

# The Enigma of Mobile Money Systems (\*)

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**Abstract:** In this paper we argue that the success of mobile banking models represents an enigma in terms of their replicability to other countries. These models offer the opportunity to diminish the financial exclusion suffered by the poor by providing access to credit, savings, and transfers, which are key tools capable of transforming the livelihoods of the poor as well as the efficiency of the market. We show that 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 and the value propositions within the business of m-banking. We develop a taxonomy of the key drivers of the business model to help assess the replicability of these models in other countries. We focus on models developed in Kenya, the Philippines, and Brazil, and explore if some of the conditions present in these models are lacking for a widespread adoption in others. We conclude, however, that there appears to be no set of clearly identifiable variables that serve as a basis for success and that those necessary conditions for the replication of m-banking models identified by the existing literature to other countries around the world do not guarantee results. Moreover, we find that some of these conditions are not present in countries where m-banking models have been successful.

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

Recently 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, savings, and transfers, which are key tools capable of transforming their livelihoods as well as the efficiency of the market.

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Financial inclusion diminishes vulnerabilities in emergencies such as illness, unemployment, or theft. 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. Formal banking offers "both access to resources and the ability to transform resources into opportunities" (JENKINS, 2008, p. 6). Inequality and social exclusion diminish economic growth and create inefficiencies in the function of the market (AGHION & HOWITT, 1998; BOURDEAU de FONTENAY & BELTRAN, 2008).

How can mobile telephony facilitate the transition into financial inclusion to those currently unbanked? While a large number of low-income people have access to mobile phones, these very groups are currently excluded from the financial market. Mobile telephony can facilitate the flow of money among rural and poor segments of the population at lower transaction costs (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 their 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: 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 some of the conditions that are preventing its swifter adoption and usage in the developing world. We develop a taxonomy of the key drivers of the business model, providing insights for assessing the replicability of these models. The paper studies the business models in the national cases of Kenya, the Philippines, and Brazil, and explores what is lacking for a widespread adoption. We analyze the conditions that are identified in the literature as enabling for the development of successful and transformative m-banking models and find that all of these conditions are present in numerous countries where m-banking models have not developed.

## ■ Literature

### Mobile inclusion

There is a significant number of studies that have demonstrated the relevance of mobile telephony in economic and social development in developing countries. Many of these studies seek to identify how mobiles contribute to economic growth as well as to poverty reduction: THOMPSON & GARBACZ (2007) [productive efficiency in developing countries]; WAVERMAN, MESCHI, & FUSS (2005) [mobile dividend in developing countries]; JENSEN (2007) [impact of ICTs on welfare through a study of the fisheries market]; GOODMAN (2005) [social role of mobile phones]; DONNER (2007), HORST & MILLER (2006), Ovum (2006), BHATIA *et al.* (2008) [role of mobile phones in diminishing poverty]; HORST & MILLER (2004) and PARAGAS (2005) [communication of diasporas]; MOLONY (2007) [use of phones by microentrepreneurs in Tanzania].

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 there has been significant progress in adopting low-cost technologies through commercial innovations and mobile phones are widely available to low income sectors, mobile applications are still in their infancy. Mobile banking holds a significant potential to have a strong positive impact on the livelihood of marginalized segments of the population. 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 and the entry of new firms to the market, which bring along economic growth. The removal of capital market imperfections has a disproportional higher effect on smaller firms, as these face the highest

constraints in accessing the financial market. The fact that small enterprises in poor countries lack access to credit leads to sustained underdevelopment (AGHION, HOWITT & MAYER-FOULKES, 2005). Lack of financial access is considered a crucial factor that explains income inequality and slow growth.

The development of endogenous growth 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 & GARCÍA-PEÑALOSA, 1998; BENABOU, 1996). Capital market imperfections are the root of the negative correlation between inequality and growth.

By not participating in the financial sector, the poor 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 situations of crisis such as job loss or health problems. Access to savings can help individuals smooth consumption; access to credit is a key vehicle for the creation and sustainability of microenterprises. Reducing financial markets imperfections and expanding access helps equalize opportunities and provides poverty alleviation (World Bank, 2008).

Several studies (see World Bank, 2008, for a review) 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 a well developed rule of law that generally translates into shareholder rights, confidence in 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, an important issue in developing countries (DJANKOV, HART, McLIESH & SHLEIFER, 2007).

Even in countries with a moderately developed financial system, there are significant barriers to financial access by the poor; transaction 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 employment

(KETLEY, DAVIS & TRUEN, 2005), hindering the majority of the population from having a bank account (BECK, DEMIRGÜÇ-KUNT & MARTINEZ PERIA, 2007). High minimum balances, recurring and transaction fees, and availability of locations are important barriers to the entrance of low-income people to the banking sector. 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 (World Bank, 2008).

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 a day. For example, in Latin America there are still large shares of the population whose financial transactions take place within the informal financial sector. With a population of approximately 582 million at the end of 2009, only 45.5% of the adult population had access to basic financial services. These figures vary across the region, from Chile (60% banked) to the low levels in Nicaragua (95% of the adult population had no access to basic financial services). TEJERINA & WESTLEY's (2007) survey of twelve countries in Latin America and the Caribbean find that in Jamaica, Panama, and the Dominican Republic more than 25% 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% of the poor do.

### **Mobile banking and financial inclusion**

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, defined as the "access to banking services through mobile technologies, associated to a bank account or specific banking services" (ENRÍQUEZ *et al.*, 2009), is one of the many possibilities brought by technology. Most popular banking services through mobile technologies are: (i) peer to peer money transactions (both domestic and internationally); (ii) accessing cash and purchasing goods, and (iii) paying bills and paying back loans (ENRÍQUEZ *et al.*, 2009). Mobile banking can be based on an additive model or a transformative one. Additive models refer to services which incorporate mobile technologies as another distribution channel for financial firms. They are designed to make traditional financial services more

convenient, but they do not focus on increasing new users from the bottom of the pyramid. Using a mobile phone to pay bills from an existing checking account is an example of an additive model.

Transformative models aim to take advantage of mobile penetration to offer banking services to the financially underserved population. These models are usually not based on a bank account and are commonly referred to as an electronic purse. They offer payments and money transfers without a bank account or a credit card; these are the dominant transactions carried out by the poor. Their low cost and independence from the formal financial system make them ideal to address the unbanked population.

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 physical roll-out and faces lower costs in handling low-value transactions. M-banking delivery is commonly set up with existing networks that already reach poor unbanked people; adding certain types of financial services 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 that 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 even in rural areas.

Indeed, as shown on Table 1, the adoption of mobile services by low income groups offers the opportunity of providing financial services as mobile users exceed the number of banked people in many developing countries (PORTEOUS, 2006). By filling a financial vacuum for the poor, they offer the possibility of gaining access to savings, micro-credits, and remittances. 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 \$318 billion dollars in 2007. The Latin America and the Caribbean (LAC) region remains the largest recipient of (recorded) remittances (RHATA *et al.*, 2007). According to the Inter-American Development Bank (IDB, 2008), LAC received remittances of US\$ 65 billion. Mexico is the leading receiver (\$24 billion), while for countries like Guatemala, El Salvador, Honduras, and Nicaragua, remittances account for more than 10% of GDP.

However, the great majority of the Latin American population does not have a bank account. For example, only 29% of remittance recipients in Mexico, 40% in Guatemala, 31% in El Salvador, 50% in Colombia, and 37%

in Peru have a bank account (IDB, 2008). 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 can substantially reduce the costs of payment transfers; receiving remittances through the formal banking system allows individuals to enter the financial market and access other financial services.

**Table 1 – Mobile phone and bank account penetration in selected countries**

Country	GDP per capita (US\$,2009)	Mobile penetration (%, 2009)	Banked population (%, 2009)
Mexico	8,135	78.2	25
Brazil	8,114	91.9	43
Nicaragua	1,096	60.4	5
Guatemala	2,800	95.7	52
Argentina	7,726	120.2	28
Chile	9,645	105.2	60
Colombia	5,056	92.3	41
Peru	4,356	71.5	26
South Africa	5,799	96.3	46
China	3,687	54.6	24
India	1,122	45.6	48
Kenya	751	46.8	10

Source: Based on IVATURY & MAS (2008); Telegeography GlobalComms Database (2010); Consultative Group to Assist the Poor /World Bank (2009); International Monetary Fund (2010)

## ■ Case studies

The following section analyzes 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 other places where only additive models have been implemented. M-banking services have been recently launched in other countries (South Africa, 2005; Mexico, 2008; Afghanistan, 2008; Sudan, 2008; Thailand, 2008; Colombia, 2009; Rwanda, 2009; East Africa, 2009; Uganda, 2009; Tanzania, 2009), but are either too new to provide real insights into the development of transformative models or have not managed to become rapidly successful.

## Kenya

The Kenyan mobile market reached a penetration of 50.3% by the end of 2009 (19.4 million subscribers), but this level is lower than other countries in the region (Tunisia, 101%; South Africa, 96%; Egypt, 71%). Despite the fact that competition has been pushing prices down, there is a clear dominant player: Safaricom still holds an 80% market share. 3G services have already been launched and have made a significant incursion: 14% of the phones in services were 3G enabled.

In 2007, Safaricom, together with its part-owner Vodafone, introduced a mobile payments service, under the name M-PESA, that allowed customers without bank accounts to deposit and withdraw cash, transfer money to another person's account via SMS, and top up their pre-paid airtime. 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 COMNINOS *et al.* (2008), 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 (Safaricom dealerships) and 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 M-PESA agents are single independent businesses. It also simplified the operation as Safaricom 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 services. In May 2008, 14 months after its launch, it had 2.7 million users and almost 3,000 agents. By the end of 2009, it had reached 7 million customers and had 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." In 2009, 40% of all adults were using this service and national remittances had increased dramatically, at 45% per year in the period 2006-2009 (CAMNER, PULVER & SJOBLONN, 2009). 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 & MAS, 2009).



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## The Philippines

Mobile penetration in the Philippines reached 82% (65 millions users) at the end of 2009; this market shows one of the best performances in the deployment of 3G services in Asia. The market is dominated by two GSM operators, Smart Communications and Globe Telecom, both of which control almost 90% of the market. In 2008, a third player, Digitel Mobile (Sun Cellular), entered the market, rapidly acquiring a 10% market share. The Philippines is one of the few developing countries where m-payments and m-banking have 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 de Oro, offering receiving payroll credit on their phones from an employer, paying their utilities, and receiving domestic and international remittances. According to a recent Infodev study (PORTEOUS & WISHART, 2006), 2.5 million people (of a subscriber base of 20 million) now use these Smart money services.

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. Another product (Pasa Load) allows customers to transfer small amounts of load credits. Smart Padala, launched in 2004, offers national and international money transfers. Smart Money has been able to tap, with an estimated 10,000 centers, the low income sector population with 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 3,500 agents. Globe Telecom did not establish any partnership with a banking institution. As customers do not need a prepaid card or a bank account to access financial services, it is clearly a transformative model. Globe is now extending the use of its payment platform to enable loan disbursements and repayments to rural banks. According to PROENZA (2007), 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 as affordable SIM cards, all of which exist in the Philippines.

## Brazil

The Brazilian mobile market has experienced a significant level of growth since the beginning of the decade, having reached a 92% penetration rate at the end of 2009 (176 million users, out of which 6.8 where 3G subscribers). Originally, Brazil was divided into ten regions for licensing purposes, but a wave of consolidation and the auctioning of several licenses in addition to the original A and B bands, has created several integrated players with nationwide footprint (Vivo, Claro, Oi, TIM). At the national level, there is no clear dominant player, but this varies significantly by region. The Brazilian government has been successful in imposing coverage obligations to all players. The number of Brazilian cities with 3G services available has been growing constantly. By the end of 2009, more than 63% of the population had at least one company from which to buy mobile broadband services.

Brazil's banking system is one of most inclusive in Latin America: 43% of the population has a bank account. Brazil has 15 branches and 18 ATMs per 100,000 inhabitants, only inferior to Chile in the region. Brazil was the first Latin American country that adopted specific regulation regarding financial services for non-banking correspondents (ENRÍQUEZ *et al.*, 2009). Even when Brazil has had regulated financial services for non-banking correspondents since 1973, there is still no specific regulation for m-money services. Some entities are working in the implementation of electronic purses, probably oriented to remittances, given their volume and value. Although they only represent 1% of GDP, they amounted to \$7.1 billion in 2007, mainly from the US, Japan, and Europe. Of the people that received remittances in Brazil, 63% already had a bank account (ENRÍQUEZ *et al.*, 2009). Additive mobile banking has existed in Brazil for over ten years; certain banks, in partnership with the mobile companies started offering basic transactions (transfers, balance inquiries) using WAP technologies. Nevertheless, it was not until 2007 that more widespread services started being offered. Oi Paggo, a subsidiary of Oi, launched a credit service, initially to buy airtime, but subsequently as a line of credit for general purchases. Oi Paggo operates as a credit card administrator with its own banner, bearing the risk of payment delinquency. It has developed a network of 75,000 establishments that accept payments through the use of mobile phones in twelve cities scattered through the Northeast. The mobile phone user, through a process similar to that used by banks and credit companies for credit scoring, opens a credit account with Oi Paggo, uses the phone to buy airtime (about two thirds of the transactions) and certain products and services, and on a monthly basis receives a billing statement, separate from the phone company statement, which can be paid through the internet, at a

bank, or at other payment agencies. On the receiving end, Oi Paggo facilitates the POS device (a mobile phone) and does not charge for it; it charges typical credit card fees (2.99% on the amount of the transaction, somewhat lower than what other credit card wholesalers charge in Brazil) but no on-going additional charges. Additional services, such as a prepaid service (similar to that offered in Kenya), credit that can only be used for top-up, utilities payments, special top-up programs, and the transfer of money (P2P), will be launched soon. For the transfer of money, they have offered an initial launching fee of R\$0.99 (about USD 0.60), substantially lower than the current offer by banks and other money-transfer companies. The money can be cashed out at certain banks, some large retail stores, or through their correspondent network.

By May 2010, Oi Paggo had around 250,000 users, representing about 5% of its user base in the cities where the services are offered. Originally, they launched an above-the-line campaign, which brought in more than 400,000 users, but due to rampant fraud, they have since scaled down, marketing their services through mobile and direct marketing, and, more successfully, telemarketing. They have a preapproved customer base of 2.5 million subscribers on which telemarketers work.

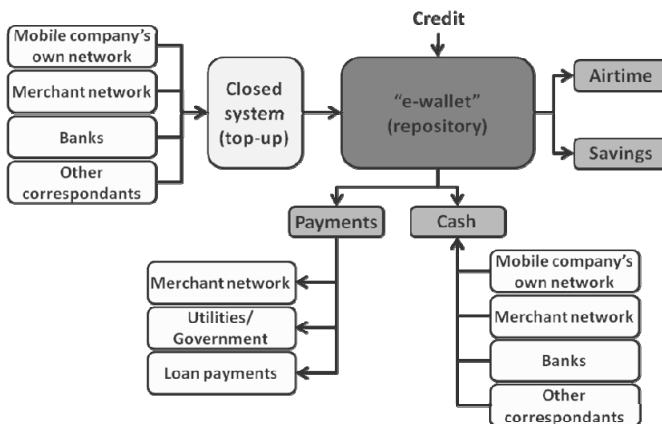
The model, successful as it is, has not yet reached enough scale or critical mass to enter into a self-supporting virtuous circle. The establishment network and the user base are still not large enough to enter into reciprocal reinforcement. It is not yet totally transformative, as it offers financial services to people mostly previously banked, only adding convenience and a lower price, but the new features will probably make it more attractive to a substantially larger consumer base, becoming then a transformative model.

## ■ Enabling conditions

Ever since the world witnessed the success of M-PESA as a sustainable business model that delivers financial services to the unbanked, there has been a surge of optimism regarding the possibility of its replication to other countries. Beginning with reports from international organizations (World Bank, IDB) and followed by scholarly studies that document Kenya's and the Philippines success stories, the literature on the subject is trying to decipher how they can be reproduced.

Conceptually, mobile money systems are very simple. They require a way for money (usually cash) to enter the system and a way for money to exit the system in a simple and user-friendly manner. However, in reality, the ecosystem is significantly more complex. More challenging than building the inlet network is building a good value proposition for the outlet network: how and where can money be used or cashed out? To address this issue, partnerships with agents, merchants, banks, and other correspondents are required, whether to make payments (acquire goods and services, pay utilities, loans) or to receive the cash. In order for this to be possible, it requires flexible regulation. Scale is also needed, as it is a service mostly targeted to the bottom of the pyramid, with large volumes of very small transactions with low transactions fees. The cash system must be considered safe and widespread; the brand equity of the system (usually associated with the mobile company) helps in providing a sense of safety and security. If the services provided enter heavily into the banking arena, such as savings, regulation is critical. Thus, the complete ecosystem is quite complex, as Figure 1 depicts.

**Figure 1 – Mobile money ecosystem**



M-PESA has concentrated on "cash in – cash out" transfers. In the Philippines, all players have extended into most parts of the ecosystem, except credit and savings, while Oi Paggo is currently building its offer based solely on credit.

The literature on the topic has identified certain necessary conditions for the surge of sustainable m-banking business models. Most studies refer to the following basic underlying enabling conditions: infrastructure, regulation, cost of alternatives, financial services penetration, volume and scale,

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migration (domestic and international), and security. As we analyze these conditions, we find that they are present in a variety of countries in the developing world, but have no guaranteed results. There does not seem to exist a set of common conditions that explain the development of widespread m-banking services.

### ***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, as they need to be able to access the service anywhere. There are more than 4 billion mobile phones in use in the world and this customer base is still growing at over 10% per year; this clearly demonstrates that the basic infrastructure is in place and that services are reasonably affordable, even to low-income people. Though a necessary condition, it is already met by most countries.

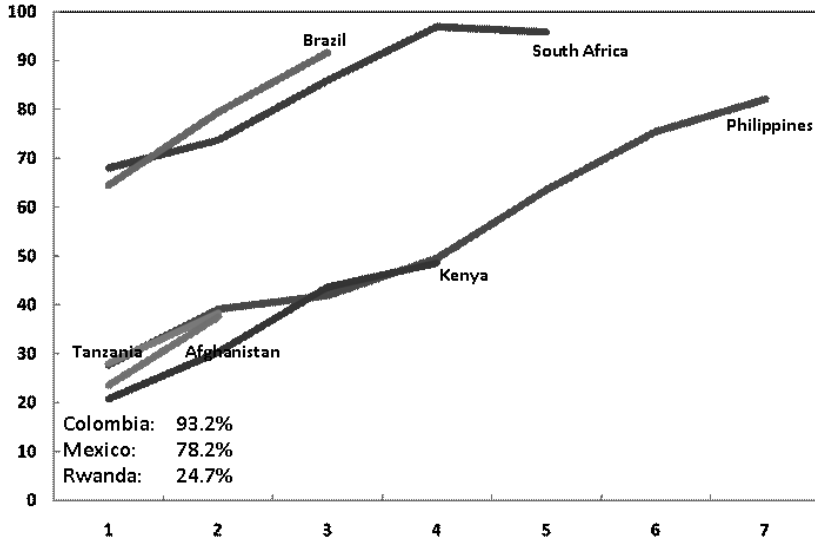
We do argue, though, that neither ubiquity nor a very high penetration of mobile telephony is a necessary condition. M-PESA began offering mobile banking services when penetration was only about 20%. Even more, Tanzania, Afghanistan, Rwanda, and the Philippines were at similar levels of penetration when these services were introduced (Figure 2).

### ***Regulation***

There needs to be a certainty that the monies exchanged are secure. Regulatory requirements include fraud protection and secure service, protection from illegal money laundering, information, and clear regulatory criteria that enable innovation and risk management. An important prerequisite is the "know your customer" requirements.

This fact is not measured by a single index. However, the World Bank, on its "Doing business: Measuring business regulations" report published every year, where it ranks countries on a series of indicators, measures, through the "Strength of legal rights index," the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. This can be used as a proxy for the overall legal framework, as credit is one of the main areas where mobile banking has a positive impact on the economy.

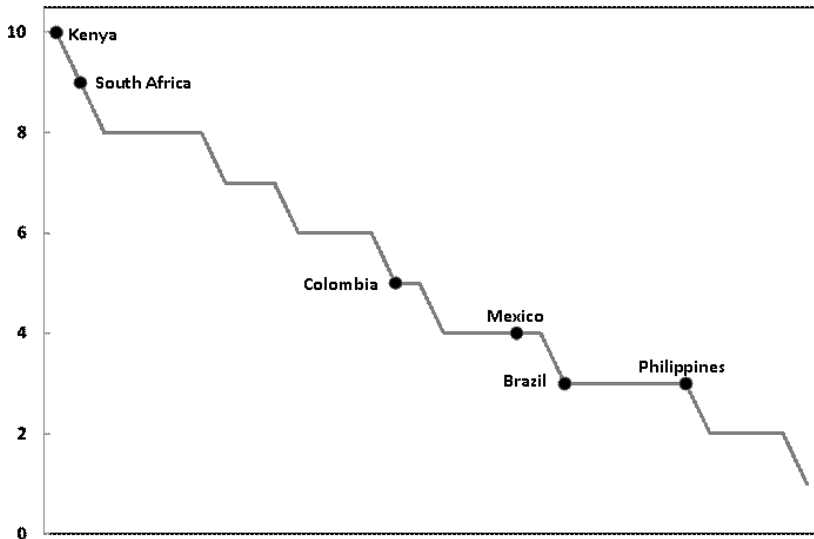
**Figure 2 – Wireless penetration at launch of mobile money services**  
Year 1 = Year of launch of mobile money services



Source: World Bank, 2009

**Figure 3 – Strength of legal rights index**

Index (0-10)



Countries ordered from highest to lowest index value

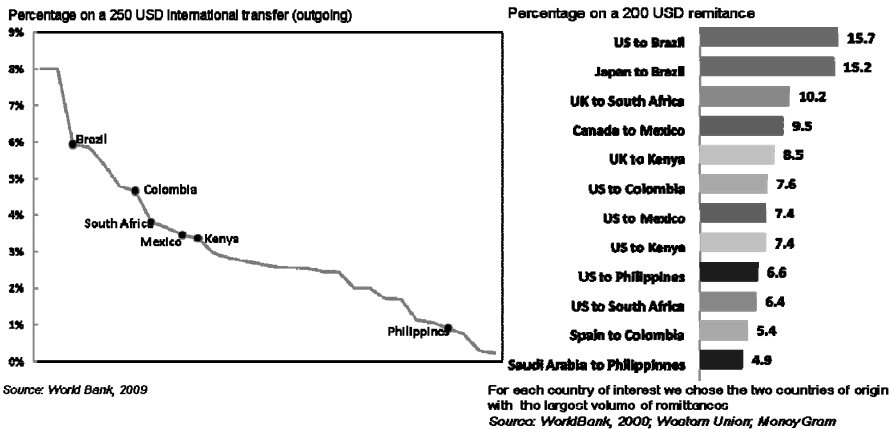
Source: World Bank, 2009

In Figure 3, we plot the index and indicate where countries with mobile banking efforts exist. There seems to be no clear pattern: Kenya seems to have one of the strongest legal rights among emerging countries, but the Philippines seems to have one of the weakest frameworks.

**Cost of alternatives**

The cost of the banking system does not seem to be a driver either. As mobile money's most immediate success has been the transfer of money, internationally or domestically, we look at the cost of this type of transaction. Figure 4 depicts the cost of international outgoing and incoming remittances. Again, the pattern is not clear. We were not able to find consistent information on how expensive it is to send a domestic transfer in each of these countries.

**Figure 4 – Cost of outgoing and incoming international transfers**

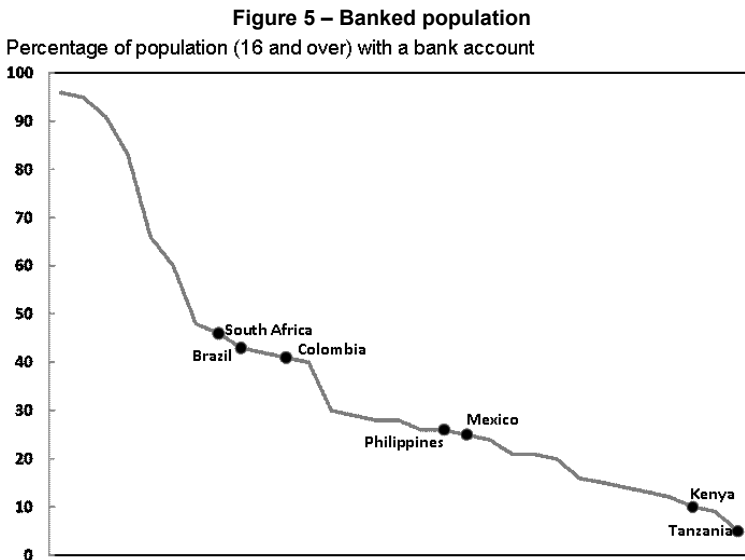


**Financial services penetration**

The size of the market ought to be another driver of how attractive the opportunity is. Volume in terms of potential customers, that is the unbanked population or the penetration of financial services, does not appear to be a driver. In countries with high penetration, services tend to be additive, whereas low penetration is not necessarily linked to a transformative model (for example, Brazil). The percentage of the banked population does not explain either possibility of success or failure (Figure 5).

### **Volume and scale (international and domestic remittances)**

The percentage of unbanked population is one measure of volume. Another is the size of part of the market; to evaluate this, we looked at international remittances. Figure 6 depicts international incoming remittances in absolute terms (in USD) vs. relative (as a percentage of GDP) for all emerging market economies. In 2008 (latest available information), only 18 countries received more than \$1 billion in remittances which at the same time account for more than 10% of GDP. These cutoff points are arbitrary, but the rationale behind them is that they have to be either large in absolute or relative terms or both. As the value of the market for the service providers is only a fraction of the volume of remittances (anywhere from 5 to 10% of the total), and this value is divided among many stakeholders along the value chain (sender, correspondent, mobile companies, other intermediaries), it has to be relevant to the "concentrator," which, in this case, is the m-money service provider. All countries where mobile payments exist have sizable remittances in absolute terms (all above \$1 billion), but there are 17 countries with remittances just as large and that represent an important fraction of GDP where no m-money transfer mechanism is in place; only the Philippines falls in this category. The market might be attractive, but other factors seem to be missing.

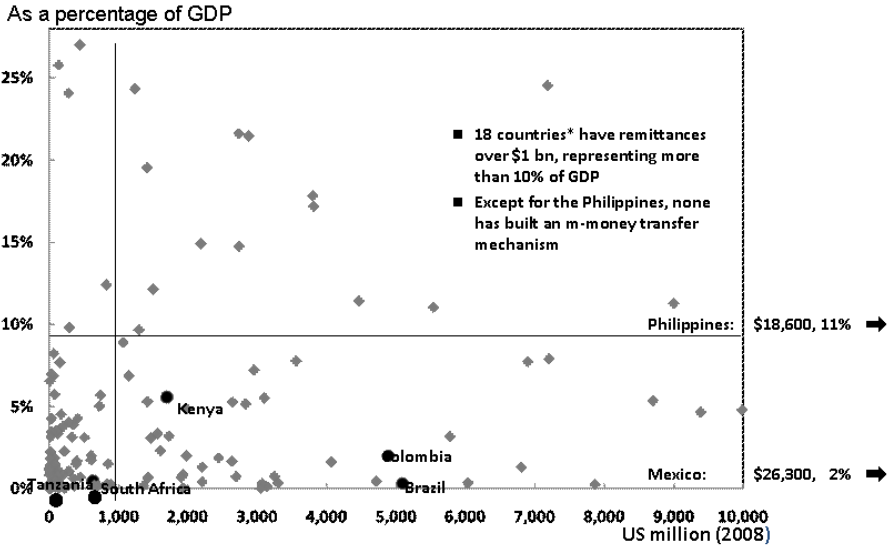


Countries ordered from highest to lowest penetration

Source: World Bank, 2009



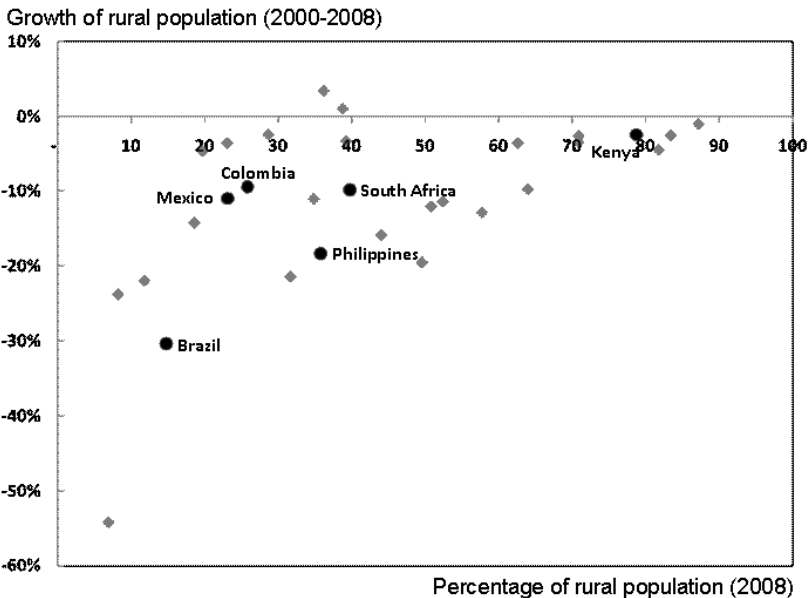
**Figure 6 – International incoming remittances**



Bolivia, Kyrgyz, Senegal, Haiti, Albania, Moldova, Jamaica, Tajikistan, Nepal, Bosnia and Herzegovina, Honduras, Jordan, El Salvador, Guatemala, Serbia, Lebanon, Bangladesh

Source: World Bank, 2009

**Figure 7 – Rural population and migration**



Source: World Bank, 2009

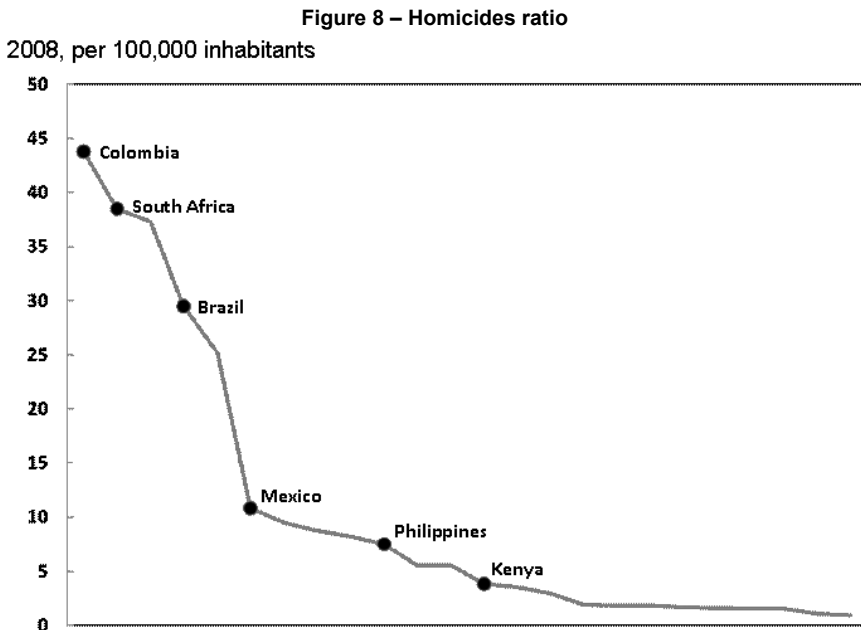
Figure 7 estimates the volume of domestic remittances indirectly, as there is no consistent information available for a country-to-country comparison. We measure migration by how much the rural population has decreased in the period 2000-2008 and compare these rates to how urban the country is. The hypothesis is that migration from rural to urban should increase the volume of domestic remittances, thus making it an attractive growth market. There is no clear pattern. Even more, Kenya has almost no migration and the population is mostly rural; South Africa and the Philippines, both in the middle of the pack, have migration rates of 1.45% and 2.75% of the rural population per year and are becoming increasingly urban; Brazil, with a migration rate of 4.4%, is becoming mostly urban.

### **Security**

Lastly, as the argument has been used to explain part of Kenya's rapid adoption rate of a mobile money system, we look at security. Many indices exist to measure this. We take one of the most common – homicides ratio (homicides per 100,000 inhabitants) – which reflects the overall state of safety and security in a country (Figure 8). Mostly, Kenya seems to be a safe country; the incident that some say triggered the adoption of m-money was probably, if at all, just a catalyst, but definitely most likely just an isolated event. One would expect that, were safety a common concern, as is the case in Colombia, South Africa, Brazil, and Mexico, and mobile banking systems helped ease this concern, these countries would be fast adopters of the technology.

Summary of identified factors None of the factors identified by the prevailing literature on the subject explains the existence and success of a mobile money system. In fact, except for very basic wireless penetration, none of these factors appears to be either essential We also find that same companies have mixed experiences (M-PESA in Kenya, Tanzania, and Afghanistan), thus success is not solely dependent on the mobile company's abilities or on its entrepreneurial skills. However, these m-banking models have not flourished around the world. Thus, there must be something akin to the specific environment. As HEYER & MAS (2009) point out, people observing the phenomena of M-PESA have questioned: was Kenya a fluke? So we are left with more questions than answers. Governments around the world are facilitating regulation for these models to be created given the high returns in terms of social and economic welfare. This has been the case in Mexico. In Mexico, as in other countries in Latin America, banks and telcos

are in a comfort zone where revenues are high enough for them to receive an attractive return for their current services. It may be a matter of time for them to perceive a need to innovate and take the risk



*Source: World Bank, 2009*

The availability of alternatives for financial services is important. Developing countries with very high levels of unbanked population could provide an opportunity for m-banking to flourish. 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. A set of unique characteristics of each country, together with non-hindering (as opposed to enabling) regulation, will probably determine success on a case by case basis. As more companies launch these services, some of them will manage to turn them into successes. At this point, there appears to be no set of clearly identifiable and replicable variables that serve as a basis for success.

## ■ 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 this adoption is now beginning to be understood by scholars and policy makers in the use of this technology to transform the access to formal financial services. The emergence of m-banking and m-payment 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. Thus, we can conclude that those necessary conditions for the replication of m-banking models identified by the existing literature to other countries around the world do not guarantee results.

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