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# The Development of Mobile Money Systems

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## Abstract

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*In this paper we argue that mobile banking offers the opportunity to diminish the financial exclusion suffered by the poor by offering access to credit and to savings which are key tools capable of transforming the livelihoods of the poor as well as the efficiency of the market. However, mobile phones need a complete ecosystem that supports its application to a functioning mobile banking service. The aim of this paper is to contribute to existing knowledge of mobile money across the value chain by providing insight into the mechanisms of m-money, the value propositions within the business of m-banking and what is preventing its swifter adoption and usage in the developing world. We develop a taxonomy of the key drivers of the business model which provides insights for assessing the replicability of these models. We focus on models developed in Kenya, the Philippines, and Brazil and explore what is lacking for a widespread adoption of m-money for the BoP<sup>1</sup> in other countries*

*Keywords: M-banking, financial inclusion, mobile applications, mobile opportunities, developing countries.*

## Resumen

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*Este artículo argumenta que servicios bancarios a través de teléfonos móviles brindan la oportunidad de disminuir la exclusión del sector financiero de personas de escasos recursos al ofrecer acceso a crédito y cuentas de ahorro, que son dos herramientas que pueden transformar la vida de estas personas y aumentar la eficiencia general del mercado. Sin embargo, los teléfonos móviles requieren de un ecosistema complejo que soporte su utilización para ofrecer servicios bancarios. Este artículo busca contribuir al conocimiento de dicho ecosistema a lo largo de la cadena de valor explorando sus mecanismos, las propuestas de valor y el porqué no han tenido una aceptación generalizada en países emergentes. Para ello, creamos una taxonomía de las palancas clave del modelo de negocios para entender su posibilidad de replicación en países emergentes. Nos enfocamos en los modelos implementados en Kenia, Filipinas y Brasil y exploramos qué es lo que falta para el lanzamiento y adopción en la “base de la pirámide”.<sup>2</sup>*

*Palabras clave: Banca móvil, inclusión financiera, aplicaciones móviles, oportunidades móviles, países en desarrollo.*

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<sup>1</sup> BoP: Bottom of the pyramid; this term applies to the population with the lowest levels in any given country.

<sup>2</sup> La “base de la pirámide” se refiere a los deciles de menores ingresos en un país dado.



## *Introduction*

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During the last years, there has been a surge of empirical studies that document the striking level of adoption of mobile telephones by the poor. This 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. Mobile banking offers the opportunity to diminish the financial exclusion suffered by the poor by offering access to credit and to savings which are key tools capable of transforming the livelihoods of the poor as well as the efficiency of the market.

Financial inclusion diminishes vulnerabilities in emergencies such as illness, unemployment or thefts. The population that is financially excluded has to rely on informal mechanisms that are not safe and are also considerably more expensive, thus facing high social and economic consequences. Moreover, formal banking offers “both access to resources and the ability to transform resources into opportunities.” (Jenkins, 2008: 6.) Indeed, inequality and social exclusion diminish economic growth and create inefficiencies in the function of the market in a country (Aghion & Howitt, 1998; de Fontenay & Beltran, 2008).

How can mobile telephony facilitate this transition into financial inclusion to those currently unbanked? First, while a large number of low income people have access to mobile phones; these very groups are currently excluded from the financial market. Second, mobile telephony can facilitate the flow of money among rural and poor segments of the population at much lower transaction costs, bringing the bank to those currently unbanked. (Jenkins, 2008) Traditional banks have not been able to service a large portion of poor people, particularly those in remote places given the high expenses of maintaining bank branches. The importance of mobile banking for the poor is less about convenience and more about accessibility and affordability (Donner, 2007). Mobile banking offers the promise of integrating the currently excluded population as formal players into the market.

However, mobile phones need a complete ecosystem that supports its application to a functioning mobile banking service. A mobile banking platform needs to be supported by a cash conversion platform that in turn requires a full collaborative system of different players. These may include mobile networks operators, banks, airtime sales agents, retailers and regulators.

The aim of this paper is to contribute to existing knowledge of mobile money across the value chain by providing insight into the mechanisms of m-money, the value propositions within the business of m-banking and what is preventing its swifter adoption and usage in the developed world. We will

develop a taxonomy of the key drivers of the business model which provides insights for assessing the replicability of these models in other countries. The paper will study the business models developed in the national cases of Kenya and the Philippines and explore what is lacking for a widespread adoption in a Latin American country, such as Mexico. It will also analyze what is preventing the creation and usage of m-money models for the BoP in the case of Mexico.

## *Literature*

### *Mobile Inclusion*

There are a significant numbers of studies which have demonstrated the relevance of mobile telephony in economic and social development in developing countries. Among these studies, we can find those which seek to identify how mobiles may contribute to economic growth as well as to poverty reduction. At the macroeconomic level, Thompson & Garbez (2007) identify a positive impact of mobiles on productive efficiency in developing countries while Waverman, Meschi, & Fuss (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 on the fisheries market is perhaps one of the most influential papers that, from a microeconomic perspective, analyses the impact of ICT<sup>3</sup> 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 ICT should not be a priority for poor countries that lack access to health and education. (Jensen, 2007: 919).

Seeking to identify the social role of mobile phones, Goodman (2005) applies a survey in South Africa and Tanzania and finds that mobile uses increases social capital in the communities under study. Using the topology of Granovetter (1973), 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: 63) Mobiles facilitated participation in social networks and thus enabling people to strengthen social capital and benefitting from the opportunities provided.

Recently, 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, 2007; Horst & Miller, 2006; Vodafone, 2005; Ovum, 2006). The application of surveys by

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<sup>3</sup> ICT: Information and communications technologies.

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. Donner finds that mobile ownership increases the income of micro entrepreneurs in Rwanda by increasing communication and enriching social networks. In this same area, Molony (2006) finds that mobile phones are used by micro entrepreneurs in Tanzania to manage reputation while creating virtual offices.

The benefits for development of mobile telephony and ICTs in general are not automatic; however, they are a key variable to the solution to a specific obstacle faced by the poor. As evidence-based research has revealed, mobiles are a key variable to increase information, diminish transactions costs and strengthen social networks which in turn diminish vulnerabilities endured by the poor.

Despite the fact that the Latin-American region has made significant progress in adopting low-cost technologies through commercial innovations and thus has made mobile phones in particular, more available to low income sectors, mobile applications are still in their infancy. Mobile banking, particularly, holds a significant potential to have a strong positive impact on the livelihood of marginalized segments of the population. Fortunately, mobile banking is beginning to be recognized as a profitable market for companies and development agencies are promoting its expansion as it provides a means for economic and social inclusion.

### *Financial Exclusion*

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, innovation which brings along economic growth. Investment in education leads to an increase in human capital and also to a country's 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. Aghion, Howitt & Mayer-Foulkes (2005) find that the fact small enterprises in poor countries lack access to credit leads to a sustained underdevelopment. Lack of financial access is considered a crucial factor that explains income inequality and slow growth.

The development of growth endogenous theories and the availability of cross-country data have produced new studies on the relationship between inequality and growth. The empirical findings point to an unambiguous relation; greater inequality leads to slower economic growth (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. Research also shows that small firms benefit the most from financial development and greater access. Thus, reducing financial markets imperfections and expanding access creates positive incentives by equalizing opportunities as well as providing poverty alleviation (World Bank, 2008). With the objective of identifying policy barriers to financial inclusion different household surveys have recently been applied throughout the developing region (see 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, McLiesh & Shleifer (2006).

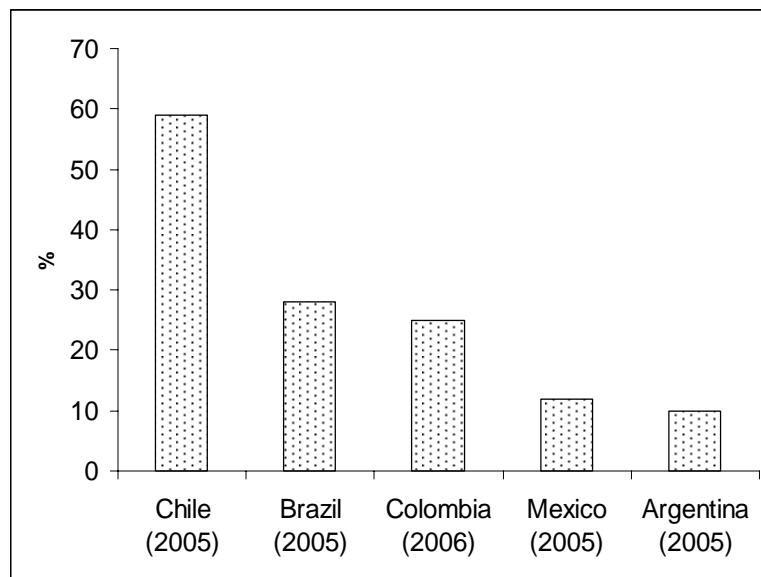
However, even in countries with a moderately developed financial system, there are significant barriers to financial access for the poor; transactions costs have a stronger negative impact on the poor who have no collaterals or credit histories. There is both a lack of appropriate financial products and a lack of geographic availability. 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.

According to "The Financial Access Initiative", a consortium of researchers, more than 2.5 billion adults do not use financial services, more



than half of the world's adults. These are people that live on less than \$5 dollars a day and see their ability to increase their income and address uncertainty severely hampered. 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% of poor households had a savings account and only 3.3% had access to credit. These figures vary across the region, from the highest in Chile of 65% to the low levels in Mexico, where in 2005, 70% of the population of Mexico over 18 years had no access to basic financial services (see Figure 1).

**FIGURE 1. CREDIT TO THE PRIVATE SECTOR AS A PERCENTAGE OF GDP (SELECTED COUNTRIES)**



Source: World Bank (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% of the population have a savings account while in Peru, Paraguay, Nicaragua and Bolivia, this rate is less than 10%. Moreover, the level of inequality within each country is significant, across the countries surveyed, 28.3% of the non-poor have a savings account while only 10.0% 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 can be defined as the "access to banking services through mobile technologies, associated to a bank account or specific banking services" (MIF, 2009). Most

popular banking services through mobile technologies are: “ (i) peer to peer money transactions (both locally and internationally via remittances); (ii) accessing cash and purchasing goods and (iii) paying bills and paying back loans / micro loans” (MIF, 2009).

Mobile banking offers 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, 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.

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 (Porteous & Wishar, 2006). In Pakistan, for example, only one million people have bank accounts while 70 million have mobile phones (Jenkins, 2008).

As Table 1 depicts, there are a very low percentage of banked individuals in these selected developing countries; however, the unbanked do have access to a mobile phone. 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, 2007a; 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.

**TABLE 1. PENETRATION OF MOBILE PHONES AND BANK ACCOUNTS IN SELECTED COUNTRIES**

COUNTRY	GROSS NATIONAL INCOME PER CAPITA (US\$)	MOBILE PENETRATION (%)	BANKED (%)
MEXICO	7310	54.71	25
BRAZIL	3460	56.03	46
NICARAGUA	910	32.62	5
GUATEMALA	2400	55.6	32
ARGENTINA	4460	80.52	28
CHILE	6040	75.62	60
COLOMBIA	2340	64.31	41
PERU	2640	30.92	26
SOUTH AFRICA	4960	77.06	46
CHINA	1740	34.71	42
INDIA	720	14.76	48
KENYA	530	19.92	10

Source: own based on Ivatury & Mas (2008), Honohan (2007) and World Bank (2007).

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

However, the great majority of the population in these countries does not have a bank account. For example in México the remittance recipient with bank account is 29%, in Guatemala 40%, in El Salvador 31%, in Colombia 50% and in Peru 37% (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 estimates that the average cost is 12%. 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.

The transformative nature of these new services depends, to a significant degree, on the particular business model adopted; it can be an additive model or a transformational one. Additive models refer to services which incorporate mobile technologies as another medium to the distribution of financial entities (branches, ATMs, web pages, etc.). They are designed to make

traditional financial services more convenient, but they don't focus on increasing new users from the BoP. Bank account based models is an example of an additive model that uses the cellular to pay bills and make money transfers to a wide range of locations.

Transformative models aim to take advantage of mobile penetration to offer banking services to the financially underserved population. These models are usually not based in a bank account and are commonly known as electronic purse. They offer payments and money transfers without a bank account or a credit card. Its low cost and independence from the formal financial system make it ideal to address unbanked population.

The following sections will analyze the transformative m-banking models that exist in Kenya, the Philippines and Brazil trying to identify the key enabling variables in their successful implementation that may shed light in drawing policy recommendations to the case of Mexico where only additive models have been implemented. Very few countries have rolled out mobile money services which are mature enough to have achieved a significant mass of users and some economies of scale; we focus on these three countries, as they are the most significant examples that exist in the developing world.

## *Kenya*

### *Mobile Services*

The Kenyan mobile market has been recently growing due to lower cost-tariffs and increased competition. Partly state-owned Safaricom held a monopoly over the provision of mobile services until 2000 when Kencell (now Zain Kenya) was awarded a wireless concession and Safaricom sold a 40% stake to the Vodafone Group. Another source of growth has been the competition policy driven by the Communications Commission of Kenya (CCK). In February 2007 the CCK ordered the mobile operators to cap interconnection charges trying to cut prices for the customers. This led to a period of very high growth as both operators invested in their networks and diminished prices.

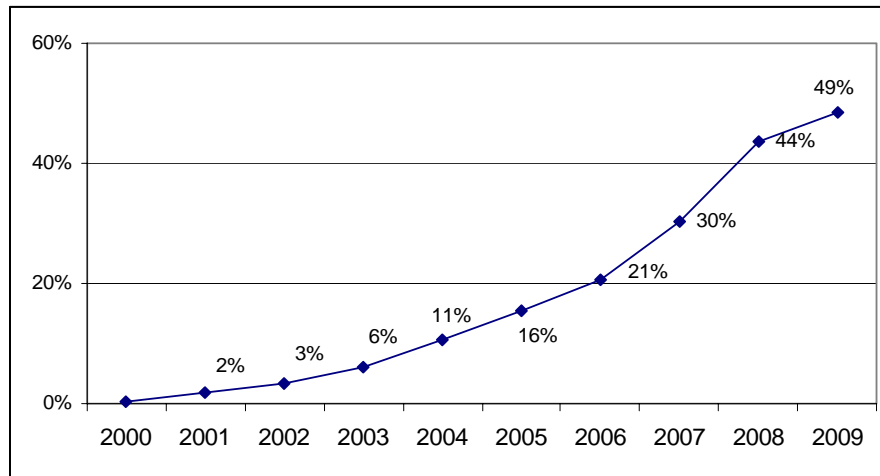
This tendency to diminish prices has been reinforced by the operator's commercial strategies: in 2008 Telkom (Orange) launched a promotion offering calls at USD 0.013 per minute. This strategy was followed by the rest of competitors, which has been pointed as "prices war" (GlobalComms 3.0, 2009). Low prices led to an ARPU<sup>4</sup> decline estimated in 12.46%, which has conducted to operators to focus on selling more Value Added Services (VAS) and Mobile Broadband Services. Prices since have stabilized at around USD 0.08 per minute.

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<sup>4</sup> ARPU: average revenue per use, calculated as revenues generated by outgoing and incoming traffic per user on a monthly basis

Pro competition policies and innovative operator's commercial strategies have generated a significant mobile penetration growth. Between 2000 and 2005 the market increased from 127,400 customers to over five million and has since continued to grow with subscriber base growth of 36.5% reported in 2006 and 48.4% in 2008. By the start of 2009 Kenya's mobile market held 16.84 million customers, up from 11.35 million a year earlier, which means a penetration rate of 49% of total population.

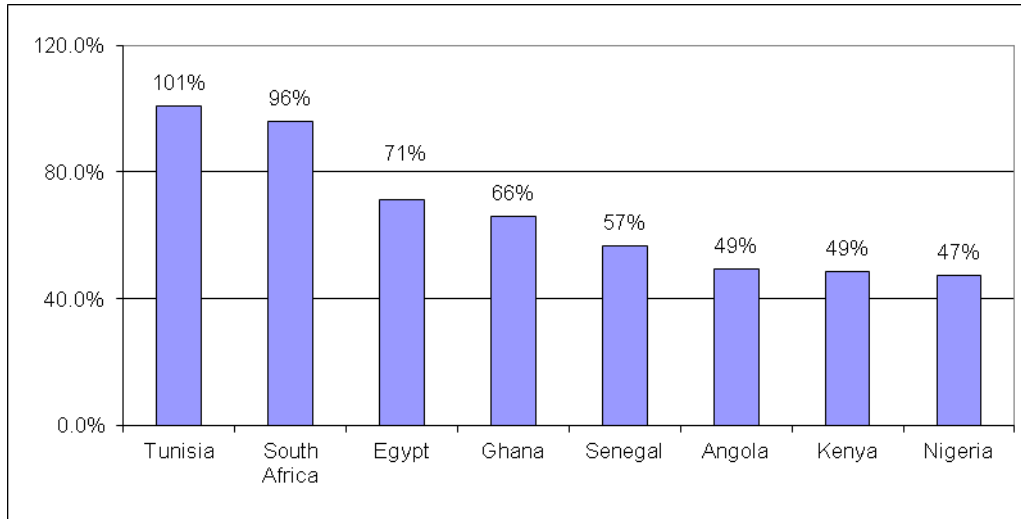
FIGURE 2. PENETRATION OF MOBILE PHONES IN KENYA



Source: Globalcomms 3.0.

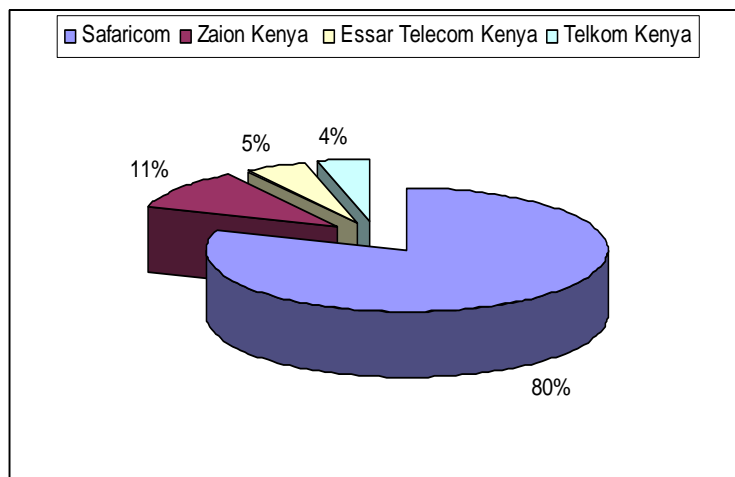
Even though penetration rate has been growing dramatically, the Kenyan market has yet to develop to its potential. Comparatively, penetration levels are lower than the African leaders like Tunisia (101%), South Africa (96%) or Egypt (71%). Moreover; despite the fact competition has been pushing prices down, there is a clear dominant player: Safaricom still holds 80% of the market's share, which might represent a barrier for further competition.

**FIGURE 3. PENETRATION OF MOBILE PHONES IN AFRICAN SELECTED COUNTRIES**



Source: Globalcomms 3.0.

**FIGURE 4. MARKET SHARE IN KENYAN MOBILE MARKET**



Source: Globalcomms 3.0.

Even though the Kenyan industry is still a rather small market, it has good perspectives given the dynamic growth of 3G services (20% in 2009). In fact, mobile data services were very limited in Kenya until May 2008 when Safaricom launched its first 3G network based in Nairobi and Mombasa, the most important urban centers. Additionally, Safaricom bought a 51% stake of Internet Service Provider One Communication, in order to develop a platform that can offer a wider range of services, including WiMax. Zain Kenya has

started to compete in 3G services since 2009, when it awarded a second national license for these kinds of services. Important rates of penetration of mobile services and the large size of its low income market are the key factors which could explain the dramatic spread of Kenyan m-banking services.

### *M-banking*

In March 2007, Safaricom introduced a new mobile payments service under the name M-PESA. Safaricom and its part-owner Vodafone teamed up to introduce the new offering which allows customers without bank accounts to deposit and withdraw cash, transfer money to another person's account via SMS<sup>5</sup>, and top up their pre-paid airtime. Through the use of a GSM platform, M-PESA is a transfer mechanism for virtual currency which is convertible to cash against transaction fees and has become an alternative for non-bank account transfers such as Western Union and Moneygram. However, according to Stork, Esselar & Ndiwalana, (2006), it is not cheap enough to become an alternative to currency as charges are too high to pay for very small items.

Cash is paid in and withdrawn at specified M-PESA agents, which are Safaricom dealerships, but which also include other retail stores. The strategy of using medium sized airtime retailers as M-PESA agents has allowed the rapid diffusion of agents; in fact, 80% of Vodacom's M-PESA agents are single independent businesses. It also simplified the operation as they did not have to deal directly with thousands of agencies across the country.

M-PESA is clearly an example of success in the implementation of mobile money service. In May 2008, 14 months after the launch, M-PESA in Kenya had 2.7 million users and almost 3,000 agents. By 2009, M-PESA has reached 7 million customers and has 10,000 agents spread across the country. This exceeds the reach of any other financial service in Kenya. To a significant degree, M-Pesa's success has been driven by its ability to exploit its large domestic remittance market through its popular slogan 'send money home'. The 2009 survey, Finaccess, showed that 40% of all adults are using this service and national remittances have increased dramatically; from 17% in 2006 to 52% in 2009. Camner, Pulver & Sjoblorn (2010).

One of the clear lessons from the Kenyan experience is the capacity of M-PESA to take advantage of the economies of scale of the informal sector, its distribution networks, the demand for remittances, infrastructural development (including the penetration of the formal financial markets), and the support from the banking regulator. (Heyer A. & Mas I., 2009).

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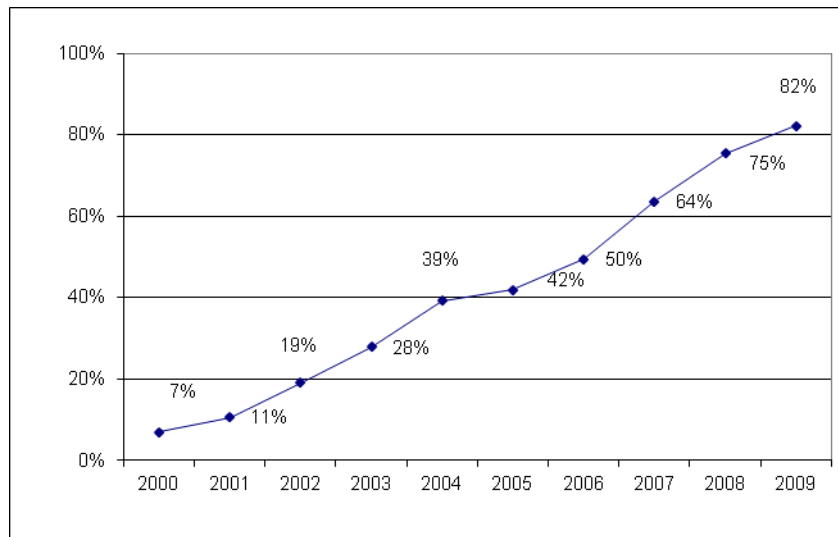
<sup>5</sup> SMS: Short message service. The customer owns a virtual account where, through SMS, sends information to request a withdrawal which is then cashed out at an authorized dealer. For payments, the SMS contains information about the receiver's account, whose account is then credited with the amount coming from the customer

## Philippines

### Mobile Services

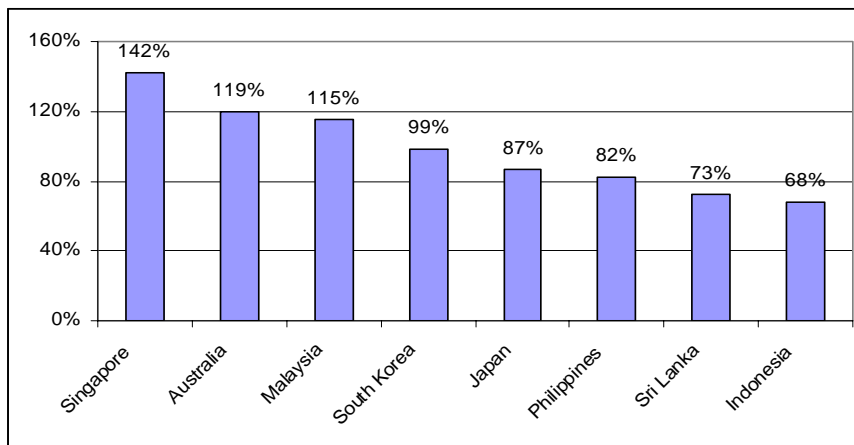
The mobile market in Philippines has been growing dynamically since 2000. Penetration rate reached 82% during 2009 and the growth rate for 3G subscribers was close to 100%. This means that the Philippine market includes around 65 million users and shows one of the best performances in the Asian area with a penetration rate of 3G services of 20% in 2009.

**FIGURE 5. PENETRATION OF MOBILE PHONES IN PHILIPPINES**



Source: Globalcomms 3.0.

**FIGURE 6. PENETRATION OF MOBILE PHONES IN ASIAN SELECTED COUNTRIES**

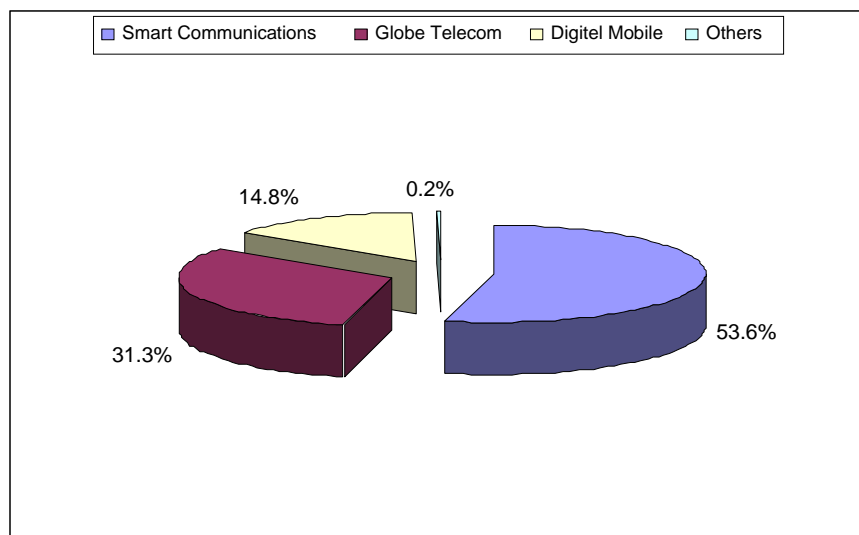


Source: Globalcomms 3.0.



The market in the Philippines is dominated by two GSM operators, Smart Communications and Globe Telecom both of which controlled almost 90% of the market. In 2008, a third player, Digitel Mobile (Sun Cellular), has entered the market and acquired a 10% of the market, around 7 million new subscribers. This situation is of great concern for the regulator NTC which in 2006 announced it was planning to curb unfair practices in the sector, but any deep regulatory change has yet to be implemented (GlobalComms 3.0, 2010).

FIGURE 7. MARKET SHARE OF PHILIPPINE MOBILE MARKET



Source: Globalcomms 3.0.

Active 2G players are Express Telecom, radio trunking operator Next Mobile, formerly an affiliate of Nextel Communications; and BellTel. Express Telecom has been facing serious financial trouble and is looking for additional frequencies to re-launch services while Next Mobile has only a marginal share of the market but it has plans to enter the 3G<sup>6</sup> arena. CURE Smart in April 2008 and launched a W-CDMA/HSDPA cellular service in the country under the banner RED Mobile to target lower-value customers currently being pursued by rival operator Sun Cellular via low-cost calls.

Globe was the first company that launched 3G services in mid 2005. This company has invested around USD 500 million on W-CDMA technologies. One of the big hits of Globe is being the first company in Philippines to launch mobile TV service on its 3G network. Actually, the new mobile option also offers “made for mobile” TV programs. The dynamic performance of mobile

<sup>6</sup> 2G and 3G services refer to the generation of mobile technology; whereas 2G networks handle voice and slow data transmission (up to about 320 kbps), 3G services can handle not only voice but data at much higher speeds (in excess of 1 Mbps).

sector is financing one of the most important funds for social development of Philippines Government: Health and Education Acceleration Program (HEAP).

### *M-banking*

The Philippines is one of the few developing countries markets where m-payments and m-banking has moved out of the pioneer phase to the start of the breakout stage where scale is achieved through rapid growth.

M-banking in the Philippines began as an additive model in the year 2000 with the partnership between Smart and a large bank, Banco D'Oro. Currently, however, debit card are issued to enable un-banked customers to access financial services using ATMs and POS devices. Banco de Oro pre-paid cards have a maximum value of US\$ 2,067 and a maximum withdrawal amount of US\$ 413. (Proenza, 2007). Services available to customers are to receive payroll credit on their phones from an employer, pay their utilities and receive international remittances. According to a recent Infodev study (2006), 2.5m people (of a subscriber base of 20 million) now use these Smart money services (Porteous, 2006).

Strengthening the transformative nature of the model, Smart introduced in 2003 a new service known as smart's e-Load that reduced distribution costs by using a preloaded SIM card. Retailers, mostly micro-entrepreneurs, now resell air time with as little as US\$ 3.10. Moreover, Pasa Load allows customers to transfer small amount of load credits and Smart Padala launched on 2004, offers national and international transfers of money. Smart Money has been able to tap the low income sector population with an estimated 10,000 centers through the reduction of churn and low distribution costs.

Globe Telecom entered the m-banking market in 2004 through the introduction of its so-called mobile wallet, G-Cash. G-Cash is a portable ATM and can be used to make remittances, transfers and payments through a network of 3500 agents across the country. Globe Telecom did not establish any partnership with a banking institution. This is also a transformative model as customers do not need a prepaid card or a bank account to access financial services. Globe is now extending the use of its payment platform, for example, to enable loan disbursements and repayments to rural banks. A new G-Cash customer may need to reimburse as little as U.S\$ 35.

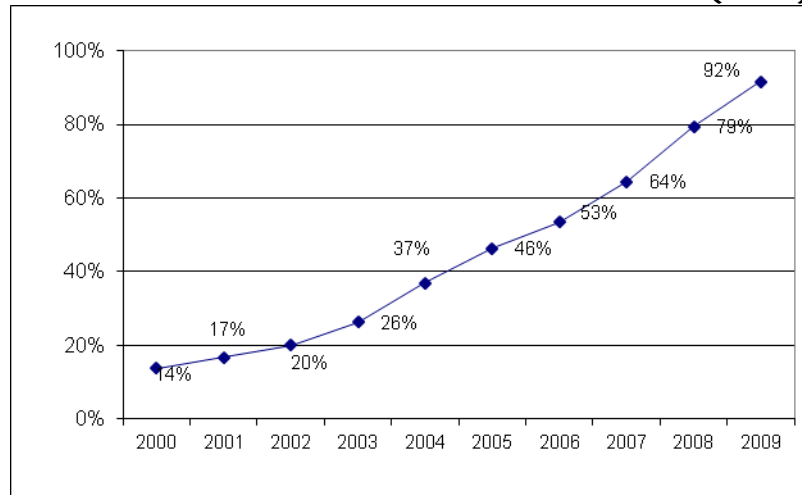
According to Proenza, some of the success factors of m-banking in the Philippines are its large urban population and a text messaging culture that is a reflection of a young literate and relatively low income population. In terms of infrastructure requirements, M-banking needs extensive mobile network coverage at affordable prices as well affordable SIM cards, all of which exist in the Philippines.

## Brazil

### Mobile Market

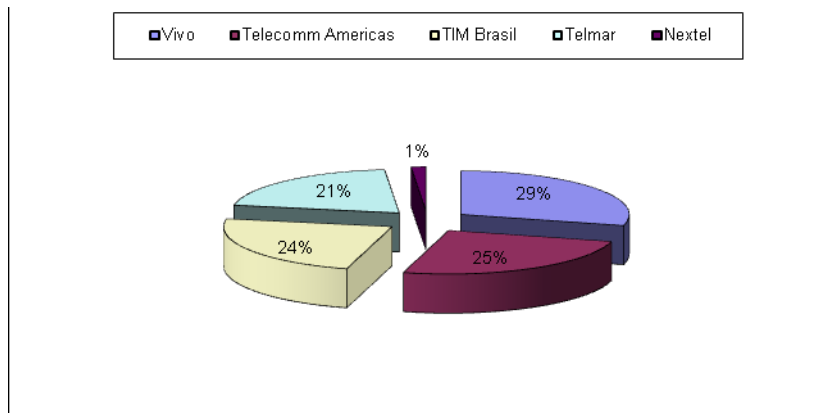
The Brazilian market has presented an important growth since the beginning of the present decade. This growth has been sharper during 2003 and 2004, when the Brazilian regulator (ANATEL) allocated a great quantity of spectrum in the market. Even more, in 2003 the operator Vivo launches the first 3G services in Brazil through the CDMA 2000 standard. Nowadays Brazilian market comprises the biggest mobile market in Latin America with 175.8 millions of users and the second regarding 3G services with 6.6 millions of costumers.

**FIGURE 8. PENETRATION OF MOBILE PHONES IN BRAZIL (2009)**



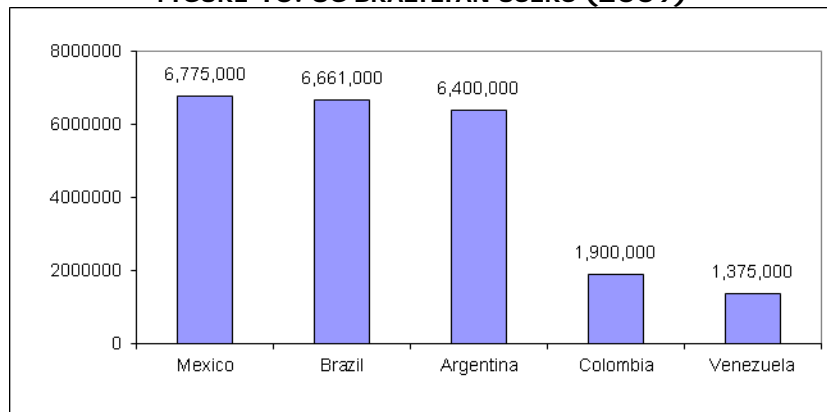
For regulatory purposes Brazilian market is divided into ten operating regions with A and B band licenses on each. The A band is occupied by companies inherited networks from the state owned company Telebras, while the B band is used by operators which had to roll out their own networks from scratch. Market concentration is relatively low if we compare it with other Latin American countries, since it is not possible to identify a clear dominant player. As it is shown in Figure 8, Vivo comprises the biggest number of users, but it is tightly followed by Telecomm Americas and TIM Brazil.

FIGURE 9. MARKET SHARE OF BRAZILIAN MOBILE MARKET (2009)



Regarding 3G services, Brazil has one of the biggest markets among Latin American countries: only Mexico is slightly greater. 3G services in Brazil have good perspectives of growth due to the pro convergence Government's policy based on liberalizing strong quantities of spectrum and the protection of consumers' rights. As an example of this, ANATEL obligated the operators to extend the number of days a prepaid card can be valid and revalidate this credit when the customer buys a new card.

FIGURE 10. 3G BRAZILIAN USERS (2009)



Even more, Anatel has imposed obligations to the mobile operators to serve non profitable zones. Brazilian cities with 3G services available have been growing constantly. As a matter of fact, in 2009 63% of Brazilian population is covered at least by one company which offers 3G services. As shown in Table 2, 602 cities enjoyed the availability of 3G services by June 2009, which means an average growth of 5% per month.

TABLE 2. NUMBER OF CITIES COVERED BY 3G NETWORKS

OPERATOR	2008	JAN-09	FEB-09	MAR-09	APR-09	MAY-09	JUN-09
VIVO	314	316	358	379	406	416	440
TELECOMM AMERICAS	282	293	293	345	371	376	376
TIM BRAZIL	23	40	40	45	48	48	48
OI MOBILE	50	50	51	52	96	96	103
BRT	49	49	49	49	49	49	49
CTBC	16	16	16	16	23	23	23
SERCOMTEL	-	-	-	-	-	2	2
TOTAL	448	450	473	523	568	580	602

Source: Globacomms 3.0.

### *M-banking*

Brazil banking system is one of most inclusive in Latin America, since 43% of population has a bank account. Moreover, Brazil has one of the best demographic coverage with 15 branches per 100,000 inhabitants and 18 ATM's per 100,000 inhabitants, only inferior to Chile's coverage. Additionally, Brazil was the first Latin American country that adopted specific regulation regarding financial services for non - banking correspondents (FOMIN, 2009).

Even when Brazil has regulated financial services for non banking correspondents since long time ago (1973), there is still no specific regulation for m - money services. Some entities are working in the implementation of electronic purses, probably oriented to the remittances' market, due to it is one of the most important in Latin American region.

Actually, Brazil is the most important remittances receptor in Latin America, even when remittances only represent 1% of its GDP. The total amount of remittances Brazil received during 2007 summed 7.075 millions of USD, mainly from USA, Japan and Europe. According to FOMIN, 2009 63% of people who received remittances in Brazil already had a bank account, which shows the high degree of penetration of financial services.

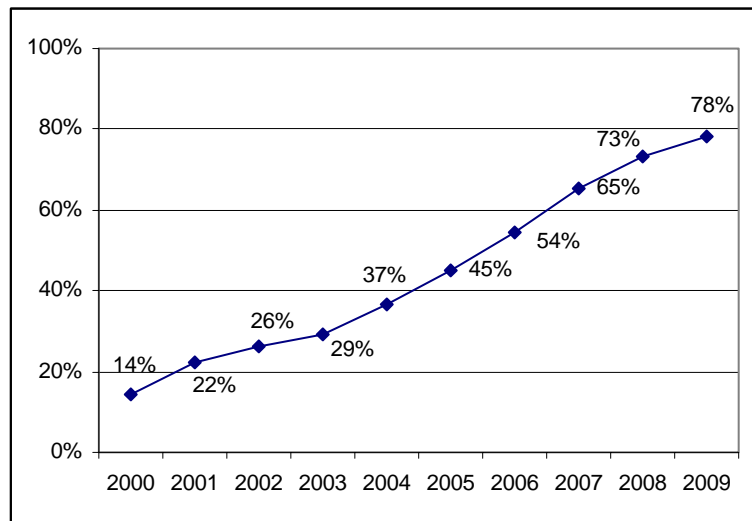
Despite the fact financial services in Brazil are extended among different groups of population mobile banking initiatives have been focused on actual banks clients. One of the few initiatives to enlarge mobile banking services to other groups is Paggo, a system developed by Telmmar Norte (Oi). This system is useful to make credit payments without a credit card or a bank account and it is being offered in the states of Rio de Janeiro, Bahía and Minas Gerais.

## Mexico

### Mobile Market

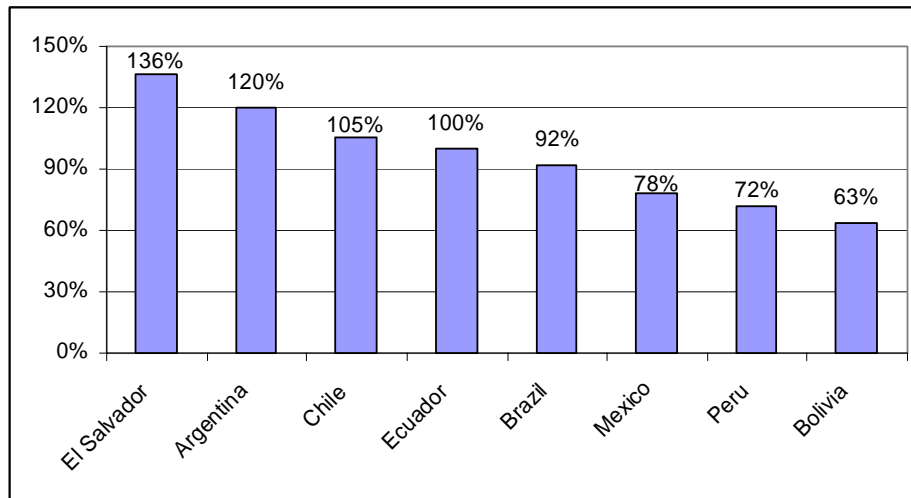
Mexico's mobile market has been growing vigorously since the end of nineties when prepaid plans and Calling Party Pays (CPP) were implemented. Mexican mobile market has reached almost 80% of penetration during 2009, which means a market size of 83 million of users. However, its mobile penetration rate is still lower than other similar countries such as Argentina, Brazil and Chile. The rate of growth of 3G services, though, more than 20%, is one of the best in Latin America.

**FIGURE 11. PENETRATION OF MOBILE PHONES IN MEXICO**



Source: Globalcomms 3.0.

FIGURE 12. PENETRATION OF MOBILE PHONES IN SELECTED LATIN AMERICAN COUNTRIES

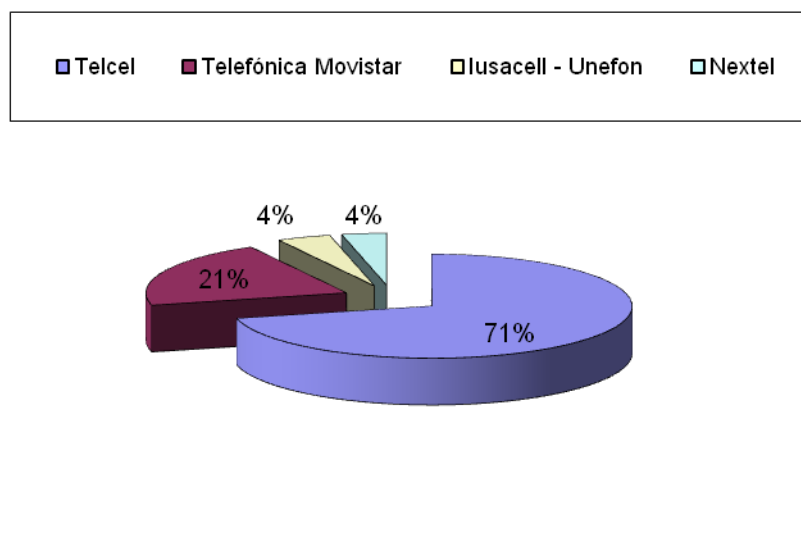


Source: Globalcomms 3.0.

Competition is quite low with the incumbent's mobile company, Telcel, having 72% of the market share. Its dominance can be explained by some factors like the advantage received from the regulator to operate with national coverage. Moreover, this company has always focused on the marketing and availability of pre-paid services while the other companies pushed higher cost contract packages. Indeed, pre-paid services remain very popular: at the end of September 2009 91.1% of the country's mobile subscribers were connected via pre-paid packages (Globalcomms 3.0, 2010).

Despite of the limited competition, some regulatory policies implemented like number portability and an interconnection plan have helped to make more competitive the Mexican mobile market. Telcel's market share has been declining constantly. An important barrier for further competition is the artificial lack of spectrum, which impedes the development of new business lines and the entry of new operators.

FIGURE 13. MARKET SHARE IN MEXICAN MOBILE MARKET



Source: Globalcomms 3.0.

3G services have grown exponentially since 2006. In fact, during 2009 the growth rate of 3G services was around 25%. Despite of this demand for 3G services Mexican companies have suffered because of the lack of spectrum; actually, mobile companies started launching 3G services until 2008.

The auctioning of 3G and WiMAX frequencies has been delayed constantly and has been subject of deep controversy. The Ministry of Communications and Transports (SCT) originally said that the auctions were to take place in 2007. However, a series of delays saw the date pushed back on multiple occasions, and it was not until mid-2009 that any progress was made; in August that year the Minister, announced that the bidding rules for the auction would be released the following month. However it was not until January 2010 that concrete details of the sale process were released (Globalcomms 3.0, 2010).

### *Mobile Banking*

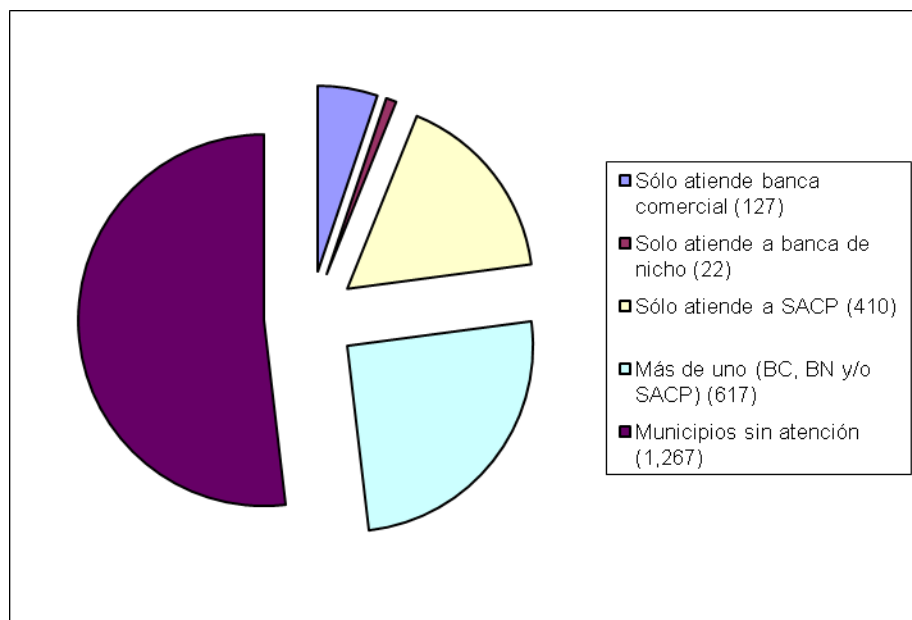
The application of mobile banking has been implemented in Mexico by major commercial banks; however, it has been circumscribed to existing bank accounts, making it only an additive model. As a means of payment, based on SMS, it is offered by a new company, NIPPER. Several pilot programs are taking place but an interoperable system is yet to be designed.

Even though Mexico, shares with Kenya and the Philippines basic characteristics in terms of mobile network coverage, a large unbanked sector of the population and the need for affordable and secure banking services, m-banking has not flourished. In Mexico, 74% of the population does not have a bank account. BANSEFI is financial micro saving micro lending institution that



has attempted to address this problem. In close association with Oportunidades a very successful government program to fight extreme poverty, BANSEFI delivers the resources and offers simple financial services such as microcredit and micro savings. Oportunidades is a conditional cash transfer safety net program that encourages parents to invest in the health and education of their children. However, in the overall picture, in terms of municipalities, out of 2500 in the country, around 1300 do not have access to any kind of financial services.

**FIGURE 14. FINANCIAL SERVICES ACCESS IN MEXICO (2007)**



Source: SHCP (2007)

**TABLE 3. FINANCIAL PENETRATION IN MEXICO**

COUNTRY	FINANCIAL PENETRATION (2007)			MOBILE PENETRATION (2009)
	PERCENT WITH ACCESS	DEMOGRAPHIC BRANCH PENETRATION	DEMOGRAPHIC ATM PENETRATION	
PHILIPPINES	26	7.83	5.31	82.1
MEXICO	25	7.63	16.63	78.2
KENYA	10	N.D.	N.D.	48.6
BRAZIL	43	14.59	17.82	91.6

Source: World Bank (2007)

Despite a very significant pent-up demand for secure and affordable financial services, a transformational model of mobile banking has yet to emerge in Mexico.

A recent development in Mexico has been the use of ICTs in the organization and delivery of resources from the program Oportunidades. They have used mobile devices to apply the survey that identifies whether a family is indeed living in extreme poverty and saved up to six months in paper work that was spent between the application of the survey and the final confirmation. Currently they are developing the mechanisms that through the use of money wallets will deliver the monies to 2.7 million families. These devices will in effect bank the current unbanked population living in extreme poverty. BANSEFI, again will be the principal financial institution that will administer the resources. However, there is still the problem that 52% of the municipalities do not have access to a BANSEFI branch or to any other financial institution. A business strategy that includes partnerships with retail stores and agents would generate the scalability necessary for m-banking to flourish.

### *Enabling Conditions*

The ability of capturing the mass market of mobile banking customers has escaped many operators around the world. There are operational complexities and marketing challenges associated with these systems that include the creation of different value chain structures; they are not merely an adoption of new channels to provide services to un-served customers. As Heyer and Mas (2009) point out, people observing the phenomena of M-PESA have questioned: was Kenya a fluke?

We are able to identify the necessary conditions for m-banking to take place, yet as we have witnessed around the world, these have not guaranteed results. Indeed, as Mas, Proenza and others have pointed out, some of these conditions include the following.

*Infrastructure.* A basic condition is the need of a mobile phone network with widespread coverage around the country that is affordable even to low income segments of the population. Potential customers need ubiquity; people need to be able to access the service anywhere. There is also a need for the availability of high capacity SIM cards (e.g. 64 Kbps).

*Regulation.* There needs to be a certainty that the monies exchanged are secure. Regulatory requirements includes protection of frauds and secure service, protection of illegal money laundering, information and clear regulatory criteria that enables innovation and risk management. An important prerequisite is the “know your customer” requirements.

*Partnerships.* A mobile operator needs partnerships with banks and retail stores. In order to offer other value added services it is useful to make alliances with microfinance institutions.

*Scalability.* As a service that is mostly targeted at the bottom of the pyramid, volume is a key factor for profitability. Successful models deal with large volumes of very small transactions where commission fees are minor. Specifically, Hayer & Mas (2009, p 4) stress the need to create speed and momentum; “being able to generate momentum and trigger simultaneous interest among users and merchants”. There are economies of scale that can be obtained only with the incorporation not only of customers but of agents that distribute the service.

Achieving scalability may be a complicated objective to reach. One needs to look at the demand side. There is a need for a dynamic demand for financial services from people that previously used informal mechanisms. The M-PESA model’s first success was tapping the need for urban migrants of sending remittances; their slogan “send money home” acquired a large number of subscribers.

The availability of alternatives for financial services is important. Developing countries with very high levels of un-banked population are an enabling factor for m-banking. However, it is still important to offer better services in terms of security and affordability for people to switch from informal mechanisms to formal m-banking services.

Mobile banking has the potential of offering these higher quality services. In contrast to traditional branch banks, mobile networks are generally widespread in developing countries making it possible for low income and rural segments of the population to access the service and reduce transaction costs. Unlike, informal financial services electronic transactions are made in real time and are supervised and thus reliable.

## *Conclusion*

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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 this adoption is now beginning to be understood by scholars and policy makers. This paper has presented evidence that has been provided by different studies, from the mobile phones patterns of use to the more potentially transformative implementation of mobile banking. 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

However, mobile banking initiatives show an uneven degree of development. The greatest level of success is still M-PESA in Kenya, followed by the Philippines. Operators around the world have yet to successfully replicate these transformational m-banking models. Their expansion and sustainability depend on a number of enabling factors that appear to be present in a great number of countries. It may be that bold entrepreneurial skills coupled with an enabling environment are scarce.

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