Mobile Money for the Unbanked

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Seeking Fertile Grounds for Mobile Money

Amrik Heyer and Ignacio Mas[1]

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Abstract

The potential of mobile phones to revolutionize access to financial services in developing countries is exemplified powerfully by the success of the M-Pesa mobile money service in Kenya. But the apparent difficulty of replicating M-Pesa's success even in neighboring countries suggests that some contexts may be more receptive to such an innovation than others. In this paper we seek to understand the environmental dynamics affecting the uptake of mobile money. We demonstrate that, aside from strong strategy and good business models, the impact of financial services in developing countries is dependent on the extent of market penetration and the political environments in which they take root.

M-PESA is a huge success… and now what?

Safaricom's M-Pesa success story has focused the global attention on Kenya as the leading edge of the mobile money revolution[2]. M-Pesa is a mobile payments solution developed by Vodafone in the UK, and currently available not only in Kenya but also in Tanzania and Afghanistan. M-Pesa allows users to hold money in a virtual 'stored value' account maintained in a server by the telecoms provider and operated by users through their mobile phone. Users can deposit or withdraw cash with a local M-Pesa agent.[3] Users can then use their available balance to send

[1] Amrik Heyer is an independent consultant in social development working with the Bill & Melinda Gates Foundation, and Ignacio Mas is Deputy Director at the Financial Services for the Poor team at the Bill & Melinda Gates Foundation. The authors wish to thank Amolo Ng'weno for her encouragement and support throughout this project, and for many insightful comments. We would also like to thank Claire Alexander, Paul Makin, Olga Morawczynski,Dr. Cosmas Ochieng and Amina Tirana for their helpful comments, and Daniel Laiser for his contribution to a comparative study of M-Pesa in Kenya and Tanzania, which provided a background to the paper.

[2] Mobile money involves three elements: (i) an electronic stored-value account (akin to a sight deposit account) linked to each user's mobile phone; (ii) a mobile phone application that allows users to manage their accounts and transfer value to other users; and (iii) a network of cash in/cash out outlets where users can exchange cash and electronic value (i.e. deposit and withdraw money from their account).

[3] A deposit entails the customer handing over cash to the agent, in exchange for an equivalent electronic money transfer from the agent's M-Pesa account to the customer's account. The reverse applies for a withdrawal. The transfer is authorized in real time by the M-Pesa system, and the agent's and customer's

money to other mobile phone users, buy airtime (for themselves or for another prepaid phone), or store money. In Kenya, subscribers now have the option of paying bills and premiums to a network of nearly 100 utilities companies, insurance brokers, corporates, NGOs, microfinance institutions (MFIs) and others.

M-Pesa's success in Kenya has been driven by mobile operator Safaricom's ability to tap into a large domestic remittance market through its popular slogan '*send money home'*. In just over two years since launch, M-Pesa has attracted 7 million subscribers (over a third of the population 15 years or older), and it is still growing. Users appreciate ease of access (anytime, anywhere), reliability and affordability compared to other channels and the flexibility ('formal/informality') of the service.

More broadly, M-Pesa affords the scale and efficiencies of corporate capitalism, and the flexibility and contextual appropriateness of informal markets. It demonstrates the volume and profitability of low-income markets as expounded in Pralahad (2006). The Kenyan experience suggests that the ability of the mobile money industry to leverage on economies of scale largely depends on the provider's capacity to leverage on the strength of the informal sector (e.g. in relation to its distribution networks), the labor market profile (e.g. demand for remittances generated by rural-urban migration), infrastructural development (including the penetration of the formal financial markets), and the support from the banking regulator.

M-Pesa is not the first sustainable mobile money deployment –that honor falls to Smart Money in the Philippines which launched in 2001—but the extent and speed of take-up of M-Pesa has been unprecedented. The M-Pesa story has instigated a wave of interest in mobile money, with new entrants rushing to replicate its achievement all over the world: CGAP counts 120 mobile money deployments, and Edgar, Dunn & Co forecasts that there will be 615M mobile wallets in use by 2011.

Yet, two years on, we remain uncertain as to where the next big mobile money success will emerge. Operators across the globe are struggling to capture the mass market for payments, and are now coming to grips with the operational complexity and marketing challenges associated with new payment systems. One hears more and more industry insiders asking: Was Kenya a fluke? What is the *natural* rate of development of a mobile money system? Where is it more likely to work?

One thing we are fairly sure of by now: we should look in developing countries for that mobile money "garden of Eden". That was not the general presumption prior to M-Pesa: why start in

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accounts are debited and credit instantaneously. Therefore, neither transacting party bears credit or settlement risks.

places with a less wealthy, less technologically experienced population? Many schemes had been tried in developed countries, but, with the exception of debit cards, they routinely failed to open up enough space within a crowded set of payment options for customers and merchants.[4] M-Pesa has shown the value of convenient electronic payments to people who have few alternatives to cash.

The apparent difficulty of replicating M-Pesa's success even in neighboring developing countries indicates that some contexts may be more receptive to mobile money offers than others. But it also speaks to the sheer difficulty of 'pulling off' a fairly sophisticated business model. As we investigated successes and failures with mobile money schemes in various countries, it became essential to try to disentangle country-level or market factors from the specific business choices and capacities of the mobile money scheme providers.[5] That is not always so straight-forward: for instance, being in an unfavorable market situation may cause the provider to underinvest in capacity development, or to take bigger gambles with bold pricing strategies.

In this paper we ask the question: 'what would be the most fertile grounds for the next mobile money success story?' The focus is on the pre-existing or enabling country conditions, not the business model or service design aspects which are less likely to be country specific.[6] The paper provides insights into whether Kenya's experience is likely to be unique, and indeed into how inevitable was the success of M-Pesa itself. More broadly, it may help commercial players and donors to target those markets which are *a priori* more conducive to the success of mobile money.

The need for scale

To appreciate what might be the grounds for the next mobile money success story, we need to understand some basic characteristics of the mobile money business. First, the model depends on *volume:* being able to capture a large number of relatively small transactions. Fixed costs at the platform and branding level create significant economies of scale. Moreover, customers are not likely to want to pay commissions exceeding a few percentage points on most transactions,

[4] This is true especially true in Europe and North America. Korea and Japan have seen more success with mobile payments. For an account of experiences in developed countries, see Mas and Rotman (2009).
[5] Two specific market comparisons the authors have undertaken are G-Cash in the Philippines and M-Pesa in Tanzania, both against M-Pesa in Kenya. These are documented in Mas (2008) and Heyer (2009); Camner and Sjöblom (2009) also compare the Kenyan and Tanzanian experience.
[6] For an analysis of the service design factors that allowed M-Pesa to exploit the market opportunity so effectively, see Mas and Morawczynski (2009). For discussion of design factors in other developing country success stories, see Pralahad (2006)

which caps the gross margins that can be secured. Low transaction sizes, fixed costs and low margins need to be balanced by substantial volume in order to close the business case.

Second, the mobile money model requires *speed:* being able to generate momentum and trigger simultaneous interest among users and merchants. Fast growth creates a special buzz which can help overcome people's natural resistance to try out a technologically-enabled service they do not quite understand. Knowledge of the service can spread by word-of-mouth, which cuts down on required marketing expenditures. And if there is sufficient density of take-up in specific communities, more experienced and sophisticated users are available to offer 'delegated' sales and customer care support to newer or less experienced customers.

Momentum is also necessary to defeat the natural chicken-and-egg problem between agents and customers: why would stores want to sign up as agents while there are few customers, but then why would people be interested to become customers while there are few agents? The longer this impasse is allowed to stand, the more difficult it is to overcome. Early market buzz can prompt both customers and stores to sign up sooner and to try it out for longer than they would otherwise consider.

Third, the mobile money model requires *coverage:* being able to use it anytime, wherever one happens to be, and to send money to anyone, anywhere. Proximity and ubiquity: this after all is the disruptive innovation that allows mobile money to penetrate a new payments market. But that requires coordinated roll-out across the entire country.

These three features of the mobile money business –the need for volume, speed and coverage— together suggest that the business model needs to be highly *scalable*.[7] Momentum will build up as customers start to bring other customers into the system simply by sending them money (inducing them to come into the shop and register); agents will start seeking to sign up and add new tills and generally the system can grow very fast for at least some period, creating a 'viral effect'.

The Kenyan market presented a large enough opportunity, and Safaricom went about exploiting it in a sufficiently scalable fashion. In fact, the growth of M-Pesa has surprised even Safaricom since the first few months and continues to grow at a strong pace even as more than half of Safaricom subscribers have already signed up for the service. How replicable is this? Some markets may present too small an opportunity in the light of established competing services. And piece-meal deployments may not work at all.

[7] For a fuller explanation of the economics of branchless banking systems, including mobile banking, see Mas (2009).

In the rest of this paper we consider five factors that determine the potential for scale of the money market opportunity in a given market. Namely: latent demand, the quality of existing alternative services, the regulatory environment, and the market landscape for both retail channels and cellular services. To repeat, we focus here on the environmental factors which determine how scalable a mobile money proposition may be, not on the business design and operational management factors which would need to be brought to bear to exploit it.

Extent of Latent Demand for Transactions

Demand-side metrics underpin the scalability of a mobile money solution. Do the volumes and profile of transactions and savings among the general population indicate a scalable opportunity? Any payment and store-of-value system ultimately serves a number of purposes for its users, but identifying a principal product application with strong mass market appeal is the cornerstone for a mobile money launch. A ready market of 'early adopters' through which to kick-start the product and gain momentum is also significant to propel the service towards a viral effect.

Safaricom based the initial launch of its M-Pesa service on the '*send money home*' proposition, even though it also allows the user to buy and send airtime, store value and, more recently, to pay bills. **Remittance services** are primarily targeted to the urban migrant population who seek better employment options and send money regularly to rural kin. s The opportunity will be larger where migration results in splitting of families, with the bread-winner heading to urban centers and the rest of the family staying back home. This is the case in Kenya and Tanzania, where 17 and 28 percent (respectively) of households depend on remittances as their primary income source (FSD-Kenya [2006] and FSD-Tanzania [2006]).

Where entire nuclear families move, remittances will be stronger where there is cultural pressure to retain connection with one's ancestral village. In Kenya, migrants' ties with rural homes are reinforced by an ethnically-based rendition of citizenship and the need to hedge insecure livelihood options. These links are expressed among other things through burial, inheritance and cross-generational ties, even in cases where migrants reside more or less permanently in the cities.[8] In other countries, a greater emphasis on national as opposed to local identity has diminished the significance of the rural 'home'.

In her study of M-Pesa, Ratan (2008) suggests that the potential market size for **domestic remittances** is related to urbanization ratios. More propitious markets will be those where the

[8] For fuller analyses of the use of mobile money for domestic remittances in Kenya, see Ratan (2008) and Morawczynski (2008).

process of rural-urban migration is sufficiently rooted to produce large migration flows, but not so advanced that rural communities are hollowed out and lose socioeconomic significance. Countries with mid-range urbanization ratios, especially those that are urbanizing at a rapid rate, are likely to exhibit strong rural-urban ties requiring transfer of value between them. This is the case in many African countries like Kenya and Tanzania; in the Philippines and Latin America, where urbanization ratios exceed 50 percent, remittances are more likely to be triggered by international rather than domestic migration patterns.

Domestic remittances might also be driven by students schooling away from home. This reverses the flow of money, from rural households to dependents in larger urban centers. Young people may be schooled away from home due to a lack of schools in rural areas (such as in Uganda and Tanzania) or due to the better quality of educational choices available in larger towns (such as in the Philippines and Latin America).

Payments also play an important role in enabling informal economic activity, and the degree of informal sector entrepreneurship may fuel the growth of mobile money. This was initially the case with traders in Tanzania, where early uptake of the service was in high demand by rural retailers sending payments to urban wholesalers, thereby contributing to a strong rural-urban flow. In Kenya, informal sector employers are increasingly using the service as a salary payment channel.

Safaricom took on the domestic remittance opportunity by launching a nationwide service, with agents scattered around the country. This might be too risky and costly a proposition for smaller operators or in larger countries such as India. In this case, being able to identify corridors for remittances would permit a more targeted, phased roll-out of agent networks and customer acquisition campaigns. This is the approach Eko is taking in India, using customer call records from partner telco Airtel to precisely identify potentially 'thick' remittance corridors.

Focusing on remittance corridors as opposed to broad national markets could also yield significant returns in the African context, where cross-border **regional remittance corridors** represent a potentially strong market opportunity. Of Africa's 16 million international labor migrants, 63 percent are *regional* as opposed to trans-continental, with major corridors in West Africa (Isaacs, 2008). Some international or regionally-based mobile operator groups (such as MTN, Orange, Orascom and Zain in Africa) may be able to create regional remittance networks linking their operations in neighboring countries, thereby harnessing this lucrative market.

Tapping **international remittances** is generally much harder than domestic remittances because a mobile money scheme operator would have to rely on foreign partners to address one leg of the transaction. Smart Money and G-Cash in the Philippines are partnering with Western Union

to effectively extend the reach of their mobile money service to the sizable overseas Filipino community.

While remittance markets have so far afforded the most lucractive mobile money opportunities, large-scale institutional payments may also comprise significant markets. **Bill payments** constitute an important and easily reachable niche application for mobile money, especially in countries where basic infrastructure is reasonably well developed. This may be the case, for example, in Nigeria, where a substantial share of the population pays utility bills and relies on cumbersome bureaucracies to do so. Government is also a major collector (payee) for services such as market fees, land rates/rental and other fees, licenses and services, as well as for contributions into government national health and social security funds. **Microcredit repayments** and micro-insurance premium collections can be a third driver of volume of institutional payments. But tapping into these payment sources requires a certain degree of sophistication on the part of the IT systems of microfinance institutions, which may not always be the case.

Mobile money schemes can provide substantial convenience to bill payers by: *(i)* linking the payment to an account from which the payment can be triggered instantaneously at any time, and *(ii)* expanding the reach of payment outlets to include any available cash in/cash out agent, for those wanting to pay in cash. For institutional billers, promoting real-time electronic payments through mobile money reduces credit risk, unremunerated float and channel management costs. So they are often willing to bear the cost of the transaction, making it free to the customer.

In addition to being a collector, government is often the single largest payer in a country, with millions of small payments on a monthly basis for salaries, pensions and social welfare transfers. Thus, **government payments** are likely to be particularly suited to the efficiencies offered by mobile money solutions. Brazil is a prime example, where a bank-led payment model operated through cards and point-of-sale (POS) devices is now the main vehicle for government social welfare payments to 11 million recipients. South Africa also has a nation-wide social transfers system covering one-third of households.

Mobile money schemes would be best placed to tap into bill payments and government payments if they were nationally interoperable. Billers and government payers are naturally resistant to pursue payment options that only reach a portion of the population and to overly fragment their payment channels.

Mobile money schemes can also tap into the payment needs of larger commercial players. Smart Money in the Philippines and Wizzit in South Africa serve as a platform for airtime top-

ups. In Zambia, Celtel uses its mobile money service to support payments between major distributors and their retail store networks. In Cambodia, WING launched a mobile money service in partnership with the garment industry to deliver salaries for workers, who then constituted an 'early adopter' segment that propagated the service more widely. Where an 'early adopter' niche is not easily identifiable, partnering with large-scale institutions to roll out a mobile offer can deliver the initial momentum needed to stimulate viral propagation.

Lastly, global evidence shows that the demand for **safe savings** products is very large (Collins et al., 2009). Yet only about 10 percent of the world's poor have access to formal bank accounts. Savings propositions which allow poor people to save money as and when they earn it, conveniently near where they live or work, in small sizes, can mobilize a very large number of transactions.

Range and quality of existing alternatives

In order to assess the market opportunity for a new mobile money scheme, demand-side indicators must be looked at in the context of the accessibility and quality of the alternatives. If there are many good alternatives (as is typically the case in developed countries), it will be difficult to convince users to switch to the new mechanism. At the other extreme, if there are no current alternatives, the mobile operator will need to create an entirely new service category in people's minds and will have few market references on which to base their marketing campaign, which may be a slow process. For example, the use of airtime transfers as an informal way of sending money in Tanzania provided initial competition for mobile money offers, but also established the idea of electronic value transfer in people's minds, facilitating popular acceptance of mobile products in the long-run.

Mobile money schemes can gain traction through identifying specific weaknesses of existing alternatives, and crafting their service proposition to demonstrate advantages over those attributes. At the same time, there is likely to be high inertia about switching to a new system, which will not necessarily be addressed through a convincing service proposition. Brand value and market share may be more significant to speed of uptake (see section on cellular market landscape).

We can distinguish payments and store-of-value alternatives by whether they are formal (licensed and regulated), semi-formal (legally constituted but not regulated) or informal. In all these contexts, attributes which are important to consumers include direct costs (fees, interest rates), safety (what is the probability that I may lose my money?), reliability (is it available for me to use whenever I need it? is there going to be sufficient liquidity when I need to get money out?), and convenience (is it easy to use? how long does it take and how far do I need to travel

to access it?). For low income groups, the most significant of these factors is often the last: the opportunity costs relating to accessibility and convenience. Semi-formal and informal options generally have a strong advantage in relation to convenience, while formal services tend to be more secure and reliable.

In general, mobile money should help in three key ways. First, the ubiquity of mobile money services should increase convenience and reduce opportunity costs (such as travel and queuing times), especially with respect to formal alternatives which tend to be more concentrated. Second, the electronic nature of transactions should increase safety, especially with respect to semi-formal and informal alternatives which are unsupervised and often even unrecorded. While customers may not be in a good position to understand the intrinsic security afforded by electronic channels, the fact that transactions happen in real time should help them to quickly gain trust in the system experientially (since the sender of funds can immediately call the recipient to confirm the success of the transaction). Third, mobile money schemes, with their greater range of agents, give greater control to users on where to transact, which helps protect privacy and reduce corruption. In the analysis below, we concentrate on three specific drivers of transactions from the list reviewed in the previous section: domestic remittances, bill payment and savings.

Formal remittance services are dominated by banks and postal services. In Tanzania, **bank transfers** are particularly attractive since inter-bank transfers are free. However, only a small share of the population has access to a bank account, and the geographic footprint of banks is very limited: even market-leading NMB Bank only has 128 branches across Tanzania's main towns. Thus, opportunity costs are high, as senders and recipients must queue sometimes for a whole day to transact at bank branches, and those living in more remote locations must travel to branches in bigger, distant towns. In other markets such as in Kenya, the absence of inter-bank payments infrastructure makes it very expensive, and bank branch presence cannot compete with mobile services. Market-leading Equity Bank has only 300 branches and ATMs across Kenya against M-Pesa's 7000 shops and Safaricom's 100,000 airtime sellers.

For poor people, the more common form of formal domestic remittance services is through **post offices**. India Post, with over 150,000 outlets mainly in rural areas, is the largest postal network in the world.[9] Sending money costs 5-15 percent depending on the size of the transaction and typically takes 5-7 days to process. The cost of a transfer may in practice be higher; it is not uncommon for postmen, particularly in rural areas, to charge an informal fee to the recipient.

[9] India Post, Annual Report 2007-2008.

Semi-formal remittance services, where they exist, probably present the most formidable competitor for mobile money offers. They form around networks of businesses in another sector. They are systematized and efficient, leveraging high volume markets to offer a competitive service. In the Philippines, **pawnshops** form networks of various sizes that offer a cheap domestic remittance service. In Tanzania, people can send money through **bus companies**, at a commission of 10 percent and with a significant risk of theft. This method may not be convenient if the sender and recipient must travel to the company office to collect the money.

Informal remittance services develop in a more opportunistic way. The most popular remittance mechanism in Tanzania is through **airtime transfers**, which can be construed as a prototype of mobile money, though it is not legal. The sender buys prepaid airtime and transfers it electronically (instantaneously) to the intended recipient. The recipient then locates a 'cash out' agent (available on every street corner), who exchanges the airtime value for cash at a discount (commission) of 15-25 percent of the face value of the airtime redeemed. The agent is then able to resell the airtime to network users. The service is expensive, but it is convenient, relatively reliable and available on all networks. Airtime transfers are not legal, but they have provided strong competition for recent mobile money launches in Tanzania.

In the Middle East and Asia, ***Hawalla*** networks are well developed along major labor migrant or diaspora corridors, and some have even been formalized (for example Dahabshil bank in Somaliland). While these networks are not necessarily competitive with formal offers in relation to price, they are substantially more convenient, with few barriers to access, and have developed high levels of trust among their clientele. Given the regulatory hurdles for formal options in delivering low cost international remittances, *Hawalla* networks are likely to remain competitive in the context of international markets, at least in the medium term.

The most basic form of remittances, though, involves human carriage of the funds. Many people opt to deliver the money personally or through friends or family members who are travelling. This presents safety, reliability and privacy issues, and often entails hidden 'costs' which must be repaid at a later date.

Utility **bill payments**, to the extent that utility services are available to poor people, are typically made in four locations: at the offices of the utility company, at bank branches (and possibly ATMs), at the outlets of specialized payments networks, and at retail shops that have an agency agreement with the utility company. The first two typically have limited geographic reach and entail long queues on bill payment days. Specialized payment networks are developing fast through Latin America (such as Pago Fácil in Argentina and Pago Express in Paraguay), and offer quicker and friendlier service. Mobile money services present an opportunity to lower the cost

and broaden the geographic reach of bill payments. On the other hand, mobile bill payments require the customer to enter long strings of billing account data on a small mobile keypad, which may cause a big customer service burden in dealing with wrong entries. This can be solved by automatically linking biller account numbers with users' phone numbers, or by combining bill payment with electronic bill presentment services. Mobile offers are thus potentially competitive for this market niche.

In relation to **savings**— the other element of the value proposition for mobile money along with electronic payments— are another potential driver of mobile money. Access to **formal bank accounts** may be very limited in emerging markets, where banks are often not able to compete directly with non-bank providers due to higher fixed and operating costs and much more limited physical presence. Postal banks offer more accessible services, but the quality of their service is sometimes deficient.

Informal savings options are quite widespread but they may not always be reliable. Deposit collectors in places like India and West Africa also offer savings services for a fee. The service they offer is a combination of temporary safe-keeping of funds as well as discipline (through their daily visits to peoples' homes or stalls in the market). Informal savings groups exist in many low-income countries, especially among women. They entail nil or minimal fees (for record keeping and group formation services), but participants need to invest significant time in building group solidarity and monitoring performance. Other popular savings options are entirely **intra-household** (typically in the form of hidden cash, jewels, livestock or building materials), between **friends and family** (typically in the form of loans) or within the community (through savings-led groups). Given the lack of reliability and/or high opportunity costs of informal savings options, a low-cost, widely available formal option would be very attractive.

Generally speaking, mobile money offers for remittances, savings and bill payments are strongly competitive in relation to formal options for the mass market. For mobile money providers, the areas to watch out for are semi formal services, and, in some cases informal services. These have developed highly efficient networks, especially in relation to remittances.

Meanwhile it is interesting to note that, in Kenya, mobile services have been taken up initially by formal service users (70 percent of M-Pesa users are banked as opposed to 40 percent of non-users (Pulver et al, 2009). Thus, M-Pesa did not acquire its initial critical mass through competition with the formal sector, but rather as a complement to formal services, for a clientele who were wealthier, more exposed to formal financial service options and less risk-averse. However, as services move deeper into the market, volumes of unbanked will be likely to drive expansion, due to the competitive advantages of formal mobile offers over other

options. This is why Africa, with its high population of unbanked, is seen as such a promising market for mobile money offers.

Regulatory Environment

Regulation of mobile money can help to secure trust in new mobile money schemes. At the same time, regulation can constrain the success of mobile money schemes in two ways: *(i)* regulations may force an inferior customer experience from a usability point of view; and *(ii)* regulations can limit the operator's degrees of freedom in structuring the business model, service proposition and distribution channels. In the case of M-Pesa in Kenya, a good working relationship with the Central Bank of Kenya resulted in a laissez faire regulatory approach in the early stages, allowing Safaricom to develop the M-Pesa service to closely fit its market.

The customer experience is defined by four main interactions: account opening procedure, ease of use of the mobile phone's user interface (UI), transacting process at retail agents, and customer care through the operator's call center or retail outlets.

Know Your Customer (KYC) regulations, driven by regulators' concerns around money laundering and terrorism financing, are key determinants of customer ease around account opening and transacting at agents. Customer acquisition will be significantly harder if prospective customers need to show mutliple documents which are hard for them to obtain, fill in lengthy registration forms, show up in person at distant, unfamiliar branches, or wait a period before the account becomes active. In Kenya, people wanting to sign up to M-Pesa can go to any registered agent, fill in a short registration form, and show their national ID (which most people do have). Agents are permitted to instantly process customer registrations online, without having to return any paperwork back to Safaricom. Instantaneous account opening has been one of the success drivers of M-Pesa.

The customer experience is more cumbersome in Peru, where regulations do not permit agents to process account opening requests at all and hence customers must go to a bank branch. In Brazil and India, banks are able to open a class of low-balance accounts with reduced KYC standards through agents, but the documents must be physically seen by the bank before an account can be opened. In Tanzania, where there is no national ID, there is a more cumbersome registration process and often accounts cannot be opened on the spot. Additionally, anti-money laundering (AML) requirements in Tanzania make registration procedures more complex for consumers wishing to transact above around USD 1,300.

AML restrictions may be particularly restrictive for international remittance operators, as governments are often wary of these networks being used in support of illicit activities. It is aslo

harder for a domestic authority to establish the provenance of the funds if these originate abroad. International remitters are also subject to foreign exchange rules which would not apply to domestic remitters.

Security and consumer protection regulations can be important to ensure trust, but they can also impact the quality of the user interface and transactional experience. Requirements for data encryption, user authentication (e.g. length of PIN, use of a token) and information checks/disclosures at the time of transaction can make the application more cumbersome.

In relation to distribution, **agent regulations** condition the ease of putting together a scalable distribution channel. M-Pesa agents are not subject to any specific regulations, but elsewhere regulations may specify who is allowed to be an agent and may place more or less onerous requirements on them. In Tanzania, business-licensing requirements for agents not only impose direct costs of licensing, but also may create a tax burden on businesses that might have previously operated informally. In the Philippines, agents are required to go through AML compliance training, which in the past was only held in the capital, Manila. Such requirements can constitute an important barrier to agent growth. In Kenya business licenses have not so far posed a problem, as the revenues generated by M-Pesa are generally more than adequate to absorb the increased licensing requirements (such as those now being imposed by city councils).

Bank licensing regulations can also influence the degree to which mobile operators can control or even participate in the mobile money business. One important element is whether there are special licensing provisions for pre-paid or e-money account issuers. These licenses typically would obligate the issuer to deposit any funds received from the public in a pooled account at a fully regulated bank. In return for not on-lending funds, the mobile money issuer would receive lighter regulatory and supervisory treatment. If such licenses are not available, as is the case in Brazil, India and Nigeria for example, mobile operators cannot themselves issue mobile money accounts and they must partner with a bank. Many operators are reluctant to do so because it creates business complexity and dilutes the value from offering the service.

The other key element which may limit mobile operators' role in mobile money relates to the ability of banks to **outsource** core banking functions to non-banks. In the Philippines, Banco de Oro is the issuer of record of Smart Money accounts, but the entire operation and marketing of the accounts is handled by (i.e., outsourced to) Smart Communications. In Brazil, this level of outsourcing would not be possible under current regulations. Not being able to issue or manage accounts, Brazilian mobile operators can only act as an electronic transactional channel for a bank.

Account pricing regulations may limit the freedom of account issuers to set fees for their services. In India, banks are not able to charge fees on no-frills accounts targeting poor people (which receive relaxed KYC treatment), so banks do not have much incentive to promote usage of the accounts. As a result, 70-90 percent of no-frills accounts are inactive. In Brazil and Colombia, there are a minimum number of transactions per month that customers must be able to perform at no incremental cost (though they can charge a fixed monthly fee in return). E-money account issuers are often not allowed to pay interest on their accounts, in order to distinguish them from fully fledged accounts. This is also the practice agreed between Safaricom and the Kenyan regulator.

Finally, there may be **interoperability rules** which may bias the business case for mobile money, such as in India and Nigeria.

Retail Landscape

A mobile money service needs to be supported by a network of retail agents reaching into the communities where customers live. Agents' main role is to provide cash in/out services within easy reach of their customers, which requires them to manage the logistics and risks associated with increased cash flow[10]. Being in the front-line of customer interactions, agents might typically also be used to promote the service within their communities, to register new customers and educate them.

In the initial stages, backers of mobile money schemes would typically seek to patch together their agent networks by working through established retail channels, although new channels may emerge in later stages in response to the success of the product. These would be retail businesses with the grassroots reach to access consumer populations, receptivity to new technologies and business lines, and the capacity to train and monitor store-level activity. Possible candidates include government distribution networks such as post offices, street level retail franchises, mass market distributors with strong logistical infrastructures and airtime reseller networks.

Some of the most extensive distribution networks are in fact government-owned, such as **post offices**. These networks are sometimes fraught with issues of mismanagement, underinvestment and corruption, so the level of trust in these outlets varies substantially from country to country and needs to be examined carefully. Street-level **retail franchises** (e.g. Pick'n Pay and Shoprite in South Africa or pharmacy chains across Latin America) can also support a

[10] In developing country settings, other liquidity management devices like ATMs rarely penetrate sufficiently into consumer environments.

robust distribution platform. However, these are generally lacking in poorer villages and slums in Africa and Asia. Another option is to partner with **distributors** such as Unilever, Cadbury-Schweppes and SAB Miller, who do not own retail franchises but reach small shops everywhere through an extensive logistics infrastructure. Their trucks can be used to remove excess cash from stores.

Some retail channels such as pawnshops in the Philippines seem very well suited to support mobile money services because they are widespread and accustomed to payment services and liquidity management. However, they will seek to ensure that the new mobile money offering does not enter into direct conflict with pre-existing payment services, thereby limiting the disruptive potential of mobile money.

Airtime re-seller networks are a potentially strong channel, partly because they are already receptive to mobile technologies. In relation to the latter, operator control over an existing airtime re-seller channel is a big advantage. In Kenya, Safaricom had a pre-existing relationship with some 1000 SMEs who controlled street-level retail outlets across the country, and of these 300 agreed to partner with Safaricom to roll out M-Pesa. This gave Safaricom a substantial advantage in achieving sufficient physical presence early on. Having direct operator control over the airtime reseller channel gives the operator the ability to identify the stores that may be the best candidates to become cash in/out points, present the case for the new business directly to them, insist on consistent branding policies, and monitor their performance on an ongoing basis.

However, the transition from agents selling airtime to agents providing cash in/out services is not always so straightforward. Mobile money requires considerably higher entrepreneurial capacities than airtime sales due to the higher working capital movements and required treasury management expertise. In Tanzania, where retail capacity is relatively less developed than in neighboring Kenya, Vodacom partnered with 6 superdealers to distribute airtime who hold all the direct relationships with street-level outlets. Superdealers wield substantial power in how the channel is structured, incentivized and used. Lacking direct control over its channel, Vodacom was not able to standardize, brand and promote a mobile money product effectively. It therefore had to build its M-Pesa distribution platform from scratch, requiring additional investment. Incentive structures at agent level were not dissimilar to Safaricom, but lack of existing relationship between provider and agent compromised the willingness of agents to finance associated risks and take on a strong promotional role, as well as their willingness to adopt the high profile branding and exclusivity of Safaricom's agents.

Mobile operators Smart and Globe in the Philippines have also struggled to convert their airtime channel into agents for their Smart Money and G-Cash service, but for a different reason. Their problem was not lack of control over the channel but high airtime commissions that are no

match to what they could offer on the mobile money service. The airtime reseller channel gets a total commission of around 18 percent of airtime value sold, of which 12 percentage points are passed on to the final retail store. At a commission of 12 percent, retail stores did not find a one percent commission on cash in or cash out very enticing. They would have to assume that the volumes on mobile money transactions will be many multiples of the volume of airtime sales in order for the former to be an interesting addition to their portfolio of services.

In Safaricom's case, in contrast, airtime commissions total 6 percent, of which 5 percent are passed on to the retail store. The same 1 percent commission on a cash in/out transaction becomes more attractive – the store now only has to believe that the cash business may be five times as big as the airtime business in volume terms. This may seem more reasonable, considering that the bulk of airtime sales are of very low denominations (KSh 20, or 25¢ US).

Thus, the airtime remuneration model is very important as it determines how interested the airtime resellers may be in becoming cash in/out points. If the airtime reseller commission is too low, retail stores will not be interested in further developing their business with the mobile operator. But if it is too high, the reseller will not be drawn by the lower commissions of the incipient cash in/out business.

Finally, the ability of retail stores to conduct the agency business for a mobile money scheme will depend on how easily they can rebalance their liquidity portfolios. This will be more difficult to achieve if bank branch penetration is too low, as this will force the agent channel to develop alternative cash transport mechanisms. Thus, an agent network will need to rely on a minimal banking retail infrastructure. This qualifies our earlier point that lack of access to formal services indicates a strong market opportunity. For example, Kenya is reasonably well supplied with cash in rural locations because of the existence of Equity Bank, other banks' and microfinance institutions' networks of branches. Even so, shortage of cash or electronic value for M-Pesa agents is a problem both in country and city. Other countries face more serious liquidity constraints, especially in rural areas, which is likely to be a major factor affecting the success of mobile services in specific country contexts.

Cellular market landscape

There are several characteristics of the mobile market which may condition the size of the mobile money opportunity on the demand side. An obvious prerequisite for mobile money is the degree of **mobile penetration** within the population, whether based on own mobile phones

or shared phones.[11] While a mobile money offer may eventually boost subscriber numbers, it will initially depend on the deployed base of mobile phones. Zambia for example, has a relatively low subscription rate equal to 3 percent of the population, while Nigeria's is 42 percent. Closely related to this is the **network coverage**, which must be strong and geographically comprehensive in populated areas to support a nation-wide mobile offer.

Another important factor is the general familiarity of mobile users with mobile **data services**, and in particular SMS. Mobile money entails entering data through the phone's keyboard, and this may intimidate and confuse people who have only used their phones to talk[12]. Usage of SMS is partly related to literacy levels, but is also a function of SMS pricing: where prices are cheap, SMS will tend to be used as a substitute for voice. It is no coincidence that mobile money services first launched in the Philippines ("the texting capital of the world"), where SMS costs as little as the equivalent of a few US cents or that it has taken off in Kenya where SMS at 5 US cents is much cheaper than voice which cost as much as 35 cents a minute a couple of years ago. In Latin America, SMS pricing is generally much higher (19 US cents in Brazil), which may partly explain why mobile money services were launched much later there than in Asia and Africa.

On the supply side, the chances of a mobile money scheme taking root partly depend on the strength of the mobile operator within its market. Operators with larger **market share** can market the new mobile money service to a larger potential customer base. At least initially, the potential pool of mobile money customers will be limited by the total number of subscribers of the operator. Operators with a larger, more mature customer base are also more likely to invest in customer retention, which will make it easier to justify the business case for the mobile money service given the expectation of greater stickyness of mobile money offers.

In addition, the larger a mobile operator's market share, the more likely it is to have the necessary investment capital, brand equity and strength of distribution to scale the mobile money service. Larger companies have a higher level of brand awareness and probably trust among the public, and can afford larger advertising budgets to promote the service. The success of M-Pesa in Kenya has shown that investments in marketing, promotion and consumer education are critical to achieving rapid transaction volumes. Safaricom enjoyed remarkable levels of trust among the general public in Kenya, as many Kenyans viewed Safaricom as a

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[11] For example, in India, many households share phones. In Kenya access to phones is estimated to be twice that of subscriber rates.

[12] The correlation between mobile money receptivity and SMS usage may be qualified by the emergence of informal brokers conducting transactions on the client's behalf. Morawczynski (2009) notes the emergence in rural Kenya of 'M-Pesa boys', who charge double the M-Pesa fees to conduct transactions on behalf of clients. Ratan (2008) notes that the 'proximate usability expertise' offered by M-Pesa 'mini community agents' is vital to adoption and use of the service, especially in rural areas.

home-grown success story, and this rubbed off M-Pesain the early days. Dominant operators like M-Pesa are also more likely to have a larger network of airtime resellers, which can be converted to cash in/out points.

Other country-level factors

Investment climate and political and country risk factors would generally tend to diminish the appetite of a mobile operator to invest in a mobile money scheme. At the same time, (the threat of) high inflation would reduce the value of a financial savings proposition for customers, although it may increase the need for speed in money transfer and bill payment. While poor political and economic certainty would thus in general discourage investment in additional services, mobile money may in fact do particularly well in extreme environments where the quality of alternatives is low. Indeed, M-Pesa experienced a big surge in usage during the election-related violence in Kenya during January 2008, partly because it remained available and partly because customers believed that M-Pesa was less susceptible than banks to political manipulation (Morawczynski & Pickens 2009). Countries experiencing high levels of conflict tend to have sizable diasporas creating strong remittance opportunities. This may also explain why m-paisa in Afghanistan seemed a good second country after Kenya to launch a mobile money service.

Socio-demographic factors must also be considered carefully. A sparser population is more expensive to cover with a suitable density of agents.

Conclusion

The global experience with mobile money is patchy: highly successful in Kenya, making modest headway in countries like Philippines, South Africa and Zambia, struggling to get off the ground in a few cases like Tanzania, Cambodia and Côte d'Ivoire, and practically non-existent in others. Despite the lack of demonstrated track record and the existence of major regulatory roadblocks in some countries, there is a sense of enormous possibility and ongoing investment by operators.

In Africa, the mobile money opportunity looms large because a large share of the population lacks access to basic formal financial services, but nonetheless needs to regularly transfer value due to domestic migration patterns (sending remittances back home, paying school fees) and underdeveloped retail networks (settling utility bills, card-based airtime top-ups). In Asia, exceptionally high population numbers and a readiness to adopt new technologies indicate a strong opportunity. In Latin America, experimentation with mobile money so far has been very limited. This is likely due to significantly higher urbanization rates and more developed retail

franchises, which make it easier for banks to address customer segments through bank-based infrastructure (whether through branches or branchless channels). Stronger, more protective bank supervision departments and more expensive telecoms services have also served to limit the potential of distributing financial services through mobile phones. In the Middle East, regulation does not generally favor mobile money.

But in the end an analysis of the opportunity needs to be undertaken on a country-by-country basis. We have documented a number of factors which influence the scalability of the mobile money opportunity, in terms of the potential volume of transactions captured and the speed of take-up by customers and agents. All of these factors need to largely align to set the scene for a successful mobile money deployment. This happened in Kenya. And while Kenya shares many characteristics with other countries, the conjunction of the Kenyan characteristics may turn out to be fairly unique. Table 1 summarizes these factors and assesses, in a qualitative and high-level fashion, the suitability of various markets against these factors.

Quantifying the factors outlined in this paper across a large number of countries would help shed light on the practical uniqueness of the Kenyan situation. Unfortunately, much of the data is not readily available, so we remain agnostic on the question of how likely it is that the M-Pesa success will be replicated elsewhere. However, we hope that this analysis will help to shed light on the underlying variables affecting the magnitude of the addressable opportunity in specific markets.

Table 1: Country readiness factors for mobile money

Topic	*Sample detailed questions*
Latent demand for transactions and savings among the poor	• How strong are urban-rural migrations? What is the urbanization rate? How prevalent are split families and female-headed households? How many households depend on remittances as their principal income source? What is the density of secondary schools in the countryside? What is the size of the SME sector? • How many households depend on international remittances? What share of these is in the top 5 corridors? • What share of the population pays utility bills regularly? How many receive government pension or social welfare payments? How tightly integrated are supply chain channels in retailing? • What is the savings rate of households by income level?
Coverage and quality of existing alternatives to mobile money	• What share of households has access to a formal bank account? How many of these enable bank transfers? • What is the cost of transfers through post offices, semi-formal channels such as airtime discounting or pawnshop networks, or through informal channels such as the Hawalla system or bus companies? • What percentage of households participate in informal group-based savings (e.g. ROSCAs), and how many pay for the services of deposit collectors?
Friendliness of the regulatory environment to mobile money	• How flexible are KYC requirements for low-balance accounts? How difficult is it for low-income consumers to obtain the necessary identification? Can accounts be opened on the spot by the agent? • Who can be an agent? How onerous are the requirements for agents? • What are the licensing terms for account issuers? Can banks outsource core banking functions to operators? • Are there pricing restrictions on low-balance or e-money accounts? Are there interoperability obligations on mobile money schemes?
Quality of existing retail infastructure	• What is the health and geographic reach of post offices or other government retail networks? Do nation-wide retail franchises exist that have a strong presence in poor communities across the territory? What is the strength of distributor networks? What is the penetration of bank branches across the territory? • What is the degree of innovation, entrepreneurial drive technology awareness of the small retail sector? • What is the spread and degree of operator control over airtime reseller networks? How are airtime commissions structured?
Mobile market landscape	• What is the penetration of mobile services in general and with poorer people in particular? What is mobile coverage by population and territory? How many cellular subscribers regularly use mobile data services? • What is the telco market share? What is their quality of management and execution track record?

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