

IFC Mobile Money Study 2011

SUMMARY REPORT



In Partnership with the Republic of Korea



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**International
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Foreword

Financial inclusion—access to a range of financial services and products for everyone needing them, in a fair, transparent, and cost-effective manner—is a goal of IFC (International Finance Corporation) and a priority of the Group of 20 development agenda.

IFC has committed to achieving greater financial inclusion by 2013 by providing more diversified financial services and by deepening outreach to microclients and small and medium enterprises. IFC also helped support and shape the G20 global financial inclusion agenda that calls for the promotion of a range of financial services beyond credit—including payments, savings, remittances, and insurance.

More than 2.7 billion people in developing countries do not have access to basic formal financial services, such as savings and checking accounts. Many governments have made savings accounts widely available, but to make payments and transfer funds, the poor must often depend on costly and unreliable informal financial services. Low levels of financial inclusion also represent an obstacle to economic development.

Developing innovative methods of retail payments is essential to increasing financial inclusion. New technologies and new business models are opening new methods of retail payments, as well as bill payments and transfers of funds among people and businesses.

Mobile technology is a channel that, once in place, allows for the delivery of other low-cost financial services bringing banking to unbanked and underserved people. Mobile money—the transfer of funds using cell phones—is an innovative method for both individuals and small businesses to transfer money. Mobile money is becoming common in developed countries for small, frequent payments such as mass transit fees. In some developing countries, it offers an opportunity for unbanked people to pay bills and transfer funds without using cash. Some businesses use it throughout their supply chain.

Why has the development of mobile money systems been so successful in some countries, yet seem blocked in others? What can be done to encourage its development globally?

This report looks at the technology required and the business models used by mobile network operators, banks, and others in four developing countries—Brazil, Nigeria, Sri Lanka, and Thailand. It compares these countries with Kenya and Japan, which have successfully developed mobile money operations, and with the United States.

Perhaps more importantly, it offers a framework for a quick market study of a country to determine whether or what type of mobile money services might be developed commercially. It offers models of user perception and demand surveys, then develops a set of parameters—such as regulatory

environments, current access to financial services, and the requirements of potential mobile money service providers to run viable businesses—that can spur or block mobile money development. By using these survey techniques and examining the relevant parameters, a government or development agency can assess a country's potential for a successful mobile money business.

We hope this report will contribute to mobile money business development globally. It is intended for regulators, mobile network operators, commercial banks, microfinance institutions,

telecommunications equipment and handset manufacturers, and others that could be involved in the development of mobile money businesses.

I would like to express sincere thanks to the government of the Republic of Korea for its support of this study through the Korean Trust Fund.



Peer Stein
Global Business Line Leader
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This study was commissioned to increase understanding of mobile money (m-money) and help address key issues in scaling up further development of m-money ecosystems globally.

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Abbreviations

2G	second generation
3G	third generation
ATM	automated teller machine
B2B	business to business
BRT-lite	Bus Rapid Transit
CGAP	Consultative Group to Assist the Poor
e-money	electronic money
e-payment	electronic payment
e-PIN	electronic personal identification number
e-wallet	electronic wallet
FEBRABAN	Brazilian Federation of Bank Associations
G2P	government to person
GDP	gross domestic product
GPRS	general packet radio service
GPS	global positioning system
GSM	global system for mobile communications
HHI	Herfindahl-Hirschman Index
IFC	International Finance Corporation
JR-East	East Japan Railway Company
KYC	know-your-customer
m-banking	mobile banking
m-money	mobile money
m-payment	mobile payment
MFI	microfinance institution
MNO	mobile network operator
NFC	near-field communication
P2P	person to person
POS	point of sale
SIM	subscriber identity module
SMS	short message service
STK	SIM Toolkit
USSD	unstructured supplementary services data
WAP	wireless application protocol
WCDMA	Wideband Code Division Multiple Access

Exchange rates used are the average exchange rate for the respective currency for the year 2010.

Executive Summary

Mobile money (m-money) refers to the use of mobile phones to perform financial and banking functions. It can be used to assist the billions of people who have little or no access to traditional financial services. Where the service is available, users can securely receive funds, pay bills, make bank transactions, transfer funds, and purchase goods and services.

Half the households in the world do not have access to financial services. The poor often must rely on informal financial services that may be more costly and less reliable. Low levels of financial inclusion represent an obstacle to economic development. Consequently, financial inclusion has become an important topic in the development agenda (CGAP and World Bank Group 2010).

M-money services have flourished in some countries, both developed and developing, but not in others. Why? What are the drivers for success and the barriers that block success? How can one recognize whether a new market will blossom if given a strategic push or whether a situation is too challenging?

This study was undertaken to increase our understanding of how m-money systems develop and to address key issues in scaling up m-money adoption. It first reports on a survey of user and nonuser perceptions and the types of demand expressed

for m-money. Then it looks at several parameters that could spur or block m-money development, such as national regulatory environments, current access to financial services, and the requirements of potential service providers to run m-money services as viable businesses.

Four countries—Brazil, Nigeria, Sri Lanka, and Thailand—each of which represents a different world region, socioeconomic situation, and financial context, were visited and analyzed in terms of m-money business models, major money flows and demand, user and nonuser perceptions and behavior, regulations, and agent networks. We also studied the two most successful m-money countries—Kenya in the developing world and Japan in the developed world—to compare them with the four countries in our study. The United States was included as a reference point and as an advanced country in terms of electronic payment (e-payment) cards (e.g., debit and credit).

M-money business models vary widely in the four countries studied, due to country context, stage of financial sector development, and the market and competitive landscape. Because of this complexity, many analysts have looked at m-money business models from the perspective of the main players. This perspective has led to three basic categorizations of business models: mobile network operator (MNO) –centric, bank-centric, and collaborative, depending on which player takes the initiative. We then developed a progressive model

of how m-money businesses tend to develop as a country grows in financial and technological sophistication. In a developing country, it is most common for an MNO to initiate the service but to later partner with a bank for enhanced financial services. We predict an eventual move to country-wide interoperable platforms that allow transfers of funds among services with different operators and different banks.

Based on our findings, we propose the best possibilities for investment in m-money in the four countries studied and can identify areas that hold little promise under current conditions. We have also developed a theoretical framework and methodology that is a powerful tool for assessing any country's m-money development potential. It provides insight into the type of business model most appropriate in a specific country context, the sort of partnerships needed, the type of regulatory environment required to enable m-money development, and—finally—the developmental paths that m-money might take.

Defining Mobile Money

There are many definitions of electronic money (e-money) and m-money. For this report, we have defined them as follows:

- **E-money** is the broader concept and refers to payments made using prepaid cards, debit and credit cards, loyalty cards, automated teller machine (ATM) cards, gift cards and store cards, as well as mobile phones and near-field communication (NFC) –enabled cards.
- **M-money** is a subset of e-money. It refers to financial services and transactions made on a mobile phone. These services may or may not be tied directly to a personal bank account.

Value Proposition of Mobile Money

Many types of cards (e.g., debit, credit, prepaid, ATM) potentially compete with m-money. To assess the opportunities for m-money, it is necessary to understand how m-money is different

from these cards. The main differences (and therefore the value proposition) are as follows:

- More people own mobile phones.
- A mobile phone is an interactive device on which the customer can check account balances and credit information, and can make transactions. A card is a simple payment instrument, typically not allowing its user to check account details or transfer money between accounts.
- A mobile phone has other functions such as communication, whereas a card's key purpose is as a payment instrument.
- A mobile phone allows remote, non-face-to-face payment without an additional device. In contrast, a card requires a point-of-sale (POS) terminal, the Internet, or a phone for remote payment. Thus, with m-money services, the consumer has not only the device but also the communications channel.

Both payment cards and m-money reduce the use of cash. Although prepaid cards can be useful for people without bank accounts, m-money has a higher potential to provide a wider range of financial services for the unbanked.

Payment cards and m-money are sufficiently similar that, in some potential m-money market segments, the opportunity could be realized by either one. Public transport is an example. Either cards or phones with NFC technology, which make a transaction when swiped over a receiver, can be used to make fast transit payments and keep rush-hour lines moving. Similarly, face-to-face retail payments could be made either by NFC cards such as Visa payWave or by m-payment with NFC-equipped phones.

The value proposition of m-money depends on whether a country is developing or developed. In a **developing country**, the financial infrastructure is likely to be poor, with a limited number of payment instruments, as well as a larger unbanked population. M-payment may be the only viable *alternative* to cash for large segments of the population.

Conversely, in a **developed country** with a well-developed financial infrastructure, there is likely to be a wide range of payment instruments, such as credit cards, debit cards, prepaid cards, checks, and direct debit. M-money is used mainly to pay for high-volume, quick transactions, such as public transport or face-to-face retail payments, mostly through NFC-enabled phones. M-money is a *complement* to other forms of payment—it is yet another convenient (often faster) way of paying for services.

Insights from Kenya, Japan, and the United States

Kenya is the most successful developing country in using m-money, and Japan is considered the most successful developed country in this regard. The United States was included as a known reference point. It is one of the more advanced countries in terms of e-payment cards such as debit and credit cards. In these countries, we looked for trends that might emerge in the four countries studied in depth and to situate the four countries into the wider context of developments in m-money.

Table ES.1 compares key metrics for m-money in Kenya and Japan.¹ Two key points emerge. The first is that m-money is used for different purposes in the developing versus the developed world. Japan has more transactions of a lower average value, while Kenya has fewer transactions with a higher average value. In the developing world, m-money is mainly used as a replacement for less-secure cash, especially in countries with a poor financial infrastructure. Funds can be transferred with relatively basic mobile phones using short message service (SMS) technology. In the developed world, the major requirement is for fast, convenient micropayments, particularly with NFC technology. As a country develops, it may use m-money initially as an alternative to cash. As m-money is integrated into the growing financial

sector, the opportunity may emerge for fast, NFC-enabled micropayments.

The second major point is that our data may indicate that in countries with an existing e-money infrastructure, m-money uptake will have difficulty reaching the same level of importance as it might in countries with limited e-money infrastructure. Table ES.1 shows that even though the Japanese gross domestic product (GDP) per capita was nearly 45 times larger than the Kenyan GDP per capita, the value being processed through m-money in Kenya was larger than in Japan. Between March 2009 and March 2010, 3.3 percent of Kenya's GDP was processed as m-money, compared with only 0.05 percent of Japan's GDP during the same period.² (In terms of all *e-money*, Japan processes about four times more than Kenya.)

Several similarities between Kenya and Japan

Table ES.1 Key Metrics for Mobile Money in Japan and Kenya

Metric	Japan	Kenya
GDP per capita	38,271	859
Value of m-money transactions	2.90 billion	4.26 billion
M-money as % of GDP	0.05	13.33
Number of m-money customers	18,500,000	9,483,408
Number of transactions	267,840,000	177,688,005
Average value of transaction	9 ^a	24 ^b

Sources: IMF, Bank of Japan, Safaricom, Telecommunications Carriers Association of Japan.

Note: Monetary values are US\$.

a. Data are from March 2009. The annual growth rate from March 2008 to March 2009 has been used to increase the size of the market until March 2010 to make it comparable against M-PESA.

b. M-PESA data are from March 2010.

explain why both are successful models of m-money.

- Most importantly, both countries provide the major economies of scale needed for m-money to succeed.

¹ We did not include the United States in this comparison because, although it has a few m-money providers, their data are insignificant compared to its economy and to the figures for both Japan and Kenya.

² The size of the Japanese m-money market was estimated as of March 2010 based on figures from the Bank of Japan for March 2009.

- In both countries, dominant players were able to capture a large market share. In Japan, there was a dominant mobile phone company, a proprietary NFC technology, a dominant credit card company, and a dominant public transport company in and around Tokyo, all working together. In Kenya, the dominant mobile phone operator developed a popular money transfer system called M-PESA, which allowed person-to-person (P2P) transfers in a country where few people had bank accounts.
- Both countries have massive addressable markets. In Japan, there were 2.3 billion monthly transactions for public transport in 2010 (compared with 858 million in the United States). In Kenya, there were 14.4 million unbanked adults in 2009,³ representing more than 77 percent of all adults in the country.
- In both countries, the regulatory situation did not hinder m-money development. In Kenya, agents that supply financial services through mobile phones enjoy more permissive regulations from the central bank. In Japan, the government supports m-money: it owns 63 percent of the stock of the largest MNO (NTT DOCOMO 2010) and only sold its shares in the largest commuter transit company in 2006. It supported NFC as the standard technology for payments.
- Initially, in each country, a single popular use—public transport in Japan and P2P transfers in Kenya—flourished, allowing the addition of other services later.
- Both countries have a large acceptance network for m-money: East Japan Railway Company (JR-East), Japan's commuter giant, was able to establish acceptance among commuters in metropolitan Tokyo, the largest city in the world with more than 35 million inhabitants. Kenya's mobile phone financial services operator has more than 18,000 agents.

The United States faces a more challenging environment for m-money development. It already has a large noncash infrastructure: 53 percent of the monthly volume of payments is card based, whereas only 36 percent is paper based (check and cash) (Foster et al. 2009). It also has a competitive—thus more fragmented—mobile market, with the largest market share being 30 percent (for AT&T Wireless).

If major economies of scale do not exist, either because the market is very fragmented or because of a predominance of e-money use—both of which apply in the United States—there is a requirement for the various players to come together and create a single, interoperable platform. It is a very challenging proposition to bring all key players together and create the necessary cooperation for a shared platform or interoperable approach, while at the same time allowing players to compete and make a convincing business case to invest into an additional payment platform.

The Federal Reserve Bank of Atlanta noted in a discussion paper, “One challenge for stakeholders is to decide collectively on the rails and infrastructure [for m-money] while considering cost issues. Attempting to establish different payment infrastructures at the same time may not work well” (Federal Reserve Bank of Atlanta 2010, p. 6). Therefore, “it is not at all clear that market forces acting on their own will get the United States [to significantly adopt NFC or contactless payments], or produce the completely open, interoperable system needed; certainly not anytime soon” (Ezell 2009, p. 42).

Interoperability among both mobile phone operators and banks is an ultimate goal for m-money services, but it is difficult to achieve in the beginning when a company is struggling for market share. It may be easier to achieve later based on growing demand from consumers. Interoperability includes both technical cooperation among service providers and cooperation among financial service providers. It seems easiest to achieve when one operator or operator-bank partnership is dominant and sets the standard for others to follow.

³Those with access to formal financial services only.

Major Money Flow Estimates

This study examined major money flows providing an indication of demand for m-money. Potential demand is found in the following:

- Government-to-person (G2P) payments
- P2P transfers
- Payroll payments from small companies in the informal sector
- Public transport payments
- Bill payments to major utilities (e.g., electricity and water), postpaid mobile accounts, fixed phone subscribers, pay TV (cable and/or satellite)
- Retail payments
- Business-to-business (B2B) payments
- Credit and microfinance
- International remittances
- Savings.

Table ES.2 summarizes monthly transaction volume estimates (not value) in each country for the first five items, showing m-money opportunities. However, since m-money must compete with both traditional payment methods and other e-money options, it is unlikely to capture all this potential demand. The table also shows the number of unbanked persons in each country.

Government-to-Person Payments

To have a potential opportunity for G2P payments, a country needs to be wealthy enough to have a social transfer program, but still have a considerable part of the population without banking services. A recent study estimates that almost 75 percent of the 1.3 billion people living on less than US\$1.25 per day actually reside in middle-income countries (Sumner 2010). This finding supports the government-to-person payments opportunity, because middle-income countries are likely to have or develop social transfer programs.

Person-to-Person Transfer of Funds

Although there is demand for P2P money transfers in every country (e.g., 38 million households in the United States transfer funds to individuals), most developed countries have other electronic means (such as online banking) to accomplish these transfers. Thus, P2P fund transfers is a major opportunity only where financial access and infrastructure are limited, such as in Kenya and Nigeria.

Informal Sector Payroll Payments

Similarly, the opportunity to use m-money for payroll depends on the size of the country's informal workforce and its developmental stage of financial access and infrastructure. Nigeria has a

Table ES.2 Summary of Potential Monthly Transactions in Quantified Market Segments

Type of transaction	Brazil	Nigeria	Sri Lanka	Thailand	Japan	Kenya	United States
G2P payments	16,666,667	40,000	1,600,000	646,800	3,840,000	60,000	4,530,451
P2P transfers	12,020,263	46,252,000	Unknown	Unknown	Unknown	14,400,000	38,000,000
Payroll (informal sector)	48,081,050	37,821,000	4,708,418	20,988,000	594,000	11,610,000	11,338,400
Public transport	1,421,900,000	10,000,000	264,000,000	58,873,333	2,273,326,417	2,450,000	858,000,000
Bill payments (utilities)	164,311,579	21,650,000	6,440,168	13,404,916	80,365,315	1,075,038	111,000,000
Unbanked persons	Unknown	46,000,000	4,885,396	5,869,461	Very small	6,114,900	20,582,400

Source: Appendix B data tables.

sizable opportunity: anecdotal evidence suggests that larger companies already use electronic cards for temporary and other workers.

Public Transport Payments

Public transport presents a significant opportunity in Brazil and Sri Lanka, whereas the United States is challenged by fragmentation in that market segment. Because using m-money for public transit depends on investment in NFC-enabled cards or phones and an NFC payment infrastructure, a more detailed cost-benefit analysis is required to determine whether economies of scale are large enough to support a business case.

Bill Payments

The bill payment market is large in Brazil and the United States, but both markets already have highly functioning bill payment channels, and thus are unlikely to need an m-money solution. Only countries such as Nigeria, where bill payment channels are limited, offer a sizable opportunity for m-money.

Parameter Analysis

We identified and examined numerous parameters that might affect m-money development, and clustered them into 8 categories and 50 subcategories. These parameters and our methodology are described in detail in the report and can be used to analyze the m-money market potential of other countries.

The most important parameters in the four countries studied are as follows:

- **Regulation**, which often determines whether, and under what conditions, incentivized players are able to provide m-money services
- **People's current access to financial services**, which determines the size and type of opportunity; if many options already exist, m-money may not be perceived as a need
- **Existing mobile market situation**, which influences investment appetite and capability
- **User perceptions**, in particular, users' financial literacy and their trust in m-money providers.

All parameters are issues that firms entering the m-money space must confront and either use to their advantage or overcome. In evaluating a country's readiness for m-money, these parameters provide a comprehensive picture of the m-money environment. This picture, in turn, can provide the insight necessary to identify practical recommendations for how m-money should be implemented.

Survey Findings

To understand user behavior and perceptions, we compared the demographics of m-money users and nonusers in the four studied countries and conducted surveys that asked questions about how people use m-money services as well as their general money-related behavior.

The socioeconomic profile of m-money users was found to be linked to their country's stage of financial development. In financially less-developed markets like Nigeria and Sri Lanka, m-money users were better off, educated early adopters. In Brazil and Thailand, where there is a more advanced financial system and a smaller proportion of unbanked and/or underserved people, most m-money users were less well-off and unbanked and/or underserved financially. In Thailand, this segment included students.

The type of m-money services used by survey respondents differed among countries, indicating that, based on a variety of parameters, m-money opportunities are country specific (table ES.3).

Other important insights from the surveys include the following:

- Marketing and literacy campaigns assist the adoption of m-money services.
- The use of data-related mobile phone services (from basic services such as SMS and SMS alerts to e-mails and Internet browsing) and data-capable mobile phone models, such as general packet radio service (GPRS) are

Table ES.3 Most-Used Mobile Money Services in Four Countries

Country	Top-ranked use	Second-ranked use
Brazil	Airtime recharge	Store purchase
Nigeria	Balance inquiry	Fund transfer
Sri Lanka	Special mobile application to schedule doctor appointments	Bill payment
Thailand	Fund transfer	Airtime recharge

Source: IFC Mobile Money Study 2011.

obviously important for adoption of m-money services (as well as an indicator of m-money readiness).⁴

- Most users heard about m-money *directly*—either from the bank, or from the mobile phone company through a call or SMS text message—whereas most nonusers heard about m-money *indirectly* through mass media. This difference might mean that a direct and personal approach is more effective in increasing the adoption of m-money services.
- In the two countries with less extensive financial services—Nigeria and Sri Lanka—cost and time savings were perceived as important by nonusers. M-money was more valued as an alternative to existing financial services, offering cheaper and faster service. In the two countries with more advanced financial sectors (Brazil and Thailand), cost and speed were less important; the value of m-money was seen as increased convenience within the existing financial sector.

Opportunity Analysis

Table ES.4 shows the potential of several m-money market segments assessed based on a combination

⁴ GPRS is a 2G/3G wireless data service that extends global system for mobile communications (GSM) data capabilities for Internet access, multimedia messaging services, and early mobile Internet applications via the wireless application protocol (WAP), as well as other wireless data services.

of parameter and demand analysis for each country. **Sri Lanka** offers the most immediate opportunities. The main obstacles to exploiting these opportunities are access to the required investment for the mobile operators and development of detailed implementation strategies.

Nigeria has massive opportunities for m-money in P2P transfers, payroll for informal workers, and utility payments; it could become a second Kenya. However, until the recent licensing of 16 service providers, including a partnership with an MNO, players with experience in rolling out m-money services in other countries had been sidelined by regulations. Because regulations prevented MNOs from leading m-money initiatives instead forcing them to partner with banks, the MNOs have had

Table ES.4 Opportunity Analysis Summary

Potential market	Brazil	Nigeria	Sri Lanka	Thailand
Bill payments (utilities)	■	●	▲	▲
P2P transfers	▲	▲	▲	▲
G2P payments	▲	■	●	■
Payroll (informal sector)	▲	▲	●	▲
Public transport	▲	■	▲	▲
B2B payments	▲	▲	●	▲
International remittances	■	▲	●	■
Credit and microfinance	●	▲	●	■

Source: IFC Mobile Money Study 2011.

Note: ● = significant and unrealized opportunity for m-money: many of the preconditions for m-money exist, such as demand, supportive regulation, and an identifiable group of customers; ▲ = potential opportunity but there are substantial challenges; ■ = unlikely to be any m-money opportunity due to lack of economies of scale or other constraints.

less incentive to become active. The recent licensing could provide the MNOs more incentive and create a major opportunity for m-money.

In **Brazil**, the biggest opportunity is public transport, where 1.4 billion monthly transactions might justify NFC deployment. Another real opportunity is microcredit. Other possible opportunities are P2P transfers and payment of informal workers; however, there is insufficient information to assess these two opportunities.

Thailand, with three existing m-money providers and its sophisticated financial infrastructure, provides few additional m-money growth opportunities.

Business Models

The main questions in developing a viable business case for m-money in the four countries in this study, as well as in other countries, are as follows:

- Which players have the clearest and strongest incentive to develop m-money services: mobile phone company operators, banks, or third-party providers?
- What is the main value proposition for potential clients: lower-cost services (cost leadership); better, more convenient, and different services (innovation and differentiation); or targeting services to a specific group, for example the unbanked or rural population (segmentation)?
- What is possible in each country, in terms of the following:
 - **Regulation.** Is the most incentivized player also allowed to provide m-money services?
 - **Demand.** Is the market large enough to warrant the cost and investment of establishing an m-money service?
 - **Partnership requirements.** Can the incentivized player establish an m-money service by itself or does it need major partnerships?

Business models vary widely in the four studied countries because of their different contexts, varied stages of financial sector development, and market

and competitive landscapes. Because of this complexity, we looked at the m-money business model from the perspective of the main players.

The basic models are MNO-centric, bank-centric, and collaborative (including third-party players). In the **MNO-centric model**, the MNO takes the lead and provides various financial services initially outside the banking system. In the **bank-centric model**, a bank takes the lead and finds an MNO with which to partner. In the **collaborative model**, an MNO and a bank join forces to create an m-money service.

These basic models have variations, and they evolve over time. An MNO-centric venture will, over time, increase its partnership with banks and possibly develop into a collaborative model. Kenya's M-PESA is a good example of this. The models are linked to certain stages of financial development in each country; thus, they are dynamic rather than static. Based on these country studies, we have developed a hypothesis of progressive development for m-money models.

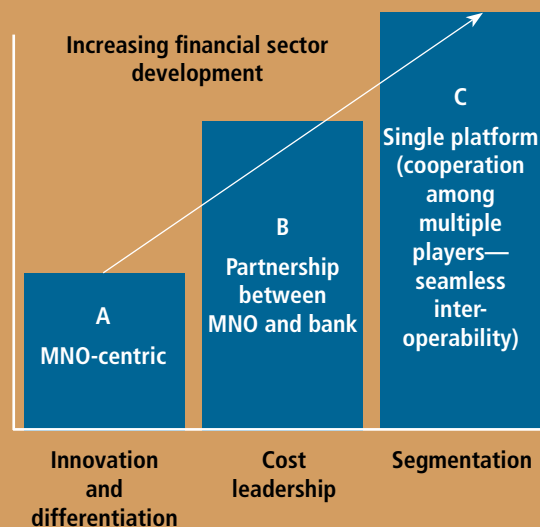
Hypothesis of Progressive Development

Figure ES.1 depicts our hypothesis of progressive development beginning with an MNO-centric model. The bars show how the business tends to develop as the country's financial sector develops. The changes in marketing strategy at each stage are noted along the bottom.

Mobile Network Operator Initiates Mobile Money Service

In countries like Kenya and Nigeria, with low financial infrastructure and high unmet demand, the MNO is the most able and incentivized player to develop an m-money business. It controls the infrastructure—both the communications network and the distribution network—that can become an alternative to the underdeveloped financial infrastructure, and has “ownership” of its subscribers. An MNO can provide at least some m-money services by itself, without a bank affiliation.

Figure ES.1 Hypothesis of Progressive Development of MNO-Centric Model



Source: IFC Mobile Money Study 2011.

Its competitive strategy is likely one of innovation and differentiation—offering services that did not previously exist such as electronic P2P fund transfers using a mobile handset.

Kenya's M-PESA service is the best example of an innovative MNO capturing a large market share. (See A in figure ES.1.) In some countries, a bank took the lead to start an m-money service, but, in contrast to the MNO-centric model, a bank requires an MNO partner from the outset.

Partnership between Mobile Network Operator and Bank

The next developmental stage is represented by countries like Sri Lanka and Thailand, with a more developed financial infrastructure and a relatively smaller unbanked population. At this stage of development, there is pressure for the MNO to integrate its financial services with the existing financial sector. A partnership with a bank becomes important for a viable business model. (See B in figure ES.1.)

For example, as the sophistication of the Kenyan consumer grew, the complexity of the model increased and collaboration with a bank became critical. There are several examples in Kenya, such

as the MNO Orange, which launched Iko Pesa, a full-featured mobile bank account (Rotman 2010), in partnership with Equity Bank. Because of its relation to a bank, Iko Pesa is not subject to the same transaction limits on accounts as is an MNO that is not linked to a bank. Thus, it is able to provide more complete services. Also, M-PESA launched a partnership with Equity Bank called M-Kesho, although this was not a full-featured banking service like Iko Pesa.

As some banks partner with MNOs, they present increasing competition to traditional banks with no m-money services. Competition is increasingly based on cost, since consumers have more choices to access financial services (e.g., mobile phones, ATMs, debit cards) and are looking for the best price. Thus, to attract subscribers in an increasingly competitive market, financial service providers are competing on cost.

Interoperability

In countries like Brazil, Japan, and the United States, the financial sector has reached a certain degree of sophistication, efficiency, and competitiveness. Overall, the unbanked market is smaller in these countries, making it necessary to target both banked and unbanked markets to reach economies of scale. The high levels of competition mean that it is harder for a single player or single bank-MNO partnership to reach the necessary economies of scale. The sophistication of clients requires a higher degree of interoperability. Thus, these countries would likely accelerate the uptake of m-money if they could develop a multiplayer collaboration and/or interoperability. (See C in figure ES.1.)

Japan, due to its unique circumstances, was able to create economies of scale because it could establish dominance throughout the value chain. However, most countries, like Brazil and the United States, are more fragmented and require collaboration among several players to reach economies of scale. This situation has been acknowledged by the Brazilian Federation of Bank Associations (FEBRABAN), and by experts in the United States such as the Federal Reserve Bank of Atlanta.

As m-money services become more common and more sophisticated, companies will segment their markets and offer each segment specialized services. Rather than focusing on one area of demand, as a start-up MNO m-money operation must, mature m-money companies can offer multiple services in specific demand areas.

Conclusion: Mobile Money Demand Curves

M-money has different value propositions in different countries. In some countries, such as Kenya and Nigeria, the value proposition for m-money was as an alternative for payments and transfers because the existing financial infrastructure had such poor penetration.⁵ In other countries, the penetration of e-payment (debit and credit) cards, ATMs, and POS devices, as well as the competitive structure of the financial services sector, has meant that the value proposition for m-money is as a complement to other services. Table ES.5 shows financial sector development indicators in seven countries. Note that low payment card penetration in particular is an indicator for m-money potential.

Kenya has the lowest figures in all categories, indicating the largest m-money opportunity. There are three natural groupings of countries based on

⁵ Historically, the value proposition was that P2P transfers were not possible using existing financial infrastructure. Of course, M-PESA has evolved far beyond simple P2P transfers to a variety of other financial products.

banking penetration, payment card penetration per 1 million inhabitants, and ATM and POS device penetration:

- Kenya and Nigeria have the least developed financial service infrastructure.
- Sri Lanka and Thailand have a more developed infrastructure.
- Brazil, Japan, and the United States have the most advanced banking structure.

The study of the seven countries supports the following conclusions regarding m-money demand:

- Developing countries typically have a larger unbanked population with high demand for low-cost, low-speed (not NFC), weekly or monthly transactions in an environment of a less-developed financial infrastructure with fewer services. As the financial sector develops, partnerships between MNOs and banks become more important and the demand for m-money services will decrease as other e-payment options increase and compete.
- In developed economies with a better-developed and more competitive financial sector, customers already have various e-payment options and a stronger demand for higher-performing services, such as very-high-speed (NFC), high-volume (frequent), and convenient payment transactions.

Figure ES.2 illustrates these relationships.

Table ES.5 Financial Sector Development Indicators

Indicator	Brazil	Nigeria	Sri Lanka	Thailand	Japan	Kenya	United States
Bank account penetration (%)	43 ^a	21	59	80	100	19	93
POS devices per million inhabitants	16,606	80	1,173	3,933	9,742	66	17,277
ATMs per million inhabitants	889	55	88	526	1,070	21	1,317
Payment cards per million inhabitants	2,711,227	166,774	279,343	934,848	6,357,199	41,026	6,842,448

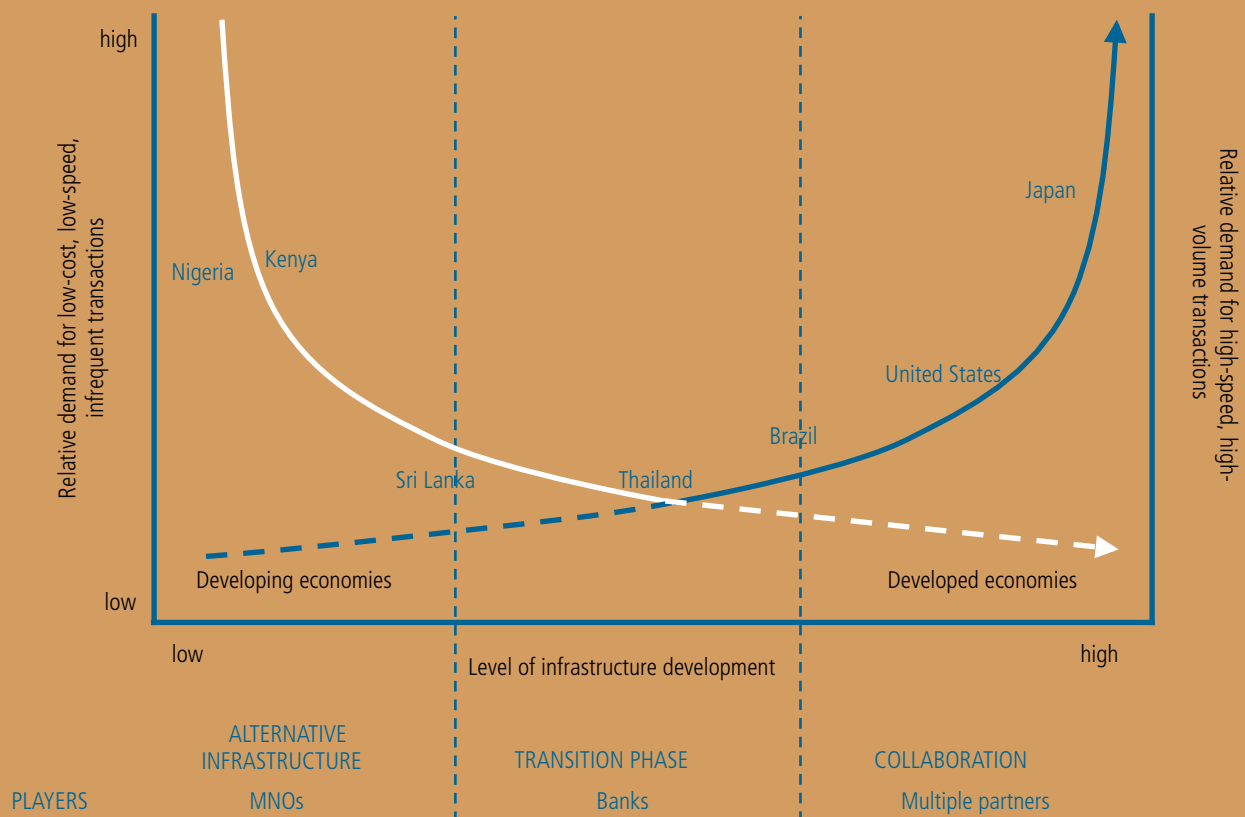
Source: Appendix B data tables.

a. Because bank account penetration data were not available, this figure is the percentage of adults who use formal (banks) and semiformal (e.g., microfinance institute) financial services.

Nigeria has the most potential for a straight m-money solution based on the Kenyan M-PESA model. Sri Lanka and Thailand, with their greater financial infrastructure, require collaboration with the existing banking network. Brazil shows the greatest potential m-money application in credit and microfinance, and a potential demand to be further explored in public transport, domestic P2P transfers, payroll, and B2B payments. Because of its large size, Brazil's unbanked and underserved sector is also likely to hold potential. In terms of m-money, the United States is stagnating, largely because of its extremely well-developed e-money infrastructure and its fragmentation of market share among many mobile phone companies.

The theoretical framework proposed in this report provides a powerful tool for assessing the potential for m-money in countries around the globe. First, the framework shows the analyst how to determine demand for various m-money services in a country. Then, it identifies and examines parameters that may help or hinder development of m-money businesses. Even if an area has a high demand, the parameter analysis may identify factors (e.g., regulation, competition) that will block efforts to meet it. Conversely, parameter analysis may uncover circumstances that could boost a business even where demand is moderate.

Figure ES.2 Mobile Money Demand Curves



Source: IFC Mobile Money Study 2011.

Note: The white curve represents m-money demand for developing economies. Demand for m-money in developing economies is for low-cost, low-speed, infrequent transactions, such as P2P transfers. As developing countries progress, financial infrastructure develops, and competition from banks, credit card companies, and other financial institutions increases. The white 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 blue 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, m-money acts as an alternative infrastructure to existing financial services; during the transition phase, m-money is moving from an alternative infrastructure to a complement. In the collaboration phase, m-money must fully integrate with the financial infrastructure.

The framework considers various business models for m-money and helps determine the model most appropriate in a specific country context, as well as the sort of partnerships needed. Finally, based on where m-money development starts, the model

of progressive development, described earlier, can project the developmental path it might take. Of course, any analysis of m-money must be dynamic and consider the phenomenal speed of developments in the sector.

Mobile money (m-money) refers to the use of mobile phones to perform financial and banking functions. It can be used to assist the billions of people who have little or no access to traditional financial services. Where the service is available, users can securely receive funds, pay bills, make bank transactions, transfer funds, and purchase goods and services.

However, the technology is far ahead of the infrastructure of financial and technical network service providers needed for an m-money system to function. Although a number of service providers have emerged around the world, few have reached significant scale. Overall, m-money services are limited compared with their promise of reaching the unbanked and underserved, servicing existing banking clients, and fostering a cashless society.

Study Context and Focus

This study was undertaken to increase the understanding of m-money and to address key issues in scaling up development of m-money services globally. It examines the potential demand for m-money, national regulatory environments, major obstacles, and the requirements of potential service providers and networks to run m-money services as viable businesses.

The study was guided by several key questions:

- How can m-money adoption be accelerated?
- Which countries are the most likely to have a mass market for m-money, and how can they be identified?
- What business strategies and partnership models can best exploit m-money opportunities?
- Where are the best investment opportunities?

Four countries—Brazil, Nigeria, Sri Lanka, and Thailand—each of which represents a different world region, socioeconomic situation, and financial sector context, were included in the study. The countries were analyzed in terms of m-money business models, money flows and demand, potential user perceptions and behavior, regulations, and agent networks. In each country, an m-money service provider acted as a partner institution.

To place these four countries in the wider context of m-money developments, three case studies—Japan, Kenya, and the United States—were also examined. Kenya and Japan are among the most successful countries in m-money development in developing and developed countries, respectively. The United States is included because it is the world's largest economy. Considering these countries helps show whether developments in Kenya, Japan, or the United States will become trends in the four developed countries analyzed.

The size of potential opportunities for m-money were quantified through demand estimates and

compared with estimates in the three reference countries. Each of the four analyzed countries was placed along an m-money demand curve with an explanation of the impact of demand on the opportunity for m-money development.

In addressing the four countries for m-money market segments, we developed a framework that can be used to assess other countries.

Understanding Electronic Money and Mobile Money

A World Bank blogger notes, “There are no universally accepted definitions” of electronic money (e-money), m-money, or mobile banking (m-banking) (Firpo 2009).

In this report, e-money and m-money are defined as follows:

- **E-money** is the broader concept and refers to payments made using near-field communication (NFC) contactless cards, credit cards, prepaid cards, debit cards, loyalty cards, automated teller machine (ATM) cards, gift cards, and store cards, as well as mobile phones.
- **M-money** is a subset of e-money that refers only to financial services and transactions made using technologies integrated into mobile phones. These services may or may not be tied directly to a personal bank account. Excluded from this definition is the use of any sort of card (though the mobile phone could be linked to ATM, prepaid, debit, or credit cards).

The most basic technology used for long-distance funds transfer is short message service (SMS) text messaging. The next step is the more user-friendly unstructured supplementary services data (USSD) technology, which gives some prompts for funds transfer. Still more sophisticated is a technology called SIM Toolkit (STK), an application encoded in a subscriber identity module (SIM) card, a portable memory chip used in some mobile phones, which has better network security. For fast payments at the point of service (POS), NFC technology, in either mobile phones or cards, allows

the user to pay by simply passing the phone or card over a receiver.

Positioning of Mobile Money

To assess the opportunities for m-money, it is necessary to understand what is unique about m-money and what it has in common with e-money transactions using payment cards.

There are many commonalities between payment cards and m-money. Both

- are carried by the consumer,
- can be linked to existing bank accounts or can be a storage device for e-money—e.g., an electronic wallet (e-wallet) or prepaid card—and can be used by both banked and unbanked people, and
- can be equipped with NFC technology.

The main difference (and therefore value proposition) is that m-money uses the widely owned mobile phone for transactions. Unlike payment cards, mobile phones have the following characteristics:

- They are interactive devices (e.g., the customer has control and can check account balances and credit information, make transactions, and transfer money). In comparison, a payment card holds account details that are not visible to the customer without an additional card reader, is a one-way tool, and cannot be used to transfer money.
- Mobile phones are communication devices that have other functions, while a card’s key purpose is as a payment instrument.
- Mobile phones are able to make remote payments without an additional device, whereas a card requires a POS terminal, the Internet, or a phone for remote payment. With mobile phone technology, the consumer has not only the device but also the communications connection.

Mobile phones can make transactions using a range of technologies from SMS or the more

user-friendly USSD technology, to STKs for long-distance fund transfers and other functions, to the sophisticated NFC-type technologies for passing a phone over a receiver to make transit trip or retail purchases.

Both e-money and m-money are means to reduce the use of cash. Although e-money (e.g., prepaid cards) can be useful to people without bank accounts, m-money has a higher potential to provide a wider range of financial services to the unbanked.

E-money and m-money are sufficiently similar that in some potential m-money market segments either could be used. Public transport is an example. NFC-enabled cards or NFC-enabled phones can be used equally well (as they are in Japan). Also, face-to-face retail payments can be made by e-money products such as Visa payWave or by m-payments through NFC-equipped phones.

Value Proposition of Mobile Money

The value proposition of m-money depends on the country context, particularly whether the country is developing or developed. The major application of m-money is for payments,¹ such as money transfers to another person, utility payments, and public transport payments.

In developing countries with poorly developed financial infrastructures, there is usually a limited number of payment instruments as well as a large unbanked population. Crowe (2010) has suggested that the application of m-money in developing countries is to “replace ‘risky’ cash since not many payment alternatives exist,”² supporting the theory that in developing countries m-money is sometimes the only viable alternative for large

segments of the population. Countries that have developed successful m-money services often have a high reliance on cash and an unmet demand for an alternative.

In developed countries with a well-developed financial infrastructure, a wide range of payment instruments—such as credit cards, debit cards, prepaid cards, checks, and direct debit—are probably available to the majority of people. In these countries, the application of m-money is mostly through “NFC chips to pay for high volume, quick transaction such as transit and/or certain retail purchases” (Crowe 2010).

One way of looking at the application of m-money is by using the economic concepts of “complements” and “substitutes” to existing payment mechanisms (including everything from credit and debit cards to checks). A *substitute* replaces an existing payment mechanism, whereas a *complement* provides an addition or extension to the existing mechanism. In developing countries, m-money is a substitute for cash as well as for many traditional financial services and other forms of payment. In some countries, m-money may spur the development of more sophisticated financial services and payments. For example, in Kenya, credit cards have experienced strong growth since the introduction of an m-money infrastructure, with Visa adding 1 million cards in the country over the past three years, bringing the total number of cards issued to 2 million (Wambui 2009).

In developed countries, m-money can be both a substitute and a complement, depending on the type of payment instrument. In developed economies that are relatively less reliant on cash,³ m-money is a complement to other forms of payment such as credit and debit cards. M-money can be a substitute for checks because it is more secure, cheaper to process, and more mobile. Importantly, it can service large sections of the population that do not have bank accounts.

¹ Another application for m-money is as an alternative (or addition) to a savings account.

² In the context of Crowe’s presentation, “risky” means that cash is more liable to theft than e-money, but includes the possibility that cash is more easily given to others (such as family members) as a loan or spent on nonessential goods, while e-money contributes to consumption smoothing.

³ See Denecker, Sarvady, and Yip (2009) for an explanation of which countries are less cash reliant than others.

Structure of the Report

This chapter provides an introduction to the study's objectives and context, and explains the definition and positioning of m-money used in this report, especially vis-à-vis e-money and payment cards.

Chapter 2 presents case studies of the prominent m-money countries Kenya and Japan, as well as the United States.

Chapter 3 presents an overview of the four country study findings and analysis. It quantifies and describes the major money flows potential in each of the four countries as an indicator for potential demand for m-money services, analyzes the parameters that affect the m-money opportunity

in each country, and presents the findings from m-money user and nonuser surveys. The chapter concludes with a summary ranking of the m-money opportunities in each country.

Chapter 4 describes the m-money business models adopted in each country and the challenges that each country faces, then develops business model recommendations based on the main players and stage of financial development in the country. Each full country case study is available as a separate report.

Chapter 5 concludes by placing each country along an m-money demand curve and explains the impact of this placement on the development of and opportunity for m-money.

Case Studies as Context: Kenya, the United States, and Japan



Among developing countries, Kenya is perceived as the most successful m-money country; Japan is considered the most successful m-money developed country. Their experiences were examined to look for trends and a context within which to analyze the four case study countries—Brazil, Nigeria, Sri Lanka, and Thailand—in chapter 3. The United States was added as a known reference point and as an example of a large developed economy with which most readers are familiar. It is also one of the more electronically advanced countries in terms of electronic payment (e-payment) cards.

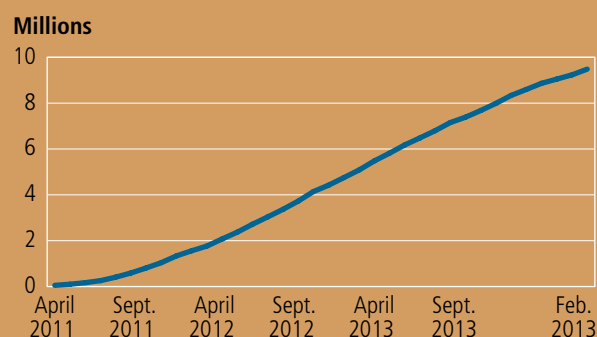
In reviewing these three countries, we focused on examining the key drivers for successful m-money development and considered the potential for replicability. Each section concludes with a rough estimate of potential existing demand. This is distinct from actual or future uptake of m-money, which is not estimated here. Data sources and details are shown in appendix B.

Kenya

M-PESA (“M” for mobile, “pesa” is Swahili for money) is a mobile phone-based money transfer service launched in 2007 in collaboration with Kenya’s dominant mobile network operator (MNO), Safaricom. M-PESA was started and is owned by Vodafone, which is the majority shareholder of Safaricom.

M-PESA has been highly successful and, along with two m-money companies in the Philippines, is the best example of a typical m-money service for the unbanked and underbanked. Initially launched in 2007 for person-to-person (P2P) transfers,¹ by 2010, M-PESA had more than 9.4 million customers (figure 2.1) and more than 18,000 agents, and accounted for US\$5.27 billion in P2P transfers. There is scarcely a household in Kenya that is not an M-PESA user. Between March 2009 and March 2010, more than 13 percent of the Kenyan gross domestic product (GDP) was transferred through M-PESA.

Figure 2.1 Kenya: Number of Current and Projected M-PESA Subscribers



Source: Safaricom 2010.

¹ “Underbanked” refers to people who may have some banking services such as a savings account, but may lack access to credit cards or loans.

As a money transfer service, M-PESA started by serving the needs of the many families split between rural and urban areas. It has since grown to provide many other financial services (but not utility or public transport payments).

Key Drivers

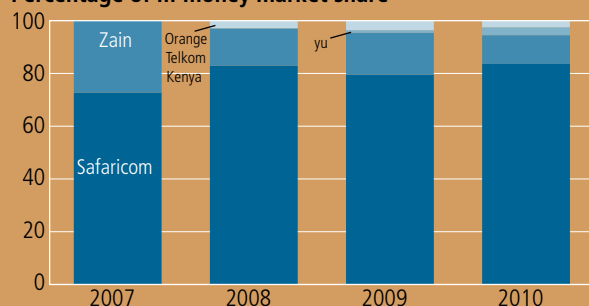
M-PESA's remarkable success is based on three key drivers: the dominance of the MNO, Kenya's permissive regulatory environment, and customer demand for additional services.

Dominant Mobile Network Operator

In 2007, the MNO Safaricom had more than 70 percent of the mobile market in Kenya, which allowed it to launch M-PESA quickly to a large subscriber base. Its dominance had enormous benefits in terms of marketing and economies of scale. The success of M-PESA allowed Safaricom to consolidate its position as the dominant operator in Kenya, increasing its market share from 72.7 percent in 2007 to 83.6 percent in 2010 (figure 2.2).

Figure 2.2 Kenya: Impact of Mobile Money on Safaricom

Percentage of m-money market share



Source: Wireless Intelligence 2010.

Zain, a competing MNO, launched its own m-money business, Zain Zap, which is having a limited impact on the market. It can be expected to gain a higher profile in the future following its acquisition by Bharti Airtel, the largest MNO in India, which recently acquired Zain's mobile companies in Africa.

Regulatory Environment

While Kenyan banks are tightly regulated, non-banks have been allowed to enter the m-money market and “perform various payment functions virtually unregulated” (CGAP 2007). Thus, Safaricom, as a nonbank, has been able to build M-PESA with virtually no interference from government regulations.

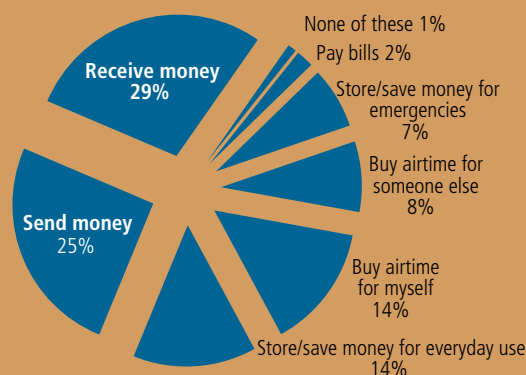
Only recently has the Central Bank of Kenya published clear rules for agency banking, a form of convenient but limited banking licensed for shops and supermarkets. The recently published agency banking rules will contribute to m-money's strength in the market by providing a path for integration of M-PESA with banking. This integration is already under way in a strategic partnership between Safaricom and Equity Bank.

Changing Customer Demand

If P2P transfers were its only business model, M-PESA would not be growing as quickly as it is today. M-PESA is increasingly used as the platform for a range of services that would, in a developed country, be provided by banks.

For example, 14 percent of subscribers use it to save money (figure 2.3). The Safaricom–Equity Bank partnership will accelerate this trend and lead to other partnerships and forms of integration with wider banking services.

Figure 2.3 Kenya: Subscriber Uses of M-PESA



Source: FSD Kenya 2009.

Replicability

The combination of the lack of regulatory oversight for nonbanks (i.e., regulatory openness), a dominant MNO, and large unmet demand created conditions suitable for m-money in Kenya. Other countries, which lack similar starting conditions, have struggled to replicate the success of M-PESA.

Nevertheless, M-PESA faces challenges. The financial services sector, while partnering with M-PESA, is also promoting credit, debit, and prepaid cards. For example, Visa has added 1 million cards in Kenya over the past three years, bringing the total number of cards issued to 2 million (Wambui 2009). Meanwhile, the volume of transactions flowing through M-PESA has become large enough to attract regulatory oversight, which could slow its growth.

Demand Perspective

Figure 2.4 shows estimates of total monthly transaction volume (not value) in key market segments that could offer m-money opportunities. However, m-money must compete with both traditional payment methods and other e-money options, and is thus unlikely to capture all of this potential.

In Kenya, with its relatively undeveloped financial infrastructure, both P2P transfers and payroll

payments to the informal workforce represent significant demand (with likely overlap).

More than 14 million P2P transactions are completed per month. The size of the unbanked sector is 14.5 million out of a population of more than 39 million.² In this large informal and unbanked market, the need for fund transfers is the largest demand; public transport and utility payments show a much lower number of transactions per month.

United States

M-money in the United States is not well developed. In comparison with both Japan and Kenya, the penetration of m-money is insignificant. However, the United States is advanced in its development of other electronic forms of payment.

Key Drivers

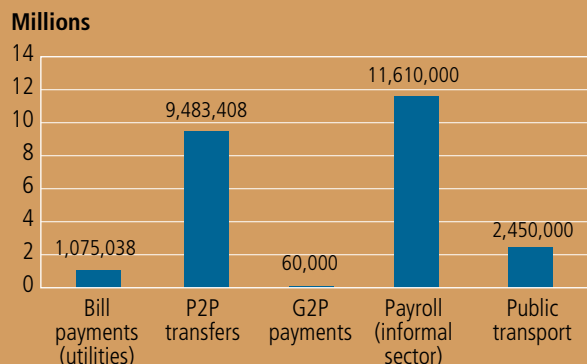
The key reasons behind the low uptake of m-money in the United States are summarized below.

Payment Instruments

In terms of e-payments, including debit and credit cards, the United States is one of the most advanced economies in the world. Payment cards account for 53 percent of payments, compared with 36 percent for cash and check (figure 2.5).

However, as figure 2.6 shows, even contactless prepaid cards (used in public transport, for example) have not penetrated the market to any real degree.³ The existence of prepaid cards can be an indicator of demand for m-money. In the United States, the prevalence of prepaid cards is much lower than in countries where m-money has been successful.

Figure 2.4 Kenya: Potential Monthly Transactions in Key Mobile Money Market Segments

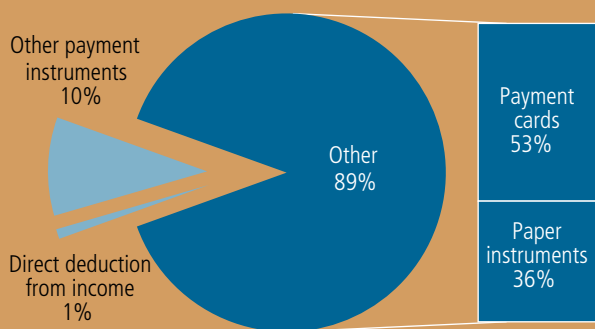


Source: IFC Mobile Money Study 2011.

² This figure is calculated by taking the total number of adult Kenyans (18.7 million) and multiplying it by the percentage (77.4 percent) that is excluded from formal financial services (i.e., financial services offered by a banking institution).

³ The general consensus is that the use of NFC on highway tolls in the United States has not yet taken off, but is poised to do so. See Visiongain (2010).

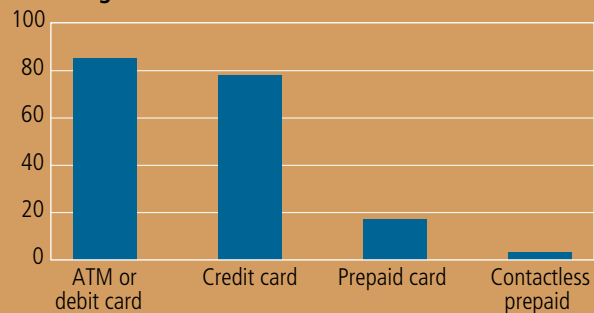
Figure 2.5 United States: Electronic Payments as a Share of Monthly Volume of Total Payments



Source: Foster et al. 2009.

Figure 2.6 United States: Penetration of Various Electronic Payment Instruments, 2008

Percentage of consumers



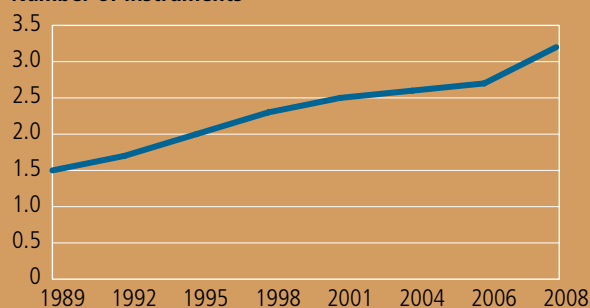
Source: Schuh 2010.

Because the United States is an economy with low cash use and a multitude of cashless payment forms and infrastructures, m-money may be just a niche market opportunity or another channel for existing banking customers. The Federal Reserve Bank of Boston notes that cash is used much less in the United States than in countries where retail m-payments have been most successful (Crowe 2010, p. 9).

U.S. consumers use a multipayment instrument strategy, paying for services with an ever-growing number of instruments: checks, credit and debit cards, and prepaid cards (figure 2.7). The result, according to a roundtable discussion at the Federal Reserve Bank of Atlanta, is that “[t]he US has a large noncash infrastructure that does not exist

Figure 2.7 United States: Growth in Number of Payment Instruments per Consumer

Number of instruments



Source: Schuh 2010.

in other countries. One challenge for stakeholders is to decide collectively on the rails and infrastructure [for m-money] to use while considering cost issues. Attempting to establish different payment infrastructures at the same time may not work well” (Federal Reserve Bank of Atlanta 2010, p. 6). Therefore, “[i]t is not at all clear that market forces acting on their own will get the United States [to significantly adopt NFC or contactless payments], or produce the completely open, interoperable system needed; certainly not anytime soon” (Ezell 2009, p. 42).

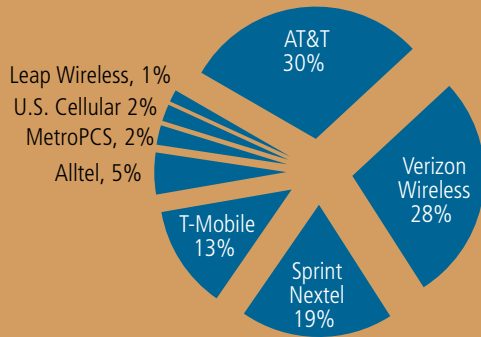
M-money’s potential is limited by competition from other options and a fragmented market (see next section), rather than by the huge demand for payment services. Thus, the returns in terms of market capture could be low compared with the cost of introducing NFC.

Fragmented Mobile Market

The U.S. mobile market is historically fragmented and diverse (figure 2.8), spread across a large geographic area. The mobile sector has taken years to consolidate and is well behind trends in the rest of the world. So far, no single operator dominates in the same way that NTT DOCOMO and Safaricom do in Japan and Kenya, respectively.

Replicability

The fragmented mobile market and a widespread e-payment infrastructure make the development

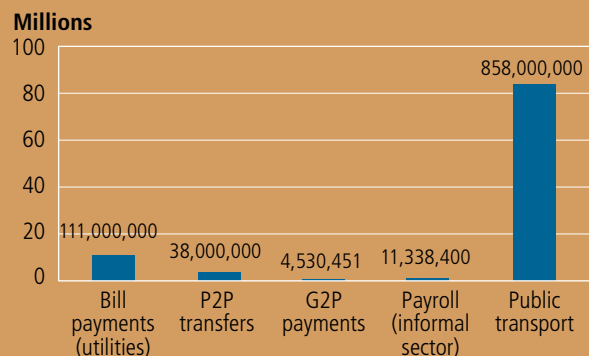
Figure 2.8 United States: Mobile Market Shares by Operator

Source: FCC 2010.

of m-money, particularly NFC-enabled phones, likely to be slow. The key issue is that there is no clear business model: “The current U.S. model cobbles together the existing infrastructures of MNOs, the bank network, and payment service providers. The challenge is that there are many alternative payment methods and no differentiating factors or obvious substantial benefits that consumers can see yet from mobile payments,” according to the Federal Reserve Bank of Atlanta (2010, p. 4).

Demand Perspective

Figure 2.9 shows estimates of total monthly transactions in volume (not value) in key market segments that could offer m-money opportunities. Because

Figure 2.9 United States: Potential Monthly Transactions in Key Mobile Money Market Segments

Source: IFC Mobile Money Study 2011.

m-money must compete with both traditional payment methods and other e-money options, it is unlikely to capture all of this potential.

Public transport in the United States is a much smaller opportunity than in many other developed countries because it represents only 5 percent of the total number of trips; the vast majority of trips are made via private vehicle. With the exception of large cities such as New York, the U.S. population density is lower than in countries like Japan, making mass transit less economical.

E-money has already made a significant in-road into the economy with significant investment in e-payment infrastructure such as credit and debit cards. While NFC is a requirement for certain segments of this market (such as public transport), the demand for fast micropayments using NFC rather than credit, debit, or prepaid cards is not as clear as it is in Japan.

In developed countries with competing forms of financial access, it is critical that there be a single, interoperable platform for m-money to ensure economies of scale. In the United States, the development of this platform would be at a massive cost, while there is already a huge infrastructure for credit, debit, and prepaid value card payment.

Japan

Japan is the ideal model for use of e-money in developed countries: it has the most widespread use, with the largest number of subscribers. In terms of certain types of payment instruments, such as NFC-enabled cards and phones, it has the highest penetration in the world. For example, 78 percent of all handsets have NFC technology installed (though the number of active users is much lower). In addition, Japanese consumers are highly technology literate and adopt new technologies quickly.

One of the major challenges in Japan has been to move from public transport payments, where e-money has been very successful, to retail payments. E-money has only recently begun to penetrate the retail payments market.

E-money has been successful in Japan because of NFC technology. NFC has at least two features that make it particularly suited to high-volume payments:

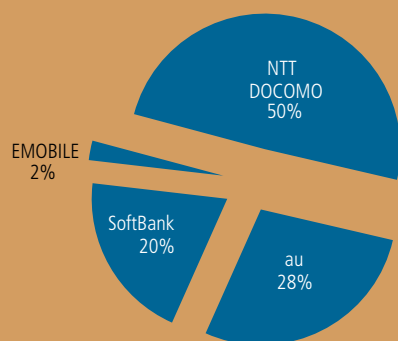
- Contactless payments are nearly 40 percent faster than credit or debit cards and 55 percent faster than cash payments; they are especially more efficient than cash for micropayments.
- The availability of comprehensive data for consumer spending allows more targeted mobile advertisements, and therefore more potential revenue for merchants.

Key Drivers

Dominant Service Providers

Like Kenya, the Japanese mobile sector is dominated by a single operator, NTT DOCOMO. The market share of NTT DOCOMO has been 50 percent or greater for a number of years (figure 2.10). In 1999, DOCOMO launched i-mode, the world's most popular platform for mobile Internet services including e-mail, browsing, and downloading now used by more than 48 million subscribers. In 2001, it introduced FOMA, the world's first 3G commercial mobile service based on Wideband Code Division Multiple Access (WCDMA).⁴

Figure 2.10 Japan: Market Share of Mobile Service Providers



Source: Telecommunications Carriers Association (www.tca.or.jp/english/database/download.html); data are as of August 2010.

Unlike Kenya's M-PESA, NTT DOCOMO's dominance did not directly translate into dominance of the e-money market. Japan has been a predominantly cash society, even though other payment instruments such as prepaid, debit, and credit cards have been available for some time.

The development of e-money—and specifically the FeliCa chip, the NFC standard (a proprietary standard owned by Sony)—was driven by dominant players in each segment of the value chain. Sony invented and patented the FeliCa technology chip in the early 1990s. Its first commercial success was its use in the Octopus card in Hong Kong in 1997. At that time, Sony was the world's dominant player in NFC technology.

In 2001, with NTT DOCOMO and others, Sony established a joint venture called Bit Wallet that issued the Edy (euro, dollar, yen) card using its FeliCa chip. Edy, a rechargeable smartcard, is the largest e-money card issuer in Japan with 58 million cards.

In public transport, the East Japan Railway Company (JR-East) is the dominant mass transit provider in and around the Tokyo metropolitan area; the largest market in Japan issues Suica NFC cards (East Japan Railway Company 2010).

In terms of payment cards, JCB—founded in Japan and the leading credit card company in Asia—is the dominant player, holding a 34 percent share of the market, which is 20 percent more than its nearest competitor (Research and Markets 2010).

Even though nearly all of the NFC systems in Japan use the FeliCa technology, they are not interoperable. Merchants must have up to four types of POS devices to process NFC transactions (Ezell 2009), although this is starting to change.

Transport companies, including subways, buses, and private railways, formed a consortium to use an NFC-based e-money service called PASMO that is now interoperable with the Suica card issued by JR-East.⁵

⁴ NTT DOCOMO Web site (www.nttdocomo.com/about/company/index.html); accessed March 15, 2011.

⁵ PASMO Web site (www.pasmo.co.jp/en/index.html); accessed May 23, 2011.

Sony initially struggled to transfer its Hong Kong success to Japan. Between 1997 and 2000, however, it made few sales in Japan. The main obstacle to expanding FeliCa technology to Japan was lack of access to a large subscriber base. NTT DOCOMO owned the largest subscriber base in Japan. The problem was that neither Sony nor NTT DOCOMO could see a viable business model. The fees from licensing the FeliCa technology would flow directly to Sony and, since NTT DOCOMO did not have any payment expertise, the fees from transactions would flow to a third party. The solution was for Sony and NTT DOCOMO to form a joint venture called FeliCa Networks, in which they would share in the proceeds.

Thus, NTT DOCOMO became the technology owner of the proprietary NFC technology, using it in both mobile phones and cards. This business model allowed the entire market for e-money to be captured by the Sony–NTT DOCOMO joint venture, providing software and service networks for both cards and mobile phones. Any competition using the the FeliCa chip paid license fees to FeliCa Networks.

A major concern with introducing NFC-enabled phones for m-payment was that the potential market could be easily contested by NFC-enabled cards.

The result of the joint venture was that Osaifu-Keitai, a mobile wallet platform enabling quick, contactless transactions for 20 applications (including several credit cards, personal identification, airline tickets, and cash) was launched in 2004 by NTT DOCOMO. More than 37 million phones equipped for Osaifu-Keitai services are now in use.⁶ NTT DOCOMO's two competitors have also adopted Osaifu-Keitai.

Government Role

In Kenya, the lack of regulatory oversight allowed M-PESA to develop. In contrast, the Japanese

government played a significant role in bringing private sector players together. In fact, the Japanese government owns 63 percent of NTT DOCOMO (NTT DOCOMO 2010) and only sold its shares in JR-East in 1993 (East Japan Railway Company 2002).

Population Density

Because of Japan's high population density, many workers take public transport to work (in contrast to the United States, where 95 percent of people do not take public transport), and they demanded fast, convenient mechanisms to pay for their public transport trips.

Additional Value

The Japanese market is unusual in that payment has become a commodity. To attract customer loyalty, a business must offer additional value over and above payment instruments such as rewards or loyalty points. Each Japanese consumer subscribes to an average of 12 loyalty cards (Portio Research 2010). Part of NTT DOCOMO's success was that its Internet service unified these loyalty cards on a single handset.

Replicability

The success of e-money, and specifically of NFC⁷ payment in Japan, depended on four factors: (1) high population density, (2) dominant service providers at each stage of the value chain, (3) high value-added, and (4) the driving role played by government.

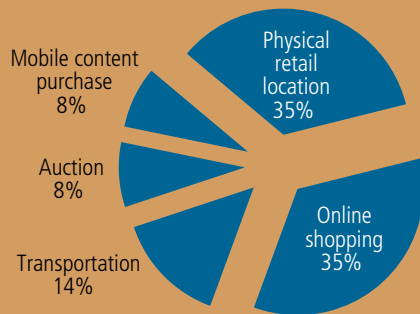
While public transport payments spurred the initial success of NFC payments, they now represent only a relatively small portion of the total volume of NFC transactions, as shown in figure 2.11.

NFC payments have managed to break out of the closed loop that threatens both Kenya and the United States by providing consumers with the ability to make retail payments using their NFC

⁶ NTT DOMOCO Web site (www.nttdocomo.com/about/company/index.html); accessed March 15, 2011.

⁷ NFC and contactless mean the same thing. They both involve an NFC chip that can be implanted in either a mobile phone or a card.

Figure 2.11 Japan: Shares of Types of Consumer Payments, 2008



Source: Ezell 2009.

cards or phones. The options this provides a dominant operator, such as NTT DOCOMO, is illustrated in figure 2.12.

As shown in the figure, mobile phones take on even greater importance as service providers add convenient features to capture consumers. For example, mobile phones now have a automatic global positioning system (Auto-GPS;

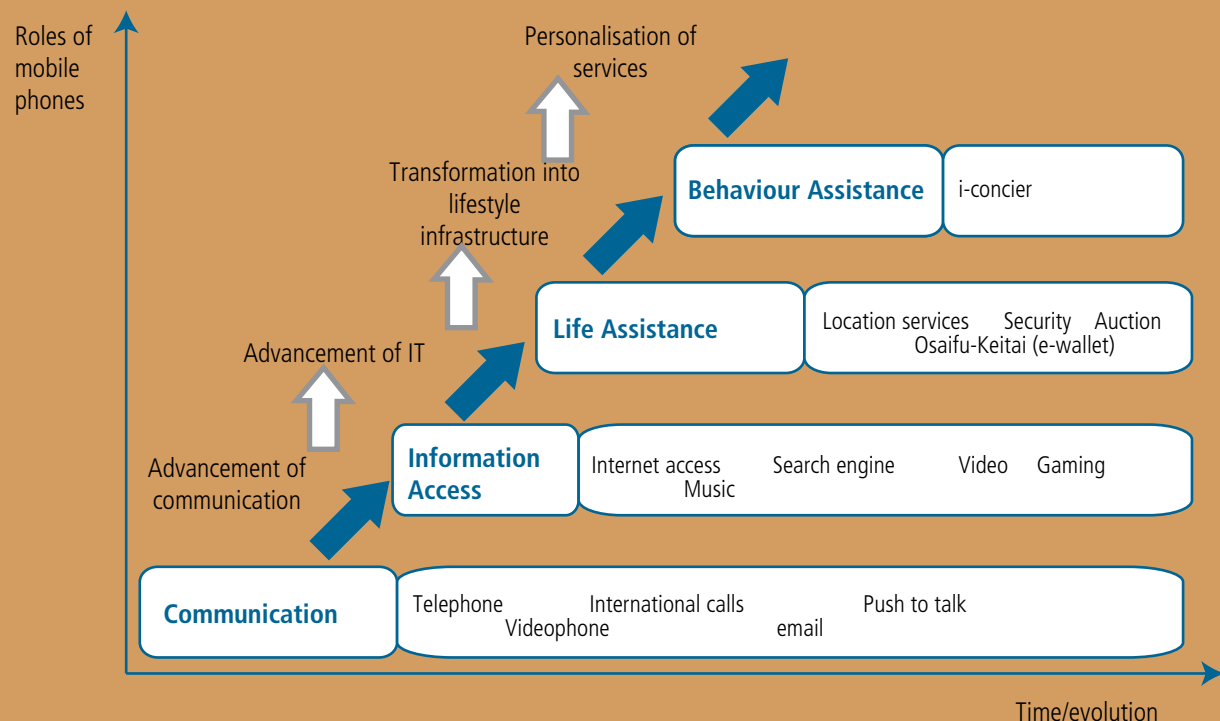
called i-concier by NTT DOCOMO) that offers, among other things, a “last train alarm” service that tells users the departure time of the last train to their home from wherever they happen to be (NTT DOCOMO 2010, p. 29).

Demand Perspective

Figure 2.13 shows estimates of total monthly transactions (in volume not value) in key market segments that might offer m-money opportunities in Japan. As m-money must compete both with traditional payment methods and other e-money options, it is therefore unlikely to capture all of this potential.

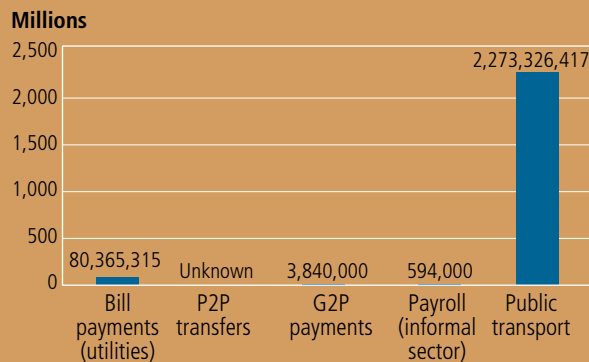
In Japan, public transport is the primary demand, with more than 2.2 billion passenger trips per month. Debit card usage is low, with use of other e-payments (credit cards, prepaid cards, store cards, and loyalty cards) far exceeding debit card payments. Other forms of demand, such as government-to-person (G2P) social welfare payments, informal sector payroll transfers, and utility

Figure 2.12 Japan: Direction of Service Evolution



Source: Reproduced from NTT DOCOMO 2010.

Figure 2.13 Japan: Potential Monthly Transactions in Key Mobile Money Market Segments



Source: IFC Mobile Money Study 2011.

payments are relatively insignificant. Japanese consumers require fast, high-volume payments, which are starting to cross over from micropayments for public transport to larger payments in the retail sector.

Summary

Table 2.1 compares key metrics for m-money (not e-money, since Kenya's e-money sector is tiny) in Kenya and Japan.⁸

Even though the Japanese GDP per capita is nearly 45 times larger than the Kenyan GDP per capita, the value being processed through *m-money* in Kenya is larger than in Japan. However, in terms of *e-money*, the value processed in Japan is about four times larger than in Kenya.

The value of transactions going through Kenya's M-PESA is more significant in relation to the overall economy than the value of m-money transactions in Japan. In Kenya, M-PESA processed 13.3 percent of its GDP between March 2009 and March 2010, while Japan processed only 0.05 percent of its GDP using m-money.⁹

⁸ The United States has been excluded because its m-money data are insignificant, and U.S. transactions using m-money are relatively insignificant.

⁹ The size of the Japanese m-money market has been estimated to March 2010 based on figures from the Bank of Japan for March 2009.

Table 2.1 Key Metrics for Mobile Money in Japan and Kenya

Metric	Japan	Kenya
GDP per capita	38,271	859
Value of m-money transactions	2.90 billion	4.26 billion
M-money as % of GDP	0.05	13.33
Number of m-money customers	18,500,000	9,483,408
Number of transactions	267,840,000	177,688,005
Average value of transaction	9 ^a	24 ^b

Sources: IMF, Bank of Japan, Safaricom, Telecommunications Carriers Association of Japan.

Note: Monetary values are US\$.

a. Data are from March 2009. The annual growth rate from March 2008 to March 2009 has been used to increase the size of the market until March 2010 to make it comparable against M-PESA.

b. M-PESA data are from March 2010.

This may indicate that in countries with an existing e-money infrastructure, m-money uptake will have difficulty reaching the same level of importance as in countries where there is little or no e-money infrastructure.

Comparing the average value of transactions, Japan shows more transactions at a lower average value, and Kenya shows fewer transactions at a higher value. As noted earlier, most m-money payments in Japan are for more frequent lower-value payments for public transport, while most payments in Kenya are for less frequent but higher-value transfers (although the number of uses for M-PESA is expanding rapidly).

Japan and Kenya clearly illustrate that m-money is used for different purposes in developing versus developed countries. In the developing world, the major requirement is for a replacement for less-secure cash and for the poor financial infrastructure. Both requirements can be met with basic mobile phone systems using SMS technology. In the developed world, the major requirement is for fast, convenient, high-volume micropayments that are particularly suited to NFC technology.

Important similarities between Kenya and Japan help explain why both are successful models of m-money.

- **Dominant players able to capture a large market.** In Japan, not only was the MNO dominant, but there were dominant players throughout the value chain including Sony's proprietary NFC technology, JCB as the leading credit card company in Asia, and JR-East as the dominant public transport provider for Tokyo.
- **Massive addressable markets.** Japan has 2.3 billion monthly transactions for public transport (compared with 858 million in the United States in a fragmented market). Kenya has 14.4 million unbanked adults representing 77.4 percent of all adults in the country.
- **A regulatory situation that does not hinder m-money development.** In Japan, the government in fact supports m-money as the majority shareholder of NTT.
- **A single initially popular application.** P2P transfers in Kenya and public transport in

Japan were the initial services that then allowed the addition of other services.

- **A large acceptance network for m-money.** M-PESA in Kenya was able to establish a network of 18,000 agents fairly quickly; JR-East has a large acceptance network used by Tokyo commuters. (Tokyo is the largest city in the world with more than 35 million inhabitants).

Development of m-money requires major economies of scale. These conditions were present in both Kenya and Japan. If major economies of scale do not exist, either because the market is fragmented or because e-money is already in common use (both of which are the case in the United States), then various players must come together to create a single, interoperable platform. The challenges of bringing competing players together to cooperate on a shared platform while allowing players to continue to compete and make a convincing business case for investment into an additional payment platform were discussed earlier with regard to the United States.

Four-Country Analysis



In this chapter, we estimate the potential for m-money in Brazil, Nigeria, Sri Lanka, and Thailand based on demand for m-money and the analysis of several key parameters: regulation, financial access, the current mobile market situation, and user perceptions.

The chapter is divided into four sections. The first provides data on the potential demand for m-money in the four countries, including quantification of five main m-money market segments.

The second section reviews the impact that several key parameters can have or have had on m-money potential in each country. A more detailed analysis of these parameters can be found in the individual country reports. The four parameters that can have the most decisive impact on m-money are **regulation**, **existing financial access**, the **current m-market situation** (dominance, investment climate), and **user perceptions**. To gauge this last, surveys were undertaken in each country regarding user and nonuser perceptions and the financial behaviors of m-money users and nonusers.

The third section examines the results of these surveys, presenting socioeconomic profiles of m-money users/nonusers, m-money use, general money transfer and payment behavior, perceived benefits of m-money, potential demand for various services, and trust and security issues.

The fourth section summarizes the potential for m-money in each country based on the demand

estimates and the influence or effect of parameters on these potential opportunities.

Applying this analysis to any country will provide the information needed to make an intelligent decision on what, if any, m-money market segments are worthy of development.

Demand Estimates

This section provides a rough estimate of the potential market size for certain m-money applications in the four countries. These estimates can be compared with the market sizes in Japan, Kenya, and the United States given in chapter 2. As explained earlier, the m-money market has some overlap with the market for e-money. Market size (addressable market) is distinct from the possible uptake of m-money or any forecasts, which are not provided here.

The potential demand areas for m-money are described in table 3.1. We attempted to estimate the size of each demand market in each country. Because data were not available in all the countries for retail and business-to-business (B2B) payments, retail payments were excluded from the analysis. Data on B2B payments were collected in three of the four countries: Nigeria, Sri Lanka, and Thailand. In those countries, the Coca-Cola Company was used as a proxy to estimate the potential for mobile payments (m-payments). Coca-Cola is one of the largest fast-moving consumer goods

Table 3.1 Potential Mobile Money Market Segments

Market segment	Description
Bill payments (utilities)	In developing economies, it is common to pay bills by queuing outside the utility company. Although this may be a niche market, the value proposition is to provide a convenient, safe, and fast mechanism to pay bills.
P2P transfers	The success of Kenya's M-PESA indicates that there is a large unmet demand in transferring money between people.
G2P payments	Governments make regular payments to at least 170 million poor people worldwide. ^a The value proposition is to provide a more cost-effective and time-saving service to citizens.
Payroll (informal sector)	This segment might overlap with the P2P market, but is a more specific opportunity for an m-money application allowing small businesses in the informal sector to pay their staff.
Public transport	The success of NFC technology in Japan indicates that there is potentially a massive market, particularly for NFC-enabled phones.
B2B payments	B2B payments in rural areas beyond the reach of banks are difficult and handled mainly by cash or check. M-money could provide mobile payment capabilities at each stage along the value chain.
Retail payments	Cash is less secure than e-money. Consumers may find paying with an NFC-enabled card or phone more secure and more convenient than using cash.

Source: IFC Mobile Money Study 2011.

a. Pickens, Porteous, and Rotman 2009.

companies in the world, with significant operations in Nigeria, Sri Lanka, and Thailand, among many other countries. Many small businesses in those three countries receive regular deliveries of Coca-Cola, and there are significant potential benefits for a more cost-effective and efficient method of payment.

Nigeria has the largest network of Coca-Cola outlets that justify a delivery by truck; this is possibly because Nigeria has the largest population of the three countries (149 million, compared with 21 million in Sri Lanka and 66 million in Thailand). Also, because Nigeria has no national retail

distribution chains, there are few economies of scale for a distributor, and more deliveries are necessary.

Table 3.2 shows that there is clearly a business case for m-money in Sri Lanka, where 88 percent of Coca-Cola distributors pay by cash. Similarly, in Nigeria, where 65–75 percent pay by check, there may be a demand for a more efficient and secure system such as m-money.

Table 3.2 Number of Coca-Cola Outlets and Form of Payment in Three Countries

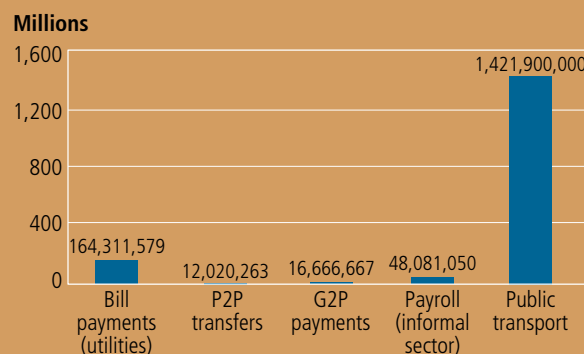
Country	Number of outlets	Form of payment (%)	
		Cash	Check
Nigeria	220,000	25–35	65–75
Sri Lanka	60,000	88	12
Thailand	26,000	Majority	

Source: IFC Mobile Money Study 2011.

To illustrate the potential demand for m-money in each market, figures 3.1–3.4 show the monthly volume (not the value) of transactions.

Brazil

Brazil has a considerable market in public transport, as well as smaller markets in utility payments and informal sector payroll (figure 3.1).

Figure 3.1 Brazil: Potential Monthly Transactions in Key Mobile Money Market Segments

Source: IFC Mobile Money Study 2011.

Public Transport

Public transport represents a sizable opportunity in Brazil, with about 1.4 billion trips taken per month. Brazil is the only one of the four countries with a potential public transport market comparable to Japan's 2.2 billion monthly trips. In Brazil, 29 percent of trips are via public transit, with 21.2 percent on municipal buses, 4.7 percent on metropolitan buses, and 3.5 percent on rail systems. Brazil is highly urbanized, with greater public transport use in the major cities.

The typical cost for a public transport trip is R\$2 (US\$1.14). São Paulo has bid out a contract to develop a noncash payment system for buses and metrorail to be implemented by 2012. Brazil has more than 180,000 taxis, with São Paulo home to 33,000 of them. Taxi companies have expressed interest in wireless POS payments.

Utility Payments

Banks are authorized to collect taxes, utility bills, and other bills; thus customers may pay their bills (*boletos*) at banks, ATMs, or correspondent banks, which have limited banking services.

Banks also issue *boletos* on behalf of utilities and other companies. Banks are thus largely the issuer and collector of bills in Brazil. Customers can pay their bills through automatic debit, the Internet, at an ATM, or via direct payment at branches and correspondent banks (88 percent of the use of correspondent banks is related to bill payments). While utility payment is the second largest opportunity in Brazil, other payment mechanisms are already in use by both the banked and unbanked.

Payroll for Informal Sector Workers

Brazil has 14 million informal small businesses that employ about 50 percent of the workforce. However, monthly payments to these workers would amount to only 3 percent of m-money opportunities in Brazil.

Government-to-Person Payments

Brazil has a massive conditional cash transfer scheme for the poor, Bolsa Familia; its payments, managed by Caixa Econômica Federal, amount to 150 million transfer payments a year. Caixa manages several other transfer payment programs for the government, amounting to roughly 200 million payments (including Bolsa Familia) per year, with an approximate value of R\$40 billion (US\$22.7 billion). These payments include unemployment insurance (which is the largest in value), special salary raises (*abono salarial*) and social integration income, social security, pension fund payments.

Brazil's Ministry of Social Development pays Caixa R\$1.20 (US\$0.68) per payment each month, resulting in annual revenue of R\$180 million (about US\$102 million) for Caixa. For Bolsa Familia payments, a card loaded with the funds can be cashed at correspondent banks as well as other locations. The administrative costs of the program are less than 5 percent of the benefit amount, and the payment channels represent 3 percent of the welfare amount (i.e., they are the costliest part).

There is certainly an opportunity in this sector if a mobile operator can link into existing correspondent banks, add additional agents in uncovered areas, convince the Ministry of Social Development of the benefits of allowing stored-value electronic wallets (e-wallets) on the phones of recipients, and offer additional financial services such as P2P transfers.

Person-to-Person Transfers

Domestic migration has decreased over the past few decades, and 84 percent of the Brazilian population is now urban. There is an opportunity for P2P transfers within cities, assuming that 25 percent of the informal workforce makes one monthly P2P transfer, as indicated in survey data.

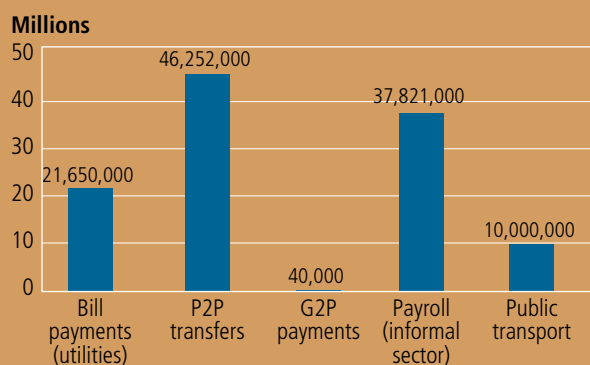
Nigeria

The biggest demands for m-money in Nigeria are for P2P transfers, informal sector payroll, and utility payments.

Person-to-Person Transfers

Figure 3.2 shows that P2P transfers constitute the largest potential m-money market with 40 percent compared with other opportunities. The lack of any m-money initiatives in Nigeria means that there is a large unmet demand for P2P transfers.

Figure 3.2 Nigeria: Potential Monthly Transactions in Key Mobile Money Market Segments



Source: IFC Mobile Money Study 2011.

In a household survey conducted in 2008, EFINA (Enhancing Financial Innovation & Access), a Nigerian nongovernmental organization that promotes financial access to the underserved, established that about 31 percent of the adult population had received money from a friend or relative from within Nigeria; 21 percent stated that they had sent money to a friend or relative within Nigeria.

Of people who transferred money within Nigeria, 57 percent used informal means to send money, and 63 percent used informal means to receive money. In comparison, 43 percent used formal mechanisms to send money, and 33 percent used formal mechanisms to receive money (EFInA 2008).

Banks have concentrated on promoting ATMs as a mechanism to transfer money, but the problems of unreliable infrastructure—such as electricity and the mobile networks that transmit ATM data in many countries—in combination with the declining use of ATMs (InterSwitch 2009) indicate that current financial services are not meeting the demand for P2P money transfers.

Informal Sector Payroll Payments

Given the large informal sector—which employs 70 percent of the country's working people—there is a potentially large unmet demand for m-money application in payroll payments.

Utility Payments

Utility payments constitute the third largest potential area for m-money in Nigeria, especially given the poor financial infrastructure and the limited availability of alternatives such as Internet banking, debit orders (preauthorized debit), and ATMs. Multichoice, HiTV, and DaarSat are Nigeria's satellite TV providers, with a combined subscriber base of about 760,000 households.

Public Transport

Public transport is not as large an opportunity in Nigeria as in other countries, because most transport is provided by the private sector, which is unregulated and highly fragmented. The estimate for public transport in figure 3.2 is limited to Lagos, Nigeria's largest city, with the country's largest public transport system, the Bus Rapid Transit system (BRT-lite), which is growing rapidly. Riders pay cash prior to boarding. The number of monthly trips on BRT-lite is estimated at 10 million.

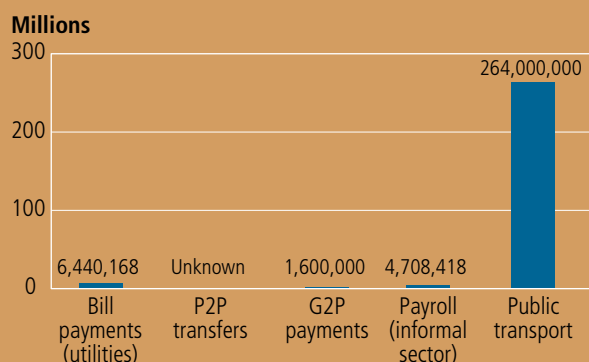
Government-to-Person Payments

G2P payments do not represent a significant area of opportunity because Nigeria has limited social welfare programs. Its three largest programs—the National Poverty Eradication Program and its Care of the People program, the Nigeria Delta Disarmament Program, and the National Youth Services Corps—serve approximately 40,000 beneficiaries in all, and the programs are plagued by inefficiencies and difficulties in identifying the correct beneficiaries. Whereas m-money might alleviate some of the inefficiencies, the number of beneficiaries is tiny compared with other countries. Brazil, for example, has 200 million G2P transactions per year. This area is unlikely to provide sufficient economies of scale at this point.

Sri Lanka

In Sri Lanka, public transit shows the largest demand for m-money (figure 3.3).

Figure 3.3 Sri Lanka: Potential Monthly Transactions in Key Mobile Money Market Segments



Source: IFC Mobile Money Study 2011.

Public Transport

The public transport system in Sri Lanka is massive. Sri Lanka suffers from a lack of rail infrastructure, so buses are the primary means of transportation. According to LIRNEasia, a regional research institute, 10 million commuters travel daily on 18,000 buses (LIRNEasia 2010). Public (government-owned) companies lose approximately 15 percent of the fare in transit, and private companies lose approximately 25 percent in transit. Some of this loss could be stemmed by a quick, e-payment method.

Utility Payments

Existing bill payment mechanisms are largely aimed at higher-income groups. Many commercial banks offer m-banking suites (including some bill payments).

Sri Lanka's largest retailer, Cargills, allows customers to pay utility bills in its convenience stores for a small fee. For example, it charges 0.2 percent of the value of a water bill. For all other bill payments it charges SL Rs 15 (US\$0.13).

Informal Sector Payroll

Even with high bank account penetration, the informal economy is large, estimated at 4.7 million workers.

Government-to-Person Payments

Samurdhi, introduced in 1994, is the main poverty alleviation program in Sri Lanka based on grant distribution and microfinance. It is governed by the Samurdhi Authority. About 1.6 million families receive monthly Samurdhi payments of SL Rs 400–1,000 (about US\$3.50–US\$8.80), depending on family size. Samurdhi uses a pass-book system; repayments of the microloans are made at the Samurdhi offices or they are collected at the doorstep.

Thailand

In Thailand, public transport, informal sector payroll, and utility payments show the most potential for m-money (figure 3.4).

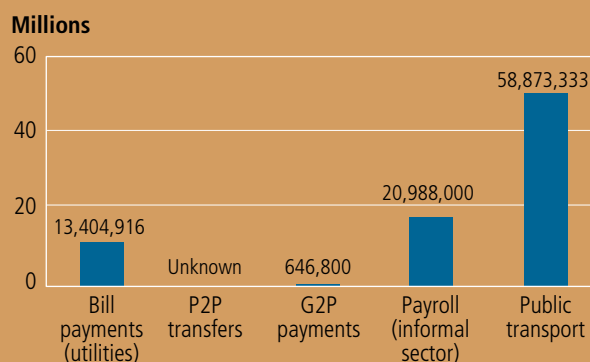
Public Transport

Currently, different payment platforms are used for different modes of transport. For example, in Bangkok, the Skytrain uses a different prepaid card from the Mass Rapid Transit underground rail, which is also different from the card used by the bus system coming into Bangkok from outlying areas. There is substantial support among MNOs, other payment providers, and the government for a single ticketing system, as the single-ticket transit is an objective outlined in the Bank of Thailand's "Payments System Report 2008." The number of public transport trips per month is 58 million.

Informal Sector Payroll

Thailand's informal sector employs 58 percent of the workforce, representing more than 20 million workers.

Figure 3.4 Thailand: Potential Monthly Transactions in Key Mobile Money Market Segments



Source: IFC Mobile Money Study 2011.

Utility Payments

Electronic utility payments are facilitated by a wide range of financial service providers. Utility payments can be made at bank counters, ATMs, and POS devices at merchants, and by direct debit.

Government-to-Person Payments

In response to the global recession, the government of Thailand implemented a monthly living allowance of B 500 (about US\$16) paid to all citizens aged 60 years and over who are not entitled to other government pensions. The number of eligible people is relatively small at 646,800.

Summary

Table 3.3 summarizes the size of certain m-money market segments for all seven countries based on monthly transactions (except for the unbanked, where the number of persons is given).

To have a potential **G2P payment** opportunity, a country needs to be wealthy enough to have a social transfer program, but still have a considerable part of the population without banking services. Brazil is an example. A recent study estimates that almost 75 percent of the 1.3 billion people living on less than US\$1.25 per day reside in countries classified as middle-income (Sumner 2010).

Although there is demand for **P2P transfers** in every country (e.g., 38 million households in the United States transfer funds to other individuals), most developed countries have other electronic means, such as online banking, for these transfers. Therefore, P2P transfers is a major opportunity only in countries where financial access and infrastructure are limited, such as Nigeria.

Similarly, the **payroll** opportunity depends on the size of the informal workforce and the development stage of financial access and infrastructure. Nigeria has a sizable and real opportunity, and anecdotal evidence suggests that larger companies already use cards for temporary and other workers.

Table 3.3 Summary of Potential Monthly Transactions in Quantified Market Segments

Type of transaction	Brazil	Nigeria	Sri Lanka	Thailand	Japan	Kenya	United States
G2P payments	16,666,667	40,000	1,600,000	646,800	3,840,000	60,000	4,530,451
P2P transfers	12,020,263	46,252,000	Unknown	Unknown	Unknown	14,000,000	38,000,000
Payroll (informal sector)	48,081,050	37,821,000	4,708,418	20,988,000	594,000	11,610,000	11,338,400
Public transport	1,421,900,000	10,000,000	264,000,000	58,873,333	2,273,326,417	2,450,000	858,000,000
Bill payments (utilities)	164,311,579	21,650,000	6,440,168	13,404,916	80,365,315	1,075,038	111,000,000
Unbanked persons	Unknown	46,000,000	4,885,396	5,869,461	Very small	6,114,900	20,582,400

Source: Appendix B data tables.

Public transport payment is a sizable opportunity in Brazil and Sri Lanka (while the U.S. market is challenged by a high degree of fragmentation). Because of the need for investment in NFC-enabled cards or phones, as well as an NFC payment infrastructure, a more detailed cost-benefit analysis is required to determine whether economies of scale are sufficiently large to make a business case.

The bill payment market segment is sizable in Brazil and the United States, but both markets have highly functioning bill payment channels and thus are unlikely to be attractive for an m-money solution. Only in countries such as Nigeria, where bill payment channels are limited, is there a sizable opportunity for m-money.

Parameter Analysis

To understand the opportunities for m-money, a range of parameters and their impacts on m-money development were analyzed. Numerous case studies try to explain the success of m-money. Most, particularly those from the Consultative Group to Assist the Poor (CGAP), have highlighted several key categories. The parameters identified in this study and used to analyze and compare each country are listed in table 3.4.

In the previous section, potential demand for some m-money market segments was quantified. In each country, these markets were also explored qualitatively, through expert and key stakeholder interviews. Additional market segments such as credit and microcredit, savings, and international remittances were investigated, but quantitative data were not available. Detailed information can be found in each country report.

All parameters are issues that firms entering the m-money market must confront and either use to their advantage or overcome. In evaluating a country's readiness for m-money, these parameters provide a comprehensive picture of the m-money environment. This, in turn, provides the insight necessary to identify practical recommendations for how m-money should be implemented. Each

of these parameters was analyzed for each of the four countries (see details in the country reports).

In this section, we concentrate on the four parameters that have the most impact on m-money: regulation, existing access to financial services, the current mobile market situation, and user perceptions. These high-impact parameters were evaluated across all four countries.

Regulation

The widely known success of Kenya's M-PESA, in which a nonbank mobile operator offers financial services, has inadvertently negatively affected the regulatory regime in other countries, such as Nigeria. It is now less likely for regulators to permit an m-money business to operate outside of the regulatory framework, even in the initial stages.

In all the countries surveyed except Brazil, regulators have issued guidelines on m-money, either as specific regulations that cover all possible aspects of the business or as regulations that cover individual elements such as e-money issuing, outsourcing and the use of agents, and risk-based anti-money-laundering rules. Each country has taken a different approach; sometimes, the ambiguity or omissions of the regulations can complicate an assessment of the regulatory environment.

To facilitate comparisons among the countries, a modified version of Porteous's regulatory environment model was used (Porteous 2006). The model positions a country's regulatory environment along two axes: openness and certainty. To determine openness, one asks: Does the country's policy, legal, and regulatory environment encourage new entrants and new approaches (i.e., innovation)? To determine certainty, one asks: Does the country's policy, legal, and regulatory environment provide certainty that there will not be arbitrary changes to a firm's prospects?

In figure 3.5, Position 1—high certainty and high openness—is the best position for innovation to occur. M-money development may occur in countries with low certainty if they have a strong motivation and an appetite for risk. Innovation is

Table 3.4 Parameters Affecting the Success of Mobile Money Services

Category	Parameters			
Socioeconomic context	Population Poverty Urbanization; rural population	GDP/capita GDP by region Gini coefficient ^a	Geographic area	Remittance flow
Regulation	Clear and risk-based regulatory framework M-money license requirements Obstacles to international remittances	Know-your-customer regulation Bank outsourcing Mandatory services banks must offer	Agent regulation Interoperability requirements Regulations on new branches	ID system Pricing restrictions on accounts Level of expensive requirements
Existing access to financial services	Reach of networks/agents Informal financial access Competitiveness of banking industry	Penetration/use of cards Nonbank provision of financial services	Penetration/use of prepaid cards Cash-electronic transaction ratio (use of cash)	Internet banking usage Unbanked population
Existing mobile market situation	Population penetration/coverage Churn ^b	Geographical coverage Level of fragmentation of industry	Level of competition	3G penetration/usage
Potential demand	Bill payments B2B transfers	Public transport Credit and microcredit	P2P transfers International remittances	G2P payments Savings Retail payments
Retail sector	Retailers with national coverage	Level of fragmentation	Postal network	Other distribution networks
Payment system	POS terminal penetration	Mass payment acceptance	Card penetration Dominant payment methods in the economy	National switch ^c Third-party payment processors
Pricing	Distortion through intervention/regulation	Banking services pricing		
User perceptions	Trust in mobile operators versus banks	Willingness to pay for m-money service	Cultural factors	

Sources: IFC Mobile Money Study 2011; CGAP.

a. The Gini coefficient is a measure of the inequality of a distribution, with a value of 0 expressing total equality and a value of 1 maximal inequality.

b. "Churn" in the telecommunications industry means customers move from one network operator to another.

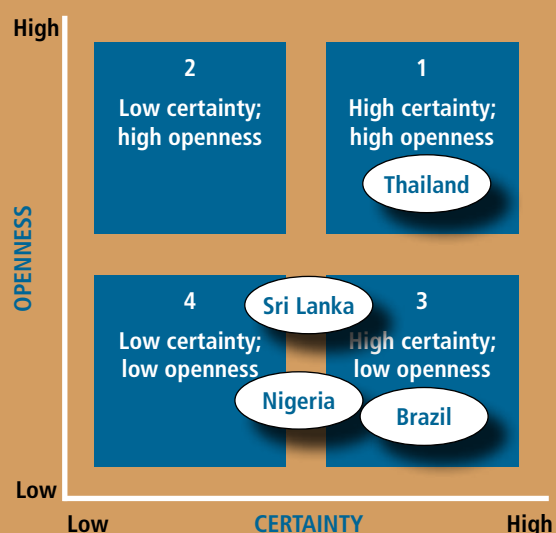
c. "National switch" here means an online interbank fund transfer system.

less likely in a country with low openness. Each of our four countries is located on the model in figure 3.5.

Nigeria is between Positions 3 and 4 because of its regulatory decision to exclude MNOs from being the lead service provider for m-money enterprises.

Nigeria's Mobile Payments Regulatory Framework has not been as permissive as legislation in other countries, such as Kenya or Pakistan. Until recently (with the issuing of a few m-money licenses that involved MNOs), it seemed as though MNOs were taking a back seat. Nevertheless, Nigeria still lacks a major, operational m-money initiative.

Figure 3.5 The Four Country Mobile Money Markets in the Porteous Regulatory Environment Model



Source: IFC Mobile Money Study 2011, based on Porteous 2006.

Sri Lanka does not have a clear regulatory framework for m-money, and there is a general level of confusion about the regulatory environment. For example, the chief executive officers of the two main mobile operators believed that only a bank-led model of m-money was allowed by the Central Bank of Sri Lanka; in fact, the regulator indicated that an MNO-led model is allowed. The lack of formality contributes to a lack of certainty but a high degree of openness. Therefore, Sri Lanka is assessed in between positions 3 and 4.

Like Sri Lanka, **Thailand** has no specific law or regulation covering m-money. Rather, m-money falls under the broad framework of the Royal Decree Regulating Electronic Payment Services and has been addressed in several official notifications. A new act is being proposed to cover e-money and associated anti-money-laundering and know-your-customer (KYC) regulations. At present, the draft act is a discussion document produced by the Office for Anti-Money Laundering, which reports to the Ministry of Justice. There is a risk that new anti-money-laundering regulations might slow the advance of m-money if they add stringent customer due diligence requirements.

Nevertheless, Thailand fits within Position 1—the best situation for m-money development.

Although there is certainty in **Brazil** regarding m-money, there is no openness, at least for players other than banks. Current regulations require any organization that takes deposits to be licensed by the Central Bank of Brazil. Although this regulation does not explicitly preclude the use of m-money by nonbanks, it prevents companies without a central bank license from providing services such as P2P transactions, prepaid cards, or e-wallets. Banks enjoy a high degree of certainty because they have a well-developed relationship with the central bank and respond with a cooperative and self-regulatory approach to its concerns. M-payment regulation is planned, perhaps in 2011.

Not unexpectedly, the regulatory environment is a decisive parameter that can either make or break the opportunity for an m-money business.

Existing Access to Financial Services

The range of access to financial services is a critical parameter for m-banking. Demand for m-money may depend on the attractiveness or unattractiveness of current banking and payment services. The extent of the financial infrastructure indicates the convenience and cost of accessing these services. Indicators include the ubiquity of ATMs and POS devices; the penetration of payment instruments such as debit, credit, and prepaid cards; the use of Internet banking; and the size of the banked versus the unbanked market.

The main focus for banks in terms of expansion in the four countries is public access to ATMs and POS devices, which were initially used for cash withdrawals, and later for a variety of payment and banking services such as transfers and bill payments (table 3.5).

Brazil, because of its inflationary history, has developed a technologically advanced financial system and banking sector. The use of e-payment channels (such as debit or credit cards, and direct debit) is on par with nations like the United States.

Table 3.5 Financial Sector Development Indicators

Indicator	Brazil	Nigeria	Sri Lanka	Thailand	Japan	Kenya	United States
Bank account penetration (%)	43 ^a	21	59	80	100	19	93
POS devices per million inhabitants	16,606	80	1,173	3,933	9,742	66	17,277
ATMs per million inhabitants	889	55	88	526	1,070	21	1,317
Payment cards per million inhabitants	2,711,227	166,774	279,343	934,848	6,357,199	41,026	6,842,448

Source: Appendix B data tables.

a. Because bank account penetration data were not available, this figure is the percentage of adults who use formal (banks) and semiformal (e.g., microfinance institute) financial services.

Although some data suggest that Brazil has a large unbanked population, our analysis shows that the Brazilian population is much better served than those figures suggest. The unbanked in Brazil are served through the following means:

- A large network of correspondent banks (up to 150,000), which allows for efficient bill payment and is largely used for that purpose by people without bank accounts
- Consumer loans and credit, given by retailers, which has grown over 30 percent in the past year, with high growth in the low-income groups; no bank account is required, and regulation allows the retailer to recover goods in case of nonpayment
- Payroll-consigned loans facilitated through regulation aimed at financial inclusion; these are popular throughout Brazil, with more than 50,000 companies participating.

The quality and quantity of financial access, measured by various indicators including financial infrastructure, financial service penetration, and payment card penetration, are decisive factors in whether there is an opportunity for a mass market for m-money. A case in point is Nigeria, with its poor financial infrastructure and financial access. If the country's regulatory regime were more open, it could emulate Kenya's success in m-money development. At the same time, Brazil's far-reaching formal and informal financial infrastructure and access limit mass market opportunity, instead

pointing to a business model that integrates itself into the financial sector and a more segmented strategy.

Nigeria has a poor financial infrastructure. It has a small number of bank branches, with the majority situated around the main cities of Lagos and Abuja. Although POS device and ATM roll-outs have been aggressive, there is a disconnect between the number of installed POS machines and those that are functional. The number of such devices deployed on the InterSwitch network (the main payment network) as of December 2009 was 11,124, but only 23 percent were active.

Sri Lanka has a large number of bank accounts compared with other countries in the region with similar GDP per capita, partly because its government banks have a mandate to increase financial inclusion. As a result of the dominance by government-owned banks, most commercial banks target niche markets, usually the middle- to upper-income segments. Commercial banks largely want to expand their range of services to their existing customer base rather than expand their subscriber base and compete with the government banks.

Thailand has an extensive ATM network offering a wide range of services, including bill payment, money transfers, and insurance payments. Importantly, banks do not charge a fee for cash withdrawals or deposits at ATMs. ATMs have grown from 10,602 in 2004 to more than 34,796 in 2008, with strong growth predicted in the

upcoming years. People are comfortable using ATMs, which are situated in convenient locations, such as marketplaces and retail stores.

Mobile Market Situation

The mobile sector parameters are factors that affect the m-money sector, in particular the dominance of a single mobile player and the investment capacity. More competitive markets are less likely to have dominant mobile operators, and to some degree the investment capacity is influenced.

Table 3.6 provides key indicators for the mobile sector in the four countries. According to the Herfindahl-Hirschman Index (HHI),¹ Brazil has the most competitive market, followed by Sri Lanka. Nigeria and Thailand have similarly competitive markets. None of the countries has a dominant mobile operator that exceeds 50 percent of market share, which was such an important factor in the success of m-money growth in Kenya and Japan.

Table 3.6 Mobile Sector Parameters

Country	HHI ^a	Mobile coverage (%)	Mobile penetration (%)
Brazil	2527	91	96
Sri Lanka	2851	90	69
Thailand	3411	97	99
Nigeria	3424	60	51

Source: IFC Mobile Money Study 2011.

Brazil has four main mobile operators, accounting for 95 percent of the market. They appear healthy, based on their 2009 earnings before interest, tax, depreciation, and amortization, with margins of 24–32 percent, though operating in a competitive

market with an HHI of 2527. No mobile operator has more than a 30 percent market share. A 3G network roll-out was estimated to cover slightly more than 60 percent of the population at the end of the first quarter of 2010.

In **Nigeria**, general packet radio service (GPRS) and SMS technologies are perceived as highly unreliable due to frequent network outages. Some banks are working with the MNOs to inform customers when their area has been affected by an outage, but the service interruptions continue.

In **Sri Lanka**, the mobile sector is more competitive than in Nigeria. In Sri Lanka, the MNOs are fighting for market share, and mobile penetration is high. Dialog is the largest MNO with a compound annual growth rate for the 2004–09 period of 32 percent (Dialog 2009). In comparison, Dialog's competitors had a compound annual growth rate of 45 percent, indicating the level of competition Dialog faces. Not only is the market competitive, but all the major mobile operators are either barely profitable or are losing money, primarily because new competitors entering the market have kept retail prices low. Dialog is losing money; and Etisalat, a competing MNO, is cutting costs to reduce expenses. Therefore, the MNOs are not ideally situated for m-money investment. This is also a factor in the gradual decline of Dialog's eZ Pay product.

The mobile sector in **Thailand** is less competitive. The industry consists of three major mobile service providers (AIS, DTAC, and TrueMove) and a few small providers (Hutch, Thai Mobile, and TOT). In 2008, the three major providers owned about 99 percent of the subscriber market share and about 97 percent of the revenue market share.

Thailand has an idiosyncratic licensing regime. Mobile operators are licensed to operate under a build-operate-transfer model. TrueMove's license expires in 2013. With the 2G license expiring, the major focus of the MNOs is on the faster 3G spectrum, which might replace the revenues earned from the existing 2G operations. M-money must therefore compete for capital against a 3G network roll-out—a business model that is proven

¹ HHI is a measure of the size of companies in relation to their industry and an indicator of the amount of competition among them. It can range from 1 to 10,000, moving from a large number of very small companies to a single monopolistic company. An increase in the HHI generally indicates a decrease in competition and an increase of market power; a decrease indicates the opposite.

to bring in substantial revenues, and that may be viewed by the network as a survival strategy rather than engendering the customer loyalty that may be achieved by m-money.

The state of the mobile market influences the m-money sector in two ways: (1) the competitiveness and health of the sector determines the appetite and capacity of MNOs to invest in an m-money business, and (2) the dominance of a single operator can be conducive to an m-money business, whereas a more competitive market needs to address the thorny issue of interoperability to create economies of scale. However, uncompetitive mobile markets with strongly dominant operators are the exception rather than the rule.

Surveys of Mobile Money Users and Nonusers and Agents

To assess potential markets, the perceptions, behaviors, demands, and technology issues faced by users and nonusers of m-money were gathered through surveys in the four countries. Surveys were also conducted with m-money agents in two countries.

Users were defined as anyone actively using an existing m-money service, including m-banking. **Nonusers** were defined as those not using m-money services, but financially active and using a mobile phone. M-money agents were interviewed in Brazil and Thailand. In Brazil, only Oi Paggo agents were interviewed. The surveys were designed to find answers to the following questions:

- Where and with whom do respondents receive money by mobile or other traditional means?
- For what is the money being used? How much is used? Where is it used and how frequently?
- What are typical financial and phone literacy capabilities?
- What is the range of use of alternative or complementary technologies such as debit and pre-paid cards?
- What are the viability characteristics of agents, such as costs, business model, and capacity-building requirements?

Structured questionnaires were given to approximately 100 users and 100 nonusers in each country. Thirty open-ended questions were asked of m-money agents in Brazil and Thailand. The survey was not intended to be a statistically significant sample, but rather to provide an overview of people's attitudes, preferences, issues, and recommendations regarding m-money services.

Respondents were surveyed in a variety of locations to increase the representation of different socioeconomic backgrounds and to ensure the inclusion of those who live and work at a significant distance from the urban economic capitals. Most respondents were urban; rural areas were not included. Operators of m-money services assisted in the identification of users and agents. The survey used the word "m-banking" rather than "m-money" for simplicity, because most respondents were expected to understand this word with its strong association to financial services. Questionnaires were translated and adapted to each country with country partners. Demographic data were analyzed for users and nonusers. Therefore, while similar topics were explored across all four countries, not all of the questions were the same, and direct comparisons cannot be made in all instances. The purpose of the survey was exploratory rather than strictly comparative.

It is noted that 100 interviews of m-money users and 100 interviews of nonusers in each country is a very small sample. Thus, the representativeness of these data is fairly low and cannot be extrapolated to the entire country or market. While some slightly semi-urban areas were included, these locations were mostly in the vicinity of major urban areas, and thus the geographic representation is low as well. The findings should be validated with larger, more representative studies. Nevertheless, the surveys provided important insights into certain topics and perceptions.

Survey Context and Sociodemographic Respondent Profiles

Brazil

Brazil's results are not comparable to the other survey results because the user survey was conducted among users of Oi Paggo, a mobile service acting as a credit card accepted by a limited number of merchants. It is used mainly to pay phone bills and does not have P2P transfer or deposit and withdrawal functions.

At the time of the survey, Oi Paggo was owned by Tele Norte Leste, popularly known as Oi, the country's largest telecommunications firm, which services mainly the northeast part of the country. Oi Paggo provided telephone contact details of its customers, and the interviews were conducted via phone (all other country surveys were conducted face to face).

The survey was conducted in the large cities of Fortaleza, Recife, and Salvador, which have populations in excess of 1 million and are major economic centers in their states; as well as in the cities of Campina Grande, Maracanaú, Mosoró, and Parnamirim, which have populations of less than 1 million and are more distant from core metropolitan areas. The nonuser survey was conducted by face-to-face interviews in Rio de Janeiro and São Gonçalo, a slightly poorer neighboring municipality. As a consequence, the differences between users and nonusers are influenced by regional differences and an accompanying difference in affluence: users in the northeast are less well-off than the nonusers in and around Rio de Janeiro, as shown in figure 3.6f.

Attributes of Oi Paggo service users follow:

- They are slightly more likely to be female.
- There is a higher representation in the younger age groups; consequently, fewer are married.
- The four largest occupational groups in order of importance are employees, self-employed, "other," and students.

- They have slightly lower educational levels, possibly connected to the fact that they are in the poorer regions of Brazil; also, there are younger users who have not yet completed their higher education.
- They are clearly less well-off economically, which is strongly connected to the large income difference between the Rio de Janeiro area and the Northeast of the country.

These socioeconomic characteristics—younger, less affluent, more students, more self-employed—may explain the higher demand for an alternative credit service such as Oi Paggo.

Nigeria

The survey in Nigeria was administered in 17 locations in and around Lagos, mostly urban and semi-urban areas, with some rural areas. The locations included residential areas, markets, business areas, industrial areas, and farming areas, as well as areas close to universities. The Nigerian survey included an additional 23 self-administered questionnaires by employees of the Intercontinental Bank.

In Nigeria, the main application of m-money is m-banking, provided by many banks as an additional access channel for people with bank accounts. As shown in figure 3.7, more than 60 percent of m-banking users had both a savings account and current (checking) account.

Both users and nonusers said they had a bank account. This is in stark contrast to the latest EFInA survey from Nigeria (EFInA 2008), which found that only 21 percent of the adult population was banked. The southwest region of Nigeria, which includes Lagos, had the largest percentage of banked population: 34 percent. The unbanked are predominantly rural, mostly female (85 percent of adult females unbanked), and more concentrated in the Northeast and Northwest.

Possible reasons for the high presence of banked respondents follow:

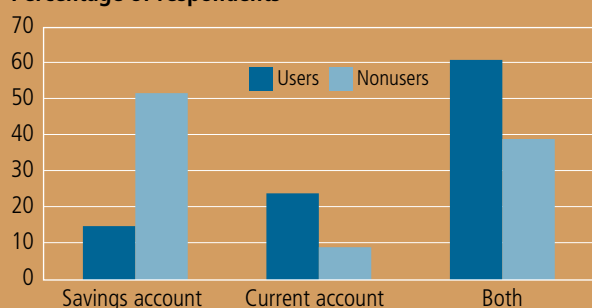
- Location—Lagos is the biggest city and has the most bank branches

Figure 3.6 Brazil: Socioeconomic Characteristics of Mobile Money Users and Nonusers

Source: IFC Mobile Money Study 2011.

Figure 3.7 Nigeria: Types of Bank Accounts Held

Percentage of respondents



Source: IFC Mobile Money Study 2011.

- Not all persons approached for the questionnaire agreed to participate—more unbanked people may have opted out of the survey
- Banking penetration has increased since the 2008 EFInA survey.

The m-banking user respondents in Nigeria are characterized as follows:

- More than 60 percent are male.
- More than 60 percent are between 25 and 45 years old.
- More than 30 percent are employed by private businesses, and about 15 percent each are professionals in the private sector or government/public service.
- More than 70 percent have a university degree, compared with 40 percent among nonusers.
- More than 60 percent are married.
- They are clearly wealthier than nonusers.

In conclusion, the m-banking users in Nigeria are the elite of the society. (See figures 3.8a–f.)

Sri Lanka

In Sri Lanka, the surveys were conducted in all central suburbs/districts in Colombo. Peri-urban areas included were Nugegoda, Maharagama, Dehiwela and Mt. Lavinia, which are 10–15 kilometers from central Colombo.

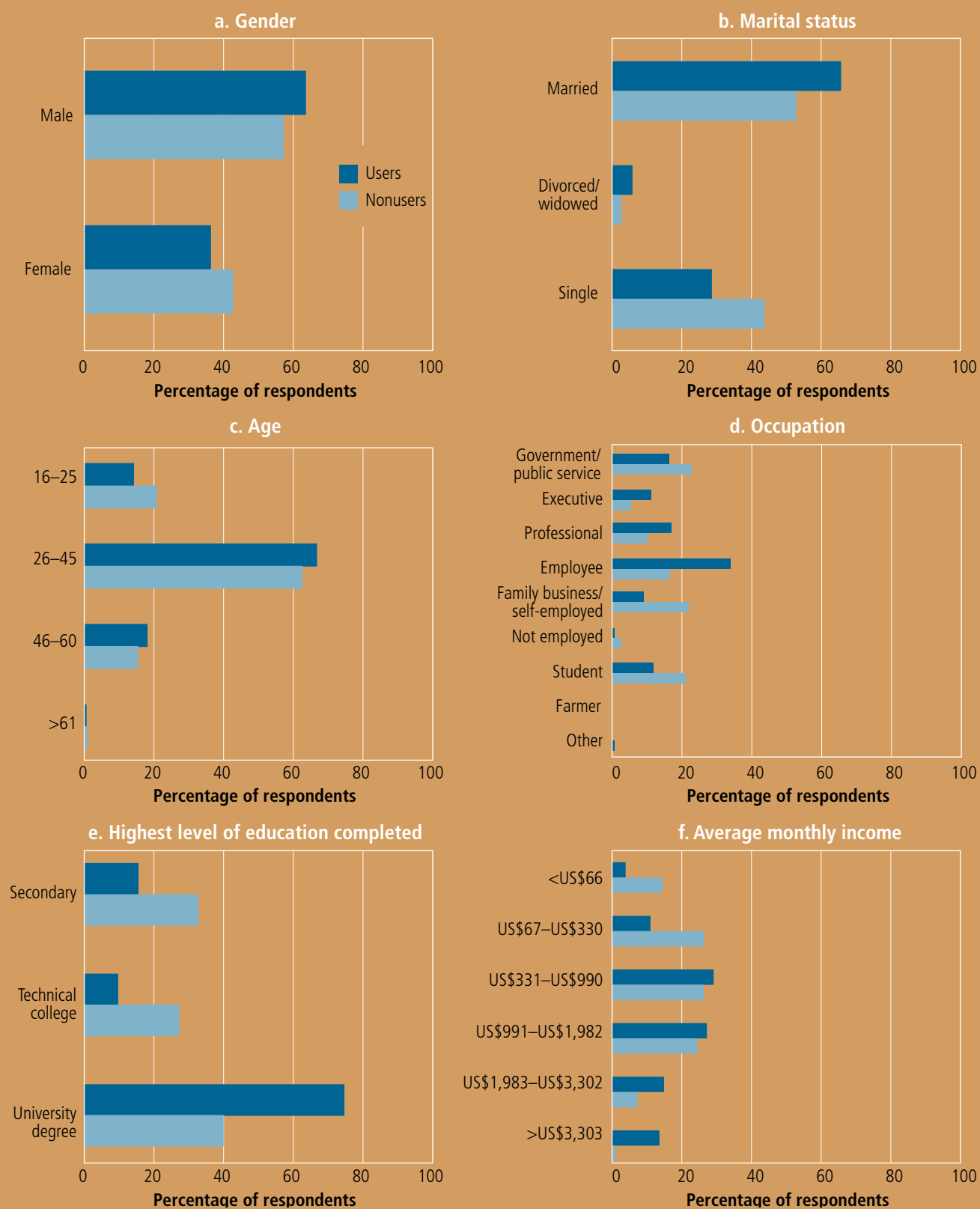
The main m-money service in Sri Lanka is called eZ Pay, provided by one of the major mobile operators, Dialog, in partnership with National Development Bank (NDB Bank). It has only about 2,800 users. Transactions began strongly at the beginning of 2009, but had nearly ground to a halt by February 2010. No marketing has been done since eZ Pay's launch. Staff at Dialog outlets were aware of the product, but had no marketing material for customers.

Figure 3.9 shows that more than 95 percent of both users and nonusers have at least a savings account, usually at one of the three government banks, which are subsidized and have a mandate to provide bank accounts to all. However, more m-money users (25 percent) have current accounts, which are more transactions oriented and are typically provided by commercial banks. Eighty-eight percent of users also have mobile phones that are GPRS/Internet access capable, compared with 39 percent of nonusers (figure 3.10).

Figure 3.11 shows the sociodemographic details of m-money users and nonusers in Sri Lanka. Sri Lanka's m-money users can be summarized as follows:

- The majority (79 percent) are male.
- More than 40 percent are 25 years old or younger; over 70 percent are 35 years old or younger.
- Almost half (46 percent) are college graduates.
- Almost 70 percent are single.
- More than 50 percent are in a junior administrative/managerial position, 16 percent are students, and 15 percent are self-employed or in business.
- More than 40 percent are in the top two income groups; in comparison, over 60 percent of nonusers are in the lowest income group.

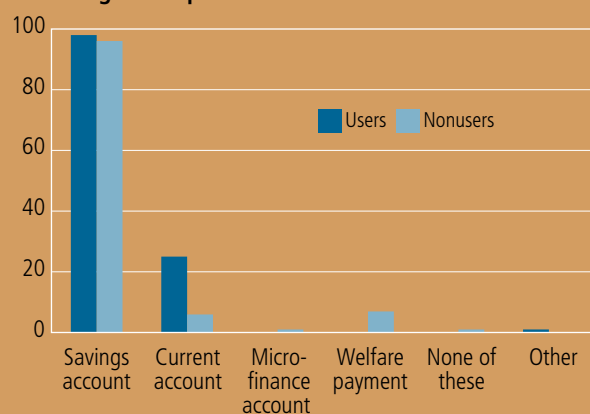
The m-money user respondents are thus predominantly young males with white-collar jobs.

Figure 3.8 Nigeria: Socioeconomic Characteristics of Mobile Money Users and Nonusers

Source: IFC Mobile Money Study 2011.

Figure 3.9 Sri Lanka: Types of Bank Accounts Held

Percentage of respondents

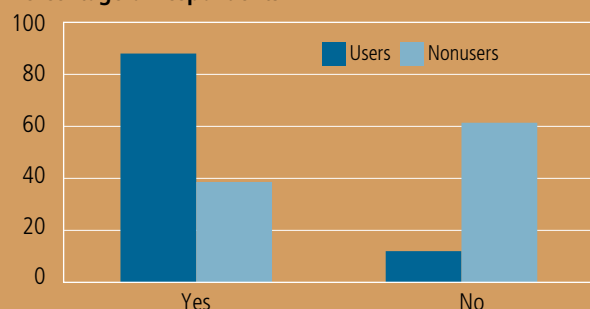


Source: IFC Mobile Money Study 2011.

Note: Multiple selections were allowed.

Figure 3.10 Sri Lanka: Mobile Phone Access to GPRS/Mobile Internet

Percentage of respondents



Source: IFC Mobile Money Study 2011.

Thailand

The survey in Thailand was conducted in and around Bangkok with most respondents in Central Bangkok (where income levels are high). Some respondents were in poorer neighborhoods on the outskirts of Bangkok; a smaller number were 50 kilometers outside of Bangkok.

Thailand has several active m-money providers. The MNOs AIS and TrueMoney provide a mobile wallet solution. At the beginning of 2010, about 6 million of 15 million TrueMove subscribers had

an e-wallet account.² Approximately 400,000–500,000 AIS subscribers have an Advanced MPay account; however, only about 100,000 accounts are active users.³ DTAC, another mobile operator, has more than 1.4 million m-banking subscribers.

The sociodemographic profile of the Thailand respondents is shown in figure 3.12. The m-money user respondents can be summarized as follows:

- Slightly more m-money users are female.
- Almost 40 percent are 26 years old or younger.
- About 80 percent are single.
- About 80 percent state they have a university degree, yet slightly over 30 percent state they are still students.
- The other large occupational group of m-money users are employees (slightly over 30 percent).
- Slightly less than 70 percent earn US\$900 per month or less.

In Thailand, m-money users are mostly young and well-educated, but are in the lower-income groups.

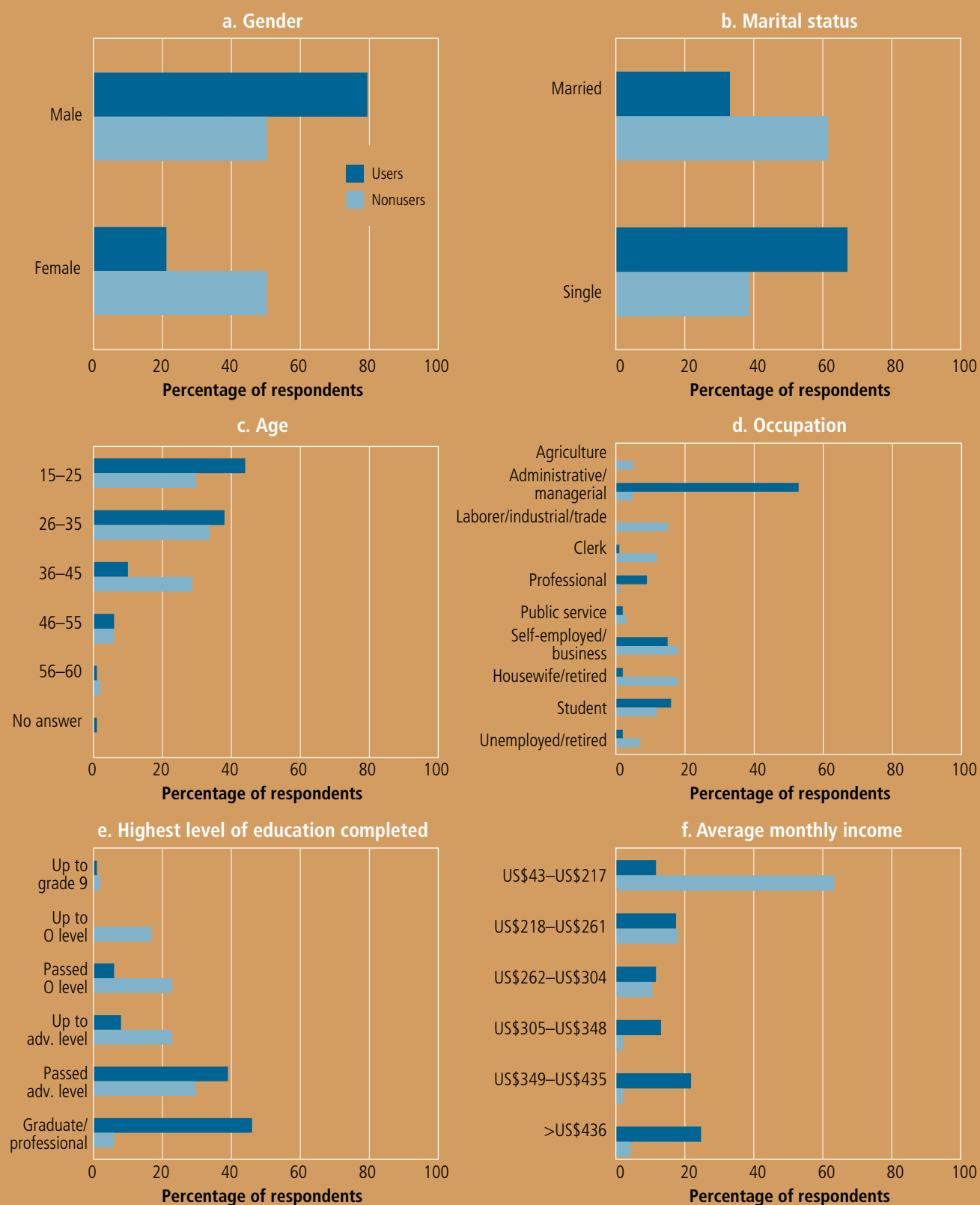
Comparison of Socioeconomic Mobile Money User Profiles

Considering the strong socioeconomic differences of the four surveyed countries and the variety of m-money offerings, is there a common trend or profile of m-money users?

- **Age.** In all four countries, the majority of m-money users is in the 26- to 45-year age range. However, Thailand and Sri Lanka have a larger percentage of younger users in the 15- to 25-year range.
- **Gender.** Slightly more females use m-money in Brazil and Thailand, whereas more males use it in Sri Lanka and Nigeria.

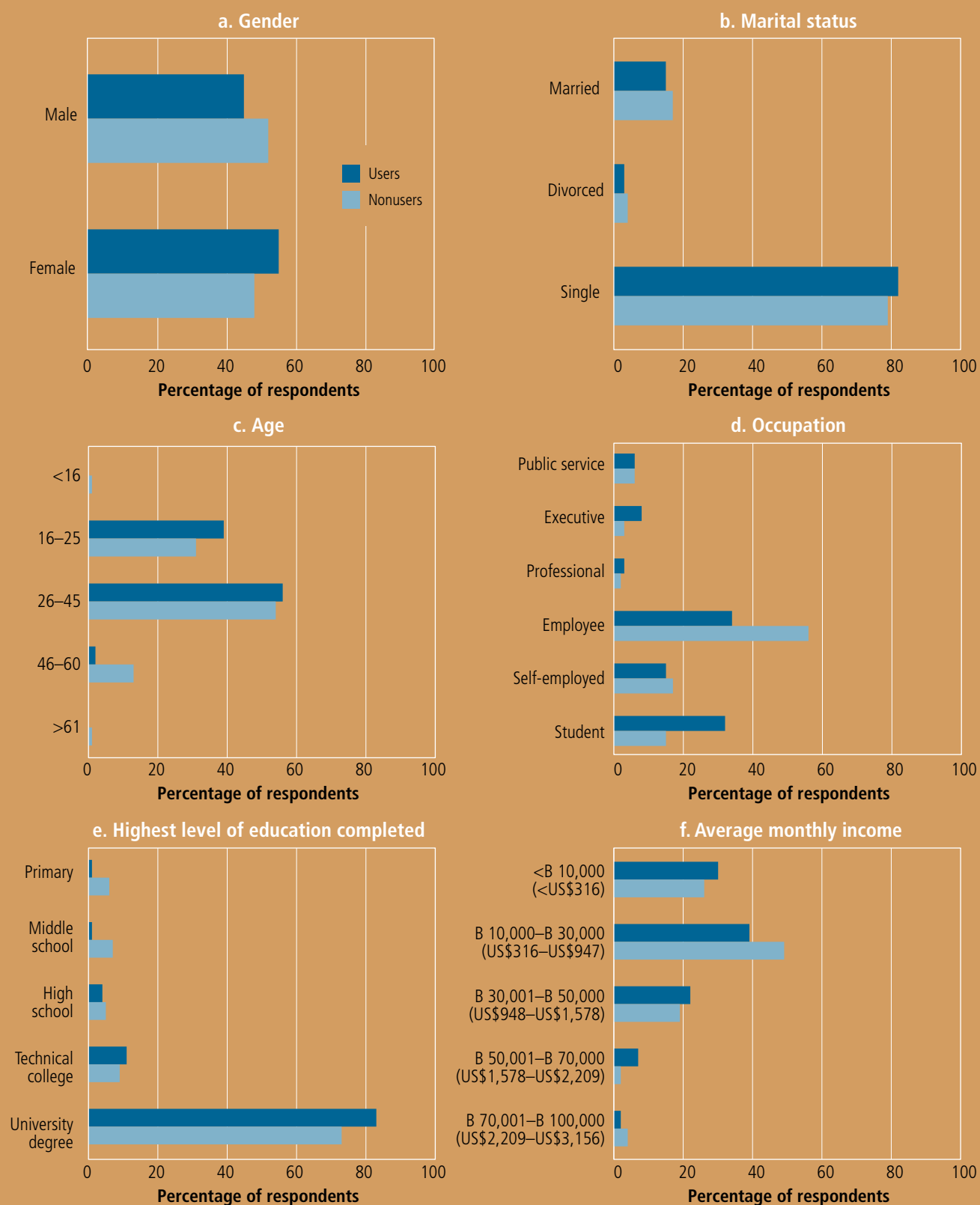
² Interview with Piyachart Ratanaprasartporn, TrueMoney general manager, January 28, 2010.

³ Interview with Supreecha Limpikanjanakowit, Advanced MPay managing director, February 25, 2010.

Figure 3.11 Sri Lanka: Socioeconomic Characteristics of Mobile Money Users and Nonusers

Source: IFC Mobile Money Study 2011.

Figure 3.12 Thailand: Socioeconomic Characteristics of Mobile Money Users and Nonusers



Source: IFC Mobile Money Study 2011.

- Education.** Thailand and Nigeria have the most educated m-money users with over 80 percent and 70 percent, respectively, having a university degree. Sri Lanka follows Thailand and Nigeria with more educated m-money users. However, Brazil has markedly lower education levels among m-money users: 60 percent with secondary education and 20 percent with only primary education.
- Occupation.** The largest occupational group among m-money users in all countries is employees, with about 30 percent in Brazil, Nigeria, and Thailand, and more than 50 percent in Sri Lanka (administrative/managerial employees). The second largest occupational group differs across the countries: about 25 percent self-employed in Brazil, more than 30 percent students in Thailand, about 15 percent each professional and government or public service in Nigeria, and more than 10 percent each self-employed and students in Sri Lanka.
- Income.** In Sri Lanka and Nigeria, m-money users are clearly better off than nonusers. In Thailand, no conclusive statement can be made. In Brazil, m-money users have less income than the nonusers (this may be related to the survey locations: Rio De Janeiro and surrounds for the nonusers and the poorer northeast for the Oi Paggo users).

Based on this analysis, the following hypothesis could be formulated for further investigation in other countries: In financially less-developed markets like Nigeria and Sri Lanka, m-money users are economically better off, more educated, early adopters. In Thailand and Brazil, where there is a more advanced financial system and a smaller proportion of the unbanked and/or underserved segment, m-money users are less well-off economically, members of the unbanked and/or underserved segment, which includes students in Thailand.

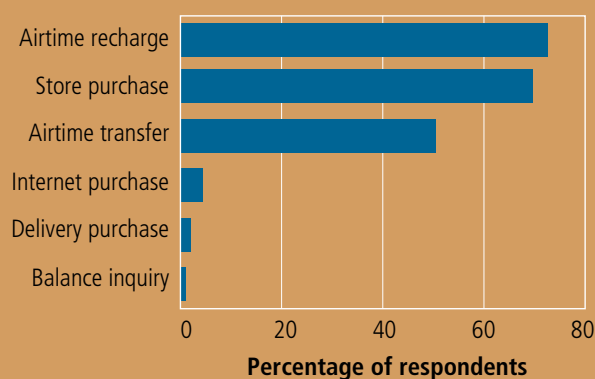
Use of Mobile Money

Brazil

Oi Paggo's use is focused on mobile phone-related services (airtime recharge and airtime transfer) and

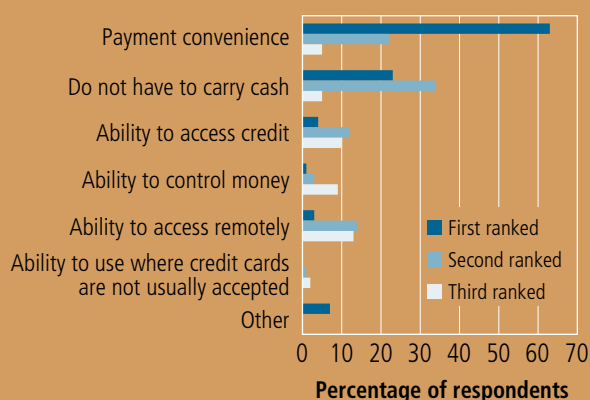
credit card function (store purchases), which are also the main services offered (figure 3.13). The top reasons respondents use the Oi Paggo service is for its convenience and the ability to make transactions without cash (figure 3.14). Surprisingly, access to credit is less important; less than 5 percent gave this as their first-ranked reason for using Oi Paggo, and only slightly more than 10 percent cited this as their second-ranked reason. This does not necessarily mean there is little demand for credit, but rather that Oi Paggo is not seen as a credit service.

Figure 3.13 Brazil: Oi Paggo Services Used



Source: IFC Mobile Money Study 2011.

Figure 3.14 Brazil: Top Three Reasons for Using Oi Paggo Services



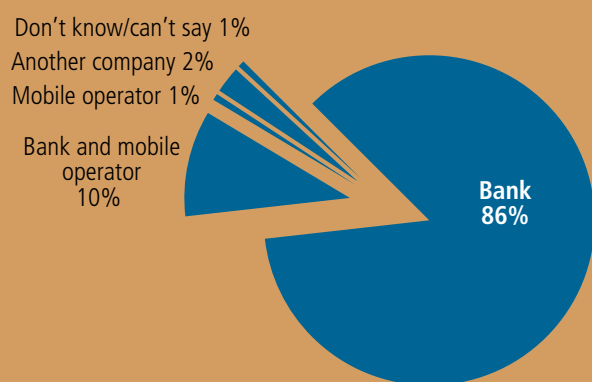
Source: IFC Mobile Money Study 2011.

Nigeria

The majority of m-banking users in Nigeria are aware that their service is provided by their bank as an addition to their account (figures 3.15 and

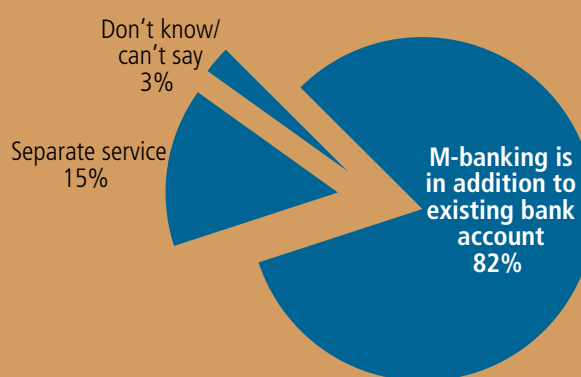
3.16). Services exist only for the banked segment of the population. The top three services used are airtime recharge, fund transfer, and balance inquiry (figure 3.17). Fund transfers are limited to between a person's own accounts and accounts at the same bank. Figure 3.18 shows that 70 percent of respondents said they used one of the top three services several times per month, but only about 15 percent used them weekly—a fairly low frequency.

Figure 3.15 Nigeria: Mobile Banking Service Provider



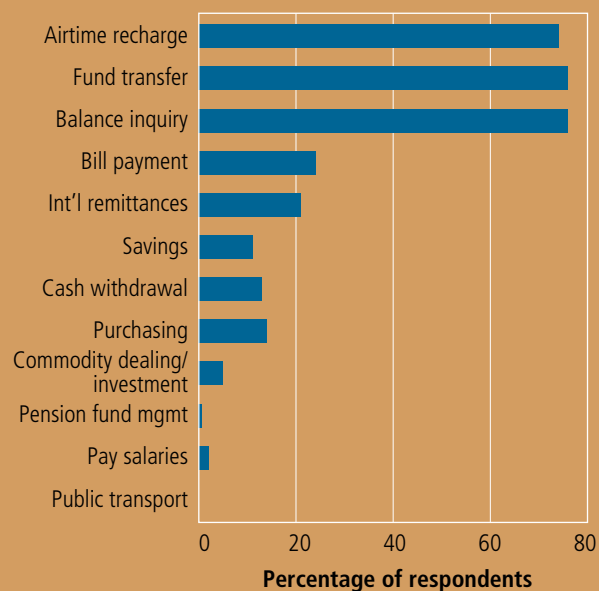
Source: IFC Mobile Money Study 2011.

Figure 3.16 Nigeria: Relationship of Mobile Banking to Regular Bank Account



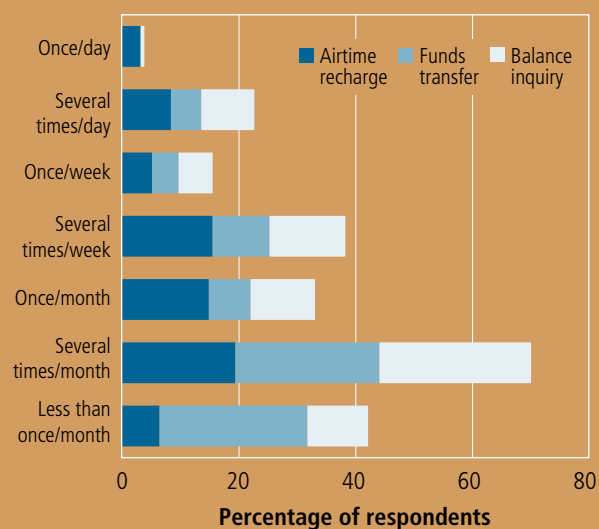
Source: IFC Mobile Money Study 2011.

Figure 3.17 Nigeria: Mobile Money Services Used



Source: IFC Mobile Money Study 2011.

Figure 3.18 Nigeria: Frequency of Use of Top Three Mobile Money Services



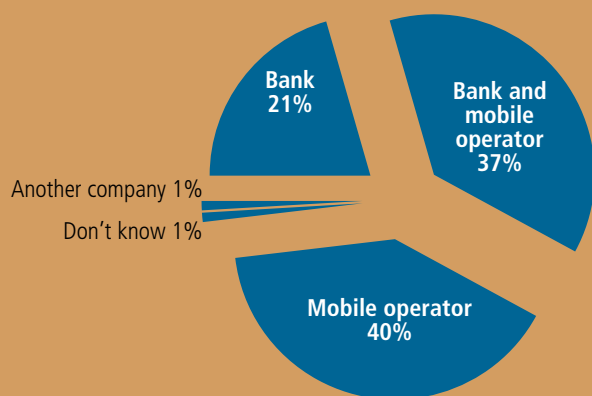
Source: IFC Mobile Money Study 2011.

Sri Lanka

A majority, 54 percent, of m-money user respondents used the eZ Pay service offered through the mobile operator as a service separate from any bank account (which is often with a government bank). This is a potential indication that the m-money offering is used by people who may be underserved by less-efficient government banks.

As figure 3.19 shows, there is a variety of opinion regarding who provides their m-money service. Only 40 percent of users were aware that the service is provided in partnership with a bank (although a bank account with NDB Bank is not required).

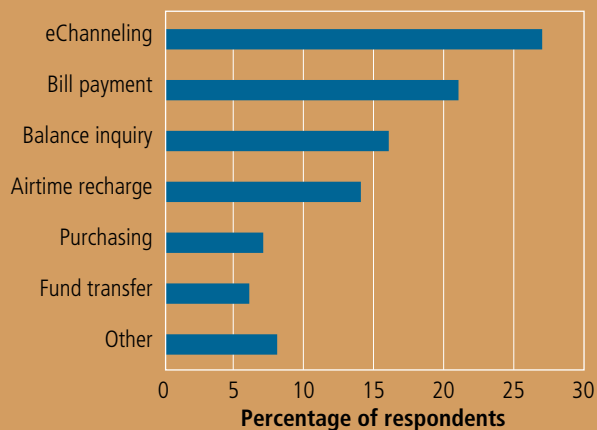
Figure 3.19 Sri Lanka: Mobile Banking Service Provider



Source: IFC Mobile Money Study 2011.

The main application used by nearly 70 percent of respondents is eChanneling, a unique product of the three major mobile providers in Sri Lanka, which is a system for booking doctor appointments (figure 3.20). A mobile subscriber phones the eChanneling call center and books a doctor's appointment. Doctors are allied to a particular hospital. The hospital and doctor's consulting fee, the eChanneling fee, and a small transaction fee to the MNO are deducted from the subscriber's airtime balance (prepaid or postpaid). The second-most-used m-money service (50 percent of

Figure 3.20 Sri Lanka: Mobile Money Services Used

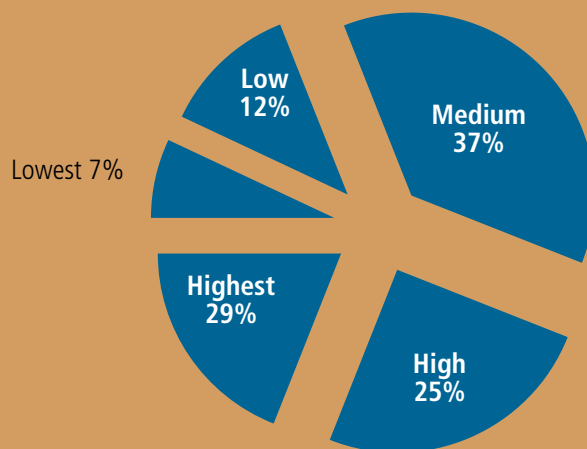


Source: IFC Mobile Money Study 2011.

respondents) is bill payment, indicating an important demand because many Sri Lankans have to stand in line to pay bills.

Overall, m-money users rated their knowledge of m-banking services as high, with almost 45 percent stating their knowledge was high or highest, and more than 35 percent assessing it as medium (figure 3.21).

Figure 3.21 Sri Lanka: Users' Reported Level of Knowledge of Mobile Banking Services

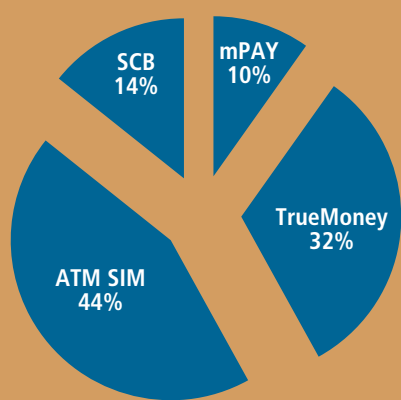


Source: IFC Mobile Money Study 2011.

Thailand

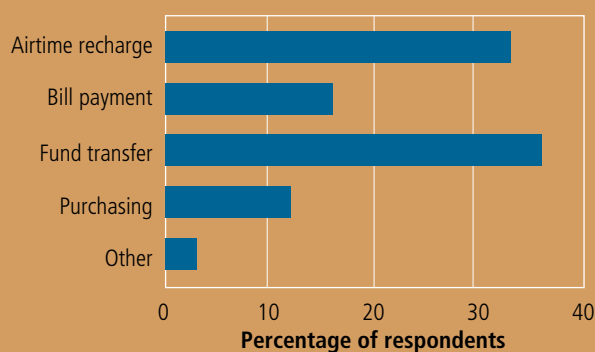
For 40 percent of m-money users in Thailand, the service is not linked to a bank account, perhaps meaning that these m-money users are unbanked. Figure 3.22 provides a breakdown of m-money service providers subscribed to by users. Figure 3.23 shows that the two biggest m-money applications used, with over 30 percent each, are airtime recharge and fund transfer.

Figure 3.22 Thailand: Mobile Banking Service Provider



Source: IFC Mobile Money Study 2011.

Figure 3.23 Thailand: Mobile Money Services Used



Source: IFC Mobile Money Study 2011.

Comparison of Mobile Money Use across the Four Countries

The m-money services that were used the most differed among countries; they are ranked in table 3.7. Based on a variety of parameters per country, m-money opportunities seem to be country specific rather than generic.

Table 3.7 Most-Used Mobile Money Services in Four Countries

Country	Top-ranked use	Second-ranked use
Brazil	Airtime recharge	Store purchase
Nigeria	Balance inquiry	Fund transfer
Sri Lanka	Special m-app to schedule doctor appointment	Bill payment
Thailand	Fund transfer	Airtime recharge

Source: IFC Mobile Money Study 2011.

Financial Knowledge, Technical Literacy, and Awareness of Mobile Money

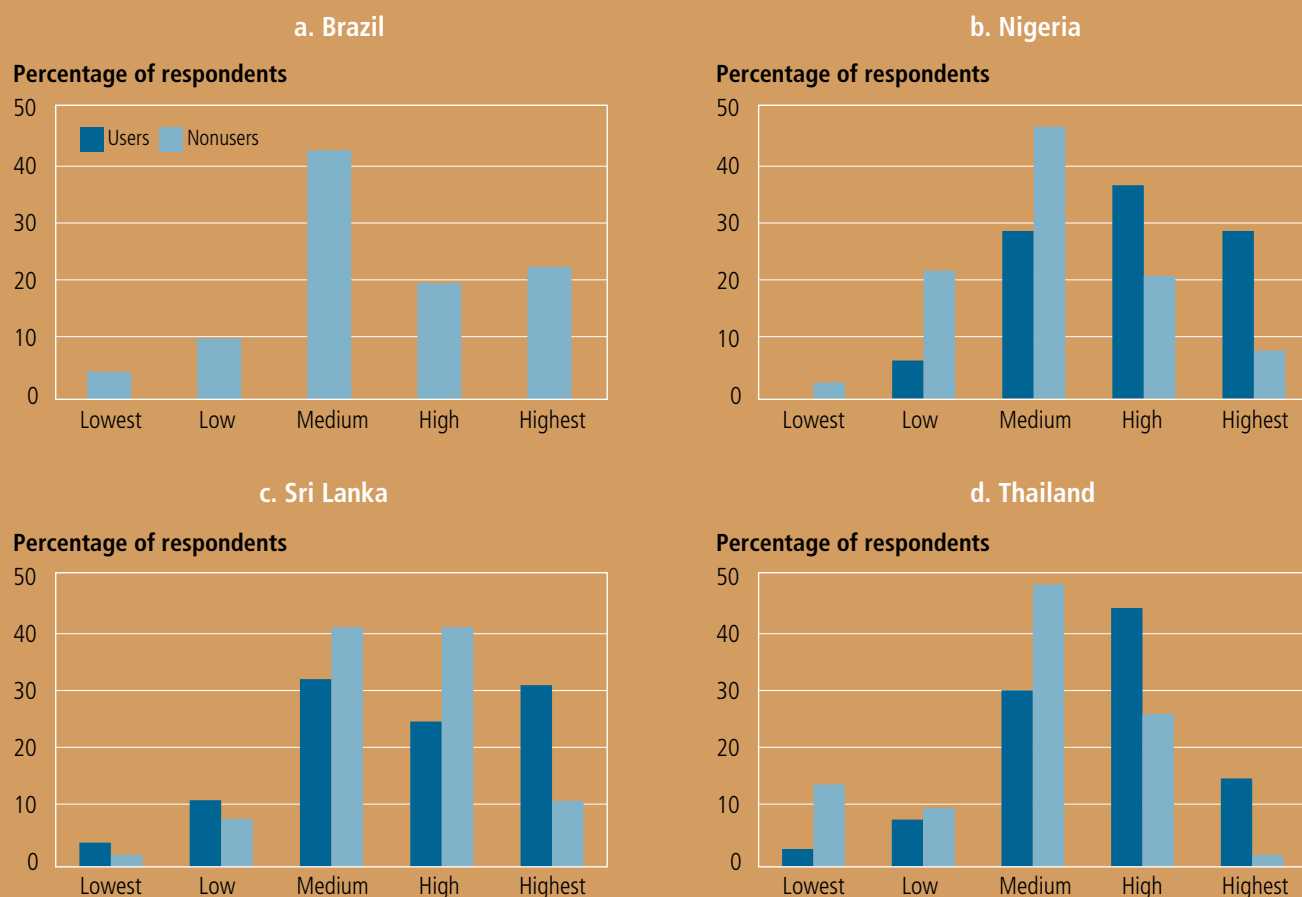
Financial Knowledge

Not surprisingly, users of m-money services consistently rated their general knowledge of banking services higher than nonusers (the question was not asked of users in Brazil). Respondents who felt their knowledge of banking services was medium to high were more likely to use m-money services (figure 3.24).

Interestingly, in all four countries, most nonusers (about 40 percent) rated their knowledge of banking services as medium. Only in Sri Lanka did 40 percent of nonusers rate their banking knowledge as high (figure 3.24c), perhaps because more than 90 percent of respondents had a savings account. Marketing and literacy campaigns are therefore clearly important to spur the adoption of m-money services.

Technical Literacy

In Nigeria and Thailand, where additional questions were asked about respondents' ability to use certain devices, users were more comfortable than nonusers with mobile phones, ATMs, the Internet, and debit and prepaid cards (figure 3.25). Interestingly, in Thailand, more respondents rated their ability to use ATMs, not mobile phones, as high or highest (figure 3.25b), possibly because of the prevalence of ATMs in Thailand. In both

Figure 3.24 Knowledge of Bank Services Available through Branch

Source: IFC Mobile Money Study 2011.

countries, respondents' perceptions of their ability to use debit and prepaid cards were low. This might be an important advantage for m-money over card-based e-money offerings in these countries.

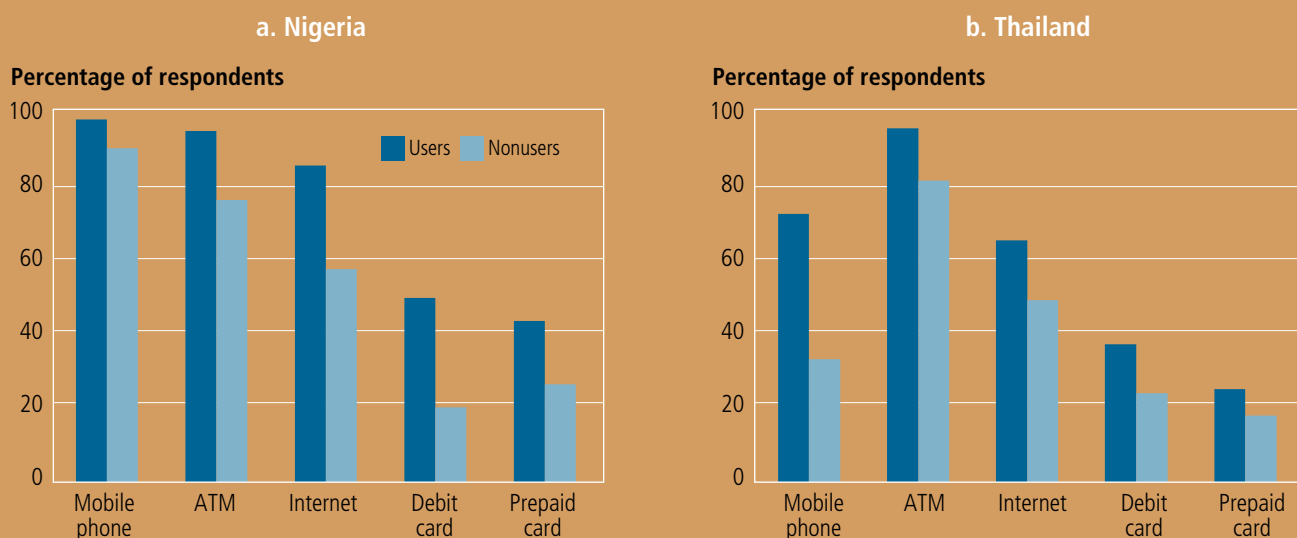
In Sri Lanka, users and nonusers were also asked to rate their ability to use certain devices: mobile phones, ATMs, Internet, POS devices, and debit and prepaid cards. Again, m-money users considered themselves more able to use these devices. It is interesting that nonusers said they had a low ability to use the Internet (43 percent), POS devices (65 percent), and debit cards (63 percent).

In Thailand, users of m-money services were stronger users of the data capabilities (SMS, Internet connection) of their mobile phones than nonusers (figure 3.26).

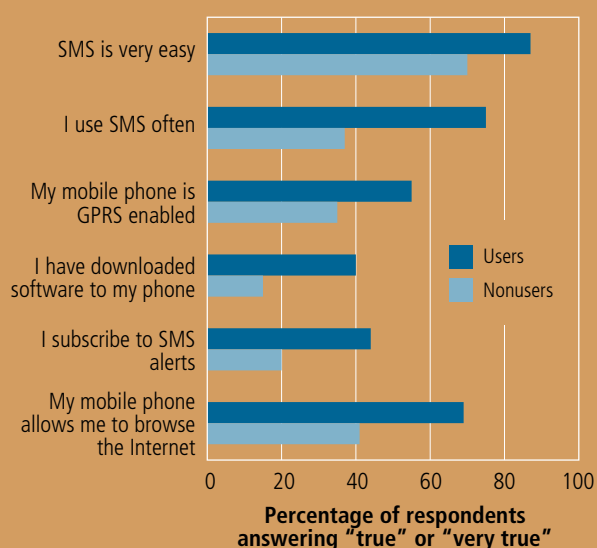
In Brazil, nonusers of m-money services were asked to rate the frequency with which they use certain data features of their mobile phones. Figure 3.27 shows that more than 50 percent of respondents do not use multimedia messages, software downloads, or e-mail, or connect to the Internet through their mobile phones. More than 50 percent use SMS. The use of data-related mobile phone services and data-capable mobile phone models are obviously important for m-money services and their adoption.

Awareness of Mobile Money and Marketing

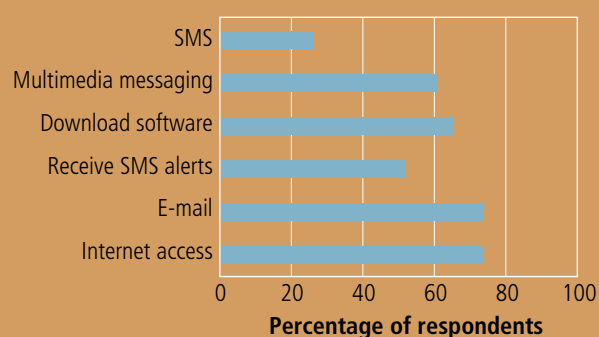
Except in Sri Lanka, nonusers were asked whether they had heard about m-banking. Knowledge of m-money was very high—between 66 and 70 percent—in the three countries (figure 3.28).

Figure 3.25 Percentage of Respondents Rating Their Ability to Use Various Devices as High or Highest

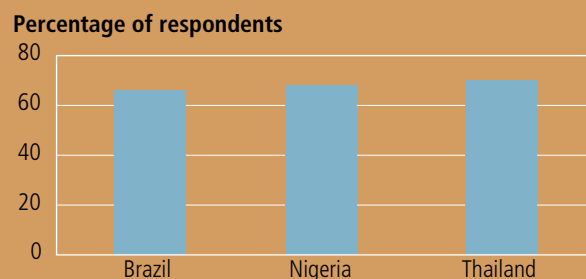
Source: IFC Mobile Money Study 2011.

Figure 3.26 Thailand: Familiarity with Mobile Phone Capabilities

Source: IFC Mobile Money Study 2011.

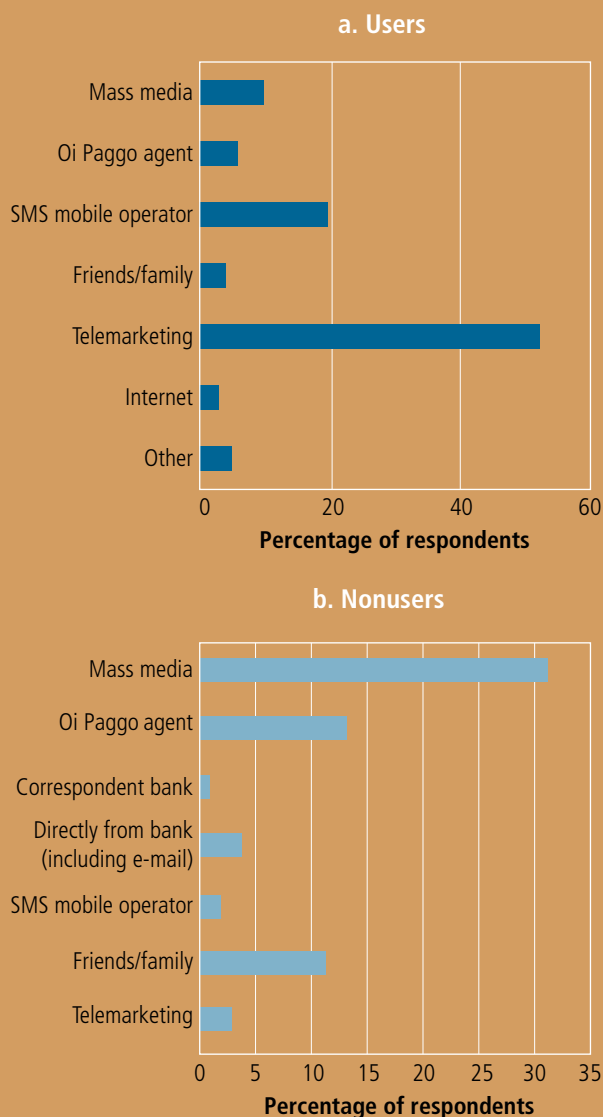
Figure 3.27 Brazil: Nonuser Unfamiliarity with Mobile Phone Capabilities

Source: IFC Mobile Money Study 2011.

Figure 3.28 Percentage of Nonusers Who Have Heard of Mobile Banking

Source: IFC Mobile Money Study 2011.

Most respondents said they had heard about m-money through the mass media. Country results are shown in figures 3.29 and 3.30. In Brazil, users were mostly made aware of the Oi Paggo service through telemarketing, whereas nonusers knew about m-banking through the mass media, followed by an Oi Paggo agent (figure 3.29).

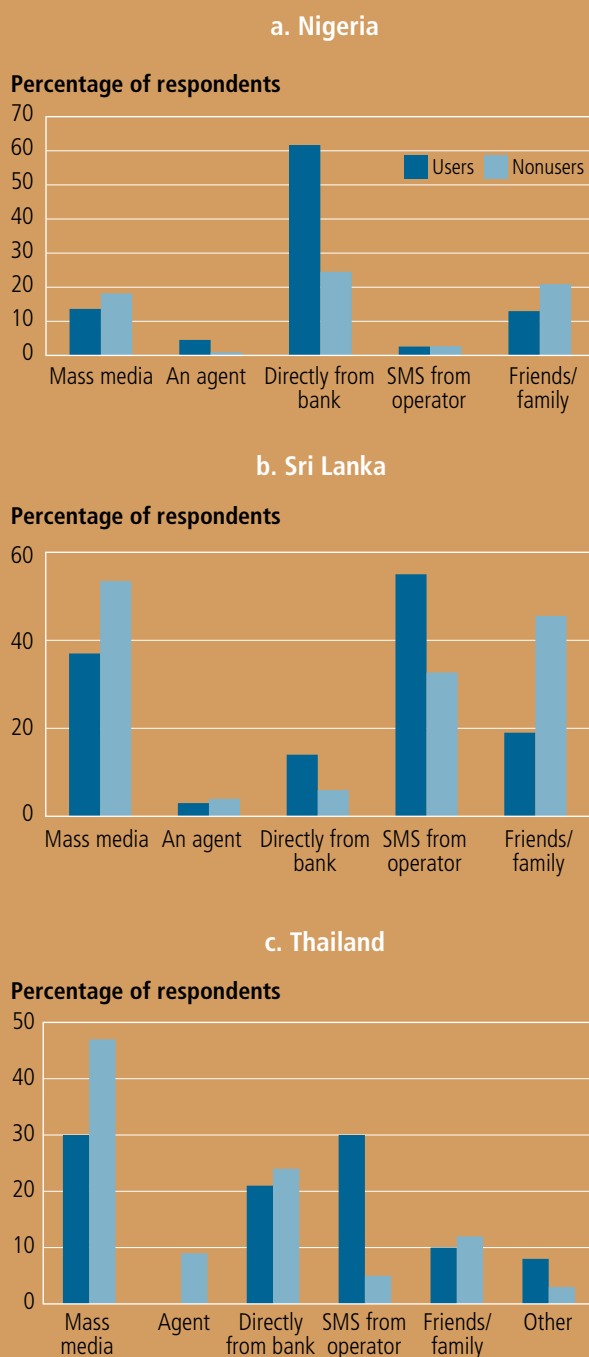
Figure 3.29 Brazil: Source of Information on Mobile Banking Services

Source: IFC Mobile Money Study 2011.

Note: Multiple selections were allowed.

In Nigeria, where the m-money service is only offered by banks as an extension for existing customers, not surprisingly, most m-banking users had heard about the service from their bank (figure 3.30a).

The main means through which users heard about m-banking services in Sri Lanka was through a SMS text message from their mobile service

Figure 3.30 Nigeria, Sri Lanka, and Thailand: Source of Information on Mobile Banking Services

Source: IFC Mobile Money Study 2011.

Note: Multiple selections were allowed.

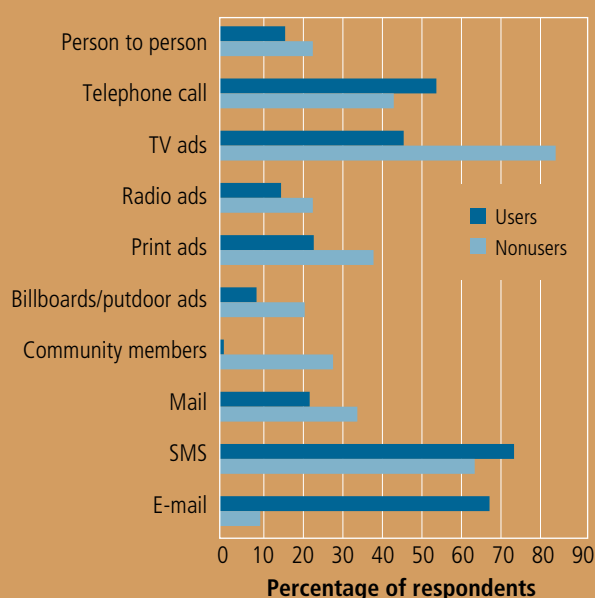
operator. Nonusers mostly heard about m-banking through the mass media, followed by friends and family (figure 3.30b).

In Thailand, most nonusers know about m-banking from the mass media, followed by their bank; users heard about m-money services equally through the mass media and an SMS text message from their MNO (figure 3.30c).

In conclusion, there is a marked difference in how users heard about m-money compared with nonusers—users heard about m-money more *directly*: either directly from the bank, or directly from the MNO through a call or SMS text message. Nonusers mostly heard indirectly about m-money—through the mass media (except in Nigeria where they heard directly from their bank). This might mean that a direct and personal approach is more helpful in increasing the adoption of m-money services.

Asked about preferred communications, most users of m-money services in Sri Lanka said they preferred to be contacted *directly* by SMS text message, e-mail, or telephone. Most nonusers preferred to learn about m-banking services through the mass media, with the second-most-popular preference being a direct SMS text message (figure 3.31).

Figure 3.31 Sri Lanka: Preferred Method to Learn about Mobile Money



Source: IFC Mobile Money Study 2011.

Financial Behaviors of Respondents

Withdrawing Money and Use of ATMs

While users of m-money services often use ATMs, nonusers rely more on human bank tellers, especially in Sri Lanka (figure 3.32).

In Thailand, both m-money users and nonusers made high use of ATMs not only to withdraw cash but also for many other functions, including P2P transfers and bill payments. ATMs are prevalent in Thailand.

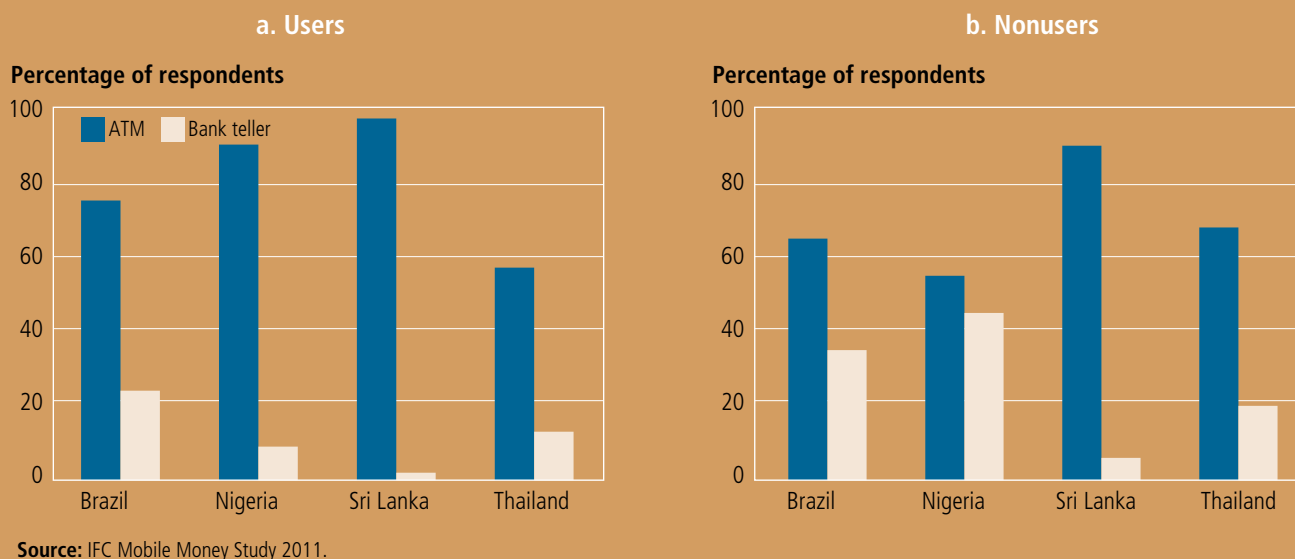
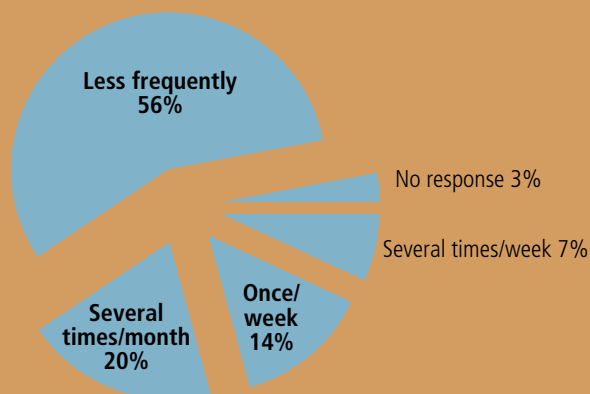
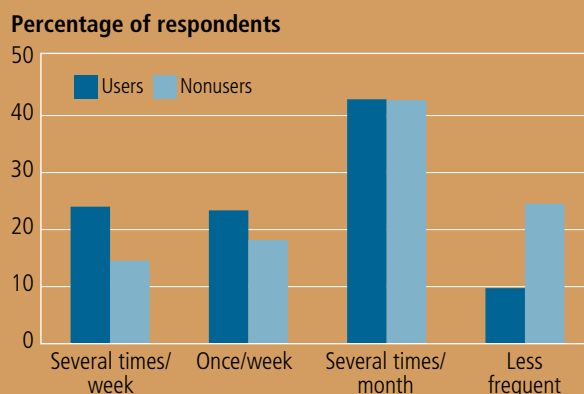
In Nigeria, a high proportion of those interviewed in Lagos, which has most of the country's ATMs, still use bank tellers, supporting the finding that overall ATM penetration is still low.

Brazil is different—more m-money nonusers than users use ATMs, probably because the nonuser respondents were from the more affluent Rio de Janeiro, and the Oi Paggo user respondents were from the poorer northeast. ATM withdrawals were low, because 27 percent of Oi Paggo users stated that they do not withdraw cash. Oi Paggo users are typically poorer, and they may be paid in cash or by check, which they cash at a bank or local store. These 27 percent are also the unbanked Oi Paggo users.

Generally, m-money users use ATMs more than nonusers, possibly because they feel more comfortable with technology. However, the widespread ATM network in Thailand means that even nonusers have migrated to ATM networks.

Relevant Behaviors of Users and Potential Users

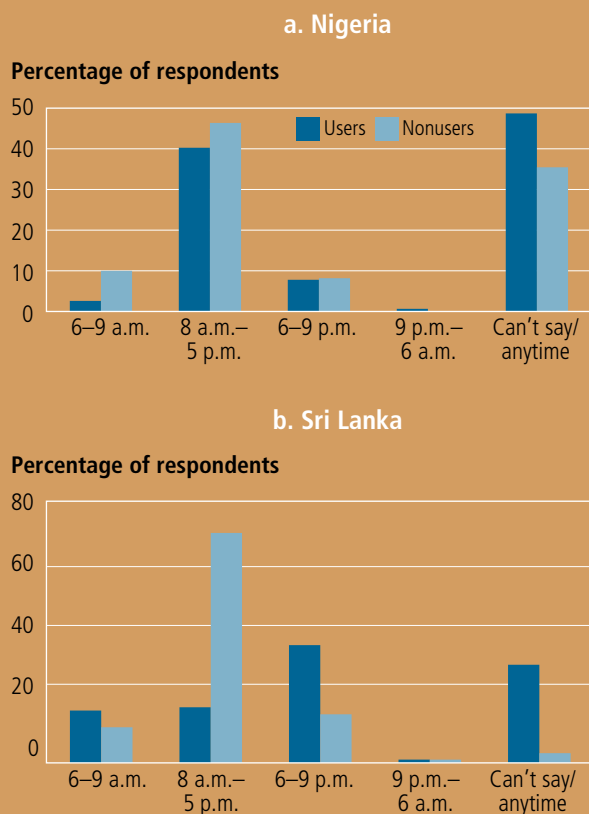
In Sri Lanka, most nonusers (56 percent) withdrew money less than once a month, whereas only 7 percent withdrew funds several times a week (figure 3.33). In Nigeria, only about 35 percent of nonusers made withdrawals monthly or less frequently; about 15 percent withdrew several times a week. Users made more frequent withdrawals, but slightly more than 40 percent of users and nonusers took out cash several times a month (figure 3.34).

Figure 3.32 Cash Withdrawal Sources Used Most Frequently by Users and Nonusers**Figure 3.33 Sri Lanka: Frequency with Which Nonusers Withdraw Money****Figure 3.34 Nigeria: Frequency with Which Users and Nonusers Withdraw Money**

User behavior is different in each country: In Nigeria (figure 3.35a), the differences between users and nonusers are not so pronounced, although a slightly higher percentage of nonusers wanted to withdraw money at any time while more nonusers were content with business hours. In Sri Lanka (figure 3.35b), most users wanted to be able to access money after business hours (6–9 p.m.) or anytime, while most nonusers seemed satisfied with typical daytime business hours.

Transfer of Funds

Figure 3.36 shows that among m-money users in Nigeria and Sri Lanka, 53 percent and 63 percent, respectively, still used bank tellers to transfer money, highlighting an opportunity for m-money to provide this service. In Thailand, however, the opportunity is much lower because so many people used free ATMs for money transfers. Nevertheless, 18 percent of Thai m-money users used their mobile phone to transfer funds. In Nigeria, 17 percent of respondents stated that their most-used mode of money transfer was by mobile

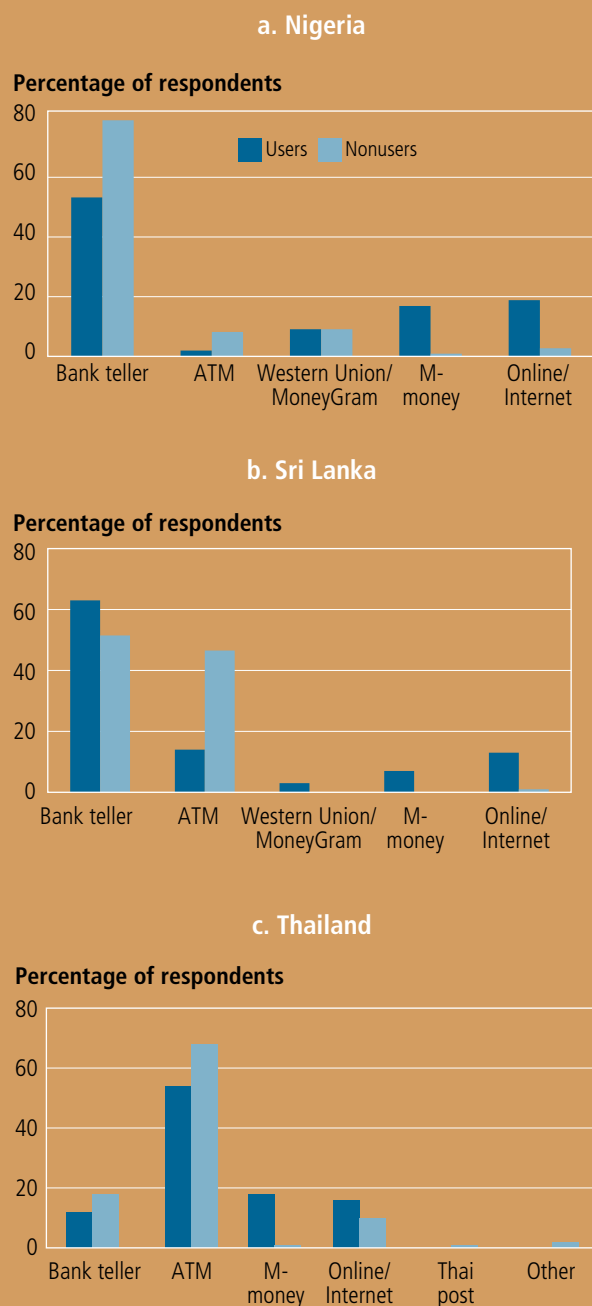
Figure 3.35 Most Convenient Time of Day to Withdraw Money

Source: IFC Mobile Money Study 2011.

phone; in Sri Lanka only 7 percent said the same.⁴ In all three countries, roughly 10–20 percent of respondents said the Internet was their most-used tool to transfer money.

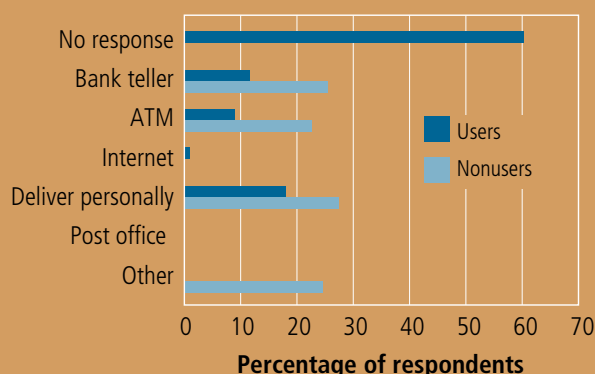
In Nigeria, the bias of the survey toward urban areas is apparent because only 9 percent of respondents—both users and nonusers—took advantage of informal means to transfer money. In contrast, the EFINA household survey found a significant number of Nigerians using informal mechanisms such as family and friends to transfer money. Among nonusers, Thais were more prone to use the Internet to transfer money than the other three nationalities.

⁴ Respondents had the option of stating that they used the post office to transfer money, but none chose that option.

Figure 3.36 Typical Methods of Money Transfer

Source: IFC Mobile Money Study 2011.

Fund transfer results from Brazil are shown in figure 3.37. It is interesting that a large group of respondents stated that they transfer funds by delivering them personally. This makes sense in the highly urban environment of Brazil, but also allows scope for a more convenient mobile P2P product.

Figure 3.37 Brazil: Typical Methods of Money Transfer

Source: IFC Mobile Money Study 2011.

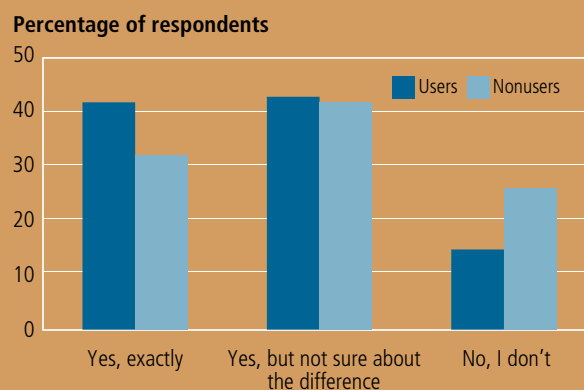
When the 25 percent of nonusers who selected “other” were asked to specify what they meant, the majority stated that they do not transfer funds.

In Thailand, respondents were asked whether they were aware of cost differences between different types of money transfer. More than 80 percent were aware of the cost differences, but only about half knew the exact amount of the difference (figure 3.38).

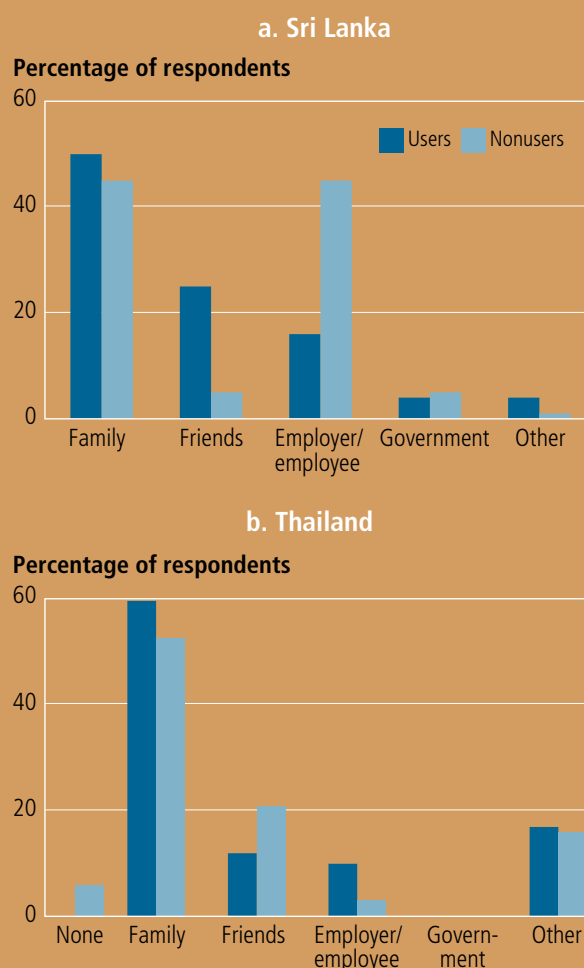
In Sri Lanka, the majority of m-money users exchanged funds mostly with family, followed by friends. Nonusers were equally as likely to exchange funds with family as with an employer/employee, indicating an opportunity for m-money for payroll for informal workers (figure 3.39a). In Thailand, respondents said they most often exchanged funds within their families (figure 3.39b).

Bill Payments

In Sri Lanka, the most common bill payment channels are still cash direct to the company, followed by paying bills at the bank (figure 3.40c). This is also prevalent in Nigeria, which shows that there is an opportunity for m-payment of bills (figure 3.40b). Almost 10 percent of users in Sri Lanka and over 15 percent of users in Nigeria use m-banking to pay their bills, demonstrating a propensity to switch over to convenient m-payment of bills. In Nigeria, m-banking competes with prepaid cards for convenient payment of bills.

Figure 3.38 Thailand: Knowledge of Cost Differences for Different Methods of Money Transfer

Source: IFC Mobile Money Study 2011.

Figure 3.39 Fund Transfer Destinations

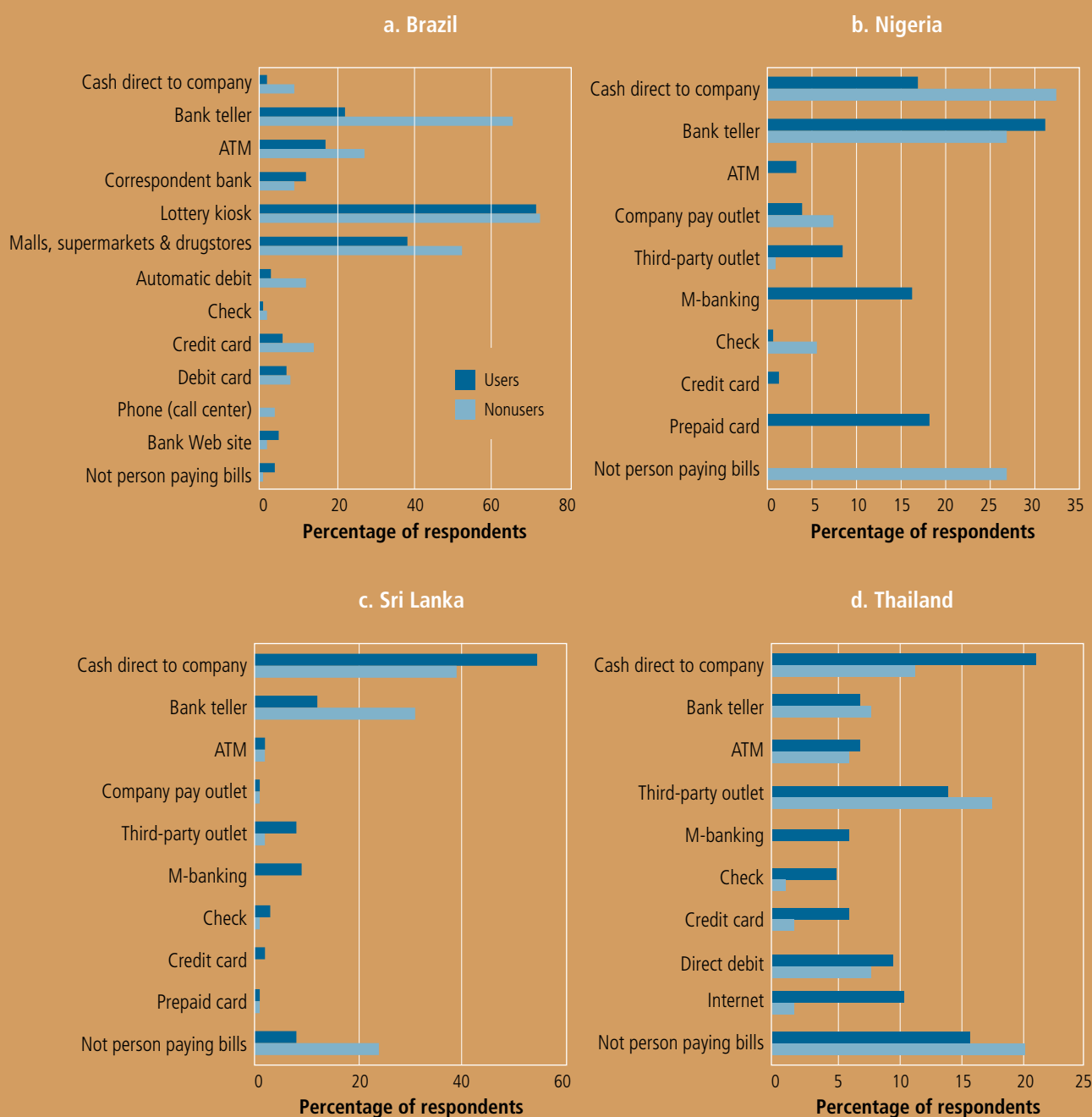
Source: IFC Mobile Money Study 2011.

The results from Brazil (figure 3.40a) show a wide variety of payment channels, though the most popular are various types of correspondent banks (the lottery kiosks are one of the major correspondent banks, also malls, supermarkets, and drugstores). Still, over 60 percent of nonusers also used bank tellers—which might be due to the higher

concentration of banks in Rio de Janeiro compared to the northeast locations.

In Thailand (figure 3.40d), like Brazil, many types of bill payment channels are used, with only slightly over 5 percent of m-money users stating they used their mobile phone. A much smaller percentage of respondents used bank tellers (less

Figure 3.40 Typical Bill Payment Channels



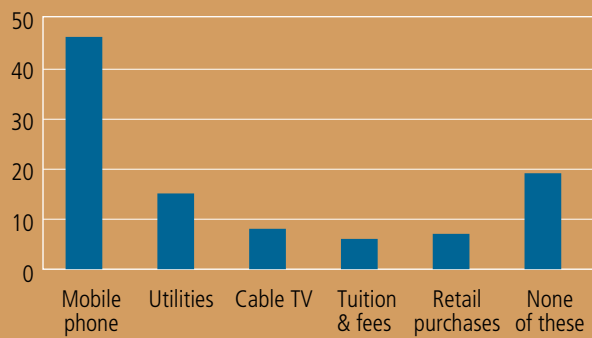
Source: IFC Mobile Money Study 2011.

than 10 percent); more than 10 percent paid cash directly to the company. Nevertheless, opportunities in Thailand and Brazil are smaller than in Sri Lanka or Nigeria.

Although only 9 percent of Sri Lankan respondents typically used m-banking to pay their bills, they used it to pay the following type of bills: mobile phone, utility, cable TV, tuition and fees, and retail purchases (figure 3.41).

Figure 3.41 Sri Lanka: Bills Paid Via Mobile Phones

Percentage of respondents



Source: IFC Mobile Money Study 2011.

Respondent's Perceptions of Affordability, Trust, and Value

Affordability

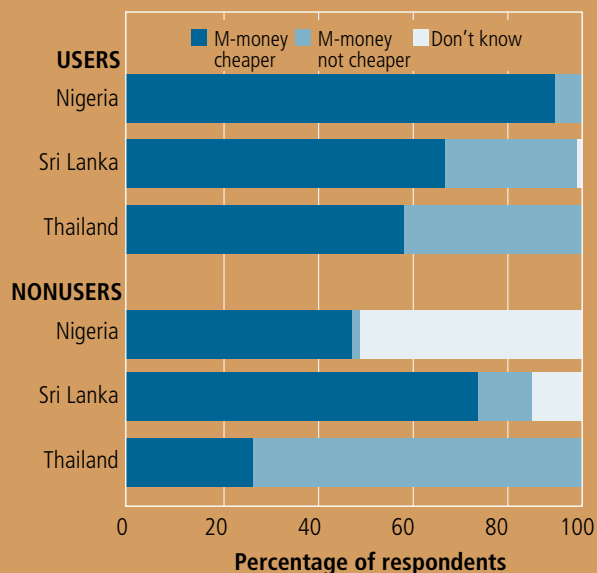
The percentage of users who believed that m-money is cheaper than traditional banking services ranges from a high of 94 percent in Nigeria to 61 percent in Thailand (figure 3.42). These results correlate inversely with the sophistication of the banking sector. In Nigeria, which has a less advanced financial sector, most people found m-money cheaper. In Thailand, where the financial sector is fairly advanced, fewer people found m-money cheaper. Transactions such as balance inquiries and money transfers are free in Thailand; some services, such as bill payments, are not.

A similar question of perceived affordability was posed to users of the Oi Paggo service in Brazil, whose main service is credit card payment and mobile phone airtime top-up. About 32 percent of respondents found Oi Paggo services to be very

cheap to cheap while, 40 percent found them moderately priced, and 28 percent found the service expensive to very expensive.

Among nonusers (figure 3.42), in Sri Lanka, nearly 80 percent believed that m-money was cheaper. The opposite was the case in Thailand, where 72 percent believed that it was not cheaper. Again, note that, in Thailand, some banking transactions are free. Also interesting is that large percentages of respondents in Brazil (60 percent of nonusers) and Nigeria did not know whether mobile services were cheaper, neither country having a strong m-money service and consequently little awareness. In Thailand, with three m-money service providers, there was no lack of opinion.

Figure 3.42 Perceptions of Relative Expense of Mobile Money and Normal Banking Services



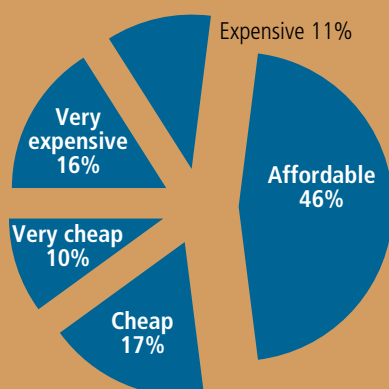
Source: IFC Mobile Money Study 2011.

Respondents using m-money services in Thailand were asked to rate whether these services were expensive or cheap; most stated the costs were affordable (figure 3.43).

Trust Issues

With the exception of Sri Lanka, users of m-money service had a higher trust in MNOs offering that service than did nonusers (figure 3.44a). Experience with the service seems to build trust. In Sri

Figure 3.43 Thailand: User Perceptions of Mobile Banking Fees



Source: IFC Mobile Money Study 2011.

Lanka, nonusers were more optimistic and trusting than the actual users.

With the exception of Nigeria, it is interesting that respondents trusted banks more than mobile operators (figure 3.44b). In Nigeria, trust levels were roughly equal for MNOs and banks, and were, in comparison with the other countries studied, quite low. It is informative that nonusers

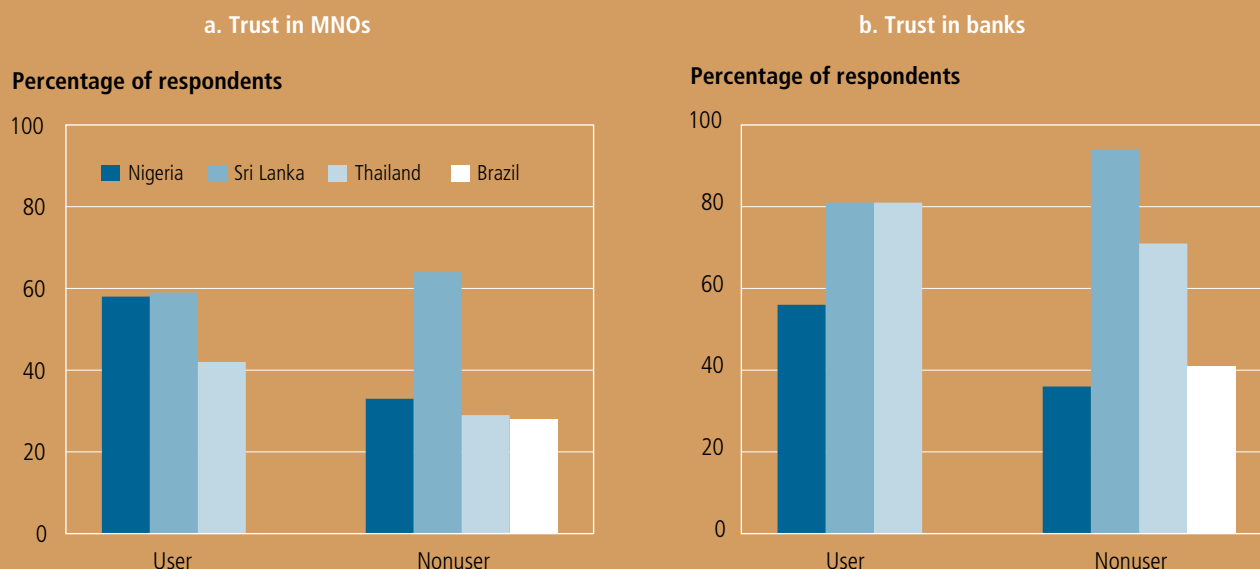
of m-money in Nigeria had much less trust in banks offering m-money than their counterparts in other countries. In Thailand, partnering with a bank is an important consideration, since 81 percent of users trust banks compared with only 42 percent of users trusting MNOs.

Value Propositions

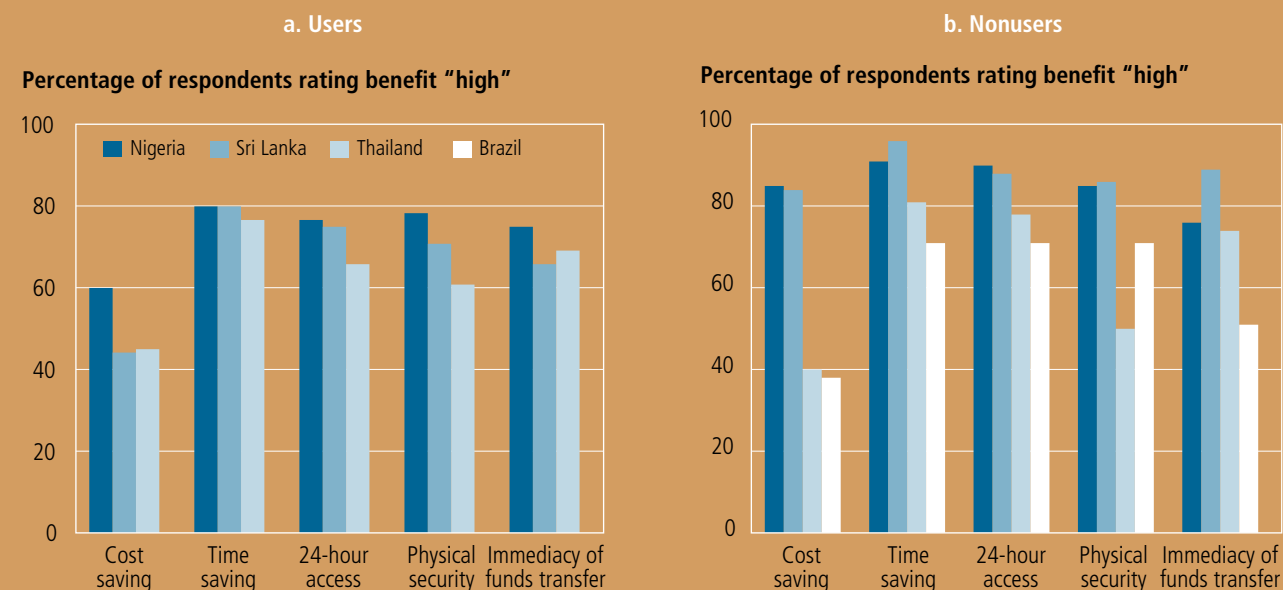
Among users in Sri Lanka and Thailand, cost saving was perceived to be the least important feature, while the convenience factors (time saving, 24-hour access, and immediacy of fund transfer) were seen as the most beneficial. Interestingly, in Nigeria, users were not as concerned about cost saving as they were about the other benefits of m-money (figure 3.45a).

In the two countries with less efficient and extensive financial services—Nigeria and Sri Lanka—cost and time savings were perceived as important by nonusers. M-money is more valued as an alternative to existing financial services, offering cheaper and faster service. In the two countries with a more advanced financial sector, cost and time savings were less important, and the

Figure 3.44 Trust in Institutions Offering Mobile Money



Source: IFC Mobile Money Study 2011.

Figure 3.45 Perceived Mobile Money Benefits

Source: IFC Mobile Money Study 2011.

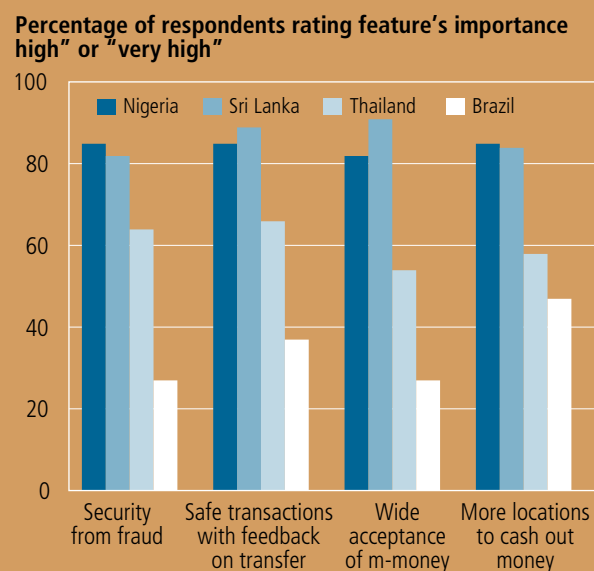
Note: Brazil data also include respondents rating the benefit as "medium high."

value proposition of m-money becomes increased convenience within the existing financial sector (figure 3.45b).

Figure 3.46 shows responses to questions about what features would encourage nonusers to use m-money. There was high interest in all four features in Nigeria and Sri Lanka, and much lower interest in Brazil and Thailand.

Nonusers in Nigeria and Sri Lanka placed a high importance on all the features that m-money can deliver. In Thailand, there seems to be some concern about fraud and safety of transactions, which could be addressed by m-money providers. Although 50 percent of Brazilian nonusers declared an interest in m-money service, they placed the lowest importance on the reasons for using m-money. The feature that would most encourage Brazilians to adopt m-money is more locations to withdraw cash.

In Thailand, when m-money users were asked why they do not use certain services, the most frequently given response was that they had no need for the service (figure 3.47).

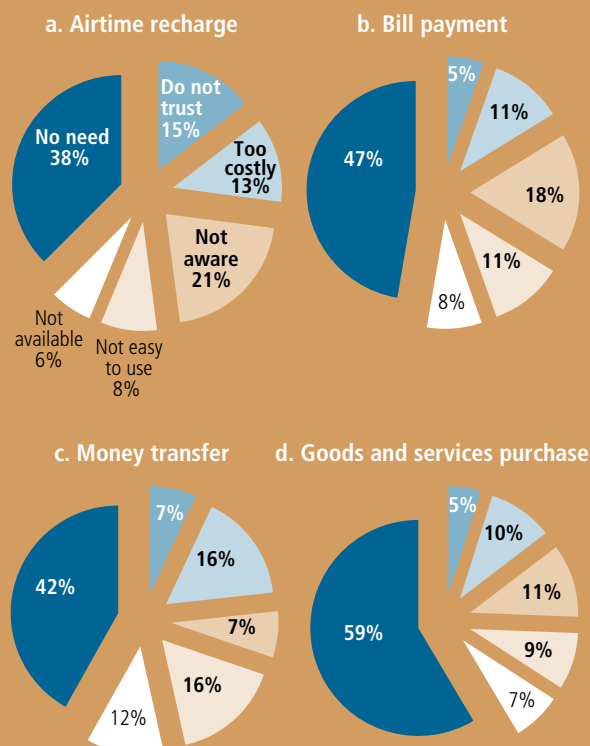
Figure 3.46 Importance of Various Features in Encouraging Nonusers to Use Mobile Money

Source: IFC Mobile Money Study 2011.

Future Demand

In Thailand, about 20 percent of users showed an interest in purchasing, salary deposit, and health insurance as future services. More importantly

Figure 3.47 Thailand: Reasons Users Do Not Use Mobile Banking for Specific Transactions



Source: IFC Mobile Money Study 2011.

more than 50 percent opted for “other,” meaning there is a demand for services not yet specified (figure 3.48). Among nonusers in Thailand, the following services were in high demand: balance inquiry, airtime recharge, and fund transfer (figure 3.49).

Opportunity Analysis

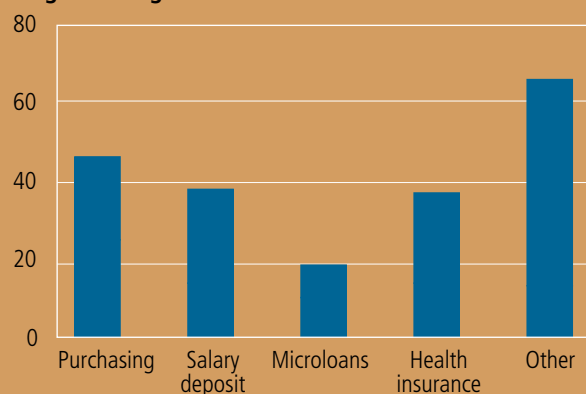
Potential m-money market segments were qualified with an analysis of high-impact parameters, and rated according to their potential opportunity.

Bill Payments

As seen in table 3.8, in Nigeria, there is a good opportunity for using m-money to pay bills. Even high-income Nigerians use bank tellers to pay their bills because other options are limited. Roughly the same percentage of people use prepaid cards as pay their bills directly to companies.

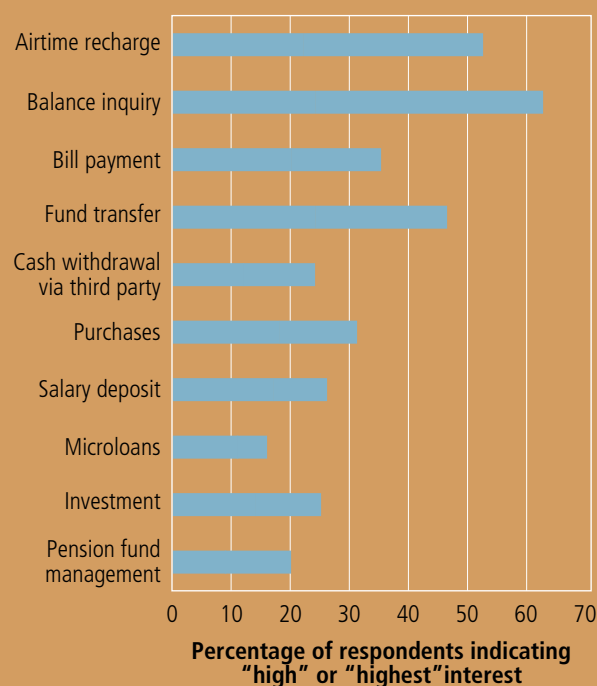
Figure 3.48 Thailand: User Interest in Various Financial Services Offered via Mobile Phone

Percentage of respondents indicating “high” or “highest” interest



Source: IFC Mobile Money Study 2011.

Figure 3.49 Thailand: Nonuser Interest in Mobile Banking Services










Source: IFC Mobile Money Study 2011.

Payments via ATM are small at 3 percent. Kenya also shows opportunity which is already being met by M-PESA.

In Sri Lanka and Thailand, there is moderate opportunity. In Sri Lanka, electronic bill payment

Table 3.8 Bill Payments

Potential market	Assessment	Description	Challenges and obstacles	Potential transactions/month
Brazil		<ul style="list-style-type: none"> Fairly efficient bill payment system, controlled by banks Majority uses correspondent bank system to pay bills 	<ul style="list-style-type: none"> M-payment requires investment in new technology (quick response codes) to read bills Substantial competition from existing financial sector 	164,311,579
Nigeria		<ul style="list-style-type: none"> Small bill payment system, low bank account penetration, high mobile phone penetration Little competition from financial sector; thus, a relatively large opportunity Majority pays bills in cash directly or at bank teller, but >15% of m-banking users pay via their mobile phones 	<ul style="list-style-type: none"> Few consumers use mobile phones to pay bills Poor infrastructure, poor regulatory environment; survey shows low trust in financial and mobile sectors >15% use prepaid cards to pay bills, which is potential competition for m-money 	21,650,000
Sri Lanka		<ul style="list-style-type: none"> Low ATM and POS penetration; high bank account penetration; many Sri Lankans line up to pay bills to company or at bank teller Survey confirms that this is mostly for direct payment More than half of m-money users have used m-money to pay bills (mostly phone bills); nevertheless, <10% use m-money as their typical payment channel 	<ul style="list-style-type: none"> Building an agent network to areas that are not covered by banking infrastructure 	6,440,168
Thailand		<ul style="list-style-type: none"> Existing m-money bill payment system, but in direct competition with banks Wide variety of payment channels are used 	<ul style="list-style-type: none"> Existing bill payments using m-money for services that are part of TrueMoney Breaking out of that ecosystem will be difficult 	13,404,916
Japan		<ul style="list-style-type: none"> M-money focused on NFC 	<ul style="list-style-type: none"> Widespread bank account penetration; main focus is on micropayments and retail payments where the speed of NFC has an advantage 	80,365,315
Kenya		<ul style="list-style-type: none"> Bill payments already being offered 	<ul style="list-style-type: none"> Few challenges, since M-PESA is the dominant service provider Regulation is supportive 	1,075,038
United States		<ul style="list-style-type: none"> Very small m-money implementation 	<ul style="list-style-type: none"> Substantial investment in debit and credit card infrastructure; investment in m-money will be difficult 	111,000,000

Source: IFC Mobile Money Study 2011.

Note: ● = significant and unrealized opportunity for m-money: many of the preconditions for m-money exist, such as demand, supportive regulation, and an identifiable group of customers; ▲ = potential opportunity but there are substantial challenges; ■ = unlikely to be any m-money opportunity due to lack of economies of scale or other constraints.

is a burgeoning industry. Existing bill payment mechanisms are largely aimed at the higher-income groups. For example, many commercial

banks offer m-banking suites (including some bill payments) as part of their product offerings. However, none of the commercial banks interviewed

plan to expand these offerings beyond their customer base. In Thailand, bill payments can be made at bank counters, ATMs, and POS devices at merchants, and by direct debit. Use of ATMs to make bill payments is rapidly increasing, and m-payment customers are now able to make bill payments both at agents and directly from their e-wallet on their phone.

In Brazil, there is little opportunity for m-money because there are already ample means of bill payment. Because the government has authorized banks to collect taxes, utility bills, and other bills, customers can pay their bills at banks, ATMs, or correspondent banks; online; or by direct debit. Eighty-eight percent of the use of correspondent banks in cities is related to bill payments. Japan and the United States also show low opportunity for bill payment because of the existence of multiple bill payment channels.

Person-to-Person Transfers

Kenya's M-PESA has taken advantage of a large market in P2P transfers for the unbanked. Brazil, Nigeria, and Sri Lanka all show possibilities in this demand area. Thailand already has other channels for this area (table 3.9).

In Brazil, there is potentially a market for P2P transfers, but primarily in the large cities; the market is difficult to quantify. Also, a large number of bank branches offer similar services. In Nigeria, there is large unmet demand for P2P transfers. An M-PESA-style m-money initiative would be successful. However, regulations exclude mobile operators from being the lead partner in providing m-money services; thus, they have few incentives to initiate the service. So far, banks have not shown leadership. Sri Lanka shows demand for P2P services, but it is difficult to quantify. There is a large rural population, but there are significant challenges, particularly around the ability of MNOs to invest.

In Thailand, there is little opportunity. The existing financial services sector provides significant competition for fund transfers. Banks are expanding their ATM networks aggressively. Currently,

MNOs charge less than banks for transfer services, but this could easily change if banks decide to compete aggressively. Japan and the United States also show little opportunity in this area.

Government-to-Person Payments

Sri Lanka shows a large opportunity for G2P payments through its large-scale social welfare scheme (table 3.10). Kenya and the United States show some opportunity.

Brazil, Japan, Nigeria, and Thailand show little opportunity. In Nigeria, social welfare programs and payments are very small. In Thailand, there is a small social welfare scheme, implemented in 2008. However, many of the beneficiaries have elected to receive cash. In Brazil, cards are in widespread use, and there is an extensive correspondent banking infrastructure.

Payroll (Informal Sector)

Kenya and Sri Lanka show the most promise for using m-money for payrolls (table 3.11). In Sri Lanka, there is a relatively large informal sector. The main challenge is creating an agent network or collaborating with government entities such as the post office. M-PESA is already operating in this market segment in Kenya.

Brazil, Nigeria, and Thailand show some promise. All three countries have a large informal sector, but there are obstacles. In Nigeria, the cautious regulatory environment is a concern. In Thailand, the financial sector already provides a service. In Brazil, there is a lack of data on whether this presents an opportunity.








Japan and the United States have small informal sectors and many financial channels; thus, opportunities are limited.

Public Transport

Japan has led the world in use of m-money for public transport (table 3.12).

Brazil, Sri Lanka, and Thailand have large opportunities. In Sri Lanka, substantial leakage from

Table 3.9 Person-to-Person Transfers

Potential market	Assessment	Description	Challenges and obstacles	Potential transactions/month
Brazil		<ul style="list-style-type: none"> Most transfers take place intracity, but there is substantial competition from the financial sector Between 18% and 27% of respondents stated they delivered funds personally; m-money P2P could be a convenient alternative 	<ul style="list-style-type: none"> Financial sector has a wide network of agents 	12,020,263
Nigeria		<ul style="list-style-type: none"> Large rural population, high use of informal channels Almost 80% of nonusers and slightly more than 50% of users reported they still used bank teller to transfer money 	<ul style="list-style-type: none"> Overcoming user perceptions of unreliability Regulations are slowing m-money implementation 	46,252,000
Sri Lanka		<ul style="list-style-type: none"> Rural population, high use of informal channels, expensive current offerings Almost 50% of nonusers and slightly more than 60% of users reported they still used bank teller to transfer money 	<ul style="list-style-type: none"> Mobile operators are short of money to invest No agent network Competition from existing financial sector 	Unknown
Thailand		<ul style="list-style-type: none"> ATMs are being expanded rapidly; transfers can be done easily via ATM even if person has no bank account 	<ul style="list-style-type: none"> Banks offer services at low cost Mobile operators focused on 3G investments 	Unknown
Japan		<ul style="list-style-type: none"> Well-banked population, high use of existing financial services M-money focused on NFC opportunities 	<ul style="list-style-type: none"> No real demand 	Unknown
Kenya		<ul style="list-style-type: none"> Large rural population, high use of informal channels 	<ul style="list-style-type: none"> Dominated by M-PESA 	9,483,408
United States		<ul style="list-style-type: none"> Widespread financial infrastructure (debit, credit, and prepaid) 	<ul style="list-style-type: none"> Low demand 	38,000,000

Source: IFC Mobile Money Study 2011.

Note: ● = significant and unrealized opportunity for m-money: many of the preconditions for m-money exist, such as demand, supportive regulation, and an identifiable group of customers; ▲ = potential opportunity but there are substantial challenges; ■ = unlikely to be any m-money opportunity due to lack of economies of scale or other constraints.

the existing system provides the motivation for an m-payment solution. In Thailand, there are multiple independent transportation systems and widespread support for a unifying system of payment. Brazil has a massive public transport system, the largest of the four countries. However, all these countries require an NFC investment to develop these opportunities.








In Nigeria, there is a small but growing public transport sector, particularly in Lagos. However, it is very fragmented, and m-money services would

be difficult to implement. For example, minibuses dominate the transport sector, with many thousands of owners throughout the country. Kenya and the United States are also unlikely to realize an m-money opportunity in this sector, because their transit systems are fragmented.

Additional Markets

Additional markets show promise for m-money in some countries. However, they have not been quantified in terms of number of monthly

Table 3.10 Government-to-Person Transfers

Potential market	Assessment	Description	Challenges and obstacles	Potential transactions/month
Brazil		<ul style="list-style-type: none"> Card solution in existence, controlled by banks, including agent network 	<ul style="list-style-type: none"> Mobile operator cannot compete with existing correspondent banking agent network for cash withdrawals (cash-out points) No clear value added at this point 	16,666,667
Nigeria		<ul style="list-style-type: none"> Some government programs, but very small 	<ul style="list-style-type: none"> Estimating number of people that should receive payments is difficult (due to lack of an ID card); poor country 	40,000
Sri Lanka		<ul style="list-style-type: none"> Large-scale government social welfare program (Samurdhi) 	<ul style="list-style-type: none"> Provide a cheaper service to government than is currently being offered (paper-based payments) Amounts being paid are very small 	1,600,000
Thailand		<ul style="list-style-type: none"> Potential demand relatively small (but growing) welfare system 	<ul style="list-style-type: none"> Elderly prefer cash payments that are delivered personally 	646,800
Japan		<ul style="list-style-type: none"> Small social welfare program 	<ul style="list-style-type: none"> Existing financial infrastructure means the m-money value proposition is small 	3,840,000
Kenya		<ul style="list-style-type: none"> Some government programs, but very small 	<ul style="list-style-type: none"> Poor country 	60,000
United States		<ul style="list-style-type: none"> Social welfare programs aimed at families and individuals to increase their economic independence and productivity 	<ul style="list-style-type: none"> Prepaid card market successfully catering to this market segment Increasing interest from Visa, MasterCard, and other financial operators 	4,530,451

Source: IFC Mobile Money Study 2011.

Note: ● = significant and unrealized opportunity for m-money: many of the preconditions for m-money exist, such as demand, supportive regulation, and an identifiable group of customers; ▲ = potential opportunity but there are substantial challenges; ■ = unlikely to be any m-money opportunity due to lack of economies of scale or other constraints.

transactions because these data were not available.

Qualitative data such as interviews and desk research were used to estimate the characteristics of these m-money opportunities.








Business-to-Business and Retail Payments

Opportunity is good in this area for Japan, Sri Lanka, and Thailand (table 3.13). In Sri Lanka, the country's largest retailer, Cargills, is currently discussing a pilot project with the MNO operator Dialog. Its objectives are to increase efficiency and convenience for its entire network of farmers (eliminating the need for a

special trip to a bank branch) and to provide an added convenience to farmers who are far from bank branches.

In Thailand, there is an extensive retail network, well served by multiple international retail chains as well as a multitude of individual businesses. CP Freshmart, part of CP Group, has about 550 stores countrywide, all of which are TrueMoney Express outlets (the payment counter service dealer of TrueMoney). The basic functions of TrueMoney Express can be fulfilled, such as bill payment, airtime top-up, and electronic personal identification number (e-PIN) sale. 7-Eleven is among the chains with an extensive network of

Table 3.11 Payroll (Informal Sector)

Potential market	Assessment	Description	Challenges and obstacles	Potential transactions/month
Brazil		<ul style="list-style-type: none"> Relatively large informal sector; also payment from banked to unbanked (e.g., domestic staff) 	<ul style="list-style-type: none"> Interoperability between mobile operators Partnership with bank needed for cash-out points 	48,081,050
Nigeria		<ul style="list-style-type: none"> Large informal sector and unmet demand 	<ul style="list-style-type: none"> Regulatory regime 	37,821,000
Sri Lanka		<ul style="list-style-type: none"> Relatively large informal sector 	<ul style="list-style-type: none"> Marketing the service to people who might be using money orders from the post office instead 	4,708,418
Thailand		<ul style="list-style-type: none"> Large informal sector 	<ul style="list-style-type: none"> Payments already facilitated by extensive network of ATMs 	20,988,000
Japan		<ul style="list-style-type: none"> Hardly any informal sector 	<ul style="list-style-type: none"> No demand 	594,000
Kenya		<ul style="list-style-type: none"> M-PESA already successfully operating in this market segment 	<ul style="list-style-type: none"> Few competitors to M-PESA 	11,610,000
United States		<ul style="list-style-type: none"> Small informal sector 	<ul style="list-style-type: none"> Relatively small, fragmented market 	11,338,400

Source: IFC Mobile Money Study 2011.

Note: ● = significant and unrealized opportunity for m-money: many of the preconditions for m-money exist, such as demand, supportive regulation, and an identifiable group of customers; ▲ = potential opportunity but there are substantial challenges; ■ = unlikely to be any m-money opportunity due to lack of economies of scale or other constraints.

stores in Thailand (3,912 stores) offering bill payment and money transfer services.

In Japan, consumers accustomed to using NFC-enabled cards for public transit are now likely to use them for retail purchases.

Brazil, Kenya, and Nigeria show moderate opportunity. In Nigeria, the market for fast-moving consumer goods is highly fragmented, but offers some opportunity. The formal retail sector is extremely small and mostly geared toward supplying the informal sector. The main disadvantage of the informal sector is its lack of organization—there are no central or regional contact points for traders across the country. There is no national retail chain in Nigeria.

As a major producer and exporter of certain food products (e.g., coffee, poultry, beef), Brazil has a strong distribution network. Potential B2B or








business-to-employee opportunities can be found in a number of industries including coffee, sugarcane, cattle, orange juice, brewing, and tobacco.

An interesting example for a wholesale/distribution business and its relations with its customers—retailers—is Grupo Martin (GMartins), the largest wholesaler/distributor in Latin America, with more than 20,000 retailers in Brazil. In 1990, GMartins created its own bank, Tribanco, which provides financing and banking services to its customers, mainly small shop owners. Tribanco follows GMartins to the most remote and neglected urban and rural areas of Brazil, where many people have virtually no access to financial services.

International Remittances

Sri Lanka has the greatest opportunity (table 3.14) in the international remittances market segment.

Table 3.12 Public Transport

Potential market	Assessment	Description	Challenges and obstacles	Potential transactions/month
Brazil		<ul style="list-style-type: none"> Large-scale opportunity with clear value proposition to replace existing system 	<ul style="list-style-type: none"> Needs NFC to succeed, requiring investment 	1,421,900,000
Nigeria		<ul style="list-style-type: none"> Small card industry and low penetration 	<ul style="list-style-type: none"> Fragmented public transport market, which only really exists in Lagos and is limited 	10,000,000
Sri Lanka		<ul style="list-style-type: none"> Large-scale opportunity with clear value proposition to replace existing system 	<ul style="list-style-type: none"> Needs NFC to succeed, requiring investment 	264,000,000
Thailand		<ul style="list-style-type: none"> Large-scale opportunity with clear value proposition to replace existing system which has different e-cards for different systems 	<ul style="list-style-type: none"> Needs NFC to succeed, requiring investment 	58,873,333
Japan		<ul style="list-style-type: none"> Large market already supplied by e-money using NFC 	<ul style="list-style-type: none"> Expanding from micropayments to larger payments 	2,273,326,417
Kenya		<ul style="list-style-type: none"> Highly fragmented and unregulated market 	<ul style="list-style-type: none"> Many small operators Limited demand 	2,450,000
United States		<ul style="list-style-type: none"> Fragmented market; most people use other forms of transport, limited to certain cities 	<ul style="list-style-type: none"> Ensuring that NFC is interoperable and not exclusive to a particular operator 	858,000,000

Source: IFC Mobile Money Study 2011.

Note: ● = significant and unrealized opportunity for m-money: many of the preconditions for m-money exist, such as demand, supportive regulation, and an identifiable group of customers; ▲ = potential opportunity but there are substantial challenges; ■ = unlikely to be any m-money opportunity due to lack of economies of scale or other constraints.








Several interviewees identified the potential of international remittances for m-money, especially from the Middle East, the region with the most Sri Lankan expatriates. In 2007, 58 percent of all international remittances to Sri Lanka were from the Middle East, at a value of US\$1.4 billion. These figures do not account for monies being transferred using the informal *hawala* system, a black market mechanism to transfer money overseas.

Nigeria has a large diaspora and is the largest receiver of remittances in Sub-Saharan Africa, mostly from the United Kingdom (Hernandez-Coss and Bun 2006). These funds are currently transferred using companies such as Western Union. While the value of remittances is large in comparison to informal P2P transfers within the domestic economy, the number of Nigerians

making use of international remittances is relatively small. Only 4 percent of Nigerians stated that they have received money from a friend or relative overseas, and 2 percent said they have sent money to a friend or relative outside the country (EFInA 2008).

Thailand and Brazil show limited opportunity. In Thailand, overseas remittances could be substantial, but little research has been done on the methods expatriate Thai workers use to transfer money from overseas. International remittances flowing into Brazil amounted to US\$5 billion in 2009, mainly from Japan, Spain, and the United States. This is equivalent to 0.3 percent of Brazil's GDP, and is low compared with countries with a high international remittance market (e.g., in the Philippines—a poorer country—incoming remittances were US\$16.4 billion in 2008).

Table 3.13 Business-to-Business and Retail Payments

Potential market	Assessment	Description	Challenges and obstacles
Brazil		<ul style="list-style-type: none"> ▪ Brazil, as a major producer and exporter of certain food products (e.g., coffee, poultry, beef), has numerous large companies working with many farmers and producers ▪ Strong retail and distribution network 	<ul style="list-style-type: none"> ▪ Not clear how many of the small businesses, farmers and food producers, and workers are unbanked and require an m-payment option
Nigeria		<ul style="list-style-type: none"> ▪ Some opportunity for fast-moving consumer goods retailers such as Coca-Cola 	<ul style="list-style-type: none"> ▪ Fragmented market with no national retailer ▪ Popular trust of small retailers and a preference for cash
Sri Lanka		<ul style="list-style-type: none"> ▪ Growing opportunity for some large retailers ▪ Cargills is offering utility payments at point of sale 	<ul style="list-style-type: none"> ▪ Most businesses have little knowledge about m-money
Thailand		<ul style="list-style-type: none"> ▪ Potential opportunity for small businesses to transfer money, competing with existing, more expensive financial services ▪ Advanced MPay is already offering this service 	<ul style="list-style-type: none"> ▪ Banks might reduce rates and squeeze smaller operators such as Advanced MPay out of the market
Japan		<ul style="list-style-type: none"> ▪ Success of NFC for public transport means that consumers are open to using phones/cards for retail payments 	<ul style="list-style-type: none"> ▪ Challenging the assumption that NFC is used only for micropayments
Kenya		<ul style="list-style-type: none"> ▪ Opportunity to replace “risky” cash 	<ul style="list-style-type: none"> ▪ Cash (no NFC) is more convenient
United States		<ul style="list-style-type: none"> ▪ Limited opportunity for m-money given existing infrastructure for credit/debit cards 	<ul style="list-style-type: none"> ▪ Large investment in credit and debit card payments (also prepaid)

Source: IFC Mobile Money Study 2011.

Note: ● = significant and unrealized opportunity for m-money: many of the preconditions for m-money exist, such as demand, supportive regulation, and an identifiable group of customers; ▲ = potential opportunity but there are substantial challenges; ■ = unlikely to be any m-money opportunity due to lack of economies of scale or other constraints.

Furthermore, international remittances into Brazil have dropped 40 percent in the 2007–09 period (Western Union 2010). In 2009, outbound remittances from Brazil were US\$1.2 billion.

Credit and Microfinance

Brazil and Sri Lanka show considerable opportunity in the credit and microfinance market segments (table 3.15). In Sri Lanka, the microfinance sector is dominated by government-run Samurdhi Bank Societies. Nearly 65 percent of microcredit, including loans for consumption, income subsistence, and microenterprise start-up capital, is provided through the government. Of the loans placed through Samurdhi, about 20 percent are for SL Rs 20,000 (US\$177), and almost 65 percent

are for less than SL Rs 50,000 (US\$442) (SAMN n.d.). The system is highly inefficient, and an m-money provider, working with the government, could certainly improve it.

In Brazil, credit and microcredit is the largest growing market segment, with the strongest demand from lower-income clients. The demand for credit is strong. Brazil's leading consumer credit rating agency, Serasa-Experian, reported in March 2010 that consumer credit demand had risen 32.5 percent since March 2009. The lowest-income group, those earning less than US\$275 a month, showed the biggest rise in demand: 32.9 percent. For a bank to issue a credit card to unbanked customers or to noncustomers is a common practice in the Brazilian financial industry.

Table 3.14 International Remittances

Potential market	Assessment	Description	Challenges and obstacles
Brazil	■	<ul style="list-style-type: none"> International remittances flowing into Brazil amount to US\$5 billion in 2009, mainly from Japan, Spain, and the United States 	<ul style="list-style-type: none"> Inbound international remittances in Brazil dropped 40% over 2007–09
Nigeria	▲	<ul style="list-style-type: none"> 4% of Nigerians stated they have received money from a friend or relative living overseas; 2% said they have sent money to a friend or relative outside the country 	<ul style="list-style-type: none"> Relatively small market in comparison to P2P Number of multinational companies entering the sector
Sri Lanka	●	<ul style="list-style-type: none"> The Middle East has the most Sri Lankan expatriates In 2007, 58% of all international remittances were from the Middle East, a value of US\$1.4 billion 	<ul style="list-style-type: none"> Well-established informal, black market system (<i>hawala</i>) already in place
Thailand	■	<ul style="list-style-type: none"> Overseas remittances could be substantial, but little research has been done on the methods expatriate Thai workers use to transfer money from overseas 	<ul style="list-style-type: none"> No data

Source: IFC Mobile Money Study 2011.

Note: ● = significant and unrealized opportunity for m-money: many of the preconditions for m-money exist, such as demand, supportive regulation, and an identifiable group of customers; ▲ = potential opportunity but there are substantial challenges; ■ = unlikely to be any m-money opportunity due to lack of economies of scale or other constraints.

Nigeria shows moderate opportunity. Its microfinance sector is small, even though there are 901 licensed microfinance banks.⁵ Still, 46 percent of the Nigerian population has never heard of a microfinance institution (MFI). Government restrictions have encouraged MFIs to open branches in the more populous and wealthy states, near urban centers. In rural areas, there are few branches and also few agents. Banks and MFIs are distrusted, perhaps paving the way for a reliable m-money credit service.

Thailand shows little opportunity. It had 6,997 local cooperatives, of which 1,796 were purely for financial services (thrift and credit or credit unions). A large proportion of cooperative members live in the northeast and north regions far from Bangkok and are well served by the financial services sector.

⁵ As of 2010, according to the Central Bank of Nigeria (www.cenbank.org/supervision/Inst-MF.asp).

Table 3.16 presents an opportunity analysis summary by consolidating the potential market opportunities in each country. Table 3.3, presented earlier in this chapter, offers a quantitative summary of these market opportunities in terms of potential transactions per month.

As can be seen from the two tables, Sri Lanka offers the most immediate opportunities; the main obstacles to exploiting them are access to investment capital for the mobile operators and the development of detailed implementation strategies.

Nigeria has massive opportunities for m-money in P2P transfers, payroll for informal workers, and utility payments. It could become a second Kenya, except for two factors—market fragmentation and regulation—which tend to check the emergence of a strong m-money model. However, the players that have the infrastructure, experience in rolling out m-money services in other countries, and that could establish a needed agent network—the mobile operators—have, until the recent licensing

Table 3.15 Credit and Microfinance

Potential market	Assessment	Description	Challenges and obstacles
Brazil	●	<ul style="list-style-type: none"> ▪ Largest-growing market with the strongest demand from lower-income clients ▪ Presents an opportunity for m-money if the right partnerships can be created 	<ul style="list-style-type: none"> ▪ Creating partnerships with banks
Nigeria	▲	<ul style="list-style-type: none"> ▪ Low credit penetration ▪ Dysfunctional microfinance bank sector 	<ul style="list-style-type: none"> ▪ No agent network ▪ No m-money initiatives at this stage ▪ Distrust of banks and particularly of MFIs
Sri Lanka	●	<ul style="list-style-type: none"> ▪ About 30% of user survey respondents showed an interest in m-money services providing microloans ▪ Market dominated by Samurdhi Bank Societies, a very inefficient system ▪ Nearly 65% of microcredit, including loans for consumption, income subsistence, and microenterprise start-up capital, is provided through the government 	<ul style="list-style-type: none"> ▪ Collaboration with government will be a challenge ▪ Reform will probably be required to strengthen the private sector in microcredit
Thailand	■	<ul style="list-style-type: none"> ▪ Potential market for credit; however, banks are expanding rapidly and offering credit cards to low-income earners ▪ Unlikely to be a viable market for m-money 	<ul style="list-style-type: none"> ▪ Strong competition from the financial sector ▪ In 2009, there were 6,997 local cooperatives of which 1,796 were purely for financial services (thrift and credit or credit unions)

Source: IFC Mobile Money Study 2011.

Note: ● = significant and unrealized opportunity for m-money: many of the preconditions for m-money exist, such as demand, supportive regulation, and an identifiable group of customers; ▲ = potential opportunity but there are substantial challenges; ■ = unlikely to be any m-money opportunity due to lack of economies of scale or other constraints.

of several new m-money providers, been sidelined by regulation. With the new licenses, it is hoped that m-money is able to take advantage of the sizable Nigerian opportunity.

The biggest opportunity in Brazil is public transport, with 1.4 billion potential monthly transactions. Another real opportunity is credit. Other

possible opportunities might be P2P transfers. Payment of informal workers might be an opportunity; however, there is insufficient information at this point to assess this.

Thailand, with three m-money providers and a strong financial infrastructure, provides few additional opportunities.

Table 3.16 Opportunity Analysis Summary

Potential market	Brazil	Nigeria	Sri Lanka	Thailand
Bill payments (utilities)	■	●	▲	▲
P2P transfers	▲	▲	▲	▲
G2P payments	▲	■	●	■
Payroll (informal sector)	▲	▲	●	▲
Public transport	▲	■	▲	▲
B2B payments	▲	▲	●	▲
International remittances	■	▲	●	■
Credit and microfinance	●	▲	●	■

Source: IFC Mobile Money Study 2011.

Note: ● = significant and unrealized opportunity for m-money: many of the preconditions for m-money exist, such as demand, supportive regulation, and an identifiable group of customers; ▲ = potential opportunity but there are substantial challenges; ■ = unlikely to be any m-money opportunity due to lack of economies of scale or other constraints.

4 Business Model Analysis

This chapter opens with an overview of the business models used by the partnering m-money companies in each of the four countries in our study. The chapter's key objectives are to provide an overview and description of each business model, identify any common elements or trends, and make recommendations for taking advantage of opportunities in each specific country market. To provide the overview, the business model of each company was analyzed according to a set of common elements.

Based on a comparison of the four business models, it is clear that a static business model for m-money is not appropriate. Instead, a dynamic business model that takes the country context into account is proposed.

Elements of Business Models

A business model can be analyzed according to the following components:

- **Target market.** What set of customers is the business trying to address? Is it wholesale or direct to consumers?
- **Competition.** What are the competing products?
- **Volume and frequency.** What kind of volume or frequency of payment can be expected? Will payments be made monthly or more frequently?

- **“Killer application.”** What is the innovative application that will drive adoption among consumers?
- **Partnerships.** Who are the critical partners in the provision of the m-money service? Who will be the issuing and acquiring partners?
- **Technology.** What technology is appropriate? Is USSD appropriate, or will it only be possible to roll out SMS-based technology? Is NFC possible?
- **Regulation.** What regulation might affect the business model? What are the requirements of the regulation? What authentication procedures must be adopted?
- **Competitive strategy.** Based on the elements noted above, which competitive strategy (differentiation, cost leadership, or segmentation) is most appropriate?

Pousttchi, Schiessler, and Wiedemann (2007) found that there are potentially six types of business models. Depending on the country context, there can be several categories within each type. Thus, any one of a multitude of possible business models might reasonably be adopted depending on the relevance or priority of certain factors.

Given this complexity, many analysts have looked at the m-money business model from the perspective of the main players, leading to three basic models: bank-centric, MNO-centric, and collaborative.

Bank-Centric Model

In the bank-centric model, a bank (or a partnership of banks) is the key player. The “acquirer bank” is responsible for deployment of the POS systems and negotiating contracts with merchants, while the “issuer bank” is responsible for deploying the m-payment application, such as an NFC card/mobile phone or a payment application on a mobile phone (figure 4.1).

Advantages

The advantages of this model for the bank are new client acquisition opportunities; new revenue streams from micropayments; and control over the system and, therefore, less risk.

Disadvantages

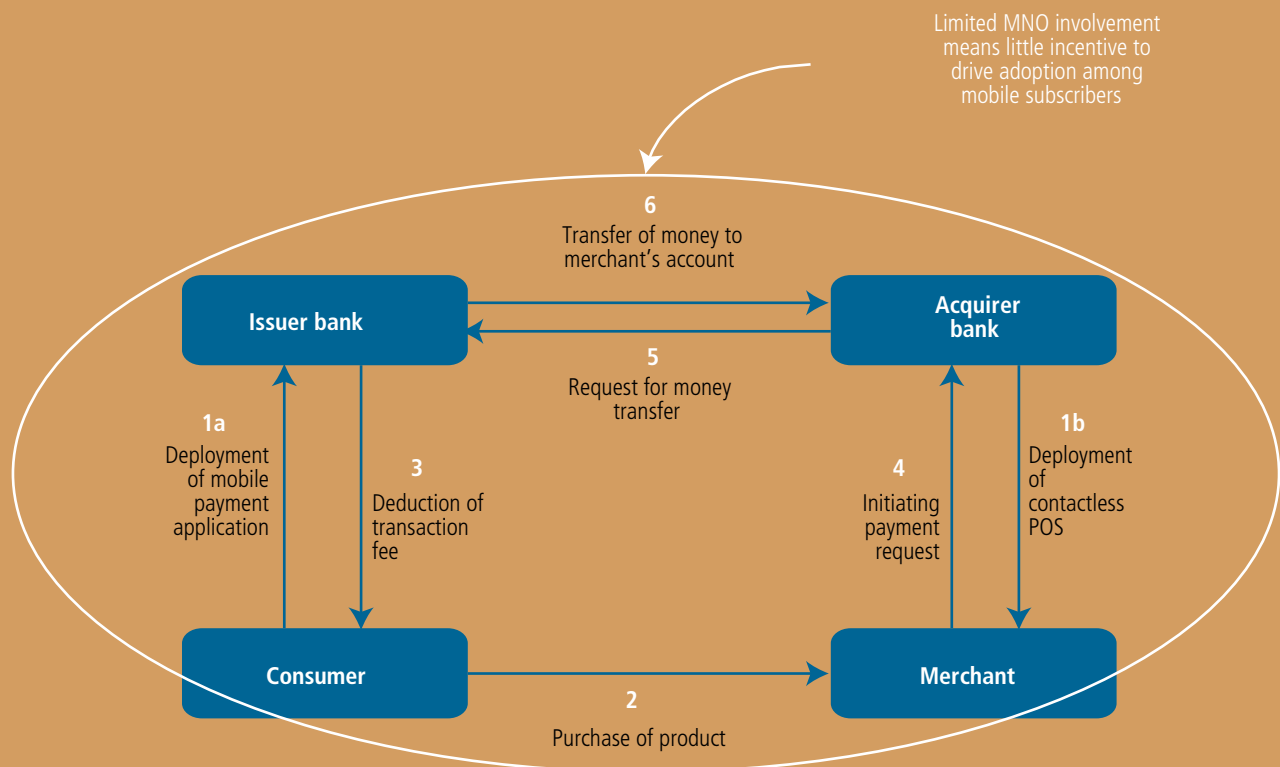
There is no clear incentive for banks to roll out this model, particularly if they have spent capital

setting up a traditional banking infrastructure, including prepaid, credit, and debit cards. The MNO is relegated to a communication channel, also removing a clear incentive to invest in the system.

MNO-Centric Model

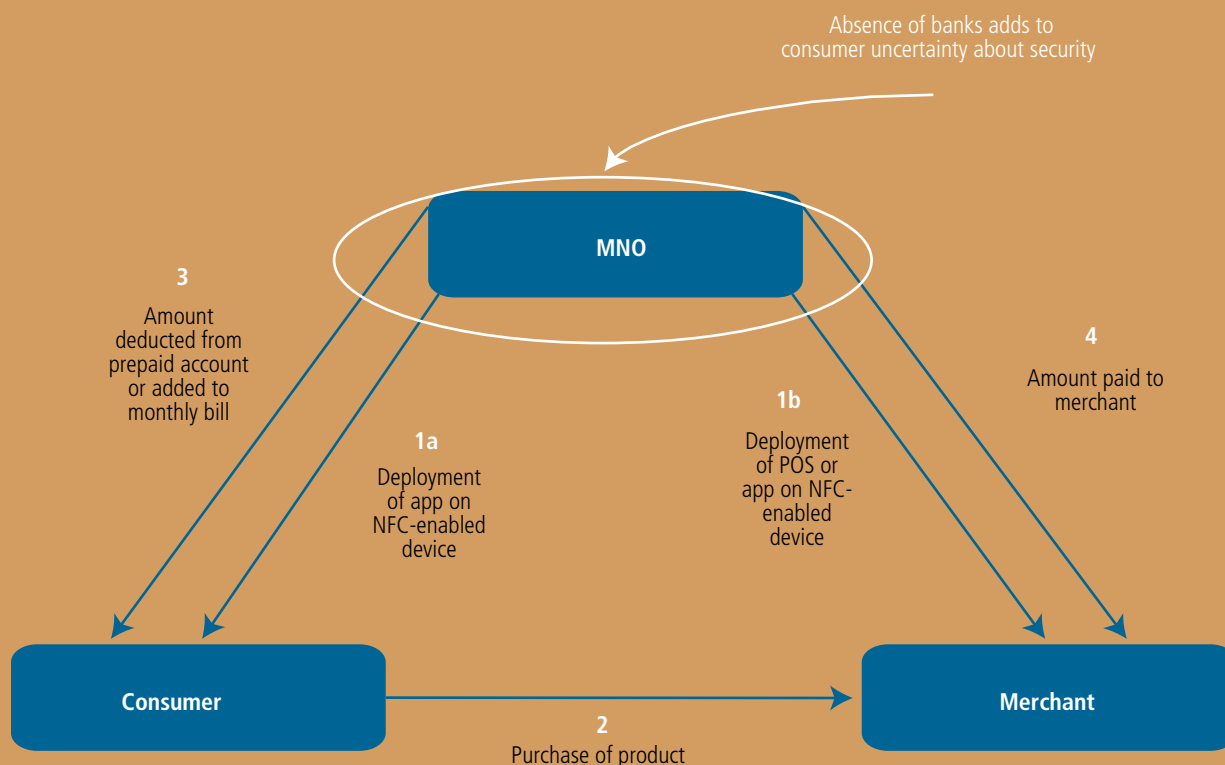
The MNO is the key player. Banks may participate but are not the decision makers or the lead in this m-money initiative. The MNO installs the application on the users’ mobile handsets, which may include NFC technology. The MNO is responsible for providing merchants with POS devices. The MNO can handle the payment processes or link to a bank to fulfill some of this role (as M-PESA does in Kenya). The model depends on a dominant MNO that is able to persuade other partners to join (if necessary) (figure 4.2).

Figure 4.1 Bank-Centric Model



Source: Portio Research 2010.

Figure 4.2 MNO-Centric Model



Source: Portio Research 2010.

Advantages

The incentive structure is clear. The MNO dominates the process and is responsible for the successful roll-out of m-money. The benefits to the MNO are also clear: it can increase subscriber loyalty (reduce “churn”) and gain an increased share of consumers’ disposable income by charging for data services as well as for voice calls.

Disadvantages

The costs of roll-out, such as the agent network, are extensive and require substantial commitment. The absence of banks (or their relegation to a secondary role) can add to consumer uncertainty about the security of transactions or deposits.

Collaborative Model

In the collaborative model, multiple players are involved: banks, MNOs, and third parties. There can be roughly equal partnerships among the

various players to share the cost of roll-out and ongoing operations (figure 4.3).

Advantages

Each party gets a share of the revenue pie. Costs are lower because they can be shared according to the expertise of each stakeholder.

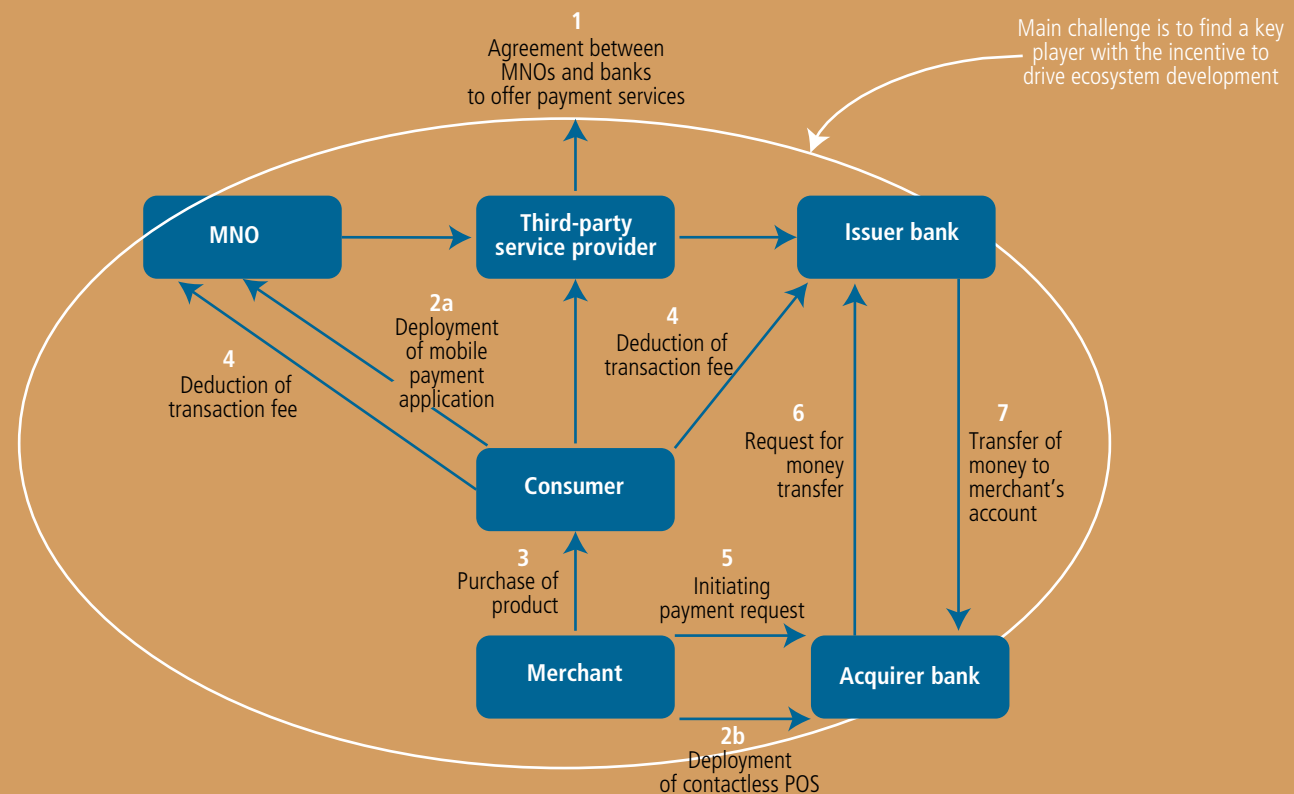
Disadvantages

The model is complex and often difficult to manage. To drive the process forward, a leading partner is generally required, and this is difficult in a collaborative partnership. In this model, prices might be higher than in others because each stakeholder requires a share of the revenues.

Competitive Strategy

Each of the three models—bank-centric, MNO-centric, and collaborative—provides a simplified

Figure 4.3 Collaborative Model



Source: Portio Research 2010.

way to consider the main players and their incentives to launch an m-money initiative.

Similarly, there are three basic competitive strategies: innovation and differentiation, cost leadership, and segmentation.

Innovation and Differentiation

A firm that believes it can offer an m-money service with unique attributes or an innovative product that is new to the market adopts a differentiation strategy. The business environment must offer either a large potential market or the ability to offer a premium price. For example, NTT DOCOMO in Japan offered an additional service through its Auto-GPS software, which informs the user when the next available train is leaving. Although this is not an m-money service, it is an example of a new service that can improve customer loyalty and reduce churn.

Cost Leadership

A cost leadership strategy is based on a firm's ability to offer a high volume of a relatively generic financial service through mobile phones more cheaply than its competitors. This can be done, for example, if the firm's cost base is lower than competitors' or if the indirect benefits of offering the service allow it to cross-subsidize the pricing (e.g., MNOs selling discounted virtual airtime directly over the phone as opposed to through agents).

Segmentation

A customer segmentation strategy is adopted when the quality and quantity of the financial infrastructure is such that an m-money firm cannot offer a lower-cost or enhanced service to all customers, but rather needs to find defined markets prepared to pay for unique benefits. Commuters using NFC payments for public transport are an example. If the market segment is small, it must

be able to generate a high volume of individual payments (as with transit trips).

Business Models in Survey Countries

The business models of the partner service providers in each of the four studied countries have been analyzed according to the following elements:

- **Business objective.** What is the value proposition for the company?
- **Strategy.** How is the company going about achieving this value proposition?
- **Target market.** What is the target market?
- **Marketing strategy.** What is the company's marketing strategy to achieve its business objective?
- **Revenue streams.** What revenue is the company currently generating?
- **Costs.** What are the key costs of providing this service?
- **Transactions.** What are the key transactions?
- **Merchants.** How many merchants does it have where consumers can pay for goods?
- **Users.** How many users does it have?
- **Pipeline.** What new products or features are being developed and will be launched within the year?
- **Model and partners.** Which generic business model has the company adopted: bank-centric, MNO-centric, or collaborative? Who are the recommended partners in the future?

The service provider from each country was classified according to the basic framework of bank-centric, MNO-centric, or collaborative. This classification helps in understanding the providers' incentives within their ecosystem and identify major challenges for the future.

Table 4.1 provides an overview of the companies analyzed in each country.

Brazil

Oi Paggo is the only m-money provider that is 100 percent owned by a mobile operator—Tele Norte Leste, the country's largest telecommunications firm, popularly known as Oi. (*Oi* means “hello” in Portuguese.) It has a strong subscriber base in the less affluent northeast of the country. Oi Paggo is basically a credit card business, with both the credit card and the POS devices for merchants replaced by the mobile phone.

Any prepaid customer currently must register and fulfill KYC requirements. Oi Paggo assesses customer creditworthiness through an external bureau and combines this with internal data such as telecommunications delinquency. Bank accounts are not a prerequisite for credit. Oi Paggo then uses a proactive process to raise credit limits of active, low-risk customers. The process is based on customer behavior, such as payment punctuality, spending levels, revolving records, and credit line use. Thus, there is a process in place to provide microcredit to existing mobile customers. What is needed is a deal that allows Oi Paggo “credit cards” to be accepted at all points of service in the country (Brazil has two dominant POS providers, both controlled by banks). This mobile credit card could be the launch pad for other services such as P2P and prepaid e-wallets (as they have a cash-in and cash-out network through the correspondent banks of their bank partner).

Oi Paggo's main challenges are to reach economies of scale and to increase acceptance of Oi Paggo as a payment instrument. Recent developments between Oi Paggo's parent company, Oi, and two large banks may influence the direction of m-money in Brazil (box 4.1).

Although some data suggest that Brazil has a large unbanked population¹ and thus a potential

¹ The Consultative Group Against Poverty estimates that 70 percent of the adult population still lacks access to bank accounts, but admits there are no official sources to verify the number (CGAP 2010). The Financial Access Initiative states that 43 percent of the adults in Brazil use formal or semiformal financial services (banks or MFIs) (FAI 2009).

Table 4.1 Overview of Business Model Elements for the Four Main Mobile Money Providers

Element	Oi Paggo, Brazil	eTranzact, Nigeria	Dialog, Sri Lanka	TrueMoney, Thailand
Business objective	<ul style="list-style-type: none"> Achieve profitability Increase telecommunications business (phone service top-up increased by 30% among Oi Paggo users) 	<ul style="list-style-type: none"> Private payment switch that provides back-office processing for electronic transfers through channels such as card, Web, and m-payments M-payments seen as growth area 	<ul style="list-style-type: none"> Dialog, an MNO, and NDB Bank have partnered on an m-money product, eZ Pay Dialog wants to reduce distribution costs and bring in new revenue streams NDB Bank sees its partnership with Dialog as an opportunity for new accounts and more distribution; it had a three-year exclusivity agreement which has now expired It wants other operators to join 	<ul style="list-style-type: none"> Ensure profitability and pass off fixed costs to merchants
Strategy	<ul style="list-style-type: none"> Create a partnership with major bank, then offer additional services, such as P2P and prepaid e-wallets 	<ul style="list-style-type: none"> Increase m-payment transactions by using more agents 	<ul style="list-style-type: none"> Maintain variable costs and variable revenues (other than marketing costs) though there are high acquisition costs because service requires new SIM cards in user phone 	<ul style="list-style-type: none"> Leverage existing TrueCorp customers by providing an efficient way to pay bills Focus on prepaid top-up services
Target market	<ul style="list-style-type: none"> Male and females up to 35 years old Demand is the same as credit card market—expected to be 7–8% of Oi subscribers, max 10% 	<ul style="list-style-type: none"> All mobile phone users 	<ul style="list-style-type: none"> Ultimately, all Dialog and NDB Bank customers Needs 100,000 customers to break even Currently 2,800 customers, though nearly all are inactive 	<ul style="list-style-type: none"> Anyone who pays a bill and/or tops up prepaid services especially online games
Marketing strategy	<ul style="list-style-type: none"> Cross-marketing through Oi Mobile marketing campaigns combined with aggressive telecommunications bonuses as a promotional currency 	<ul style="list-style-type: none"> None at present 	<ul style="list-style-type: none"> None at present 	<ul style="list-style-type: none"> Convergence-based cross promotion across group companies; e.g., free cable TV if spend at least B 300 (about US\$10) on airtime top-up through TrueMoney Superdealers promote multipurpose cash card used for airtime and/or cash top-up
Revenue streams	<ul style="list-style-type: none"> Main revenue (~70%) comes from the 15.99% monthly interest charged on outstanding balances Monthly flat usage fee of R\$2.99 (US\$1.70) if there has been activity during that month (includes outstanding credit) represents 10% of revenue Merchants pay Oi Paggo 2.99% on all purchases made through it, representing 15–20% of Oi Paggo revenue Currently not profitable 	<ul style="list-style-type: none"> Fee per transaction 	<ul style="list-style-type: none"> The transaction fee is shared between the software provider (mChek), the acquiring bank, the issuing bank (NDB Bank), and the issuing and acquiring operators (Dialog) SL Rs 25 (US\$0.22) transaction fee is paid by the customer for electricity and water bills All other transactions cost customers SL Rs 10–25 (US\$0.09–US\$0.22) (depending on whether a promotion is being offered) compared with SL Rs 25 (US\$0.22) bank charges SMS costs (one per transaction) are SL Re 1 (US\$0.01) 	<ul style="list-style-type: none"> Bill payments B 10 (US\$0.32) for postpaid bills, e.g., utility (although can be reduced to B 5 (US\$0.16) through promotions); True Bills free to customer True revenue from customer transaction fee, commission from bill issuer and prepaid service companies Low interest rate so little earned on float of average B 200 million (about US\$6.3 million) B 1.5 billion (about US\$47.3 million) revenue; net profit is B 30 million (about US\$947,000)

Element	Oi Paggo, Brazil	eTranzact, Nigeria	Dialog, Sri Lanka	TrueMoney, Thailand
Costs	<ul style="list-style-type: none"> Costs of acquiring a merchant are R\$130 (US\$74), which includes commercial/sales effort, SIM card, training, technical set-up, labor; does not include marketing material and signage 15–20 staff look after merchants, roughly 1–2 staff per city 	<ul style="list-style-type: none"> Switching platform: sunk cost No marketing costs at present Cash handling not yet seen as a major issue (there is virtually no cash handling) 	<ul style="list-style-type: none"> Platform provided by mChek Transaction-based model; mChek takes a cut of every transaction Marketing costs shared between bank and operator SMS costs (one per transaction) are SL Re 1 (US\$0.01) New SIM card required to operate eZ Pay Cash handling not yet seen as a major issue (there is virtually no cash handling) 	<ul style="list-style-type: none"> Commission paid in real time to merchants Merchant training—now only in Bangkok, full-day session is focused on product features Special line at call center for TMX merchants
Transactions	<ul style="list-style-type: none"> Transaction numbers are confidential Typical split of transactions is two-thirds for top-up and one-third for other purchases Average top-ups are around R\$10 (about US\$6), and other purchases average R\$63 (US\$36) 	<ul style="list-style-type: none"> Utility bill payments Cash-in/cash-out (tiny) 	<ul style="list-style-type: none"> Utility bill payments Cash-in/cash-out (tiny) Registration—usually requires SIM exchange to 128-bit SIM eChanneling (medical appointment booking) 	<ul style="list-style-type: none"> Touch wallet—offline for small value transactions Online wallet—TrueMoney Merchants for cash top-ups, bill payments, buy games Internet payments—to avoid using credit card online Cash-out only at True's own shops 10% transaction charge to cash-out; merchants do not like paying out cash Cash-in from linked bank account or credit card or electronic transfer from TMX agent or buying cash card Cash card top-up 80% of cash-in channel
Merchants	<ul style="list-style-type: none"> 75,000 merchants, with levels of activity from inactive to high performers 	<ul style="list-style-type: none"> Building up a merchant network 	<ul style="list-style-type: none"> All Dialog outlets Dialog outlets can do KYC on behalf of NDB Bank; funds are sent daily to bank for final verification and approval; embossed cards created; file sent to mChek for activation (four working days to process) Agents not incentivized to open accounts, but receive payment for selling SIMs (this is linked to the lack of marketing) 	<ul style="list-style-type: none"> Pay B 19,990 (about US\$630) for TMX EDC if no PC, B 1,990 (about US\$63) for TMX online one-time license, B 599 (about US\$19) for TMX mobile version Own shops—130 True partners/franchises—800 TMX—shops with TMX payment service (level one distributors = 10–20) Agents buy e-money and are paid commission in real time by True
Users	<ul style="list-style-type: none"> 100,000 users who only use Oi Paggo to pay their phone bill 150,000 signed up as m-payment users, nearly 50% of whom had used the product in the last three months 	<ul style="list-style-type: none"> Very limited use 	<ul style="list-style-type: none"> Very limited use 	<ul style="list-style-type: none"> Anyone who pays a bill and/or tops up prepaid services; e.g., young people playing online games

Element	Oi Paggo, Brazil	eTranzact, Nigeria	Dialog, Sri Lanka	TrueMoney, Thailand
Pipeline	<ul style="list-style-type: none"> Once partnered with a bank, Oi Paggo plans to launch a range of new services, such as P2P transfers, prepaid e-wallets, limited credit facility, bill payments 	<ul style="list-style-type: none"> Merchant-initiated transactions—bill payments Bring in other banks and operators 	<ul style="list-style-type: none"> Merchant-initiated transactions—bill payments Bring in other banks and operators Now testing USSD 	<ul style="list-style-type: none"> Move away from TrueMoney cash card to cheaper electronic transactions for non-True group bill payments and money transfers Expand to remote areas using TMX model
Model/ partners	<ul style="list-style-type: none"> Model: MNO-centric Recommended partners: Banks, payment providers 	<ul style="list-style-type: none"> Model: Collaborative Recommended partners: MNOs and banks 	<ul style="list-style-type: none"> Model: Amalgamation of bank-centric and MNO-centric models Recommended partners: other banks (beyond NDB Bank) 	<ul style="list-style-type: none"> Model: MNO-centric Recommended partners: Banks

Source: IFC Mobile Money Study, 2010.

opportunity for m-money, our analysis shows that the Brazilian population is much better served than those figures suggest. The unbanked in Brazil are served through the following means:

- A large network of correspondent banks (up to 150,000) that allow for efficient bill payment, and is largely used for that purpose by people without bank accounts
- Consumer loans and credit provided by retailers, which has grown more than 30 percent in the last year, mainly in the low-income groups; no bank account is required, and regulation allows the retailer to recover goods in case of nonpayment
- Payroll-consigned loans facilitated through regulation aimed at financial inclusion; these are popular throughout Brazil, with more than 50,000 companies participating.

The banking sector is competitive and efficient, and the country is decently served by both formal and informal means, limiting opportunities for m-money. Although many Brazilian banks offer m-banking services to customers, m-money is not seen as a business model in itself but rather an additional access channel for customers. The main value added that m-money could potentially provide in such a market follows:

- The ability for existing bank customers to make transactions while on the move and to make remote purchases or payments (otherwise a

payment card could be used and is currently faster and more convenient until NFC is universal)

Box 4.1 Update on New MNO-Bank Partnership

Since the field study in April 2010, there were the following developments. Federally controlled Banco do Brasil and Brazil's leading card acquirer Cielo have signed deals with the country's largest telecommunications firm, Tele Norte Leste (Oi) "with the purpose of establishing a business partnership to issue co-branded credit cards and pre-paid cards," as well as working on increased mobile payment with Oi's client base. Banco do Brasil, which owns a controlling stake in Cielo jointly with the private sector bank Bradesco, had Cielo's equity holding arm, CieloPar, take a 50 percent stake in a new company called Paggo Soluções, with an Oi subsidiary Paggo Acquirer taking the other half.

Paggo Soluções is now conducting activities in connection with the capture, transmission, processing, and payment of business transactions with the m-payment technology originated or completed in cellular phone devices and accrediting current and new stores to its acquiring network of transactions originated in cell phone devices through the existing relationships of Cielo and Paggo Acquirer all over Brazil. The deal has been cleared by Brazil's antitrust regulators. Cielo plans to invest US\$1.17 million into the joint venture and believes that no major additional investments are required, because the controlling companies already have the capability and infrastructure to operate this activity.

- Stored value accounts for unbanked customers, which would require a wide cash-in/cash-out agent network (which only banks have) and large payment acceptance network (which only payment card providers have)
- Extending microcredit to MNO customers, who may be unbanked customers who cannot be reached by the banks or credit card companies.

Nigeria

Nigeria's eTranzact has several innovative products. Most of its m-money products are at the pilot phase. One product, EasyMe, provides youth with a source of income by ensuring that they earn value on day-to-day transactions via their mobile phones. When someone signs up for EasyMe as an agent, any other bank account holder can approach the EasyMe agent for airtime top-ups and bill payments. Bill payments include satellite TV payments (called "cable TV" in Nigeria) and payments for goods and services sold by merchants.

Because the financial market in Nigeria is so unreliable (start-ups have a propensity to fail, and there are poor levels of service), public perceptions of both MNOs and banks are negative, especially among m-money nonusers.

Since eTranzact is a third-party service provider, the most applicable of the three generic business models is the collaborative model, in which a third party can intermediate between banks and MNOs to provide an m-money solution. eTranzact has some experience in this model in its current role as a payment switch, but does not have experience dealing directly with consumers or in managing relationships among multiple partners offering different services. It may have to rely on another partner (such as a bank) to, for example, roll out POS devices.

The biggest risk facing eTranzact is that it has limited experience with end users. It does not operate a large agent network. Those agents that it does use are run by an outsourced company and based primarily in Lagos. For an m-money solution to

gain traction, it needs to be trusted by customers and rapidly achieve customer adoption and transaction volumes. Initial trust is usually achieved through the use of a known and trusted brand.

The sophistication of Nigeria's financial sector is poor and penetration of ATMs and POS devices is low; thus, the competitive strategy most appropriate for eTranzact is the differentiation strategy, providing a product with features not currently available: reliability and geographic reach.

Given the inefficiency of the financial market and the negative perceptions of consumers, it is recommended that eTranzact adopt a differentiation strategy by partnering with multiple banks and third-party agent operators. eTranzact would differentiate itself from its competitors by providing a clear set of innovative services. It should first market a product with a wide agent network that takes advantage of the latest mobile technology and provides good customer service (including a dedicated call center and rapid problem solving). It should focus specifically on the reliability and convenience of its services in comparison with existing offerings.

Sri Lanka

Sri Lanka has a highly banked population, though it suffers from poor service from government banks. Even assuming that many people have multiple accounts, penetration is still high: in the user survey, 98 percent of respondents said they had a bank account. Yet convenient payment services are relatively rare because the penetration of debit and credit cards is low, and ATM and POS device roll-out is limited. The majority of bank accounts are with government institutions, while private sector commercial banks focus on the middle and upper classes. Bank accounts are primarily used to store value—that is, as savings accounts and not as transactional accounts. Non-face-to-face transactions, both domestic and international, are largely made through informal channels.

Sri Lanka's main MNO, Dialog, has partnered with NDB Bank to provide an m-money service called eZ Pay, which was launched initially as a

pilot and then expanded to service a larger portion of the country, including Colombo. However, transactions have been anemic to date.

The eZ Pay account seems to be an experiment for NDB Bank and Dialog rather than an integral part of their retail strategy. For example, it is not clear that eZ Pay has sufficiently defined its customer base or its offerings.

Since the eZ Pay product is a partnership between NDB Bank and Dialog, it is an amalgamation of the bank-centric and MNO-centric models. The partnership between Dialog and NDB Bank suffers from a lack of direction partly because neither company is taking primary responsibility for the roll-out of eZ Pay.

Although there are difficulties in the relationship between Dialog and NDB Bank, there are also a couple of opportunities in the Sri Lankan market. First, there is a massive public transport market with an identified inefficiency. The formalization of this market could potentially benefit both consumers and bus companies. In the absence of an NFC-enabled phone, linking a smart card (with card-based NFC) to alternative mechanisms of payment and allowing the smart card to be topped up using an m-money account, could represent a potential business opportunity.

A second potential opportunity is the payment of bills such as water and electricity. More than 8 million utility payments per year are made at the post office. Dialog could approach the post office as a partner, offering to assist it in modernizing its bill payment network to reduce costs and increase efficiency. As a partner, Dialog would have access to the post office's large distribution network.

Thus, there are opportunities to link an effective payments infrastructure, which requires a relatively low capital investment, with existing banking products to provide secure and low-cost transactional capabilities.

Thailand

Thailand has two relatively successful m-money operations: TrueMoney and Advanced MPay.

(Table 4.1 details the TrueMoney plan.) The country has a high ATM penetration in addition to a strong national retail network. Both TrueMoney and Advanced MPay have integrated into retail networks such as 7-Eleven and CP Freshmart. In addition, banks have concentrated on a low-cost and multifunctional ATM roll-out to service all consumer segments, offering a range of services, including money transfers, bill payments, insurance payments and cash-in/cash-out. To compete with the banks, particularly with bill payments, both TrueMoney and Advanced MPay provide bill payments at a cheaper rate than the banks. However, both businesses have based their m-money initiatives on offerings that leverage the needs of other businesses in their group by providing them with efficient payment systems to reduce bad debts and improve cash flow.

A third m-money competitor in Thailand is DTAC, the third largest MNO in the country, in partnership with Kasikorn Bank (K-Bank). By allying itself with K-Bank, DTAC has integrated into the existing financial services sector. Thus, customers can easily transfer funds to customers of any bank and can use any ATM or POS device at no cost, as well as using Internet banking or a bank branch.

The user survey established that even though TrueMoney has the largest subscriber base, far more respondents are aware of the DTAC–K-Bank partnership. K-Bank has been successful in marketing targeted products such as the ATM SIM.² K-Bank has a strong brand, a significant benefit especially with customers who already know and trust it. Conversely, ATM SIM is a low-risk cost to K-Bank and a cheaper channel than rolling out its branch network. In comparison, TrueMoney is relatively inexperienced at providing financial services.

There are at least two types of generic business models at play in Thailand: MNO-centric

² The ATM SIM product requires a new SIM card, issued by DTAC, on which K-Bank financial services are offered.

(TrueMoney and Advanced MPay) and bank-centric (DTAC–K-Bank).

Proposed Evolutionary Business Model

The business model ties all the various analyses together. The main questions to ask in order to develop a viable business case for the four countries of this study, and possibly other countries, are the following:

- Which player(s) have the clearest and strongest incentive to develop m-money services: mobile operators, banks, or third-party providers?
- What is the main value proposition to offer potential clients: better, more convenient, and different services (differentiation); lower-cost services (cost leadership); or services to unserved or underserved clients, such as the unbanked or rural population (segmentation)?
- What is possible in each country, in terms of the following:
 - **Regulation.** Is the most incentivized player also allowed to provide m-money services?
 - **Demand.** Is the market large enough to warrant the cost and investment of establishing an m-money service?
 - **Partnership requirements.** Can the incentivized player establish an m-money service by itself, or does it need major partnerships?

Business models vary widely in the four studied countries due to different country contexts, varied stages of financial sector development, the market, and the competitive landscape. Because of this known complexity, many analysts have looked at the m-money business model from the perspective of the main players. Common basic categorizations are MNO-centric, bank-centric, and collaborative models. These basic models can have some variation, and they also evolve over time. For example, an MNO-centric m-money venture will, over time, increase its partnership with banks and develop into a collaborative model as happened in Kenya. Furthermore, m-money ventures are linked to certain stages of financial development

in each country. Thus, these models are dynamic rather than static.

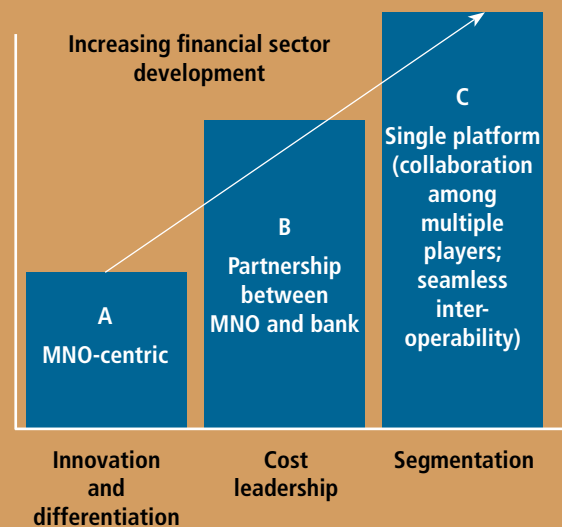
Based on the four country studies plus the case studies of Japan, Kenya, and the United States, we have developed a hypothesis of a progressive development for m-money business models for further study, as shown in figure 4.4.

MNO-Centric Model

In countries like Kenya and Nigeria, with low existing financial infrastructure and high unmet demand, the MNO is the most able and incentivized type of company to develop an m-money business. It controls the infrastructure (both the communications network and the distribution network) that can become an alternative to the underdeveloped financial infrastructure, and has “ownership” of its subscribers. Although the MNO may later partner with a bank, it can provide m-money services by itself. (See A in figure 4.4.)

Its competitive strategy is likely one of innovation and differentiation, offering services that did not previously exist in that country, such as electronic P2P fund transfers using a mobile handset.

Figure 4.4 Hypothesis of Progressive Development of MNO-Centric Model



Source: IFC Mobile Money Study 2011.

The fact that the Nigerian m-money market is underdeveloped, despite its obvious potential, is because the regulatory regime does not encourage MNOs as m-money service providers.

Collaboration between an MNO and a Bank

In countries with a slightly more developed financial infrastructure and a relatively smaller unbanked population, such as Sri Lanka and Thailand, there is increasing pressure for the MNO to integrate its financial services with the existing financial sector. (See B in figure 4.4.) Collaboration and partnership with a bank become important for a viable business model. For example, in Kenya, as the sophistication of the Kenyan consumer grew, the complexity of the model increased; and collaboration with banks (such as Equity Bank and others) became critical. Kenya's MNO, Orange, launched its Iko Pesa service in partnership with Equity Bank. Iko Pesa is a full-featured bank account and thus not subject to the same transaction limits on accounts like M-PESA (Rotman 2010).

In Brazil, m-money development was led by a subsidiary (Oi Paggo) of the country's largest telecommunications firm, Oi. Oi recently signed a deal with the Bank of Brazil and Cielo, a credit card company, that could move it toward a collaborative model.

Although it is not inevitable, the competitive strategy at this stage tends to focus on cost leadership, because the m-money business is competing with the existing banking system.

Single Platform: Collaboration among Multiple Players and Seamless Interoperability

In countries like Brazil, Japan, and the United States, the financial sector has reached a certain degree of sophistication, efficiency, and competitiveness. Overall, the unbanked market is smaller in these countries, making it necessary to target both banked and unbanked clients to reach economies of scale. Yet, the high levels of competition makes it harder for a single player or single bank-MNO partnership to reach the necessary economies of scale. The sophistication of clients requires a higher degree of interoperability. Thus, these countries would likely accelerate the uptake of m-money if they could develop a multiplayer collaboration and/or interoperability. (See C in figure 4.4.)

Japan, due to its unique circumstances, was able to create economies of scale because it could establish dominance throughout the value chain. Most countries, like Brazil and the United States, are more fragmented and require collaboration among several players to reach economies of scale. This situation has been acknowledged by FEBRABAN, the banking association in Brazil, and by experts at the Federal Reserve Bank of Atlanta in the United States. The latter authority notes: "One challenge for stakeholders is to decide collectively on the rails and infrastructure [for m-money] to use while considering cost issues. Attempting to establish different payment infrastructures at the same time may not work well" (Federal Reserve Bank of Atlanta 2010, p. 6).

5 Mobile Money Demand Curves

M-money has different value propositions in different countries. In some countries, such as Kenya, the value proposition for m-money was as an alternative financial infrastructure for payments and transfers because the existing financial infrastructure had such poor penetration.¹ In other countries, the high penetration of e-payment cards (debit and credit cards), ATMs, and POS devices, and the competitive structure of the financial services sector, make for a different value proposition for m-money. One measurement of the potential for m-money is the level of e-payment card penetration as shown in table 3.5. Kenya consistently has the lowest figures, indicating the largest m-money opportunity.

As shown in table 3.5, there are three natural groupings based on banking penetration, payment card penetration per million inhabitants, and ATM and POS device penetration: Kenya and Nigeria; Sri Lanka and Thailand; and Brazil, Japan, and the United States. The case studies of Japan, Kenya, and the United States illustrate the different routes that each of the ideal m-money models have taken.

¹ Historically, the value proposition was that P2P transfers were not possible using the existing financial infrastructure. Of course, M-PESA has evolved far beyond simple P2P transfers to a variety of other financial products.

In Kenya, a dominant operator, the lack of government oversight, and a large unmet demand from the informal and unbanked sectors drove P2P transfers. Even though Kenya is a tiny economy relative to Japan, it is the largest market in the world in terms of the absolute and relative monetary value of mobile phone payments (as distinct from electronic card payments).

In the United States, m-money has not yet taken off for a number of reasons, including the existence of an e-payment infrastructure, a historically fragmented mobile market without a dominant operator, and the lack of a “killer application” like Japan’s public transport system. Nevertheless, e-payment in terms of credit and debit cards is very strong.

In Japan, a set of dominant service providers, a facilitative government, and a clear business model (or clear value proposition for customers) have pushed the success of m-money. Nevertheless, the value of m-money transactions, defined as payments on a mobile phone and distinct from e-money, is still smaller than in Kenya.

The different factors that influenced the success of m-money in Kenya and Japan support two conclusions.

- In developing countries, a country’s relative demand for low-cost, low-speed (not NFC), and infrequent transactions (e.g., monthly), is a critical factor alongside the low level of financial infrastructure and service development.

- In developed economies, a country's relative demand for high-speed (NFC), high-volume (frequent) transactions is a critical factor, alongside a high level of financial infrastructure and service development.

These conclusions are illustrated in figure 5.1. Each country in the study has been placed along its appropriate demand curve. It should be noted that while we have placed Nigeria above Kenya in terms of fundamental demand, other factors, such as market fragmentation and regulatory constraint, have kept it from matching Kenya's success. In Nigeria, the central bank has followed a relatively lengthy licensing process, but has recently licensed 16 new m-money service providers, at least one of which includes a mobile operator as a partner. Even though the environment is challenging, there is reason to believe that there could be an acceleration of m-money services over the next few years.

Three countries—Brazil, Sri Lanka, and Thailand—are in a transition phase, and it is unclear along which demand curve they will move.

The opportunity is greatest at the stage where m-money is poised as an alternative infrastructure to existing financial services. At this stage, the primary players are usually MNOs, although technology companies have also offered m-payment services, sometimes by connecting multiple banks and multiple operators, going beyond transaction processing to manage merchants and the customer interface. The unmet demand is huge. Kenya has successfully exploited this stage. Nigeria, theoretically, has the opportunity to exploit m-money, but there are obstacles.

The opportunity is less in the transition phase, where m-money is competing against existing financial services. At this stage, the best strategy is to integrate into existing financial services. The opportunities for m-money are in segmented markets, with a clear and particular value proposition. Both Sri Lanka and Thailand fall into this category. Brazil is on the cusp of entering the collaboration phase, where there is significant financial penetration and where the percentage of the

population that does not have access to some form of financial services is relatively insignificant. The various stages on the m-money adoption curve are discussed in more detail in the next sections.

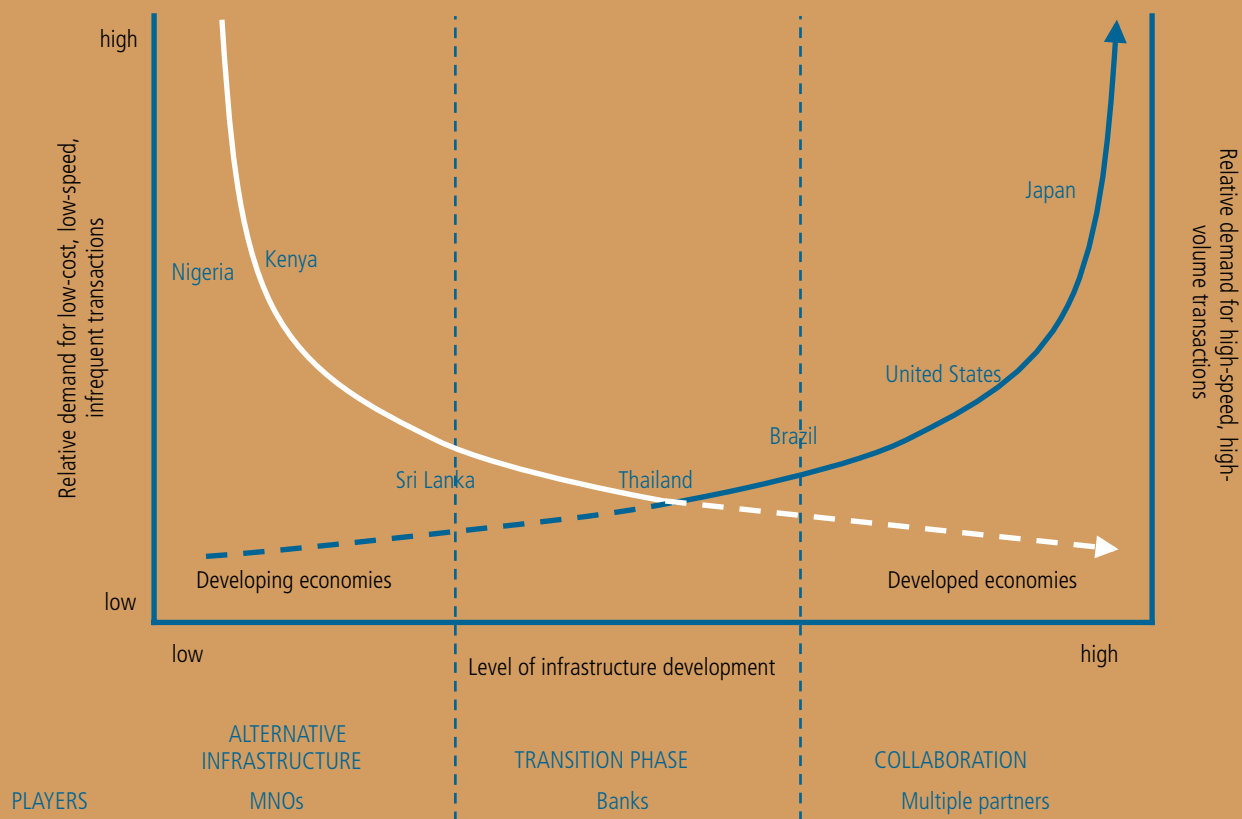
MNO-Centric Model Provides Alternative Financial Infrastructure

M-PESA in Kenya has been a brilliant example of what is possible in m-money in an economy where the financial sector has failed to meet the needs of the majority of the population, including those who are banked. It has been hugely successful with more than 9.4 million customers, more than 18,000 agents, and US\$5.27 billion in P2P transfers since inception (Joseph 2010). Informal surveys show that there is scarcely a household in Kenya that is not a user of M-PESA: between March 2009 and March 2010, more than 13 percent of the national GDP was transferred by M-PESA. As a result of its success in achieving high customer adoption and transaction volumes, M-PESA has been a guide for the implementation of m-money in other countries, although not necessarily with a deep understanding of the relevance of the particular circumstances and environment in Kenya. The M-PESA business model, initially focusing on domestic remittances, has been used in a number of other countries—though, so far, not with as great a degree of success.

Mobile operators from around the world studied the M-PESA phenomenon. The initial conclusion was that MNOs could bypass existing financial services and build an alternative low-cost financial system. However, it has been difficult to duplicate the M-PESA model. Understanding the reasons for this difficulty can open the door to opportunities elsewhere, even if precise duplication is difficult in the unique political, regulatory, and financial sector environments of each country. Several studies have looked closely at the reasons for M-PESA's success and provided recommendations for other countries.² These studies have

² See, e.g., Camner and Sjoblom (2009) and Mas and Radcliffe (2010).

Figure 5.1 Mobile Money Demand Curves



Source: IFC Mobile Money Study 2011.

Note: The white curve represents m-money demand for developing economies. Demand for m-money in developing economies is for low-cost, low-speed, infrequent transactions, such as P2P transfers. As developing countries progress, financial infrastructure develops and competition from banks, credit card companies, and other financial institutions increases. The white 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 blue 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, m-money acts as an alternative infrastructure to existing financial services; during the transition phase, m-money is moving from an alternative infrastructure to a complement. In the collaboration phase, m-money must fully integrate with the financial infrastructure.

mainly looked at parameters such as the market share of Safaricom, urbanization rates in Kenya, and demand for domestic P2P payments, including overseas remittances. However, many of these studies downplayed the fact that although the cost of rolling out an agent network is substantially less than rolling out a formal financial infrastructure, such as ATMs or mobile bank branches, it is still a major investment and requires significant ongoing resources. Moreover, different capabilities, such as risk management and sales skills, are required to service a financial product than are needed to sell and manage airtime.

M-money businesses have struggled to break out of the traditional categories of relatively low-volume,

high-value individual transactions, such as international remittances, remote P2P transfers, and bill payments, where the profit margins are low and become even lower as other players enter the market. M-PESA has been so successful because it was able to quickly reach “network effects,” in which every household had an M-PESA account; thus, sending money was viable and convenient. M-PESA has, in effect, become Kenya’s national payment instrument and processor.

In countries such as Kenya and Nigeria, where there is little financial infrastructure and payment card infrastructure is just developing, m-money provides a viable alternative. In the Kenyan market, the critical factors that contributed to

the success of m-money were also in place: a very open (almost nonexistent) regulatory regime, high demand for P2P transfers, and an MNO that had 80 percent of the mobile market. These factors paved the way for the development of an alternative financial system in Kenya.

For an MNO, building an alternative financial system has several advantages:

- Countries such as Kenya have a nascent financial services sector that currently provides services to a limited, but relatively wealthy, group of consumers. There is a large gap in the market that can be served by the mobile operators providing basic financial services such as P2P transfers and bill payments.
- An MNO's per transaction costs can be substantially lower than those of payment systems such as Visa and MasterCard. Although the costs are lower, the range of services offered is also limited to the basics, such as P2P transfers, overseas remittances, or basic bill payments, if the MNO is able to provide the points of presence where communications services are available to subscribers.
- MNOs could use their expertise in providing services to the bottom end of the market to successfully promote new financial services such as remote P2P transfers or bill payments. Leveraging existing airtime agents means that some of the costs of setting up a cash-in/cash-out system are reduced, especially in comparison with banks.
- A significant benefit for MNOs is their ability to capture a large percentage of the consumer's wallet and increase customer loyalty to their brands. Successful m-money roll-outs have reduced the level of subscriber churn (turn-over).

At this stage of m-money development, success is primarily defined by the objectives of the MNO. The initial motivation of an MNO might be to reduce churn, especially in comparison with competitors, but as M-PESA has recently shown, m-money can contribute significantly to overall

revenues and become an important profit center.³ It should be noted that it took several years of experience for M-PESA to become profitable as a stand-alone product.

Transition Phase Brings More Offerings

As mobile operators investigate or invest in m-money ventures, banks expand their offerings of prepaid, debit, and credit cards along with ATMs and POS devices.⁴ The number of ATMs in Sri Lanka grew by 115 percent between 2005 and 2009; the number of POS devices in Thailand grew by 209 percent between 2004 and 2008.

In addition to the rapid growth of electronic transactions via ATMs and payment cards, the ratio of the value of e-payments to cash payments is an indicator of the level of financial competition and financial services penetration in a country. It has not been possible to establish the cash-to-electronic transaction value ratio in Nigeria, but the low penetration of ATMs and POS devices can be used as a proxy metric for the conclusion that it is very low. In comparison, in Sri Lanka, the ratio is 0.72 electronic transactions (in value) to 1 cash transaction; in Thailand, the ratio is 8.9 to 1 (the value of payment card transactions is 8.9 times the value of cash transactions). In Brazil, the value of debit and credit card transactions for individual consumers is 2.8 times the value of cash in circulation, indicating a fairly well-developed financial sector (Central Bank of Brazil 2009a, 2009b).

Countries like Sri Lanka and Thailand, which have significantly greater financial infrastructure than Nigeria, are in transition from a small financial sector toward high levels of account penetration as in the developed world. Their financial services sectors are aggressively expanding and offering increasingly sophisticated services. In

³ Estimates based on Safaricom's recent financial results are that M-PESA earned US\$47.2 million in profits, generating 18 percent of all Safaricom profits. See Pickens (2010).

⁴ This reduces the opportunities for other nonbanks like technology companies.

Sri Lanka, the bank account penetration rate is 59 percent, though debit and credit cards are still taking off as a payment mechanism. Thailand has more than 80 percent bank account penetration and an extensive ATM network that offers a full range of services, including P2P transfers and bill payments. In these economies, the market opportunity for mobile operators is lower, limited by the extent of existing financial services. Integration into this financial infrastructure is becoming vital, as consumers increasingly expect to be able to perform transactions seamlessly across platforms.

During the transition phase, the winning business strategy is focused on segmentation of the customer base. Unlike the previous phase, in which there was a huge unmet demand, a much larger proportion of the consumer base has access to financial services. Thus, the business opportunity lies in developing a range of services that meet the demands of different segments of the population.

At this more advanced stage of m-money development, potential revenues are less important than other factors such as efficiency, convenience, and customer loyalty whether the business owner is an MNO or a bank. In contrast to the previous stage, the MNO is now competing against the banks, and the success of an m-money venture is linked to what each of these players considers important. For example, TrueMoney provided an efficient

mechanism for consumers to pay bills, thus lowering the overall costs for its parent company, True Corporation. Of course, revenues and profitability are still important, but the emphasis at this stage is trending away from revenues toward efficiency in terms of cost reduction.

Brazil is on the cusp of entering this phase. In Brazil, the role of the MNO in m-money is virtually insignificant because banks have rolled out a successful branchless banking network. The metric for the success of m-money is no longer the MNO, but rather the banks, and there is a return to the traditional metrics of revenue and profitability.

Seamless Integration and Collaboration Phase

The final stage on the m-money continuum is a seamless integration between a variety of channels through which consumers can make payments. At this stage, collaboration among different platforms is critical. The consumer demands multiplatform, real-time access to financial services. Banks and MNOs continue to provide the underlying services, but their services are commoditized. Application providers, or third parties, supply mechanisms to conduct transactions in a variety of ways, including public transport purchases using NFC technology, money transfers using iPhone apps, and salary payments using the Internet.

Appendix A

Methodology

This appendix summarizes the methodology employed for the IFC Mobile Money Study 2011 by Intelcon Research and Consultancy Ltd, as consultants to IFC. In three of the four countries—Nigeria, Sri Lanka, and Thailand—studies of m-money ecosystems had not previously received much attention.

Desk Research and Analysis

A desk research report summarized the latest research, literature, and thinking on m-money, in preparation for country visits and user and agent surveys. The following topics were investigated:

- Definitions, concepts, and understanding of m-money
- Objectives and incentives for players operating an m-money business, such as revenue sources and cash flow, the business environment, and partnership models
- Agent economics, incentives, and challenges
- User and demand issues, such as financial literacy and m-money perceptions, previous surveys, etc.
- Country specifics for Brazil, Nigeria, Sri Lanka, and Thailand: socioeconomic, financial and telecommunications sector data, existing studies and literature
- M-money ecosystem issues such as regulation, players, etc.

- Models and concepts of m-money adoption.

The desk research report provided insight into how various factors influencing the adoption of m-money could be prioritized to assess the suitability of a country for m-money.

Field Visits and Key Stakeholder Interviews

Field visits to each of the four countries were conducted, typically for a period of two weeks, during the time periods shown in table A.1. The visits were conducted by at least two consultants, either an Intelcon team member, or both an Intelcon team member and the principal of the subcontracting consulting firm, Jenny Hoffmann of Riskfrontier Consulting. In all countries, we worked with local associates.

Table A.1 Field Study Visits (2010)

Country	Dates	Local associate
Brazil	March 15–April 1	Antonio Bothelo, Diálogo Regional sobre la Sociedad de la Información
Nigeria	February 1–19	Ike Moweto, Research ICT Africa!
Sri Lanka	March 8–20	Harsha de Silva, LIRNEasia
Thailand	March 21–April 2	Deunden Nikomborirak, Thailand Development Research Institute

Source: IFC Mobile Money Study 2011.

A wide range of informants were interviewed in each country by the field teams with the help of local partners. These interviews were qualitative, but for each of the main types of key informant (MNOs, banks, regulators, and platform providers), checklists had been prepared in advance to ensure consistency in covering key topics in each country.

Examples of key informants included existing m-money providers, major mobile operators, important banks, the country's central bank and/or regulatory authority, third-party payment providers, agent network managers, payment switching services, industry associations, and academics or other experts in the field of m-money. The key informant interviews offered expert insight into issues regarding the m-money ecosystem in each country that helped us assess the potential for and constraints to mass adoption.

After each country visit, field visit summary reports were provided, with initial outcomes and key issues faced by the country in implementing m-money systems.

User and Nonuser Surveys and Agent Surveys

Survey activities were initiated during the latter half of the in-country missions so that local advice and input from key stakeholders could be integrated into the surveys. The project team leaders led the training and piloting of the surveys with the local associates and survey teams, who then finalized the surveys as required.

The surveys consisted of formally structured questionnaires to individuals who were m-money service users, individuals who were currently not m-money service users, and m-money agents in the study countries. The purpose of the surveys was to investigate perceptions and behaviors, demands, and technology issues. We sought answers to the following questions:

- Where and with whom do respondents receive money by mobile or other traditional means?
- For what is the money being used? How much is used? Where is it used and how frequently?

- What are typical financial and phone literacy capabilities?
- What is the range of use of alternative or complementary technologies such as debit and pre-paid cards?
- What are the viability characteristics of agents, such as costs, business models, and capacity-building requirements?

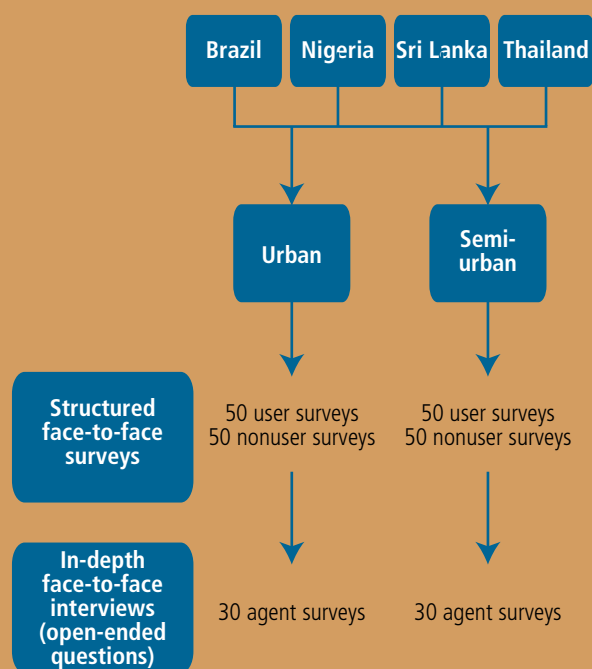
The surveys consisted of polls of approximately 200 users and nonusers in each country. The techniques involved structured, face-to-face interviews. Thirty open-ended questionnaires were conducted with m-money agents in two of the countries (Brazil and Thailand). The surveys were not intended to be statistically significant samples, but rather to provide an overview of people's attitudes, preferences, issues, and recommendations regarding m-money services.

Respondents were surveyed in a variety of locations to ensure a good representation of socioeconomic backgrounds and inclusion of those who lived and worked at a distance from the urban economic centers. It was assumed that in the larger metropolitan areas, which are often economic and political centers, there would be a greater concentration and availability of financial services, in contrast to other urban or semi-urban centers which, although they sometimes have populations in excess of 1 million, are geographically distant from the main metropolitan areas and are influenced by rural resources and agriculture industries. Urban and semi-urban location classifications were as follows:

- Urban locations were defined as metropolitan areas in close proximity to services and economic activities and whose populations are generally economically well-off and educated, but could include significant numbers of poor inhabitants.
- Semi-urban locations were defined as smaller towns, cities outside metropolitan areas, or even metropolitan suburbs outside the urban core, which are characterized by fewer services and whose economic emphasis may extend into rural and agriculture areas.

In total, 800 user and nonuser surveys, supported by 60 in-depth agent surveys, were conducted across the four countries from February to April 2010. The approach that guided the sampling and survey of respondents is summarized in figure A.1.

Figure A.1 Approach to Sampling and Survey



Source: IFC Mobile Money Study 2011.

Project partners, including various operators of m-money services, sometimes assisted the study by identifying users and agents to be sampled for the survey.

A user was defined as an active user of an m-money service in financial transactions such as payments and cash-in/cash-out functionality; a nonuser was defined as a person who is not using m-money services, but is financially active in utilizing payment services, and who uses a mobile phone.¹

Where feasible, sampling and survey of respondents followed the guidelines outlined in the project methodology. In some cases, country-specific

¹ An m-money service is characterized as having a third-party agent network to support financial transactions, but is not a traditional banking branch or Internet banking supported by mobile phones.

and logistical circumstances resulted in slight variations to the methodology, such as in the proportions sampled in each survey category. For example, in Nigeria and Sri Lanka, agent surveys were not carried out because the m-money service provider did not have an independent agent network. Any variances to survey approaches are reported in the country survey results detailed in the reports on each country.

Consolidation Methodology Report

Intelecon provided IFC with a “Consolidation Methodology Report,” which explained the methodology for consolidating results from the field visits and surveys across all four countries. To achieve a rigorous and consistent approach, a three-dimensional model was created that incorporated the parameters in the m-money ecosystem, generic business strategies, and the various markets where m-money could potentially be offered.

The various study reports and their associated delivery dates are shown in table A.2.

Table A.2 Study Report Timetable

Report	Date submitted
Survey Design Report (Inception report)	December 7, 2009
Desk Research Report	January 2, 2010
Field Study Summary Reports	
Nigeria	March 15, 2010
Sri Lanka	April 23, 2010
Brazil	April 28, 2010
Thailand	April 29, 2010
Consolidation Methodology Report	May 10, 2010
Draft Summary Report and Individual Country Reports	July 16, 2010
Draft revised with additional contents	February 17, 2011

Source: IFC Mobile Money Study 2011.

Appendix B

Demand Estimates

Table B.1 Brazil

Socioeconomic data	
Population (millions)	191.5 ^a
GDP per capita (US\$)	10,456 ^b
Gini index	55 ^c
Financial data	
Bank accounts (million)	125.7 ^d
Banking penetration (percent)	43.0 ^e
Number of POS devices (million)	3,180,000 ^f
POS devices (per million inhabitants)	16,606
Number of ATMs	170,240 ^g
ATMs (per million inhabitants)	889
Payment cards (million)	519 ^d
Payment cards (per million inhabitants)	2,711,227
Mobile data	
Mobile operators	4
Mobile penetration (percent)	70.2
Number of mobile subscribers (million)	134
Potential demand	
E-payments (per month)	Unknown
G2P (transactions per month)	16,666,667 ^h
Payroll, informal sector (transactions per month)	48,081,050 ⁱ

P2P (transactions per month)	Unknown
Public transport (trips per month)	1,421,900,000 ⁱ
Unbanked (persons)	Unknown
Utility payments (per month)	164,311,579 ^k

a. CIA 2010.

b. International Monetary Fund, World Economic Outlook Database, April 2010; http://www.imf.org/external/pubs/ft/weo/2010/01/weodata/weorept.aspx?sy=2009&ey=2009&scsm=1&ssd=1&sort=country&ds=.&br=1&pr1.x=42&pr1.y=8&c=223&s=NGDP_R,NGDP_RPCH,NGDP,NGDPD,NGDP_D,NGDPRPC,NGDPPC,NGDPDPC,PPPGDP,PPPPC,PPPSH,PPPEX,PCPI,PCPIP,CH,PCPIE,PCPIEPCH,LP,BCA,BCA_NGDPD&grp=0&a=#download.

c. United Nations Development Programme, Human Development Report Statistics 2009, <http://hdrstats.undp.org/en/indicators/161.html>.

d. Central Bank of Brazil 2009a, 2009b.

e. GSM Association, 2010, Brazil Mobile Money Status, <http://www.wirelessintelligence.com/mobile-money/>.

f. Central Bank of Brazil 2009b.

g. CIAB FEBRABAN 2009.

h. 200 million Caixa Econômica Federal annual payments (Bolsa Familia plus others).

i. Total labor force: 95,210,00; with 49.5 percent in formal sector; 48,081,050 informal workers; assumes monthly payment frequency.

j. 16.8 billion public transport (bus and rail) trips and 262.8 million taxi trips per year (180,000 taxis, assuming average 4 trips per taxi every day per year) (ANPT 2009).

k. 33,200,000 postpaid mobile subscribers (calculated from CIA 2010 and Anatel website); 41,497,000 fixed-line subscribers (ITU 2009); 46,867,105 households paying electricity bills (IEA 2008); 38,803,947 households having water connections (WHO-UNICEF JMP 2008), of which 34,147,473 pay bills (calculated from World Bank 2003); 8,600,000 pay TV subscription (Anatel).

Table B.2 Japan

Socioeconomic data	
Population (millions)	127 ^a
GDP per capita (US\$)	38,271 ^b
Gini index	24.9 ^c
Financial data	
Bank accounts (million)	127 ^d
Banking penetration (percent)	100.0 ^d
Number of POS devices (million)	2,362,000 ^e
POS devices (per million inhabitants)	9,742 ^f
Number of ATMs	136,510 ^f
ATMs (per million inhabitants)	1,070 ^f
Payment cards (million)	808 ^e
Payment cards (per million inhabitants)	6,357,199
Mobile data	
Mobile operators	4 ^g
Mobile penetration (percent)	90.3
Number of mobile subscribers (million)	114.7989 ^g
Potential demand	
E-payments (per month)	472,966,667 ^e
G2P (transactions per month)	3,840,000 ^h
Payroll, informal sector (transactions per month)	594,000 ⁱ
P2P (transactions per month)	Unknown
Public transport (trips per month)	2,273,326,417 ⁱ
Unbanked (persons)	0
Utility payments (per month)	80,365,315 ^k

a. CIA 2010.

b. International Monetary Fund, World Economic Outlook Database, April 2010; <http://www.imf.org/external/pubs/ft/weo/2010/01/weodata/weorept.aspx?sy=2008&ey=2015&scsm=1&ssd=1&sort=country&ds=.&br=1&pr1.x=91&pr1.y=9&c=158%2C111%2C664&s=NGDPDPC&grp=0&a=>.

c. United Nations Development Programme, Human Development Report, 2009, <http://hdrstats.undp.org/en/indicators/161.html>.

d. Assuming universal banking access.

e. Bank of Japan 2009.

f. Cirasino and Garcia 2008.

g. Telecommunications Carriers Association of Japan, 2010, <http://www.tca.or.jp/english/database/2010/08/index.html>.

h. Statistics Bureau of Japan 2010, "Social Security, Health Care and Public Hygiene."

i. National Statistics Centre of Japan, <http://www.e-stat.go.jp/SG1/estat/GL32020101.do?method=extendTclass&refTarget=toukeihyo&listFormat=hierarchy&statCode=00200531&tstatCode=&tclass1=&tclass2=&tclass3=&tclass4=&tclass5=>.

j. Total passengers carried per month was calculated as follows:

Railways: 22,976,100,000

Buses: 4,303,817,000

Number of months per year: 12

Number of passengers per month: 2,273,326,417

Source: Japan Ministry of Land, Transport, Infrastructure and Tourism 2010.

k. Utility payments consist of cable TV: 31,302,315; and electricity/water: 49,063,000 (Statistics Bureau of Japan 2010).

Table B.3 Kenya

Socioeconomic data	
Population (millions)	39 ^a
GDP per capita (US\$)	859 ^b
Gini index	47.7 ^c
Financial data	
Bank accounts (million)	7 ^d
Banking penetration (percent)	19 ^d
Number of POS devices	2,334 ^e
POS devices (per million inhabitants)	66 ^e
Number of ATMs	734 ^e
ATMs (per million inhabitants)	21 ^e
Payment cards (million)	1.60 ^f
Payment cards (per million inhabitants)	41,026
Mobile data	
Mobile operators	4 ^g
Mobile penetration (percent)	51.0
Number of mobile subscribers (million)	19.9 ^g
Potential demand	
E-payments (per month)	Unknown
G2P (transactions per month)	60,000 ^h
Payroll, informal sector (transactions per month)	11,610,000 ⁱ
P2P (transactions per month)	9,483,408 ^j
Public transport (trips per month)	2,450,000 ^k
Unbanked (persons)	6,114,900 ^l
Utility (payments per month)	1,075,038 ^m

a. CIA 2010.

b. International Monetary Fund, World Economic Outlook Database, April 2010; <http://www.imf.org/external/pubs/ft/weo/2010/01/weodata/weorept.aspx?sy=2008&ey=2015&scsm=1&ssd=1&sort=country&ds=.&br=1&pr1.x=91&pr1.y=9&c=158%2C111%2C664&s=NGDPDPC&grp=0&a=>.

c. United Nations Development Programme, Human Development Report, 2009, <http://hdrstats.undp.org/en/indicators/161.html>.

d. Alliance for Financial Inclusion 2010.

e. Cirasino and Garcia 2008.

f. Central Bank of Kenya, National Payment System Survey of 2008, <http://www.centralbank.go.ke/>.

g. Communications Commission of Kenya 2010.

h. Pickens, Porteous, and Rotman 2009.

i. Payroll data and sources:

Working force = 13,500,000 (*Business Daily* 2010)

Informal sector size = 86.0% (Pollin, Mwangi, and Heintz 2008)

Payroll (informal sector) = 11,610,000, assuming that the informal sector size remained the same as 1998–99 (Pollin and Heintz 2007).

j. Safaricom 2010.

k. A total of 7.5 million trips per day, of which 32.7 percent are on buses and taxis (*matatu*) (Irungu 2007).

l. Unbanked calculation:

Formally excluded: 32.7% (FinAccess 2009)

Excluded (formal and nonformal): 77.4%

Adult population: 18,700,000 (FinAccess 2009)

Formally excluded (number): 6,114,900

Excluded (formal and nonformal) (number): 14,473,800.

m. Utility payments include cable TV: 104,000 (Naspers 2010); and electricity: 971,038 (Parshall et al. 2009).

Table B.4 Nigeria

Socioeconomic data	
Population (millions)	149.2 ^a
GDP per capita (US\$)	1,142 ^b
Gini index	42.9 ^c
Financial data	
Bank accounts (million)	34.6 ^d
Banking penetration (percent)	21 ^e
Number of POS devices	12,000 ^f
POS devices (per million inhabitants)	80 ^g
Number of ATMs	8,138 ^d
ATMs (per million inhabitants)	55 ^h
Payment cards (million)	25 ^f
Payment cards (per million inhabitants)	166,774
Mobile data	
Mobile operators	5
Mobile penetration (percent)	51.2
Number of mobile subscribers (million)	76.4 ⁱ
Potential demand	
E-payments (per month)	Unknown
G2P (transactions per month)	40,000 ^j
Payroll, informal sector (transactions per month)	37,821,000 ^k
P2P (transactions per month)	46,252,000 ^l
Public transport (trips per month)	10,000,000 ^m
Unbanked (persons)	46,000,000 ⁿ
Utility (payments per month)	21,650,000 ^o

a. CIA 2010.

b. International Monetary Fund, World Economic Outlook Database, April 2010; <http://www.imf.org/external/pubs/ft/weo/2010/01/weodata/weorept.aspx?pr.x=24&pr.y=0&sy=2008&ey=2010&scsm=1&ssd=1&sort=country&ds=.&br=1&c=694&s=NGDPD%2CNGDPDPC&grp=0&a=>.

c. United Nations Development Programme, Human Development Report Statistics 2009, <http://hdrstats.undp.org/en/indicators/161.html>.

d. CBN 2009.

e. Isern et al. 2009.

f. InterSwitch 2009.

g. Calculation based on number of POS devices divided by population (million).

h. Calculation based on number of ATMs divided by population (million).

i. Nigerian Communications Commission, Subscriber Data, <http://www.ncc.gov.ng/subscriberdata.htm>.

j. Consists of Nigeria Delta Disarmament Program (20,000) and National Poverty Eradication Program and its Care of the People program (20,000).

k. Based on total working population of 54,030,000. National Bureau of Statistics, http://www.nigerianstat.gov.ng/nbsapps/annual_reports/CHAPTER%207.pdf; size of the informal sector: 70 percent (Akintoye 2008).

l. Thirty-one percent of adults have sent money within Nigeria (EFInA 2008).

m. Lagos Metropolitan Area Transport Authority, 2009.

n. EFInA 2008.

o. Utilities includes cable and electricity customers: cable: 762,000 (Naspers 2010); electricity: 20,888,000—14 percent of adults have electricity bill (EFInA 2008).

Table B.5 Sri Lanka

Socioeconomic data	
Population (millions)	21.3 ^a
GDP per capita (US\$)	2,041 ^b
Gini index	41.1 ^c
Financial data	
Bank accounts (million)	7 ^d
Banking penetration (percent)	59.0 ^e
Number of POS devices	24,977 ^f
POS devices (per million inhabitants)	1,173 ^g
Number of ATMs	1,876 ^f
ATMs (per million inhabitants)	88 ^h
Payment cards (million)	5.95 ⁱ
Payment cards (per million inhabitants)	279,343
Mobile data	
Mobile operators	5
Mobile penetration (percent)	69.0
Number of mobile subscribers (million)	14.1 ^j
Potential demand	
E-payments (per month)	1,521,750 ^k
G2P (transactions per month)	1,600,000 ^l
Payroll, informal sector (transactions per month)	4,708,418 ^m
P2P (transactions per month)	Unknown
Public transport (trips per month)	264,000,000 ⁿ
Unbanked (persons)	4,885,396 ^o
Utility (payments per month)	6,440,168 ^p

a. CIA 2010.

b. International Monetary Fund, World Economic Outlook Database, April 2010; <http://www.imf.org/external/pubs/ft/weo/2010/01/weodata/weorept.aspx?sy=2008&ey=2010&scsm=1&ssd=1&sort=country&ds=.&br=1&pr1.x=33&pr1.y=9&c=524&s=NGDPD%2CNGDPDPC&grp=0&a=>.

c. United Nations Development Programme, Human Development Report Statistics 2009, <http://hdrstats.undp.org/en/indicators/161.html>.

d. Central Bank of Sri Lanka 2010, appendix.

e. Honohan 2008.

f. Divide number of POS devices by population (million).

g. Central Bank of Sri Lanka 2010, chapter 8.

h. Divide number of ATMs by population (million).

f. Central Bank of Sri Lanka 2009.

i. Telecommunications Regulatory Commission of Sri Lanka, <http://www.trc.gov.lk/information/statistics.html>.

j. E-payments per year (18,261,000), divided by 12 months.

k. Central Bank of Sri Lanka 2008.

l. Samurdhi payments to households.

m. Informal sector = 61.9 percent (Sri Lanka Labor Force Survey).

n. Public transport data (de Silva 2010):

Public transport (per month) = 264,000,000

Bus trips (state-owned) per day = 2,000,000

Bus trips (state-owned) per month = 44,000,000

Bus trips (privately owned) per day = 10,000,000

Bus trips (privately owned) per month = 220,000,000

o. Unbanked data: Number of bank accounts = 7,030,204. Assuming 59% penetration, total number of potential accounts = 1,915,600. Unbanked = 4,885,396 (Central Bank of Sri Lanka). Calculation of total number of potential bank accounts (11,915,600), minus the number of actual bank accounts referenced above.

p. Utilities consists of

Postpaid subscribers: 2,000,000 (estimate that 16 percent of subscribers are postpaid; see LIRNEasia)

Satellite television (DTV): 160,000 (*Lanka Business Online* 2010)

Electricity: 4,280,168 (Ceylon Electricity Board).

Table B.6 Thailand

Socioeconomic data	
Population (millions)	66 ^a
GDP per capita (US\$)	3,940 ^b
Gini index	42.5 ^c
Financial data	
Bank accounts (million)	118 ^d
Banking penetration (percent)	80.2 ^e
Number of POS devices	259,567 ^d
POS devices (per million inhabitants)	3,933 ^f
Number of ATMs	34,745 ^d
ATMs (per million inhabitants)	526 ^g
Payment cards (million)	62 ^d
Payment cards (per million inhabitants)	934,848
Mobile data	
Mobile operators	5
Mobile penetration (percent)	74.1 ^h
Number of mobile subscribers (million)	68,590,362 ⁱ
Potential demand	
E-payments (per month)	35,000,000 ^j
G2P (transactions per month)	646,800 ^k
Payroll, informal sector (transactions per month)	20,988,000 ^l
P2P (transactions per month)	Unknown
Public transport (trips per month)	58,873,333 ^m
Unbanked (persons)	5,869,461 ⁿ
Utility (payments per month)	13,404,916 ^o

a. CIA 2010.

b. International Monetary Fund, World Economic Outlook Database, April 2010; <http://www.imf.org/external/pubs/ft/weo/2010/01/weodata/weorept.aspx?sy=2008&ey=2015&scsm=1&ssd=1&sort=country&ds=.&br=1&pr1.x=48&pr1.y=7&c=578&s=NGDPD%2CN GDPDPC&grp=0&a=>.

c. United Nations Development Programme, Human Development Report Statistics 2009, <http://hdrstats.undp.org/en/indicators/161.html>.

d. Bank of Thailand 2009a.

e. Bank of Thailand 2010.

f. Calculated by dividing population into POS (million).

g. Calculated by dividing population into ATMs (million).

h. AIS 2010.

i. Thailand National Telecommunications Commission 2010, Thailand ICT Info, report list, <http://www.ntc.or.th/TTID/>.

j. Bank of Thailand, http://www.bot.or.th/English/PaymentSystems/OversightOfEmoney/Documents/E-Money_data_eng.xls.

k. G2P data and sources:

% of population over 65 = 7 (Population Reference Bureau 2008, Data by Geography, Thailand; http://www.prb.org/Datafinder/Geography/Summary.aspx?region=161®ion_type=2)

% of population below the poverty line = 14 (OPHI 2010)

G2P payments (B500 program) = 646,800.

Calculated by taking percentage of population over 65, multiplied by percentage of population below the poverty line, multiplied by total population (OPHI 2010).

l. 58.3 percent of workforce is in the informal sector (UNDP 2010).

m. Public transport data:

Public transport (month) = 58,873,333

Bus = 585,160,000

Bus, public = 12,067,000

Train = 47,835,000

Underground = 61,418,000

Calculated by adding bus trips (private), bus trips (public), train, and underground, and dividing by 12 months (Thailand Ministry of Transport, <http://vigportal.mot.go.th/portal/site/PortalMOTEN/menuitem.fb4c866ede3f942d6a48be80506001ca/>).

n. Calculated from data from the National Statistical Office of Thailand.

o. Calculated from various sources: postpaid subscribers: 7,104,916 (Thailand National Telecommunications Commission, <http://www.ntc.or.th/TTID/>); cable and satellite TV: 6,300,000 (*The Nation* 2010).

Table B.7 United States

Socioeconomic data	
Population (millions)	307 ^a
GDP per capita (US\$)	47,701 ^b
Gini index	40.8 ^c
Financial data	
Bank accounts (million)	287
Banking penetration (percent)	93.3 ^d
Number of POS devices	5,183,000 ^e
POS devices (per million inhabitants)	17,277 ^e
Number of ATMs	395,000 ^e
ATMs (per million inhabitants)	1,317 ^e
Payment cards (million)	2,102 ^f
Payment cards (per million inhabitants)	6,842,448
Mobile data	
Mobile operators (national)	4 ^g
Mobile penetration (percent)	90.0
Number of mobile subscribers (million)	277.6 ^g
Potential demand	
E-payments (per month)	5,225,000,000 ^h
G2P (transactions per month)	4,530,451 ⁱ
Payroll, informal sector (transactions per month)	11,338,400 ^j
P2P (transactions per month)	38,000,000 ^k
Public transport (trips per month)	858,000,000 ^l
Unbanked (persons)	20,582,400 ^m
Utility (payments per month)	111,000,000 ⁿ

a. CIA 2010.

b. International Monetary Fund, World Economic Outlook Database, April 2010; <http://www.imf.org/external/pubs/ft/weo/2010/01/weodata/weorept.aspx?sy=2008&ey=2015&scsm=1&ssd=1&sort=country&ds=.&br=1&pr1.x=91&pr1.y=9&c=158%2C111%2C664&s=NGDPDPC&grp=0&a=>.

c. United Nations Development Programme, Human Development Report 2009, <http://hdrstats.undp.org/en/indicators/161.html>.

d. FDIC 2009.

e. Cirasino and Garcia 2008.

f. Federal Reserve Bank of Philadelphia, Consumer Statistics, 2009; <http://www.philadelphiafed.org/payment-cards-center/tools-for-researchers/consumer-statistics/>.

g. FCC 2010.

h. Calculated by dividing total number of e-payments, 62,700,000,000, by 12 months (Federal Reserve System 2007).

i. U.S. Department of Health and Human Services, Temporary Assistance for Needy Families, http://www.acf.hhs.gov/programs/ofa/data-reports/caseload/2010/2010_recipient_tanssp.htm.

j. Derived from U.S. Census Bureau 2007.

k. Shy 2010.

l. Calculated by taking total number of trips per weekday, 39 million, and multiplying by 22 working days in a month (Kietel 2009).

m. Assuming 93 percent bank penetration, 7 percent of the population is unbanked.

n. Utilities equals "Electricity accounts," which is the number of households in the United States, as penetration is nearly 100 percent (U.S. Department of Energy, Energy Information Administration, http://www.eia.doe.gov/emeu/rep/er01_us_tab1.html).

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