Mobile banking and mobile money adoption for financial inclusion

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ABSTRACT

As the developed economies are poised to transition many smart mobile phone users from the cash-based payment and other forms of digital payments such as the credit/debit card systems to smartphone payment, the emerging economies of Sub-Saharan Africa (SSA) are also finding ways to use their second and third generations (2G and 3G) mobile phones for financial activities (Bold & Rotman, 2012; Donovan, 2012, Ehrbeck et al, 2012; Holmes, 2011; Hughes & Lonie, 2007; Jack & Suri, 2011; The Economist, 2012). The success that Vodafone has achieved in managing the M-PESA Mobile Money, the leading mobile money in Kenya and East Africa is reported in this paper. While M-PESA has brought financial inclusion to millions of Unbanked in Kenya, West African countries such as Ghana and Nigeria lag behind with less than 10 percent adoption rate. This paper provides insight into the lack of mobile money adoption in West Africa through an information and communication technology (ICT) study in Nigeria, the largest country in West Africa. The study was geared towards investigating the use of mobile phones for mobile banking and mobile money services. The author investigated whether participants in the study perceived mobile phones as easy to use for various tasks including mobile banking and mobile money transfers and whether mobile money services were adopted. The findings were that while basic mobile phones were widely adopted and used mainly for communication with mostly family and friends, they were rarely used for servicing high order tasks like mobile banking or mobile money transfers.

Keywords – mobile payment, mobile money models, near-field communication, emerging markets, unbanked, mobile network operators, M-PESA

LITERATURE

The literature informs that basic mobile phones have been adopted in Sub-Saharan Africa (SSA) and that they could help to transform the region's emerging markets (Bishop et al, 1999; ADB, 2003; Business Week, 2007; Butler, 2005; Elijah & Ogunlade, 2006; Srivastava, 2008; Ssewanyana, 2007; Economist, 2012; Etim, 2011, 2012). The ubiquity of the mobile phone in the region can bring significant changes, sustainable growth as well as economic opportunities for the large unbanked population. One area of transformation that is being observed is that ICT as a whole is enabling service delivery in various sectors and human endeavors. A new area of service delivery is in the use of embedded apps and the Near Field Communication (NFC) technology in mobile phones' for financial service delivery. It has been reported that there is a positive relationship between mobile money adoption and financial inclusion (Bold et al, 2012; Jenkins, 2008, Porteous, 2006; Ehrbeck, 2012). According to Jenkins (2008:5) "It is mobile money's ability to facilitate financial inclusion that gives it its enormous potential for development impact…Financial sector inclusion is thus a critical prerequisite for effective market participation in its broadest sense – from being able to send a utility bill payment by mobile phone instead of losing half a day's work in line at the bank, to being able to integrate one's small business into the value chains of larger market players".

Two important sectors in SSA - banking and telecommunications – are developing innovative strategies and collaborative efforts for business management, services delivery, particularly financial services delivery. This effort is a positive move towards financial inclusion for the 80 percent of the region's unbanked population.

An important strategy is the collaboration by banks and mobile network operators (MNOs) to deliver mobile phone-based money transfer services (Ehrbeck, 2012; Jenkins, 2008). The Eastern African region, specifically Kenya is taking the lead. Even though West Africa is forging ahead for inclusion of its large unbanked population of up to 80 percent into the financial sector, the region is still very far behind the Eastern or South African region as well as the developed economies like the USA, Great Britain and Japan in mobile technology adoption and use. In the developed economies where smartphones have been adopted, mobile payment is evolving from credit and debit cards payments to the use of smartphones. Mobile transactions in the western world are predicted to reach $1 trillion by 2015, but despite such predictions, mobile payments may not dominate the western markets immediately (Computerworld, 2012). Newman (2012) reports that as more people in the USA adopt smartphones like Apple iPhone or the Android phones and as online shopping continues to increase, technology and payment companies will make smartphones replace paper money or plastic (credit/debit cards) forms of payment.

The technology behind this new trend in digital payment is the mobile apps and Near Field Communication (NFC). The NFC is a technology that allows short range communication using magnetic field induction of a RFID (Radio Frequency Identification) of the devices. In Switzerland and some other EU (European Union) economies, mobile payment using NFC has been tested since 2007 (Ondrus and Pigneur, 2007). In a 2009 study, Ondrus and Pigneur found that mobile industry experts were very enthusiastic about implementing NFC. In the USA, Apple and Android phone makers like Samsung are poised to lead (Beach, 2011). Mobile phone companies and wireless carriers are implementing NFC through collaborative effort and joint ventures. Companies and service providers like AT&T, T-Mobile and Verizon in the USA are working together on NFC projects and products. One of such products is the *Isis.* Sprint has

partnered with Google for the *Google Wallet* (Newman, 2012). Both Isis and Google Wallet use the same payment processes like Visa, MasterCard, Discover and American Express and as such, users make payments by waiving their phones at the point-of-sale (POS) terminals that currently support the credit and debit cards. These mobile collaborations (m-collaborations) will allow for ease of technology development, customer acquisition and profitability although there are some associated risks that are involved in being early to market (Kock, 2005).

Mobile Money Adoption in Sub-Saharan Africa

In Sub-Saharan Africa (SSA), smartphones are expensive to adopt but the second-generation (2G) and in some instances where mobile network operators (MNOs) make the services available, third generation (3G) mobile phones have been adopted (Bold & Rotman, 2012; Donovan, 2012; Etim, 2012). These basic phones are predominantly being used for communication. Writers like Jenkins (2008), Ehrbeck et al (2012) and Bold, et al (2012) have asserted that in SSA as a whole, one important use of mobile phones for other activities other than communication is for mobile money. These writers have based their argument on the success of *M-PESA*, the dominant mobile money in Kenya and East Africa. They have, however, forgotten to draw a parallel to mobile technology adoption as well as mobile money adoption in the West African region. There is therefore an important question that is yet to be address in the literature: Why has mobile money and mobile banking adoption rate very low in West Africa?

First, it is important to explain important terms, the models and key players in SSA. The phrase, *mobile money* in general is used to refer to financial activities that are conducted via the mobile phone or other mobile devices. Writers like Porteous (2006), Weber and Darbellay (2010) have subdivided mobile money into mobile banking (m-banking) and mobile payment (m-payment). The International Finance Corporation (IFC), a World Bank Group, defines mobile money as money that can be accessed and used via mobile phone (Jenkins, 2008).

There are two m-payment and m-banking models that are significant in SSA region, the additive and transformative models. The additive models allow bank account owners to use their mobile phones to access their existing bank accounts and associated services such as checking account balances, transfer funds between accounts or view check images. The transformative models, on the other hand, allow the *unbanked* to access financial products without existing bank accounts, mainly through their mobile phones based on services provided by MNOs, MFIs (microfinance institutions) and non-bank agencies (Weber and Darbellay, 2010; Porteous, 2006; Dias and McKee, 2010). In a culture where 80 percent of the population have no bank accounts and are unable to access banking services such as deposits and loans, the literature have coined the term, *unbanked* for this population. Therefore, SSA has one of the largest unbanked populations in the world (Weber and Darbellay, 2010). It is now an established fact that mobile phone owners have actually exceeded the number of people who own bank accounts in the region (Etim, 2013; Weber and Darbellay, 2010; Porteous, 2006; Dias and McKee, 2010). This implies that the transformative models, if implemented well, hold potential for the unbanked.

Mobile money is very fragmented SSA region. Some of the schemes that were developed have already disappeared and some of the new ones are yet to take roots (Holmes, 2011). There are many actors as well as roles in the arena and the larger ones such as M-PESA tend to do well while smaller ones struggle. On the supply side, it is not uncommon to see partnerships between banks and mobile network providers (MNOs). The MNOs in particular have ceased the

opportunity of providing financial services to the 80 percent unbanked and it is now possible for people to make payments with their basic (2G or 3G) mobile phones. This is what holds the key to the transformative models' implementation in SSA. According to a Washington D.C's CGAP (Dias and McKee, 2010) and Jenkins (2012), mobile subscribers in Kenya and South African markets who do not have bank accounts are now using mobile money for transactions including bill payment, payroll deposits, international remittances, loan receipts and payments, airtime purchases, groceries, bus tickets and a whole range of other financial services. Table 1 provides a summary of some of the key participants and their roles in mobile money.

Table 1: Key Participants, Capabilities and Roles in Mobile Money

Participant	Access, Capabilities and Roles
MNOs	- Provide mobile network infrastructure - Aggressively build large customer bases by marketing to low-income groups products such as airtime and pay-as-you-go mobile phone services - Generate revenue mostly through mobile payments, send/receive monies transaction fees, interest earned on floats, commission on B2B transactions and opening new accounts for partner banks
Banks	- Banking infrastructure and licenses - Facilitate the clearing of funds and foreign exchanges - Access to Central Bank's resources and monitoring - Compliance with many financial regulatory practices - Back MNOs with funds/line of credits as well as partner with them to recruit new customers
MFIs (Microfinance Institutions)	- Provide easier access to different types of microloans for low-income groups though often at high rate of interest - Direct impact on small business development entrepreneurship
Government Policy Makers and Regulators	- Ability to make policies that directly impact other participants - Ability to impose regulations and provide monitoring
End Users	- Having their financial needs met particularly where access to bank products is either denied or unavailable - Reduced the risk of traveling without carrying cash - Convenience of making payment for goods and services - Ease of sending and receiving money, remittances and handling other financial transactions

The Case of M-PESA

The M-PESA mobile payment service was formed in March 2007 by Safaricom and its parent organization, Vodafone in Kenya. MPESA is coined from the Swahili word, "Pesa", meaning cash; and "M" stands for mobile. According to Jenkins (2008), M-PESA gained 2.37 million subscribers in about a year. In a 2008 survey of households in Kenya, about 43 percent indicated using M-PESA and when the study was repeated in 2009, nearly 70 percent of

households were M-PESA users (Jack and Suri, 2011). In July 2012, Safaricom's M-PESA had over 185 billion KSH (Kenya Shillings, about 2.15 billion US dollars) and controls 68 percent of the Kenya's mobile money market (Wakoba, 2012). In 2010, Safaricom boasted of more than 12 million M-PESA customers and 16,000 agents (Dias and McKee, 2010). The Vodafone executive, Nick Hughes who started M-PESA reports it began as a project in 2003 (*Innovations*,2007). The core business strategy for M-PESA was to have senior level management put focus to grow M-PESA to become a global model of mobile payment.

What is M-PESA's product concept that makes it so successful? M-PESA customers use the mobile phones to move money quickly and in a secure manner across long distances to other mobile users. M-PESA is a transformative model in the sense that it is not required for customers to have bank accounts before they could move money. Customers turn their cash into electronic money (e-money) at Safaricom and Vodafone participating dealers or agents. They are provided with instructions on their phones to make payments through their M-PESA accounts. It is a secure money transfer with PIN number protection and 24/7 service support by the Safaricom and Vodafone group (Hughes and Lonie, 2007).

Safaricom and Vodafone are MNOs and not banks; they must assure the Central Bank of Kenya about their non-bank identity in order to continue to receive exemptions from the detail regulatory practices that banks face. Safaricom has been at pains to stress this position to the Central Bank of Kenya, however, the ubiquity of mobile phones have allowed the unbanked to access financial services through M-PESA as if it were a bank, making it qualify as playing the role of "branchless banking" (Jack and Suri, 2011; Martinez and Mckay, 2011). In addition to the contradictory regulatory requirements that they have had to deal with, Hughes and Lonie (2007) explains that Vodafone had to "marry" the divergent cultures of global telecommunications companies, banks and microfinance institutions in order to effectively manage mobile money services to the unbanked.

As a mobile payment giant that has dominated 68 percent of the market share, M-PESA is a threat to new entrants like *Tangaza* and *Mobikash* (mobile money services that are also operating in Kenya). The M-PESA dominance could have played a role in the recent World Bank call for interoperability among MNOs (Wakoba, 2012). If such requests are implemented, smaller MNOs will also have a chance of operating across networks to expand sales and customer base; for now, M-PESA dominates mobile payment services.

The Study Methodology

Survey

The study was conducted at a large university in South Eastern Nigeria. Any student in the University was qualified to participate in the survey; it was a self- selected sample. The recruitment tools that were used were flyers, posters and word of mouth. The posters were strategically located in the different buildings at the two campuses of the university in order to attract a representative sample. Information sharing by word of mouth was also helpful in recruiting students for the study. The categories of the questionnaire items included the following:
- General profile, ICT adoption, access and affordability
- Ease of ICT use for important tasks - communication, mobile banking, mobile money, e-learning and training needs

- Infrastructure and ISP services

At the end of the administration of the paper and pencil questionnaires, which took several days, a total of 320 questionnaires were collected, and 300 of them were usable.

Focus Groups

Two focus group interviews were conducted in order to support the survey technique and to better inform various aspects of the primary study:
- The perceptions about the use of mobile phones for various tasks – communication, mobile banking, mobile money, e-learning and social networks
- The perceptions about the use of mobile phones to increase income or to alleviate extreme economic and information poverty.
- The perceptions about mobile phones as a technology innovation that is diffusing successfully or unsuccessfully into the population.

Group One consisted of eight participants in the study (ten were invited and eight showed up) who indicated in the initial survey extreme likelihood that mobile phones were helping to alleviate extreme and information poverty. This group also included respondents who indicated that mobile phone innovation was a technology that was widely accepted and extremely easy to use. Group Two on the other hand consisted of five respondents (ten were invited and five showed up) who indicated in the initial survey that mobile phones were not helping in alleviating both information and extreme poverty and as such had a very low or non-acceptance within the population. Some items in the questionnaire instrument were re-asked as open-ended questions during the focus group interview sessions in order to gain insight into the opinion of the groups and to solicit further responses or additional detail on those questions. The focus group interview sessions were audio taped (with the University IRB approval).

Observations

From the moment the author arrived at Lagos, the commercial capital of Nigeria, she took interest in observing the different types of mobile technologies that people were using for different tasks. There was much to see and observe during the field research, particularly the daily interactions with the students. It helped the author to understand first hand, the mobile technology market and the ICT services in the area. The Finnish company, Nokia dominates the Nigerian mobile phone market. The distributors displayed many Nokia brands and they range from basic phones of about 3,500 naira (about $20) in Lagos but sold for about 5,500 naira (about $35) in smaller towns to flip phones as well as touch screen phones with price tags well over 15,000 naira ($100 or more). The good news is that Nokia and a few other manufacturers have adapted the mobile phone to a wide range of consumers at prices that many of them could afford to purchase after about a year's worth of savings; some purchase second hand or used mobile phones.

The services on the other hand are very expensive and of poor quality. The author bought a Nokia N79 mobile phone for 5,000 naira (about $34) and it had most of the features of a basic 2G (second generation) mobile phone. Since it was a GSM (Global Systems for Mobile) phone, it had a slot for a SIM card beneath the battery. One of the interesting or customized features for

mobile phones in that market is a touch light that glows beautifully in the dark. A person can depend a lot on the touch light feature to move around or finish whatever he or she was doing when the federal government entity, the National Electric Power Authority (NEPA) interrupted power supply every evening at about 8:00 PM the local time because the electricity is rationed to ensure that each area had a few hours of electric supply daily.

Data Analysis and Findings

Out of the 300 survey participants, 144 were female (48.0 percent), 153 (51.0 percent) were male and three participants did not indicate their gender. Tables 2 - 4 show the age, levels of education and fields of study of the participants.

Table 2: Age Range of Survey Participants

Age range					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 25 years	229	76.3	76.6	76.6
	25-30 years	44	14.7	14.7	91.3
	31-35 years	7	2.3	2.3	93.6
	36-40 years	11	3.7	3.7	97.3
	41 and above	8	2.7	2.7	100.0
	Total	299	99.7	100.0	
Missing		1	.3		
Total		300	100.0		

Table 3: Level of Education of Survey Participants

Level of education					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Undergraduate	271	90.3	92.2	92.2
	Post Graduate Diploma	2	.7	.7	92.9
	Masters Degree	14	4.7	4.8	97.6
	Post Masters	6	2.0	2.0	99.7
	Professional (DVM, LLB, MBBS)	1	.3	.3	100.0
	Total	294	98.0	100.0	
Missing		6	2.0		
Total		300	100.0		

Table 1: Fields of Study of Survey Participants

Field of study		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Math and Science	92	30.7	32.2	32.2
	Arts and Social Sciences	41	13.7	14.3	46.5
	Education	23	7.7	8.0	54.5
	Law	42	14.0	14.7	69.2
	Medicine and Health-Related	88	29.3	30.8	100.0
	Total	286	95.3	100.0	
Missing		14	4.7		
Total		300	100.0		

Figure 1 shows the distribution of ICT adoption by the study participants. About 67 percent used prepaid SIM cards with their mobile phones and 29 percent indicated that in addition to their use of mobile phones/ prepaid SIM cards, they also use public paid phones. Figure 1also shows that fixed telephone line contract was the least adopted telephonic services.

Figure 1: Distribution of Telephone Services Adoption by Study Participants

Distribution of telephone services adopted by study participants - service contracts, prepaid SIM cards with mobile phones, public paid phones, and fixed land lines
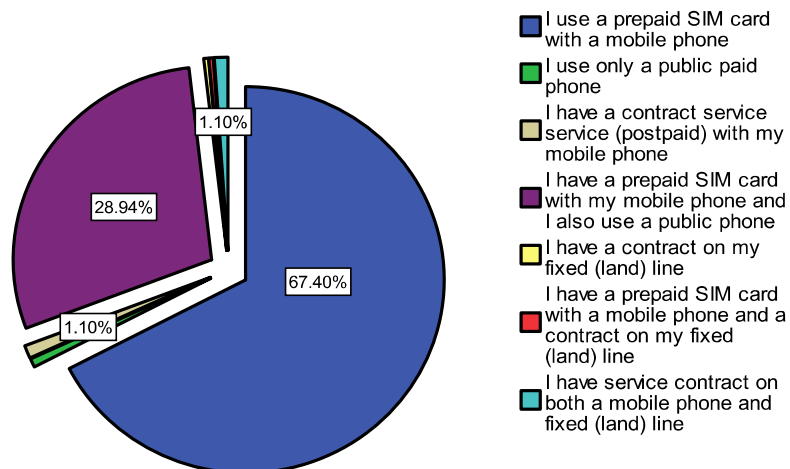
The overall assessment of the use of the adopted ICT tools, specifically mobile phones was measured with variables such as perceived ease of use, perceived usefulness, facilitating conditions (such as service quality) and personal factors that influence attitude towards use. The personal factors that were considered for this study were technology orientation and advanced knowledge in the use of technology tools. The frequency counts and percentages are presented followed by further detailed analysis. Pearson Product Correlation was used for further analysis to show significant relationships but not causality.

Perceived ease of use (PEU) was measured using items such as ease of use of mobile phones for different tasks including voice communication, mobile banking, accessing online information for class assignment, and surfing the Web or accessing e-mail. Table 5 shows that 77.7 percent of study participants found mobile phones as extremely easy to use for voice communication.

**Table 5: Mobile Phone is Easy to Use for Voice Communication**

Mobile phone is easy to use for communication					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Extremely difficult	5	1.7	1.7	1.7
	Quite difficult	3	1.0	1.0	2.7
	Neither easy or difficult	6	2.0	2.1	4.8
	Quite easy	51	17.0	17.5	22.3
	Extremely easy	227	75.7	77.7	100.0
	Total	292	97.3	100.0	
Missing		8	2.7		
Total		300	100.0		

When participants were asked about their perceived ease of using mobile phone for other tasks, the results were different. Table 6 shows the ease of use of a mobile phone for class assignments; 33 percent said it was extremely difficult, 13.5 percent indicated that it was quite difficult. The total percentage of those who indicated some level of difficulty in using mobile phone for class related work therefore stood at 46.5 percent. The percentage of those who indicated that it was extremely easy to use mobile phones for class assignments was 27.7 percent. Figure 2 shows the distribution for ease of use of mobile phones for banking services and money transfer services. What many in the region refer to as e-banking but it is actually called mobile banking or m-banking for short.

Table 6: Ease of Mobile Phone Use for Class Assignments

Mobile phone is easy to use for class assignments

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Extremely difficult	93	31.0	33.0	33.0
	Quite difficult	38	12.7	13.5	46.5
	Neither easy or difficult	21	7.0	7.4	53.9
	Quite easy	52	17.3	18.4	72.3
	Extremely easy	78	26.0	27.7	100.0
	Total	282	94.0	100.0	
Missing		18	6.0		
Total		300	100.0		

Figure 2: Perception that the use of Mobile Phone has helped Access to Mobile or Electronic Banking and Money Transfers
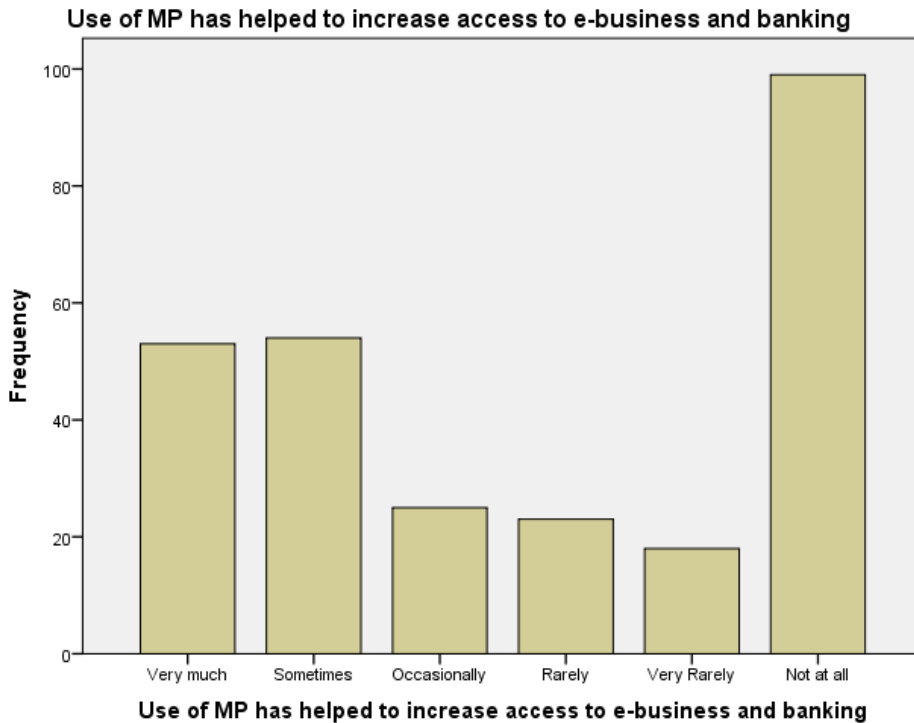
Discussion and Conclusion

The governments of SSA like many of their counterparts in other global regions have enacted information and communication technology (ICT) policies and are implementing them. Nigeria has had its ICT policies since the early 2000s. Special provisions are made in the policy

manual about using ICT to enable all sectors, including the financial sector in order to grow the economy, improve lives and reduce poverty as well as strengthen global competition. Although there is still so much work to be done policy wise, mobile financial transactions has begun but it is slow. Study participants during the focus group interviews shared that the m-banking and mobile money services were very new and not relevant to them yet. The lack of relevance to them is because it is associated with banks and they had no bank accounts. A few of the students also blamed the low acceptance rate on the fees that banks require people to pay to use their e-banking services. Based on the focused group study, the aspect of mobile money services that has picked up in the region is Western Union or Money Gram and that most people only use the service to receive monies sent by family members from abroad or large cities like Lagos or Abuja. They also indicated that transferring phone credits to others were common; it allows parents, for example to pass along phone credits to their students who are at the University without having to meet them face-to-face. The government has begun to use electronic methods for paying salaries or collecting revenues and this can promote greater financial inclusion as many people will be able to hold bank accounts. In a neighboring country like Ghana, the government launched its mobile payment system, *e-zwich* since 2008.   The e-zwich card is an RFID (radio frequency ID card with an electronic chip designed for use both online and offline because it has biometric and wireless features. It holds prospects for Ghana as its citizenry steadily progresses into middle income status (Ghana Broadcasting, 2008).

During the AITEC Banking and Mobile Money Conference in Accra, West Africa, May 28 – 29, 2012, which the writer of this paper attended during the time of the study, scholars and practitioners in the banking and telecommunication industries discussed Ghana mobile money future. What stood out was that the Central Bank of Ghana is providing policies that are enabling banks to conduct m-banking. The MNOs, MFIs and other non-banks, recognizing the regulatory controls that could prevent them from operating like Safaricom (M-PESA) are beginning to forge alliances with banks to deliver financial services that could bring about financial inclusion for the unbanked of Ghana. It is yet to be seen whether countries like Nigeria and others in the West African region will follow suit with mobile money adoption. One of the 2012 pilots in Ghana was that of a large MNO, Airtel. This giant in West Africa is collaborating with Ecobank, one of the largest commercial banks in Ghana to provide mobile money to the unbanked that are subscribers of Airtel services. Airtel is marketing lower rates airtime and other incentives that will attract its customers to open new bank accounts with Ecobank through a mobile App interface on customers' mobile phones. Registered customers with Airtel and Ecobank can use their mobile phones to pay for airtime, check bank balances, handle remittances, transfer funds, etc.

There is a great need for a more sustainable solution for financial inclusion for the 80 percent SSA unbanked. The World Bank (Donovan, 2012) has made a deposition about Nigeria and other SSA countries that regulations are emerging to help structure mobile money in the region. The effort is to prevent a single provider like Western Union or Vodafone from dominating the market or controlling pricing. Innovative home grown solutions will help bring many onboard to adopt and use mobile money in the SSA region.

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