



In Latin America, innovations in microfinance come not only from new technology, but by focusing on the people and processes making use of that technology, achieving important advances in scale and reach.

LATIN AMERICAN INNOVATIONS IN MICROFINANCE TECHNOLOGY

SUMMARY



Since microfinance is based on small loans with no formal information and no real guarantees, technology plays a key role in lowering transaction costs and increasing profitability. In this Brief, we understand technology in a broad sense, not only focusing on technological advances in equipment, but in the personnel, processes and procedures that make use of these advances. This Brief provides an overview of how the microfinance business is organised at an operational level and the role that basic technologies have played in making it a viable activity in Latin America. We also show practices that, when coupled with an effective use of equipment, have been quite successful, contributing to the development of microfinance itself, and making microfinance a business of scale in the region, focusing on operations related to decentralised decision making, long-term client relationships and diversified products. Finally, we outline enabling factors that facilitated the adaptation of technologies and effective operations and the lessons learned in the process.

TRADITIONAL BANKING VERSUS MICROFINANCE

Microfinance differs from traditional bank lending in that it lacks formal business information sources, such as accounting books, and real collateral as a guarantee. Indeed, lack of reliable information about clients has been the most important challenge faced by microfinance institutions (MFIs) from the beginning. MFIs need to be concerned not only with the potential risks they could be assuming, but also for the size of transaction costs, since the loans are typically quite small, as well as the potential to expand coverage and the production of personalised products according to consumers' needs.

In this Brief, we understand technology as 'the entire range of activities carried out by a loan-granting institution which have to do with selecting borrowers, determining the types of loans to be granted, the loan amounts and terms to maturity, and the way in which loans will be secured, as well as the monitoring and recovery of loans'.¹ We adopt this definition because by understanding technology not in the limited sense of equipment like computers, but as the combination of labour and physical capital needed for workers to efficiently carry out their tasks, we may be better able to understand the extent of the technological revolution that microfinance has entailed in relation to traditional banking in Latin America. Such a revolution has been the Latin

¹ Schmidt, R., Zeiting, C.P. 1996. [Prospects, Problems and Potential of Credit-granting NGOs](#). *Journal of International Development* 8(2) 241-258.



American response to the specific challenges of the business: lack of information and the small size of the average loan.

In addition, microfinance technology requires that the client be approached in his or her workplace, meaning microfinance officers do not wait in offices for their clients to come, but rather are out in the field. MFIs thus face the challenge of finding ways to find and evaluate new clients quickly while also seeking to deliver a better service. MFIs thus need both more workers and workers with specialised abilities. An MFI officer need not be an expert in reading accounting books, but does need to be able to find specific kinds of basic information to make the credit operation viable. Instead of looking at the books, he or she needs to understand how the business works, its financial needs and potential, and how to best meet them. Since loan amounts are small, the costs of acquiring and processing information need to be minimised. In this context, the technological challenge is making microfinance a business of scale.

MAKING MICROFINANCE A BUSINESS OF SCALE

Two key elements are necessary to make microfinance viable: physical capital that reduces transaction and information costs, and workers that have the necessary abilities - analytical, communications and organisational - to engage in operations. This section focuses on the kinds of innovative capital improvements that are typically imagined in the discussion of microfinance technology, before turning in the next section to the broader definition of technology, incorporating operational processes and personnel.

Information Access

Information technology helps MFIs confront the scale limitations of their business as new instruments help to fill in the gap of reliable information about customers' ability to pay by storing and processing information in real time. Constant access to prior information allows for fast and effective monitoring, which facilitates quick responses by MFIs. It should be noted, however, that there is a need for technical support in order for loan officers to be efficient in the field. Among the most important instruments that help in producing and maintaining information, and making it accessible, are mobile banking, network systems, remote data processing, personal digital assistants (PDAs) and Biometrics. Table 1 highlights the most important

impacts these technologies have had in Latin America.

In addition to the technological tools previously mentioned, a new tool is starting to be tested: [psychometric testing](#). This innovation tries to assess the viability of small and medium-sized enterprises for credit by focusing on attributes like ethics, integrity, personality and business skills. The initiative was launched recently by the Inter-American Development Bank (IDB) with the creation of a \$25 million facility that aims to grant loans and partial credit guarantees to Latin American financial institutions, giving small and medium-sized enterprises that cannot meet traditional banking requirements access to credit. Countries involved in the project include Belize, Bolivia, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Nicaragua, Panama, Paraguay, Peru and Surinam.

TEXT BOX 1 SMART CARDS, BIOMETRICS AND ATMS: SPOTLIGHT ON BOLIVIA

Smart cards ensure the security of transactions and can be used in institutions or in Point-of-Sale (POS) terminals, facilitating access to credit. [Bazoberry](#) (2003) shows the success that can be achieved with technologies adapted to the circumstances and needs of the rural microfinance market in Bolivia. The MFI *Prondem* installed 34 ATMs to operate its network in order to reduce the operating costs of delivering services in rural areas. The ATMs combined with smart cards also provide audio instructions in three languages (Spanish, and two indigenous languages, Aymara and Quechua) giving people who cannot read access to services. They also include fingerprint-recognising systems in which transactions cannot proceed if the fingerprint does not match, providing protection against fraud. Clients are also able to carry out money orders, currency exchanges, cash deposits and withdrawals.

Findings show that the main reason people opened a savings account was due to the security of the fingerprints and the fact that having a smart card was perceived as a status symbol. Also, the amount required to open the account (\$US 10) appeared to be feasible and withdrawal was easy, according to clients. Moreover, the most important result in Bolivia's experience was the possibility of reducing funding costs for *Prondem* down from 7.62% in December 2001 to 5.55% in December 2002, and declining even further to 5.3% in March 2003. This reduction of costs from one year to another through savings accounts was equivalent to US\$ 854,175.

Source: Bazoberry, E. 2003. [The Bolivian Experience of the Prondem Private Financial Fund S.A.](#) PRONDEM, La Paz.

TABLE 1: Highlight on Latin American Use of Technology

Technology	Impacts
Mobile Banking ²	<p>Fast message transmission, speed of payments, high reliability, low costs (such as from less paperwork), improved security.</p> <p><i>Challenge:</i> Reluctance of customers to adopt new mobile banking technologies; need for client education.</p> <p><i>Example:</i> In 2010, the International Finance Corporation (IFC) invested \$2 million in mobile banking in Panama's YellowPepper company, a provider of valued added mobile services in Bolivia, Colombia, Ecuador, Guatemala, Haiti, Panama and Peru. In Haiti, for example, Yellow Pepper provided agents, software, and IT infrastructure after the 2010 earthquake, making banking possible for the 90% of Haitians that have cell phones but no bank accounts.</p> <p>To evaluate the impact of this technology, Karlán et al. (2010) randomly assigned clients to receive a text message or letter that reminded them about savings practices in Bolivia and Peru. Findings show that these reminders increased savings and were more effective when they highlighted the importance of a specific expenditure.³</p>
Network Systems	<p>Point-of-sale (POS) terminals,⁴ which are part of Network Systems, allow customers from different institutions to pay in the same terminals, leading to reduction of costs, such as through economies of scale and expansion of outreach.</p> <p><i>Challenges:</i> Need to build client trust in POS terminals.</p> <p><i>Example:</i> Red Transaccional Cooperativa (Transactional Cooperative Network) and World Council of Credit Unions (WOCUU) in Ecuador 2006 developed a network of 153 offices and 15 cooperatives, and now has more than 2000 machines across the country. A member of a cooperative can use any ATM to obtain funds, make deposits and check transactions.</p>
Remote Data Processing	<p>Minimisation of clients' risk and evaluation of creditworthiness (upgraded client selection), lower costs (expansion of outreach), better quality of loans, higher productivity. PDAs, laptops or smartphones when used to run credit-scoring programs are also included in this category.</p> <p>PDAs: Standardised lending methodologies, lower transaction times, improve loan officer efficiency and productivity, increase of data accuracy.</p> <p><i>Challenges:</i> The investments require mature loan products in order to avoid constant adjustments. For example, the experience of Compartamos in Mexico showed that the early adoption of this technology is not recommended if there is not a stable management information system.⁵</p> <p><i>Example:</i> ADOPEM, a programme in the Dominican Republic, saw dramatic improvements from the use of PDAs, including a decline in the number of days between application and disbursement from 5 to 2, reductions in expenses for paperwork of 60% and for data entry of 50%, and productivity measures increased by about 35%.⁶</p>
Biometrics ⁷	<p>Secure transactions, lower costs (for example, signatures imply paperwork), faster transactions.</p> <p><i>Challenges:</i> Need for client education and development policy guidelines to avoid problems with customers; the system integrator should be carefully chosen and it should be anticipated that the integration process might require changes.</p> <p><i>Example:</i> Prondem Fondo Financiero Privado (FFP) from Bolivia, also detailed in Box 1, demonstrates how biometrics-equipped ATMs can lead to significant reductions in funding costs through expanded outreach, and in reduced possibility of fraud.⁸</p>

Own elaboration.

Source: Goldberg, M., Palladini, E., 2010. [Microfinance: Managing Risks and Creating Value with Microfinance](#). World Bank, Washington, DC.

² Europe has lead wireless penetration rates going from 20.5% in 2003 to 102.8% in 2008, while Latin America increased from 19.7% in 2003 to 70.4% in 2008. Africa nearly reached 30.6% in 2008 and Asia 39.1%.

³ Gutierrez, C., Soarez, F. 2011. [What is the Evidence on Microfinance Impact?](#) Working paper. Multilateral Investment Fund, IDB, Washington, DC.

⁴ They involve card swipe technology, bar code readers, modems for data transmission, and the like.

⁵ CGAP. [Personal Digital Assistants \(PDAs\)](#). CGAP IT Innovation Series. CGAP, Washington, DC.

⁶ Ibid.

⁷ Biometrics refers to identifying an individual through physical or behavioural characteristics such as fingerprints, iris scans or voice recognition.

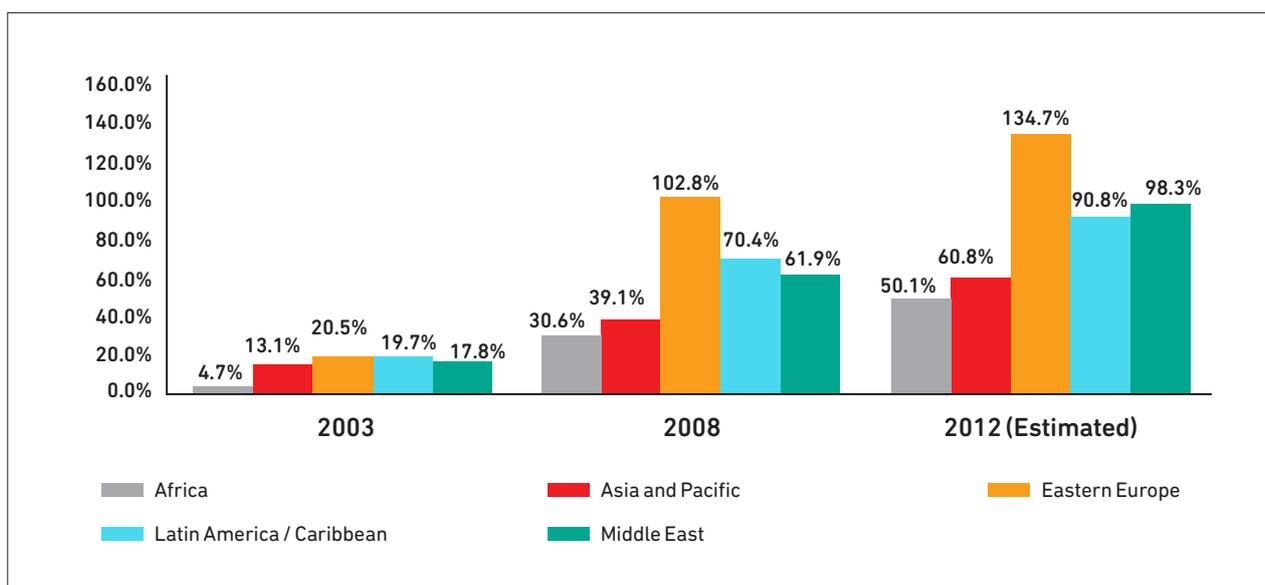
⁸ CGAP. [Biometrics Technology](#). CGAP IT Innovation Series. CGAP, Washington, DC.



The infrastructure context also matters. This problem is still present in Latin America, and even more so in Africa and Asia, although some countries are currently overcoming it at a faster pace than others. By 1999, wireless device penetration, a measure of information technology sophistication, was uniformly low everywhere, except Western Europe and North America. Figure 1 shows that

although the state of the telecommunication systems in Latin America was not adequate, technology infrastructure was poor, and financial institutions did not have adequate technology, wireless connectivity has still grown quickly, expanding faster in Latin America than in Asia or Africa, though a significant gap remains in all three regions.

FIGURE 1: Wireless Device Penetration Rates Worldwide (%)



Own elaboration.
Source: Goldberg, M., Palladini, E., 2010. *Microfinance: Managing Risks and Creating Value with Microfinance*. World Bank, Washington, DC.

STRATEGIES FOR GROWTH IN MICROFINANCE

Returning to the wider definition of technology that includes personnel and operational processes, this section presents some of the strategies implemented by MFIs that may be considered best practices from the Latin America region.

These include: establishing long-term relationships with clients; on-site monitoring of activities to assess or confirm information; decentralised decisions to react faster to needs; and diversification of products that increase operations and profits while benefiting customers.

Long-term relationships with high-performing clients

One strategy to reduce information costs is to develop long-term relationships with clients, and one way to do so is through scaling-up loans. The relationship starts with the granting of a small loan to a client. Once the client's ability to

repay has been tested, the loan may be extended or increased. As the client develops a credit history, the relationship between the institution and borrower becomes long-term. Client monitoring allows the firm to gather further information about his or her particular financial needs, thereby making it possible to offer additional products to meet those needs, from savings accounts to export financing. This also supports MFIs in achieving economies of scale, as the value of the business per client increases.

This type of strategy also has a strong advantage in terms of weeding out poor performing clients by making it more difficult for them to obtain further credit.

The policy is reinforced through standardised processes facilitated by information technologies that help to write off loans once clients have payments of capital or interest that are overdue by more than 30 days.⁹ Once this happens, clients cease to be qualified for credit.

⁹ Source: Rosales, R. 2006. *Regulation and Supervision of Microcredit in Latin America*. In: Berger, M., Goldmark, L., Miller-Sanabria, T. (eds). *An Inside View on Latin American Microfinance*. Inter-American Development Bank (IDB), Washington, DC.



An example of this technique combined with good use of physical capital innovations comes from the government-owned bank *Caixa Econômica Federal* in Brazil. The bank expanded outreach by setting up the *Caixa Aqui* account, accessible through numerous POS terminals and with debit cards. Terminals extended even into remote areas and are currently licensed to pay out social benefits and to accept deposits and small withdrawals from ATMs of up to \$500. By 2006, 3 million accounts had been opened, totaling 10% of total accounts. The accounts also included a pre-agreement to provide credit. Ninety days of account use must pass before the bank sends the customer a contract to sign offering an initial credit of up to US\$ 70 for a period of four months at an interest rate of 2% per month. After that period, scoring of the client’s actual credit performance and continued account usage allows for access to larger loans for longer periods up to a maximum of one year. In this way, the Bank has been effective in building longer-term relationships with high performing clients. The number of accounts has climbed from 2 million in 2004 to 7 million in 2007, which may be an indicator of clients’ confidence in the system.¹⁰

On-site monitoring

Since MFIs rarely have access to formal information on their clients’ finances, they need to verify the conditions of the business on-site, making microcredit a labour-intensive activity. Since accounting books are not usually available, loan officers often need to use other techniques to gauge the status of the business, both to assess a loan request and to monitor repayment once it is granted. This involves periodic visits and, often, even establishing a close relationship with the client: knowing how many children he/she has, birthday, etc. Thus, loan officers need to have different abilities than in traditional banking, in part because confirming and updating information is vital for microfinance operations (see Box 2).

PDA technology helps in reducing the costs of the on-site collection and storage of data that is necessary for monitoring. However, physical capital is of little help if it is not adapted to the needs of different operations carried out by workers. While PDAs may help collect data, loan officers

TEXT BOX 2 PERSONNEL RECRUITMENT AND COMPENSATION: THE EXPERIENCE OF BEME, CHILE

BancoEstado Microcréditos (BEME, Chile) acknowledges that the role of loan officers is crucial in microcredit activities. They select and train employees carefully, making sure that they meet the following characteristics:

- Willing to spend most time outdoors, in the field
- Have good communication skills, since most work is done talking to people.
- Have previous knowledge of accounting and ability to do quick calculations, and specific knowledge of the sector assigned
- Willing to work with a flexible schedule

In addition, they offer an effective payment scheme to incentivise worker performance, in which the employee earns 80% constant income and a 20% variable income, which is only paid if the established goals are met. If goals are surpassed, there is a quarterly bonus that can reach double the amount of the wages.

Source: Larrain, C. 2007. *BancoEstado Microcréditos: Lecciones de un Modelo Exitoso* (BancoEstado Microcredit: Lessons of a Successful Model). CEPAL - Serie Financiamiento del Desarrollo 195 (Financing Development Series No. 195). Economic Commission for Latin America (ECLAC), Santiago de Chile.

must have incentives to perform, especially because microfinance occurs primarily in the field and not in offices. Personnel compensation needs to take this into account as well, as the *Banco Estado* example from Chile demonstrates (see Box 2).

Decentralised decisions

Management of MFIs involves working with portfolios of thousands of uncollateralised loans. Reducing the costs of allocating credit involves a large degree of decentralisation, placing more decisions in the hands of loan officers. Of course, adequate overview policies are also necessary, involving area managers, head office executives, and even the board of directors.¹¹ These internal controls are facilitated thanks to technologies and wireless penetration that have

¹⁰ Bebczuk, R. 2008. *Financial Inclusion in Latin America and the Caribbean: Review and Lessons*. Working Paper 68. Centro de Estudios Distributivos, Laborales y Sociales (CEDLAS), La Plata.

¹¹ Rosales, R. 2006. *Regulation and Supervision of Microcredit in Latin America*. In: Berger, M., Goldmark, L., Miller-Sanabria, T. (eds). *An Inside View on Latin American Microfinance*. Inter-American Development Bank (IDB), Washington, DC.



helped to make reliable and constantly updated information available. This enables loan officers and branch managers to make fast decisions based upon evidence of compliance, leading to adequate oversight of operations and, in turn, arrears.

Some institutions have applied standard microcredit technology packages provided by international microfinance organisations, like [Accion](#). Also, credit-scoring techniques provided by data processing technologies have been adapted to assess risk profiles in microcredit activities, so that important variables for the sector are included. This allows for faster operations, improving efficiency and lowering transaction costs.¹²

An example of rolling out decentralised decisions comes from the case of *Mibanco* in Peru. In 2001, they decided to start using credit-scoring techniques in one branch, employing the Accion model. Once they started, reports were made to monitor statistical indicators and thus validate the tools being used. Although monitoring showed

the model was reliable in terms of accurately predicting customer performance, there were some variables from the initial model that did not function as planned; in 2004 the model was modified and the problematic variables were eliminated. Needless to say, credit-scoring has allowed *Mibanco* to standardise application of policies, processes and procedures, thus increasing retention of low-risk clients and improving the quality of portfolios.¹³

Product Diversification

Thanks to effective use of technology, today upgraded MFIs in Latin America have sophisticated information systems, and nearly all have expanded services from only working with entrepreneurs needing capital, to supporting low-income households in a variety of ways. For this reason, most of them have employed technological developments such as ATMs, credit and debit cards to meet client demands and design products according to their needs, such as long-term loans. Some of the diversified products offered in Latin America are presented in Table 2.

TABLE 2: Financial Products Offered by Upgraded MFIs, by Year of First Offering

Institution	Group Loans	Individual Microloans	Individual Small Loans	Housing Loans	Consumer Loans	Savings Accounts	Certificate of Deposit
BancoSol	1992	1999	2000	2001	2001	1993	1992
Finamerica	1994	1994	1998	2003	None	2006	1994
MiBanco	1998	1998	1998	1999	2000	1998	1998
Banco ProCredit (Bolivia)	None	1995	1999	2002	2004	1995	1995
Banco ProCredit (El Salvador)	None	1995	1999	2001	2004	1995	1995
Banco ProCredit (Nicaragua)	None	2000	2004	2002	2004	2000	2000

Own Elaboration.

Source: Berger, M., Otero, M., Schor, G. 2006. [Pioneers in the Commercialization of Microfinance: The Significance and Future of Upgraded Microfinance Institutions](#). In: Berger, M., Goldmark, L., Miller-Sanabria, T. (eds). *An Inside View on Latin American Microfinance*. Inter-American Development Bank (IDB), Washington, DC.

¹² Marulanda, B. 2006. [Downscaling: Moving Latin American Banks into Microfinance](#). In: Berger, M. Goldmark, L., Miller-Sanabria, T. (eds). *An Inside View on Latin American Microfinance*. Inter-American Development Bank (IDB), Washington, DC.

¹³ Caire, D. et al. 2006. [A Handbook for Developing Credit Scoring Systems in a Microfinance Context](#). USAID, Washington, DC.



Latin American experience shows most institutions have gone from individual microloans or group loans into housing and consumer loans. MFIs have sought to motivate higher-income individuals to enrol while providing easier access to credit requiring a low or no minimum balance. Personalised products have also proved critical in motivating client loyalty.

In Latin America, downscales - commercial banks or non-bank financial institutions (NBFIs) that decide to begin offering microfinance services - also have to go through processes of adaptation in order to compete effectively in the microfinance market. Even if traditional banks may already have an appropriate technology for operations, their challenge comes from adapting their procedures to the new services they are offering.

The international MFI ACCION carried out a survey in 2005 among 28 representative MFIs in Latin America, and found some interesting regional trends. For example, even though the first product innovations were in the credit area, the need to tailor products to clients' needs pushed MFIs to begin

providing a variety of loans, such as loans at fixed rates to finance home construction, renovation or expansion with maturities ranging from three to seven years. These are the loans with the longest maturities offered, which is why they are only offered to well-established clients.

Table 3 shows the products offered by the institutions surveyed. Evidently, consumer credit has nowadays an important presence in the business, since 78% of MFIs and 38% of NGOs surveyed reported offering them. Second in line are commercial loans, followed by mortgage loans.¹⁴

Interestingly, there is a reasonable proportion of MFIs offering savings products, though commercial banks still lead in this area. Although NGOs are not supposed to offer savings, there was one NGO that reported having been acquired by a financial institution at that time, which is why there is a 6% in the table. Bolivia is a good example of the evolution of savings, since by 2004 PRODEM reported 120,000 savings account customers, up from less than 20,000 in 2001 and more than twice the number of its credit clients.

TABLE 3: Product Offerings by Surveyed Institutions in LA

	Commercial Banks	MFIs	NGOs
LOANS			
Consumer	90%	78%	38%
Commercial	70%	67%	31%
Mortgage	60%	44%	25%
Microcredit	90%	100%	100%
Rural	50%	33%	44%
SAVINGS			
Accounts	70%	44%	6%
ATMs	60%	44%	6%
Internet	20%		
Remittances - National	50%	22%	
Remittances - International	30%		
OTHER SERVICES			
Insurance	50%	11%	6%
Training		11%	38%

Note: Percentages represent the percent of institutions out of the total surveyed that offered the product or service indicated.

Source: Marulanda, B., Otero, M. 2005 *The Profile of Microfinance in Latin America in 10 Years: Vision & Characteristics*. ACCION International, Boston.

¹⁴To learn more about products developed specifically for rural areas in Latin America, see the [ELLA Brief: Expanding Microfinance in Rural Areas](#).

CONTEXTUAL FACTORS

ENABLING LATIN AMERICA'S MICROFINANCE INNOVATIONS



Microfinance technology in Latin America developed because innovation was necessary in a context where microfinance needed to become a business of scale to achieve sustainability, in contrast to 'social borrowing' models. Technology, understood by a broader definition as the combination of labour and physical capital needed to carry out business tasks, is associated with a strong process of learning by doing, where understanding the local conditions and the restrictions it imposes on traditional banking practices have brought about new ways of conducting business.

The advance of information and communications technology has helped to enhance efficiency in a faster way. MFIs have benefitted from these advances by adopting new technologies such as mobile banking, network systems, remote data processing, and biometrics that reduce the cost of managing information.

The widespread use of IT by the microfinance industry in Latin America is associated with the rapid expansion of

telecommunications systems in the last decade. It is also related to changes in regulatory systems to facilitate the use of new technology, such as electronic payments services, loan processing and credit card issuance. Moreover, greater regulation of MFIs has put pressure on them to adopt sound technologies to manage risk.

In some cases, the role of international donors has also been key in facilitating access to technical knowledge, adoption of organisational models and continuous technological adaptation. In the case of Peru, for example, municipal savings banks created under a model brought in by GTZ now cover 30% of the market and offer access to savings and credits systems to more than 1.5 million clients.

MFIs' willingness to implement practices adequate to their context, such as on-site monitoring of clients; decentralised decisions; diversification of products; and establishment of long-term relationships with clients, have been key to achieving greater efficiency through technological innovation.

KEY LESSONS

- 1 Technology needs to be understood not only as the use of IT devices, but as the right combination of human resource abilities and adapting IT to their needs. Capital investments in technology are essential to reduce risks, but the Latin American experience shows that organisational innovations in personnel management must be simultaneously carried out in order to boost productivity.
- 2 Appropriate technology benefits MFIs by increasing efficiency and benefits customers through greater outreach and product diversification.
- 3 Latin America shows how both infrastructure development and regulation play an important role in technological development, making it possible to use the newest IT, promoting healthy competition and setting the minimum requirements for operations.
- 4 Determination of a technology's specific objectives is essential in adoption decisions. An evaluation of benefits and costs of a particular technological solution is crucial for optimal results.

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