective thinking. Finally, in part because the microfinance industry is still young, it lacks adequate regulation.

The dilemma facing microfinance is how to achieve financial sustainability, and at the same time improve impact. A number of examples suggest that there should be a correlation between financial sustainability and technology: some MFIs appear to be sustainable although they do not share the characteristics of sustainable MFIs described above. For example, Women World Banking (WWB) Popayan in Colombia has consistently achieved ROA close to 20% while its portfolio and average loan sizes kept relatively small compared to other institutions. Also, according to Microrate report (54), MFIs in Latin America with the highest personnel productivity can be observed at the WWB affiliates, which are known to be technology oriented. Another example is PRODEM (Bolivia) which saw the number of its customers grow from 1400 to 12000 within a year after having introduced smartcard technology and fingerprint identification devices at cash dispensers.

2.3.3. Suggested approach

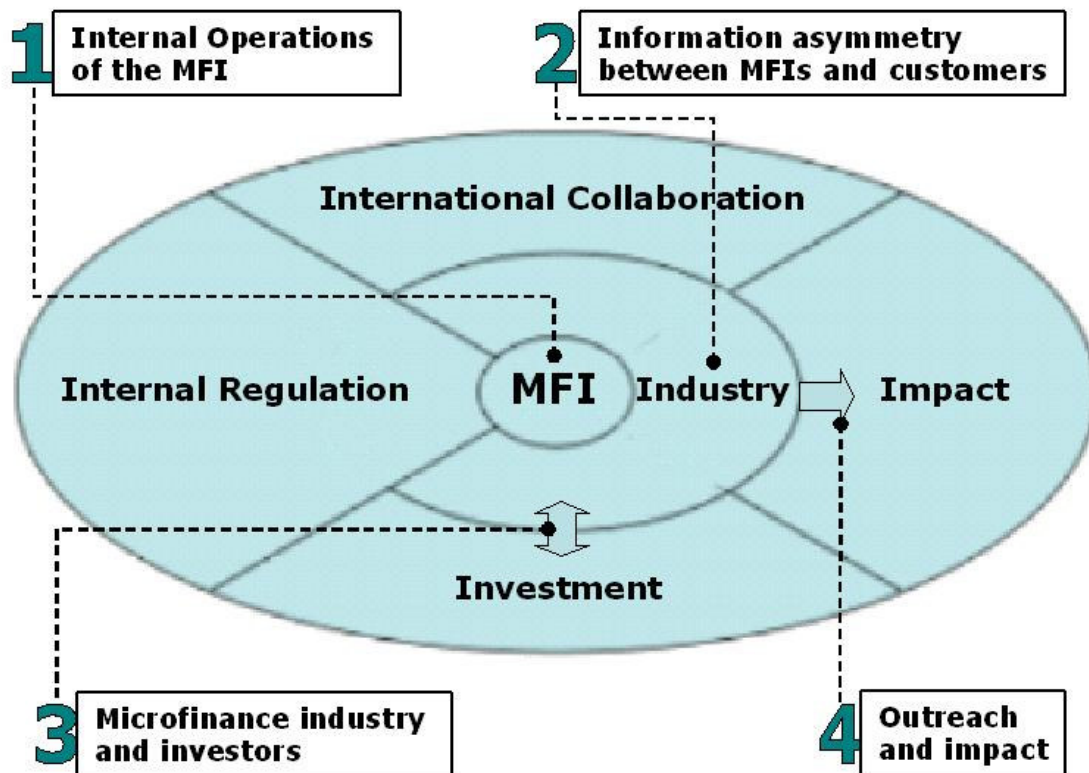


Fig. 3. Suggested approach

One can classify the problems experienced by the microfinance industry along the suggested earlier framework. This paper segments the approach (Fig. 3) by stating that, in order to be sustainable, a given MFI needs not only to operate efficiently by itself but also to operate in a market efficient enough. Besides, even given the industry is efficient, the MFI needs to broadcast this information to capital markets to obtain the necessary capital. Finally, the issue of impact and outreach is addressed. Consequently, the following four areas are analyzed and technological solutions to alleviate their problems are suggested:

- 1) Technology as a tool to improve operations of MFIs.
- 2) Technology as a means to alleviate market imperfection within the microfinance industry, in particular the problem of information asymmetry between MFI and their clients.
- 3) Technology as a means to mitigate information asymmetry between the microfinance industry and investors.
- 4) Technology as a tool to increase impact and outreach.

These four issues will be analyzed in the next chapter.

3. Issues

3.1. Internal operations of the MFI

3.1.1. Issues

The issues of MFI's internal operations can be classified into the following three categories:

Small size, scarce resources, time pressure. The primary problem of MFIs is a small human resources pool and a virtual absence of an access to financial markets. As a result, MFIs do not have sufficient resources to hire, train and retain professional staff. Consequently, the personnel often lacks the basic skills, including computer literacy, may be unmotivated and even engage in fraudulent activities or corruption (88).

Difficulty to control high growth rate. Demand for micro-credit is such that MFIs tend to grow at a very high pace in their initial years. However, the lack of access to capital and limited financial resources make it extremely difficult for MFIs to manage this growth. Moreover, operations during this phase are also a complex issue since human resources are to be sufficient and methods and systems robust enough to support the expansion.

High number of customers with small loans in remote location. MFIs have to serve a large number of clients often dispersed over vast suburban or rural areas. To reach the clientele and reduce the risk of loan delinquency, MFIs need to establish frequent physical interactions with customers, and as a result they tend to adopt geographically dispersed structures. Since each client usually has a very small loan, MFIs have to manage a complex and costly business operation.

3.1.2. Current practices and their limitations

Sound operating and management practices supported by automation are recognized as effective tools to solve the above problems. These solutions require adequate software and hardware to centralize client and loan information, monitor the portfolio and the impact, and report results.

Software solutions

Management Information Systems (MIS) are tools that capture and process data providing relevant information for control, analysis and decision making at the operational and strategic level in a cost efficient and timely manner (97). Appendix II provides a (non-exhaustive) list of MFI software available in December 2003. Two major problems of software solutions are the costs of procurement, as well as the difficulty to find the software adequate for the MFI's needs:

Cost. MFIs can obtain basic IT equipment through donor programs, NGOs or Governmental channels. However, frequently MFIs can afford only to equip the headquarters, while field offices have to communicate portfolio information by phone or by traveling to the head office.

Procuring or developing the software is also costly. A promising method, already applied by some MIS providers, is to make the software on a subscription basis. For example, MicroBanx is planning to rent its COBIS software platform to MFIs. The platform would allow access to MIS software online without purchasing or developing it in-house. This solution will be tailored to MFI's needs eliminating the necessity to invest in IT development and providing an opportunity to change the system corresponding to the growth rate of MFI (49).

Finally, equipment and software support and maintenance require adequate IT expertise, and MFIs, lacking in-house IT resources, have to rely on third parties, which can prove costly. Moreover, experts may not be available in the country or region where the MFI operates.

Software features. The second major problem is the absence of universal standard software suited to all MFIs. MFIs are subject to complex socio-economic and political factors (44) since they have strong social goals, unlike their commercial counterparts. Designing generic information systems for MFI is difficult since the information requirements of a single MFI vary 'cross-section', as a function of its environment, and 'longitudinally' according to socio-economic changes that take place overtime in a given environment. As an example of 'cross-sectional' variation can be gender issues - a key factor in policy determination in a certain environment while remaining a side issue in another one. 'Longitudinal variation' can be best demonstrated by the impact of Sudan Islamic laws on local financial institutions which had to adapt their lending methods, revise the notions of interest rate and return on a loan, and adapt their terminology (44). As a consequence of these variations, the software solutions that currently exist are not readily adapted to the needs of the majority of MFIs.

Thus, MFIs have an incentive to develop their own systems. However, both in-house software development and its procurement from a third party are challenging tasks that require expertise, time and substantial investment - resources exceeding those to purchase an off-the-shelf solution.

Laptops / PDAs

Using both laptops and PDAs in the field drastically reduces paperwork and allows field loan officers to access/input client information, make calculations on the spot and take financing decisions. These solutions are effective to maximize the number of transactions per visit since the loan officer uploads the data collected in the field onto the MFI server at a later stage.

PDAs are less expensive than laptops decreasing equipment costs when hundreds of loan officers are to be in the field. They also increase officers' mobility due to their small size and are more suitable for adverse conditions (humidity, dust, power outages).

PRODEM has been using PDAs in the field since 2001. ACCION International (a network of microlenders in 13 countries in Latin America) has introduced PDAs in 5 of its affiliates : Banco Solidario (Ecuador), Compartamos (Mexico), Banguente (Venezuela), BancoSol (Bolivia), Finamérica (Colombia). Other examples are Caja Los Andes (Bolivia), ADOPEM (Dominican Republic) and FinComún (Mexico). Institutions affiliated with the WWB have also started to use PDA technology in a number of pilot sites (five organizations in Colombia and Dominican Republic). Data collection process automation applying PDAs enabled the above MFIs to decrease paperwork, improve loan officers' productivity and portfolio management.

However, PDAs require the development of very specific applications, which is time-consuming and costly. Moreover, any modification in the centralized data system may require new applications development for the PDAs. In this respect, laptops appear more flexible since standardized and readily available software (email, Microsoft Office) can be used for data storage and communication between head and field offices. Laptops also enable to print documents and carry-out calculations on the spot that before had to be done only in the office. Banco Del Estado de Chile - one of the first institutions to use PDAs - decided for the above reasons to switch to a laptop-based solution that substantially reduced the cost of their loans (24).

Despite apparent theoretical benefits of automation, IT and telecommunications, MFIs seem to apply these technologies with different rates of success. Reasons frequently put forward include high costs, difficulties to maintain the equipment and software and the PC illiteracy of MFIs' personnel.

3.1.3. Way forward

Complex IT solutions most of the time are beyond financial and human resources capacities of MFIs struggling to balance their operational and management practices with social impact objectives. The role of donors', governments' and international collaborators' assistance is to facilitate the process of MFIs to get acquainted with technology and to use it accordingly - as a tool to reach self-sustainability and a greater impact.

Role of Collaborators

International collaborators should continue assisting MFIs to procure IT and software since centralized procurement enables economies of scale and a higher bargaining power with vendors. International collaborators can also establish partnerships with IT providers.

Stakeholders' assistance in the analysis of existing software is also crucial for the microfinance industry. An excellent example is the software database at Microfinance Gateway sponsored by the CGAP. This database provides a list of available software solutions with information on their features, the countries where they were implemented and the number of installations. It is also powered by a search tool that enables comparison in synthetic tables. The website site has two main purposes: to stimulate the development of cost-effective IT solutions for the microfinance industry, and to assist MFIs in their due diligence process for selecting an appropriate information system application.

Due Diligence

It appears that IT procurement is not always accompanied by cost benefit analysis (CBA) – an instrumental tool to ensure feasibility and relevance of the solution (46). Institutions that assist MFI in technological solutions procurement are to develop benchmarks and methodology to demonstrate the profitability of the overall project, including all phases such as the CBA itself, specifications, development, installation, training, and maintenance. This approach would detect procurements where the cost of the specification phase only exceeds the future benefits of the software to the MFI.

Simple applications and centralized development

The best software solutions are not necessarily the most complete and sophisticated. In many cases, the MFI only need a simple software to run efficiently. This software can then be upgraded / replaced when the needs of the MFI change.

A possible way forward would be to develop a standardized and simple MIS - possibly targeted to smaller MFIs – with a source code controlled by an international collaborator. Such an application would have to be user-friendly and modular, making it easier and less expensive to adapt the software to local needs. The Collaborator would also assist with installation, training, support, maintenance and upgrades. Services would be accessible to any MFI worldwide and could be either financed by donors or provided on a subscription basis.

The above described model is similar to the one already used by such international institutions as Eurocontrol, the European Agency for the safety of air navigation. Eurocontrol,

which is financed by the Member States, federates applied research and development of software that are made available for free to European Member States. Eurocontrol also provides installation, training, support, maintenance and ensures systems upgrades.

Technology can become an effective tool for MFIs to reach self-sustainability given a more active involvement of international collaborators, necessary IT due diligence and the development of an open and simple software solution available to MFIs, and controlled by an international entity.

3.1.4. Perspectives

Benefits of adequate IT and software solutions go beyond the sole efficient management of the MFI. For example, the use of laptop computers at Workers Bank of Jamaica not only increased efficiency of loan application, client information management and portfolio monitoring, but also played a role in showing applicants that the bank was providing professional and serious financial services. Consequently, the professional image of the MFI may also positively impact loan repayments (88).

In addition, the better software would enable the MFI to create products that follow its customers' needs, and thereby avoid losing proven profitable customers whose needs have evolved beyond microcredit. For example, it may help the MFIs to solve the problem of "graduation": many NGOs have the objective of graduating micro-entrepreneurs to the commercial banking system. This approach contradicts the logic of self-sustainability since MFIs struggle to recover high costs for customer credit screening but "constantly replace the tested clients with new entrants". Adequate systems would enable MFIs to keep good customers by proposing them additional financial products depending on their evolving needs (122).

However, there is a question whether MFI's managers and personnel really want to use technology. A number of reasons, which differ widely among the MFIs, seems to explain current reluctance to adopt technologies: fear of a failure to manage technological solutions, unwillingness to become dependent on software/hardware suppliers, lack of time for a long-term planning, inertia, or in some cases, fear to scare off clients (in some countries a loan officer using a laptop in the field may intimidate clients, who then hesitate to apply for credit).

3.2. Information asymmetry between MFIs and customers

3.2.1. Issues

The microfinance industry, where principal-agent relationship defines financial contract between lenders and borrowers, faces issues of adverse selection and moral hazard that are rooted in the information asymmetry of the microfinance market.

Such information asymmetry enhances the risk to choose a wrong customer (adverse selection) and the risk whether the borrower's actions may negatively impact loan repayment (moral hazard). Thus, MFIs are to develop specific customer selection approach to mitigate adverse selection and tools to fight loan delinquency:

Customer selection. Commercial credit agencies hedge the risk of adverse selection by analyzing prospective customers' credit history, payrolls and property. However, this information is not only extremely costly to obtain for MFIs, but also most of the time unavailable since low-income and poor clients usually lack credit history, property and even official papers. To mitigate the above risk, MFIs need to gather substantial amount of data,

mostly during field visits, and to store to enable efficient querying. However, the absence of established metrics hampers data analysis, while in turn a lack of statistical history is an obstacle for adequate metrics development.

Fighting loan delinquency. Finding the right customers is a first step to improve loan delinquency. To reduce the risk further, credit agencies ask for the collateral to raise the cost of default to the borrowers. However, this method is generally not available for MFIs since their customers usually have neither property nor stable income inflow from formal employment. Thus, MFIs need to apply custom-tailored and in-house developed solutions.

At the same time customer information is dispersed between MFIs. The lack of a centralized customer data bank makes the industry inefficient as a whole and even though some MFIs may operate efficiently, they remain subject to the inefficiency of the industry. Absence of information sharing between MFIs may lead to the moral hazard problem when client borrows from several MFIs having failed to or choosing not to repay loans outstanding. In this case technology can mitigate this risk making information available to the market and facilitating the exchange of data.

3.2.2. Current practices and their limitations

Client selection

Customer/macroeconomic data gathering. MFIs apply different methods to reduce adverse selection: they may send loan officers to visit the borrower or interview his/her neighbors. They may also rely on socio-economic data such as the housing indicator (the types of constructions in a community indicating the poverty level and socio-economic status of its members). These socio-economic indicators are generally used to ensure that the borrower represents limited risk of repayment, and that he/she is part of the right target segment of the population.

Credit scoring. MFIs may implement credit scoring and risk management systems in-house (Banco Mundial de la Mujer, Colombia) or use services of credit bureaus. In some cases, the local central bank centralizes client information (Indonesian Central Bank), or private companies assume this role (Credidatos, Honduras). In other cases MFIs associate with each other to share client information (micro lenders group alliance in South Africa, Bancared in Guatemala). However, in many countries shared client information is still insufficient to guarantee information asymmetry alleviation and efficiency in the industry.

Fighting loan delinquency

Raising the cost of default. Some MFIs use the borrower's personal belongings as collateral, if regulation allows. Such collateral often has no market value but nevertheless increases the borrower's incentive to repay. However, it may be counterproductive since seizing the few assets the borrower owns may prevent him/her to exercise professional activity and repay the loan.

Peer pressure. The most common expression of this method is to make use of group lending or solidarity loans, but it may also include sending letters to the defaulter family members or influential relatives (88). The technique of group lending is effective when group members share the risks of non repayment of one of the members, in addition, it helps reducing the administrative costs for the MFI (loan administration, monitoring, repayment). An example is the partner model implemented by the Workers Bank of Jamaica. It is modeled on the rotating savings and credit association (ROSCA) model. ROSCA is the oldest savings

arrangement in the world and exists in many parts of the world, being called Susu in Trinidad and Tontine in Africa (145).

A limitation of group lending is that peer selection does not always guarantee that the resulting group will be a good borrower, and group behavior appears to vary widely depending on local culture. This method may also drive the poor into over-indebtedness by forcing them to borrow at high interest rates from private lenders in case of default under strong peer pressure.

Incentives to repay: Progressive lending, providing first a small loan and granting larger loans if a borrower repays in time, is an efficient tool to reduce moral hazard problem - provided the MFI is credibly sustainable in the long run and the borrower cannot easily switch to another institution. Since the borrower has a low incentive to pay-back having access to new sources of funding in the competitive environment, it is crucial that MFIs establish ways to control customers' switchovers by exchanging customer information.

Relationship MFI-customer: MFIs emphasize quick disbursement of loans, long-term customer relationship, frequent contact between loan officer and borrower, and quick turnover portfolios. Substantial operating costs are a major limitation of this method.

Principal-agent problems of microfinance industry can be reduced by a number of existing methods, each with particular limitations. Technological solutions can drastically mitigate the problem of information asymmetry - the issue pertinent to all of the mentioned methods - by improvement of data gathering, sharing and analysis.

3.2.3. Way forward

As a first step, it is critical to define the indicators that should be used to make the loan approval decision, such as family information, collateral, entrepreneurial track record. This task is very dependent on the local context, and should be done on a national basis by MFIs, with a possible assistance of national or international collaborators. Secondly, MFIs in each country should develop or advocate for the development of a nationwide client credit rating system or a credit bureau. This client credit rating system could be operated by MFIs themselves, by the central bank, or by any other adequate entity. Connection of each MFI to the web is a prerequisite for them to feed the database with client information.

To date, few countries have such systems developed and when they do, these systems don't often include microfinance clients in their databases. Some countries however, such as Bolivia, have made substantial progress in the field (98).

It is important that international collaborators can incite and assist MFIs in developing these systems and installing adequate infrastructure, especially in countries where MFIs face competition. Technological advances have lowered the costs of maintaining large databases and have made the cost-efficient operation of credit bureaus feasible.

3.2.4. Perspectives

Credit bureaus can only be effective if most MFIs agree to share all necessary information about their undesirable as well as their desirable clients. MFIs don't appear to be willing to do so, a reason being that, due to the relative immaturity of the industry and its practices, information sharing with competitors is perceived as a threat. However, MFIs increasingly perceive the benefits of information sharing, as can be observed from the high number of credit bureaus willingly launched and operated by groups of MFIs.

Credit information should also take local idiosyncrasies into account. For example, even though loans are provided for “productive use”, borrowers can incur large expenditures for traditional/religious events (7) and misuse the loans. Thus, it is important to design flexible finance payment schemes in the period of financial stress taking into account local culture.

3.3. The microfinance industry and investors

3.3.1. Issues

Even when the MFI has the means to operate efficiently and when industry is competitive with a minimal information asymmetry between MFIs and clients, a remaining challenge is to improve information flow between the industry and investors to attract the latter to provide funds.

Today, many investors are not aware about the potential profitability of investing in microfinance. Many are scared away by perceived lack of professionalism of MFI management, the “NGO-reputation” opposed to that of a profit-making institution, too many market failures, possible misuse of funds and rent seeking. On the other hand, investors who are likely to invest, have very limited means to select the right targets due to the scarcity of reporting data.

Performance data availability

The lack of MFI’s performance data available to investors is the underlying issue of many problems of today’s microfinance industry. The major reason is that MFIs are reluctant to provide their data for the fear to disclose proprietary information to competitors – a feature shared by many young industries. Besides, only a minority of MFIs have a spectacular ROI and majority of those with poor performance have no desire to report this data not to scare away funding agencies.

At the same time MFIs may not have the relevant data to report or may not have the tools (MIS), or the time (fast growth, time pressure) to provide it. Also, MFIs have no incentive to report any data as long as they benefit from available donor funding.

As a result, not only very few MFI report data, but also results of those few who choose to do so are skewed toward more successful and larger MFIs (22). For example, in September 2000 Microbanking Bulletin had data from only 114 MFIs out of several thousands and only 23 were willing to show their disaggregated figures. Besides, a variety of reporting systems used in the world, prevents to obtain a comprehensive understanding whether an MFI is financially sustainable.

Moreover, there are no universally approved methods to assess MFI’s financial sustainability. And since an investor needs consistent, up-to-date and validated data to make an investment decision, the absence of such information prevents the inflow of funds into the microfinance market.

3.3.2. Current practices and their limits

Today, information channels between MFIs and investors are disorganized and scarce: there are less than 10 rating agencies in the world that are focused on MFIs. Since profitability can be interpreted in different ways, each of them uses different assessment methods.

PlanetRating uses the GIRAFE method, which assesses non-financial indicators (Governance, Information and management systems, Risks) as well as financial indicators (Activities and loan portfolio, Funding, Efficiency and profitability) (43).

Another example is Microrate, a leading microfinance rating agency, which produces a technical guide to MFIs performance indicators for the IDB. This guide analyses portfolio quality (portfolio at risk, provision expense ratio, risk coverage ratio, write-off ratio), efficiency and productivity (operating expense ratio, cost per borrower, average borrowers per staff, average number of borrowers per loan officers), financial management (funding expense ratio, cost of funds ratio, D/E), and profitability (ROE, ROA, portfolio yield) (48).

In addition, several organizations apply both quantitative and qualitative methods to assess the impact of microfinance. For example, MicroBanking Bulletin developed a series of benchmarks like Target Market, Profit Status, Charter Type and Lending Methodology. CGAP Poverty Assessment Tool (PAT) provides information about the depth and breadth of MFIs' outreach (90).

3.3.3. Way forward

It is critical for the future of the microfinance industry to develop consistent and unbiased financial-rating methods supported by strong incentives mechanisms for MFIs to report their data and have ratings established.

The mentioned incentives can only come from the investors' community. Since today investors are fragmented, consolidation in entities like APEX may be a solution to increase their bargaining power and demand such rating before an MFI is eligible for funding (22). This approach is also endorsed by CGAP (158).

However, as already discussed in 2.3.1, a purely financial rating is neither a solution nor a panacea. It may result in a social shift of the microfinance industry, where MFIs concerned about attracting funds may focus more on profit making at the expense of impact and outreach. The only MFIs eligible for sufficient funds may become commercial banks, serving the better-off of low-income customers at higher interest rates. At the same time non-profitable MFIs would continue to compete for scarce donor funds and still operate with no incentive to improve. The above situation would result in unfair competition and continued industry inefficiency.

Thus, financial rating should not be the only factor to consider and investors/international collaborators are to be in the position to require establishment of rating of impact: impact-monitoring.

Currently a number of initiatives exist to develop MFIs performance measurement and impact, but none is commonly agreed yet. Agreeing on such methods that would be applicable worldwide is a difficult task. It is nonetheless a prerequisite to solve the problem of information asymmetry between MFIs and investors. A possibility would be to define straightforward methods that would be applied worldwide. Even though these methods would need to be improved on an ongoing basis and adapted locally, their application on a wide basis would enable the creation of a worldwide microfinance performance database that would considerably help understand better the industry.

A concrete solution could be to create a central dual-rating (financial and social impact) agency with online database where MFIs would input data by themselves. An automatic system would calculate financial rating and impact assessment. Results would be public to those investors that pay a fee. The program would need to be accompanied by offering the

required software, reporting methods and training to MFIs. The implementation of this solution could be initiated with international collaborators financing. Progressively, it could become fully sustainable working on donors' money and possibly at last on MFIs' money when the industry is mature enough. The ratings should always be controlled by a leading international microfinance organization.

3.3.4. Perspectives

Untapped demand/ benefits for investing

In 1999 the microfinance need for funds was estimated at about \$12 billion, whereas the industry received only \$500 million in international aid (about 1% of total international aid), which demonstrates a strong demand for additional capital markets financing. Undoubtedly, microfinance industry and its customers would greatly benefit from investors confidence (150).

Investors could also benefit from the inherent potential of MFIs investments for portfolio diversification. MFIs would be quite an attractive and unique type of investment, with a beta close to 0, and maybe even negative - as can be inferred from their performance in Peru and Colombia where the recession did not appear to have any impact on MFIs operations. The possible interpretation of this phenomenon is that microentrepreneurs operate outside commercial circuits, in a parallel economy, and are not influenced by such exogenous factors as exchange rates. Recession may even have the positive effect to draw more clients towards MFIs and increase the perceived value of the loans they obtain, resulting in lower delinquency rates (151).

Dual-rating for informed investment decisions

With a dual-rating, the investor community will have the means to make an informed investment decision. The profit-oriented investors will be investing in those MFI that provide return consequent to their risk profile. Others, poverty alleviation and social returns-oriented, will have the means to select MFIs that may not be fully financially sustainable but that have a strong social impact. A wide range of choices between these two extremes will enable investors with different financial and social objectives to participate in the development of the microfinance industry.

The dual-rating will also foster socially responsible investment (SRI) – an investment that allows investors to take into account wider concerns, such as economic development, poverty alleviation and gender empowerment. This trend is in line with the apparent increase in social awareness of consumers and is illustrated by the rapid growth of SRI options in 401K pensions in the US, by the increasing number of funds in North America and Europe implementing social screening policy and by the development of the first global Sustainability Index (172).

Since MFIs have neither financial nor human resources sufficient to implement such a complex system and the rating of a single MFI is costly, dual-rating benefiting all stakeholders and overall objectives of microfinance can be feasible only if financed by groups of investors and/or international collaborators. It can be expected that in the future MFIs will be willing to incur rating costs, similar to the development of bond ratings.

In order to design a dual-rating system, the main challenge will be to reach an agreement on social impact and financial indicators specific to the microfinance industry, that would be applied worldwide, and that would be accepted by the investors community.

3.4. Outreach and impact

3.4.1. Issues

It is not sufficient that an MFI operates efficiently, that the microfinance industry is efficient enough and broadcasts information successfully to the capital markets. The industry also has to demonstrate a sustainable social impact, reaching as many customers as possible. Outreach of MFIs is a major prerequisite to their impact and is defined as the extent to which financial systems reach the poor directly, increasing their participation in economic markets and hence empowering economic and political processes.

Outreach, efficiency and sustainability are interdependent, as demonstrated by the correlation between MFIs' sustainability and the customer base. On the one side, a large customer base fosters efficiency and sustainability through increased economies of scale. On the other side, efficient operations enable MFIs not only to reach more customers, but also to create a positive image for the whole industry and attract investors and other players.

Efficiency and sustainability factors are an important constraint for outreach and greatly explain the observed slow pace of outreach. Microcredit has an average outreach of 10% of the poor families with only a few exceptions like Bangladesh where this number is 75% (173). To meet the Microcredit Summit objective to reach 100 million of the poor these figures are to be at least 50% for the developing countries.

In addition, microfinance is constrained by factors linked to geography and its customers. Geographically, MFIs operate often in regions where the lack of basic infrastructure such as modern communication facilities hampers outreach efforts. As far as the customers are concerned, they are often uneducated, if not illiterate. This problem reduces the options available to MFIs to implement cost-effective solutions such as the use of mail, on-line services, or even cash-dispensers. Depending on their poverty level or way of living, the poor have diverse needs that require a wide range of services – like different types of credit (loan size, duration), insurance and savings.

3.4.2. Current practices and their limitations

To maximize outreach and impact, MFIs can apply several methods. One is to have decentralized operations where management is carried out in a central office while field/regional offices link the MFI to its clients. However, this structure is costly and difficult to manage. Another solution is group lending which minimizes transaction costs per customer enabling the MFI to reach more people with the same amount of resources. From a number of case studies the above practices provide the best results in terms of both outreach and impact when enhanced by technological solutions such as smart cards, ATMs, and the use of PDAs.

Smart cards, ATMs and fingerprint identification

These solutions make it less costly to provide loans to customers and process their savings. Smart cards with embedded microchips, for example, allow data storage and contain all loan related and purchases information. Since smart cards contain all necessary information about a customer, cash dispensers can operate in the most remote location without a permanent network connection. (10). Fingerprint identification enables illiterate customers to use easily the dispenser. It also protects customers from unauthorized usage in case of theft or card loss.

For example, Prodem (Bolivia) has been using smart cards and fingerprint identification devices in its ATMs within the last couple of years. This technology allowed Prodem to expand drastically its operations: in 2001, the number of customers grew from less than 1400 to almost 12000, while deposits increased from \$280,000 to \$3.6 million. The fingerprint identification played an instrumental role as many Bolivian microentrepreneurs are illiterate and therefore cannot sign their names. Moreover, many don't have personal identity cards, which prevented them from depositing and withdrawing funds in traditional commercial bank. Banco Solidario (Ecuador) is another example of MFI that implemented ATM machines.

PDA's

These small portable handheld computers reduce officer-customer transaction time in the field and in the office. Thus, loan officers can dedicate more time for existing customers increasing the quality of services or generate leads for new customers increasing outreach of MFI programs.

The above technological solutions appear to have a proven positive effect on outreach, since they significantly reduce operation costs to service customers. In addition, they improve customer service by making loan officers more efficient, reducing paperwork, providing access to information and ability to compute complex analysis on the spot.

Limitations

However, a major limitation of these technologies is their implementation cost since profitability is achieved only with a critical mass of clients. Development of technological solutions for MFIs exceeds industry average costs for ATMs and software application since these solutions in each case need to be customized due to high diversification of MFIs and their customers. Even though Prodem found the way to manufacture ATMs for less than half a price of the industry standard, it came across great difficulties in cross-border expansion.

An important component of the cost is also the operating/maintenance cost, as new technologies require employee/customer training and support, regular servicing and maintenance.

Another difficulty is customer acceptance of technologies. Since technology is new to many customers, it bears high operational and business risk depending on the local culture. This is especially relevant when customers value personal interaction with loan officers and replacing it by technological devices may scare away the poor and hamper outreach efforts of MFIs.

The last important issue is customer education. For example, South Africa's EBank had to place attendants at groups of ATMs to train and assist clients and develop both software and instructions with pictures.

3.4.3. Way forward

Proven technological solutions

Proven technological solutions like smart cards and PDAs have demonstrated high impact on operational efficiency of MFIs and their outreach. These solutions are to be accessible and affordable for MFIs, especially to smaller ones and those operating in rural areas, provided these MFIs have the means to grow in line with their customer base.

To minimize costs MFIs can implement a shared or pay-per-use access. For instance, a commercial institution could sponsor the installation of a cash dispenser, and then charge the MFI a fee each time the machine is used by its customer (Research SunLink, Microsave Africa). Alternatively, some MFIs charge customers for a smart card: Basix in India (Sudama project) issues cards for a fee paid in small installments; when the payment for the card is completed, the customer is eligible for a loan (149).

Technology customization

Experiments to apply speech recognition technology to expand outreach of microfinance programs to the poor in rural areas have been successful and some Village Centers use it to educate clients to read and to write. At the same time this model can be used to make ATMs and any type of software more friendly for illiterate customers. One of the most successful examples of technology application in poor rural areas is the E-Inclusion of Hewlett Packard that outreached 1000 villages with a goal to bridge the "digital divide" (177, 178, 179).

Increased role of international collaborators

To promote and implement application of technological solutions to outreach the poor, the role of international collaborators is of great magnitude: assistance in cost benefit analysis, specifications and project implementation. In this case, due to the high costs and to ensure that MFIs have sound reasons to implement these solutions, we believe that the MFI should bear most of the assistance costs. Subsidies could be made available depending on the expected impact/outreach.

3.4.4. Perspectives

Technology is an effective tool to reach large numbers of microentrepreneurs in need for financial services. Nowadays, a whole range of solutions exists to reduce MFI's costs and expand services to remote areas. Nevertheless, many MFIs - mostly informal institutions like NGOs - are reluctant to use technologies because of their cost and complexity. Some MFIs are unfamiliar with technological solutions available and are even more reluctant to apply them in practice for such lack of experience. Others are myopic and do not see their cost-cutting and expansionary benefits.

A risk is that a strong trend for fast adoption of technology may exceed practicality resulting in excessive sunk costs (118). The best solution to mitigate the possibility of such a risk is to focus assistance on already proven technologies for which customer acceptance can be assessed, and on those MFIs that are operating efficiently enough to sustain the growth of their clientele.

3.5. Synthesis

The following table summarizes the issues of microfinance industry, existing solutions and ways forward.

	Issues	Current practices	Limitations	Way forward
1 Internal operations of the MFI	<ul style="list-style-type: none"> •Small size, scarce resources, time pressure •High growth rate •Large number of customers, with small loans, in remote locations 	<ul style="list-style-type: none"> •Software : Management Information Systems (MIS), portfolio tracking, etc. •Off-the-shelf purchase or in-house development •PDA or laptops to improve productivity in the field 	<ul style="list-style-type: none"> •Cost to procure equipment and software •Cost/expertise to maintain the equipment •Strenuous conditions of equipment operation •Need for IT expertise to operate the equipment/software •Cross-section and longitudinal variation of MFIs' needs: No universal software solution •Custom software development requires financial resources, time and expertise •PDAs software may have high introduction costs 	<ul style="list-style-type: none"> •International organization to assist MFIs in specifying needs and procurement •Always balance Cost and Benefit •International organization to define a generic, modular, simple and freely available MIS for smaller MFIs
2 Information asymmetry between MFIs and customers	<ul style="list-style-type: none"> •Customer selection/adverse selection •Lack of client information •Loan delinquency/moral hazard •Absence of collateral •MFIs do not share client information •Competition 	<p>For client selection :</p> <ul style="list-style-type: none"> •Direct and frequent visits to clients •Socio-economic analysis <p>For loan delinquency :</p> <ul style="list-style-type: none"> •Peer pressure •Group lending and solidarity loans •Progressive lending 	<p>For client selection :</p> <ul style="list-style-type: none"> •Information is costly to obtain •Information is not readily available <p>For loan delinquency :</p> <ul style="list-style-type: none"> •Delinquency within a group •Customer switching costs to another MFI are low (in a competitive environment) 	<ul style="list-style-type: none"> •Establish credit bureaus/client information database •Relevant information sharing between MFIs •International collaborators /investors to advocate information sharing
3 Microfinance industry and investors	<ul style="list-style-type: none"> •Investors are unaware about microfinance •Investors are scared away by its perceived negative image : non-professionalism, market failures, misuse of funds •Investors have limited means to make informed decision about their investment suitable to their financial and social objectives 	<ul style="list-style-type: none"> •Limited financial/efficiency rating •Limited impact assessments 	<ul style="list-style-type: none"> •Absence of commonly agreed methods to rate MFI's profitability •Absence of commonly agreed methods to assess MFIs' social impact •MFIs are reluctant to share information 	<ul style="list-style-type: none"> •Dual-rating (financial sustainability and social impact) •International collaboration to define and agree on core rating methods •Application of rating methods worldwide •Follow-up and continuous improvement of method
4 Outreach and impact	<ul style="list-style-type: none"> • Large number of customers, remotely located • Customer education/illiteracy 	<ul style="list-style-type: none"> •Decentralized operations •Transactions maximization •Group lending •Smart cards, ATMs and fingerprint identification •PDAs 	<ul style="list-style-type: none"> •High operating costs of decentralized operations •Technological solutions must be user-friendly and accepted •Customers must be trained •Risk due to novelty •Cost to operate and maintain 	<ul style="list-style-type: none"> •International organization to centralize know-how on proven technologies and provide advisory services to MFIs that have the means to grow

Table 2: Issues, solutions and ways forward

4. Issues of local regulation and international collaboration

4.1. Regulation

The microfinance industry is regulated inadequately in many countries, making it difficult for MFIs to plan ahead and limiting their options to reach profitability. For example, proposing saving services to clients can be an effective way to increase transactions per client, and reduce the risk of providing loans. However, in many countries MFIs are not allowed to propose such services unless they undergo a complex and costly process to change their status to that of a commercial entity.

International collaborators and investors have the power to influence local governments for the latter to enact regulation benefiting microfinance industry. For example, the recent trend of commercialization made many NGOs lobby for a shift towards better regulated institutions and appropriate integration into mainstream financial services.

Currently, several countries are in the process of changing their regulation for microfinance services. According to Microfinance Network, Bolivia, Peru and Ghana have developed a category of a non-bank financial institution (NBFI) appropriate for the unique characteristics of MFIs - it has a lower capital requirement, lower acceptable leverage ratios and different reporting stipulations than commercial banks, in return for more limited powers. Guatemala is introducing a law requiring the formalization of MFIs status and their supervision by the Bank Superintendence for microfinance customers to enjoy tax breaks that they could only obtain by moving to formalized institutions. This law is expected to result in an increased outreach of local MFIs.

Local governments also appear to enact regulations to improve efficiency and competitiveness of the microfinance industry, indirectly imposing adoption of more efficient methods and tools. These regulations require increased capital requirement and stronger management: for example, the *Non-banking Financial Intermediaries Law* in El Salvador, the recent Decree 229-2000 in Honduras. The *Free Negotiation of Foreign Currency Law* in Guatemala indirectly requires MFIs to install MIS that manage accounts in US dollars thus handling more than the national currency (81).

Another example is the trend to cap interest rates. For instance, new laws of Honduras and Nicaragua prohibit charging the interest rate exceeding more than 3 basis points the maximum rate of commercial banks. As a result, MFIs are forced either to drastically cut their costs or to reduce their credit offer – the latter leading to foreseeable non-sustainable financial situation and bankruptcy (81).

In some cases the government directly supports MFIs in equipping themselves with adequate technological tools. A good example is the recent *National Strategy for microfinance initiative* of the Philippines Government that separated market-oriented credit services from social welfare. The Strategy includes a technical assistance program aiming at capacity-building of MFIs and in particular the use of IT and training.

Thus, regulation may facilitate the efficient use of government funds to foster technological development of MFIs and thereby increase the adoption of technologies by those MFIs that are still reluctant to use them. Besides, efficient and adequate regulation requiring formalization and supervision of MFIs and subsequently improving reporting and performance measurement will foster sustainability and strength of MFIs and consequently their technological development to reduce operational costs. This in turn, will spur further

development of the microfinance industry, market competition, as well as accountability of MFIs to the government by increased transparency and performance standards.

However, an unbalanced government assistance may lessen incentives of MFIs to perform since their management may not be accountable for “free money” and possible sunk costs resulting from misuse of funds or inadequate technologies procurement. In addition, new regulation may negatively impact small and informal MFIs that may be social welfare-oriented and not follow the pace of commercialization. These MFIs may be forced either to declare bankruptcy or to apply for bigger subsidies to survive. To mitigate this risk, it will be crucial that MFIs find tools enabling them to follow the trends in regulatory changes. Making those tools available will be a responsibility of international collaborators.

4.2. Collaboration and leadership

In spite of a large number of industry stakeholders and numerous programs, microfinance seems to lack coordinated efforts and collective thinking in general, with only a few recent endeavors to improve the situation.

As discussed in Chapter 3.2, most MFIs lack incentives to collaborate sharing client financial information. The intent to co-operate rarely seems to come from the MFIs themselves, most likely due to competitive pressure, lack of time to plan ahead, or perceived cultural differences. The pioneers and promoters of industry-wide initiatives are NGOs, international organizations and development agencies. Among recent promising endeavors are the following initiatives:

- International forums on best practices and regulatory reforms: e.g. Microcredit Summit, G7/G10 Emerging Markets Initiative.
- Conferences and workshops organized by such intergovernmental bodies as the World Bank and UNESCO.
- International symposia and conferences: e.g. Tecnoferia (June 2003, Lima) promoting technological innovation in microfinance; USAID-COPEME with collaboration of Chemonics and IT consulting firm Echange LLC, addressing exchange of good practices, case studies, and recent innovations in MIS, connectivity, smartcards, ATM machines, PDAs, credit scoring and risk management.
- Grameen Technology Center, “committed to information technology solutions that increase the efficiency of microcredit institutions”. Acting as a liaison between MFI and software producers, this Center provides market analysis of automation demand and surveys of Grameen programs that use software in accounting and loan portfolio management.
- Industry-wide service platforms like PlanetFinance internet site, which centralizes information, provides guarantees and credit ratings, sells shares of MFIs and ensures their liquidity, provides training courses and other services. This reduces information asymmetry, increases market liquidity and credibility of MFIs, overall reducing the cost of capital in the microfinance industry.

However, one can observe that many of these initiatives are organization, region or country-specific. Other programs appear politically oriented (e.g. UNESCO, WB) and target global objectives, of which microfinance is only a modest part. At the same time a trend emerged to attribute the name “micro” to a very wide range of financial services – from agricultural and consumer credit to small businesses. Such extension of boundaries has led to the lack of

a sharper focus on specific issues pertinent to microfinance and, moreover, to stakeholders' and investors' confusion.

Greater benefits could be reached with more collaboration between stakeholders through various multilateral efforts, and a stronger leadership within collaborators.

Many players have emerged in the microfinance environment, that sometimes leads to a lack of coordination, duplication of efforts and overlapping roles. The absence of publicly available consolidated data on the global spread of microfinance makes some players like International Food Policy Research Institute (IFPRI) to undertake their own research programs targeting the impact of microcredit. Although diversity of approaches does foster innovation, it is highly desirable that a single entity assumes a strong leadership role in microfinance.

Since microfinance is a global trend, and since it is critical that its development be driven effectively and with comprehensive international collaboration in order to strengthen the industry through the commercialization trend, we believe that a structure similar to that of International Civil Aviation Organization (ICAO) would be an adequate starting point.

The entity would be governed by a council representing its Member States. Member States would ideally comprise of all States concerned about the orderly development of their local microfinance industry. It would draw upon the resources of existing players currently serving the microfinance sector: development banks, international organizations, NGOs, etc. Finally, the entity would be responsible for:

- coordinating agendas between all entities and stakeholders involved in the field;
- developing and promoting methods for financial sustainability and impact assessment;
- centralizing rating information and industry data;
- developing methods and tools applicable worldwide, in particular, technological solutions;
- monitoring the progress of the microfinance industry worldwide;
- establishing a global Information Exchange Network (IEN) for MFIs;
- proposing advisory services to local governments and MFIs;
- federating and coordinating research.

Decentralized offices of this central entity would cover various regions (Latin America, Africa, Eastern-Europe, Asia, South-Asia and developed nations). Working closely with local partners, branches would take responsibility to adapt generic solutions and disseminate best practices to specific regional needs.

5. Opportunities beyond and risks

5.1. Opportunities beyond

The use of adequate technologies in microfinance would not only result in a more efficient and financially sustainable industry, but also lead to a number of spillovers beneficial to other aspects of development.

5.1.1. Association MFI / Community Information Centers / school

Equipping branches of MFIs with IT equipment and internet connections could help poor communities access an equipment otherwise too costly to obtain.

Co-operation between MFIs and Community Information Centers (CIC), schools or telecommunication centers, as well as equipment and connection sharing could enable low-income communities to access IT solutions otherwise too costly to obtain. This would allow them to benefit from services relevant to their needs among which:

- e-governance, such as application for certificates and licenses, payment of taxes and fees, data reporting to the government. This could help reduce paperwork and deter bribes.
- educational and learning opportunities. For instance, IT equipment and internet connection could be used to grant local entrepreneurs an access to tutoring and courses, and increase their ability to launch and sustain successful micro-enterprises (93). Thus, the access to education by means of communications technology can be an effective way to accelerate poverty alleviation and the empowerment process.
- market and other information to improve livelihood. A successful example of market information dissemination is the Milk Cooperatives in India that eliminated fraudulent practices of intermediaries. In Jammu and Kashmir (India) farmers use web connection to manage their timetable, schedule their crops, control insects and rodents, support marketing and even water management (174).
- empowerment (especially women empowerment). The success of the Grameen Phone Program in Bangladesh where most of phone operators are women has increased their status in the communalities and spurred a number of similar programs in other parts of South Asia.
- creating new employment opportunities.
- health care services (medical appointments and information).

ASA (India) is an example of such CIC, providing a platform - including adequate software for rural networking and marketing services - that enables e-Government, education and health services. This MFI, currently reaching 40,000 families and planning to grow to 87,000 by 2005, was established within the frames of the Grameen's village computing project (38).

The advantages of rural CIC are unparalleled in areas where fixed telecommunication network are not present: they provide an access to communication since micro businesses could share otherwise prohibitive cost of equipment installation and maintenance. The association merging MFI, CIC, and school could also become a central social point in the community, attracting people who otherwise would not know about the services available.

Limitations of this model could be possible rent seeking due to consolidation of the superior information and monitoring technologies in the hands of a local intermediary. Nevertheless, program design may limit the level of rent capture, for example by establishing competitive bidding for contracts or by a system that assures local political accountability. But as community groups compete for control of available rents, they may also spend resources and offset the benefits of the program. The distribution of intended benefits will vary greatly across communities because of variations in the local culture and politics.

Decentralization of microfinance programs may also include limitations of Community Based Targeting (CBT) when community agents/intermediaries are gradually incorporated into the social welfare bureaucracy or create their new layer (175).

5.1.2. E-commerce

E-commerce is a unique tool to help sell the production of micro-entrepreneurs on a national or worldwide market, provided they create goods that are suitable for a distribution outside their local community. MFIs could assume the role of intermediary between the micro-entrepreneurs and the entity responsible for the marketing/sales web-site, charging a fixed or variable fee to micro-entrepreneurs.

Advantages of such an access to global markets are unprecedented for entrepreneurs located in remote locations. However, both infrastructure and government regulations are to support E-commerce turning it into indispensable tool and a driver for the local industry. The success of India as the largest outsourcing platform for US businesses is the most eloquent example of such an approach since it has enjoyed an unconditional support of the local government. In case of microenterprises this model would decrease costs to establish and operate E-commerce entities by shared access to such a service provided by MFIs and also would help to sustain entrepreneurs long-term.

Even though E-commerce seems to be a right solution for entrepreneurs from developing countries, challenges to implement this strategy are not to be underestimated. Micro-entrepreneurs are subject to limited production and uncertain demand; issues of quality and reliability of deliveries can also be important constraints.

To promote E-Commerce it is not sufficient to disseminate knowledge about this solution and to recognize its benefits. Its successful implementation requires active participation of local governments and private sector since such prerequisites for successful E-Commerce as infrastructure development can be financed only with multilateral assistance in developing countries.

Governments as major stakeholders of economic development are to establish infrastructure facilitating E-Commerce and technological absorption by local economies. Private sector role is of significant magnitude as well since substantial funds and expertise are required to implement infrastructure projects, and private businesses' experience and expertise are invaluable tools for such projects.

PEOPLink (India) has linked producers of commodities in poor communities in Tamil Nadu to potential markets through the Internet. Kizhur village, which excels in making traditional saris and other garments, sells its produce through PEOPLink's Web site to consumers all over the world. Another example is the Foundation of Occupational Development (FOOD) (India) that promotes the sale of rural women cooperative's products through the Internet (174).

Benefits of E-Commerce innovations have the potential of substantially reducing transaction costs by eliminating the layer of intermediaries who often absorb a large chunk of the profits. E-Commerce also reduces search costs, coordination costs, transaction risks and impacts the incentives of market players. However, success can be hampered by such barriers to Internet commerce as trust between buyers and sellers, payments, security and distribution.

5.1.3. Technology spillovers

Benefits of investments in technology are often assumed to occur in terms of spillovers to local firms that raise productivity and enhance technology assimilation. However, the evidence on the concrete spillovers of microfinance programs and subsequent impact of such spillovers on local communities and economies has not been studied yet.

Nevertheless, approximation of technological spillovers in microcredit to those resulting from foreign direct investment (FDI) may suggest that technology transfer is a fundamental source of economic growth and development. For example, in Great Britain, a 1% raise in FDI stock is estimated to raise technological progress by 0.26% (176). Such transfers are outcomes of established and improving trade mechanisms (imports learning) between microentrepreneurs and the market. They can occur directly, through the licensing of a particular technology, through supplier networks or subcontracting arrangements, or indirectly as knowledge becomes public, and spillovers are assimilated by the domestic sector.

But actual spillovers' effect depends not only on the structure of the host economy, but also on its capacity to absorb innovations (access to financing, human capital, management expertise and the size of "digital divide" gap) (176).

5.2. Risks

5.2.1. Do MFIs really want to be profitable?

This issue deals with incentives of MFIs and the current financing mechanisms of their operations. In most instances these organizations are non-professional, having emerged from NGOs where the culture per se does not endorse "for-profit" scenarios. Social aspects sometimes may prevent MFIs to evaluate business and financial risks which in most cases are mitigated by new donor loans priced much lower than market rates.

As far as the industry as a whole is concerned, the several thousands organizations composing it are all concerned with poverty alleviation, but relatively few of them seem fundamentally committed to long-term financial sustainability and exponential growth. Most MFIs would like to be large and sustainable, but very few of them, who understand the full price of sustainability, are willing to pay it, stretch their operations and methods to become more efficient. "MFIs without this profound commitment to sustainability may often be doing excellent work, but they do not represent the cutting edge of the microfinance industry" (90).

5.2.2. Local governments agenda and inertia

Even though microfinance was on governments' agenda for the last decade, it failed to attract significant attention in terms of enabling regulation, establishing industry impact and outreach performance standards and promotion of microfinance activities. Recent policy trend to institutionalize informal and smaller microfinance players introducing stringent legal requirements, without addressing performance measurement based on both financial and social impacts, may prove detrimental to initial objectives of microfinance industry.

At the same time inertia to address pertinent problems of industry struggling with an “absurd gap” (13) between demand and supply may also contribute to the possibility of microfinance monopolization by large consumer credit groups.

5.2.3. Unfair competition

An industry where most MFIs would be willing to operate in a financially sustainable way while competing with other MFIs who would benefit from free subsidies would result in an unfair competition. This competition may put the survival of self-operating MFIs at stake. It is crucial that subsidies from governments and international donors should be allocated taking due account of this counter-productive phenomenon. A way to mitigate the problem could be to direct subsidies only to those MFIs that operate in non-competitive environments (geographically) and who could not survive without free funding (for example, because they would target the very poor).

5.2.4. Investor’s confidence, diversion of funds toward other goals

During the past decade, the microfinance movement has attracted considerable attention of a number of stakeholders and billions of dollars in grants and subsidies. Achievements have been significant when compared with the initial situation. However, only a few programs proved to be self-sustainable and scalable. The poor performance of many initiatives with loan recovery ratios as low as 50% (India’s Integrated Rural Development Program, with over \$4.6 billion in disbursements) and rent seeking undermined the trust of donors and investors to the industry.

Microfinance is currently struggling to find the right model that would strike a right balance between development and finance translating noble social objectives into a concrete business proposition providing social impact.

Industry’s inertia, lack of strong leadership in turn leading to the lack of investors’ and stakeholders’ confidence may result in funds’ diversion from microfinance to other industries competing for donor financing: e.g. environmental protection, health and nutrition.

6. Conclusion

The microfinance industry suffers from a number of issues that result from its fast and unorganized development. The first type of issue is the operational inefficiency of most MFIs, mainly due to their small size, fast growth, and lack of expertise of their management. The second is linked to the information asymmetry between MFIs and their customers. Client information is costly and MFIs are reluctant to share it, that makes the industry inefficient especially in competitive environments. The third problem is the lack of consistent information channels between the industry and the investors/donors community, which results in an 'absurd gap' between supply and demand for funding. Finally, outreach poses difficulties due to the lack of education of customers and their remote location.

The various financial and management techniques that MFIs have applied to counter those difficulties have proved to have limitations. Adequate technological solutions can supplement these techniques and considerably help mitigate these four issues, thereby greatly facilitating the development of the whole industry. Such solutions can be diverse and do not necessarily involve complex and costly technological innovations. As a matter of fact, many have already been tested throughout the world. They include MIS, client information exchange networks, a dual-rating database and proven field solutions to increase outreach such as ATM and smart-cards. They are not straightforward to develop and to implement in a consistent and cost effective way by MFIs alone and require to be initiated and promoted by local governments and international collaborators.

However, the situation is still complex. Local governments do not have the global view and are often influenced by their political agendas, hence they may adopt uncoordinated or inadequate regulation, if any. This may increase difficulties of small MFIs with social objectives or hamper the development of the microfinance industry by introducing inefficiencies. On the other hand, international collaboration appears disorganized, since a great number of stakeholders with overlapping mandates are involved in the microfinance environment, and no organization has taken a clear leadership position yet. Although this lack of leadership fosters diversity of approaches, it may also prevent the industry to develop in a controlled and timely manner, following the pace of the inevitable commercialization.

An uncontrolled commercialization may result in an undesirable consolidation of profit-oriented players at the expense of smaller and less competitive ones targeting less profitable customer segments. This would go far beyond the 'paradigm shift' and may well lead to a destruction of the social objectives of microfinance. In order for all types of players to cohabit in the industry, each serving their respective segments in line with their specific financial and social objectives, it will be crucial that a socially responsible entity takes worldwide leadership and assists MFIs in their development, in particular by developing, promoting and assisting in the implementation of cost-effective technological solutions.

This entity would be governed and financed by its Member States. It could draw upon the expertise of already existing institutions and NGOs operating in the microfinance environment and would have the following main challenges among its responsibilities:

- define core methods to rate financial sustainability and social impact, follow-up these methods; continuously improve them, advocate their worldwide application; which would enable worldwide industry monitoring and introduction of consistent dual rating;

- advocate the creation of dual rating (financial and impact), and assist MFIs to gather and provide relevant information; availability of this information would serve the demand for socially responsible investing;
- federate the development of core tools and methods for MFIs. In particular a generic, modular, simple MIS for smaller MFIs, freely available; provide installation, maintenance and follow-up services;
- lobby governments/MFIs for the creation of credit bureaus/client information databases; provide assistance to implement those databases.

Of course, obviously, there are numerous obstacles on the path in order to achieve these revolutionary goals (but yet instrumentally crucial to push microfinance on the right track), among which the creation of the entity itself. Failure to do so may result in a social shift of microfinance, while success will enable the development of an efficient industry, more effective in its mission to alleviate poverty, and will enable to free resources for other purposes that cannot be served by microfinance, such as alleviating extreme poverty and improving schooling or health services.

The microfinance industry is living a transitory period. Technological solutions to catalyze sustainability are readily available. But success of their implementation will mainly depend on the ability of microfinance players to reshape their working methods, think globally, and cooperate to establish leadership, in spite of existing idiosyncrasies. The future of microfinance and its efficacy to alleviate poverty and reach the Millennium Goals are not granted and will depend on the actions taken now.

Appendix I – Acronyms

ADB	Asian Development Bank
AFDB	African Development Bank
AROA	Adjusted Return on Assets
ATM	Automatic Teller Machine
BRI	Bank Rakyat Indonesia
CBA	Cost Benefit Analysis
CBT	Community Based Targeting
CGAP	Consultative Group to Assist the Poorest
CIC	Community Information Center
CPS	Client Profiling System
D/E	Debt to equity ratio
ICAO	International Civil Aviation Organization
IDB	Inter-American Development Bank
IFPRI	International Food Policy Research Institute
IEN	Information Exchange Network
IFC	International Finance Corporation
IT	Information Technologies
MF	Microfinance
MFI	Microfinance Institution
MIS	Management Information System
NBFI	Non-Bank Financial Institution
NGO	Non-Governmental Organization
PDA	Personal Digital Assistant
ROA	Return on Assets
ROE	Return on Equity
ROSCA	Rotating Savings and Credit Association
SUM	Special Unit for Microfinance
UN	United Nations
UNCDF	United Nations Capital Development Fund
UNDP	United Nations Development Programme
USAID	US Agency for International Development
WB	World Bank
WWB	Women's World Banking

Appendix II – Existing software solutions

The products highlighted are those currently used by more than 100 MFIs. This list is not exhaustive and is for illustration purposes only. It has been extracted on December 2003 from the CGAP Microfinance Gateway web site - Information Systems Services : http://www.cgap.org/iss_site/.

General features	Languages	No of client installations	Location of clients	Base software price
Cubis 2001 International				
Accounting Loan Portfolio Savings/Deposits Client Info Share Insurance Integrated	English Spanish Chinese Other User-Defined	220	Africa East Asia and the Pacific Latin America and the Caribbean Western Europe	\$1000 to \$15000
FAO MicroBanking System - EXTE version for Philippine Rural Banks				
Accounting Loan Portfolio Savings/Deposits Client Info Integrated	English	193	East Asia and the Pacific	\$800 to not provided
MicroManager				
Accounting Loan Portfolio Savings/Deposits Client Info Share Integrated	English	20	Africa South Asia Eastern Europe and Central Asia	not provided
SIEM				
		12		\$2000 to not provided
Small Bank Manager				
		12		\$1250 to \$1250
TEMENOS eMerge				
Accounting Loan Portfolio Savings/Deposits Client Info Share Integrated	English Spanish French Portuguese Other User-Defined	14	Africa East Asia and the Pacific Latin America and the Caribbean Eastern Europe and Central Asia Western Europe	not provided
AdBanking				
Accounting Loan Portfolio Savings/Deposits Client Info Share Insurance	French	1	Africa	not provided
Ascend				
Accounting Loan Portfolio Savings/Deposits Client Info Payroll	English	1000	South Asia	\$700 to \$1500
Bankers Realm				
Accounting Loan Portfolio Client Info Share Payroll Integrated	English	25	Africa	\$5000 to \$25000
Conexus				
Accounting Loan Portfolio Savings/Deposits Client Info Share Integrated	Spanish	21	Latin America and the Caribbean	\$8000 to \$40000

CoopLeader XXI Accounting Loan Portfolio Savings/Deposits Client Info Share Integrated	Spanish	Latin America and the Caribbean	not provided
CUMIS Plus Accounting Loan Portfolio Savings/Deposits Client Info Share Payroll Insurance Integrated	English	93 Latin America and the Caribbean	not provided
DolFin Loan Portfolio Savings/Deposits Client Info Integrated	English	0	not provided
DownHome Loan Manager			
Loan Portfolio	English	150 North America	\$2000 to not provided
e-Finance Accounting Loan Portfolio Savings/Deposits Client Info Share Integrated	English	3 Africa	\$5000 to not provided
eSIACOM Accounting Loan Portfolio Savings/Deposits Client Info Share Integrated	Spanish	7 Latin America and the Caribbean	not provided
IMP@CT Accounting Loan Portfolio Savings/Deposits Client Info Payroll Insurance Integrated	English	20 South Asia	not provided
Kredits Loan Portfolio Client Info Integrated	English Russian Other User-Defined	14 Eastern Europe and Central Asia North America	\$15000 to not provided
Loan Performer			
Accounting Loan Portfolio Savings/Deposits Client Info Share Integrated	English Spanish French Russian	110 Africa South Asia East Asia and the Pacific Latin America and the Caribbean Eastern Europe and Central Asia Western Europe	\$700 to not provided
Loan Tracker Accounting Loan Portfolio Client Info	English Arabic	8 Africa South Asia	not provided
Loan Traking System - Loantsys Loan Portfolio Savings/Deposits Client Info Share Payroll	English Arabic	1 Middle East and North Africa	not provided
M2 (Microfinance Manager) Accounting Loan Portfolio Savings/Deposits Client Info Share Integrated	English Spanish French Russian Other User-Defined	35 Africa East Asia and the Pacific Latin America and the Caribbean Eastern Europe and Central Asia	\$750 to not provided

Microbank Information System			
Accounting	Spanish	10 Africa	\$8000 to \$16000
Loan Portfolio	Portuguese	Latin America and the Caribbean	
Savings/Deposits			
Client Info			
Share			
Payroll			
Integrated			
MicroBanx iBSP			
Accounting	Spanish	3 Latin America and the Caribbean	not provided
Loan Portfolio			
Savings/Deposits			
Client Info			
Integrated			
ORCHID Microfinance			
Accounting	French	4 Africa	not provided
Loan Portfolio			
Savings/Deposits			
Client Info			
Integrated			
Portfolio Manager			
		1	not provided
PowerFinance			
Accounting	English	Africa	\$3500 to \$3500
Loan Portfolio			
Savings/Deposits			
Client Info			
Integrated			
SAF2000			
		41	\$2250 to not provided
SML VISION 2003			
			not provided
The Exceptional Assistant (TEA)			
Loan Portfolio	English	310 Africa	\$2500 to \$10000
Client Info	French	North America	

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