A Pathway to Financial Inclusion: Mobile Money and Individual Savings in Uganda

By

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Abstract

This study provides a micro perspective on the impact of mobile money services on individual's saving behaviour using the 2013 Uganda FinScope data. Results show that although saving through the mobile phone is not common practice in Uganda, being a registered mobile money user increases the likelihood to save with mobile money. Saving using mobile is more prevalent in urban areas and the Central region compared to other regions. This can be explained by: one, rural dwellers tend on average to have lower incomes and thus have lower to savings compared to their urban counterparts. Similarly, residents of the central region have higher incomes and thus high savings compared to residents of other regions. Secondly, poor infrastructure in rural areas in terms of lack of electricity and poor telecommunication network coverage may limit the use of mobile phones and consequently the use of mobile money as a saving mechanism. Overall the use of mobile money as a saving mechanism is still very low and this could be partly explained by limitations in the legislation that doesn't incorporate mobile finance services into mobile money. The absence of interest payments on mobile money savings also may act as a disincentive to saving through this mechanism. Given the emerging mobile banking services, there is need to create more awareness and the need for enhanced synergies between telecom companies and commercial banks.

Keywords: Mobile Money, Financial Inclusion, Savings, Uganda

1. Introduction

Exclusion from the formal financial system has increasingly been identified as one of the barriers to eradicating poverty (Donovan 2012). Indeed lack of access to financial services

such as credit and savings reduces households' ability to invest, save and respond to shocks (Aker & Wilson, 2013). At a macro level, low levels of financial inclusion lead to lower economic growth and exacerbate income inequality (World Bank 2008; Demirgüç-Kunt *et al.* 2008). Financial inclusion refers to the absence of price or non-price barriers in the use of financial services (Sharma & Kukreja 2013). In other words, financial inclusion comprises of all initiatives that make formal financial services available, accessible and affordable to all segments of the population (Alliance for Financial Inclusion (AFI) 2013).

In comparison to other parts of the world, Africa registers the lowest levels of financial inclusion amongst its population that is largely poor. Only 25 percent of the adult population own an account in a formal financial institution compared to 39 percent in Latin America and the Caribbean, and 89 percent in high income countries (Demirgüç-Kunt & Klapper 2013). Consequently a number of African governments have adopted financial inclusion as one of the key issues to address in their policy agendas as a means to spur economic growth and development. To achieve financial inclusion, the evolution of mobile money has been cited as a game changing agent in the financial inclusion for the poor (IFC Mobile Money report 2011; ITU-T 2013; EPRC 2013). Mobile money technology is a viable platform for financial services to be extended to large sections of the population at a relatively cheaper cost, as compared to traditional branch-banking that requires substantial investments both in infrastructure and personnel (Jack & Suri 2011; Nandhi 2012).

In Uganda, there are various efforts both by government and its partners to sustainably improve financial inclusion. For instance, the financial inclusion project of Bank of Uganda (BoU) intends to expand access to financial services to a cross-section of Ugandans. One key avenue to achieving this goal is through the growth of mobile money services in the country (BoU, 2013). In 2006, 62 percent (8.1 million) of Ugandans were financially excluded with only 18 percent (2.4 million) having an account in a formal financial institution including commercial banks, Microfinance Deposit Institutions (MDIs) or credit Institutions regulated by the BoU. Only three percent were served by semi-formal Savings and Credit Cooperatives (SACCOs) or microfinance institutions (MFIs), while 17 percent (2.2 million Ugandans) used informal financial services through informal groups like Accumulating Savings and Credit Association (ASCA), Village Savings and Loan Associations (VSLA) and Rotating Savings and Credit Association (ROSCA) (FinScope II Report 2007). The introduction of mobile money in 2009, was followed by an increase in the proportion of the population using formal non-bank financial services from 7 to 34 percent (EPRC 2013). On the other hand, the use of informal services reduced from 42 percent to 31 percent between 2009 and 2013; these developments are largely attributed to the evolution and adoption of mobile money.

Despite these efforts and developments, there is limited empirical evidence on the extent to which mobile money services have impacted the saving behaviour of Ugandans. It is against this background that this study sought to provide a micro perspective on the impact of mobile money services on individuals' saving behaviour for purposes of promoting financial inclusion

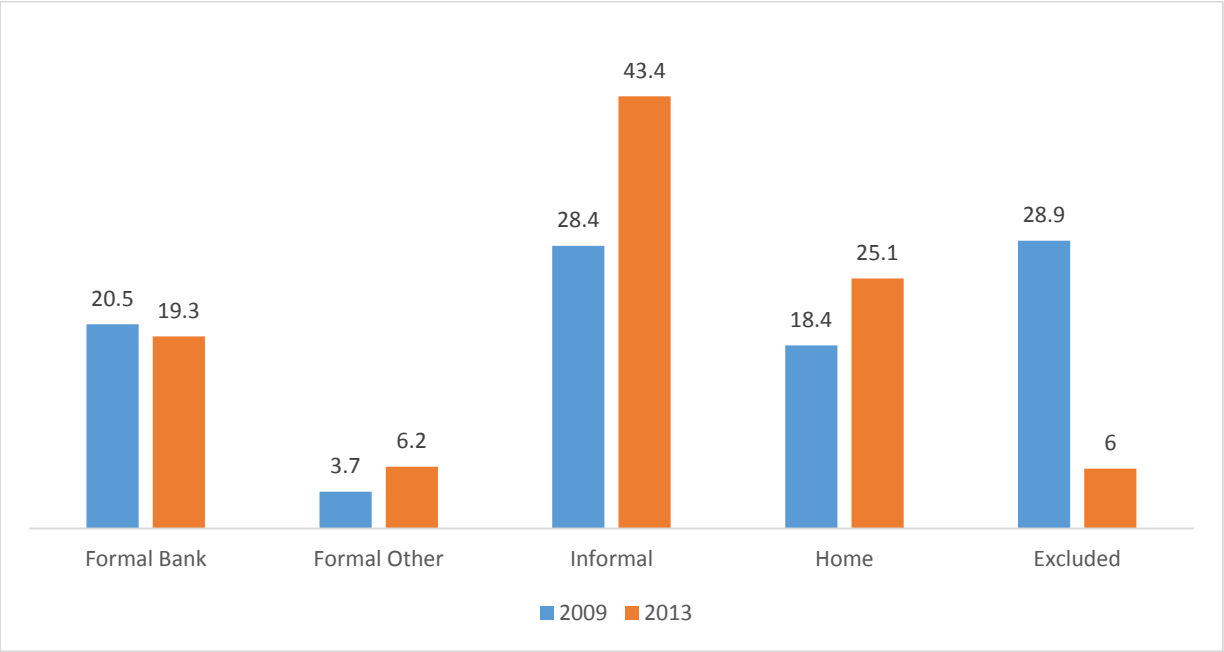
in Uganda. Using the 2013 Uganda FinScope data, the paper employs the probit and instrumental variable probit modelling techniques to examine the effects of being a registered mobile money user on individual savings behaviour. Specific study objectives included: determining the extent and use of mobile money as savings means in Uganda and determining the extent to which being a registered mobile money user impacts on an individual's propensity to save. We contrasted the factors that influence an individual's choice in saving in the different ways namely formal, informal, non-bank formal and through mobile money. Similar to Jack &Suri (2012) and unless otherwise stated, in this paper, saving through mobile money refers to keeping money on a mobile money account for future use. Findings from the study show that, saving through mobile money is not a common practice in Uganda but being a registered mobile money user increases the likelihood to save. Similarly, those unable to access financial institutions due to distance are also less likely to save with mobile money. Spatially, individuals in Kampala and the central region show a higher propensity to save through mobile money than their counterparts in other regions.

The paper is organized as follows: section one provides the introduction of the study and a brief overview of mobile money growth in Uganda, section two presents both the theoretical and empirical literature while section three presents the methodology and data. The study results are presented and discussed in section 4 while section 5 presents the conclusions and policy options.

1.1 An Overview of Mobile Money Growth in Uganda

Like most developing countries, Uganda is grappling with low levels of financial inclusion. Statistics show that in 2013 only 20 percent of the adult population had accounts in formal regulated financial institutions, nearly 34 percent were using only the non-bank formal/semiformal institutions and 31 percent were using informal institutions and an estimated 2.6 million adult population were financially excluded (EPRC 2013). In terms of savings, despite the fall in exclusion from 28.9 percent in 2009 to 6 percent in 2013, majority of the adult population saved through informal means (figure 1).

Figure 1: Savings Mechanisms in Uganda



Source: EPRC, 2013

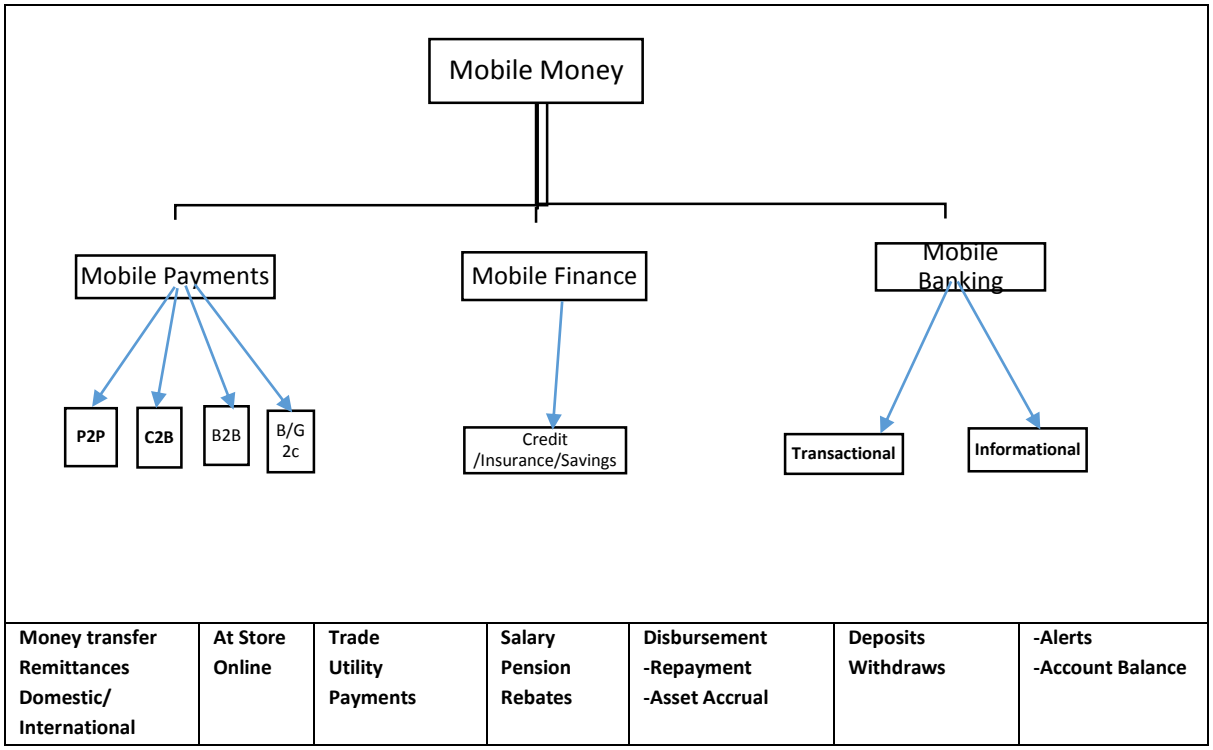
Mobile money use and its evolution in Uganda

Mobile money refers to the use of mobile phones to perform financial and banking functions (IFC Mobile Money report 2011). This definition encompasses a number of services which include payments (such as person to person transfers, utility payments), finance (such as insurance products), and mobile banking (such as account balance inquiries), among others (Donovan 2012; Gencer 2011). Globally, the growth of mobile money has been phenomenal particularly in developing and emerging economies where a large proportion of the population are excluded from the more formal traditional financial services (GSMA 2014).

The Structure of Mobile Money

Figure 2 presents the structure of mobile money services. Under mobile payments we have person to person (P2P), sometimes referred to as peer to peer, which represents remittances both domestic and international, customer to business (C2B) which encompasses payments for retail good purchased at the store or online, business to business (B2B) which represents payment for good and services between firms, and Business to Government or Government to customers (BlG2C) which includes salary payments, taxes, pension etc. Under mobile finance we have the provision of credit, savings, insurance and other financial products. While in mobile banking we have transactional and informational services like checking for account balance etc.

Figure 2 Structure of Mobile Money Services



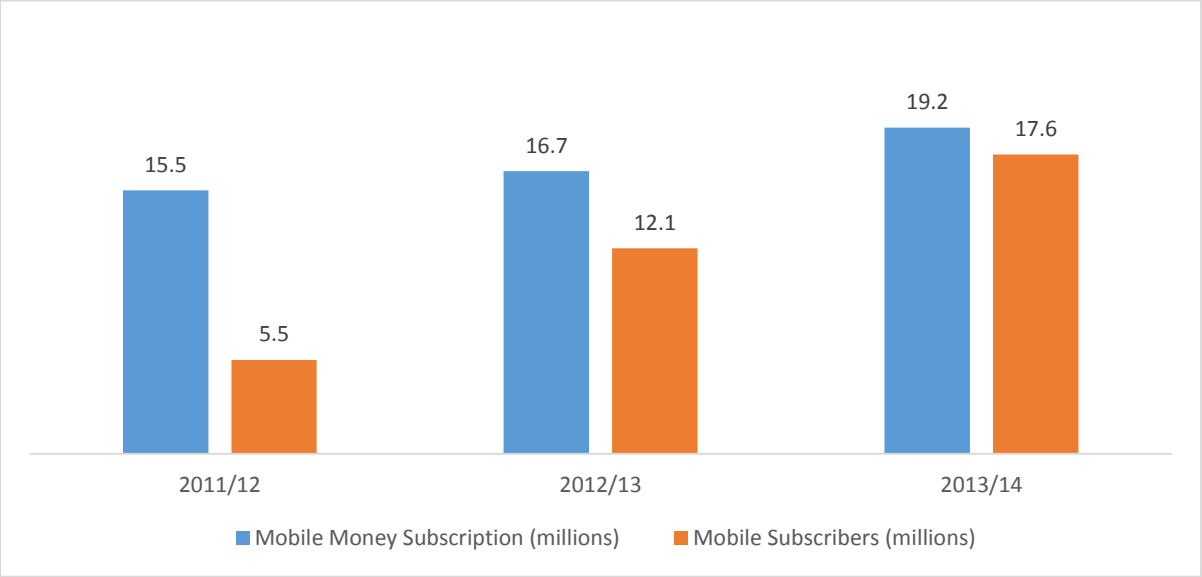
Money transfer **Remittances** **Domestic/** **International**	**At Store** **Online**	**Trade** **Utility** **Payments**	**Salary** **Pension** **Rebates**	**Disbursement** **-Repayment** **-Asset Accrual**	**Deposits** **Withdraws**	**-Alerts** **-Account Balance**

Source: Adapted from Gencer, 2011

Mobile money was introduced in Uganda in 2009 by MTN[1] following successful launch of M-Pesa[2] in Kenya in 2007. MTN was followed by other mobile network operators (MNOs) namely Warid, Airtel, Uganda Telecom Ltd, Orange Telecom. Since its introduction, the number of mobile money registered account holders has grown tremendously in Uganda from 3 million in 2011 to over 17.6 million in 2014 (Uganda Communications Commission 2015). The number of mobile phone subscription has increased from nine million in 2009 to over 19.2 million in 2014 (Figure 2), surpassing the 5.6 million account holders in formal financial institutions including commercial banks, Credit Institutions (CIs) and Microfinance Depositing Taking Institutions (MDIs)) combined. The number of mobile money agent's stands at over 1,790 as compared with 477 commercial bank branches with 699 Automated Teller Machines (ATMs) (Appendix 2).

[1] MTN is a phone network in Uganda and has the highest number of customers.
[2] M-Pesa (M- for mobile and PESA for money in Swahili) a mobile phone based transfer and microfinancing service centre launched in 2007 in Kenya. M-Pesa allows users to deposit money and send balances.

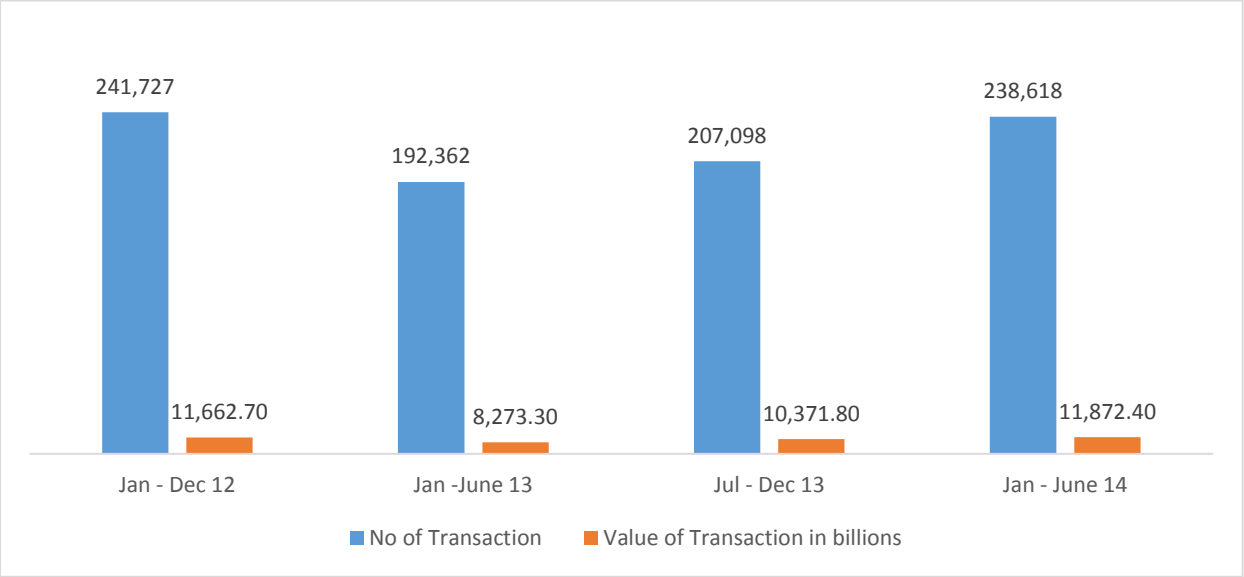
Figure 3: Mobile Phones and Mobile Money Subscription Statistics



Source: Uganda Communications Commission, 2015

Between 2011 to June 2014, the number of mobile money transactions grew by 24 percent and the value of transaction grew as well by 43.4 percent (Figure 3). This rapid growth of mobile money in terms of subscription and value of transaction demonstrates its increasing importance in the financial sector and the overall economy. The increase in mobile money registered accounts is partly attributed, the increased mobile phone usage and the mandatory registration of SIM cards in 2012. Consequently, the ratio of mobile money subscription to total mobile phone subscribers increased from 36 percent in 2011/12 to 92 percent in 2013/14.

Figure 4: Number of transactions and value of transactions



Source: Uganda Communications Commission, 2015

Mobile Payments; Initially Mobile Telephone Network Operators (MNOs) largely offered person to person money transfer services, however due to technological advancements and increased demand, operators now offer a wide range of products and services such as payments for utility bills, school fees, airtime purchases as well as sending and receiving remittances domestically and internationally.

Mobile Banking Services; the mobile money platform has expanded further with MNOs partnering with other financial institutions like commercial banks to offer mobile finance services. Individuals can now link to their bank accounts through their mobile phones. This is expected to reduce commercial bank transaction costs and in turn increase financial inclusion in Uganda.

In addition a number of banks have set up mobile finance platforms to offer mobile banking to both bank and non-bank clients. For example, Bank of Africa through the Bank of Africa Mobile Wallet offers mobile money services to both their bank customers and non-bank customers. The mobile wallet application offers a wide range of services which include; checking account balance, requesting bank statement, viewing last 5 transactions, requesting for a cheque book, blocking Automated Teller Machine (ATM) cards, transferring money from a Mobile Wallet account to a Bank of Africa account, transferring money from Mobile Wallet account to an account in another bank, transferring money from Mobile Wallet account to any mobile number on any network, withdrawing money from the ATM without a card, sending TT (Sending money/payments to anywhere in the world), paying utility bills (like "Umeme", Water, DSTV, Star Times, and School Fees etc.) and buying airtime regardless of which network one is subscribed to. Centenary bank through CenteMobile also offers a number of services which include paying utility bills (Umeme, NWSC, and DSTV), monitoring and checking account balance, purchasing airtime, transferring money from one Centenary

Bank account to another Centenary Bank account and requesting for mini-statements. Number of other commercial banks have similar platforms that offer a wide range mobile money services. These include Equity bank, DfCU etc. The expansion of mobile money beyond mobile payments indicates it ability to improve financial inclusion. On the supply side, these development are likely to reduce commercial bank transaction costs and in turn improve financial inclusion. On the demand side, customers are able access their account at their convenience regardless of time of the day, reduce on the costs of travelling to bank branches as well time spent in line at banking halls.

Mobile Finance; MNO have moved beyond mobile payments and mobile banking to include mobile finance services. With the help of mobile money, financial services like insurance can be extended towards the general public at cheaper and affordable rates. For example, in 2013, MTN in partnership with AON and Jubilee Insurance launched a life insurance policy, ("MTN LifeCare"). MTN customers can subscribe to this life insurance policy through MTN Mobile Money services for UGX. 7,500 to UGX. 22,500 (approximately 2 US Dollars fifty cents to 8 US dollars) per year which will provide death benefits of UGX. 1,000,000 to UGX. 5,000,000 (approximately 345 and 1725 US Dollars) respectively. The registration process is simple and convenient. A customer just simply dials *221# to get insured with no additional paper work required.

Despite the noted developments, mobile finance is still limited in Uganda partly due to limitations in legislation. While mobile money falls under financial services, MNOs are licensed and regulated by the Uganda Communications Commission. Under the law, financial services are regulated by Bank of Uganda under the Financial Institutions Act, 2004. This contradiction has led to questioning of the legality of mobile money service provisions in Uganda. For example, in 2012 MNOs were sued by a Member of Parliament for the provisional of financial services with no license from the central bank.

In 2013, Bank of Uganda designed guidelines to address mobile money issues. Under these guidelines, mobile money is defined as "e-money available to a user to conduct transactions through a mobile phone and mobile banking as the use of a mobile phone to perform transactions on one's account in a licensed institution (including balance inquiries, mini-statements, statements and cheque books requisitions, forex rates enquiries and funds transfer to other nominated bank accounts)" (BoU, 2013). However, this definition is limiting and doesn't include mobile finance products like insurance, savings or credit. As such no interest is paid on mobile money in Uganda and therefore in this paper unless otherwise stated, saving through mobile money refers to keeping money on a mobile money account for future use.

Overall, mobile money is evolving in Uganda beyond mobile transfers to broadly encompass other dimensions of financial inclusion.

2. Review of related literature

A number of studies have been done on the use and growth of mobile money in developing countries particularly in sub Saharan countries (Allen *et al.* 2014; Nandhi 2012; Jack & Suri 2011). Literature shows that mobile money technology has spread tremendously across the world particularly in developing economies since its introduction a few years ago. This phenomenal growth of mobile services has been aided by a number of factors including the increase in the use of mobile phones in developing countries (GSMA 2014) as well as the cost of and ease of transaction (Jack & Suri 2012).

Developing countries are faced with a number of challenging factors majorly attributed to high infrastructural costs that exclude the poor from accessing formal banking services. Mobile money has a potential to significantly expand financial inclusion for the poor given its ability to improve access to underserved areas and its high convenience to customers (Di Castri 2013). In Uganda, the increased use of mobile money has been due to the increased use of mobile communication services. The number of mobile telecommunication companies has increased leading to lower costs of mobile communication services (EPRC 2013). This coupled with the availability of cheaper phones has made it possible for a larger portion of the public to acquire mobile phones. The increased use of mobile phones in Uganda has thus aided the quick adoption of mobile money services.).

Mobile money provides a safe and cheaper avenue for storing and transferring money across long distances for a number of household (both banked and unbanked). Before the introduction of mobile money, most households in developing countries like Uganda delivered remittances via hand or informally through friends or bus drivers while a large number stored money informally at home. The available formal channels like banks, Western Union etc. were and still are quite expensive and inaccessible to the average household. The whole process of transferring money was thus expensive, fraught with delays, and involved substantial losses due to theft (Jack & Suri 2011; ITU-T 2013). The introduction of mobile money has thus led to increased access to safe and cheaper means of transferring money between households and firms. Indeed the introduction of mobile money has led to a reduction in transfer charges by other formal transfer service providers like banks and Western Union. Studies conducted elsewhere (such as Mbiti & Weil 2011 on Kenya) find a significant reduction of prices of transfer services offered by various firms.

The reduced transaction cost resulting from the use of mobile money has a positive impact on household welfare. Jack & Suri (2011) find that mobile money has a significant impact on the ability of households to spread risk due to the reduction in transaction costs. Their findings show that while shocks reduced per capita consumption by 7 percent for households not using mobile money, the consumption of households with access was unaffected. Likewise Munyegera & Matsumoto (2014), investigating the impact of this mobile money on rural household welfare, using household survey panel data from rural Uganda discover that

mobile money increases household per capita consumption by 69 percent. Their findings further reveal that rural households using mobile money are more likely to receive remittances unlike their counterparts not using mobile money.

By providing a quick and cheaper avenue for transferring money, mobile money facilitates trade by making it easier for people to pay for, and to receive payment for, goods and services (Jack & Suri 2011). In addition mobile money facilitates payment of utilities (like water and electricity) and airtime purchases, among others, save household the time to walk to utility payment points.

Most of the evidence shows that mobile money is primarily used for sending and receiving money (EPRC 2013; ITU-T 2013) and less for savings and credit facilities. Nevertheless, by providing a safe storage mechanism, mobile money has the potential to increase net household savings and overall improvement in financial inclusion (Nandhi 2012; Mbiti & Weil 2011). Jack & Suri (2012) using two rounds of data set collected in 2007 and 2008 find an increased proportion of households using mobile money to save their earnings. Their definition of savings was however limited to whether or not an individual had a balance reserve in their phone. Amongst the reasons attributed to saving money on their mobile money accounts and not elsewhere were- the ease of use, safety reasons and emergency situations. Similarly, while analysing data from the 2006 and 2009 financial surveys for Kenya, Mbiti & Weil (2011) showed that that the adoption of mobile money decreases the use of informal saving mechanisms such as ROSCAS in addition to increasing the frequency of sending transfers.

Overall, evidence shows that innovations in the mobile money sector that encourage households to save through minimizing the transaction costs and the risky nature of informal saving methods, increase the possibility of saving by low income earners (Nandhi 2012). In India for example, a saving mechanism from phone to bank account encouraged low income earners such as vegetable sellers, taxi operators to save directly from the phone to the bank and it substituted for informal saving methods that were risky (ibid). This service is also available in Uganda between MTN and Centenary bank. In Tanzania, Tigo Tanzania pays out interest accrued on a mobile money account; an incentive that is directed towards encouraging mobile money savings (GSMA 2014). For greater financial inclusion in terms of saving products and credit, there is a need for new approaches in terms of new services, delivery channels and providers (Allen *et al*. 2015).

3. Data and Methods

3.1 Data

The paper draws heavily on the nationally representative 2013 Uganda FinScope[i] data on demand for, access and usage of financial services. The Finscope III survey builds on the

previous nationally representative FinScope I and II surveys conducted in Uganda in 2006 and 2009 respectively. However, FinScope III included a detailed module on mobile money.

Sampling design and sample size.

Finscope III survey was based on a two stage stratified random sampling design. In the first stage selection was done by region and stratum (rural/urban). This first level of stratification corresponded to the geographic domains of analysis which are the national, five regions and whether the area is rural or urban. In each stratum, the Primary Sampling Unit (PSU) was the Enumeration Area (EA) and was selected systematically using the probability proportional to size within each stratum. The selection of EA was the second stage of stratification and was the ultimate sampling unit. Within each EA, 8 households were targeted and household selection was by simple random sampling. Within each household, one adult person (aged 16 years and above) from a list of all adults in given household was selected using KISH grid method. In this study we use a total of 3,401 individuals; the actual sampled households with complete information.

Scope of the survey

The survey captured information on the extent to which financial services and products are used, by whom and what constraints are faced by individuals who do not use financial services. The survey captured information at individual (one individual aged 16 years and above from each sampled household) and household level that is relevant for this study. The individual level information include: age, sex, education, socio economic characteristics and use and non-use of financial services; and at household level variables included: wealth status of household and regional location.

3.2 Methods

Instrumental variable probit models

The paper employs the instrumental probit and probit models to examine the effect of being a registered mobile money user on the savings behaviour of individuals. Being a registered mobile money user is potentially endogeneous in the equation of whether an individual saves or not. EPRC (2013) established that the use of mobile money is highest among the wealthier, the educated and individuals in the younger age group. Given the endogeneity[3] of being a registered mobile money user on saving in mobile money, the use of instrumental variable probit model potentially sorts the problem by allowing for the use of instruments. Instrumental variable probit uses maximum likelihood estimation and stata allows for the Wald test of exogeneity. In the Wald test for exogeneity, the null hypothesis is no endogeneity and if the test statistic is not significant, then there is no sufficient information in the sample to reject the null. From Appendix 1, being a registered mobile money user is only endogenous

[3]

in the equation on whether an individual saves with mobile money or not (Equation 1) and is exogenous in other equations.

To compare factors that influence registered mobile money users to save with mobile money, the dependent variable is whether an individual saved with mobile money or not in 2013. This is as expressed in Eq. (1). We contrast this with the choice for other saving mechanism – formal, informal and non-bank formal. Formal saving mechanisms are financial institutions that are directly supervised and regulated by BoU.

(1) $$Y_{ij} = G(\beta_0 + \beta_i X_i + \varphi)$$

Y_{ij} is the dependent variable of whether an individual saves with a given saving mechanism or not . The different saving mechanism include formal, informal, non-bank formal or by using mobile money. G is the standard normal cumulative distribution function (cdf), β_0 is a constant, β_I is a vector of coefficients and X_i is a vector of variables that affect the behaviour of the individual to save money while ϕ is the error term. We only consider registered mobile money users of the regression for Eq. 1. A description and the likely sign of these variables is described in **Error! Reference source not found.**. Estimation of the log function of the above equation is by maximum likelihood.

To ascertain the impact of being a registered mobile money user on the propensity to save using mobile money, we use Eq. (2).

(2) $$Mobile\_saving = \beta_0 + \beta_1 X_I + \beta_2 X_1 Y + \beta_3 X_1 Z + \beta_4 H + \mu$$

Where X_1 is whether an individual is a registered mobile money user or not, $X_1 Y$ is an interaction of whether an individual is a registered mobile money user and location (rural or urban) and $X_1 Z$ is an interaction of whether someone is a registered mobile money user and distance to financial institutions while H represents other covariates that affect saving using mobile money such as wealth status, regional location etc. The impact of being a registered mobile money user will be ascertained by variables X_1, $X_1 Y$ and $X_1 Z$.

The variables that we use to instrument whether an individual is a registered mobile money user or not are: distance to the nearest shop, a dummy variable of whether mobile money is accessible or not and whether mobile money is cheap or not. The description and the anticipated signs of the variables are shown in Table 1 below:

Table 1: Description and anticipated signs of variables used in estimation

		Expected effect on the likelihood to save through			
Variable	**Description of the variable**	**Formal means**	**Informal means**	**Non-Bank Formal**	**Mobile money**
Registered mobile money user	Whether an individual is registered with mobile money or not	Positive	Negative	Negative	Negative
Have a bank account	Whether an individual has a bank account or not	Positive	Negative	Positive	Positive/Negative
Individual is in Rural place	Whether an individual resides in the rural areas or not	Positive/Negative	Positive	Positive	Positive
Registered rural mobile money user	Whether an individual is registered rural mobile money or not	Positive/Negative	Negative	Positive	Positive
Interaction of registered and distance to semiformal institution	Interaction of registered and distance to semiformal institution	Positive	Negative	Positive	Positive
Distance to semiformal institution	Distance in km to semiformal institution	Negative	Positive	Negative	Positive/Negative
Respondent Age	Age of the respondent	Positive/Negative	Positive	Positive	Negative
Distance to market	Distance in km to the market	Negative	Positive	Negative	Positive
Some primary	Individual has a primary education or not, we contrast it with one without primary education	Positive	Negative	Positive/Negative	Positive/Negative
Completed primary	Individual has a completed primary or not, we contrast it with one without primary education	Positive	Negative	Positive/Negative	Positive/Negative
Secondary and above	Individual has a completed secondary or not, we contrast it with one without primary education	Positive	Negative	Positive/Negative	Positive/Negative
Second wealth quintile	Individual is in the second wealth quintile or not	Positive	Negative	Positive/Negative	Positive/Negative
Third wealth quintile	Individual is in the third wealth quintile or not	Positive	Negative	Positive/Negative	Positive/Negative
Fourth wealth quintile	Individual is in the fourth wealth quintile or not	Positive	Negative	Positive/Negative	Positive/Negative
Eastern	Individual is located in eastern Uganda; we contrast it with individual located in central Uganda	Positive/Negative	Positive/Negative	Positive/Negative	Positive/Negative
Northern	Individual is located in Northern Uganda; we contrast it with individual located in central Uganda	Positive/Negative	Positive/Negative	Positive/Negative	Positive/Negative
Western	Individual is located in Western Uganda; we contrast it with individual located in central Uganda	Positive/Negative	Positive/Negative	Positive/Negative	Positive/Negative

4. Results and Discussions

4.1 Awareness and use of mobile money

Across economic status, gender, regions and education, there is a considerable number of people who own phones and are aware of mobile money services (Table 3). However, across gender, age group, educational attainment, employment status and wealth quintile, there are variations in ownership and awareness. In general, ownership of mobile phones and awareness of mobile money services is higher among males and people with higher education levels. Predictably, Kampala has the largest percentage of mobile phone ownership and mobile money service awareness while northern Uganda lags behind all the other regions. Interestingly, although a considerable number of people within all categories have ever used mobile money or are active mobile money subscribers, fewer people are actually registered mobile money users. Results show that 56 percent of individuals report having used mobile money although only 33.7 percent are registered users (Table 2). This implies that a significant number of people make over the counter transactions (OTC) (though a mobile money agent) or use another person's mobile account either a friend or a family member. OTCs have identified been as a barrier to increasing mobile money services thus might limit the spread of financial inclusion.

Table 2: Awareness of mobile money

Characteristic	Population share, %	Knowledge about mobile money	Registered user	Currently using
Uganda		76.8	33.7	56.0
Gender				
Female	52.5	73.3	27.6	52.5
Male	47.5	80.7	39.9	59.7
Age Group				
Below 18	3.1	75.0	8.8	33.7
18-24	19.8	84.5	31.2	53.9
25-39	41.1	80.9	39.0	61.3
40-59	23.9	74.4	34.3	56.1
60+	12.2	55.3	20.8	42.4
Educational attainment				
No formal education	23.7	54.6	18.1	39.2
Some primary	37.4	72.8	21.9	45.2
Completed primary	15.2	86.8	35.4	58.8
Some secondary	9.7	88.7	44.3	70.7
Completed O level & above	14.0	96.6	59.8	77.4
Employment status				
Self Employed	63.8	76.6	31.3	55.1
Paid Employees	16.3	80.9	48.4	68.7
Contr. Family members	5.3	70.7	34.0	51.0
Not working	14.7	75.0	26.5	46.5
Wealth quintile				

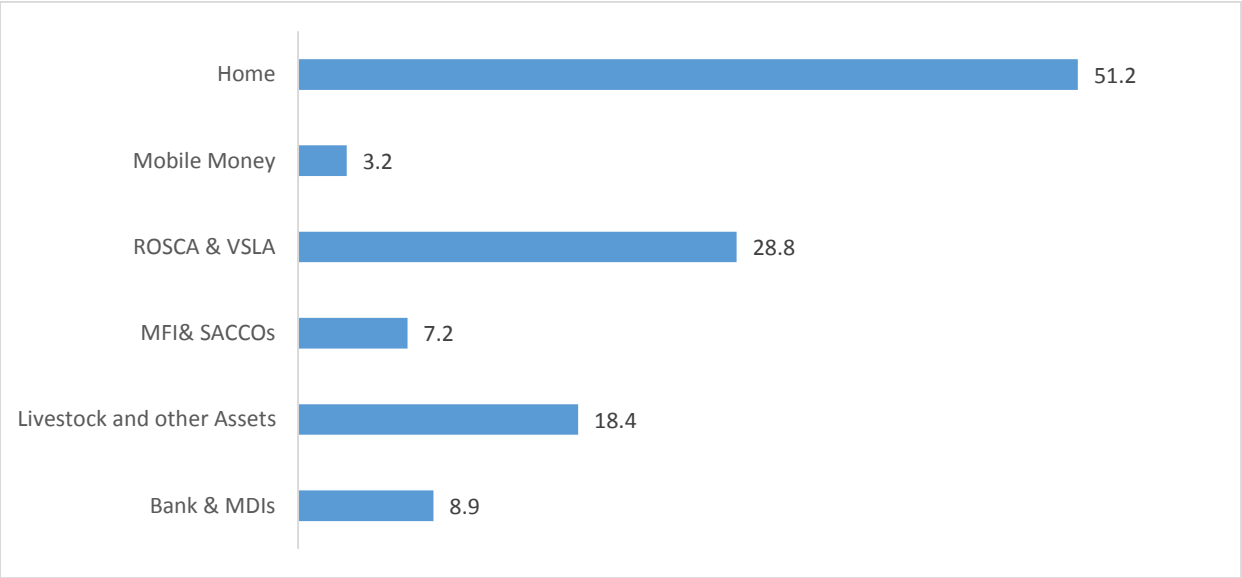
Lowest	18.5	62.0	14.7	31.6
Second	20.0	68.6	19.6	41.5
Middle	21.2	76.6	27.8	54.1
Fourth	21.2	83.6	39.5	63.4
Fifth	19.2	92.2	56.6	78.4
Place of residence				
Rural	80.9	73.5	28.8	50.7
Urban	19.1	90.7	50.7	74.5
Region:				
Kampala	5.3	96.8	60.6	83.0
Central exc. Kampala	24.1	88.7	36.8	66.7
Eastern	25.6	70.9	28.3	51.3
Northern	20.9	65.5	22.9	34.8
Western	24.15	76.5	36.1	57.4

Source: Author's calculations based on the 2013 Uganda FinScope data.

4.2 Saving using mobile money

More than half of the population in Uganda save through informal means that is at home, through ROSCAs, ASCAs, Saving Clubs, and Village Groups etc. About nine percent save through formal banking institutions, 7.2 percent non-bank formal means and only three percent save through mobile money. In Kenya, saving through M-PESA was also found not to be a common practice (Mas & Radcliffe 2010). As of early 2009, only 21 percent used M-PESA for storing money. Mas & Radcliffe (2010) attributes this to a number of factors: the lack of interest by Safaricom to publicly promote using M-PESA as a saving tool for fear of provoking the Central Bank of Kenya to regulate it more tightly - the fact that M-PESA deposits are not supervised by the Central Bank of Kenya and hence the minimal trust that customers have yet savings is built on trust. The other factors include: the lack of privacy yet saving behaviour of people is centred on privacy and the ubiquity of M-PESA agents which makes it easy for customers to cash out their funds thus limiting their ability to accumulate funds. The other fact that may discourage saving through the phone is the lack of interest that accrues from phone savings when compared to saving through the bank. However, there have been recent technology innovations in the mobile and banking industry mainly through partnerships. In Kenya for example, m-shwari has emerged as a partnership between safaricom, Vodafone and commercial bank of Kenya to provide interest bearing saving accounts through M-pesa menu.

Figure 5: Proportion of individual's saving through the different saving means



Source: Author's calculations based on the 2013 Uganda FinScope data

4.3 Impact of being a registered mobile money user on which saving mechanism to use

Table shows probit and instrumental variable estimates (probit models for saving using, formal, informal and non-bank formal means and instrumental variable for saving using mobile money) for the impact of being a registered mobile money user on the different saving mechanism of individuals with interest on saving using mobile money. Results show that being a registered mobile money user increases the likelihood to save with mobile money. This is similar to findings by Nandhi (2012) who found that mobile money has the potential to increase net household savings and overall improvement in financial inclusion. Further, considering mobile money registration and location (rural or urban areas) shows that registered mobile money users in the rural areas are still less likely to save with mobile money than their registered counterparts in urban areas. A plausible explanation for this is that people in the rural areas are still poor and any remittances received through mobile money are used to meet their immediate needs. In as much as mobile money is being viewed as an alternative to the access barriers related to formal financial institutions (Mas & Radcliffe 2010), registered mobile money users who are far from these financial institutions are still less likely to save as shown in the results. Rural areas due to poor supportive infrastructure may be affected by network coverage and few mobile money agents that makes it hard for rural population to save through mobile money (Actually the results in Table 3 show that individuals in the rural areas are more likely to save through informal means than their urban counterparts). Additionally, the issue of liquidity emerges in rural areas. Most mobile money agents often don't have enough float for individuals to withdraw large amounts of cash and do not have the security to hold large amounts.

The results also show that the least developed regions are still less likely to save with mobile money when compared to their counterparts in the central region. Individuals in Eastern, Northern and western are still less likely to save with mobile money than their counterparts

in central Uganda (Kampala inclusive). The plausible explanations for these may be the presence of a widespread network of mobile money agents in Kampala and in the central region (Appendix 1) and the increased awareness of the use of mobile money services to save. Aker & Wilson (2013) in their study on whether mobile money could be used to promote savings pointed out the significant delays in activating mobile money due to limited mobile phone coverage and mobile money agent's ability to travel to rural areas as major factors limiting adoption of mobile money.

Table 3: Probit and Instrumental variable estimates of impacts of registered mobile money user on different saving mechanism

	Saving mechanism			
	Formally	**Informal**	**Non-Bank Formal**	**Mobile money**
Registered mobile money user	-0.570	0.358	-0.033	4.503***
	[0.41]	[0.24]	[0.30]	[1.38]
Have a bank account	2.200***	0.061	0.840***	
	[0.15]	[0.10]	[0.11]	
Individual is in Rural place (cf: Urban area)	-0.148	0.253**	0.022	0.499
	[0.25]	[0.13]	[0.19]	[0.45]
Registered rural mobile money user	0.200	0.214	0.113	-0.901*
	[0.28]	[0.18]	[0.22]	[0.49]
Interaction of registered and distance to semiformal institution	0.443	-0.245	0.322	-1.617*
	[0.29]	[0.16]	[0.21]	[0.86]
Distance to semiformal institution	-0.054	-0.086	-0.529***	0.530
	[0.22]	[0.09]	[0.15]	[0.40]
Respondent Age	0.005	0.003	-0.003	-0.014**
	[0.00]	[0.00]	[0.00]	[0.01]
Distance to market	-0.184	0.067	0.021	-0.142
	[0.20]	[0.09]	[0.13]	[0.21]
Some primary	-0.392**	0.090	0.153	-0.168
	[0.17]	[0.09]	[0.13]	[0.20]
Completed primary	-0.536**	0.260**	0.275*	-0.228
	[0.24]	[0.11]	[0.14]	[0.23]
Secondary and above	0.022	0.106	-0.126	0.281
	[0.18]	[0.12]	[0.16]	[0.18]
Second wealth quintile	-0.063	0.126	0.026	-0.356
	[0.32]	[0.12]	[0.19]	[0.29]
Third wealth quintile	0.337	0.234*	0.294	-0.366
	[0.29]	[0.12]	[0.19]	[0.27]
Fourth wealth quintile	0.372	-0.038	0.282	-0.606**
	[0.26]	[0.12]	[0.19]	[0.29]
Fifth wealth quintile	0.723**	-0.084	0.253	-0.707**
	[0.28]	[0.14]	[0.21]	[0.29]
Eastern	-0.108	0.269**	-0.221	-0.730***
	[0.18]	[0.11]	[0.15]	[0.20]
Northern	0.570**	0.564***	-0.182	-0.815***

	[0.23]	[0.13]	[0.18]	[0.25]	
Western	-0.164	0.512***	0.274*	-0.536**	
	[0.20]	[0.12]	[0.15]	[0.21]	
Constant	-2.361***	-0.831***	-1.030***	-2.083***	
	[0.51]	[0.24]	[0.35]	[0.80]	
Wald test for exogeneity (/athrho=0)					3.95
P value					0.047
Number of observations	1,344	1,344	1,344	1,521	

Instruments (Distance to the shop, dummy variable of whether mobile money is accessible or not, mobile money is cheap and expenditure on airtime)

Notes: Figures in parenthesis are standard errors; level of significance *at 5%, **at 10%, and ***at 15%.

Source: Authors' calculations based on the 2013 FinScope data.

Other important variables that affect the respondents' likelihood to save with mobile money are the age and the wealth quintile. Saving with mobile money is associated with younger people who can easily manoeuvre and follow instructions on the mobile phone (technology use). People in the fourth and fifth wealth quintile are actually less likely to save with mobile money than those in the lowest wealth quintile. Instead they are more likely to save with formal means (particularly those in the fifth wealth quintile) confirming the role of mobile money in improving financial inclusion of the poor.

5. Conclusions and Policy Implications

This paper has been able to show that although saving through the mobile phone is not yet a common practice in Uganda, being a registered mobile money user increases the likelihood to save using mobile money. The findings also show that the relatively lower cost of mobile money and proximity to mobile money agents and financial institutions increases the likelihood of using mobile money as a saving mechanism. The findings further show that, registered mobile money users in urban areas are more likely to save with mobile money compared to their rural counterparts. From a regional perspective, individuals living in Kampala and central region are more likely to save through mobile money than individuals living in other regions. These findings can be explained by: one, rural dwellers tend on average to have lower incomes compared to the urban counterpart and thus have less to save. Similarly, residents of Kampala tend to have higher incomes and thus high savings compared to residents of other regions. Secondly, poor infrastructure in rural areas in terms of lack of electricity and poor telecommunication network coverage may limit the use of mobile phones and consequently the use of mobile money. Overall saving through mobile money is still very low and this could be partly explained by limitations in the legislation that doesn't incorporate mobile finance services into mobile money. The absence of interest payments on mobile money saving may act as a disincentive to save through this mechanism.

Policy Options

From the results it is clear that use of the use of mobile money services for saving is skewed toward the rich and better developed regions. Hence there is need government for government to draw policies that encourage inclusive growth. For example, infrastructural projects like roads and energy should be extended to lagging regions in order to boost incomes and savings well as access to financial

services. Secondly, the government should come up with the appropriate institutional and legal framework that fosters the growth mobile money beyond mobile payments to encompass all spheres including mobile finance. Such policies should encourage linkages between financial institutions and MNOs to explore synergies and come up with the least cost and most effective way to deliver financial services in Uganda. Thirdly, the government should draw guidelines that compel all mobile phone subscribers to register for mobile money accounts. This will likely increase the use of mobile money and mobile money savings, reduce OTCs and reduce the incidences of mobile money fraud.

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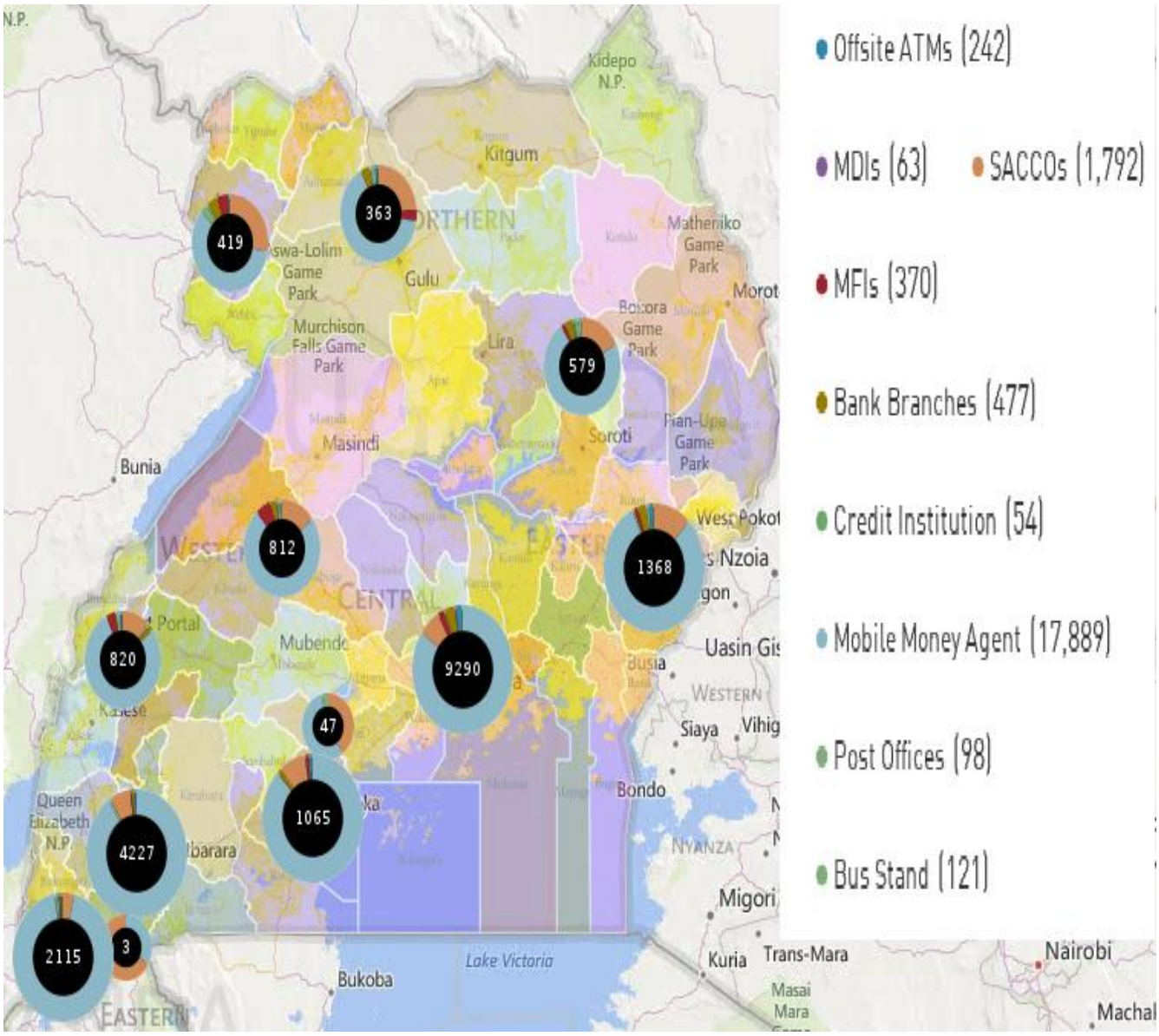
Appendix 1: Location of financial services in Uganda



Source: Bank of Uganda, 2014

Appendix 1

Table 4: Testing for endogeneity of being a registered mobile money user on the different forms of saving.

Variable	Mechanism of saving			
	Formally	Informally	Non-bank formal	Mobile money
Bank account	2.134***	0.239**	0.270**	0.024
	[0.19]	[0.10]	[0.13]	[0.20]
Have expenditure on airtime	0.166	0.093	0.316**	0.589***
	[0.18]	[0.12]	[0.15]	[0.20]
Mobile money is accessible	0.088	0.215*	-0.078	-0.106
	[0.21]	[0.11]	[0.14]	[0.20]
Mobile money is cheap	0.030	0.117	0.579***	1.005***
	[0.16]	[0.11]	[0.12]	[0.22]
Mobile money is less expensive	0.092	0.038	-0.067*	-0.111
	[0.18]	[0.03]	[0.04]	[0.09]
Distance to shop	-0.113	0.144	0.826***	0.314
	[0.07]	[0.12]	[0.15]	[0.23]
Respondent age	0.004	-0.001	-0.003	-0.027**
	[0.01]	[0.00]	[0.00]	[0.01]
Some primary education	-0.388	-0.088	0.278	0.366
	[0.26]	[0.16]	[0.23]	[0.48]
Completed primary education	-0.482	0.021	0.295	0.178
	[0.36]	[0.18]	[0.26]	[0.49]
Some secondary education	0.407	-0.083	0.014	0.872*
	[0.32]	[0.19]	[0.28]	[0.50]
O' level and above	0.026	-0.304	0.320	0.814
	[0.30]	[0.20]	[0.26]	[0.52]
Sex of household head	-0.002	0.209*	-0.029	0.585*
	[0.21]	[0.12]	[0.15]	[0.31]
Ownership of land	0.265	0.186	-0.007	-0.374
	[0.22]	[0.13]	[0.16]	[0.26]
Self employed	-0.331	0.233*	0.127	0.035
	[0.21]	[0.14]	[0.16]	[0.25]

Paid employed	-1.191**	-0.328	0.349	-0.321
	[0.54]	[0.24]	[0.36]	[0.48]
Contributing farm work	-0.474*	-0.006	-0.240	-0.323
	[0.25]	[0.17]	[0.23]	[0.31]
Western	-0.357	0.485***	0.303*	-0.206
	[0.28]	[0.17]	[0.17]	[0.26]
Northern	0.371	0.657***	-0.120	-0.732**
	[0.31]	[0.17]	[0.18]	[0.36]
Eastern	-0.153	0.277*	-0.239	-1.037***
	[0.29]	[0.16]	[0.19]	[0.32]
Distance semi informal institution	0.159	-0.101	-0.420***	-0.066
	[0.19]	[0.09]	[0.12]	[0.21]
Wealth quintile 2	-0.332	0.235	0.049	-0.663*
	[0.37]	[0.15]	[0.24]	[0.38]
Wealth quintile 3	0.419	0.336**	0.303	-0.611
	[0.34]	[0.14]	[0.23]	[0.38]
Wealth quintile 4	0.213	0.104	0.100	-1.271***
	[0.32]	[0.15]	[0.23]	[0.40]
Wealth quintile 5	0.676*	-0.155	-0.223	-1.089**
	[0.38]	[0.20]	[0.28]	[0.46]
Residual	***0.154***	***-0.115***	***0.230***	***1.351******
	[0.18]	[0.11]	[0.15]	[0.26]
Constant	-2.783***	-0.919***	-1.294***	-1.273
	[0.60]	[0.33]	[0.45]	[0.80]
Observations	1,234	1,234	1,234	1,167

Appendix 2

Variable	Linearized mean	Std. Err.	[95% Conf.	Interval]
Respondent Age				
0	37.1605	0.4746669	36.22768	38.09332
1	36.51981	1.215415	34.13126	38.90836
Education level				
No education				
0	0.1875448	0.0113781	0.1651843	0.2099053
1	0.0533183	0.0200753	0.013866	0.0927706
Some primary education				
0	0.4433908	0.0148502	0.4142069	0.4725747
1	0.1309058	0.0318022	0.0684077	0.1934038
Completed primary education				
0	0.1414432	0.0093676	0.1230339	0.1598526
1	0.0616225	0.0215875	0.0191984	0.1040466
Some secondary education				
0	0.1083455	0.0093798	0.0899122	0.1267789
1	0.1641195	0.046588	0.072564	0.255675
Completed secondary				
0	0.1192757	0.0102276	0.0991763	0.1393751
1	0.5900339	0.0559884	0.4800046	0.7000632
Gender of the household head				
0	0.7857002	0.01125	0.7635915	0.8078088
1	0.7782503	0.0388301	0.7019409	0.8545597
Ownership of land				
0	0.8561935	0.0130597	0.8305283	0.8818586
1	0.7967537	0.0400754	0.7179969	0.8755105
Employment status				
Self employed				

0	0.6478515	0.0140032	0.6203322	0.6753709
1	0.517223	0.0510173	0.4169631	0.6174829
Paid employment				
0	0.0635985	0.008125	0.0476311	0.0795659
1	0.011565	0.0092345	-0.0065828	0.0297129
Contributing to Household labor				
0	0.1537733	0.0105836	0.1329742	0.1745724
1	0.0909221	0.021966	0.0477541	0.1340901
Regions				
Kampala				
0	0.0243728	0.0034894	0.0175154	0.0312302
1	0.1588073	0.0320818	0.0957597	0.2218549
Central				
0	0.1316043	0.0139393	0.1042106	0.158998
1	0.1773633	0.0481057	0.0828253	0.2719014
Eastern				
0	0.2838006	0.0149326	0.2544548	0.3131464
1	0.1639735	0.0411075	0.0831885	0.2447586
Northern				
0	0.313938	0.0163251	0.2818558	0.3460203
1	0.222539	0.0394858	0.1449409	0.3001371
Western				
0	0.2462842	0.0133308	0.2200863	0.2724821
1	0.2773168	0.0504981	0.1780771	0.3765565
Distance to informal institutions				
0	1.160896	0.01149	1.138315	1.183476
1	1.067294	0.0188226	1.030303	1.104284
Distance to semi informal institutions				
0	1.514013	0.0192931	1.476098	1.551928
1	1.312913	0.0459455	1.22262	1.403206
Distance to formal institutions				
0	1.757437	0.0179216	1.722218	1.792657
1	1.523644	0.053735	1.418044	1.629245
Wealth quintile				
Lowest wealth quintile				
0	0.2280797	0.0143407	0.1998971	0.2562623

1	0.0525957	0.0173161	0.018566	0.0866255
Second wealth quintile				
0	0.2380104	0.0126367	0.2131765	0.2628443
1	0.0301469	0.0135472	0.0035238	0.0567701
Third wealth quintile				
0	0.2313413	0.0134038	0.2049999	0.2576827
1	0.1198382	0.0324626	0.0560423	0.1836341
Fourth wealth quintile				
0	0.1845755	0.0115703	0.1618374	0.2073136
1	0.1999446	0.0344837	0.1321768	0.2677123
Fifth wealth quintile				
0	0.1179932	0.0100841	0.0981758	0.1378106
1	0.5974746	0.0481114	0.5029254	0.6920238

[i] FinScope studies are national geographic and demographic surveys on the demand for, access and usage of financial services carried out in several countries namely: Uganda, Kenya, Tanzania, Rwanda, Nigeria, Ghana, Mozambique, Malawi, South Africa, Botswana and Zambia.