

Can Mobile Phones Really Work to Extend Banking Services to the Unbanked? Empirical Lessons from Selected Sub-Saharan Africa Countries

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Poor, vulnerable and low-income households in Sub-Saharan Africa (SSA) countries often lack access to bank accounts and face high costs for conducting basic financial transactions. The rapid growth of mobile phones usage with E-banking can bridge the economic transformation and increase the bancarisation rate. This paper aims to discuss how mobile phones can be used to extend banking services to the unbanked, poor and vulnerable population. Regression analysis was applied to identify the effects of mobile phones on bancarisation rate and, on poor and vulnerable populations. Mobile phone is statistically significant at 1 per cent level, showing that the level of the mobile phone utilization in an economy at any given time impact the bancarisation rate. The coefficient of the explanatory variable shows that increasing in mobile phone result to about 46.8 per cent increasing in the bancarisation rate. Mobile phone is a specific electronic financial channel using in the 30 selected SSA countries to bank the unbanked. The mobile phone presents a great opportunity for the provision of financial services to the unbanked. In addition to technological and economic innovation, policy and regulatory innovation is needed to make these services a reality.

Keyword: bancarisation rate, contestable market, e-banking, mobile phone, unbanked

Introduction

Ask the average European to list the inventions that have had optimum impact on human life over the past century, and they'll probably mention electricity, cars, planes and computers. Share this with the average African and you'll get a pitying smile because the average African may have none of these things. Ask the average inhabitant of Sub-Saharan Africa (SSA) countries to name the recent innovations that have rocked their world and they might mention mosquito nets, bicycles or the sinking of a well. One thing they'll definitely mention, however, will be the arrival of the mobile phone, which some would say has had almost as much impact as the wheel.

Access to mobile phone technology has revolutionized just about every aspect of SSA life. Revolutions in information and communication technologies (ICTs), the emergence of innovation and knowledge societies, the eradication of poverty, vulnerability and inequality, among others, have been identified in 2010 as major challenges of the 21st century. Electronic banking (E-banking) enables customers to do their banking 24 hours a day, 7 days a week. E-banking customers are able to check their account balances, pay bills, apply for a loan, trade securities, and conduct other financial transactions.

E-banking can be divided into five major categories: (i) Internet banking, (ii) Telephone banking, (iii) TV-based banking, (iv) Mobile phone banking, and (v) or personal computer (PC) banking. Technological innovations in recent decades have made the move towards E-banking possible. The increasing competition for customers in the banking sector, the need to decrease cost of providing banking services and the need to bank those who do not access to bank accounts, known as "unbanked", have led banks to integrate these changes. Poverty and vulnerability are still massive and deeply rooted, and processes that lead to financial exclusion and marginalization of large segments in the African societies are still ongoing. In SSA countries a huge proportion of poor and vulnerable population make up a large chunk of unbanked. These populations have access to mobile phone in urban and rural areas. Since ICTs play one of the most crucial roles in social, economic and political development of the continent, their role in marching poor households out of poverty is crucial.

In this regard, certain questions arise. For instance, do mobile phones play an important role in the process of unbanking the poor and the vulnerable in SSA countries at the turn of the Millennium? Poor, vulnerable and low-income households in SSA countries often lack access to bank accounts and face high costs for conducting basic financial transactions through check cashers and other alternative financial

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service providers (Barr, 2004). Unbanking is a marketing term created by various credit unions and banks for use in ads, brochures and other creative materials. Some authors use “unbanking” as a conceptual platform and wrap all their brand messages around it, while others use it to make a singular, standalone statement, perhaps just in a tagline. Unbanking is not necessarily the opposite of banking. It’s a philosophical rejection of those (frustrating) things that often plague consumers’ banking experiences. In this day and age, when bankers are reviled more than big tobacco lawyers, it’s easy to understand why a financial institution would want to distance itself from the nasty taint of big banks. Many banks and credit unions looking to keep Wall Street at arm’s length simply go negative and bash the snot out of competitors. Unbanking creates this same kind of separation and engenders the exact same sentiment in a much more engaging, evocative and positive way. Unbanking lets a financial institution say “We’re not like big banks” without having to dwell purely on banking’s ugliness.

This research is founded on the contestable market theory (Baumol et al., 1982). This theory is associated primarily with its 1982 proponent Baumol (1982), and holds that there exist markets served by a small number of firms, but which are nevertheless characterized by competitive equilibriums. Its fundamental features are low barriers to entry and exit. In theory, a perfectly contestable market would have no barriers to entry or exit (“frictionless reversible entry” in William Brock’s terms). Contestable markets are characterized by hit and run competition. If a firm in a contestable market raises its prices much beyond the average price level of the market, and thus begins to earn excess profits, potential rivals will enter the market, hoping to exploit the price level for easy profit. When the original incumbent firm(s) responds by returning prices to levels consistent with normal profits, the new firms will exit. Because of this, even a single-firm market can show highly competitive behavior. The applicability of the theory to real world situations may be questioned, however, particularly as there are very few markets which are completely free of sunk costs and entry and exit barriers (Brock, 1983). Low-cost airlines, low-cost airtimes and low-cost m-banking financial services, among others, remain a commonly-referenced example of a contestable market. Entrants have the possibility of leasing for example aircraft and should be able to respond to high profits by quickly entering and exiting. The theory of contestable markets has been used to argue for weaker application of antitrust laws, as simply observing a monopoly market may not prove that a firm is exploiting its market power to control the price level. Baumol (1982) himself argued based on the theory for both deregulation in certain

industries and for more regulation in others. The recent growth in the Sub-Sahara African telecom market, considered as a contestable market, has not only benefited local economies, but has also generated significant amounts of revenue for mobile giants (Vodafone, Orange, and MTN). Going after the Sub-Sahara African market is not a money-losing proposition for firms. MTN Group is a South Africa-based multinational mobile telecommunications company, operating in many African and Middle Eastern countries. The South African mobile phone operator with networks in Nigeria, Cameroon, Côte-d’Ivoire, Uganda, Rwanda, Swaziland, among others, had an operating margin of around 50 per cent outside South Africa (Rhett, 2005). The investment in mobile phone, its infrastructure and derived services provide significant benefits to the economy of SSA countries.

It is important for developing countries to have such technology and benefit from it in order to further their economic growth. MTN which has almost launched the mobile phone financial services in South Africa in 2005 has also launched of a banking service on mobile phones in many SSA countries. The service is being launched where access to traditional banks is very poor. But it wasn’t a full bank account with the mobile phone at the primary access. It was very focused on key basic financial services, such as money transfer in many microfinance institutions (MFIs). MTN has planned to offer a fully-fledged bank account on mobile phones called “MTN Mobile Money” which allows users to pay for purchases or check balances. A credit card will be optional. The service is a convenient, secure and affordable way for MTN subscribers to send money, buy airtime and pay bills (for example water or energy bills) using their “cell” phone. Both British mobile phone giant Vodafone and France’s Orange are also active in the market in SSA countries. Mobile banking has come in handy in many parts of the world with little or no infrastructure development, especially in remote and rural areas. This part of the mobile commerce is also very popular in poor countries where most of their population is unbanked. In most of these places banks can only be found in big cities. Rich and poor customers have to travel hundreds of miles to the nearest bank agency. In SSA countries like Sudan, Ghana and South Africa have first received this new commerce very well. Kenya’s Safaricom, part of the Vodafone Group, has had the very popular M-PESA Service- mainly used to transfer limited amounts of money, but has been increasingly used to pay utility bills. Zain in 2009 launched their own mobile money transfer business known as ZAP in Kenya and other African countries (Mwangi & Njuguna 2009).

According to the Encyclopedia Wikipedia, in Latin America countries like Uruguay, Paraguay, Argentina, Brazil, Venezuela, Colombia, Guatemala and recently

Mexico started with a huge success. Mexico released the mobile commerce with Omnilife, Bancomer and a private company (MPower Ventures). In Colombia was released with redesign. Guatemala has the support of Banco industrial. In Iran banks like Parsian, Tejarat, Mellat, Saderat, Sepah, Edbi and bank melli offer this service. Telenor Pakistan has also launched Mobile banking solution, in coordination with Taameer Bank, under the label “Easy Paisa” (Mobile Banking, 2012).

The mobile communications market is changing dramatically and the next generation of customers will require more than vocal services. The technological and commercial convergence of mobile networks and Internet puts the telecom operators in this century in front of new challenges and enormous opportunities. Thus, in spite of the growth of user’s number and the growing traffic on mobile networks, the rise of competition led to a strong fall in prices and margins. Differentiating products will be realized less on vocal communications than data exchanges. The traditional income of telecom operators -initially based on relatively constant subscription fees- will yield more place to economic models based on mobile Internet.

Many more poor and vulnerable people possess mobile phones than bank accounts across SSA countries. Is it possible in the 21st century to bank all the poor and the vulnerable? Facilitate access to bank for the poor and vulnerable calls for the transformation of financial services. Are information and communication technologies (ICTs), especially mobile phones, used to increase the bancarisation rate in SSA countries? Better access to financial services is critical for low-income and vulnerable persons in SSA. Mobile banking services are already offered as an addition to existing bank accounts. Instead of adding a mobile phone as a complementary channel to a bank account, why not add a bank account to an existing mobile phone number? This would narrow the access gap to financial services considerably, allowing mobiles to be used to provide services to those, individuals and households, without bank accounts. Is there any effect of mobile phone on unbanking in SSA? This paper aims to discuss how mobile phones may be used to extend banking services to the unbanked poor and vulnerable population.

Literature Review

At the beginning of the 21st century, African as a whole lags behind others in the use of modern information technology in domestic as well as international trade activities. Telecommunications services are inadequate, inefficient and very expensive. Africa has the slowest and the lowest internet diffusion in the world. Many mechanisms have been put in place

in Africa to insure the evolution of ICTs. The Regional African Satellite Communications Organization (RASCOM), created in the early 1990s by African telecommunications ministers, has as its main objective to extend affordable telecommunications services to the entire population of Africa, by setting up telecommunications infrastructure based on satellite technology. It also aims to establish direct links between African countries. The African Information Society Initiative, launched by the Economic Commission for Africa (ECA) in 1995, was designed to bridge the digital divide between Africa and the rest of the world. It intended to provide a guiding framework for African countries in modernizing and interconnecting their information and communication infrastructure and services (ECA, 2004a). The Pan-African Telecommunications Network (PANAFTEL) was aimed at setting up a continent-wide telecommunications network directly linking neighboring countries. The project proved unsuccessful, however, due to political diversity, concentration on international links instead of national networks, cultural differences, and financial constraints. The African Telecommunications Union, established in 1999, seeks to foster the rapid development of information and communication technology in Africa to improve service, access, and interconnections between African countries. It has a wide range of objectives covering such issues as joint capacity building, regional policy convergence, financing of joint projects, exchange of information and standardization of tariffs and technology. The New Partnership for Africa’s Development (NEPAD) which was formed in 2001 is a holistic, and integrated sustainable development initiative for the economic and social revival of Africa. The primary objective of the initiative is to eradicate poverty in Africa and to place African countries both individually and collectively on a path of sustainable growth and development (Ntangsi, 2003) in order to halt the marginalization of Africa in the global economy. One of its key concerns is enhancing new technology infrastructures and trade between African countries.

Clarke (2001) has analyzed how Internet connectivity affects export performance. Developing countries export more to developed, but not other developing countries, when Internet penetration is higher. Although this could be because Internet penetration stimulates exports, it could also be because trade openness encourages Internet use. To test the direction of causation, Clarke and Wallsten (2006) allow Internet use to be determined endogenously using countries regulation of data services as an instrument. The results suggest that access to the Internet does improve export performance in developing countries. Internet connectivity has dramatically lowered communication costs. Many

observers have suggested that it is one of the primary reasons for the increase in globalization. Friedman (1999) writes: “The new information technologies are able to weave the world together even tighter. These technologies mean that developing countries don’t just have to trade their raw materials to the West and get finished products in return: these countries can become big-time producers as well. These technologies also allow companies to locate different parts of their production, research and marketing in different countries, but still tie them together through computers and teleconferencing as though they were in one place.”

Although the Internet connectivity might affect enterprises, like those in the banking sector, that produce goods and services that can be delivered electronically most significantly, it might also affect enterprises that produce other goods. However, there is a wide variation in the use of ICT across Africa according to ITU (2006).

The figures showed in Table 1 presents the situation of mobile telephone and internet connectivity by Regional Economic Community in Africa in 2004. Communications in SSA countries depends largely on outside operators. In ECOWAS, only 2.8 per cent of transit traffic relies on routing facilities within the sub region, while the rest uses Canadian, European, and US operators. Transit traffic represents 29 per cent of total traffic and 41 per cent of direct traffic. There are some encouraging signs in the ICT sector. For example, fixed line telephone connectivity has increased in most regional economic communities as policies on foreign investment have been liberalized (ECA, 2004b).

The use of mobile phone services has also increased with the greater openness of markets and cross-border investment in service provision. Egypt and South African telephone companies have been active in establishing mobile phone companies in other Sub-Saharan African countries. Internet connectivity is also increasing rapidly in SSA.

Table 1. Mobile phones and internet connectivity by regional economic community.

| Regional economic community | Estimated population (10 ³) | Mobile phones subscribers per 10 ² people | Internet users per 10 ⁴ people |
|-----------------------------|---|--|---|
| CEMAC | 31,705 | 5.2 | 21.8 |
| CEN-SAD | 339,092 | 2.5 | 57.5 |
| CEPGL | 67,331 | 0.5 | 0.9 |
| COMESA | 436,824 | 5.8 | 35.0 |
| EAC | 88,722 | 1.5 | 23.7 |
| ECCAS | 99,186 | 3.6 | 7.6 |
| ECOWAS | 226,888 | 2.0 | 27.2 |
| IGAD | 166,835 | 0.8 | 12.5 |
| IOC | 18,603 | 15.6 | 115.5 |
| MRU | 15,620 | 0.5 | 14.1 |
| SACU | 51,249 | 11.3 | 490.5 |
| SADC | 284,115 | 10.1 | 147.1 |
| UEMOA | 71,635 | 1.9 | 57.2 |
| UMA | 77,900 | 5.2 | 129.3 |
| Total | 1,810,959 | | 63.6 |

Source: Author calculations from ITU (2006).

The vitality of technology utilization by banks in establishing competitiveness in urban and rural areas is unarguable. According to Masocha, Chiliya, and Zindiye (2011) the arrival of the Internet technology on the commercial panorama has generally changed the nature of contemporary banking. Indisputably, the trend is towards more of financial transactions migrating to online electronic systems using highly sophisticated computer machines. The world of information has created a new customer on the marketing podium whose traits make it somewhat difficult to serve. This same consumer has been exposed ceaselessly to empowering technological advancements. Is the presence of the Internet and mobile digital connectivity has eliminated the banking boundaries for clients? Banking customers are now global tyrants. They represent and possess the power of international connectivity. Other than acquiring banking services from banks in the urban and rural milieus in their countries of origin they are able to foster business with other banks in other countries.

In SSA large portions of the populations are still unbanked though there is great variation among the countries. In South Africa, the banked-unbanked represent respectively 51-49 per cent (Bångens & Söderberg, 2008).

In Tanzania, only 9 per cent have access to formal banks and 89 per cent either have no access or rely on informal financial services whereas in Kenya the number of banked people is higher (19 per cent) and only 38 per cent are unbanked. Botswana and Namibia show similar profiles as South Africa while countries like Uganda and Zambia portray similarity to Tanzania. Note that the level of development (GDP per capita in USD) is equally skewed between the two “camps”: South Africa (4960), Namibia (2990), Botswana (5180) and the least developing countries (LDCs); Kenya (530), Tanzania (340), Uganda (280), Zambia (490) (WDI, 2005/2009). The habit of using someone else’s bank account means that access is actually higher for certain segments of the unbanked. This is more common within families with few members having formal employment. Indeed in many SSA countries, banking costs are perceived as high, and the majority of the population is excluded from formal employment.

Drawing from Finscope data, the marked difference is employment security as formal employment is the strongest correlation to accessing and using formal banks. Most unbanked have consequently no formal earnings, rely on farm income, survive or live on ‘welfare’ from friends, relatives and family. Moreover, irregular income, earning too little or earning too little to save are also reasons for not having a bank account (Bångens & Söderberg, 2008) in more SSA countries. Who are

the unbanked? According to Caskey (2002) several surveys have examined the socioeconomic characteristics of the approximately ten million households that do not have bank accounts. The surveys find that the unbanked are disproportionately represented among lower-income households, among households headed by African-Americans and Hispanics, among households headed by young adults, and among households that rent their homes (Kennickell et al 2000). Banking the unbanking using the prepaid platforms and mobile phones is also actually ongoing in developed countries.

According to Prior and Santomà (2010) the rapid growth of mobile phones usage and the continuous rise in wireless coverage fuel expectations that access to financial services through mobile phones could transform the way financial services are provided to poor, vulnerable and low-incomes population.

Household surveys have also asked people why they do not have deposit accounts (Booz-Allen, 1997; Caskey, 1997a). The surveyed families most frequently report that they do not have accounts because they have almost no month-to-month financial savings to keep in them. Other common responses include: "bank fees are too high"; "bank minimum balance requirements are too high"; "we want to keep our financial records private"; and "we are not comfortable dealing with a bank".

Many of the unbanked have reported that they encounter few problems from their status (Prescott & Tatar, 1999). They have no financial savings, so there is no hardship from not having access to a financial institution to safeguard such savings. They have no immediate need for credit or do not find that their unbanked status excludes them from the credit that they do need. Payment services are also not problematic for a variety of reasons. Many receive and make few non-cash payments. Others cash paychecks for free at an accommodating deposit institution, grocery store, or other business. Those making long-distance payments do so by purchasing money orders from the post office or convenience stores. There is a growing body of literature exploring the value of mobile electronic payments in economic development. Some of the literatures examine Sub-Saharan Africa's ability to use mobile telephones to make electronic mobile payments (Sparks, 2008). The advent of the Internet has enabled new ways to conduct banking business, resulting in the creation of new institutions, such as online banks, online brokers and wealth managers. Such institutions still account for a tiny percentage of the industry. Over the last few years, the mobile and wireless market has been one of the fastest growing markets in the world and it is still growing at a rapid pace. According to the GSM Association and Ovum,

the number of mobile subscribers exceeded 2 billion in September 2005, and nowadays exceeds 2.5 billion, of which more than 2 billion are GSM. With mobile technology, banks can offer services to their customers such as doing funds transfer while traveling, receiving online updates of stock price or even performing stock trading while being stuck in traffic. Smartphones and 3G connectivity provide some capabilities that older text message-only phones do not.

Online banking was introduced in the 80's but its growth across the globe took place in the 90's. Europe has been and still the leader in Online banking technology and usage. Online services have become an added feature in the banking sector. Online banking or Internet banking allows customers to conduct financial transactions on a secure website. Credit goes to internet that provided ultimate ease to the customers at their door step (Zahid, Mujtaba & Riaz, 2010). Online banking allows people to perform all the banking related activities such as money transfer, past transactional information, cash withdrawals and deposits with a just one click of a mouse. Clients can easily check the account balance every day just by visiting the website of their bank. This provides the place and time utility to people provided if one has Internet access.

Online banking also eliminates unnecessary waste, which an organization incurs in the form of office supplies. This facet has also helped in meeting the social concerns. However, using Internet for money transaction is never free from risk. More importantly, security is always been an issue with Internet transactions. Despite several safety measures taken by the banks in the form of information encryption, firewalls, encoding, among others, there is still reluctance prevails in relaying totally at online banking especially in developing countries like those in SSA. This led to the foundation of this study. The core purpose of Davis, Bagozzi, and Warshaw (1989) research was to figure out the most critical factors having an impact on the acceptance of online banking with the help of Technology Acceptance Model (TAM).

According to a study by financial consultancy Celent (2007), 35 per cent of online banking households will be using mobile banking by 2010, up from less than 1 per cent today. Upwards of 70 per cent of bank center call volume is projected to come from mobile phones. Mobile banking will eventually allow users to make payments at the physical point of sale. Mobile contactless payments will make up 10 per cent of the contactless market by 2010. Another study from 2010 by Berg Insight forecasts that the number of mobile banking users in the United States will grow from 12 million in 2009 to 86 million in

2015. The same study also predicts that the European market will grow from 7 million mobile banking users in 2009 to 115 million users in 2015 according to The World's first WAP Bank is Norwegian in 1999. Many believe that mobile users have just started to fully utilize the data capabilities in their mobile phones. In Asian countries like India, China, Bangladesh, Indonesia and Philippines, where mobile infrastructure is comparatively better than the fixed-line infrastructure, and in European countries, where mobile phone penetration is very high (at least 80 per cent of consumers use a mobile phone), mobile banking is likely to appeal even more.

Aker and Mbiti (2010) show that access to and use of mobile telephony in SSA has increased dramatically over the past decade. Mobile telephony has brought new possibilities to the continent. Across urban-rural and rich-poor divides, mobile phones connect individuals to individuals, information, markets, and services. These effects can be particularly dramatic in rural SSA, where in many places mobile phones have represented the first modern telecommunications infrastructure of any kind. Mobile phones have greatly reduced communication costs, thereby allowing individuals and firms to send and to obtain information quickly and cheaply on a variety of economic, social, and political topics. An emerging body of research demonstrates that the reduction in communication costs associated with mobile phones has tangible economic benefits, improving agricultural and labor market efficiency and producer and consumer welfare in specific circumstances and countries. Aker and Mbiti (2010) research first examines the evolution of mobile phone coverage and adoption in SSA over the past decade. These authors explore the main channels through which mobile phones can effect economic outcomes and appraise current evidence of its potential to improve economic development. And they conclude with directions for future research and outline the necessary conditions for mobile phones to promote broader economic development in SSA.

Mobile banking can offer services such as the following: Account Information (Mini-statements and checking of account history, Alerts on account activity or passing of set thresholds, Monitoring of term deposits, Access to loan statements, Access to card statements, Mutual funds/ equity statements, Insurance policy management, Pension plan management, Status on check (cheque), stop payment on check, Ordering check books, Balance checking in the account, Recent transactions, Due date of payment (functionality for stop, change and deleting of payments), PIN provision, Change of PIN and reminder over the Internet, Blocking of (lost, stolen cards); Payments, Deposits,

Withdrawals, and Transfers (Domestic and international fund transfers, Micro-payment handling, Mobile recharging, Commercial payment processing, Bill payment processing, Peer to Peer payments, Withdrawal at banking agent, Deposit at banking agent).

A specific sequence of SMS messages will enable the system to verify if the client has sufficient funds in his or her wallet and authorize a deposit or withdrawal transaction at the agent. When depositing money, the merchant receives cash and the system credits the client's bank account or mobile wallet. In the same way the client can also withdraw money at the merchant: through exchanging SMS to provide authorization, the merchant hands the client cash and debits the merchant's account.

For investments there are services like: portfolio management services, real-time stock quotes, personalized alerts and notifications on security prices, and mobile banking. And the supports are: status of requests for credit, including mortgage approval, and insurance coverage, Check book and card requests, Exchange of data messages and email, including complaint submission and tracking and ATM location. Based on the literature survey, mobile banking will be attractive mainly to the younger than the older. The younger educated mobile phone users manipulated phones more than the older. Mobile phone users say that they may consider performing some kind of financial transaction through their mobile phone. But most of them are interested in performing basic transactions such as querying for account balance and making bill payment.

The rapid expansion of M-PESA reveals that there is a risk that the market could be dominated by initial entrants. Such a result could create uncompetitive outcomes raising consumer protection concerns. In countries where there is only one provider and many consumers (monopoly market), it would be important for authorities to monitor the pricing of mobile banking services. Nevertheless, the best strategy is ensuring that other providers can enter the market for mobile banking. In Kenya, another company, Zain, has introduced a mobile banking service known as Zap. Other providers are also expected to enter the market. The result is a contestable market where, although there are only a few providers, the threat of entry is sufficient to protect consumers and ensure that pricing is competitive (Mwangi, Kimenyi & Njuguna, 2009). Mobile phone banking has opened opportunities for many Kenyans and others in developing countries. The rapid growth of mobile phone banking in Kenya is evidence of the great need for low-cost financial services in developing countries. This growth is expected to continue and to benefit other sectors of

the economy and thus contributing to economic growth in the country. The note has highlighted some of the main factors that have contributed to the growth of mobile telephony and successful mobile phone banking. Also, emphasizing the fact that such innovations, while extending financial services to many consumers, can also compromise the integrity of the financial system; and cautioning that relevant authorities must be careful to ensure that oversight capacity does not lag behind innovations.

While the role of the informal sector in promoting economic growth in SSA is increasingly acknowledged, access to capital remains one of the biggest obstacles hindering the development and growth of the sector (Stork & Esselaar, 2006). From Comminos et al (2008), Sub-Sahara Africa is struggling with access to formal financial services for its citizens and the informal sector. In addition to the underlying structural limitations of poverty and vulnerability, risk-averse bankers, unsuitable financial products and high bank charges have also been blamed for this state of affairs. Poor and vulnerable people with irregular income and informal businesses often have no choice but to make use of informal financial services, which are many times more expensive than formal ones. Formal financial services are usually only extended to those with regular income or collateral (Firpo, 2008). Informal businesses also often lack the required accounting skills and systems to generate necessary data to convince a bank to extend loans to them. Other obstacles include the bureaucratic and educational bottlenecks that prevent many Africans from having identity documents. This fosters corruption around documents such as birth certificates, identity cards (IDs) and passports, increasing the risk for banks in dealing with new customers.

A critical issue to overcome is that of asymmetrical information (Akerlof, 1970). Someone without a bank account approaching a bank for a loan is likely to be rejected unless he or she possesses some form of collateral. The bank has no transaction history for this person or informal business and hence does not know anything about the applicant's creditworthiness. Transaction patterns can be used to predict whether or not a customer will be able to repay a loan. Absence of a transaction history means that the ability to repay loans is unknown to banks, making it risky for banks to serve such a person unless the loan is fully collateralized. Few individuals in the informal sector have access to collateral. They either have their own informal small businesses (such as street vendors) or work on an ad hoc basis. M-banking can be seen as one solution to these problems. Despite having been around for some time in several Sub-Sahara African countries, the existing

offerings are mostly value-added services – where the mobile phone is a complimentary channel to operating an existing bank account. Such services are not geared towards the inclusion of the poor, vulnerable and unbanked, and while they are growing in popularity, they have yet to shift the access frontier in order to become “transformational” (Porteus, 2007).

To become transformational, m-banking must progress towards bringing more informal businesses and the poor and vulnerable into the formal economy so that they are better able to access micro-loans and other financial services. Transacting on a mobile payment platform can also generate a transaction history that can act as a basis to evaluate creditworthiness. This would address the inadequate access to finance that restricts the entrepreneurial potential of Sub-Saharan Africa's informal sector, the poor and the vulnerable populations.

The prime reason for holding an account is to save money in a “safe” place, but is often triggered by employers' wish to pay out salaries to accounts rather than in cash. Most accounts have limited number of transactions, and as soon as salaries are paid, money is withdrawn. This is the case for more than 39 per cent of accounts in South Africa (Bångens & Söderberg, 2008). The low-income accounts in South Africa – so called Mzansi – shows a higher instant withdrawal at 46 per cent. Even in a country like South Africa, the level of sophistication is low among low-income earners who mainly are the ones using the account for withdrawal, only. For instance, ATM cards are used by 31 per cent and debit cards by 14 per cent in this group whereas high-income earners commonly use the service; 85 per cent and 51 per cent respectively.

According to Bångens and Söderberg (2008) remittance is a common phenomenon in SSA countries which includes remittances from abroad Africa as well as from Africa countries and from urban to rural areas. The Finaccess (2007) Kenyan study states that whilst around 16 per cent have received remittance from within Kenya only 2.8 per cent have received remittances from abroad. Sending money within Kenya is done by 16.9 per cent whereas remittance abroad is minimal. The most common means of transferring money is to use a friend who is travelling (52 per cent), followed by nationwide bus coaches (25 per cent), and remittance services through Western Union or MoneyGram (23 per cent). Bank transfer, cheques, money orders are not often used. At the time of the Finaccess study no one indicated using M-PESA (Gamos, 2003). Data from Cameroon, Senegal (Gamos, 2007) and others francophone countries points to similar remittance patterns.

Analyzing the effect of remittances on poverty and financial development in SSA, Gupta, Pattillo and Wagh (2008) shows the effect of the steadily growing remittance flows to SSA. Though the region receives only a small portion of the total recorded remittances to developing countries, and the volume of aid flows to SSA swamps remittances, this research finds that remittances, which are a stable, private transfer, have a direct poverty-mitigating effect, and promote financial development. These findings hold even after factoring in the reverse causality between remittances, poverty, and financial development. The paper posits that formalizing such flows can serve as an effective access point for “unbanked” individuals, and households.

Hartsenko (2004) makes a cross-country comparison of the use of the different payment instruments (such as Mobile phone, Phone bank, Internet bank, Bank card, among others) in the Baltic countries. The author has applied regression analysis to identify the effects of individual characteristics on people’s using specific electronic payment instruments and analyzed the impact of consumer characteristics on the use of payment instruments in Estonia. The results show a strong effect of demographics characteristics (age, sex, education, occupation living place, and personal income) on consumers’ use of payment instruments.

In the banking sector in SSA, many barriers to banking the poor and vulnerable exist. While the banking system works extraordinarily well in most SSA countries and for Africans, many low income individuals, poor and vulnerable face some key barriers to account ownership. First, regular checking accounts may not make economic sense for many low-income, poor and vulnerable families. Consumers who cannot meet account balance minimums for an account at a bank often pay high monthly fees. A second barrier comes from difficulties that many unbanked individuals may have in qualifying for conventional bank accounts because of past problems with the banking system. Third, while many urban communities contain adequate numbers of banks, in some low-income and poor neighborhoods, banks, thrifts, and credit unions are not as readily accessible to potential customers as such institutions are in higher-income areas. Fourth, for some low-income, poor and vulnerable households, lack of general education or specifically lack of financial and technical education with respect to account ownership, budgeting, saving, and credit management is a significant barrier to personal financial stability. The need for financial and technical education may be particularly acute among rural/urban migrants and other groups unfamiliar with formal banking practices. The benefits of financial and technical education are

not likely to be fully captured by any one financial institution because an educated poor or rich consumer will shop for financial services among competing providers. Thus, education at any scale will likely be under-funded without public or philanthropic subsidy. Lastly, immigrant communities may face difficulties regarding proper documentation for opening an account, either because they lack such documentation, or they fear that depositories will police immigration laws. While consular identification cards may now be used by banks, at their discretion, for checking accounts.

Methodology

Method of analysis and model specification

Are mobile phones, can be used to increase the bancarisation rate and to extend services to the unbanked in SSA countries? The objective of this paper is to identify the effects of mobile phones on bancarisation rate and on the unbanked. The methodology used is based on the regression analysis with panel data of 30 Sub-Sahara African countries. From Hartsenko (2004), regression analysis was applied to show the effects of individual characteristics of poor and vulnerable population’s using mobile phones as specific electronic financial instruments for unbanking. Hartsenko (2004) had considered ICT_{it} as equivalent to mobile phone.

Adapting and transforming his model, the bancarisation rate (the opposite of unbanking rate) depends on income, age, education, sex, family, occupation, living place, and on information and communication technologies (ICTs), so that the following equation was estimated: $Bancarisation\ rate_{it} = \beta_0 + \beta_1\ income_{it} + \beta_2\ age_{it} + \beta_3\ education_{it} + \beta_4\ sex_{it} + \beta_5\ family_{it} + \beta_6\ occupation_{it} + \beta_7\ living\ place_{it} + \beta_8\ ICT_{it} + e_{it}$ (1)

Where: *Bancarisation rate* is the dependent variable, *ICT*, *income*, *age*, *education*, *sex*, *family*, *occupation*, and *living place* are independent variables. *ICT* equals 1 if the respondent uses any type of electronic payments; *income* is the respondent’s income; *age* is the respondent’s age (if under 35 is 1, if 36-55 is 2 and 3 if the respondent was more than 55 years old); *education* equals 1 if the respondent has less than secondary school education, 2 if the respondent has at least college education, and 3 if the respondent has at least high education; *sex* equals 0 if the respondent is a female, 1 if a male; *family* is the number of people in the respondent’s household (1 if respondent lives alone and 5 if the family has 5 persons); *occupation* is the type of employment: 5 for unemployed, 4 for retired person, 3 for student, 2 for

blue-collar workers (including production, transportation, farming and service), and 1 for white-collar workers (including professional, technical, and administrative occupations); *living place* is 1 if urban, 2 is rural place. The term of error or residual term is e_i ; i is the individual selected SSA countries (30) and t is the time from 2002 to 2009. β_0 is the slope/intercept. β_1, \dots, β_8 are regression coefficients or parameters to be estimated.

Data sources

Data from ITU and Global Information Society Watch (GISWatch) are used. While focusing on ICTs, GISWatch aims to make a critical contribution to building a people-centred information society. Its purpose is to stimulate a collaborative approach to policy advocacy, and to create a common platform where disparate experiences can be shared, and progress. Also data from World Development Indicators, from financial access initiative research framing note, from Fincscope (2002, 2009), from CGAP (2002-2009), and particular data from Bångens and Söderberg (2008) and Comninos (2008) are used. Our study has covered 30 Anglophones, Francophones and Lusophones Sub-Sahara African countries (Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central Africa Republic, Chad, Congo, Côte d'Ivoire, Democratic Republic of Congo, Djibouti, Ethiopia, Gabon, Ghana, Guinea Bissau, Kenya, Mali, Mauritania, Mozambique, Namibia, Niger, Nigeria, Rwanda, Senegal, South Africa, Tanzania, Togo, Zambia, and Zimbabwe).

Empirical Results and Discussions

The model (1) was estimated with panel data based on Sub-Sahara African countries. The test of the Lagrange multiplier used, allowed us to judge the existence of specific effects in these 30 countries. When the hypothesis of their existence is retained, the modified Hausman test permits us to reject or not the exogeneity hypothesis of these effects. If this individual-specific effect is supposed to be a random variable that is uncorrelated with the explanatory ones -and then, a part of the error term- then, 'random effects' estimation should be applied. Applying random effects, ordinary least square (OLS) estimators will be not efficient and the appropriate method of estimation will be generalized least squares (GLS). Generalized least squares are used. GLS are techniques employed for estimating the unknown parameters in a linear regression model. In this case ordinary least squares are statistically inefficient. The GLS is applied here because the

variances of the observations are unequal, and there is a certain degree of correlation between the observations.

The Table 2 presents the results of the regressions processes which served to test the link between bancarisation rate and mobile phone (ICT). Empirical results of our research show that the value of the parameter β_8 here is 0.468 with p -value equal to 0.001. So, the positive relation between the two variables is confirmed, and adjusted R-square is equal to 0.91. Mobile phone is statistically significant at 1 per cent level, showing that the level of the mobile phone utilization in an economy at any given time impact the bancarisation rate. The coefficient of that explanatory variable shows that increasing in mobile phone users will result to about 46.8 per cent increasing in the bancarisation rate. This equally connotes that a high number of mobile phone users in Sub-Sahara African countries will enhance the provision of financial services to the unbanked.

Table 2, Result of the regression analysis.

| | OLS | GLS | MVI Hausman Taylor |
|------------------------|---------------------|----------------------|----------------------|
| ICT | 0.244 (0.003) | 0.468*** (0.001) | 0.388*** (0.002) |
| Income | -0.029** (0.000) | -0.063*** (0.000) | -0.148*** (0.000) |
| Age | 0.028*** (0.000) | -0.033*** (0.000) | -0.034*** (0.000) |
| Education | 0.366*** (0.001) | 0.771*** (0.000) | 3.64*** (0.006) |
| Sex | 0.132*** (0.001) | 0.149*** (0.006) | 0.043 (0.524) |
| Family | 0.048 (0.244) | 0.058 (0.351) | 0.018 (0.834) |
| Occupation | -0.004 (0.727) | -0.002 (0.251) | -0.007* (0.061) |
| Living Place | -0.102 (0.391) | -0.081 (0.702) | -2.64* (0.058) |
| Countries number | 30 | - | - |
| Number of observations | 240 | - | - |
| Adjusted R-square | 0.90 | 0.91 | 0.86 |
| LM-Test (1ddl) | - | 5.02** (0.25) | |
| Hausman test | - | - | 5.235 0.92 |

The figures inside the brackets represent p -value. The triple, double and simple asterisks indicate thresholds of statistical meaning of 1 %, 5 % and 10 % respectively.

Results of our study indicate that significant reasons for not having a bank account are lack of regular income and the perception that a bank account is not needed or too expensive. The transaction costs of maintaining a bank account as well as related costs like transports are far greater obstacle in SSA than in

the developed world. This is due to the uncompetitive nature of the SSA countries banking sector. Sub-Saharan African banks typically require a deposit fee, for example when the account is opening. This is not incentive for poorer and vulnerable to take their savings to banks institutions. Hence it limits the funds that a commercial bank can raise from individual savers and channel into productive investment. Banks can increase their profitability and expand the number of account and their market in Sub-Saharan African countries by focusing on financial intermediation like mobile-banking, rather than transaction fees.

There are many effects of mobile phone on unbanking in SSA. For example a mobile banking solution whose motto is “banking the unbanked” has no opening fees, and though it’s linked to a bank account. The customer doesn’t actually need to go to a bank. If poor and vulnerable population don’t have bank accounts, it’s hard for them to conceptualize electronic banking. It can be difficult for the unbanked to see the benefits of mobile banking. But the advantages and impacts are many: it’s risky to carry cash, the account doesn’t get closed for inactivity, and it’s pay-per-transaction. Comminos, Esselaar, Ndiwalana and Stork (2008), who focuses on some SSA countries, also pointed to the potential for mobile banking’s growth on economics because there are far more people in SSA with mobile phones than bank accounts.

Significant amounts of households are receiving remittances from another household, either in a different city or a different country. International remittances have great significance to national economies, with inward bound remittances being over three times the size of official development assistance in SSA as a whole. The cost of remittances however is a significant concern for those sending money home. International airtime transfer could be an efficient and cost saving solution. Several multinational mobile operators, such as Zain already allow cross-country airtime transactions.

Income levels and employment have the closest correlation to use of financial services, which means there are average threshold levels for stepping inside the formal banking sector. In Tanzania the transition takes place in earning levels per month around USD 80 whereas the crossover level is around USD 110 in South Africa. Lowering the entry level has also a clear effect on the diffusion of bank products. The Mzansi accounts introduced in South Africa in 2004 have speeded up the use of banking services by previously unbanked. Mzansi is offered by the banking sector in South Africa and an account can be opened at Absa, Nedbank, Standard Bank, FNB and the Post Office. It is designed for customers who

never had a bank account before. There is no minimum balanced required but there is only one free cash deposit per month. The account comes with a Visa Electron debit card at a cost of ZAR 30. It is estimated that within two years around 1.2 millions such accounts were opened. The bureaucracy involved in becoming a bank customer should not be underestimated, which comprises a main barrier in most SSA countries. The requirement to submit employer’s certificate, referral letters, permanent address and P.O. Box may sound trivial but serve as major obstacles to most common people. These hurdles may in fact support the diffusion of m-banking, as such accounts often come with ceiling amount restrictions, which allows for lighter control mechanisms.

Demand for mobile banking and payments are permanently increasing in SSA countries. In Kenya for example, which has one of the most successful m-banking applications in Africa, banks are complaining to the financial services regulator that mobile operators are unfairly competing against them. This is precisely the point: innovation often outsmarts regulation. It is up to policy-makers to create an environment that supports innovative applications and to adjust regulation to evolving innovations. Results from RIA’s e-Access and Usage Household Survey indicate that there would be significant interest in some of the abovementioned options being offered as m-banking services. When asked if they would consider having their salary paid into a mobile phone bank account, 3.5 per cent to 49.4 per cent indicated that they would. 1.9 to 49.7 per cent of respondents said that they would trust mobile banking if it were backed by a mobile operator and between 1.8 to 47.7 per cent if backed by a bank.

Ethiopians would trust mobile banking least. This could be explained by the low bank account and mobile penetration in Ethiopia. In Benin, Burkina Faso, Mozambique and Nigeria, respondents indicated that they would trust mobile banking more if backed by a mobile operator. However, individuals’ attitudes to mobile banking in Botswana point to the opportunity for mobile operators and banks to cooperate. Between 19.7 per cent and 26.3 per cent trust mobile operators and banks respectively, but together 44.4 per cent state that they would consider depositing their salary into a mobile bank account. A similar picture emerges in Ghana and South Africa.

To ensure a contestable market, the rapid expansion of m-banking reveals that there is a risk that the market could be dominated by initial entrants. From monopolistic state market, it became true privatizations process oligopolistic private market with low public’s participation. Such a result could create uncompetitive outcomes raising consumer protection

concerns. In SSA countries where there is at times only one provider, it would be important for authorities to monitor the pricing of mobile banking services. Nevertheless, the best strategy is ensuring that other providers can enter the market for mobile banking (in Kenya for example another company, Zain, has introduced a mobile banking service known as Zap). Other providers are also expected to enter the market. The result is a contestable market where, although there are only a few providers, the threat of entry is sufficient to protect consumers and ensure that pricing is competitive.

Mobile phone banking has opened opportunities for many Sub-Sahara Africans and others in developing countries. The rapid growth of mobile phone banking in SSA is evidence of the great need for low-cost financial services in developing countries. This growth is expected to continue and to benefit other sectors of the economy and thus contributing to economic growth in SSA countries.

This paper has highlighted some of the main factors that have contributed to the growth of mobile telephony and successful mobile phone banking. Also, the study has emphasized the fact that such technologies of communications and innovations, while extending financial services to poor and vulnerable, can also compromise the integrity of the financial system. So the relevant authorities and regulators must be careful to ensure that oversight capacity does not lag behind innovations.

Conclusion

The aim of this paper was to analyze how mobile phones are used to extend banking services to the unbanked, poor and vulnerable population. Lessons in SSA countries show that it is possible that mobile phones bank the unbanked. Findings show the impact of mobile phones bank on unbanked. The level of the mobile phone utilization in an economy in SSA countries at any given time impacts the bancarisation rate. When mobile phone bank, as a specific electronic financial channel using in SSA countries to bank the unbanked, well works, increasing in the number of mobile phone results to increasing in the bancarisation rate. The mobile phone presents a great opportunity for the provision of financial services to the unbanked. In addition to economic implication, technological and economic innovation, policy and regulatory innovation are needed to make these services a reality to the unbanked.

The poor in SSA tend to use public access facilities and share phones, so low tele-density figures can mask the extent to which the poor accesses telecommunications and banking services.

Kefela (2011) shows that in “typical” rural districts of SSA, about 80 per cent of households make regular use of phones. One of the key features driving growth in mobiles is that when poor and vulnerable populations are mobile with airtime they can be also mobile with their bank accounts. And inherently, poor infrastructures of information and communications in urban and rural areas have to be build or re-enforced.

The mobile phone adds a new channel by which the banked can really do their banking. They use m-payment solutions mainly for larger transfers. To make mobile banking into an ecosystem that connects banks, postal systems, rural banks, MFIs, employers, and international donors need interconnections between mobiles, money, and operators.

M-banking can be used for person-to-person (P2P) transfers including remittances or disaster response; payments such as utility bills, airtime, microfinance, and loans; disbursements such as payroll, government benefits, or NGO operations; and incentives for health or education. The mobile phone presents a great opportunity for the provision of financial services to the unbanked. In addition to technological and economic innovation, policy and regulatory innovation is needed to make these services a reality.

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