Microfinance vs. traditional banking in developing countries

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Abstract: This paper describes some of the main aspects of microfinance (MF) in under-developed countries, showing why it has succeeded in reaching the poor, while traditional banks have not, using innovative devices such as group lending with self-monitoring, short repayments instalments and small loans. The aim of the paper is to show how microfinance institutions (MFIs) can fill the lack of traditional banks in under-developed countries, proposing unconventional products and innovative business models. This study also investigates about possible synergies between banks and MFIs, avoiding overlaps and mission drift. It is shown that MFIs can improve their outreach using technological devices such as M-banking. Innovative questions and proposals are illustrated, so as to give an updated and synthetic picture of the state-of-the-art, which might prove useful for researchers and practitioners.

Keywords: microcredit; poverty alleviation; lending innovations; corporate governance; outreach; sustainability; NGO; non-governmental organisation; group lending; moral hazard; adverse selection; microinsurance; microdeposits; m-banking; technology.

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1 Introduction

Traditional banking systems are unfit for illiterate poor with no guarantees, while specific products, tailored to suit the needs of potentially billions of unconventional borrowers, might prove successful in widening financial access, with a positive side effect of reducing inequalities and fostering economic development. Financial innovation and flexibility are a crucial solution for forms of lending that are collateral or cash flow based only to a small extent.

Precursors of Microfinance Institutions (MFIs) include rural moneylenders, often similar to usurers, or credit and group-lending cooperatives, while more formal MFIs are

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increasingly similar to standard banks, albeit with peculiar characteristics. Microfinance (MF) is proving a useful device for pooling risk and cross-subsidising borrowers; its greatest success is the demonstration that even the poorest can become reliable borrowers.

Group lending with self-monitoring, short repayment instalments and small loans can help softening otherwise unbearable governance problems, such as adverse selection (the difficult distinction between those who deserve credit and those who do not), moral hazard (temptation to "take the money and run away") and strategic default (false bankruptcy to avoid repayment).

The supply of synergic products such as micro-deposits or insurance allows passing from microcredit to MF and represents a real parachute against endemic adversities.

MF allows international institutional investors and individuals to embrace socially responsible opportunities and might offer a reasonable risk-return profile, diversified from other investments.

The most exciting promise of MF is that it might reduce poverty with a self-fulfilling mechanism, once adequately ignited, without requiring continuous donations that often spoil and humiliate the poor, emptying the donors' pockets.

Unsubsidised sustainability and profitability combined with deep outreach to the underserved stands as the most challenging goal.

While the existing literature covers many MF issues (see for instance Armendariz de Aghion and Morduch, 2010; Brau and Woller, 2004), these topics are still under-investigated. In particular, whereas the literature describes issues such as inadequacy of standard banks to serve the poorest, it does not properly address trendy issues such as the fast changing business models of traditional credit institutions (less and less relying on expensive physical branches) and the parallel literature stream of technological MFIs, whose reduced costs is due to push affordability and outreach.

Within this context, the aim of the research is to show how MFIs can fill the lack of traditional banks in under-developed countries, proposing unconventional products and innovative business models. The paper also investigates about possible synergies between banks and MFIs, avoiding overlaps and mission drift.

The key research question of the paper investigates about the best business model for MFIs, considering the unfitness of standard banks to serve the poor and the IT innovations that shape their trendy business models, boosting sustainable outreach.

2 What is microfinance? Characteristics and differences with traditional banking

According to the United Nations' definition:

> "Microfinance can be broadly defined as the provision of small-scale financial services such as savings, credit and other essential financial services to poor and low-income people. The term 'microfinance institution' now refers to a broad range of organisations dedicated to providing these services and includes non-governmental organisations, credit unions, cooperatives, private commercial banks, non-bank financial institutions and parts of State-owned banks."

In the mind of many, MF and microcredit are synonymous (Bogan, 2008); however, while microcredit simply deals with the provision of credit for small business

development, MF – sometimes called "banking for the poor" – refers to a broader synergic set of financial products, including credit, savings, insurance and sometimes money transfer.

MFIs can be classified according to their organisational structure (cooperatives, solidarity groups, rural or village banks, individual contracts and linkage models …) or to their legal status (NGOs, cooperatives, registered banking institutions, government organisations and projects …) or even according to their capital adequacy standards (from Tier 1 mostly regulated MFIs to Tier 4 start-up MFIs; Deutsche Bank, 2007).

MFIs are different from traditional banks since they have to use innovative ways of reaching the underserved and poorest customers, not suitable to mainstream institutions, mixing unorthodox techniques such as group lending and monitoring, progressive lending (if repayment records are positive), short repayment instalments, deposits or notional collateral, as it will be seen later.

Group lending is the most celebrated MF innovation (being the model for Grameen bank; see Yunus and Jolis, 1999), making it different from conventional banking, even if MF goes beyond it. Frequent repayments (short-term instalments, starting immediately after disbursement) are another smart pragmatic device, avoiding balloon payments where the principal is all reimbursed at maturity: given the financial illiteracy of many poor (that find it hard to understand that 'time is money'), postponing repayments for years to come would generally end up in a disaster, for them and for the incautious lender.

Another frequently unnoticed but significant feature of MFIs – not typical of mainstream banks – is the marketing approach to the customer: poor potential customers, especially if living in rural and not densely populated areas, often do not know if a MF branch exists and where it is, cannot afford to travel long distances and suffer from cultural ignorance about financial matters.

Going to meet the potential customer at his home – or, more realistically, barrack – is expensive and time consuming, but proves effective not only for the possibility to reach him and his clan, but also to reduce information asymmetries (getting acquainted with him and his family, life, job and environment), speed transactions and enforce compliance (Roodman and Qureshi, 2006). In this context, branchless m-banking can help (Moro Visconti and Quirici, 2014).

Gender is a crucial issue in MF, which has a preferential social target towards women – the poorest of the poor – since they tend to spend more of their income on their households and children education, so increasing the welfare of the family, with a positive and longer lasting sustainable effect; women are generally more vulnerable, since they more than men carry the burden of raising and feeding children and have also a lower mobility, so ensuring a higher focus on keeping their original location, with a positive effect on the reduction of opportunistic behaviours (such as the "take the money and run option") and possibilities for emancipation, due also to the participation in credit meetings (that might represent an embryonic form of political gatherings).

In under-developed areas, social control on women is higher and easier and blame for misbehaviour is generally stronger; on the other side, empowerment chances, starting from a usually lower level, if compared with men, are higher. Women are however often conduits for loans to men, who are the natural target for larger borrowings, in order to finance bigger investments (here the MFI faces a trade-off between higher profitability due to scaling and increased risk, due to gender switch but also – mainly – to increased exposure).

Another characteristic of recent and more sophisticated MF models – always attempting to circumvent the original sin of the lack of guarantees – are concerned with progressive loans, according to which loans are divided in regular instalments that can be cashed by the borrower only if previous repayments are regular. Even in group lending systems, this sanction might be personal, so relieving the group from the misbehaviour of single members. Small and fractionated loans are however unfit for capital intensive projects that require a high start-up financing or for projects where cash flow gains are irregular and difficult to forecast. The credible threat to deny defaulters' access to future loans, either with the group or with individual loans, has proven effective in minimising delinquency.

Notional collateral – often used by moneylenders – might prove a powerful and surprising form of guarantee, since it is characterised by a limited market value – bad news for the lending MFIs – with a high personal or affective value for the borrower. This system seems somewhat cruel but effective against intentional misbehaviour, even if it proves incapable to prevent involuntary default. Collateral serves to reduce the risk of strategic default when the borrower might be tempted to divert cash flows, while social sanctions (especially within group lending and in more sensitive rural areas) and denial of further credit are effective punishments to be imposed on defaulting borrowers.

Repayment is hard to get without adequate pressure and unsanctioned bad examples are very contagious. In the absence of guarantees, no parachutes are available for MFIs: that is why repayment discipline is for them a question of life or death.

The poor often face significant problems in obtaining access to credit services; MF tries to overcome these issues in innovative ways (World Bank, 2008, p.12):

- Loan officers come from similar backgrounds and go to the poor, instead of waiting for the poor to come to them, following a bottom-up marketing approach.
- Group-lending models, if applicable, improve repayment incentives and debt monitoring through peer pressure (particularly effective in rural areas and with women); they also build support networks and educate borrowers with frequent meetings and discussion panels.
- MF products include not just credit but also savings, insurance and fund transfers (internal or remittance).
- Development activities, focused on social issues, health and education, are frequently a corollary to MF activities, especially if sponsored by NGOs.

Micro-loans should normally finance micro-enterprises, which especially in low-income countries play a central role in economic and social development, since the bigger companies are almost non-existent, the public sector is under-developed and unable to absorb many job seekers, but also the traditional agricultural sector has a limited upside in creating employment.

MFIs start-ups generally have a donation (or public) driven equity, while standard banks collect it within private or public entrepreneurs.

The business of MFIs and mainstream banks does not – or at least, should not – show fundamental differences. Getting money back and a proper remuneration to guarantee survival is a quite obvious but not-to-be-forgotten basic point in common. Both look for safe borrowers, and try to keep positive margins containing operating costs with

efficiency, scaling and standardisation (whenever possible) and fixing interest rates at profitable levels.

The target for self-sustaining MFIs should normally be convergence to a (normal) banking model.

Lenders traditionally face:

- financial costs for collecting capital to be lent (with a mix of cost of equity and cost of debt for the remuneration of depositors, bondholders, interbank lenders …); cost of capital grows with risk and is traditionally higher in MFIs, if compared to mainstream banks
- default costs (for delinquencies in the repayment of interests and principal)
- operational and transaction costs, suffering in MFIs from lack of economies of scale.

Small loans have high unitary costs of screening and monitoring, which substantially increase operating costs, without scale benefits that are possible only with larger loans; unitary costs per loan tend to be similar and irrespective of their size.

The bridge between (not fully viable) MFIs and commercial banks can be established in both ways, either with organic growth and development of the former, or with 'downscaling' of mainstream banks to the MF market. While this bridge is highly wanted, evolution to profitability of subsidised MFIs is a long and challenging process, whereas the penetration of commercial banks in the MF arena is neither natural nor common. Flexible contamination on both sides seems, however useful for the MF industry and might foster financial innovation and outreach.

In today's financial climate, banks are becoming increasingly attracted to markets they did not previously serve. While most banks prefer to reach these new markets by supporting MFIs, some banks are starting to offer MF products themselves (downscaling). As the MF sector becomes increasingly visible and mature, relationships between the banking and MF sectors should evolve into more fruitful and diversified collaboration. Regarding microcredit as an additional market segment could be important for banks in order to increase activities in terms of outreach and in business sectors (European Microfinance Network, 2015).

The comparison between traditional banks and MFIs is investigated even in developed countries. According to Cozarenco (2015), "in most European countries, MFIs and banks are not in direct competition. They serve different segments of the market and provide complementary services. Collaboration benefits all parties. For MFIs, partnerships ease access to funding and cost-reducing technologies. They contribute to the expansion of MFI lending activities and improve their financial performance. Banks benefit from a better image through corporate social responsibility. MF facilitates the construction of a pool of prospective, profitable clients. Additionally, collaboration creates cross-selling opportunities for banks".

2.1 Different ways of achieving the same result: Getting money back!

Standard commercial banks and MFIs have many differences, especially if the latter are informal and unregulated intermediaries, but they tend to have at least one common and essential aspect: they live out of repayments from borrowers.

If ways to get money back show to be different, the ultimate goal does not change, should institutions belonging to one of the above-mentioned models desire to survive and, possibly, prosper.

Subsidies, as we shall see later on, can soften the ways and methods to claim money back from poor borrowers, but the ultimate goal is unlikely to change – and evidence shows how unwise it might prove.

When a potential borrower asks for a loan, traditional bankers demand him what he needs the money for, how he thinks to repay it and, should the answers not be enough convincing, how he can guarantee the reimbursement. No convincing answers, no money. This is the standard picture, even if opportunistic behaviour such as moral hazard or strategic bankruptcy is always possible.

In micro-lending, basic rules might seem different, even if experience continuously shows that favour treatments generally produce disasters in the long run and if the method can and has to be different – due to the peculiar context where collateral is usually absent – some fundamental principles, inspired by common sense, still deserve to apply.

The purpose of the borrowing is a standard question that has to be linked to a feasible and credible, albeit simplified, business plan: moreover it is the borrower's duty – if he wants to get the loan – to demonstrate how he thinks to generate adequate cash flows to service the debt. Simple questions often have challenging answers.

Higher repayment rates also come as a natural consequence of a careful selection of the business to finance and many MFIs are not focused towards risky peasants, having shifted towards 'non-farm enterprises' – like making handicrafts, livestock-raising and running small stores (Cull et al., 2008). A correct assessment of the volatility of the financed business – albeit difficult to detect – is a significant lending parameter even in under-developed countries.

2.2 Cooperation between banks and MFIs, avoiding the mission drift

While traditional banks and MFIs may cooperate, the main challenge for MFIs involved in partnerships with banks is to make sure that the objectives of banks and MFIs are aligned to avoid the risk of the mission drift (Cozarenco, 2015).

Mission drift is concerned with not-for-profit MFIs targeting the poor, which might transform into for-profit institutions aimed at maximising returns.

The MF sector has room for pure for-profit MFIs, non-profit organisations, and 'social' for-profit firms that aim to pursue a double bottom line. Depending on their business model, these institutions target different types of borrowers, change the size of their loans and adjust their loan pricing (Bos and Millone, 2015).

2.3 Precautionary saving and risk management: micro-deposits and micro-insurance

The poor, living on a subsistence income, might be unable to save, especially in hard times (wars, epidemics and illnesses to humans, livestock or plants, Biblical plagues such as famine, drought or floods, hail …) but when they succeed to, they are often unable to find a safe harbour for their savings.

However savings against hard times, which in under-developed countries are generally endemic, are in many cases the best insurance for mere survival and represent the first primordial form of insurance.

Savings help poor households to smooth consumption, keeping it above a survival break-even point, when income is volatile, without the stress of servicing debt.

Micro-deposits are – perhaps surprisingly – often more requested than micro-lending by the poor and might well go along together, representing a partial form of guarantee for lenders, especially if linked with insurance products (considering, for example health insurance which might prevent ill borrowers from abandoning their job, masterminding paybacks).

Savings are also intrinsically related to borrowing, since they can fuel repayments, teaching borrowers a disciplined way to save and also to behave, for the sake of debt service. Being forced to repay debt might help to prevent wasting money in drinking!

Forced savings are a typical feature of group lending packages, serving as effective cash collateral for loans, and usually have unattractive characteristics, since they pay no interests and cannot be claimed back until the member exits the group. Micro-loans are more diffused than micro-saving products (Roodman and Qureshi, 2006) due to:

- regulatory and compliance policies, traditionally harder for the latter
- trustworthiness, since it is harder for a MFI to persuade potential customers to deposit savings than to collect money
- timing and entity of cash flows, since debt repayments are regularly set, disciplining borrowers, whereas deposits occur randomly.

In bigger and sounder MFIs, belonging to the Tier 1 or 2 capital adequacy segment, savings collection through deposits might be replaced by cheaper funds (interbank loans, international funds, equity injections …). MFIs should, however, try hard to attract even the penny savings – small and expensive to collect, but with positive albeit under-estimated effects on poverty alleviation.

Moreover those who collect the savings obviously need appropriate lending strategies, to make proper use of their collected funding.

The poor have little if no access to formal insurance products, even if social networks, particularly strong in rural areas, might provide some essential informal insurance, generally with loan exchanges, whose repayment schedules might, however, be severely affected by a common systematic risk, so zeroing the insurance when it is most wanted.

When the poor undergo economic problems, their 'insurance' often means drastic reduction in consumption – such as eating less – or taking children out of school: poor children tend to leave the school in bad years.

3 Is microfinance a solution for adverse selection, moral hazard and strategic default?

The standard agency problem concerns conflict of interests between a potential lender (the principal), who has the money but is not the entrepreneur and a potential borrower (the agent), a manager with business ideas who lacks the money to finance them. The

principal can become a shareholder, so sharing risk and rewards with the agent, or a lender, entitled to receive a fixed claim. Agency theory explains the mismatch of resources and abilities that can affect both the principal and the agent: since they need each other, incentives for reaching a compromise are generally strong. In MF, equity stakes are usually rare and the standard model is concerned with a peculiar form of lending, which tries to overcome the above-mentioned problems.

The main differences in dealing with these agency problems between traditional banks and MFIs are the following:

- Limited liability companies, where shareholders risk only the capital invested, are frequently financed by traditional banks, whereas MFI mainly finance households or small businesses with unlimited responsibility; limited liability protects borrowers who might not be stimulated to repay their debt, especially if it exceeds their equity stake.
- The motto “no collateral, no money” traditionally applicable in standard banking undergoes severe problems in poor areas, where the collateral is mostly nonexistent (by definition, those who have valuable collateral are not poor!) or difficult to seize, also due to unclear property rights, a primitive judicial system and ethical problems (taking resources away from poor households might seriously undermine their chances of survival).
- MF loans have very short maturities, if compared with traditional banking loans, which can last even several years, and this gives the lender a big monitoring and enforcing power, checking weekly or monthly the repayment of interest rates, cashing early the lent capital and preventing the borrower from asking new money if he has proven delinquent with the first loan.
- Microloans generally consist of very limited amounts, which strongly reduce the magnitude of the lending risk and allow for a better diversification.
- Monitoring MF borrowers is more expensive and challenging, since credit scoring devices, computerised data, credit histories with delinquency rates and proper book keeping from the borrower are normally non-existent or present at an infantry stage; on the other side, weekly meetings between the MFI and the group members (borrowers) allow the creditor to monitor the repayment status of each debtor publicly, increasing the transparency within the group and generating a form of peer pressure which is expected to foster internal monitoring, minimising debt screening costs (Deutsche Bank, 2007).
- *Ex post* moral hazard, which emerges after the loan is made and when the investment is in the process, might lead to the above-mentioned “take the money and run” temptation, even invoking a fake strategic default (Tedeschi, 2006): while this well known phenomenon might be present in both cases, in traditional banking guarantees can represent a parachute, while in a MF context the absence of guarantees can be counterbalanced by a deeper in site (on field) control on the borrower and lower chances for him to leave his rural area (take the money without knowing where to run away might prove difficult); as a matter of fact, poor have poor chances of escaping repayments.

- Reputation also plays a significant role in preventing opportunistic behaviour and poor borrowers, who, at first sight do not have much to lose, in reality often are more concerned about this issue, since the chances they have are very limited and new opportunities strongly depend on a good track record.
- Strong information fallacies and asymmetries that evidently affect poor borrowers are in reality offset by good local information and enforcement mechanism that characterise rural lenders.
- MF might soften information asymmetry problems, if relationship lending and peer monitoring – often associated with mutual responsibility – is in place.
- Micro-savings and micro-insurance can be positively linked to microloans, with a double side effect: if they are not available – as it frequently happens – then the whole MF circuit is weakened and more exposed to conflicts of interest.

Information asymmetries traditionally arise since borrowers have better information about their creditworthiness and risk taking that has the lending bank. They originate agency costs and conflicts of interest (Moro Visconti, 2011) that might seriously prevent efficient allocation of finance: the liquidity allocation problem derives from the fact that although money is abundant, it is nevertheless not easy to give it to the right and deserving borrowers.

Relationship lending relies on personal interaction between borrower and lender and is based on an understanding of the borrower's business, more than to standard guarantees or credit scoring mechanisms, and represents a crucial factor in countries with a weak financial system counterbalanced by strong informal economic activity; multi-period and state-contingent contracts – typical of relationship lending – are an efficient device for dealing with asymmetric information.

Adverse selection is a typical problem in money lending and it occurs even in traditional banks, when – not knowing who is who – they cannot easily discriminate between safe and risky borrowers; the latter should deserve higher interest rate charges.

Moral hazard is a classical "take the money and run problem", since borrowers might try to abscond with the bank's money or try not to get fully engaged in the project for which they have been financed.

Strategic bankruptcy is false information that the borrower gives about the outcome of his financed investment, stating that it has failed even if it is not true only in order not to give back the borrowed money. Poor borrowers generally have little or no collateral, so they might have little reason to avoid a strategic default.

These classical corporate governance problems are well known in traditional banking and they naturally bring to sub-optimal allocation of financial resources and to capital rationing problems that frequently affect even potentially sound borrowers, if they are not able to differentiate themselves from those who bluff.

The standard agency problem concerns conflict of interests between a potential lender (the principal), who has the money but is not the entrepreneur and a potential borrower (the agent), a manager with business ideas who lacks the money to finance them. The principal can become a shareholder, so sharing risk and rewards with the agent, or a lender, entitled to receive a fixed claim. Agency theory explains the mismatch of resources and abilities that can affect both the principal and the agent: since they need each other, incentives for reaching a compromise are generally strong. In MF, equity

stakes are usually rare and the standard model is concerned with a peculiar form of lending, which tries to overcome the above-mentioned problems.

The lender and the borrower might align their interests, paddling in the same direction – so reducing opportunistic behaviour, one of the worst and most slippery hidden problems – if the borrower participates in the MFI business, also becoming a depositor and, possibly, a shareholder, this being a possible solution especially for loyal and not-so-poor customers; multi-role stakeholdership is a well-known device to reduce many conflicts (and to worsen others).

Lending is normally cash-flow based or collateral-based but with micro-credit this general banking classification seems too rigid and unable to describe its peculiar nature; poor borrowers with hardly predictable cash flows and unworthy collateral might still get credit, using typical MF innovative products. Improving cash-flow forecasting and/or use of effectively worthy collateral might be of great help in reducing interest rates: while this strategy seems hardly consistent with the poorest real possibilities, it might prove easier – at least to some extent – for the not-so-poor taking individual loans, with an established and growing business.

Progressive lending, a powerful device experimented in particular within group lending, might show some drawbacks – well known to industrial or trading corporations that increase their sales to customers that have gained a good reputation, but then start to misbehave, avoiding payments – if borrowers who lack the increased repayment capacity, go to other lenders in search for bridge loans, and pay old debts making new ones, exploiting information asymmetries and moral hazard techniques, in a well-known spiral of growing indebtedness, concealing and deferring the solution of problems that sooner or later come to a final judgement.

4 From survival to self-sufficiency: how NGOs with a social vision might become commercial banks

MFIs generally operate according to one of the following three different evolutionary modes: bare survival, longer-lasting sustainability or full self-sufficiency (Pollinger et al., 2007):

- In survival mode, institutions barely try to cover their running expenses, facing a progressive erosion of the start-up sponsored capital, unable to generate any retained resources for future operations. These institutions, unless continuously sponsored, are condemned to death, explaining the high Darwinian selection and mortality of the sector, which burns out organisations, together with their goodwill, future programs and expectations for the poor, generating dissatisfaction in the donors and dismay in the borrowers; opportunistic behaviours might also arise, since if borrowers believe that a lender is not permanent or unwilling to impose sanctions, delinquency might increase.
- Sustainability is concerned with the ability to secure a longer lasting survival, reaching and keeping a breakeven point between earned revenues and subsidies vs. fixed and variable running costs. Sustainable MFIs earn their cost of capital.
- Self-sufficiency is an even higher standard, giving the possibility to increase the quality and the number of products – making the big jump from lending-only micro-

> banks to overall MFIs (with deposits, insurances …) – while applying market prices that attract non-bankable but potentially viable borrowers; competition, not undermined by 'addicted' subsidised institutions can also increase, with positive spill-over (and some drawbacks); full self-sufficiency facilitates the ability to raise capital from a variety of sources, while market competition prompts MFIs to control costs and to look constantly for efficiency gains.

The institutional life cycle theory (Bogan, 2008) of MFIs development describes an evolutionary pattern where most MFIs start out as NGOs with a social vision, funding their operations with grants and concessional loans from donors and international financial institutions (De Sousa-Shields and Frankiewicz, 2004; Helms, 2006) that provide the primary source of risk capital.

A significant step forward – a real jump of quality – is represented by the collection of public deposits, before which the MFI has to accept formal banking regulation. This passage is normally accompanied by a reduction in subsidies and with targeted interest rate charges to borrowers that are consistent with the market rate remuneration of deposits and other funding sources, such as interbank loans.

The intensity of regulation is a long debated issue: like a medicine, too much kills the patient and too little is useless. Advantages, costs and enforceability of regulatory policies constitute a typical trade-off from a theoretical but also practical point of view, also considering the difficulties of less developed countries in effectively controlling unsophisticated intermediaries; the Consensus Guidelines on MFI regulation take a balanced view, arguing that small-scale deposit-collecting should be allowed to go unsupervised, especially in a closed context where depositors are only forced-saving borrowers, with a net debt towards the MFIs.

The transition process from a non-profit organisation or a credit cooperative to a profit-oriented firm is strongly advocated and considered 'politically correct', since bigger and sustainable institutions have consistent advantages, especially in terms of cheaper and broad provision of capital; in severe imperfect markets, where most MFIs still operate, costs related to market contracts are, however generally cheaper for non-profit institutions, that consequently seem still useful (Mersland, 2007).

Banks making small loans need a higher – more expensive – capital adequacy, setting aside larger provisions against the higher expected losses from small loans (World Bank, 2008, p.16), somewhat mitigated by the MF low delinquency rate.

Exclusive reliance on donors funding brings to well-known capital rationing problems, which prevent MFIs from meeting the enormous demand from the underserved, and might also avoid pressures to operate efficiently: commercially-funded MFIs have to survive in the market and have to cope with a daily pressure for revenues enhancing and cost cutting, in order to keep survival margins, flexibly reacting to competitive market shifts (e.g., if market interest rates go down, the commercial institution has to follow the trend; otherwise, it will sooner or later be abandoned by the customers).

Donor-backed MFIs may not fully respond to market pressures to operate efficiently or may deliberately choose to pursue other goals, such as outreach over efficiency, by serving poorer or rural customers with higher delivery costs (Armendariz de Aghion and Morduch, 2010).

The marginal involvement of poorer customers, although socially desirable, substantially increases the running costs of the institution, due to concomitant and

interacting factors (lower loan sizes with decreasing economies of scale; higher unitary screening and monitoring costs; absolute lack of any worthy collateral; low cultural – entrepreneurial level …).

Cost–benefit analyses are important in order to assess if and to which extent MF is effective in respecting its goals and if it can have a better impact that other alternative methodologies or uses of funds. This is evidently of crucial importance for both donors and beneficiaries, with psychological as well as material good or bad consequences.

Empirical evidence and statistics show that the vast majority of MFIs are tiny – and very few are large; dimensional growth is often not one of the main concerns – as it is for many companies in other industries – of sponsored MFIs: the paradox is that in order to grow to a sustainable level they need additional 'fuel' (subsidies) but exhausted donors might empty their pockets – pouring money into a bottomless pit – before reaching the magic threshold. Scarce donor funding has an empirical evidence of being the principal factor in limiting growth (and consequent positive side effects, such as scaling, increased efficiency, outreach, attractiveness of private investors …) and donor-led models are hardly sustainable in the long run.

Moreover, the real effectiveness of foreign aid is strongly challenged by a harsh local environment where the cultural distance between donors and beneficiaries requires time and patience much more than money.

The transformation of NGOs or other subsidised MFIs to commercial banks does not only require central banks authorisations, but it is also normally accompanied by the presence of new private and profit-oriented shareholders; changes in the objectives and in the by-laws of the institutions generally foresee the ability to distribute profits, which do not necessarily have to be reinvested in the business. Donors can conveniently act as catalysts for subsequent professional and profitable intervention, 'crowding in' funds and preparing the ground for self-sustainable MFIs (Morduch, 2005).

Earning survival profits is quite different from earning higher enough profits in order to attract investors not concerned with social missions (Cull et al., 2008), maybe heartless and greedy but often necessary for a jump of quality, in order to approach otherwise unreachable international financial markets.

Investors in MFIs might be attracted by low correlation to global capital markets (Krauss and Walter, 2008; Deutsche Bank, 2007) but significant exposure to domestic GDP, with an attractive portfolio diversification for international investors but not for domestic investors lacking significant country risk diversification options.

5 Combining outreach with sustainability

The success of microcredit does not imply that it can solve all the existing socioeconomic problems that affect the poor: this false and simplified conviction is both dangerous and deceiving.

MFIs are actually limited in their ability to serve the underserved for many complementary reasons such as the poorest natural unwillingness to borrow – life is already risky enough without taking on debt – or exclusion (often self-exclusion) from group members. The poorest also desperately need primary goods and services such as food, grants or guaranteed employment before they are in a position to make proper use of financial products.

Highly subsidised safety net programs are what the destitute at the bottom of the economic ladder primarily need. MFIs can cooperate and interact beyond a certain level, even if their job is different and confusion does not help in an already messy environment.

The MF business is often unprofitable or – in the luckiest cases – offering only decent returns and consequently it does not easily attract ambitious and profit-maximising managers, unless they have a charitable background, looking for 'values' beyond money and success; larger and well-established MFIs, transformed into formal banks, might generally be more seductive, but the problem is to let them arrive at such a level; good strategic management is strongly needed even in this complex field, where poor management is often offered to poor customers, creating a vicious circle difficult to sort out.

The key for a feasible and progressive solution of the main MF target – maximising outreach and impact while preserving long term, possibly unsubsidised, sustainability – is to insist on the search for financial innovation, in order to find smart and unconventional solutions to unorthodox problems. This strategy has proved successful in the past, allowing to reach unthinkable results, and has to be followed even in the future.

For-profit institutions normally target wealthier customers – from the not-so-poor onwards – and are generally able to increase the average size of their loans, so decreasing operating costs and consequent interests charged to clients (who become increasingly demanding and have a broader set of opportunities, stimulating competition from the supply side). Customer selection is unfortunately strongly linked with discrimination and unprofitable women, albeit recording better repayments than men, are frequently left aside.

The threshold to profitability can be measured by accounting and financial indicators such as the "financial self-sufficiency ratio", which calculates the ability to generate enough revenues to cover the running and fixed costs. Institutions serving especially poor customers, if compared with those serving better-off customers, charge higher interest rates and have fewer default rates, even if operating costs are consistently higher as it is their effective cost of collected capital.

6 Scalable development, combining microfinance with technology

MF is a capital and labour intensive business, with consequent high break-even point. Even if standard banks may be even more labour intensive, in the MF industry the issue may be more serious, since margins tend to be lower and collateral is generally absent. Technology can significantly help lowering costs, making MF widespread and affordable.

According to Moro Visconti (2015), IT applications disrupt and reengineer business models, easing mobile payments. Their impact on MF is astonishing, even if still largely under-exploited.

To the extent that technology and MF can be suitably combined (Venkateswara and Hanumantha, 2012), they may lever scalable productivity. This may happen for instance with M-banking, within a 'digital culture' environment.

According to Moro Visconti and Quirici, (2014), technical or social innovation, also concerning the creation and commercialisation of new products, strategies and management, has a deep actual – and especially potential – impact on MFIs. This contributes reshaping their business model, with an impact on their overall risk profile.

Innovation is mostly an opportunity even for MF risk mitigation, considering its effect on risk factors, represented by worldwide 'banana skins'.

Technology unbundles and then repackages the business model, making it sounder and more resilient to external shocks, albeit requiring initial investments on both sides. This concerns not only MFIs but also increasingly sophisticated clients. Technology has an impact on competition and on mission drift: without competition, even a motivated MFI may lend to the not-so-poor in preference to poor borrowers (Guha and Chowdhury, 2014).

Technology stands out as a big disrupting factor, which segments haves from haves not, so creating a market barrier among different MFIs, where only the strongest are fit for upgrading. To the extent that it reshapes the equilibriums among different stakeholders, it is likely to have important – albeit under-investigated – corporate governance consequences.

New technologies offer a broad range of possibilities that the MF sector should capitalise upon (M-banking, crowdfunding, peer-to-peer lending, etc.) (European Microfinance Network, 2015).

Finding ways to downscale MF is one of the current challenges facing commercial banks, especially in developing countries. As banks have a poor knowledge of MF, operating in this market will require capacity-building, innovative business models and new technological architectures (Diniz et al., 2014). That is also why technology is so vital in the MF industry, which simply cannot survive without it.

Information Technology plays a significant role in reducing the cost of providing banking services, particularly in the rural and the financially excluded population. The role of Information Technology can be realised from the fact that it has greater population penetration and its ability to serve at remote location at low cost that is essential requirement for financial inclusion (Singh et al., 2014).

One important reason for the high lending interest rates is the transaction cost or sometimes called administrative cost or operating expenses. Vong and Song (2014) show that mobility technology solutions can reduce interest rates of microfinance loans.

Mobile financial services can be used by nearly everyone at any time of day or night and from anywhere, eliminating the accessibility issues presented by traditional banking (Nduati and Moronge, 2014). This is another key characteristic of technological devices, particularly useful in remote rural places, where physical bank branches cannot be present. Transactions cost and distance theories inform a new ICT-enabled MFI outreach theory positing that information and communication technology (ICT) adoption among MFIs will result in direct improvements to MFI operations and a greater capacity for poverty and geographic outreach (Weber et al., 2012).

The internet has created new opportunities for peer-to-peer (P2P) social lending platforms that have the potential to transform the way MFIs raise and allocate funds used for poverty reduction. P2P lending is coherent with group lending, which represents a distinctive MF function.

To the extent that mobile phones are increasingly used to exchange money, they can contribute to big data processing, for instance creating a credit history of its users.

Cellular technology also creates a set of spatial data, since each analysis can be geo-localised (thanks to the GPS coordinates taken by the mobile devices). These data can be manipulated with Geographical Information System (GIS) software to produce dynamic maps highlighting the spatial distribution of customers and transactions in relationships to their geographical, social and economical environment.

Mobile apps incorporated in Smartphones are still in their infancy and tailor-made MF products are being generated by on site innovation.

7 Conclusion

After the pioneer experiment of Grameen Bank some 30 years ago, MF has entered the adult age and thousands of mostly small MFIs are competing in a market where demand for financial services from the poorest is potentially unlimited, while supply is not.

While the success of MF has gone beyond any expectation, enormous problems are still on the ground and the road towards what is now considered MF's optimal goal – maximisation of outreach to the poorest, combined with financial self-sustainability of MFIs – is still full of obstacles.

Academic research, both on theoretical and empirical grounds, is broad and it is proving useful in a field where flexibility and financial innovation, in order to overcome problems that make the poorest unbankable according to commercial banking standards, are highly needed.

Local experiences are, however showing a difficult universal application and what works in Bangladesh (Habib and Jubb, 2015) is not always successful in South America (Washington and Chapman, 2014) or in Sub-Saharan Africa (Moro Visconti, 2012), even if international cross-pollination plays a substantial role.

Empirical evidence from hundreds of micro-cases is represented in models that often have just a local application: precisely the contrary of the fundamental rules of a scientific approach … from Galileo onwards. A disappointing but healthy lesson for those who believe that science alone is a solution to every problem, while the poorest need and deserve much more.

Even in MF, the last mile to the customer seems the most difficult to reach, requiring a flexible cultural and technical adaptation to local habits and needs.

While technology follows a top-down approach, which allows for scalable geographical diffusion, its on-site application is driven by complementary bottom-up feedbacks.

Technology is proving crucial for MF sustainability and outreach, since it strongly contributes to lower the break-even margin of MFIs. Can it end poverty?

Further research and on field application is strongly needed to make substantial progress in meeting the basic needs of the destitute and underserved. Particular attention should be dedicated to cost-cutting technological applications. Since the poorest are naturally humble, even scientists and practitioners addressing their problems should accordingly be.

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