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Assessing the Potential for Mobile Payments in Africa: *Approaches and Evidence from Uganda*

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Abstract

This paper provides an evaluative framework that assesses the potential for mobile device-based payments (m-payments) in Africa. The framework is developed according to an analysis of the financial services environment and the drivers and constraints for change within a specific country context – Uganda. The paper draws upon secondary data from published surveys, as well as field research conducted by the author.

The framework distinguishes between formal, informal and un-served market segments and the findings suggest that the potential for m-payments is differentiated according to existing levels of financial sector participation. Clients of formal or semi-formal sector institutions are likely to be the early beneficiaries of new m-payment services delivered by existing providers. Informal sector participants may provide greater potential for extending access given their greater financial resources and literacy, but will require more tailored solutions. Relatively little is known about the financial practices and behaviours, and the extent of mobile use, amongst the financially un-served. Reaching the unbanked majority with m-payment services will involve greater ingenuity and innovation on behalf of service providers.

Overall, the analysis suggests limits to market-based solutions for mobile and financial service delivery, highlighting constraints to change that are conditioned by non-market factors related to financial and technical literacy and the need for new organisational solutions making use of appropriate community-based intermediaries.

Keywords: Mobile phones, m-Payments, Finance, Uganda, Africa

Background and Aims

Across sub-Saharan Africa (SSA) less than 10 percent of households have access to formal checking (current) or savings bank accounts with access to services largely confined to those who are in formal sector employment, better educated and urban-based (Claessens, 2006). Historically, the formal banking sector within SSA has shown little motivation to extend services to meet the needs of the less well off who remain largely 'unbanked'. Mobile phone networks may hold considerable potential to fill this banking gap, and to transform the way in which monetary payments and transfers are conducted. In the formal banking sector, this has already been demonstrated in Kenya through Safaricom's M-PESA money transfer service which has attracted over 2 million registered users since its inception in 2007 (Hughes & Lonie, 2007; Vaughan, 2007). The success of M-PESA has spurred the major mobile phone operators to develop, trail and (more recently) roll out similar services. Most notably MTN (the largest service provider in SSA) has launched Mobile Money Transfer (MMT) in five West and Central African countries (including Uganda) and is piloting in five others.ⁱ In recent years, and in the absence of formal service provision, informal mechanisms have also become apparent. Most notable is the widespread transfer of phone credits between mobile phone users as a means to effect monetary transfer (such as via MTN's Me2U service) whereby the recipient is able to cash-in the value of credits by utilising the services of a broad range of informal agents (Chipchase & Tulusan, 2007; Goodman & Walia, 2007).

In SSA the high degree of industry investment in new m-payment services suggests a high perceived market potential, not only for m-payments, but also for the introduction of a broad range of m-banking services by mobile phone operators in partnership with banks or other financial service providers. It is unclear, however, to what extent this market potential will translate into new financial service access opportunities for the unbanked majority. There are three strong driving forces which point towards m-payments being potentially transformational.ⁱⁱ The first is the expansion of network availability which now reaches the majority of the general population in all the countries of SSA.ⁱⁱⁱ Second, the particular functionalities associated with mobile phones which are highly applicable to the type of financial transfers and payments required by the less well off (i.e., transfers of small denominations incorporating low transaction costs and the ability to operate cash-in/out systems). Third, broader evidence of socio-economic impact which suggests that increased access and use of mobile phones is creating overall outcomes which are positive for poor communities (Jensen, 2007; Overa, 2006).

Strong drivers for effecting change in monetary payments are balanced by considerable constraints to extending m-payments services. The purpose of this paper is to evaluate these driving and constraining forces in order to assess the potential of mobile networks to address the needs of the unbanked for financial payments and transfers. The analysis will focus on a single country context – Uganda. Uganda provides a wide range of documented research and experience concerning financial service provision in poor communities. Whilst this evidence base does not directly address the potential of m-payments, it does provide a broad and detailed picture of the current payments landscape, as well as qualitative research concerning the financial behaviour and practices of the financially served and un-served population – thus providing a relevant context for the analysis. There is also a growing body of research concerning mobile phones and development (m-development) in Uganda,

which provides useful insights into general patterns of access and usage within poor communities. Thus, the paper has the following aims:

- To provide a literature review outlining conceptual approaches for m-payments research in Africa.
- To reframe these approaches according to an evaluative framework that assesses the potential of m-payments according to an analysis of the financial services environment and the drivers and constraints for change.
- To assess potential for m-payments drawing upon: a) evidence from previous field studies conducted in Uganda that highlight socio-economic variations in financial service provision and use of mobile phones; b) evidence from a preparatory study conducted by the author in the Western Region of Uganda.
- To provide conclusions to the analysis concerning the potential for m-payments.

M-Payments Literature Review

With the exception of Batchelor et al (2007)^{iv} community needs assessment for m-payment systems is relatively under researched (see: Duncombe & Boateng, 2009). There is greater attention in the literature to specifying requirements for m-payments according to market needs focusing on patterns of demand for m-payment services. This is not surprising given that the mobile phone industry (which is the key innovating sector for m-payments) is strongly market-driven. At the conceptual level, ‘bottom of the pyramid’ economics of Prahalad (2005) have been widely cited. For example, Knight-John et al (2005) make use of the theory of the marginal customer – one who gets excluded from transactions under a given market setting or a particular configuration of supply and demand conditions. Here the advent of pre-paid market options and airtime transfer of small denominations are demonstrated as proof that market innovations can be inclusive of the poor. Williams & Torma (2007) define banking opportunities for the unbanked as a banking ladder that models take up of services along a continuum – moving from informal to formal systems. They present evidence from South Africa that suggests a relationship between uptake of banking services and increasing levels of income, but questions whether willingness to pay (for m-payment services) is a result of price insensitivity given the attraction of security and convenience, or a reflection of the exploitation of market power and the extraction of economic rents by the service providers.

The most influential conceptual approach in the area of m-payments is that of the access frontier (Porteous, 2005; 2007). This models the development of a market over time within an environment where the majority lacked access to a service (such as a bank account). Users and non-users of a service within a particular market are segmented according to: a) those who currently access and use the service; b) those who can access but have not yet used it: this is the current access frontier – which includes those who are *voluntarily excluded* (who choose not to use the service); c) those who are likely to have access within 3-5 years (the future access frontier), and d) those who are considered to be beyond the reach of foreseeable market solutions or the *involuntarily excluded*. National FinScope survey data from South Africa (comparing 2004 and 2006) was used to test the model. The results show how structural changes in the banking sector – including the introduction of new ‘Mzansi’ bank accounts and other banking initiatives aimed at the previously unbanked – have pushed the access frontier forward significantly. The contribution of m-banking to this positive trend was still small (450,000 m-banking customers or 3 percent of the

banked population by 2006). The socio-economic make up of these customers also suggests that take up during this period was confined to 'those who were wealthier than the national average and certainly to the unbanked in general' (Porteous, 2007: 23).

New initiatives in South Africa such as WIZZIT have since provided more innovative agent-based services, and Ivatury & Pickens (2006) reported a greater level of uptake amongst low-income users, although with the majority of users confined to those with higher levels of education. Greater potential for m-banking is suggested, however, for the future access frontier in light of the 4.8 million unbanked adults who are identified as mobile phone owners. This group is also more likely to be from lower socio-economic groupings with 41 percent reporting no personal income. In the South African case, the research identifies future potential dependent upon whether providers of banking services are able to target this (voluntarily excluded) group with low cost m-banking services. Within this group, and in accordance with Batchelor et al (2007), the greatest area of untapped demand is for m-payment services.

The potential for m-payments has been demonstrated most conclusively in Kenya where Safaricom's M-PESA service has been successful in shifting the access frontier forward by attracting new users that were previously unbanked. Latent (unmet) demand was a key factor in the success, but issues of application design were also identified as critical in determining uptake. Hughes & Lonie (2007) and Vaughan (2007) identify three key success factors. First, M-PESA was created as an initiative to address the specific needs of the unbanked (the design and development phase being partly funded by the DfID Financial Deepening Challenge Fund), so the system needed to incorporate low transaction costs and a novel 'account' mechanism from its inception. Second, the functionality was restricted to a single money transfer service via a simplified text-based user interface using basic entry level mobile phones, thus attracting the mass of phone users that were unbanked. Third, it utilised a network of existing agents to facilitate cash-in and cash-out services that were licensed to act on behalf of a trusted entity – Safaricom – an institution perceived to be financially independent. Detailed and independent adoption studies of M-PESA have yet to come into public view and we rely on Safaricom estimates of uptake. Since its introduction in March of 2007, and up until June 2008 there were over 2.3 million registered users and over 18 Billion Ksh (c.US\$230m) had been moved through the system (Rosenberg, 2008).

Overall, research concerning m-payments in SSA is at an early stage and there is little published evidence or experience upon which the potential for m-payments can be assessed. Distinguishing between availability/access (market-push and supply factors) and consumption (market-pull and demand factors) provides a useful starting point. It is less clear, however, what may drive or constrain market frontiers to shift. Price may be identified as the key arbiter of access. That is, as the price of the m-payment service falls (in comparison with alternatives), a greater proportion of the voluntarily excluded are likely to switch or to access banking services for the first time. However, evidence pertaining to adoption of banking innovations also suggests that uptake will be influenced by a wide range of non-price factors (Brown et al, 2003). Non-price factors may vary between country, cultures and socio-economic profile, and it is not certain whether the experience from South Africa and Kenya will

be replicated in other SSA countries such as Uganda where a different set of contextual factors may influence uptake.

Participation in Financial Services in Uganda

Participation in financial services falls into four categories in Uganda (FinScope, 2007; Johnson & Nino-Zarazua, 2007).

- Those who access and make use of the *formal* banking sector and who may hold deposit or savings accounts.
- Those who access *semi-formal* Micro-Finance Institutions (MFIs) which also include Savings and Credit Cooperatives (SACCOs).
- Those who participate in the *informal* sector which includes a wide range organisational forms – ROSCAs (Rotating Savings and Credit Associations), ASCAs (Accumulating Savings and Credit Associations) and other community-based savings clubs and funds.
- A fourth group that includes all those who are un-served – who neither participate in formal or semi-formal banking systems and who do not report membership or participation of informal groups.

Data from FinScope (2007) suggests that 38 percent of Ugandans are financially served by formal, semi-formal or informal financial institutions/groups, whilst 62 percent fall into the un-served category. Research conducted by Johnson and Nino-Zarazua (2007) demonstrates that the key determining factors for financial sector participation in the formal or semi-formal sector is formal sector employment (implying higher and more regular income) and an educational level beyond primary standard 6. Other factors that correlate strongly are gender, age and poverty level proxy indicators such as type of clothing owned and fuel used. Unsurprisingly, ownership of technological assets (TV, bicycle, telephone or car) are also key indicators of participation. Mobile phone ownership is found to be the most significant of all the assets measured, thus the study concludes that... ‘those with a mobile phone are more likely to have a formal sector bank account by a factor of three’ (Johnson & Nino-Zarazua, 2007: 6). The most significant barrier to entry to the formal/semi-formal sector is stated as the fees and charges levied by the banks.

FinScope (2007) found that 22 percent of respondents belonged to informal groups (ROSCAs, ASCAs and other savings or investment clubs) which represent the key financial coping mechanism for the poor, and in some cases for those who are chronically poor or disadvantaged (Lwanga-Ntale et al, 2008). Informal groups also have an important social function – they hold regular meetings acting as a focal point in the community – and can provide social support in times of crisis or need. They are used more often by women. A key function of the groups is to handle payments. The methods employed are almost exclusively cash-based involving manual distribution and collection of monies from secure cash boxes. This is often preferred for reasons of trust, visibility and oversight, and to reduce the need for detailed financial record keeping of transactions (which for multiple short-term and small loans can become onerous). There are many convenience factors of belonging to informal groups. They are close by and the cost of travel is affordable, mitigating the transport costs associated with travel to an urban centre to make small/regular deposits or withdrawals (Johnson & Nino-Zarazua, 2007).

Amongst the un-served – those who fail to access even informal groups – the barriers to access mentioned most often are that they do not have money to save and do not trust the groups involved. This is reported to be, at least in part, due to a wide range of problems associated with the operation of community-based associations including lack of availability of funds due to members pulling out or not paying contributions, or problems of maladministration, dishonesty or fraud. A lesser number of non-participants felt they did not have sufficient knowledge to open an account, whilst only 6 percent felt they were constrained by distance.

Financial participation in Uganda falls into four main functional categories:

a) Income Generating Activity. The Uganda National Household Survey data (UNHS, 2006) indicated that the main source of earnings for rural households is subsistence farming (57.8 percent of households) illustrating multiple sources of income with the sale of produce or assets (predominantly livestock) accounting for the largest proportion of income earned. Wage employment and income from non-agricultural enterprises provided the most significant sources of income for some rural dwellers (16.4 percent and 14.9 percent respectively). Payment methods for goods (and services) and frequency of transactions varied according the nature of the activity. For example, payments from the sale of crops are more likely to be seasonal comprising less frequent lump sums. Other activities (including smallholding or fishing for example) may provide for more regular daily or weekly transactions (Burrell & Matovu, 2008).

b) Remittances. FinScope (2007) states that 28 percent of Ugandan households reported income from personal transfers in the form of a domestic remittance. UNHS (2006) report a higher figure, with 41.4 percent of all households in Uganda having received at least one remittance from a domestic source in the year preceding the survey. The mean monthly value of the amount received domestically was USH18500 (US\$8.22)^v whilst from abroad it was USH70500 (US\$31.33) with significant variations between the amounts remitted to urban and rural areas. The vast bulk of remittances received were used to pay for consumption goods and services (63.4 percent of the monies received from domestic sources) whilst lesser amounts were for school fees (13.6 percent) and medical fees (6.6 percent).

c) Savings and Credit. Access to savings and credit also generates need for monetary transfer – facilitating either deposits or withdrawals from accounts held. Overall, there is greater demand for a means to save than to borrow. FinScope (2007) data suggested that 71 percent of all adults were able to save, whereas 33 percent claimed to be borrowing, with the majority borrowing small amounts informally from shops, wholesalers or veterinary services (47 percent) or from family members and friends (22 percent) and from schools, hospitals and clinics (20 percent). The majority of borrowing takes the form of goods or services in kind or credit that is not monetised. Informal personal loans, however, are more likely to involve cash transactions.^{vi} The two main reasons for borrowing cash were to meet day-to-day expenses and for emergencies.

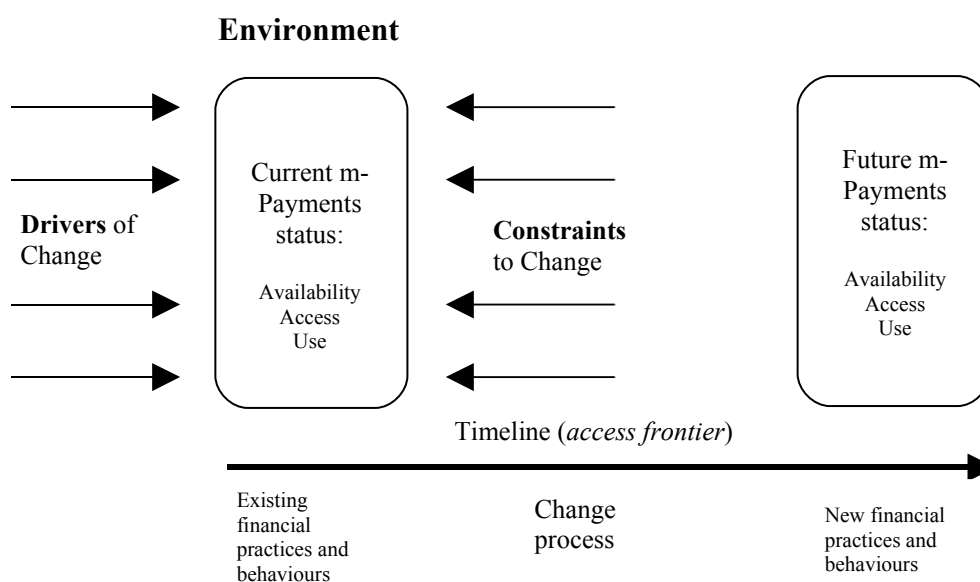
Social Protection Cash Transfers. Only a relatively small number of households depended ‘exclusively’ on income transfers for social protection (3.7 percent of rural and 1.5 percent of urban households according UNHS data) and evidence suggests

these are likely to be the poorest, and the least likely to participate in any form of formal banking system and would be unlikely to directly access cell phone services.^{vii} DfID (2006) suggest that such recipients are unlikely to benefit from direct m-payments, but could benefit from new payment systems where mobile networks are able to facilitate cash transfers via the agencies that are interacting directly with poor clients.

Analysing Drivers and Constraints to Change

The following analysis provides an evidence-based approach to building a broader conceptual understanding of m-payments potential in Uganda. It is based on an approach to assessing processes of change that considers the relative effect of both drivers and constraints to change (Lewin, 1951). Lewin posits that driving forces such as environmental factors may push for change, whilst restraining forces, such as personal and organisational factors may resist change. The change process is facilitated by adding to or reshaping the driving forces, whilst simultaneously reducing the restraining factors. That approach is summarised in Fig. 1.

Fig 1. m-Payments: Drivers and Constraints for Change



Source: Adapted from Falletta (2005)

The driving forces for a movement to m-payment systems can be categorised as twofold. First, 'market push' factors that are present in the financial, technological and socio-economic environment. These factors will be instrumental in shaping how well m-payment services can be tuned to the needs of the unbanked. Second, 'market pull' factors which pertain to the extent and pattern of demand for m-payment services. The barriers to change (or the constraining forces) are less easy to categorise but it is likely they will be experienced at two main levels: micro-level constraints experienced by existing or potential users and meso-level constraints associated with adaptation to new forms of organisation and delivery of financial services. There are also constraints at the macro-level concerning policy and regulatory requirements, and although crucial, they are beyond the scope of this paper.^{viii} In the following analysis of m-payments potential in Uganda each of the dimensions of the model will be considered in turn.

Drivers for m-Payments

Market Push Factors

Mobile Phone Access. The primary technological requirement for use of m-payments is access to a mobile phone. Figures are inevitably dated, and different sources give a contradictory picture of the extent of subscription, ownership and access. Table 1 summarises the most recent International Telecommunication Union data (ITU, 2008) for mobile cellular subscribers for 2007 also indicating growth rates (2002-2007) and the percentage of the population covered by mobile phone networks. Figures for South Africa and Kenya are included for comparative purposes.

Table 1. Mobile Cellular Subscribers for Uganda, Kenya and South Africa

		Uganda	Kenya	South Africa
Mobile subscribers per 100 inhabitants 2007	2005	4.56	13.46	71.6
	2007	13.58	30.48	87.08
CAGR (percent)	2002-2007	60.5	57.3	92
Population coverage (percent)	2005	70	86	96
	2007	80	92*	99.8

*figure is for 2006
Source: ITU (2008)

A simplistic approach to these figures would suggest there are roughly 4.2 million mobile phone owners in Uganda (given a population size of 30.88 million in 2007). However, research conducted with regard to developing countries (James & Versteeg, 2007) suggests that subscription data may considerably overestimate mobile ownership.^{ix} However, per capita subscription data also underestimates considerably the extent of subscription amongst the economically active population aged 14-64: 50 percent of the population in Uganda is less than 15 years old, very few of whom are likely to be phone subscribers. Mobile subscription figures also underestimate overall access due to privately owned mobile phones often being a shared commodity (with family, friends or neighbours) and the availability of mobile phones at public access points (e.g., Grameen Village Phone Operators or at Village Information Centres - VICES).

A more accurate view of actual ownership may come from national surveys of representative samples. Slightly earlier data (comparable with the ITU figures for 2005) comes from the UNHS (2006) which reports ownership of assets by households according to wealth quintile with ownership of mobile phones exhibiting ownership rates ranging from 1.1 percent amongst the lowest quintile to 8.2 percent for the middle and 51.9 percent for the top wealth quintile (i.e., the top 20 percent of the population by income/assets). Interestingly these figures are mirrored by the proportion of households that report having savings accounts with a formal institution (1 percent - lowest; 8.1 percent - middle; 44.3 percent - highest). The data suggests levels of ownership by households that become increasingly low according to income level and overall poverty status (Tusubira et al, 2005). The UNHS data also notes a gender divide in ownership of mobiles, observing that 8.1 percent of male household heads own a phone compared with 5.2 percent of female heads.

Data on access provides a more optimistic view of the potential for mobile phones to address the banking gap. UNHS (2006) provides details of access to formal banking and communication services at a community (LC1) level.^x Only 0.4 percent of communities report access to a bank branch office in their community, 4.3 percent a micro-credit institution or SACCO, and 1.1 percent a post office. This compares to 48.5 percent of communities that reported the availability of a mobile telephone service in their village (a figure that is likely to have risen considerably since the time of the UNHS survey). At a household level, FinScope (2007) reported that 37 percent of rural households have access to a cell phone compared with 58 percent for urban. In a survey conducted by Scott et al (2008) of households covering the four rural regions of Uganda, 46 percent of rural respondents had access to a mobile phone, and 39 percent had their own handset, 6 percent had a SIM card but no handset, but only 1 percent shared a phone. On the ground surveys, therefore, seem to provide evidence of higher rates of ownership and access to mobile, but with a high degree of inequity according to socio-economic status. There is also an indication of a trend towards increasing substitution of and preference for, personal phone ownership over shared phone use as a larger proportion of the population gain personal access, and the costs of access fall.

A Competitive Environment. As identified by Wright and Rippey (2003) financial services in Uganda are delivered within a highly competitive market environment. This provides for a significant amount of choice of banking service provider (formal or semi-formal) for existing or new users. Amongst those who are financially served, there are quite high levels of multiple usage spanning formal, semi-formal and informal tiers. For example, of those who participate in informal financial groups – not including ASCAs – 19 percent also use commercial banks, with a lesser number (2.5 percent) making use of MFIs or SACCOs (which have low levels of use in Uganda compared with other developing countries in SSA). This suggests a fairly high degree of switching between financial service institutions depending upon the service benefits available (FinScope, 2007).

Research conducted in Uganda by Hudson (2003) identifies recommendation of family and friends to be the key factor that determines choice of financial service provider. This was mentioned by 58 percent of a sample of 979 financial service users, whilst another study conducted by Mukwana & Sebageni (2003) finds that existing clients exercised choice on the basis of other subjective criteria such as staff attitudes or the physical appearance of the premises, and to a lesser extent on objective criteria pertaining to interest rates offered, loan terms, etc. Wright and Rippey (2003) found that 14 percent of those using savings accounts had switched in the two years prior to their study. The key reasons for switching were found to be new information or recommendation, problems with existing providers or poor customer care, and the need to borrow for emergencies or relocation.

There is an growing trend in urban areas to open savings accounts in order to have access to ATM services which are increasingly being targeted at new unbanked customers. Hudson (2003) found this to be the top-rated reason for opening a savings account amongst low income users. In this respect, one of the key challenges for larger MFIs and SACCOs is the management of these low value high transaction accounts. ATMs provide a far cheaper alternative than use of branches or tellers. However, in the FinScope (2007) survey 84 percent of all respondents did not know

of, or they were unsure how to use an ATM. Of all the access technologies, mobile banking applications provide by far the lowest transaction costs. Thus, it is likely that availability of m-payments (and eventually) other m-banking services will increase the choice of financial products and services offered to the banked and unbanked segments. However, as illustrated by Claessens (2006) the key issue remains whether availability and choice within a competitive environment can be translated into increased access and consumption.

Market Pull Factors

Demand for m-Payment Services. The extent of demand for monetary payments and transfers can be gauged from existing data concerning volume, frequency and sources. The FinScope (2007) survey finds that 28 percent of Ugandans make regular use of monetary transfer. On a weighted basis this would extrapolate to approximately 1.8 million households. Fifty percent make use of family and friends to facilitate transfers, with only a small proportion (less than 10 percent) accessing formal means (banks, post offices or specialist companies such as Western Union). Over 90 percent of transfers are in the form of cash (which was also the preferred method for 86 percent of those receiving money from outside Uganda). The majority, however, (64 percent), reported no instances of sending money (either formally or informally). However, it is not clear whether this data interrogated the full range of payments or only domestic and overseas remittances. FinScope (2007) also provides detail of frequency and method of receiving income, indicating that 98 percent of all rural dwellers received varying proportions of their income in cash. More frequent payments were reported by those running non-agricultural enterprises (with 63 percent reporting daily transactions and 13 percent weekly) or receiving domestic remittances (with 16 percent reporting daily transfers, 10 percent weekly and 16 percent monthly). Research on the extent of payments and transfers in Uganda is only partial, but it is clear that the bulk of demand relates to the facilitation of cash payments. There are also differences in patterns of demand according to:

- *Regional variations:* the Western and Eastern regions show the highest incidence of money transfer, and the Northern region the lowest.
- *Urban-rural differences:* the highest demand is in areas designated as rural where 85 percent of Uganda's population reside. There are no significant differences between urban and rural areas in the importance of cash as a financial instrument.
- *Socio-economic profile:* there is no data that differentiates patterns of monetary transfer according to poverty levels, and there is little research concerning how the cash economy operates amongst the financially un-served majority. Income data suggests that 40 percent of all Ugandan households were in the lowest income class – less than USH50,000 (22.2USD per month) whilst a further 21.5 percent recorded incomes in the next lowest income class –USH50,000-100,000 (USD22.2-44.4 per month) (2006 figures).
- *Functional use areas:* the analysis suggests that the most widespread use of cash payments concerns transactions associated with income generating activity. Remittances to or from domestic sources are also important together with deposits and withdrawals for savings and informal borrowing.
- *Personal characteristics:* characteristics of education, gender and age show strong correlative relationships according to inclusion/exclusion from formal

financial services, but there is no evidence that personal characteristics impact upon demand for payment services, other than those that correlate with socio-economic status.

Evidence of Latent Demand. Key indicators of latent or ‘pent-up’ demand are instances of informal monetary transfer via mobile phone networks. Reports suggest that the practice is widespread, although the breadth and depth of impact have not been measured. Burrell & Matovu (2008) found use of mobile phone networks for domestic remittance to be ‘quite common’. Similar evidence of informal monetary transfer is reported by Chipchase and Tulusan (2007) and Diga (2007) from different locations in Uganda. A short field study conducted by the author in September 2008 elicited a number of similar examples on the basis of data collected from interviews and focus groups from the Kabale and Mbarara Districts. Examples - shown in Box 1 and Box 2 - can be used to illustrate a number of different characteristics of the informal m-payments identified.

Box 1. Informal m-Payments Amongst Cattle Farmers

William is the owner of a small dairy cattle farm in the Kenshunga sub-county of Mbarara – a relatively well off community in the Western Region. He has one herd and one banana plantation. He employs two herdsmen and two workers on the plantation. The workers in the plantation are promised payment of USH500,000 (USD222) for one year and paid in instalments in arrears to encourage them to stay for the whole season. Cattle herders are paid monthly – USH30-50,000 (USD13-22) per month. The farmer transfers airtime (via MTN Me2U) to his wife and brothers who live away from the farm (USH5,000 (USD2.22) or USH10,000 (USD4.44) amounts about once per month). In this case the amounts are either retained as airtime, or cashed for a small commission with local traders. He also reported sending USH10,000 to a niece at a school in Mbarara on three occasions. In these cases the airtime was cashed by the headmaster of the school concerned – for part-payment of school fees. He also sends airtime to a brother who is working in Iraq, and to his brother’s sons in Uganda – possibly USH5,000 in a week. One worker (a migrant from Karamoja in the north of Uganda) sent small amounts of airtime to his home village – he has no bank account. However, the farmer feels that the ownership of phones by workers is primarily an extravagance. They will beep him and he will have to call them back as they usually have no airtime on their phones. An example was when a goat got gored by another goat and the phone call meant that the vet could be summoned quickly and the goat treated.

Source: author fieldwork

Interviews were carried out with seven farmers in total and all reported similar patterns of monetary airtime transfer of small denominations. A second study was conducted in a less prosperous and more densely populated sub-county of Rubaya in Kabale District. Male and female focus group responses elicited further evidence of use of airtime as virtual money, as exemplified in Box 2.

Box 2. Informal m-Payments Amongst Small Holders

Farmers in the Kibuga Parish of Rubaya are horticulturists and small holders. This leads to a precarious existence due to the harsh mountainous environment which is frequented by heavy rains and floods, causing soil erosion. There is also drought in the dry season. Income varies according to season, and there are considerable risks incurred when financing planting due to potential loss of crop due to climatic conditions. In the last three years improvements in telecommunications have been dramatic in the village, with phone links to emergency services established via mobile networks. The village information centre (VICE) has a community phone with a list of emergency contact numbers. Ownership and use of phones is primarily by men, amongst whom airtime transfer is practiced. For example, one farmer transferred USH20,000 (USD8.88) to a relative in a neighbouring village by texting a scratch card number. In this case the task of cashing in the airtime was onerous as the relative had to search for people to purchase the airtime credits in 100-200USH (USD0.05-0.1) lots in order to reconvert them into cash. This incurred a very high comparative transaction cost with each Me2U airtime transfer text charged at USH50 (USD 0.22).

Source: author fieldwork

Overall, the evidence of use of mobile phone networks for informal monetary transfer is anecdotal and there is no research that gives an indication of the extent of financial impact. The research conducted by the author reflects the findings of Burrell & Matovu (2008) who identify two additional ways (other than airtime transfer) in which use of mobile phones impact upon the conduct of monetary payments. The first is use of mobile networks to arrange financial transfers via friends and personal contacts which are subsequently handled in cash. The second is use of mobile networks to mitigate the risk of cash transfers by checking on status and completion. The extent of local innovation in this area tends to indicate that mobile users are motivated to reap the benefits of overcoming distance and time that mobile phone networks can offer.

Constraints on m-Payments

Financial Literacy. Research suggests that lack of financial literacy is a key constraint for poor households in the pursuit of asset-building strategies and effective financial management (Bell & Lerman, 2004; Sebstad & Cohen, 2003). In Ugandan terms financial literacy is defined as knowledge and information about personal, household finance, banking and banking systems. Asiimwe (2007:5) observes that...

"On the one hand, consumers are lacking information and good money management skills and thus are constrained in their ability to make informed choices. On the other hand, most MFIs have a capacity gap to direct the consumers on how best to access their services and to develop/deliver market-driven products respectively"

In Uganda, the way in which the poor obtain financial information and assimilate knowledge is under-researched. Johnson & Nino-Zarazua (2007) indicate that general education is the single most important factor. UNHS (2006) data shows that 20.1 percent of the population above the age of 15 have had no formal schooling and 43.3 percent have only completed some primary schooling. 14.1 percent have completed primary education, and 18.1 percent have attended secondary school. 3.4 percent of this cohort attended some form of post-secondary education. Education at secondary level is likely to command more stable formal sector employment and higher income.

Analysis of the unbanked (the majority of whom are not educated beyond the primary level) suggests that the main source of financial knowledge is local informal networks – friends, family and community-based organisations. For this reason there has been considerable effort in Uganda to deliver consumer education regarding financial services at the community level. For example, a Consumer Financial Education Programme (CFEP) has been created on the premise that service providers will not necessarily provide independent advice, and consumer education towards the building of financial literacy should be considered a public good. Lack of financial literacy amongst the unbanked is not only a constraint on effective decision making and choice of financial service, but also on assimilating the required skills to interact effectively with mobile phones and m-payments technologies (e.g., sending and receiving text-based information, loading and transferring credits or making use of money transfer services). Lack of literacy skills has been mentioned as a reason for lack of use of text-based services in Uganda where only 10 percent of the poorest use SMS compared with 82 percent of the richest. Operator phone services are preferred to public (non-operator) run phones, with key barriers identified as lack of confidence in the use of SMS and lack of menus in local languages.

Costs of Access. Mobile phone network coverage stands at 80 percent of the population in Uganda, but overall penetration is only 14 percent. This suggests significant cost constraints for use of mobile. Mobile phone subscriptions and call charges have fallen significantly due to competition amongst the four established network providers (MTN, Celtel, Zain and UTL). The average cost of calls per minute (off-peak=US\$0.20) stands at the lower end of the range for SSA countries and on a par with South Africa. However, whilst costs of calls/texts are falling, affordability still remains beyond the reach of the majority. This is illustrated when the cost of 100 minutes of use is considered as a percentage of GNI (Gross National Income) per capita. In Uganda this figure stood at 96 percent in 2007, which compared with only 7 percent for South Africa. A second constraint is the cost of the handset. These have fallen rapidly, although still far from the point where they could be considered as an affordable commodity available to the majority (ITU, 2008).

Use of formal m-payment services is predicated on mobile phone access. As in the case of M-PESA in Kenya this is achieved through personal access comprising ownership of a phone and subscription to the m-payments service of a network provider (e.g., Safaricom or MTN). It is difficult to predict the future costs of m-payment services, but the current charges levied by providers in South Africa and Kenya are a guide. MTN (mobile money) charge a flat rate fee of three rand (US\$0.36) for a single money transfer to another mobile money account or another bank account.^{xi} M-PESA, which is an agent-based system, charges from 75 to 400KSh (US\$0.97 to 5.15) to send money to a non M-PESA registered user (depending upon the amount transacted) and just 30KSh (US\$0.40) to send any amount up to 35,000KSh (US\$450) to an M-PESA registered user.^{xii} Registration for an M-PESA account is free of charge, and there are over 5,000 agents countrywide located within petrol stations, supermarkets, courier companies, cyber cafes, retail outlets and banks.

At the time of writing there is no information available concerning the initial charges levied by MTN mobile money in Uganda. Charges on a par with M-PESA are likely to be attractive given the lack of an alternative service. However, the ability to access

any service – including M-PESA – is dependent upon mobile phone ownership and the replacement of an old, or purchase of a new, SIM card. The extent to which the currently unbanked may be drawn into mobile phone ownership for the purpose of accessing m-payments services is likely to be highly price sensitive. In this respect, there is some evidence of the willingness of poor households in Uganda to prioritise expenditure on mobile phones, and the services they can offer, ahead of other essential items. For example, research conducted by Diga (2007) in the Wakiso District found that households were willing to substitute essential store-bought items, as well as transportation costs, for the purchase of mobile phone credits.

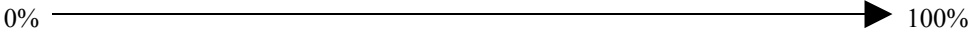
Organisational Factors. For access to cash-in and cash-out facilities the services of a local agent become essential unless the user is within reach of a collaborating bank branch. This has been the case with M-PESA which has attracted a majority of new subscribers that were previously unbanked. As with any banking institution, the client is being asked to place their money in the trust of others (Benamati & Serva, 2007). The need to build trust can be seen as a constraint in two respects. First, trust in technology – in the less conspicuous software designs, network architectures and operational models that lie behind the hardware interface of the mobile handset, and which underpin m-payment applications. Second, trust in the organisation that is offering the service, which for agent-based services is located at two different levels – that of the agent and the service provider. The importance of trust in the financial entity is emphasised with regard to M-PESA in research carried out by Morawczynski & Miscione (2008) who identify a multitude of problems of cementing trust between individual users and the plethora of agents that operate M-PESA. These problems, however, were largely overcome by the high levels of overall trust in the management and integrity of the system as a whole – a direct result of the trusted position of Safaricom in Kenyan society – and in particular the trust invested in the owner of the company who is a Kenyan national of high standing. Addressing issues of trust may be equally, if not more, significant in Uganda given that the studies reviewed in this paper report a particularly low level of trust of existing financial service providers amongst the unbanked.

New entrants, such as mobile network providers, may have an advantage in this respect. As demonstrated by M-PESA, cementing trust at the level of the agent is highly dependent on the effective operation of the system as a whole. However, the selection and make up of an agent network will be key to achieving a high level of market penetration. Partnerships with retail or banking chains that already have expansive networks have been successful in South Africa and Brazil^{xiii}, but such existing networks are less extensive in less wealthy and smaller countries such as Uganda. The approach of considering any business that regularly deals in cash would seem more appropriate and more likely to reach into rural areas at the sub-district level. In this respect, those in urban areas have an advantage in terms of the reduced time, costs and choice associated with access to agent-based services. Of those in rural areas almost all make use of public transport or go on foot to access financial services. FinScope (2007) indicate that 41 percent of rural dwellers report the journey to financial service access points taking less than 1 hour, and 42 percent between 1 and 3 hours. Any m-payments agent network would need to offer time savings over and above those reported in order to attract existing and new financial service users.

Conclusions

The analysis in Table 2 provides comparative estimates of key indicators of access to mobile and financial services in Uganda based on the secondary data sources surveyed.

Table 2. Estimates of Comparative Access to Financial and Mobile Services for Adults in Uganda

Adult Pop	0%  100%	
Financial access (1)	Financially served (38%)	Financially un-served (62%)
Type of financial access	Formal (18%) Semi-formal (3%)	Informal (17%)
Mobile coverage (2)	With network coverage (80%)	No coverage (20%)
Mobile access (3)	With phone access (42%)	Without access (58%)
Mobile ownership (4)	With phone ownership (20%)	Without ownership (80%)

(1) & (3) Based on calculations from a representative sample of 2,959 adults (FinScope, 2007)

(2) Based on ITU (2008)

(4) Based on mobile subscription rate of 13.58 per 100 (ITU, 2008) of the total population which has been adjusted to exclude 50% of the population who are recorded to be below the age of 15 (UNHS, 2006). This figure has then been adjusted by a factor of 0.75 as an estimate of the difference between subscription and actual ownership according to the estimate of Heeks (2009).

It is useful to consider these estimates in the light of the access frontier methodology applied by Porteous (2007; 2005) and make a comparison with findings from South Africa. Porteous (2007) estimated (also on the basis of FinScope data from 2006) that 51 percent of the adult population of South Africa were banked (predominantly in formal and semi-formal institutions). Amongst those with bank accounts 37.3 percent owned a cell phone, whilst 13.7 percent did not. Amongst those without a bank account 15.5 percent owned a cell phone and 33.65 percent did not. The unbanked group with phone ownership (4.8 million adults in South Africa) constituted the current access frontier, and a large potential new market for m-payments or m-banking services. The position in Uganda is slightly different due to the overall lower level of mobile phone penetration (see Table 1). In line with the findings of Johnson and Nino-Zarazua (2007) and UNHS (2006) the estimates for Uganda suggest a strong correlation between formal/semi-formal sector financial service participation and mobile phone ownership generating roughly equal numbers equating to approximately 20 percent of the adult population. Thus, the potential pool of mobile phone owners who may be potential new banking customers may be small. In South Africa there existed a far larger pool of potential users of m-payment or m-banking services. However, even in these more favourable market conditions the findings from Porteous (2007) conclude that m-banking initiatives had little impact on shifting the access frontier...

"The conclusion is that they have not; the account features are similar to existing bank accounts, and if anything, they may cost more. There is evidence of substantial ignorance about

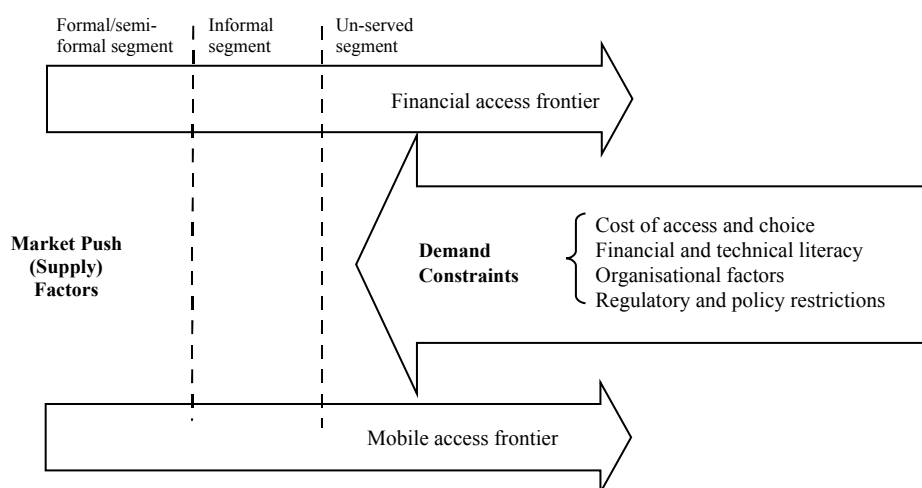
mobile banking even among presently banked customers, and also considerable mistrust of banking using these devices.” (Porteous, 2007:4)

In this respect the type of m-payments service and the nature of the product offered may be crucial. Generic m-banking services offered by network service providers in collaboration with established banks are likely to be aimed at the ‘can reach now’ market segment comprising the proportion of the population already banked in the formal sector. Mas & Kumar (2008) recognise this in terms of the motivation of service providers to sell more services to existing customers and to retain valued customers. There is also the incentive of encouraging existing customers of other banks to switch to those offering m-payment services.

As illustrated by the case of M-PESA, addressing the needs of the unbanked majority will likely require a more tailored solution. In Uganda the segment of the population that may be most attracted to m-payments services are those who currently bank and conduct their finances through informal organisations, which according to estimates comprise approximately 17 percent of the adult population, and who, in the terms of Porteous, constitute the future access frontier. Research suggests that the barriers of affordability of phone ownership are lower in this group and their financial literacy is likely to be higher due to their group participation. Johnson and Nino-Zarazua (2007) in research conducted in the informal sector identify that... ‘6-8 percent of the (total Ugandan) population have the characteristics of the formally included, but are excluded. They represent a group to whom banking could be most easily extended.’ Evidence of dissatisfaction with the operation of informal groups may also be a spur for some participants to migrate to new affordable formal sector services delivered by mobile phone via local agents, although it is likely that many existing participants will also elect to continue to participate in their local groups.

The model outlined in Fig 2 encapsulates the analysis carried out in this paper.

Fig 2. m-Payments Analysis Model



Source: Author

In line with Porteous (2007; 2005) it suggests that the frontier for both financial and mobile service access is conditioned by market supply and demand factors. Within

the formal/semi-formal market segments market mechanisms are likely to provide an effective means to deliver m-payment services within a competitive environment. Reaching the informal segment will likely require more tailored solutions (as described above in relation to M-PESA). Addressing the needs of the mass of the financially un-served (the involuntarily excluded) will require greater ingenuity and innovation on the behalf of service providers. In the first instance, there is a need to more accurately define the extent of mobile phone ownership and use amongst this group. It is likely that penetration will have risen, possibly quite considerably, since 2007, and it will likely continue to increase in the future. There is also a need to understand more fully how mobile phones are used by the poor. Evidence suggests that mobile is more likely to be used as a tool to communicate and coordinate cash transactions, rather than to deliver funds electronically. The extent and impact of use of airtime as a currency is also unknown. If mobile networks are to facilitate cash transfers for this group it will be necessary to enable access to services for those who do not own phones, and to those who do not have access within their immediate vicinity. This will require an intermediated solution and effective participation and inclusion of appropriate community-based groups in m-payments initiatives.

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Endnotes

ⁱ Mobile Money Transfer (MMT) is a mobile payments service that is being offered by MTN (Uganda) in partnership with Stanbic Bank. The partnership is being forged to ensure full compliance with financial service regulations. The service is also due to be launched in Cameroon, Ghana, Cote d'Ivoire and Nigeria. See: Van der Merwe, C. (2009) 'MTN launches Uganda mobile banking services', Creamer Media's Engineering news on-line, pub 10 Mar 09. [On-line]

<http://www.engineeringnews.co.za/print-version/mtn-launches-uganda-mobile-banking-services-2009-03-10> [Accessed 20/04/09]

ⁱⁱ Porteous (2007) distinguishes between transformational and additive m-banking or m-payments applications. Applications are transformational if they target the section of the population that is currently unbanked. They are considered to be additive if they merely provide an alternative banking channel for existing customers to switch to.

ⁱⁱⁱ International Telecommunication Union (2008) data shows in the case of the poorest continent – Africa – mobile penetration for individual countries has increased from an average of 2% of total population in the year 2000 to an average of 25% in 2007. This impressive growth masks extreme variations between countries, but overall, mobile cellular networks have now extended coverage to over 60% of the total African population creating network access potential for previously un-served communities in some of the poorest countries. Many sub-Saharan African countries with a GDP per capita less than US\$500 (in 2007) are fast approaching near universal mobile network coverage. For example, Ghana stands at 68%, Rwanda at 80%, Sierra Leone at 70% and Uganda at 80% coverage of the total population.

^{iv} Batchelor et al (2007) who demonstrated (using data from 650 households in Senegal) that amongst the poor, informal (cash-based) financial systems predominate even amongst the 12-15 percent of the sample that were banked or belonged to credit unions. Forty percent expressed confidence in any future m-payments system for sending or receiving remittances, identifying a strong need amongst the poor to facilitate transfers and payments of small value that become uneconomic when transaction costs are high.

^v On the basis of a 2009 exchange rate of US\$1=US\$1

^{vi} Payment in kind is payment for goods and services made in the form of other goods and services rather than cash or other forms of money. Payment in kind is different from [barter](#) because the payer gets the same goods and services in return, not other goods and services of equivalent value, as is the case in barter.

^{vii} This is reflected in a wide variation in the importance of monetary and other transfers between regions ranging from 2.1 percent of households in the Western Region to 13.2 percent in the troubled Northern Region. This is accounted for through transfers conducted by relief agencies to the many displaced peoples in the North as well as via personal transfers.

^{viii} See: CGAP (2008a).

^{ix} There are at least five reasons for this: a) some individuals have multiple subscriptions; b) visitors to Uganda may buy a subscription/card for their phone during a short-term visit; c) some people living in neighbouring countries may subscribe when they live close to the border within service range; d) subscriptions are counted for some period of days/months after the last use and some of these subscriptions may be on cards/phones that are now discarded; e) some may have a SIM card and no phone (Heeks, 2009).

^x LC1 is the lowest administrative unit for the purpose of compiling census data. It is usually consistent with a village or parish in a rural area. Typically a parish will contain between 500 and 1000 households.

^{xi} For a full list of charges for MTN mobile money in South Africa, see:

http://www.mtnbanking.co.za/SBIC/Frontdoor_MTN_02_01/0,2547,12865163_12866081_0,00.html

^{xii} See: <http://www.safaricom.co.ke/index.php?id=748> for a full list of M-PESA charges

^{xiii} For example, since 2000 there has been an unprecedented growth in the outreach of Brazil's banking system. The most striking has been the huge expansion in 'correspondent banking outlets' with 32,000 new outlets created between 2000 and 2004. The correspondent outlets focus mostly on transaction and payment services, including government benefits and payment receipts, as well sale of pre-paid cell phone cards and SIM cards. Correspondent outlets have been particularly successful in reaching poor clients, due to the considerable reduction in variable and fixed costs of providing services (see: Kumar et.al, 2006).