

## Chapter 4

# Mobile Money for Financial Inclusion

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**M**obile financial services are among the most promising mobile applications in the developing world. Mobile money could become a general platform that transforms entire economies, as it is adopted across commerce, health care, agriculture, and other sectors. To date, at least 110 money mobile systems have been deployed, with more than 40 million users. The most well-known system, M-PESA, started in Kenya and is now operational in six countries; it has 20 million users who transferred \$500 million a month during 2011.<sup>1</sup> While the benefits of mobile money payment systems are clear, observers remain divided over whether mobile money systems are truly fulfilling their growth potential.

This chapter evaluates the benefits and potential impact of mobile money, especially for promoting financial inclusion in the developing world, before providing an overview of the key factors driving the growth of mobile money services. It also considers some of the barriers and obstacles hindering their deployment. Finally, it identifies emerging issues that the industry will face over the coming years.

### Mobile money: an ecosystem approach

At the most basic level, mobile money is the provision of financial services through a mobile device (box 4.1).<sup>2</sup> This broad definition encompasses a range of services, including

payments (such as peer-to-peer transfers), finance (such as insurance products), and banking (such as account balance inquiries). In practice, a variety of means can be used such as sending text messages to transfer value or accessing bank account details via the mobile internet (figure 4.1). Special “contactless” technologies are available that allow phones to transfer money to contactless cash registers.

Although mobile phones are central to all these uses, mobile money is more than just technology—it needs a cash-in, cash-out infrastructure, usually accomplished through a network of “cash merchants” (or “agents”), who receive a small commission for turning cash into electronic value (and vice versa).

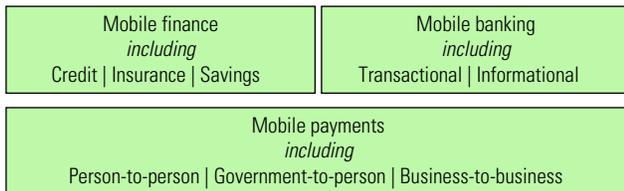
Because the mobile money industry exists at the intersection of finance and telecommunications, it has a diverse set of stakeholders, with players from different fields in competition. Mobile network operators, banks, and increasingly new entrants, such as payment card firms, continue to catalyze the industry with innovative offerings, but to be sustainable, these must be met with sufficient demand from consumers and firms—a variable missing in many contexts. A host of supporting businesses, such as agents and liquidity management firms, are also necessary. In areas where it has proved successful, mobile money has created a platform for start-ups to build upon (Kendall et al. 2011). Finally, all of this must happen in an environment with appropriate government regulations for both finance and the ICT

### Box 4.1 One device, many channels

Mobile phones are multifunctional devices that allow for a variety of communication methods. These range from ubiquitous voice and SMS channels to more sophisticated means such as software applications or web browsers. To be a viable solution for mobile money, the channel should ideally be universally available (including the cheapest mobile phones) and must be secure. In practice, this requirement largely limits mobile money to using a standard network service, such as USSD (Unstructured Supplementary Service Data) or SMS (short message system), or an application preloaded on a unique SIM card. Since mobile operators control both of these channels, they remain essential gatekeepers in deploying mobile money.

**Sources:** <http://mmublog.org/blog/on-channels/>; [http://www.ictinagriculture.org/ictinag/sites/ictinagriculture.org/files/web\\_Module3.pdf](http://www.ictinagriculture.org/ictinag/sites/ictinagriculture.org/files/web_Module3.pdf).

**Figure 4.1 Different types of mobile financial services**



**Source:** Adapted from Gencer 2011.

sector, as well as appropriate safeguards for consumer protection.

### The financial inclusion imperative

Poverty is more than just a lack of money. It involves a lack of access to the instruments and means through which the poor could improve their lives. Exclusion from the formal financial system has increasingly been identified as one of the barriers to a world without poverty. In many developing countries, more than half of households lack an account with a financial institution, while small firms frequently cite difficulty in accessing and affording financing as a key constraint on their growth. This exclusion does not necessarily mean that the poor lack active financial lives: in fact, the fragility of their situation has led to the development of sophisticated informal financial instruments. However, the use of only informal instruments means that the poor are limited in their ability to save, repay debts, and manage risk responsibly. On a macroeconomic level, these financial constraints on the

poor can slow economic growth and exacerbate inequality (Demirgüç-Kunt, Beck, and Honahan 2008).

Finding innovative models to extend financial services to the poor has now become an urgent challenge. The excitement around mobile money has arisen in part because it is widely seen as an effective way to provide access to finance to millions of people around the globe. According to the Consultative Group to Assist the Poor (CGAP), roughly 1 billion people have a mobile phone but no bank account. Providing them access to mobile financial services will involve difficult implementation that is unlikely to succeed quickly.

In addition to extending financial services to the poor, mobile money is expected to improve productivity by increasing the efficiency and lowering the cost of transactions, improving security, generating new employment opportunities, and creating a platform on which other businesses can grow.

Mobile money could transform financial inclusion. “Where most financial inclusion models have employed either ‘credit-led’ or ‘savings-led’ approaches, the M-PESA experience suggests that there may be a third approach—focusing on building the payment ‘rails’ on which a broader set of financial services can ride,” wrote the authors of one report (Mas and Radcliffe 2010). As illustrated in the next section, while benefits from the simple diffusion of an improved infrastructural “rail” are significant, even greater impact arises because mobile money systems can serve as a platform for additional innovations, whether they be bill payment services that avoid lengthy queue times or more striking examples such as efficient conditional cash transfers for drought relief or compensation.<sup>3</sup> In places where no

financial infrastructure exists, this type of change is truly transformational.

### What is the impact of mobile money?

According to data from the GSM Association, most of the 100-plus deployments of mobile money systems have been in developing countries, with around half in Africa alone (figure 4.2). Mobile money systems can be made available wherever there is wireless phone service, helping to overcome distance, as well as the lack of branch offices in rural areas (box 4.2).

Since mobile money is often linked to financial inclusion, it is vital to understand how and under what conditions mobile money applications can extend financial services to the poor. Support for mobile money initiatives from governments, nongovernmental organizations, and the international development community needs to be justified by assessing the impact on development goals such as financial inclusion, poverty reduction, increased productivity, and risk management.

Although the mobile money industry has achieved significant scale in only a handful of countries, a growing number of studies are establishing its impact in a variety of areas. Its potential advantages include benefits arising from the inherent characteristics of the services; benefits arising organically from widespread usage and network effects; and benefits arising from purposeful and innovative applications, either made by developers or created by people's uses of mobile money services.<sup>4</sup>

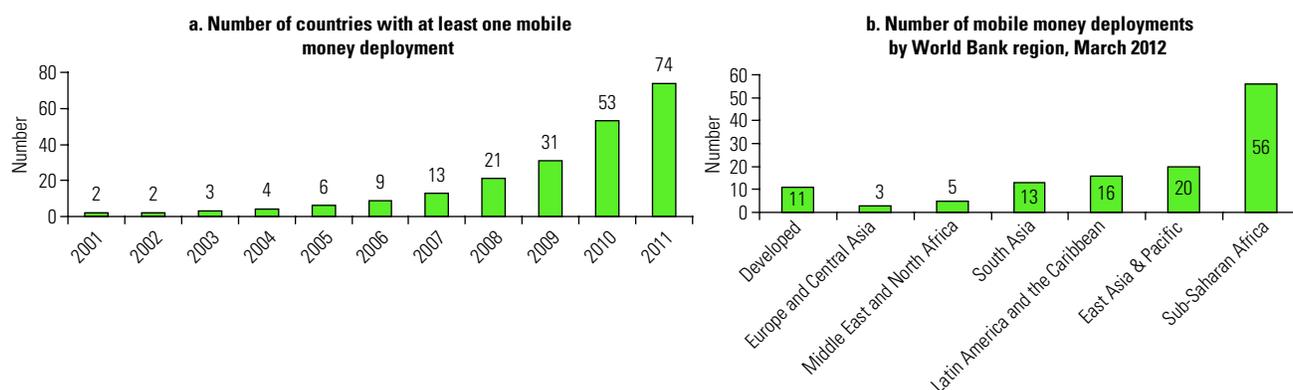
### Inherent benefits

Mobile money is often successful because it is considerably cheaper than other alternatives to cash. In an international comparison of 26 banks, McKay and Pickens (2010) found that branchless banking (including mobile money) was 19 percent cheaper on average than alternative services. At low transaction amounts or for informal money transfer options, this difference more than doubled.<sup>5</sup> In Kenya M-PESA was routinely one-third to one-half as expensive as alternative systems. Lower costs directly translate into money the poor can keep—in Kenya the amount of money remitted increased when transferred using M-PESA compared with traditional forms of remittances. Conversely, where transaction costs are high, as in Botswana where the cost per transaction is a minimum of 8 pula (\$1.07), mobile money has been slow to take root.

Well-supervised mobile money can be safer than alternatives, including cash. Early studies of M-PESA in low-income areas found that the risk of muggings declined, because cash was less evident. Because it is less visible than cash, mobile money also has consequences for privacy and autonomy. Research has found that women are able to have personal savings without seeking permission from their husbands (Morawczynski 2009), but, of course, this autonomy holds true for both genders.<sup>6</sup>

The speed and liquidity of mobile money are also key benefits. The limited assets the poor own often take the form of valuable objects (such as livestock or gold), which are relatively illiquid. In times of crisis, such assets can be difficult to realize quickly, and their value may decline if the

**Figure 4.2 Global mobile money deployments**



Source: GSMA Mobile Money Tracker 2012.

### **Box 4.2 Using mobile money**

Mobile money applications are typically small pieces of software embedded on a SIM card or available over a mobile network. A customer can use an inexpensive mobile to send value to someone else. To change this digital value into cash, a user simply visits a retail agent who verifies the user's identity and makes the switch. In this way, money can cross enormous distances at the speed of a text message. Consider a young Tanzanian who has moved to Dar es Salaam to find work. With mobile money, he can send regular, small payments to his family at their rural home without needing to pay and trust a courier or take it himself. His family can then exchange the digital value for cash at a local agent.

market floods with other families seeking to convert similar assets to cash at the same time. Moreover, sending gold bracelets or cash to a family or friend in need can be a risky enterprise. Mobile money can be an accessible and convenient medium for the delivery of financial services and more reliable than traditional, informal methods.

#### **Benefits from scale**

In some jurisdictions, mobile money has achieved critical mass, so nonusers are encouraged to adopt the systems used by their peers. When the poor are connected on a large scale, they are able to use mobile money to improve their livelihoods. The best data available on this point comes again from Kenya, where households with access to mobile money were better able than those without to manage negative shocks (including job loss, death of livestock, or problems with harvests). Whereas households that did not use M-PESA saw consumption fall by 6–10 percent on average, M-PESA users were often able to fully absorb the shocks, because they received more remittances and lost less to transaction costs (Suri and Jack 2011). Evidence of such “livelihood strategies” was also evident during the violence following Kenya’s 2007 election, during which M-PESA “became one of the only means through which [residents of Nairobi’s informal Kibera settlement] could access cash” (Morawczynski 2009). Even in less tumultuous times, mobile money at scale can serve to meet the needs of the poor: research in Kenya found that M-PESA was a useful means to access cash. Often the poor lack fungible sources of exchange such as cash, and through the network of cash agents and people’s contacts willing to send value, mobile

money allows many to get cash when and where they need it (Stuart and Cohen 2011).

Mobile money can also prove commercially significant for service providers, when it reaches scale. Although the transaction fees that mobile money providers charge are individually quite small, in total, they can represent an important revenue source. For example, Safaricom, the mobile operator that offers M-PESA, reported mobile money revenues for the first half of 2011 of K Sh 7.9 billion (\$90 million). In addition, cash agents may also gain commercial benefit from the fees they receive.

#### **Benefits from innovation**

Improving the ability of the poor to transfer money is certainly beneficial, but in isolation, mobile transfer services do not capture the full potential of mobile money to enhance financial inclusion. Early studies of South African mobile money found that while it had the potential to advance financial inclusion, it had not increased access to banking, especially compared with nontechnological efforts, such as a particular type of bank account designed especially for the poor (Porteous 2007). In Kenya, for example, the predominant use of M-PESA is still sending money, although some people use it for savings (Stuart and Cohen 2011). Access and use of more sophisticated financial services such as savings, credit, and insurance could prove far more beneficial to the poor. To develop these services, businesses, governments, and other institutions must innovate actively on top of the payment services that are being deployed by mobile money operators.<sup>7</sup>

Some organizations are deliberately using mobile money to enhance their traditional offerings. For example, during a recent drought in Niger, a set of randomly selected households received cash transfers via mobile money (Aker et al. 2011). In comparison with physical cash, this trial found lower variable costs for senders, as well as lower costs for recipients. Over the course of the crisis, recipient households also enjoyed better diets and depleted fewer assets.

Insurance, credit, and savings services are now being developed atop mature mobile money systems. Kilimo Salama is a micro-insurance product that uses M-PESA to provide payouts to smallholder farmers whose crops fail. In its second year of operation, 12,000 farmers were insured, and 10 percent of those received payouts of up to 50 percent of their insured inputs (Sen and Choudhary 2011). Likewise, Equity Bank and Safaricom have partnered to offer M-Kesho, a mobile service that offers microsavings accounts, credit, and insurance. As individuals develop financial histories with mobile money, the ability to provide credit can expand because financial institutions will be able to analyze those histories and assign credit scores.

The impact of mobile money is also likely to extend to the public sector through increased efficiency and reach. Government adoption of mobile money is still in its infancy, but a study by McKinsey for the Gates Foundation estimates that connecting poor Indian households to an electronic payment system for cash transfers would have considerable impact through reduced leakages, transaction costs, and overheads (Lochan et al. 2010). It would also improve the government's ability to monitor financial flows, collect tax revenues, and reduce illicit activity. Government use of mobile money—such as salary disbursements—could prove to be an enormous driver of the service throughout the economy on the whole.

### **Growing mobile money: challenges and success stories**

Despite a growing number of successes, the mobile money industry faces a number of challenges. Mobile money deployments in developing countries often target customers who may be poor, dispersed, and remote. Mobile money also spans two distinct industries with different business models. Telecommunications and payments are transaction-based, with fees collected on transactions; conversely, banking is float-based, with money earned through holding deposits.

Developing the necessary cross-sectoral partnerships—including bridging cultures and regulations—may therefore prove difficult.

Additionally, mobile money services represent a two-sided market, and new deployments must convince both agents (supply) and customers (demand) to sign up for the service in sufficient quantity to be viable. Building and properly incentivizing the agent network is no small task, and maintaining the necessary cash liquidity at the outlets can prove a constant challenge. Winning and retaining the trust of customers, including those who are poor and new to the technology, is central to success. Commercial viability in this industry requires scale, and operators are faced with the trade-off between higher costs to recoup their investments or lower costs to reach scale and build a mass market (Mas and Radcliffe 2010).

Despite these challenges, mobile money has grown in a variety of markets. Although the International Finance Corporation (IFC) identified more than 50 factors influencing the growth of mobile money, 3 are especially important (IFC 2011): regulation, competition with other instruments of financial access, and user perceptions and skills.

### **Regulation**

Since mobile money straddles finance and telecommunications, it faces regulation originating within two different sectors. For mobile money to develop, regulations must encourage inclusiveness, while minimizing fraud and risk. The uncertainty associated with innovative industries means that regulations must be incremental and proportional. Kenya's initial success with mobile money was arguably based on a virtual absence of formal regulation in favor of industry-government engagement (World Bank 2010). However, since mobile money services manage the limited capital of the poor, caution is essential (USAID 2010).

Successful regulation is usually marked by collaborative exchange between industry, government, and civil society. For example, regulation should allow agents outside of bank branches to handle financial transactions and develop tiered anti-money-laundering and know-your-customer (AML/KYC) requirements. To facilitate more sophisticated service offerings, ongoing regulatory development will be necessary—for example, most mobile money is regulated as “payments,” “denying e-money accounts the benefit of interest payments and deposit insurance” (Ehrbeck and Tarazi 2011). In considering these new regulatory issues,

protection against fraud and failure, including regular monitoring by financial regulators, is essential. But it is also important to remember the goal is to find ways to provide society's poor with financial services, and often mobile is the most promising way.<sup>8</sup>

### **Existing status of finance and mobile industries**

Mobile money is by no means the only instrument for extending access to finance to the poor; cooperatives, savings and loans groups, and even ATMs (automated teller machines) are popular throughout the developing world. Among the factors that will determine whether mobile money will succeed is the extent to which alternative options are accessible and desirable. In places with sophisticated financial or mobile industries, the commitment of leading firms to mobile money can do much to drive adoption of the service, but already-existing alternatives or a limited market size can limit the economies of scale necessary for mobile money to succeed. On the other hand, too low a volume of existing financial services can be a detriment for mobile money because cash agents need a way to manage their liquidity (such as traveling to bank branches, for example). In short, mobile money is one part of the solution that also requires other forms of infrastructure and resources (box 4.3).

### **User perceptions, behavior, and skills**

The success of mobile money also rests on various factors relating to end users. There may be considerable distrust of the formal financial services, or people may be uneasy about parting with their cash. Mobile money operations need to create a clear and trustworthy value proposition that fits within social and cultural practices. For example, mobile phones are widely available, but they are not universal, and many people in the developing world share or rent phones. Designing mobile money requires a careful understanding of these diverse interactions.

### **Emerging issues in mobile money**

Mobile money is a fast-moving and wide-ranging industry, but as it matures and evolves, several emerging issues are worth increased attention. This section flags these issues as a first step toward finding longer-term solutions.

#### **Technological issues**

It was technological change—in the form of less expensive phones and expanded network coverage—that made mobile

money feasible. As mobile telephony continues to evolve toward more sophisticated devices and services, the range of feasible mobile money applications will continue to expand.<sup>9</sup> Over the coming years, three technological developments will have a significant impact on mobile money: the rise of smartphones, near field communications, and biometrics.

**Smartphones.** Over the coming years, smartphones will become more widespread in developing markets. The relatively well-off and young individuals who will adopt them first will serve as important trendsetters, but adoption will eventually become more widespread. Already, in Kenya, Huawei is offering an Android-powered smartphone for under \$100, and when smartphones begin to be sold on the second- and third-hand market, they will be even more widely accessible. The enhanced capabilities of smartphones will mean that mobile money applications will move beyond channels closely controlled by the mobile operators to platforms that are more open to competition (although SMS and USSD functionality will remain important for reaching a broader base of customers). Because smartphones serve as a gateway to the internet, a broader range of applications will become available, enhancing the need for interoperability. These changes will be accompanied by opportunities, such as the chance to use graphical interfaces with illiterate populations, and challenges, such as the growth in data traffic and increased burden on network capacities. Smartphones will also drive home the importance of device-makers to mobile money.

**Near field communications.** Near field communications (NFC) is a technology that allows devices to communicate through mere proximity, usually by waving a specially equipped phone or card near a receiving device, as opposed to having to physically swipe it. NFC could serve to make transactions more efficient and secure by reducing errors, such as those that arise from mistyped numbers. In the coming years, more phones will be equipped with NFC, which is expected to become more popular for financial transactions. For mobile money, this means that transactions can be completed by waving a phone near a receiver, as opposed to having to text value to a recipient. Since NFC requires a new infrastructure to receive the payments, it may be slow to grow, but as wallets become digitized onto phones, mobile money agents and businesses may start to use their own NFC-enabled smartphones to receive payments. Already

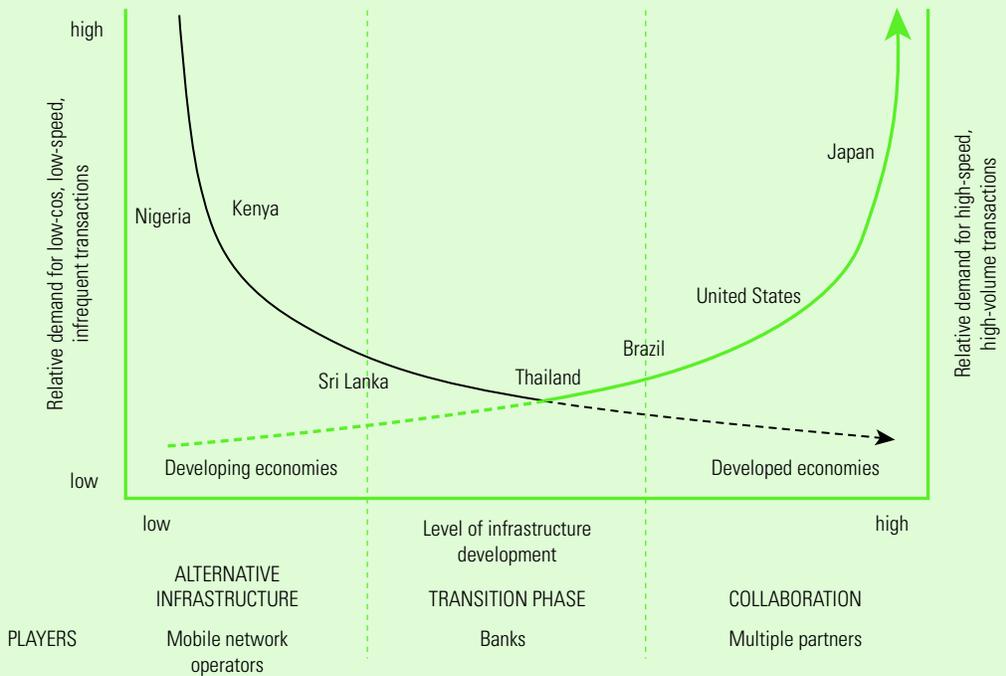
**Box 4.3 Business models for mobile money**

Although it has received both direct and indirect support from the public sector, to date, mobile money remains a private sector enterprise. To achieve profitability, mobile money providers have pioneered three general business models: mobile-operator-led, bank-led, and collaborative. Because operators control the mobile platform and have significant distribution capacity through their existing retail agent networks, it is logical that mobile money deployments will often be initiated by operators who may partner or collaborate with a bank. In some places, such as Pakistan, where the operator Telenor purchased a 51 percent stake in Tameer Micro-finance Bank, the boundaries between the two entities may be blurred.

A variety of business models exist for mobile money. Although M-PESA popularized a model based primarily on peer-to-peer transfers, mobile money systems elsewhere are quite different. For example, in South Africa, WIZZIT is an independent mobile money provider that works over all mobile networks and that has partnered with banks to provide customers with easily accessible accounts. In Thailand, the two relatively successful mobile money operations have partnered with retailers from the start and emphasize bill payment offerings.

According to the International Finance Corporation’s *Mobile Money Study*, in a given market, the business case for mobile money will be driven by those players with the strongest incentive to develop mobile money; the primary value proposition for targeted customers; and the regulation, demand, and partnership requirements. Combining these variables, the International Finance Corporation has developed mobile money demand curves that show how mobile money has different appeal in different environments.

**Box figure 4.3.1 Mobile money demand curves**



*(continued next page)*

### Box 4.3 (continued)

The black curve represents mobile money demand for developing economies. As developing countries progress, financial infrastructure develops, and competition from banks, credit card companies, and other financial institutions increases. The black curve becomes dotted because demand changes from low-cost, low-speed, and infrequent to high-speed and high-volume as represented by the blue curve. The green curve starts off dotted because developed countries already have substantial financial infrastructure, thus demand for low-cost, low-speed, infrequent transactions is low. The continuum is divided into three parts: alternative infrastructure, transition phase, and collaboration. In developing economies mobile money acts as an alternative infrastructure to existing financial services; during the transition phase mobile money moves from an alternative infrastructure to a complementary one. In the collaboration phase mobile money must fully integrate with the financial infrastructure.

Source: IFC 2011.

at the start of 2012, Absa, a large South African bank, was testing NFC deployments for its payments.

**Biometrics.** The Center for Global Development estimates that over 450 million people in developing countries have had their biometric data recorded, and this number is expected to triple over the next five years (Gelb and Decker 2011). The most ambitious biometric program—India’s Project Aadhaar, which is aiming to provide a universal ID system for all citizens, including iris scans, ten fingerprints, and a picture of each face—has been explicitly linked to financial inclusion.<sup>10</sup> These identification schemes are typically associated with security initiatives, but they are also seen as a means of improving delivery of cash by governments and development agencies. Many of these programs are in the early stages, and significant challenges abound. Deploying biometric systems can be very expensive, and ensuring high accuracy is often out of reach. Further, it is likely to raise political concerns given the implications for citizen privacy, so some countries are opting for less intrusive means of identification.

#### The changing role of agent networks

Understanding the human dynamics of a growth market is essential. Building and incentivizing networks that serve as the cash-in, cash-out point of contact, as well as customers’ primary interface with the brand, is difficult and costly. Many operators have found that existing airtime resellers are useful agents, but other intermediaries (such as large-scale retail chains or post offices) are also likely candidates. This

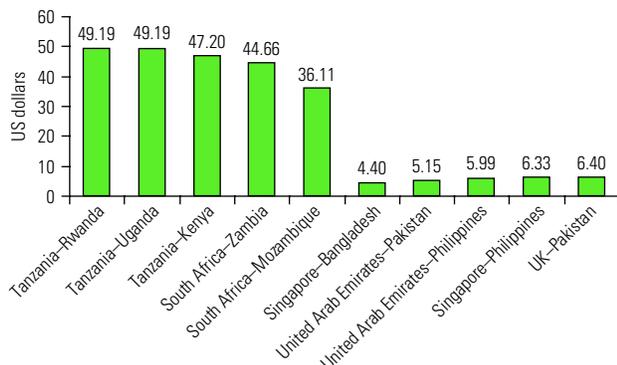
development is important because increased competition, not to mention the possibility of digital money lessening the need for cash, could reduce agents’ profits: in Kenya, M-PESA agents have already seen daily profits drop from \$5 to \$4 (Pickens 2011).

As mobile money providers have realized the importance of agents in their business models, four interlinked problems have emerged: profitability, proximity, liquidity, and trust (Maurer, Nelms, and Rea forthcoming). The agent model is founded on the exchange of cash through a franchise model, so the profitability of agents is vital for success. If the agent network grows too quickly and saturates the market, however, mobile money agents may not have sufficient transactions to remain in business. If agents’ costs for managing their cash liquidity are too high, they will also suffer. Finally, if the agents behave improperly or fail to develop relationships with their customers, the all-important client trust will not develop.

#### Internationalization of mobile money

International remittances are one of the largest sources of external financing in developing countries and often serve as a lifeline to the poor.<sup>11</sup> However, the costs of transmitting money from abroad are often large and uncertain. For example, according to World Bank data, the cost of sending money across the Tanzania-Kenya border was nearly 10 times the price of sending money from the United Kingdom to Pakistan in 2011 (figure 4.3). Easing and improving international remittances will have significant development impacts, just

**Figure 4.3 The most and least expensive remittance corridors**



**Source:** World Bank (<http://remittanceprices.worldbank.org>).

**Note:** Data is for Q3 2011.

as easing remittance transactions at the domestic level has done (Maimbo, Saranga, and Strychacz 2011). Prices are high because of underdeveloped payment systems infrastructure, inappropriate legal frameworks, and the difficulty many migrants have obtaining identification in order to access finance; a lack of transparency, competition, and consumer protection has also kept prices high. Mobile money could do much to ease this situation, but regulatory assistance and the creation of the appropriate payment systems infrastructure will be required.

Policy-makers are justifiably concerned about criminal and terrorist financing, as well as the monetary policy issues arising from illegal cross-border remittance flows, but regulators need to give increased attention to easing the policy constraints on internationalization of mobile money. Because multinational negotiations are time-consuming, smaller pilot projects could be implemented to explore how to improve the regulation of international mobile money remittances. Regions with currency unions, such as parts of West Africa, or where existing infrastructure is present, such as between Mexico and the United States, may lead the way here because foreign exchange considerations have been eliminated.

### Competition and interoperability

Additional regulatory attention is also needed for issues of competition and interoperability. Like other network industries, economies of scale and high barriers to entry could create uncompetitive market outcomes in the mobile

money industry. In cases where a mobile money service is tied to a dominant mobile network operator (as in the case of Kenya’s Safaricom, which has 68 percent of the mobile subscribers market; see Communications Commission of Kenya 2011), that operator is at an advantage in dictating the terms of the product.

The appropriate form of regulation is still emerging and will depend on context. Premature competition regulation may even stymie the growth of mobile money. As a recent World Economic Forum report noted, “initial adoption appears to be driven by constrained access to formal financial services, as opposed to well-developed institutions and competitive markets” (WEF 2011). On the other hand, waiting too long to curtail anticompetitive practices may incur social and financial costs to society.

One of the main ways to reduce mobile money market domination is through interoperability (box 4.4). Interoperability can occur at various levels: in Nigeria, where the Central Bank has been keen to avoid a dominant market player, interoperability is required at the level of the bank, the switch, and the payment channel (IFC 2011). In other countries, mobile money occurs in a “walled garden” because interoperability is not technically allowed. Consumers wishing to swap between mobile money services must have multiple SIM cards and use cash to exchange between different digital wallets (incurring time, effort, and extra fees).

Sensing a market opportunity, third-party firms are beginning to offer interoperability between different mobile money services. Because these interoperability systems are often unofficial, however, they remain tenuous. While some observers are of the opinion that consumer demand will ultimately pressure providers to allow interoperability in time (IFC 2011), others detect a potential market failure.

Mobile money operators are often reluctant to allow formal interoperability because, after investing heavily in their product, they do not want to make it easy for customers to move their money to competitors. In fact, in markets where customers frequently change mobile operators to save money, mobile money services are seen as a key way of keeping customers locked into an operator’s own network. However, it has been argued that interoperability will benefit operators by expanding the pool of customers, reducing incentives to have multiple SIM cards (and thus to make calls on competing networks), and minimizing the need for retail agents to have cash, which is costly to move around between different agents (Mas 2011). Interoperability

#### **Box 4.4** Interoperability and innovation in mobile money

The excitement surrounding successful mobile money deployments has spurred significant additional innovative activity. Surveying the landscape in Kenya, Kendall et al. (2011) found that M-PESA has emerged as a platform for a wide variety of new applications and services. Businesses have started integrating M-PESA into their activities, often to improve efficiencies and reduce costs. Other entrepreneurial ventures offer entirely new services based on the mobile phone, such as a medical savings plan from Changamka Microhealth Ltd. Finally, an entirely new category of businesses is developing; these businesses serve as intermediary bridge-builders, allowing others to integrate with mobile money. For example, Kopo Kopo is a start-up that offers smaller financial institutions and competing mobile money providers the technical means to integrate with M-PESA.

There is reason to worry that this initial flourishing is tenuous. The lack of seamless interoperability (for example, through an M-PESA application programming interface) is a common complaint, raising the costs of working with M-PESA. Because it is a proprietary service of Vodafone, the businesses building on top of the platform are highly dependent upon the choices of Vodafone and its local affiliate, Safaricom.

**Source:** [http://www.microsave.org/research\\_paper/analysis-of-financial-institutions-riding-the-m-pesa-rails](http://www.microsave.org/research_paper/analysis-of-financial-institutions-riding-the-m-pesa-rails).

may also benefit mobile money agents who currently have to maintain redundant infrastructure for each mobile money deployment they wish to serve, as well as enhancing overall efficiency gains in the economy. But because premature interoperability may limit the market's development, regulators must approach this issue with caution.

#### **Universal access and service**

The populations least likely to feel the benefits of mobile money are societies' poorest citizens because they have the least connectivity, ability to pay, and requisite skills.

Both mobile network operators and financial institutions find it commercially infeasible to operate in remote rural areas. In the realm of telecommunications, this market failure has led to universal access and service funds that aim to connect all citizens, and the rationale for extending those to programs to mobile financial services should be considered.

Because mobile money has been driven by for-profit entities, most transactions incur a fee that many poor find difficult to pay, even if they are willing to do so because of the convenience and speed of transfer. Regulators must ensure that the mobile money industry is competitive to allow well-functioning market forces to drive prices down. As

mentioned, interoperability could serve as a primary lever by which to reduce redundant costs and expand access.

Finally, many would-be mobile money users lack the necessary skills—including basic and quantitative literacy—that are necessary to fully realize the benefit of mobile money. Mobile money providers have an incentive to educate consumers about their products, and governments can support this through promoting transparent business practices.

#### **Product innovation for meaningful financial inclusion**

Today, concerns about excluding the poorest from mobile money are premature in most developing countries. Despite the runaway success of a few deployments, in the vast majority of cases, mobile money services have struggled to achieve the scale at which they might raise distributional concerns.<sup>12</sup> Surveying the globe, CGAP found that only one in four branchless banking services (a broad category that includes mobile money) had more than 1 million registered customers, and of those launched since 2007, only 1 in 15 has more than 250,000 active customers (Fathallah, Mino, and Pickens 2011). Furthermore, customer use of many mobile money services remains low—often only a couple of

transactions a month. In many cases, the transaction fees remain too high to enable mobile money to replace cash for petty purchases.

At the moment, however, a “product gap” exists in most countries between the financial services the poor are being offered and the services they want (Morawczynski and Krepp 2011). The model so successfully pioneered by M-PESA—starting with peer-to-peer transfers—has been widely replicated but may not fit well in other contexts. For example, an extensive ATM network already meets many of the consumer financial needs in Thailand. By definition, mobile money will not have a comparative advantage in every location or for every service, so the business environment must be enabling and open to allow businesses to pioneer new forms of mobile money tailored to local circumstances.

Product innovation is also essential to realize the full potential of mobile money. Currently, only 1 in 8 branchless banking deployments offer functionality beyond basic peer-to-peer transfers and e-wallet services. Indeed, the IFC’s study of mobile money in Brazil, Nigeria, Sri Lanka, and Thailand found that the most popular uses for mobile money were essentially moving money over *distance*. However, customers also want the ability to move money over *time* (in the form of savings, insurance, and credit). As argued above, simply formalizing people’s finances onto the mobile platform falls short of meaningful financial inclusion—for that, the simple “additive” models of mobile money (where mobile is just another channel) is to move to “transformational” mobile money (where finance is extended to those previously unbanked, excluded populations) (Porteous 2007). While a mobile payment infrastructure is a first step, tailored products and services that enable the poor to better manage and capitalize on their assets must follow.

### **Mitigating the growing pains**

In celebrating mobile money as a disruptive innovation, it is important to remember the second half of that phrase. The introduction of technology into communities can upset existing practices, sometimes causing stress or worse. Although humans are adaptive and generally adopt mobile money willingly, it is worth being on guard for undesirable disruptions from innovation. For example, ethnographic work from Kenya suggests that mobile money users in Nairobi who had previously traveled frequently to family in rural areas did so less often after they began to use mobile

money, leading to family troubles arising from worries about their whereabouts, potential infidelity, and financial stress.

Another example might be the use of mobile money in microfinance. Many microfinance supporters believe that the social pressures exerted through face-to-face group meetings are essential for generating the high rates of repayment that make microfinance viable. If they are correct, the disintermediation created by mobile money could prove harmful to microfinance. The Gates Foundation argues that bringing together different models such as banks, co-ops, savings-led groups, and mobile money could leverage their respective strengths, instead of “creating a single synthetic model” (WEF 2011).

Finally, as mobile money matures, people are increasingly discussing the “cashless society.” Although that is unlikely, mobile money may displace many uses of cash. Already, the Central Bank of Nigeria is promoting “cashless Lagos” in an effort to reduce the amount of cash circulating in the economy in favor of electronic transactions, including direct credit and debit, payment cards, internet-based services, and mobile money. The U.S. Agency for International Development, too, is arguing for adopting alternatives that are “better than cash” (USAID 2010). If this trend toward replacing cash continues, financial transactions could become uniquely identified and recorded, introducing complexities for consumer privacy. Others have suggested that the provision of money by private companies over private infrastructure risks undermining an important function of the public sector, namely, that the means of value transfer are not “owned” by anyone.

## **Conclusions**

Many of the characteristics that make mobile money so promising—its scale and impact, its varied uses, and the novelty of its role—are also reasons why achieving these hopes is so difficult. While exciting, the success of a few mobile money deployments should not shelter the fact that those examples remain the exception, not the rule. With this caution in mind, governments, donors, and industry have good reason to support the creation of vibrant mobile money services that include the world’s poor in financial markets and allow them to manage and use their own money. Although far from the only mechanism, mobile is certainly one of the most powerful means by which to realize this promise.

## Notes

1. *Vodafone Annual Report 2011* ([http://www.vodafone.com/content/annualreport/annual\\_report11/business-review/strategy-in-action/focus-on-key-areas-of-growth-potential/emerging-markets.html](http://www.vodafone.com/content/annualreport/annual_report11/business-review/strategy-in-action/focus-on-key-areas-of-growth-potential/emerging-markets.html)).
2. Mobile money can be considered a subsector of a wider industry—branchless banking that uses a variety of methods and technology to extend financial access.
3. An example of the latter is the World Bank–funded initiative to use mobile phones to compensate ex-combatants in the Democratic Republic of Congo; see [http://www.mdrp.org/PDFs/In\\_Focus\\_3.pdf](http://www.mdrp.org/PDFs/In_Focus_3.pdf).
4. For additional information on the adoption and impact of mobile money, see Institute for Money, Technology and Financial Inclusion (<http://www.imtfti.uci.edu>) and the Financial Services Assessment project (<http://www.fsassessment.umd.edu/>).
5. In reality, the savings are likely even greater for mobile money because this study grouped mobile money with other methods of branchless banking and did not account for the savings arising from the reduced travel.
6. At the same time, anecdotal evidence suggests that the need to go to an agent to cash in or cash out can advertise a person's relative wealth, perhaps increasing risk.
7. Despite the justifiable promise of such approaches, a word of caution is worthwhile. Innovation implies the possibility of failure, and given the precarious situations of the poor, entities wishing to improve the poor's financial situation through mobile money must take every caution to understand the risk involved; see, for example, USAID 2010. As is evident with other industries working with the poor, changing incentives and policies can result in disaster. Furthermore, creating dependencies on private infrastructure can be disastrous in the event of bankruptcy or other disruptions.
8. For additional information, see the regulatory resources from the Consultative Group to Assist the Poor and Chatain et al. (2011).
9. Although device innovation gets the majority of attention, larger developments, such as cloud computing or network standard negotiations, could serve as the underlying infrastructure for mobile money.
10. However, high-profile disputes around the program in December 2011 emphasized the clashes that are likely to emerge with large-scale biometric programs.
11. Although international remittances are expected to become increasingly important to the mobile money landscape, it is essential not to lose sight of the opportunity presented in the market for domestic remittances. Kendall and Maurer (2012) document nationally representative surveys of eight African countries and “a vast and untapped domestic payments market”

with 64 million people in the surveyed countries not using any formal remittance instrument.

12. Of course, this is not to say that these subscale examples will not, in the future, raise those concerns. Indeed the very purpose of this section is to consider that possibility.

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