

## THE IMPACT OF INNOVATION AND TECHNOLOGY ON MICROFINANCE SUSTAINABLE GOVERNANCE

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### Abstract

Technical or social innovation, concerning also the creation and commercialization of new products, strategies and management, has a deep actual - and especially trendy - impact on microfinance institutions (MFIs), contributing to reshape their business model, with an impact on their overall risk profile. Innovation is mostly an opportunity even for MF risk mitigation, considering its pervasive impact on risk factors.

This original analysis is addressing, in a multidisciplinary and innovative comprehensive way, apparently weakly related topics such as MF governance, and IT issues, within recessionary cycles. This hardly investigated frontier faces key trendy issues, which are likely to deeply reengineer the relationship among different stakeholders, as it has already happened, on a different and more sophisticated scale, with traditional banking.

To the extent that technology (with access to Internet, social networks, cashless electronic payments, etc.) reshapes the equilibriums among different stakeholders, it is likely to have important – albeit under-investigated - corporate governance consequences, softening the conflicts of interest among stakeholders and reinforcing the business model, making it more resilient during recessions, with positive externalities on both sustainability and outreach.

**Keywords:** Stakeholders, ICT, Risk Management, Outreach, Mobile Banking, Cashless Society, Social Networks, Recession

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### 1. Introduction

Microfinance (MF) is spreading everywhere in the world, some 30 years after Yunus' pioneering intuition, but at the same time is rapidly changing, with new opportunities, mainly induced by innovations, but also with unprecedented threats, such as mission drift – the irresistible temptation to abandon social objectives, looking for wealthier clients – or worldwide recession contagion (see Engels, 2010; Moro Visconti, 2014).

Technical or social innovation, concerning also the creation and commercialization of new products, strategies and management, has a deep actual - and especially potential - impact on microfinance institutions (MFIs), contributing to reshape their business model, with an impact on their overall risk profile.

Innovation is mostly an opportunity even for MF risk mitigation, even if with some possible unwanted side effects. Whereas the impact of risk factors on microfinance is still an under investigated field, somewhat forgetting that money intermediation is intrinsically a risky business, the link between

innovation and sustainability and outreach, incorporating risk, is even less explored.

The topic of this paper is so original and interesting, especially forecasting the potential impact of innovation, which may significantly improve MF scalability, making it profitable, strengthening sustainability and pushing outreach towards deeper financial inclusion. Risk mitigation is also likely to improve both sustainability and outreach.

Technology (represented by M-banking, mobile payments, PDAs ...), cutting through complexity, "deatomizes" the business model, making it sounder and more resilient to external shocks, albeit requiring initial investments on both sides, concerning not only MFIs but also increasingly sophisticated clients. 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.

MF banana skins (Moro Visconti, 2012) are a "slippery" metaphor for risk and are monitored with a worldwide survey. Even if "managing technology", the classified risk factor closer to technological

innovation, appears in a mid ranking position, its link with other risk factors - starting from top ranking credit risk – is worth being investigated, albeit being sometimes surreptitious, since risk factors are likely to have an epidemic domino effect, self igniting and fulfilling each other.

M-banking, shortening the organizational chain with its space-less and timeless virtual branches, stands out as an interesting device to soften the human resources bottleneck, tackling technological risk, even if it needs a strong investment background.

Both sustainability and outreach are based on a going concern scenario which enables the MFI to survive and prosper, avoiding both equity and cash burn out.

This original analysis shows structural and evolving patterns, providing intriguing insights for improvements, in order to soften development bottlenecks, enhancing MF sustainability and outreach with suitable technology, within a dynamic corporate governance context.

The paper is organized as follows: being the first article on this broad issue, we try to analyze a large framework, starting from technological pollination of ideas and devices and proceeding with the impact of technology on corporate governance mechanisms, involving the stakeholders that rotate around the MFI. Since technology and innovation reshape the equilibriums among different stakeholders, they are likely to have important corporate governance consequences on MFI; this hardly investigated thesis may well be extended to other industries.

MF risks are then investigated, considering in particular the impact of innovation, which fully reengineers the organizational system within the MFI, simplifying and expanding its business model, with positive consequences on both sustainability and outreach. Risk factors are to be included in MF business planning, where technology and innovation are again to be considered for their potentially powerful impact.

Technology is 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. Sponsoring equity-holders increasingly acknowledge the importance of IT contributions and technical managerial training, but there is still an enormous effort to make, involving thousands of small and unskilled MFIs, too unsophisticated and fragile for scaling up, unless properly assisted.

Concluding remarks contain a summary of the main findings and implications of this paper, with some tips for further research avenues.

## **2. Applying Information Technology to Microfinance**

MFIs are subject to a continuous contagion, both horizontal - among different countries, which export ideas, projects but also problems – and vertical,

among different industries, considering that the financial sector, where MFIs are broadly collocated, influences and is also influenced by all the economic sectors, which represent the real world underlying its backing financing.

Technology is possibly the most powerful transmittable tool within a globalized world, subject to unprecedented and often uncontrollable movements of capitals, goods, people and their know-how, a common denominator which represents the “software” behind any “hardware” transfer, with a demiurgic impact that makes it a cornerstone of internationalized economic value.

To the extent that MFIs are located in an institutional framework of many (often confusingly and informally) interacting financial intermediaries, they can both influence and mostly, be influenced by technological pollination, mainly in the form of spill-over and trickle down from bigger and sounder institutions.

Growing technological innovation follows the Darwinian development pattern of MFIs, which need being increasingly backed by IT sophistication.

Information and communication technologies (ICT) are an important driver in the maturing microfinance industry. MF Providers - both non-profit MFIs and for-profit banks - provide financial services to the poor, which are unbanked, in order to eradicate poverty and to promote economic development in developing nations. As the industry matures, MFIs face an increasingly competitive environment that forces them to balance the dual goals of outreach and sustainability. In this context, ICT may be both the instigator of the new environment and the potential solution to MFIs survivability. In this sense, Kauffman and Riggins, 2012, propose research direction on the role of ICT in the microfinance industry, with special attention given to the industry's stakeholders and to the value chain of MF services.

Providing financial services to poor people is costly and this in part because these clients exchange small amounts of money, live in sparsely populated areas and rarely have documented credit histories. According to some studies (Ivatury, 2006) MFIs, handling small transaction for dispersed population, have operating costs of 12-15 % of assets, while the similar ratio for banks rarely exceeds 5 %. So, innovative operating methods are required to reduce transaction and managerial costs. It is so necessary to find delivery channels that are inexpensive to set up, a wider range of financial services according to poor characteristics, in order to handle transactions at low cost.

"Direct banking" technology channels -such as Internet banking, automated teller machines (ATMs) or point-of-sale (POS) terminals make possible to reduce the cost of process transaction at only one-fifth of the cost of a branch teller. These terminals can be set up at a cost of less than 0.5 % the cost of setting up a typical bank branch.

Obviously, it is necessary to consider the particular conditions characterizing places and habits of poor people. Most of them, particularly those working in the informal economy and in rural areas, where also electricity could be absent, earn and spend in cash: to handle a cash transaction outside of a bank branch MFIs may use or an ATM (that can accept, store and dispense cash, but requiring a "always-on" telecommunication connection to a bank's central service), or a POS device placed in an outlet where cash is kept on hand.

According to CGAP, 2006, 62 financial institutions in 32 countries report using technology channels (including at first place ATM, and POS devices, only in a little part mobile phones) to handle transactions for poor people; moreover, nearly 75 % of the respondents were banks, operating both in large markets (India, Brazil and South Africa) and in small markets (e.g. Namibia, Guatemala or Malawi). Surely, most respondents to CGAP's survey use technology channels for automatic basic transactions, to reduce processing costs and to give customers added convenience, gaining new ones in areas where setting up a branch is too costly (CGAP, 2006).

These results consent many different consideration, but two in particular:

1) most survey respondents are banks and only in a little part are MFIs: and this because most MFIs could be not well suited to develop technology delivery channels, being lacking the strong core information systems, substantial financial and management resources and membership in electronic payment association required for such initiatives (Ivatury, 2006);

2) most survey respondents use ATMs, and this suggest that they target customers in urban and semi-urban areas. In fact, even if now telecommunication and electricity infrastructure are more widespread and increasingly available in developing countries - because of falling hardware cost and growing support infrastructure - in many places, above all rural areas, they are not available.

The most developing technology channel is now M-banking: in countries where debit and credit cards, POS devices and ATMs and bank branches are nonexistent, using mobile phone may be a lower-cost way to expand access to financial services, opening basic accounts for customers who previously were excluded from the formal financial system. Many studies can demonstrate the continued growth of the mobile money industry, which really represents an emerging new banking business model (Kumar *et al.*, 2010; Hanouch-Rotman, 2013; Ehrbeck, 2013; Tarazi-Brelhoff, 2010, Srivastava, 2014). Some examples of particular success of M-banking are BankO in the Philippines and M-PESA in Kenya. In particular, M-PESA, turning out to be a real game-changer, has nearly fully penetrated the market, reaching at least 84 % of Kenyans living below \$2 per day (see Ehrbeck, 2013).

Kumar *et al.*, 2010, highlighted that the MFIs world largely uses unsophisticated backend systems, while the m-banking world uses very sophisticated backend systems. But also according to other studies - particularly Rozzani *et al.*, 2013, in their literature review - many MFIs are still facing difficulties in using sophisticated technology. Hence, technology is often said to be one of the biggest obstacles faced by modern MFIs worldwide.

Making use of mobile phones can also drive the expansion of insurance coverage in low-income markets (Prashad *et al.*, 2014), increasing the efficiency of transactions across the entire value chain.

The successful use of technology in MFIs stands as an exception rather than a ruling, despite the falling cost of hardware and connectivity (CGAP, 2013); Kulik and Molinari, 2004, found that the main reason for the poor performance of MFIs is the lack of access to technology; Mishra and Chowbwy, 2009, underline insufficient availability and use of technology in Indian Microfinance; Frankiewicz, 2003, argues that the emergence of information technology can be a strategic tool for MFIs.

In other words, these studies put in evidence that, despite the accessibility of technology, in MFIs there is a problem in developing adequate Management Information Systems (MIS) (see Ahmad, 2005; Sahoo and Sahoo, 2013) with consequent difficulties in managing their credit delivery to clients and in gathering data of clients. But this lack has deep consequences in MFIs management's ability to have a timely and proper decision-making process. The implementation of an appropriate MIS lies at the heart of a MF business, being a necessary requisite for MFIs' management both to monitor the effectiveness, sustainability, quality and efficiency of their loan portfolio and to manage general administrative tasks, thanks to an easy access to all critical management information. MIS increases productivity, lowers transaction cost and reduces the risk of failure, but most of the MFIs have yet to realize the importance of its use to achieve outreach and sustainability. As strong core MIS can deliver cost-effective integration of data, channels and processes, easing a consolidated view of the whole portfolio, the implementation of the right MIS becomes really one the most important strategic aim for MFIs, which would allow also a better integration of MFIs with the other elements of the financial sector.

### **3. The Impact of Technology on Corporate Governance Issues**

Technology may contribute to soften corporate governance issues and related risk factors, which severely hamper MF development, starting its useful application from double checking against undeclared and otherwise hardly detectable multiple borrowing.

Corporate governance issues represent, even within the MF industry, the very backbone of firms, intrinsically shaping their workings and likely attitude to survive and prosper.

Corporate governance is concerned with the set of processes, customs, policies, laws, and institutions affecting the way the MFI is directed, administered, and ultimately controlled, including the relationships among the stakeholders that rotate around it that are represented by the providers of capital and debt (equity-holders and debt-holders) versus the clients of microcredit (borrowers), since micro-depositors are considered as debt-holders.

Conflicts of interest among different stakeholders arise when they pursue different goals - and this is what normally happens, following the "*mors tua, vita mea*" Roman motto (your death is my life) - and any attempt to minimize them, aligning their interests with cooperative behaviors, can be of great help in the reduction of corporate governance problems. No conflicts, no governance puzzles (Moro Visconti, 2011).

Conflicts of interest derive from market imperfections and deviations from theoretical rationality and fairness. Stakeholders may indeed behave opportunistically, with conflicts of interest against other stakeholders, to the extent that they have divergent priorities and objectives. Opportunistic behaviors are of course much more common and tempting for borrowers, and that is the reason why lenders typically tend to be overcautious. The corporate governance framework is necessary in order to understand how the various players are supposed to behave and why, in order to get useful insights about the mitigation strategies against harmful conflicts of interest.

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 risky and safer borrowers, so applying to anybody the same interest rates, with unwanted and undeserved implicit subsidy to the worst borrowers, which in many cases disincentives honest ones from asking for loans. Reduction of information asymmetries might contribute to reduce unfair extra charges, with reputable customers being able to send a believable signal to the MFI about the reliability of potential joiners. Technology and IT applications, with written, storable, monitored and transmittable flows of data, stand out as a key device to soften info asymmetries, improving the whole value chain and making it more transparent and accountable, to the benefit of all the stakeholders (micro-lenders, micro-borrowers, micro-insurers, equity-holders, debt-holders, local and central authorities, etc.) that rotate around the MFI.

Moral hazard is a classical "take the money and run problem", since borrowers might try to abscond

with the bank's money or not to get fully engaged in the project for which they have been financed. A milder, but highly frequent form of moral hazard is represented by microcredit misallocation, using it for consumption rather than for investment purposes. Multiple borrowing is another frequent possibility, which is eased when computerized banking credit records are missing - typically coordinated by central banks.

Strategic bankruptcy consists in 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 strategic default.

These classical corporate governance problems are well known in traditional banking, and they naturally bring to suboptimal 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.

Cross-borrowing is another potential conflict of interest between lenders and borrowers, sourcing once again from information asymmetries: it is an overlapping strategy, according to which poor clients borrow from an intermediary to pay back older loans contracted with others. It is an evident symptom of repayment difficulty, which is hopefully temporary but in many cases structural. This arbitrage or "shopping" disguising strategy can take place in underdeveloped countries and/or in informal markets where intermediaries are not enabled to cross and check IT databases with recorded credit histories.

Standard banks in developed countries normally react trying to reduce information asymmetries, using credit scoring analyses, monitoring and asking for guarantees (in the form of sizeable collateral with intrinsic market value).

Since MF borrowers are normally unable to give any worthy guarantee, these problems normally are even more acute in a context that has also to take care of greater information fallacies, even due to IT and other technological deficiencies and weak judicial systems (see Armendariz De Aghion, Morduch, 2010, Chapter 2).

As a consequence, it is of crucial importance for the success of MF to find any attempt or device to identify a solution that can contribute to mitigate these conflicts of interest between the lending bank and the micro-borrower.

A synthesis of the impact of technological devices in softening corporate governance concerns is represented in Table 1.

**Table 1.** The Impact of Technology on Corporate Governance Issues

<b>Conflict of interest / deviating behaviour</b>	<b>Brief description</b>
Adverse selection	The micro-lender finds it difficult to discriminate between risky and safer micro-borrowers. Clearing systems and computerized credit histories help softening this problem.
Moral hazard	A classical "take the money and run problem", since micro-borrowers might try to abscond with the bank's money or not to get fully engaged in the project for which they have been financed or misallocate money for other purposes. Again ICT devices may ease cross checking and tracking of operations.
Strategic bankruptcy	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. Cross checking and ICT controls soften these problems.
Cross borrowing	Poor clients, taking profit from information asymmetries, borrow from an intermediary to pay back older loans contracted with others. Clearing systems coordinated by Central banks, if operating in real time, consistently downsize the issue.

#### **4. Impact of Innovation on Microfinance Risks**

Technology and innovation may profoundly reshape risk factors in any industry, including MF.

The Microfinance Banana Skins surveys explore the risks that the worldwide MF industry faces, considering both the current hazards and their trends (fastest rising risk factors).

Managing technology is a key factor. It is sufficient to see how ICT has changed the banking industry, to understand its current (and potential) impact on the less sophisticated - but increasingly similar - MF industry. Small loans towards many poor clients are among the main economic weaknesses of the MF industry, bringing to low marginality and inability to implement economies of scale. Technology so becomes crucial to cut staff costs, making the business less labor intensive, and to foster outreach (with mobile banking, computerized data bases for credit scoring, back office efficiency with proper computerized bookkeeping, etc.).

The impact of innovation and management technology on the main MF risk factors is summarized in table 2.

Innovation will probably drive towards an increasingly cashless society, where digital native

children, also in booming underdeveloped countries, are likely to exchange money mainly with electronic devices, such as M-banking, ATM, etc. Transactional components of the e-payments, along an increasingly automated value chain, are now becoming commodities, supplanting traditional bank intermediation. Unfair competition, cutting regulatory corners, may so come from shadow banks or other informal intermediaries, threatening financial stability.

Cheap, reliable and transparent cashless virtual wallets, even using M-phone apps, store details of payments and may quickly build up otherwise missing credit histories. The world of payments is changing and the titans of Internet are mastering it, threatening old fashioned bank dominance.

Conferencing tools, such as Skype or other instruments, linked with social networks (Facebook, LinkedIn, Twitter, WhatsApp, Youtube, etc.) may consistently reduce information asymmetries, with an unprecedented impact on corporate governance traditional concerns. And digital divide, due to unavailability of IT technologies and access to Internet, is rapidly shrinking, even in the poorest areas, opening new markets.

**Table 2.** Impact of Innovation on MF Risks

<b>Microfinance biggest risks</b>	<b>Impact of innovation and management technology</b>
1 Credit risk	IT technology can have a significant impact in detecting and monitoring credit quality, with credit scoring and sharing of information.
2 Reputation	Friendly and accessible technology can improve reputation.
3 Competition	Technology creates digital divide between haves and have not; competition increases with comparability, speediness and other innovative products and processes. Early innovators get competitive lead and may disrupt older players.
4 Corporate governance	It may soften conflicts of interest, as illustrated in the dedicated paragraph
5 Political interference	Little if any impact.
6 Inappropriate regulation	Little if any impact. Regulator supervision and audit may become easier (if all information is available faster), but new audit skills will be required owing to the speed of movement of mobile transfers of money.
7 Management quality	Technology increases skills and productivity.
8 Staffing	Staff competencies change Staff is more productive but more expensive.
9 Mission drift	Temptation to reach wealthier and more technological clients may increase.
10 Unrealisable expectations	Technology changes strategies, with mixed impact on any potential outcome.
11 Managing technology	Technology is a specific issue of quality of management; according to CSFI (2011) "the problem of getting technology right is moving up the risk scale. MFIs face tough decisions on the management of their IT systems and their delivery strategies in the near future. (...) A microfinance analyst said it was a case of «Invest in technology or cease to exist in five years». Concerns about this Banana Skin were strongest in Africa and the European Union".
12 Profitability	Technology and digital procedures may strongly contribute making the business model more scalable, cutting variable costs (with an increase in fixed IT costs, which may raise the break-even point) and easing monitoring; productivity should also improve.
13 Back office	The "dirty job behind" is likely to be profoundly changed by technology and computerized systems of recording; it may also be centralized and dematerialized, with economies of scale and experience.
14 Transparency	Written and recordable IT procedures are a key starting point for transparency and softening of information asymmetries.
15 Strategy	Technology and innovation may have a deep impact on management, reshaping and rethinking strategies, reconsidering the whole value chain, target products and clients, etc.
16 Liquidity	Technology improves awareness and accountability, with a potential impact even on liquidity, which may be better handled and foreseen.
17 Macro-economic trends	Little impact, even if technology may reduce segmentation factors among different MFIs, so making them less insulated from macroeconomic shocks, but also creating opportunities for better reaction to positive trends.
18 Fraud	Fraud is linked to (lack of) transparency (# 14), and may be more easily detected with IT procedures, allowing for better monitoring. As mentioned earlier, speed of movement of money may make fraud detection more difficult and too late.
19 Product development	New products and especially innovative product delivery (e.g., M-banking and its endless by-products) may be conceived as a result of innovation.
20 Ownership	Little if any impact, even if shareholders may change, giving room to ICT players.
21 Interest rates	They do not depend on technology but again may be better detected and handled. If costs reduce, NGO MFIs, at least, may cut interest rates, driving down industry rates. IT decreases the interest burden (Song <i>et al.</i> , 2014).
22 Too much funding	Overfunding can be accounted and monitored with proper IT bookkeeping.
23 Too little funding	Same as above (# 22).
24 Foreign exchange	Linked to macroeconomic trends (# 17) and interest rates (# 21).

## **5. Microfinance, Recession and Corporate Governance**

Recession has a big impact on governance mechanisms, altering the equilibriums among different stakeholders and increasing the risk of investment returns; any governance improvement is highly welcome and recommended. Lessons from recessions teach that with no governance, there is no money for growth or bare survival (Moro Visconti, 2011; Ferguson, 2013).

Corporate governance sets the rules of cohabitation and the behavior of the different stakeholders that pivot around the MFI (borrowers, lenders, shareholders, supervisory authorities ...). As pointed out by Kostyuk *et al.*, 2011, and by Wright *et al.*, 2013, corporate governance mechanisms greatly differ across the world, reflecting country specific attitudes. These differences impact also on MF structures and may be exacerbated during recessions, threatening MFIs sustainability and outreach potential. Recession brings to credit criticalities, liquidity constraints, etc., forcing MFIs to reshape and reengineer their business models, in order to make them stronger and more resilient.

The key idea behind this paper is that innovation and technology have a great impact on MF governance, as it has already happened in traditional banking, affecting – hopefully for the better – all the stakeholders. Recessionary times have a cathartic effect, forcing MFIs to boost efficiency and in this painful and uneasy process, IT and other technological issues have crucial importance.

To the extent that technology is expensive and often uneasy to procure and engineer, entry barriers are likely to increase and many smaller MFIs, intrinsically fragile and far from reaching sufficient scalability (first of all, to cover fixed costs with enough intermediation margins), may find it difficult to survive.

Trendy governance impact, still to be fully detected (since the process is still in progress and it is uneasy to analyze) is likely to be substantial, on both quantitative and qualitative sides, since it may change the relationships and equilibriums among existing stakeholders, introducing also new players (such as TLC operators, indispensable in M-banking).

Plasticity and flexibility of MF structures is a wanted characteristic in order to make them resilient to external potentially disrupting shocks, such as recessions.

## **Conclusion**

This paper is addressing, in a multidisciplinary and innovative comprehensive way, apparently weakly related topics such as MF governance, and IT issues, within recessionary cycles. This hardly investigated frontier faces key trendy issues, which are likely to deeply reengineer the relationship among different

stakeholders, as it has already happened, on a different and more sophisticated scale, with traditional banking.

Experience teaches that technology needs being conceived, designed and implemented with a mixed approach, both top down and bottom-up and with horizontal integration of the MFI with external ICT providers, with synergistic and scalable outsourcing. Technology is already having a disrupting impact on corporate governance mechanisms, especially in less sophisticated countries (Claessens and Yurtoglu, 2013).

The interaction of top down and bottom-up strategies is particularly interesting in the MF arena and may deserve further research: in synthesis, it may suffice noting that top down approaches try to address development issues with a worldwide methodology, centrally planned, which may benefit from economies of scale but not be particularly fit for peculiarities and “biodiversities”.

Technology mostly follows a top down approach, since inventions such as M-phones may be working everywhere, irrespectively of their original conception; but technology needs to be constantly adapted to a less-than-ideal playground, where the aforementioned “biodiversities” do matter, up to the point of making the difference between success and failure; a bottom-up approach, starting from the very bottom of the social pyramid, is so complementarily needed.

Even MF marketplace – playfield – is increasingly virtual and intangible, so requiring growing technology, opening the way to new products, providers and users.

And new products, including distance learning (with didactic videos in local languages, explaining the basics of MF) or geomatic applications (which can improve land titling, allowing for the introduction of MF housing products), may provide deeper outreach, strengthening the value chain that links MFIs to their fragile clients, increasing awareness and focus on viable strategies. Marketing risks are intrinsic in new products, since it is difficult to predict the reaction of customers.

Out of the pocket technology (smart-phones with germinating apps are like mobile phones some years ago, originally unaffordable but then rapidly and cheaply spreading) is an entry barrier for both providers (MFIs, backed by their technological partners) and clients (users).

Rapidly proliferating peer-to-peer (P2P) lending schemes, mainly represented by not intermediated mobile payments, outside the official (highly regulated) banking system, may completely reshape the financial landscape, with unprecedented opportunities mixed with unknown concerns, especially in financially unsophisticated countries. Ancillary governance issues are just consequential, to the extent that stakeholders are going to be deeply affected by these new financial paradigms.

Any technological device that can soften information asymmetries, increasing consciousness, is likely to bring strategic added value, even with cost reduction; examples may include real time information on the MFI's conditions (interest rates; size of loans and repayment schedule, etc.), benchmarking comparisons regarding both credit institutions (alternative MFIs, branch locations, etc.) and market trends in the specific industry sponsored by MF loans. Even if MF apps are still to be proposed, as soon as smart-phones and tablets will reach a sufficient critical mass, the pattern will rapidly change and scale up.

Diffusion of technology is easier in crowded towns, where there is a critical mass for infrastructures and networks, but may be somehow even more useful in under-populated rural areas, in the middle of nowhere. Potential for outreach is enormous, but it has to be properly supported, especially if tackling the poorest, who suffer for an increasingly harmful digital divide, and consequent lack of opportunities.

The economic and social impact of branchless M-banking still needs further investigation, considering also innovative aspects such as information asymmetries reduction, which may have a positive impact even on final clients, strengthening their business models and so enabling micro-borrowers to establish better links with their sponsoring MFIs; we may think, for instance, about a real time device to communicate in real time wholesale and retail prices of tradable commodities, key information for farmers, small shop owners, etc., which may shorten the whole intermediation chain, to the advantage of producers and consumers. Even P2P micro-lending increasingly depends on technological platforms.

The impact of technology may be measured with differential analysis on MFIs, considering their accounts before and after the introduction of innovative devices; to the extent that technology can reduce fixed costs and improve the scalability and flexibility of the business model, economic margins are likely to expand and cash flows should increase, with positive side effects on both sustainability and potential outreach. For MFIs, technological upgrade is to be considered a key strategic issue in the next years, with a likely digital divide between haves and have not. New research avenues may conveniently investigate on these 'savings & phone' not trivial issues, supported by appropriate empirical evidence.

The role of new coming stakeholders such as big ICT players also needs to be further investigated, considering the potential positive impact of their partnering for development in Telco-led M-banking, but also the possible – likely – abuses that naturally characterize stronger players.

Mother Nature, representing the under-banked poorest, may be once again threatened by Father Profit, with significant governance implications,

reincarnating *déjà vu* scenarios, which deserve proper investigation and subsequent mitigation.

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