

# Mobiles for Development: M-Banking

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## **Abstract**

The adoption of mobile phones by the poor has been an unexpected phenomenon that is having a remarkable impact on social and economic development. The significance of mobile adoption is now beginning to be understood by scholars and policy makers; the emergence of m-banking/m-payments systems has implications for the more general set of discussions around the role of mobile telephony in the developing world.

This paper offers a survey of recent literature on access gaps that focuses on pro-poor market solutions provided by mobile applications. The emerging literature on mobile uses in developing countries has focused on the benefits of voice and text messaging. However, there is little academic research on mobile applications such as m-banking. While a large number of low income people have access to mobile phones; these groups are excluded from the financial market. M-banking offers the opportunity to diminish this financial exclusion by offering access to credit and to savings which are key tools capable of transforming the livelihoods of the poor and the efficiency of the market. Accessibility is the major barrier for the expansion of mobile adoption by the poor. There is an important role for regulators to play in enabling an appropriate environment for the increase in the mobile penetration as well as business models for m-banking.

## INTRODUCTION<sup>1 2</sup>

Latin American governments have responded to the risk of increased Information Communication Technologies (ICTs) exclusion largely by implementing universal access programs that offer shared access initiatives in low income communities. These supply side solutions often with a top down approach have had little knowledge about the needs of low income groups and thus with some exceptions have provided limited impact on poor communities. Additionally, the level of public funding is not enough to address the ICTs needs and scale of demand of the underserved population in the region.

These programs are consistent with the view ICTs access gaps are the result of an unavoidable market failure. Low income people or those that live in remote areas cannot afford to pay the market prices of ICTs services. Thus, the government must intervene, offering subsidies or directly providing connectivity to the undeserved population. The argument in this paper is that the most effective policies to address access gaps have a pro-market approach. A successful example of a market solution is the dramatic increase in mobile phones that has offered the most cost-effective and accessible alternative to communications for low income groups. Innovative business strategies such as pre-paid systems have contributed to dramatically increase mobile penetration in developing countries. These market strategies reached an increase in ICTs access by low income groups that no public initiative has achieved to date. This is a significant achievement as diverse studies identify a positive impact of mobiles on productive efficiency in developing countries (Thompson & Garbacz; 2007). Waverman *et al.* (2005) find that the mobile dividend in developing countries is higher than in developed countries given that it is largely the only source of communication.

Moreover, the dramatic technological innovation experienced by the ICT industry offers potential benefits to low income groups that beyond communication and information. While digital exclusion is being addressed by mobile telephones, financial exclusion, the inability to access banking services, continues to be a significant developmental problem. Financial exclusion has become a major policy concern for many developing countries as it reinforces social exclusion; those unbanked do not have access to credits, savings or cost-effective reception of remittances. Mobile-banking offers the opportunity to diminish this financial exclusion by offering these services to low income groups that have access to mobile telephones but not to financial services. These are key services capable of transforming the livelihoods of the poor as well as the efficiency of the market. Indeed, inequality and social exclusion diminish economic growth and create inefficiencies in the function of the market (Aghion, Howitt, & Mayer-Foulkes, 2005; Bordeau de Fontenay & Beltran, 2008). New business models that offer m-banking have flourished in several developing; regulatory policies need to promote an enabling environment for these strategies to prosper.

The first section presents the literature on uses of mobile phones and its impact on pro-poor development followed by indicators that show the level of digital adoption in Latin

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<sup>1</sup> This paper is a version of a forthcoming book chapter entitled "Overcoming digital divides: constructing an equitable and competitive information society" Enrico Ferro, Yogesh K. Dwivedi, J. Ramon Gil-Garcia, Michael D. Williams (Editors).

<sup>2</sup> I acknowledge the valuable support of Armando Aldama and Fernando Ramírez in the research process.

America followed. The third section presents recent studies on mobile banking that are portrayed as a transformative market solution to the access gap faced by low income groups and identifies the role of regulatory policy in this area. The fourth section presents some m-banking experiences. This paper concludes with suggestions on the role of regulation in fostering pro-market solutions to help diminish social and economic exclusion through mobile services.

## **MOBILE SERVICES' IMPACT: LITERATURE REVIEW**

Studies that empirically document ICTs contributions to economic and social development are multidisciplinary and vary across segments of the ICTs market as well as across regions (Meijers, 2004; Madden & Savage, 1998; Roeller & Waverman, 2001; Waverman, Meschi, & Fuss, 2005). Recently, however, there has been an increased academic interest in understanding the causes and impacts of the dramatic spread in the use of mobile telephony in developing countries. From the supply-side perspective, studies find that market mechanisms such as pre-paid and calling party pays have significantly contributed to mobile expansion in developing countries (Hodge, 2005; Mariscal & Bonina, 2006; Stork, Esselaar, & Ndiwalana, 2006).

A key variable identified with network deployment is competition; the higher degree of competition in the mobile sector relative to the fixed sector played an important role in the growth of mobiles around the world (Petrazzini & Clark, 1996; Wallsten, 2001; Bortolotti, D'Souza, Fantini, & Megginson, 2002; Fink, Mattoo, & Rathindran, 2001; Wallsten, 2001, 2003).

Most of the literature, in the early 1990s, that analyzed the factors that led to telecommunications reform focused on market variables. Later, during the late 1990s, the institutional factor received increasing attention; the efficiency of regulatory institutions became a key factor to explain network deployment. (Heinz & Zelner, 2001; Levy & Spiller, 1996; Noll, 1999). Following the institutional perspective but analyzing the more broad political systems, Andonova (2006) compares mobile deployment with Internet penetration in developing countries through an econometric exercise that includes variables which try to capture the quality of institutional factors such as political rights and liberties.

Recent econometric studies construct indexes that try to measure these characteristics through specific country variables and evaluate their impact on network deployment (Gutiérrez & Berg, 2000; Gutiérrez, 2003; Jordana & Sancho, 1999; Ros, 1999). The results of these studies empirically support the basic intuition; a regulatory agency that has autonomy and independence, accountability, clarity of roles and objectives as well as transparency and participation leads to an effective regulation.

In terms of the impact of mobile diffusion, studies interested in the development component of ICTs (Information Communications Technologies for Development; ICT4D) seek to identify how mobiles may contribute to economic growth as well as to poverty reduction. At the macroeconomic level, Thompson & Garbacz (2007) identify a positive impact of mobiles on productive efficiency in developing countries while Waverman et al. (2005) find that the mobile dividend in developing countries is higher than in developed countries given that it is largely the only source of communication.

Robert Jensen's study (2007) on the fisheries market is perhaps one of the most influential papers that, from a microeconomic perspective, analyses the impact of ICTs on welfare. Through a weekly survey applied in three districts in Kerala during six years, Jensen finds a significant positive impact of information in these poorly developed markets. He finds that the addition of mobile phones reduced price dispersion, waste and increased fishermen's profits and consumer welfare. These findings offer evidence that counters the criticism ICTs should not be a priority for poor countries that lack access to health and education.

From a sociological perspective, the impact of ICTs has been studied from a social capital analysis. In these studies, the economic sphere is not separated from the social context; the concept of social capital is useful as a lens to study economic activities. (Chapman, 2004; Fafchamps & Minten, 2002). However, some of the results of studies that link social capital to ICTs conclude that this relationship is ambivalent (Huysman & Wulf, 2004). Following the same line of inquiry, Goodman finds that mobile telephony use mediates strong links with family members and close friends while weak links with others such as businessmen, teachers or doctors provide information and possible economic and social opportunities (Goodman, 2005, p 63).

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On a more broad economic and social perspective, there has been a number of surveys that explore if and how mobile phones are helpful to diminish poverty by identifying the patterns of use by poor income groups in developing countries (Donner, 2007a; Horst & Miller, 2006; Zainudeen, A., Samarajiva, R., & Abey Suriya, A., 2006; Molony (2006)). The application of surveys by Horst & Miller (2004) in Jamaica and Paragas (2005) in the Philippines show that diasporas use mobile phones to communicate with family for both economic and social reasons.

For the case of Latin America and the Caribbean, the research network, DIRSI, applied a survey to 7,000 individuals with the objective of understanding the strategies employed by the poor in the region to access and use mobile telephony services. The results of our survey are consistent with the general trend observed in region; the general growth in the mobile market has had a significant impact on telephony access for the poor. With the exception of Mexico, the majority of respondents in the countries studied had used a mobile phone in the past three months and in most cases users own their own handset.

The exceptions are Colombia and Peru, where a service resale market in urban areas (with very competitive tariffs) reduces ownership incentives.

As is the case with low income sectors in developing countries, the great majority of users prefer prepaid service given their fluctuating incomes and limited insertion in the formal economy. Service affordability remains a key barrier for increased adoption; non-users identify tariffs as the main reason for not using a mobile. Even though in most markets the current structure of tariffs creates incentives for an intensive use of text messaging (SMS, Short Message Service) and despite increased adoption, users are not taking full advantage of the services enabled by the mobile platform. SMS is the only service beyond voice that is being more intensively used.

The key perceived benefit of mobile use among the poor is associated with improved communication with family and friends; it strengthens existing ties. Increased business opportunities are beginning to be significant. These results reinforce the findings in the survey applied in Tanzania, by Goodman (2005) which associates mobile use with the increase of social capital as its use promotes a tight-knit support network.

The growing importance in the use and the positive impact of mobile phones for the developing world bring back the issue of the digital divide. New perspectives on this old issue identify the risks associated with the inequality in access to ICTs and mobile phones specifically. Tongia & Wilson (2007) focus on the costs of exclusion and find that these rise faster than the growth of the network. De Fontenay & Beltran (2008) understand the digital divide as a force that limits society's ability to achieve a higher productivity. Inequality in ICTs access represents a shortfall of inputs to the production process; i.e. the economy is performing away from the production frontier and thus inequality in general, and ICTs inequality in particular, distorts the development and allocation of human capital. The following section will provide an analysis of the different degrees of ICTs adoption in the Latin American region.

## ICTS ADOPTION IN LATIN AMERICA

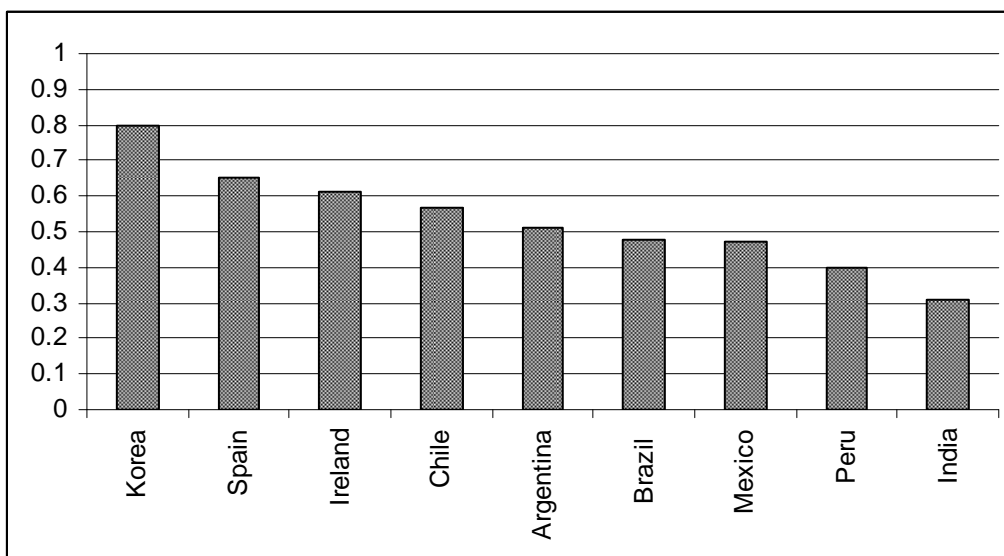
Latin America still faces the problem of a significant number of underserved groups of the population; this lack of connectivity and significant adoption of ICTs in the region varies across income groups, countries and technologies. As shown Digital Opportunities Index (DOI) in figure 1, Latin America is behind other developing regions in terms of ICT adoption, especially those that have implemented successful ICTs strategies, such as Korea and Ireland.<sup>3</sup> The low level of adoption, illustrated by these measures of digital competitiveness is limiting the opportunities to use ICTs for social and economic development.

*Figure 1. Digital Opportunities Index (DOI)<sup>4</sup> (2006)*

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<sup>3</sup> For more information about ICT strategy in Korea see [www.nia.or.kr/open\\_content/board/fileDownload.jsp?tn=MO\\_0000097&id=4941&seq=1&fl=7](http://www.nia.or.kr/open_content/board/fileDownload.jsp?tn=MO_0000097&id=4941&seq=1&fl=7) – About Ireland's ICT strategy see: <http://www.taoiseach.gov.ie/upload/publications/238.pdf>

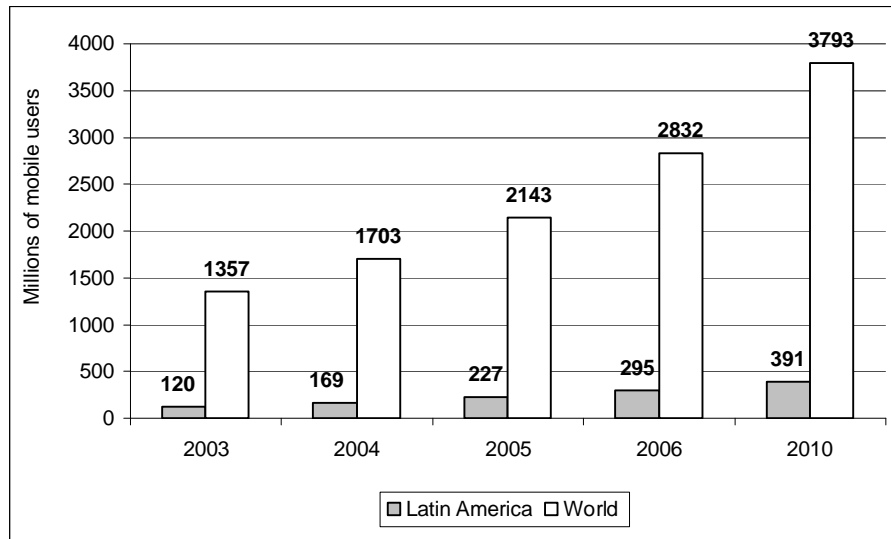
<sup>4</sup> The DOI measures the progress a country has made on bridging the digital divide. For more information see: <http://www.itu.int/ITU-D/ict/doi/material/WISR07-chapter3.pdf>



*Source: International Telecommunications Union & United Nations Conference on Trade and Development (2007).*

There are a number of factors that hinder upon the level of adoption of ICTs in the region including low national income, unequal distribution of rents and regulatory policies that maintain barriers to entry. As a result of this accessibility to ICTs is a key barrier to use. In the specific case of mobile telephony the average penetration in 2007 in Latin America was approximately 60 subscribers for every 100 inhabitants, which is above the world average of approximately 54 subscribers for every 100 inhabitants. Mobile telephony penetration in the region has more than doubled the penetration of fixed telephony. Estimates suggest that by 2010, the number of cellular telephony subscribers in the region will increase by 80%. The increase in penetration has largely been due to regulatory and commercial policies such as the “calling party-pays” billing system, the prepayment modality and significant investments (Mariscal, 2005 and 2006).

*Figure 2. Mobile telephony subscribers in LAC and the world*



Source: Enter et al. (2007)

## BANK ACCESS IN SOME LATIN AMERICAN COUNTRIES

Modern development theories identify the financial market as an essential part of the development process. Financial development fosters capital investment; the entry of new firms to the market and innovation which produces economic growth. The removal of capital market imperfections has a disproportional higher effect on smaller firms, as these are the ones that face higher constraints in accessing the financial market. Empirical findings point to an unambiguous relation; greater inequality leads to slower economic growth and the fact small enterprises in poor countries lack access to credit leads to a sustained underdevelopment (Aghion, Caroli, & Garcia-Penalosa, 1998; Benabou, 1996). Moreover, capital market imperfections are the root of the negative correlation between inequality and growth.

By not participating in the financial sector, the poor of the region are severely constrained; access to transaction services such as debit cards and checking accounts can produce significant savings in a period of time. A savings account is particularly important to the poor as they are more vulnerable to situation of crisis such as job loss or health problems. Access to savings can help individuals to smooth consumption and access to credit is a key vehicle for the creation and sustainability of microenterprises. Reducing financial markets imperfections, expanding access creates positive incentives by equalizing opportunities as well as providing poverty alleviation (World Bank, 2008).

Financial inclusion then is a high priority policy for development, but there is still much to know about how to design efficient policies that address financial inclusion. There is a lack of concrete knowledge on the policy barriers to financial inclusion, on who is excluded; it is important to distinguish between voluntary and involuntary exclusion; this difference is the result of choice or of affordability, lack of appropriate financial products and lack of geographic availability.

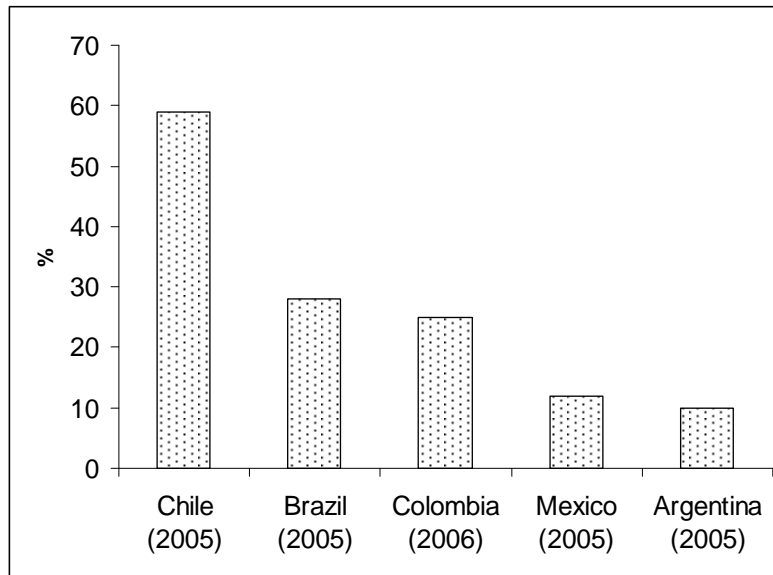
Seeking to address these knowledge gaps, different household surveys have recently been applied throughout the developing region (World Bank, 2008 for a review). These surveys and other empirical studies find that the lack of financial access depends foremost on background conditions where, not surprisingly, the institutional variable is crucial in providing information and solving agency problems. Background conditions include, at a macro level, a well developed rule of law that generally translates into share holder rights, confidence on and stability of the financial system. Financial market imperfections such as information asymmetries and transaction costs become a barrier to all types of enterprises. Strengthening or reforming an existing institutional framework is a long term venture that is essential for government to undertake. However, in the short run, progress can be made by diminishing information asymmetries as it appears to be an important issue in developing countries according to a study carried out by Djankov, Hart, McLiesh, & Shleifer (2007).

However, even in countries with a moderately developed financial system, there are significant barriers to financial access for the poor; transactions costs have a stronger negative impact on the poor who have no collaterals or credit histories. In order to open an account, banks commonly require formal documents such as proof of address and of an employment (Ketley, Davis, & Truen, 2005). Beck, Demirgüç-Kunt, & Martinez Peria (2007) carry out a survey in fifty-eight countries and find that the requirements of a formal employment and identity documents hinder the majority of the population in developing countries from having a bank account. High minimum balances, monthly and transaction fees and availability of locations are important barriers to the entrance of low-income to the banking sector. Moreover, as the World Bank (2008) report suggest, the quality of access to the service may constitute a barrier to the poor; service may be available but not customized to the need of low income groups.

In Latin America there are still large shares of the population whose financial transactions take place within the informal financial sector. In Latin America, in 2006, with a population of approximately 570 million, only 14.5 percent of poor households had a savings account and only 3.3 percent had access to credit. These figures vary across the region, from the highest in Chile of 65 percent to the low levels in Mexico, where in 2005, 70 percent of the population of Mexico over 18 years had no access to basic financial services (see Figure 3).

*Figure 3. Credit to the Private Sector  
as a percentage of GDP (Selected Countries)*





Source: De la Torre (2007)

Tejerina & Westley's (2007) survey of twelve countries in Latin America and the Caribbean find that in Jamaica, Panama, and the Dominican Republic less than 50 percent of the population have a savings account while in Peru, Paraguay, Nicaragua and Bolivia, this rate is less than 10 percent. Moreover, the level of inequality within each country is dramatic, across the countries surveyed, 28.3 percent of the non-poor have a savings account while only 10 percent of the poor do.

Technology today has changed the landscape for financial inclusion; it has enabled new entrants to the banking system offering lower costs and the possibility of ubiquitous access to the banking service. Mobile banking uses mobile telephony or a different mobile device to undertake financial transactions such as the storage of value in an account via the handset, the ability to convert cash in and out of the stored value account and the ability to transfer stored value between accounts (Donner, 2007b). In cases where stored value functions are not available users have found creative strategies such as the exchange of airtime or minutes that are managed as quasi currency.

Mobile banking provides the possibility of addressing two key barriers to financial inclusion for the poor: affordability and physical availability. Compared to branch based banks, mobile banking does not incur in the cost of roll-out and faces lower cost of handling low-value transactions. Mobile banking delivery is commonly set up with existing networks that already reaches poor un-banked people; adding a bank account to the mobile phone can channel the power of new distribution networks for cash transactions such as airtime merchants (Gamos LTD, 2006). The use of the existing mobile infrastructure and the fact it delivers all services online gives m-banking the possibility to bring cost efficiency to the provision of cash in and cash out services for the poor people even in rural areas.

As can be seen in the table 1 there is a lack of access to basic financial services in Latin American Countries. In the case of bank branches and ATM availability, measured

geographically or demographically, it is possible to verify that in most Latin American countries selected physical availability is a limiting factor to access financial services, in Bolivia, Honduras and Peru the situation is more evident.

*Table 1. Branch and ATM availability*

	Geographic branch penetration*(number)	Demographic branch penetration (number)	Geographic ATM penetration (number)	Demographic ATM penetration (number)
Argentina	1.40	10.01	2.09	14.91
Bolivia	0.13	1.53	0.4	4.8
Brazil	3.05	14.59	3.72	17.82
Chile	1.98	9.39	5.06	24.03
Colombia	3.74	8.74	4.1	9.6
Dominican Republic	10.83	6.0	27.24	15.08
Ecuador	4.38	9.3	2.97	6.32
El Salvador	14.58	4.62	34.89	11.07
Guatemala	11.49	10.12	22.93	20.2
Honduras	0.46	0.73	2.22	3.56
Mexico	4.09	7.63	8.91	16.63
Nicaragua	1.29	2.85	1.18	2.61
Peru	0.89	4.37	1.24	5.85
Venezuela	1.28	4.41	4.81	16.6

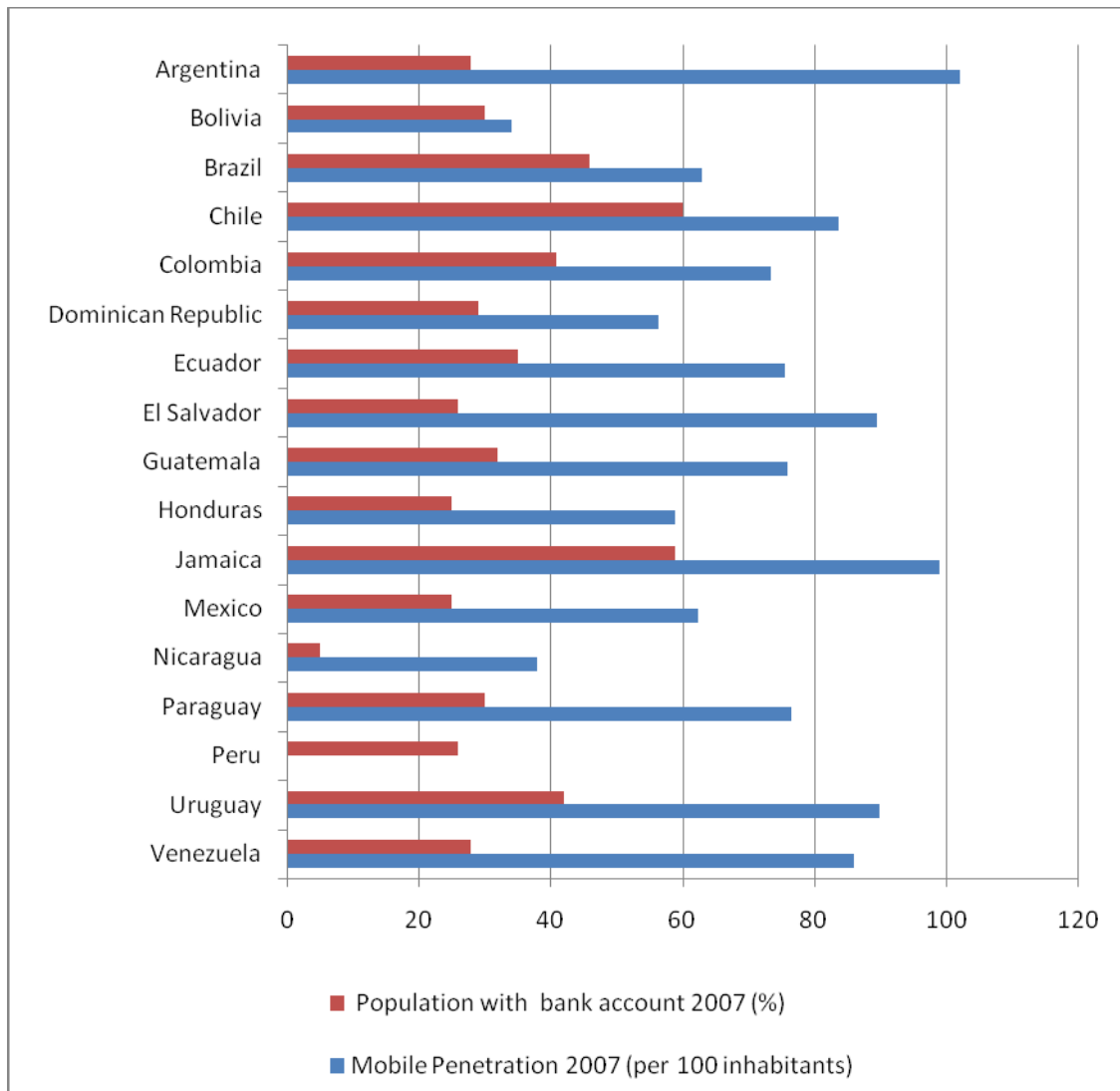
*Source: World Bank (2008)*

*\*Geographic branch (ATM) penetration refers to the number of branches (ATMs) per 1,000 square kilometers. Demographic branch (ATM) penetration refers to the number of branches (ATMs) per 100,000 people.*

Indeed, the dramatic adoption of mobile services by low income groups offers the opportunity of providing financial services through ICT as mobile users already exceed the number of banked people in many developing countries (Porteus, 2006). There are a very low percentage of banked individuals in these selected developing countries; however, the unbanked do have access to a mobile phone.

Figure 4 shows that in all the countries the mobile penetration is higher than the percentage of the population has bank account. In several of these countries the mobile penetration is 100% in the short term these are the cases of Brazil, Mexico, Uruguay and some Central American countries like El Salvador and Guatemala. But the penetration of bank accounts is very low, only in Chile and Jamaica it is greater than 50% of the population.

*Figure 4 . Penetration of Mobile Phones and Bank Accounts in Selected Countries*



Source: Honohan (2007), World Bank (2008) and ICT Statistics from ITU web page.

Empirical studies show that the solution for the poor is to rely on informal financial services which are more expensive than formal financial and often times unsafe (Coyle, 2007; Donner, 2007b; Porteus & Wishart, 2006). By filling a financial vacuum for the poor it offers the possibility of gaining access to savings, micro-credits and receiving remittances; in this sense mobile banking is portrayed as a transformative resource towards economic development.

The transformative nature of these new services depends, to a significant degree, on their capacity to be integrated into consumers' economic lives. (Jenkins, 2008) In a globalized world, where current migrations occur at a very large scale, remittances and remote payments are an important use of mobile money. Worldwide flows of remittances reached the amount of \$318 billion dollars in 2007. Latin America and the Caribbean (LAC) region remains the largest recipient of (recorded) remittances (Rhata, Mohapatra, Vijayalakshmi, & Xu, 2007). According to the Inter-American Development Bank ([IDB], 2008), LAC received remittances of USD\$ 65,000 million. Table 2 shows that Mexico is

the leading receiver (24 million), while for countries like Guatemala, El Salvador, Honduras and Nicaragua, remittances account for more than 10 percent of its Gross Domestic Product (GDP).

*Table 2. Remittances' importance for Latin America*

	Remittances, % of GDP	Remittances, % of total income	Households receiving remittances (%)	Remittances through Banks (%)	Remittances recipients w/bank account (%)
<b>Bolivia</b>	8.7	1.14	3.26	50.9	44.0
<b>Dominican Republic</b>	9.0	10.31	17.88	40.2	66.0
<b>Ecuador</b>	7.8	0.65	2.46	57.6	46.0
<b>El Salvador</b>	18.2	11.57	22.52	78.6	31.0
<b>Guatemala</b>	10.1	6.06	11.49	67.8	41.0
<b>Honduras</b>	24.8	6.43	14.33	81.8	34.0
<b>Jamaica</b>	18.3	13.63	20.90	19.2	65.0
<b>Mexico</b>	2.9	2.79	4.72	70.2	29.0
<b>Nicaragua</b>	14.9	5.59	18.62	40.7	10.0

*Source: Inter-American Development Bank (2008).*

However, the great majority of the population in these countries does not have a bank account, just like in other developing regions (Comninou, Esselaar, Ndiwalana and Stork, 2008). For example in Mexico the remittance recipient with bank account is 29 percent, in Guatemala 40 percent, in El Salvador 31 percent, in Colombia 50 percent and in Peru 37 percent (IDB, 2008). Moreover, remittances sent through formal channels are commonly subject to high costs which drive many remittance senders to informal remittance agencies. The consultancy Gamos LTD (2006) estimates that the average cost is 12 percent. Payment systems based on electronic fund transfers rather than checks can substantially reduce the costs of payment transfers and very importantly receiving remittances through the formal banking system allows individuals to enter the financial market and access other financial services such as savings accounts.

## **MOBILE BANKING EXPERIENCES IN DEVELOPING COUNTRIES**

As may be expected, most of the m-bank initiatives have emerged in developing countries where the number of unbanked is very high. Mobile phone operators and financial institutions have begun to identify m-banking as a significant opportunity to widen their market and to obtain high profits given the volume of transactions (William & Torma, 2007). Some examples of these initiatives are:

- M-PESA in Kenya. Safaricom, a mobile operator jointly owned by Vodafone and the Kenyan government, initiated services funded in part by an English development agency. The rate of early adoption of M-PESA is very significant:

over 6000 people per day; it has attracted close to a million registered users. (Nokia, 2008a; Vaughan, 2007).

- Global G-Cash and Smart Money in the Philippines. These cash platforms are used largely by small and medium enterprises and provide deposit, credit and money transfers through mobile phones. Introduced by the Central Bank, Global G-Cash has more than 1.5 m customers and Smart Money more than 2.5m customers; the rate of adoption has been 2000 clients registered weekly (Nokia, 2008b; Roman, 2006).
- Wizzit in South-Africa. Launched by the South African Bank of Athens, it offers person-to-person payments, transfer money, purchase prepaid electricity and buy airtime for a prepaid mobile phone. Wizzit does not have a minimum balance requirement and does not charge fixed monthly fees (Ivatury & Pickens, 2006; Williams & Torma, 2007).
- BANSEFI, in Mexico. Government-owned institution that offers through a technological platform, savings deposits to unbanked groups as well as technical assistance. Minimum banking fees and no transaction fees (Taber & Cuevas, 2004). BANSEFI program has extended savings accounts in Mexico increasing from 850,000 in 2001 to 3.3 million five years later. By 2006, there were 523 BANSEFI branches, one-half located in areas un-served by commercial banks (Gavito Mohar, 2006). Seventy percent of BANSEFI's customers are women, with average savings balances of US\$150.8.
- In Paraguay Millicom has begun serving Tigo Cash, a mobile e-wallet (m-wallet) that operates through an interactive menu. Stored in purse money is independent of the balance of airtime. The amount of shopping is not limited and can perform more types of transactions: Payments (already have agreements with some other companies like Burger King, Pizza Hut, and Pedime.com Pancho's), transfers to other cell refills telephone (skid of \$ 4) and loading operations and withdrawal of cash (cash in and cash-out).
- HalCash is a joint project of several Spanish banks (Bankinter, Banesto and various savings banks) with the Bank of Guayaquil in Ecuador. With this system you can make money transfer to national or international, provided that the recipient has a mobile phone to receive the code for the operation and have access to any of the ATMs of the partners in order to withdraw the funds transferred.

However, these models are still at a very incipient stage and their development towards a critical mass of mobile money still faces significant barriers. One of these is the issue of interoperability with other payment systems and other mobile devices. M-PESA has eliminated this barrier by allowing consumers to send money to any phone, even non-Safaricom phones. However, this is not a widespread practice among m-banking providers; there is a need for bilateral agreements to be forged or as some experts suggest a multilateral or networked hub model.

The importance and real potential of m-banking not only is in the opportunity of adding an additional channel to an existing bank account or of adding a bank account to an

existing mobile phone, but also, and mainly, in the possibility to extend banking services to the unbanked (Comninos, Esselaar, Ndiwalana and Stork, 2008), A Global Service for Mobile Communication Association ([GSMA], 2007) study points: “To be a compelling consumer proposition, there has to be a critical mass of uses of mobile money.” (p. 14). These uses include besides sending remittances, the capacity to pay utilities, receipt and repayment of loans, savings, as well as wage deposits (Jenkins, 2008).

## REGULATORY POLICY: THE ROLE FOR GOVERNMENT

Since the 1990s, governments in Latin America have largely faced the digital divide problem with shared access points, the creation of connectivity centers, known in some countries as telecenters. A considerable amount of resources has been invested in telecenters; however, the impact of these points of connection has been limited. There are few successful experiences; due to a significant degree to the design these programs followed: they were neither sustainable in the long run nor adapted to the local needs (Maeso & Hilbert, 2006; Villatoro & Silva 2005). Moreover, as shown in table 3 the increasing number of potential users makes it difficult for government telecenters to meet the pent-up demand. The market response to the unmet demand has been the creation of private telecenters or cybercafés that, as depicted in table 3 have covered a significant higher proportion of customers than government telecenters have (Robinson 2001).

*Table 3. Public and Private Telecenters  
in some Latin American Countries (2006)*

Country	Government TC	Private TC	Total TC	Proportion of Gov. TC over the total (%)	Potential users for each TC
Argentina	9,555	20,647	30,202	32	889
Chile	2,476	587	3,063	81	3,454
Brazil	9,976	1,178	11,154	89	8,143
Mexico	10,034	50,164	60,198	17	1,300
Costa Rica	484	715	1,199	40	2,238
Peru	1,171	18,765	19,936	6	1,017
Guatemala	54	20	74	73	2,423

Source: ECLAC (2007)

Still, in spite of the low purchasing power of the poor in Latin America, there is a potential demand that has not been met. Recently, low income groups have begun to spend a considerable percentage of their income on telecommunications. For example, studies have found that even though rural income is significantly lower than urban, the rural population in Mexico spends almost the same as the urban population (Björhov & Weidman, 2007; Frost & Sullivan, 2006). Mobile penetration in D and E socioeconomic groups grew more than 20 percent just in two years (Bonina, Piedras, & Verut; 2006).<sup>5</sup>

<sup>5</sup> In order to have an instrument for income comparison among its member agencies, the Mexican Association of Marketing and Public Opinion Research Agencies (AMAI) developed a socio-economic classification system made up of six levels: A/B, C+, C, D+, D and E, where A/B represents the highest level of income and E represents the lowest.

Despite this fact, universal access programs in Latin America follow the view that ICTs access gaps are the result of an unavoidable market failure. Low income people or those that live in remote areas cannot afford to pay the market prices of ICTs services. In this context, the policy suggestion is for government to offer subsidies or directly provide connectivity to the underserved population. The underpinning dual concept of market gaps and access gaps is analytically useful to distinguish two different policy issues: that of a competitive and efficient market from an underserved market that cannot afford ICTs services at prevailing market prices (Navas-Sabater, Dymond, & Juntunen, 2002). However, the policy suggestions that have been interpreted from this view have led to limited success in bridging the digital divide.

For those at the bottom of the income pyramid, access to telephony is largely based on different strategies of use around mobile telephony that was made accessible to these groups, to a significant degree, by pre-paid mechanisms; that is by market strategies. Moreover, mobile banking is a business strategy that provides the possibility of transforming the livelihoods of the poor that are excluded from the market. The most important role for regulatory policy is to promote an enabling environment for these strategies to flourish.

In terms of market development, the evidence provided is not intended to be an argument for “regulatory holidays”; there are still barriers to entry into the ICTs market that must be eliminated by regulatory policy. The ICTs sector has evolved in the context of technological convergence to the point where the literature on regulation prescribes deregulation with ex-post antitrust enforcement for the sector. Wherever facilities-based competition (intra-modal) is feasible, market power is diminished and price competition can be strong. A discussion of recent developments in the literature of ICTs regulatory policy is beyond the scope of this paper, however, in terms of the general trends towards promoting solutions to access gaps, there are at least two key regulatory actions. One of these is spectrum allocation that is a crucial variable in promoting investment and competition; moreover when spectrum licensees are technologically neutral, operators can exploit economies of scale and scope diminishing costs (Hazlett, 2008; Mariscal & Ramírez; Picth, 2008). A second key variable is interconnection; the provision of high quality interconnection is a process in which the regulator must intervene to eliminate bottlenecks and promote competition. Also, high interconnection rates in mobile services increases tariffs for the consumer; the mechanism “caller party pays” provides a negative incentive for mobile operators to diminish tariffs as customers cannot choose the network they use.

Accessibility is still the major barrier for the expansion of mobile adoption by the poor. Moreover, evidence shows that the poor largely use the pre-paid mechanism which is significantly more expensive than post-paid packages; in Peru the differential reaches up to 40 percent. Even when, the operator faces less administrative costs in a pre-paid scheme, those who do not have access to formal channels of credit are penalized with higher prices. Still in Chile, where ICT penetration is higher than in other countries in the region, both of these schemes are offered at practically the same price. Regulatory policies should encourage business models tailored for the patterns of consumption and expenditure of the poor such as micro-charges (allowing very small amounts of money to obtain an increase in credit) as well as tariffs charges per second instead of minutes.

In terms of mobile banking, regulatory policy needs to create an environment for innovation and competition among financial sector operators. Barriers to entrance to this sector need to be eliminated; there is still a lack of openness to new models and lack of policy certainty that contribute to a high perceived level of risk among potential customers. Public confidence and trust is an essential pre-requisite for the creation of a mobile money market; market inefficiencies and a secure environment needs to be addressed.

It is necessary to maintain a balance between certainty and innovation through the coordination of at least two separate entities: banking and telecommunications. Indeed, boundaries between several sectors have been eliminated and have come together in the creation of this new market where there is an interaction between banks, mobile carriers, utilities, microfinance institutions and other high technology providers. Several models of interaction have been implemented in different countries; some m-banking is provided solely by banks while some by a partnership between a bank and a mobile provider. Other actors, that are not providers but play a key role are international financial institutions and donors and civil society organizations.

Some of the issues needed to be addressed by regulators to create an enabling environment for mobile money are summarized by Lyman, Pickens, & Porteous (2008), Mas & Kumar (2008) and Mas (2008) in three Consultative Group to Assist the Poor (CGAP) papers. The success and sustainability of mobile banking depends on at least these key requirements:

- Clarity in the requirements of becoming an agent that can use the existing retail network for mobile money deliveries.
- Effective regulatory rules for the issuance of electronic money by nonbanks or on the outsourcing of the operation of bank accounts to nonbanks.
- Effective consumer protection minimum data security levels as well as customer privacy.
- Regulation of payment system.
- Regulation of competition among providers; offering incentives for entrants into the markets (interoperability).

Thus, there is an important role for ICTs and financial regulators to play in enabling an appropriate environment for these models to expand. There is a need to promote competition in the telecommunications market which may contribute to diminish mobile tariffs which are still not accessible for a significant portion of the population, extending coverage requirements to un-served locations and setting interoperability standards. The transformational impact of mobile banking depends on resolving the challenges this service faces.



## CONCLUSION

The adoption of mobile phones by the poor has been an unexpected phenomenon that is having a remarkable impact on social and economic development. The significance of mobile adoption is now beginning to be understood by scholars and policy makers; the emergence of m-banking/m-payments systems has implications for the more general set of discussions around the role of mobile telephony in the developing world.

The studies presented here offer evidence that counters the criticism ICTs should not be a priority for poor countries that lack access to health and education. There is a positive impact of mobiles on productive efficiency in developing countries and, as the fishermen's study shows, the addition of mobile phones reduces price dispersion, and increases profits and consumer welfare. Mobile use facilitates participation in social networks and thus enables people to strengthen social capital.

Mobile banking initiatives have achieved a considerable degree of success in a very short period. However, their expansion and sustainability depend on an enabling environment that should be promoted by regulatory policies. There is still much to be learned about the limits and opportunities of mobile banking for financial inclusion. How will these services be used to help alleviate other economic needs? What are the impacts of mobile phones and mobile applications such as m-banking on other social and economic relationships? As Donner (2007b) suggests the mobile phenomenon is in need of a research agenda that studies how this technology is changing the structure of transactional networks.

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