Can Mobile Money Induce Financial and Entrepreneurial Behaviors of Members of Village Savings and Loan Associations in Rural Malawi?

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By

Levison Chiwaula, PhD

Mirriam Matita, PhD Candidate

Tayamika Kamwanja, PhD Candidate

Lucius Cassim, MA

Department of Economics, University of Malawi, P.O. Box 280, Zomba

Malawi

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Abstract

Over 70% of Malawians living in rural areas are excluded from the formal financial sector, which has led to a drive in government's efforts towards increasing financial inclusion through expansion of digital payment systems and group savings (most importantly the Village Savings and Loan Associations (VSLAs)), amongst others. The main aim of the study therefore was to measure the impact of mobile money and financial literacy training together with reminder SMSs among VSLAs members would induce financial inclusion and entrepreneurial outcomes. This was achieved through the implementation of a clustered randomized control trial in two purposively selected districts in Malawi. The trial had two randomly selected study groups each with 21 randomly selected VSLAs: (1) The control arm which received no intervention; and (2) The treatment arm which received face to face training on use of mobile money services for business, financial inclusion, and SMSs reminders on the content of the trainings. We used the Analysis of Covariance (ANCOVA) regression analysis to estimate the casual effect of the intervention. The results indicate that mobile money and financial literacy promotion impacted on knowledge of mobile money services and utilisation of mobile money services. The findings show that the treatment effect of the intervention on the knowledge to use mobile to save money was 6% and the effect on the knowledge that they can take loans was 5%. The treatment effects on usage of mobile money to receive money and usage of mobile money to save money were 10% and 5%, respectively. The treatment also led to the digitization of VSLAs by 7%. With these findings, we conclude that mobile money and financial literacy training together with reminder SMSs has positive impact on mobile money knowledge and utilisation to individuals and VSLAs. The experiment fails to show significant treatment effect on financial inclusion and entrepreneurial behaviour partly due to the length and the timing of the experiment. Further research should consider observing the participants for a longer period.

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1 Background

Most Malawians, especially those from rural areas are excluded from formal financial services and make little use of digital cash transfers. The 2014 Finscope Survey estimates that in Malawi only 28% of rural adults use formal financial services compared to 63% of urban adults and that women (29%) are less served with financial services than men (37%) (FinMark Trust, 2014). When overall financial access levels are considered (including informal), access levels for women and men are similar (47% vs 50%, respectively) largely due to involvement of women in Village and Savings Loan Associations (VSLA) (GoM, 2017). This situation happens at the backdrop of very low financial literacy (Chirwa and Mvula, 2014; FinMark Trust, 2014). Rural women are therefore the most financially excluded population group, and this would affect their entrepreneurial activities and outcomes because effective financing mechanisms contributes to improved entrepreneurship and hence economic development of a country (Toma et al., 2014). Additionally, the role of financing mechanisms in economic development is enhanced by information and communication technologies (ICT) (Andrianaivo and Kpodar, 2011) and VSLAs have been shown to have positive impacts on business outcomes and financial inclusion (Karlan et al., 2017).

The Malawi Financial Sector Development Strategy for 2016-2020 identifies expansion of digital payments reach, increasing savings through savings groups (VSLAs), and improving levels of financial literacy (GoM, 2017) as priority areas. Digital payments can be promoted through use of mobile money while expansion of savings can be attained through promotion of VSLAs. Mobile money subscription introduced in 2012 has been on the increase (RBM, 2017) so has VSLAs proliferation indicating the potential of using VSLAs and mobile money to improve rural women's access to formal financial markets and their entrepreneurial practices. As of 2015, there were 37,461 VSLA groups with 610,596 members across the 28 districts in Malawi (Ministry of Finance, Economic Planning and Development, 2015) and about 90% of the population was covered by a mobile signal, with mobile penetration of

approximately 33%, 45% of which is rural based and 55% urban based (Buckley et al., 2015).

2 Problem Statement and Relevance of the study

Although use of mobile money and participation in VSLAs are on the rise, the level of financial inclusion remains low. Mobile phone companies promote mobile money as a commercial product without considering their developmental roles, while the government and other stakeholders are promoting VSLAs independently as development initiatives. The need for assessing the impact of integrating the use of mobile money for business among VSLA members on financial inclusion and improved entrepreneurial outcomes cannot be overemphasized. For example, this would create a platform for integrating mobile money and VSLAs as a development initiative. Of course, previous studies have analysed the effects of mobile money on financial inclusion and entrepreneurship (see FinMark Trust, 2016; Asongu and Nwachukwu, 2017) while others have assessed the impact of VSLAs on financial inclusion and entrepreneurship (see Karlan et al., 2017). These studies have found positive impacts of both VSLAs and mobile money services on financial inclusion and entrepreneurship. However, the combined effects of mobile money services and VSLAs on financial inclusion and entrepreneurship have not been analysed in Malawi despite the policy relevance of such information. This study therefore tests the combined effects of VSLAs and mobile money on financial inclusion and entrepreneurship, which is currently not well documented. The combined effect is assessed by measuring the incremental impacts because we did not have adequate time and resources to for an experiment that can form flesh VSLAs and observe the impacts.

On the other hand, the findings from this study will also be of high relevance in informing policy. To explain this, one recalls that poverty in Malawi is more widespread in rural areas. The poverty headcount rate in rural areas is estimated at 59.5%, representing an increase of about 2.8 % from the 2010/2011 rate, as compared to 17.7

% rate in urban than urban areas (National Statistics Office Malawi, 2016). It is a fact that most of the smallholder farmers reside in rural areas in Malawi (25% of the population live in urban areas). These farmers have very limited access to formal financial institutions and services, and therefore lack the opportunity to invest in agricultural inputs to increase their income (Karlan, et al., 2017) and also lack capital to invest in any enterprise. These rural areas are characterized by long time spans between input and output of the agricultural production, uncertainty and weather dependency, making "ability to smooth consumption, access credit, and employ risk coping strategies very important" (Ksoll, et al., 2013). To that extent, policy implementation aimed at improving people's living standards is crucial. Recently Malawi launched the Financial Sector Development Strategy for 2015-2020 to champion financial inclusion as an important tool for reducing poverty and inequality. Financial services expansion to those that are currently excluded from formal markets through digital payments and expanding savings in groups are seen as catalysts to achieve aspirations in the strategy. Savings group like VSLAs avail to the informal sector similar services such as savings accounts, access to loans, and insurance that the formal sector provides. However, the potential of VSLA to mobilise enough savings for entrepreneurial engagements can be enhanced through among other things active use of digital payments. Thus, this study is relevant as it will try and test these linkages with purpose of informing policies for inclusive financial sector development.

3 Research Questions

The main aim of the study is to analyse whether the promotion of the use of mobile money in VSLAs impacts on financial inclusion and entrepreneurial outcomes of VSLA members in rural Malawi. To achieve this broad objective, the following specific research questions were pursued:

- Can training on the use of mobile money for business transactions plus reminder Short Messages Services (SMS) influence usage of digital financial services by VSLA members in rural Malawi?
- Can training on the use of mobile money for business transactions plus reminder SMSs improve savings by members of VSLAs in rural Malawi?

4 Study hypotheses

The study tested the following null hypotheses:

- Training in the use of mobile money for business transactions plus reminder SMSs among VSLA members in Malawi does not influence usage of digital financial services.
- Training in the use of mobile money for business transactions plus reminder SMSs does not improve savings among members of VSLAs in rural Malawi.

Both hypotheses stem from literature (see FinMark Trust, 2016; Asongu and Nwachukwu, 2017; Karlan et. al., 2017), we expect the trainings that introduce the mobile money services to open the participants to services that offer them security as well as ease of transacting with the fellow group members. As group members usually conduct their transactions in cash, and the treasurer keeps the money is cash boxes, and gives out loans in that form too. We expect that the possibility of a secure place to store the groups monies in the form of mobile money, as well as the ease of giving out loans in this way would be appealing to the group, as it can also offer accountability. The follow up reminders would reinforce the training materials and encourage take up of the services. The second hypothesis tests whether the group members would increase the amounts they save with the group due to the security and accountability offered by the mobile money service.

5 Related literature

Financial inclusion for the poorest and vulnerable populations is one way of attaining inclusive growth (Cordova, 2013). The intuition is that increased access to financial services provides the poor with much needed capital for entrepreneurial activities and this leads to inclusive and shared growth (Aryan, 2004; Kiit and Mutinda, 2011; Nandi, 2012). It has also been recognized world over that there are more mobile phone holders than bank account holders most specifically in rural areas (Nandi, 2012). This means that use of mobile money presents a great opportunity to improve financial inclusion since mobile money has been found to improve formal financial inclusion (Mbiti and Weil, 2011). Research has hence revolved around how mobile money can be used to improve formal financial inclusion (Aryan, 2004; Kiit and Mutinda, 2011; Stuart and Cohen, 2011; World Bank, 2011; Nandi, 2012; Majanga, 2016; Abiona and Koppensteiner, 2016). Mobile money has been found to improve efficiency of formal saving mechanisms in India (Nandi, 2012) and VSLAs in Kenya (Mutinda, 2012). Mobile money facilitates financial inclusion in Kenya, increases circulation of money, makes available capital when most needed, improves local farm employment and savings (Mbiti and Weil, 2011; Jack and Suri, 2014; Ntwiga, 2016; Ouma, et al., 2017; Demombyens and Thengeya, 2012).

As already indicated in earlier sections, studies have been conducted on the effects of mobile money on financial inclusion and entrepreneurship (FinMark Trust, 2016; Asongu and Nwachukwu, 2017) as well as effects of VSLAs on financial inclusion and entrepreneurship (Karlan et al., 2017). These studies have found positive impacts of both VSLAs and mobile money services on financial inclusion and entrepreneurship. It is however, not known whether combining VSLAs and mobile money services would strengthen these positive impacts. Our literature search has not identified any study that has assessed the combined effects of mobile money services and VSLAs on financial inclusion and entrepreneurship in Malawi. This is the literature gap that the study aims to fill.

6 Methodology

This section outlines steps undertaken to achieve the study objectives. We provide details for the experiment design and procedures including sample size determination, and sampling procedure.

6.1 Experimental Description

The research strategy adopted in this study was experimental design. The experiment was implemented among VSLA members to measure the incremental impact of the mobile money promotion. This approach was adopted because proper combined impact of VSLA and mobile money would be measured by randomising both membership to a VSLA as well as ownership of mobile money which would require more participants as well as long observation period. The experiment promoted use of mobile money and financial literacy among VSLA participants in the treatment arm through training sessions and remainder SMSs. The two interventions (training and SMSs) were promoted as a package because other trials (Abebe et al., 2016) have shown that training alone does not lead to significant savings outcomes but is more effective when combined with reminders.

The experiment therefore had two randomly selected study groups:

- The control arm which received no intervention;
- The treatment arm which received classroom type (in person) group trainings on use of mobile money services and financial literacy as well as SMSs reminders on content of the trainings.

Following Ksoll et al (2014), the crucial challenge for an impact evaluation is to construct a credible counterfactual that is not sensitive to selection bias, arising typically due to non-random program placement and self-selection into program participation. To avoid creating disincentives for participants in the control group as well as sharing of information between individuals from the treatment and control groups, we randomized the roll-out of the intervention at the group village head level (cluster randomized control trial where a group village is a cluster). A group village head is a traditional jurisdiction area that consists of about 8 villages. Assuming a single VSLA in a village, each cluster therefore consists of about 8 VSLAs. One VSLA per group village headman was randomly selected to reduce the effects of contamination between experimental groups. The random assignment to treatment or control group was carried out with oversight by officers from local VSLA implementing partner - Emmanuel International. The experiment took place in rural communities of two southern region districts of Malawi; Mangochi and Machinga. The two districts were selected purposively based likelihood of finding entrepreneurs that belong to VSLAs and could use mobile money.

In Malawi, there are two major mobile money service providers namely, Airtel Malawi whose mobile money service is called Airtel Money and Telekom Networks Malawi (TNM) whose mobile money service is called TNM Mpamba. The study worked with both providers to formulate the training materials on usage of both platforms. Participants could choose the service provider of their choice. To facilitate quick implementation, we implemented the training at two levels. In the first level, research team (researchers and research assistants) were trained by mobile money operators on how VSLAs and their members can use mobile money in their transactions. The training also included elements on financial literacy by the Reserve Bank of Malawi, which included areas such as savings, credit, budgeting and formal financial services. The first level took place from 3 December 2018 to 4 December 2018. The materials from the first training session were used to develop training materials for the second level by the research team. In the second level, the research team trained study participants in the treatment group. The training for study participants took place

from 9 December 2018 to 17 December 2018. After the training, the treatment group received reminder SMSs twice every week for a period of two months from 21 January 2019. The content of the SMSs was on financial literacy and use of mobile money services. The intervention (training material and SMSs) were offered in the local language, Chichewa.

6.2 Outcome Variables

The study had two primary outcome indicators which include: the proportion of VSLA members that use mobile money and the level of savings. Secondary outcomes included proportion of VSLA members with a bank account, level of capital injected into business, and demand for credit measured as loans obtained.

6.3 Sampling, Randomization and Power Calculations

We used two stage sampling procedure. In the first stage we randomly selected 42 Group Village Heads (GVH) from the two districts. Secondly, we randomly selected one VSLA per GVH. To select VSLAs in the first stage, we obtained a list of active VSLAs from Emmanuel International from the two districts. All members of the selected VSLAs were included in the sample. We further randomized the VSLAs to either control or treatment groups. Table 1 below presents the number of sampled VSLAs members by district and their treatment status[1].

Table 1: Realized Samples of VSLA members by treatment status

	Baseline	End line	Total
Control	298	265	558
Treatment	342	290	627
Total	640	555	1195

[1] Detailed VSLAs information given in Appendix.

Number of interviews were 640 at baseline and 555 cases at end line which were lower than the calculated sample size of 973 which was determined before we implemented the experiment. The sample declined at end line because of attrition as well as identification problems which occurred because individuals in some individuals used different names at follow up and baseline and it became difficult to match them.

The attrition that was experienced would result in biased estimates of the impact measures if this was system. Particularly, if study participants of a certain characteristics that could affect the outcome variables could leave the sample, we will have estimates that are not representative of the whole population. To check this, we compared the baseline characteristics of the full baseline sample and the reduced sample. The results are presented in Table 2 below. The characteristics that are presented in the Table are for the study participants at the time when we were implementing the baseline survey. The only difference in the two columns is, thus the sample sizes. From the results in the Table, the sample largely remained stable with most of characteristics remaining the same even after losing some cases. For example, the average age of the respondents was 38 years in the original sample and it marginally increased to 39 in the reduced sample. Similarly, household size remained at 5.7 members and the proportion of males in the sample remained at around 7%. Other characteristics such as education level, marital status, and main economic activity also remained the same. This means that the attrition we experienced are not leading to biases in the estimates we are derived from the data.

Table 2: Overall Group Member Descriptive Statistics at Baseline

	Baseline			Follow up		
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Age	650	38.308	14.620	554	38.673	14.858
Household size	650	5.712	2.019	554	5.699	2.039
Male	650	0.077	0.267	554	0.072	0.259
Education						
Primary education	650	0.346	0.476	554	0.347	0.476
Secondary education	650	0.263	0.441	554	0.273	0.446
Tertiary education	650	0.052	0.223	554	0.049	0.216
	650	0.032	0.177	554	0.025	0.157
Main economic activity						
Farmer	650	0.549	0.498	554	0.554	0.498
Business	650	0.314	0.464	554	0.312	0.464
Student	650	0.006	0.078	554	0.005	0.073
Other	650	0.105	0.306	554	0.105	0.306
Marital Status						
Married Polygamous	650	0.206	0.405	554	0.215	0.411
Divorced	650	0.085	0.279	554	0.087	0.282
Separated	650	0.066	0.249	554	0.061	0.240
Widowed	650	0.071	0.257	554	0.078	0.268
Never Married	650	0.025	0.155	554	0.022	0.146

6.4 Data Collection

We collected information through two surveys; baseline and end line surveys. The baseline survey was conducted from 4th November to 23rd November 2018. The end line survey was conducted from 29th March, 2019 to 18th April, 2019. Data were collected by administering a questionnaire in face to face interviews with VSLA members. Survey CTO was used to collect data.

6.5 Analytical Approach

Our analytical approach employs both descriptive and regression approaches to measure the causal-effect of the intervention. Assessing the impact of a program on a set of outcomes is equivalent to assessing the causal effect of the program on those outcomes (Gertler et al., 2016). In our study, the assignment to treatment and control was random and this was tested by using the balancing test in the baseline survey data. This means that the probability of participating in the intervention for any individual in the population of interest is expected to be independent of the potential gain from the intervention. In this case, the estimation of the impact of the intervention is simply the difference of means between the treatment group and the control group. Defining Δ as the difference between the outcome (Y) in the treated ($I = 1$) and untreated ($I = 0$) states conditional on control variables (X);

$$\Delta = (Y \mid I = 1, X) - (Y \mid I = 0, X) \qquad (1)$$

This states that the causal impact (Δ) of an intervention (I) on an outcome (Y) is the average difference between the outcome (Y) *with* the program (in other words, when $I = 1$) and the same outcome (Y) *without* the program (that is, when $I = 0$).

To measure the treatment effects more precisely, we employ regression analysis and control for relevant observable characteristics. To estimate the causal impact, one would expect us to use difference-in-difference technique; after all we have both

baseline and end line information. However, following McKenzie (2012) and Abebe (2016) we employ an analysis of covariance (ANCOVA) regression model regressing the outcome variable on the treatment status dummy and other controls. We follow an argument by McKenzie (2012) as a justification of running ANCOVA over DID model in this study. According to McKenzie (2012), ANCOVA regression yields important gains in power over the differences-indifferences (DID) regression, which is a major analytical tool for field experiments. In fact, according to McKenzie (2012), the ratio of the DID variance to the ANCOVA is $2/[\rho+1]$, where ρ is the autocorrelation coefficient. That implies, for example, that when $\rho = 0$, we need twice the sample size when using DID to get the same power as that obtained in ANCOVA. The ANCOVA regression models were specified as follows:

$$Y_{jA} = \varsigma + \beta Z_j + \vartheta Y_{jB} + \Omega' X + \eta_j \quad (2)$$

Where Y_{jA} denotes the mobile money usage or savings outcome indicators of individual *j after* the treatment taking value 1 if individual *j uses mobile money for business purposes and zero otherwise*, Z_j is the dummy variable for the randomized treatment taking value 1 if treated and zero, otherwise. Subscript *B* denotes the data point *before* receiving the treatment; *X* denotes the vector of control variables which include sex, education level, marital status, employment status of the respondent, and district. Cognizant of the results of the balancing test, equation 2 was also estimated without the control variables. Our interest is in the value of β, which measures the intention to treat effect (ITT), that is, the average increment in the outcome variable of the treatment group in excess of the control group.

7 Empirical Results and Discussion

In this section we present and discuss the results of the study. The section begins with the presentation of baseline survey characteristics of the sample and the results of the balancing tests before moving on to present the results of the ANCOVA regression.

7.1 Descriptive Statistics

To assess the reliability of the randomisation in the experiment, we compared the baseline characteristics of treatment and control groups whose results are presented in Table 3. The findings show that the average age for the whole sample was 38 years with the control group having average age of 38 years while the treatment group having average age of 37 years. Similarly, about 8% of the sampled individuals are males with the control group having 12 % males and the treated group having about 5% males. There are more female participants because Emmanuel International promotes VSLAs among women in Machinga as they call them the Women Empowerment VSLAs (WE-VSLAs). Regarding household size, one notices that the average household size for the whole sample, the treatment group and indeed the control group is about 6 individuals. About 75 % of the individuals are married regardless of whether they are from the control or treatment group. Regarding education, the results show that about 69.8% had some form of formal education. About 73 % of the individuals in the control group received some formal education compared to 67 % in the treatment group.

About 34 % in the total sample own cell phones implying that about 76 % do not have phones. When compared between control and Treated groups, one notices that phone ownership for the control group is at about 33 % compared to 34 % in the treatment group. Of the total sample, about 17 % of the individuals have mobile money accounts. For the control group 18 % of the individuals have mobile money accounts while 16 % of the treatment group have mobile money accounts. Usage of mobile money services is even lower at VSLA level. The baseline information showed

that only 1% of the total VSLAs sampled used mobile money in VSLA transactions. This is the same for control and treatment group VSLAs.

Table 3: Comparison of baseline characteristics of treatment and control groups

	Whole sample	Control Group	Treatment Group
Phone ownership (0/1)	0.336	0.329	0.343
Age	38.074	38.920	37.307
Male (0/1)	0.079	0.115	0.046
Household Size	5.709	5.588	5.818
Married (0/1)	0.756	0.754	0.758
Educated (0/1)	0.698	0.728	0.671
Wealth Index	0.000	0.105	0.000
Number of Adults	2.806	2.703	2.899
Number of Children	2.903	2.885	2.919
Can Read Chichewa (0/1)	0.453	0.460	0.447
Can Read English (1/0)	0.259	0.275	0.245
Owns Business (0/1)	0.445	0.476	0.418
No. of Males in VSLA	1.898	2.521	1.337
No. of Females in VSLA	19.947	17.663	22.006
Mobile money (0/1)	0.165	0.176	0.156
Use of MM in VSLA	0.011	0.010	0.012
Observations	660	313	347

Note: The 0/1 in brackets imply dummy variable equal to one for the state variable, zero otherwise.

7.2 Balance Test of baseline characteristics of treatment and control groups

We conducted basic balance tests between the control and treatment groups in terms of observable characteristics. These tests checked for statistical differences between the two groups to justify the use of the average treatment effect (ATE) estimator. Simple linear regressions were used to test the statistical differences in baseline characteristics of participants in the treatment and control groups. The statistical tests used standard errors clustered at the VSLA level.

7.2.1 Household baseline characteristics

Table 4 below presents the findings for raw differences in mean baseline household characteristic tests between treatment and control groups. The findings show that there was no statistical difference between participants in the treatment group and those from the control group in terms of age, education, employment status, marital status and the size of households from which study participants came from. The only characteristics where we found a significant difference is sex with more males found in the control group.

Table 4: Comparison of Baseline Household Characteristics Between the Treated and Control Groups

Household Characteristics	Treatment Group	Control Group	Difference	P-values
Age	37.3	38.9	-1.600	0.150
Household Size	5.810	5.600	0.200	0.143
Education (0/1)	0.670	0.720	-0.060	0.112
Married (0/1)	0.750	0.750	0.004	0.907
Male (0/1)	0.046	0.115	-0.069	0.001
Wealth Index	-0.095	0 .105	-0.200	0.220
Employed (0/1)	0.084	0.079	0.004	0.863
Observations	347	313		

Note: The 0/1 in brackets imply dummy variable equal to one for the state variable, zero otherwise.

7.2.2 VSLA group characteristics

Looking at group characteristics (Table 5), we find that the treatment VSLAs have slightly more women than men compared to the control groups. Further, VSLA deposits made in the two groups were not statistically different. There are also no statistical differences in terms of phone ownership, access to a relative's phone and use of mobile phones to pay bills between treated and control groups.

7.2.3 Financial services usage and access among groups

We next tested for differences among treatment and control groups in terms of use of financial services. *Table* 6 shows the results from the simple regressions for testing the differences in the access and use of financial services. The results show that the treatment and control groups do not statistically differ in terms of ownership of mobile money and bank accounts. About 18% of the individuals from the control group reported to have mobile money accounts compared to 16% from the treated group. In terms of bank accounts, only 5% of those in our control groups reported to have bank accounts compared to 3% among the treated participants.

We did not find any statistical differences in the usage of mobile money services to receive money (23% for treated group vs 31% control group), make payments or send money (11% for treated group vs 14% for the control group), or pay bills (2% for the treated group vs 3% for the control group) amongst members of the two groups. Importantly, we did not find any statistical differences in availability of bank branches within the community and mobile money agents outside the community between treated and control groups. This shows that our control and treated groups are similar both in terms of access of financial services as well as usage.

7.2.4 Mobile money usage within the groups

In this section we looked at differences in our group's usage and opinions of mobile money. Results in Table 6 also show that there are no statistical differences between treatment and control groups with regard to whether the members in VSLAs have

ever used mobile money to deposit money to the group. However, we find that the control group had a statistically higher probability of using mobile money to take a loan than the participants from the treated group. This could be as a result of the group treasurer having a mobile money account that would be used to transfer the monies, although not necessarily as a group account.

Generally, in our sample the assignment to treatment and control was perfectly random as there are no statistical differences between the control and treatment groups in terms of basic observable characteristics. This, as expected earlier, means that the probability of participating in the intervention for any individual in the population of interest was purely independent of the potential gain from the intervention. In this case, analytically, the estimation of the impact of the intervention was purely the difference of means between the treatment group and the control group.

Table 5 : Group characteristics Treated vs Control

	(1) Number of men	(2) Number of women	(3) Deposits	(4) Total deposits	(5) Own a phone	(6) Relative own a phone	(7) Access to relative's phone	(8) Use mobile phone to pay bills
	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p	b/se/p
Treated-control	-1.1900	4.3650*	306.79	-1833.41	0.0098	-0.0088	-0.0495	-0.0145
	(0.7332)	(2.3810)	(417.71)	(4274.34)	(0.0721)	(0.0666)	(0.0490)	(0.0184)
	0.117	0.074	0.467	0.670	0.892	0.896	0.319	0.436
Constant	2.5222***	17.6582***	1624***	16259.34***	0.3312***	0.6667***	0.8429***	0.318*
	(0.6683)	(1.2498)	(298.02)	(3448.39)	(0.0555)	(0.0452)	(0.0324)	(0.0168)
	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.065
Observations	660	658	651	606	660	438	290	660

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 % significance level and the b represents the coefficients, se; standard error in brackets and p is the p values.

Table 6 : Financial service usage group characteristics Treated vs Control

	(1) Mobile Money Account b/se/p	(2) Money in mobile money account b/se/p	(3) Bank account b/se/p	(4) Bank branch outside community b/se/p	(5) Bank branch within community b/se/p	(6) Mobile money agent outside community b/se/p	(7) Mobile money agent within community b/se/p	(8) Used phone to receive money? b/se/p	(9) Used phone to transfer money)? b/se/p	(10) Use mobile phone to pay bills b/se/p
Treated-control	-0.0191	1234.94	-0.0131	-0.1315*	-0.0223	-0.0280	0.0775	-0.0748	0.1488	-0.0145
	(0.0419)	(7249.6)	(0.0173)	(0.0773)	(0.0210)	(0.0696)	(0.0680)	(0.0556)	(0.1930)	(0.018)
	0.641	0.866	0.455	0.096	0.294	0.689	0.261	0.186	0.441	0.436
Constant	0.1752***	836**	0.048***	0.5159***	0.0541***	0.6783***	0.2780	0.309***	-1.094***	0.318*
	(0.0346)	(4031.9)	(0.0129)	(0.0612)	(0.0189)	(0.0603)	(0.0543)	(0.0411)	(0.1631)	(0.017)
	0.000	0.046	0.001	0.000	0.000	0.000	0.000	0.000	0.000	0.065
Observations	660	109	660	660	660	660	659	660	660	660

Note: ***, ** and * indicate statistical significance at the 1, 5 and 10 % significance level and the b represents the coefficients, se; standard error in brackets and p is the p values.

7.3 Impact measurement of the interventions

7.3.1 Comparing outcome variables between the treated and control groups

In measuring the impact, we first compare the values of the outcome variables between the treated and control groups at end line. The results for this comparison are presented in Table 7.

The findings show differences in some indicators and differences in others. There are no differences between treated participants and control participants in terms of access to phone as measured by the number of individuals who own phones and those who have access to their relative's phones. The levels of deposits made to VSLAs in the previous month as well as the total savings were also similar with the control group registering slightly more amounts at MK722 versus MK665 for last month and total deposits being at MK13, 017 versus MK10, 468 by the date of the survey. The low levels of total savings are because the follow up survey was implemented in April which is about four months when most VSLA groups had shared savings from the previous cycle and had just started a new saving cycle, which also coincides with the lean season.

We however note that there is more use of mobile money in VSLAs among the treatment group VSLAs than in control group VSLAs. For example, we found that 9% of the sample reported that their VSLA has ever used mobile money compared with 2% in the control group. We also found that 94% of the respondents in the treatment group reported that they their VSLA will likely use mobile money in the future compared to 89% in the control group. The findings also show that there is higher level of knowledge and utilisation of mobile money among members of the treatment group than among those who were in the control group. The level of knowledge was established by asking the respondents whether they know different aspects of mobile money operations as well as whether they have ever used these aspects. To validate the level of knowledge, the respondents were also asked to agree or disagree with few sentences about mobile money operations and these results are presented in

Table 8. These results validate the responses that have been given by the respondents on their knowledge of mobile money operations. As presented in Table, more participants in the treatment group than in the control group know that money that is saved in a mobile money wallet is more secure than when the money is kept in a box, they also know that mobile transactions are quicker than physical transactions. They also know that when a phone is lost, the money is still secure. This validates the responses that were self-reported by the respondents in Table 7.

In terms of usage of mobile money services the results in Table 7 show that slightly more participants from the treatment group (29%) than in the control group (21%) used mobile money services to receive money and slightly more of the treatment group (9%) than in the control group (5%) used mobile money to save money. For the rest of usage indicators, there seem to be no difference in the levels. The extent to which mobile money promotions impacted the outcome variables are presented in the next sections.

Table 7 : VSLA and mobile money knowledge and utilisation

	Control			Treatment		
Variable	Obs	Mean	Std. Dev.	Obs	Mean	Std. Dev.
Own a Phone	264	0.32	0.47	291	0.35	0.48
Access phone of a relative	127	0.80	0.40	145	0.78	0.42
VSLA deposits last month	264	722.41	2586.60	291	665.28	2000.83
Total VSLA deposits	264	13107.27	21869.82	291	10467.70	12912.88
Use of mobile money in VSLA	264	0.02	0.14	291	0.09	0.28
Willingness to use MM in VSLA	259	0.89	0.32	266	0.94	0.25
Knowledge of mobile money						
Receiving money	264	0.31	0.46	291	0.34	0.47
Transferring money	264	0.17	0.38	291	0.22	0.41
Paying bills	264	0.05	0.21	291	0.09	0.29
Buying airtime	264	0.12	0.32	291	0.16	0.37
Sharing phone credit	264	0.11	0.32	291	0.15	0.36
Saving money	264	0.14	0.35	291	0.21	0.41
Getting loans	264	0.11	0.31	291	0.14	0.35
Usage of mobile money						
Receiving money	264	0.21	0.41	291	0.29	0.45
Transferring money	264	0.06	0.23	291	0.07	0.25
Paying bills	264	0.01	0.11	291	0.01	0.12
Buying airtime	264	0.06	0.25	291	0.08	0.27
Sharing phone credit	264	0.03	0.16	291	0.05	0.23
Saving money	264	0.05	0.22	291	0.09	0.29
Getting loans	264	0.02	0.15	291	0.02	0.14
Ownership of bank account	264	0.03	0.18	291	0.04	0.21

Table 8: Comparison of mobile money operations knowledge between treatment and control groups

Statement	Treatment status	Strongly agree	Agree	Not sure	Disagree	Strongly disagree	Total	Chi-square
Putting all the money for the VSLA group will make our money secure	Control	72.0	16.3	7.6	2.7	1.5	100.0	
	Treatment	82.8	11.3	4.1	1.0	0.7	100.0	10.33**
Putting all the money for the VSLA group will make transactions quicker	Control	59.5	21.6	11.7	4.5	2.7	100.0	
	Treatment	67.0	23.0	4.8	4.1	1.0	100.0	11.65**
Putting money in mobile money is more profitable to the mobile money operator	Control	26.9	19.7	25.4	15.2	12.9	100.0	
	Treatment	24.1	22.3	19.9	22.7	11.0	100.0	7.24
When I lose a phone that has mobile money account, I will also loose the money in it	Control	30.3	14.0	16.3	18.2	21.2	100.0	
	Treatment	18.6	14.4	8.6	21.0	37.5	100.0	27.45***

7.3.2 Impact of on knowledge of mobile money services

The results of the simple ANCOVA regressions are presented in Table 9 and the ANCOVA models with other control variables are presented in Appendix 1. The results show that mobile money and financial literacy intervention significantly impacted on the knowledge that mobile money can be used to pay bills and that mobile money can be used as a platform for saving money. The intervention did not generate a significant impact on the knowledge on how to use mobile money to receive money, how to use mobile money to transfer money, and how to use mobile money to pay bills. The treatment effect on the knowledge that mobile money services can be used to pay bills was 5% implying that 5% more of the participants in the treated group than in the control group know that they can pay bills by using mobile money platform. It has also been found that 6% more participants in the treated group than in the control group know that they can use mobile money as a platform for saving money. There is no difference in these findings and the findings that are presented in Appendix 1 .

Table 9 : Impact of mobile money and financial literacy on knowledge of mobile money services

	Receiving money		Transferring money		Paying bills		Saving money		Obtaining loan	
Treatment	0.037	(0.72)	0.049	(1.03)	0.049**	(2.45)	0.064*	(1.82)	0.044	(1.43)
L.Receiving	0.387***	(7.36)								
L.Transfering			0.345***	(5.95)						
L.Paying bills					0.282***	(3.03)				
L.Saving money							0.479***	(6.81)		
L.Obtaining loan									0.147***	(2.85)
_cons	0.223***	(5.72)	0.125***	(4.66)	0.030***	(2.98)	0.095***	(5.04)	0.083***	(3.56)
r2_a	0.114		0.088		0.056		0.147		0.023	
F	27.154		17.845		6.657		23.689		4.424	
p	0.000		0.000		0.003		0.000		0.018	
df_r	41.000		41.000		41.000		41.000		41.000	
df_m	2.000		2.000		2.000		2.000		2.000	
rss	107.610		79.597		33.298		68.565		59.544	
N	554		554		554		554		554	

7.3.3 Impact on mobile money utilisation

Results of the simple ANCOVA regression that measured the impact of mobile money and financial literacy(training and SMS remainders) on usage of mobile money are presented in Table 10 and the results that used other regressors as a robustness check are presented in Appendix 2. The findings show that the mobile money and financial literacy promotion increased the number of individuals who received money and saved money by using mobile money services. The impact of the mobile money and financial literacy promotion on receipt of money through mobile money was 10% and the impact of the individuals who used mobile money to save money was 5%. There were no statistically significant treatment effects of the intervention on the use of mobile money to transfer cash, pay bills, take loans, and own a mobile money account. The results are similar with those presented in Appendix 2.

Table 10 : ANCOVA Regression Results on Impact of Mobile money and financial literacy on Mobile Money Utilisation

	Receiving money		Transferring money		Paying bills		Saving money		Obtaining loan		Mobile money account	
Treatment	0.103***	(2.76)	0.015	(0.55)	0.005	(0.66)	0.051*	(1.87)	-0.001	(-0.11)	0.033	(0.76)
L.Receiving	0.364***	(11.39)										
L.Transfering			0.290***	(3.81)								
L.Paying bills					0.293**	(2.22)						
L.Saving money							0.338***	(7.23)				
L.Obtaining loan									0.054	(1.65)		
L.MM account											0.521***	(10.65)
_cons	0.107***	(4.45)	0.021*	(1.82)	0.005	(1.02)	0.015	(1.27)	0.017*	(1.95)	0.133***	(4.48)
r2_a	0.136		0.144		0.119		0.141		0.009		0.201	
F	74.161		7.378		2.687		28.165		1.771		57.493	
p	0.000		0.002		0.080		0.000		0.183		0.000	
df_r	41.000		41.000		41.000		41.000		41.000		41.000	
df_m	2.000		2.000		2.000		2.000		2.000		2.000	
rss	90.100		27.221		6.067		31.027		11.590		78.778	
N	554		554		554		554		554		554	

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

7.4 Impact on Financial Behaviour

To measure the impact of the intervention on the financial behaviour of VSLA members, we measured the impact of the intervention on total deposits in a VSLA, total amount of non-VSLA credit in the past month, mobile money account balance, and whether the participant had a bank account or not. Table 11presents the results of this analysis. The findings fail to show any significant treatment effect of the on these outcome variables. This means that individuals that were treated and those that were not treated saved similar amounts of money in VSLAs, obtained similar amounts of credit from sources other than VSLAs, had similar amounts of money in mobile money accounts, and that similar proportions owned bank accounts.

Table 11: ANCOVA Regression Results on Impact on Financial Behaviour

	VSLA Deposits	Non-VSLA credit in past month	Mobile money account balance	Ownership of bank account
Treatment	-2646.163	-1826.765	-167.280	0.010
L.Total VSLA deposits	0.156**			
L.Non-VSLA credit		0.156		
L.MM account balance			0.287***	
L.bank_account				0.384***
_cons	10871.546***	6408.667**	2302.718*	0.022***
r2_a	0.040	-0.102	0.019	0.112
F	3.734	0.364	30.708	5.696
p	0.032	0.704	0.000	0.007
df_r	41.000	10.000	41.000	41.000
df_m	2.000	2.000	2.000	2.000
rss	1.674e+11	7.167e+08	2.164e+11	18.684
N	554	15	554	554

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

7.5 Impact on VSLA digitization

One of the elements in the training was that participants can digitize their VSLAs where they can implement VSLA operations by using mobile money. We therefore measured the impact of the interventions on the digitization of VSLAs. Digitization of VSLAs were measured by checking whether the VSLA has ever used mobile money in its operations and whether the individual has ever used mobile money to take a loan from a VSLA. The findings are presented in

Table **12**. The findings show that the treatment effects of the interventions on digitization of VSLAs was significant and positive. It was found that the intervention increased the number of individuals that use mobile money to make VSLA transaction by 7% and those that took VSLA loans through mobile money by 6%.

Table 12: ANCOVA Regression results on impact on VSLA digitization

	Use of MM to make VSLA transactions		Use MM to obtain VSLA loan	
Treatment	0.068*	(1.96)	0.056**	(2.30)
Female (1/0)	0.067*	(1.78)	0.080*	(1.94)
Junior Primary	-0.002	(-0.06)	-0.004	(-0.14)
Senior Primary	-0.021	(-0.89)	0.007	(0.27)
Junior Secondary	0.010	(0.31)	-0.017	(-0.36)
Senior-Secondary	0.035	(0.39)	0.075	(0.77)
Employed - Formal Sector	-1.079***	(-13.21)	-1.034***	(-36.38)
Employed - Informal Sector	-0.998***	(-11.44)	-0.960***	(-36.79)
Business	-1.044***	(-13.33)	-0.971***	(-37.66)
Unpaid farm	-0.884***	(-4.64)	-0.968***	(-7.00)
Fishing	-0.622***	(-4.21)	-0.588***	(-4.09)
Fish processing	-1.062***	(-13.99)	-1.035***	(-40.43)
Marital status				
Married Monogamous	-0.208*	(-1.98)	-0.054	(-0.84)
Married Polygamous	-0.230**	(-2.16)	-0.021	(-0.31)
Informal Union	-0.250**	(-2.35)	-0.098	(-1.42)
Divorced	-0.232**	(-2.14)	-0.117*	(-1.76)
Separated	-0.210*	(-1.90)	-0.033	(-0.42)
Machinga	-0.039	(-1.27)	-0.058**	(-2.62)
L.vsla_digital1	-0.098	(-1.29)		
L.vsla_digital2			-0.002	(-0.07)
_cons	1.263***	(9.80)	1.066***	(16.52)
r2_a	0.136		0.088	
df_r	41.000		41.000	
df_m	18.000		18.000	
rss	23.683		28.892	
N	554		554	

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

8 Discussions and Conclusions

This experiment was implemented with the main aim measuring the impact of the promotion of mobile money and financial literacy among VSLA members on financial and entrepreneurial behaviours. The results of the experiment show that the intervention had positive and significant effects on knowledge of the use of mobile money and the actual use of mobile money. The study also establishes that the interventions impacted on the digitization of VSLAs as significant proportions of members of VSLAs were found to have started using mobile money for VSLA transactions more than the individuals in the control group. These findings show that the mobile money and financial literacy training and reminder SMSs have significant and positive impacts on the knowledge of mobile money services and the actual usage of the services. This means that the government's policy to promote digitization of financial transactions can be attained through a program that should be comprised of trainings and reminder messages.

However, the experiment failed to show significant impacts on financial and entrepreneurial behaviours of the study participants. Several entrepreneurial and financial behaviour indicators were tested and all of them found no significant treatment effect. These results may be due to the period when the experiment was implemented as well as the duration of the intervention period. The intervention was implemented between December 2018 and March 2019 which is a short observation period and it also coincided with the lean season in Malawi. This is the time when most rural households do not enough food and money. The households in the sample that resided close to Mangochi could however not be affected by the agricultural season because these were mainly involved in fishing and fishing related activities. We however did not expect households to change their savings behaviour as well as business decisions such as capitalisation, and number of business enterprises within this short period. Further experiments should consider observing the impacts for longer period.

We conclude that mobile money and financial literacy training together with reminder SMSs has positive impact on mobile money knowledge and utilisation to individuals and VSLAs. Further research should consider observing the participants for a longer period after the intervention has been implemented to rule out the effects of lean seasons and short intervention period.

9 REFERENCES

Abebe, G., Tekle, B. and Mano, Y., (2016). Changing saving and investment behavior: the impact of financial literacy training and reminders on micro-businesses. CSAE Working Paper WPS/2016-08

Abiona, O., and Koppensteiner, M. F. (2016). Financial inclusion, shocks and welfare: evidence from the expansion of mobile Money in Tanzania. Upcoming publication

Andrianaivo, M. and Kpodar, K., (2011). ICT, Financial Inclusion, and Growth: Evidence from African Countries. IMF Working Paper Number WP/11/73.

Aryan. (2004). Technology Applications for financial inclusion in India, IBEF.

Asongu, S. and Nwachukwu, J., (2017). ICT, Financial Sector Development and Financial Access. *Journal of the Knowledge Economy*

Buckley, R., Greenacre, J. and Malady, L. (2015). The Regulation of Mobile Money in Malawi. *Washington University Global Studies Law Review*, 14(3)

Chirwa, W.E. and Mvula, P.M., 2014. Malawi: Baseline Financial Literacy and Consumer Protection Household Survey, Lilongwe: Reserve Bank of Malawi

Colen and Stuart (2011). Prices or Knowledge? What drives demand for financial services in emerging markets? *The Journal of Finance*,66(6),1933-1976

Cordova (2013). Creating the Environment for Entrepreneurial Success, Centre for International Private Enterprise, Washington, DC

Demombyens, G. and A. Thengeya (2012). Kenya's mobile revolution and the promise of mobile savings, Policy Research Working Paper 5988, The World Bank, Washington DC.

FinMark Trust (2016). The Role of Mobile Money in Financial Inclusion in the SADC region: Evidence using FinScope Surveys. Policy research paper No. 03/2016.

FinMark Trust (2014). FinScope Consumer Survey Malawi 2014. [Online] Available at: http://www.finmark.org.za/wp-content/uploads/pubs/Broch_Consumer_Malawi_2014.pdf

GoM, (2017). National Financial Inclusion Strategy 2016-2020. Ministry of Finance and Economic Planning and Development, Lilongwe.

Jack, W. and Suri, T. (2014). Risk Sharing and Transaction Costs: Evidence from Kenya's Mobile Money Revolution; The American Economic Review.

Karlan, D., Savonitto, B., Thuysbaert, B., Udry, C. (2017) Impact of savings groups on the lives of the poor. Proceedings of the National Academy of Sciences of the United States of America, 114(12): 3079 - 3084

Ksoll et al., (2013). Financial inclusion and legal discrimination against women; The American Economic Review. American Economic Association

Ksoll, C.,Lilleor H, Lonborg,J., Rasmussen(2014). Impact of Village Savings and Loan Associations: Evidence from a cluster randomized trial, Journal of Development Economics

Majanga B., (2016). The Journey to Financial Inclusion in Malawi-What Does the Future Hold? International Journal of Economics and Financial Research.,vol.2,issue 9,169-175

Mbiti, I and Weil, D.N. (2011). Mobile banking: The impact of M-Pesa in Kenya. NBER Working Paper 17129. Cambridge, National Buruea of Economic Research (NBER).

Nandhi A.M , (2012). Effects of mobile banking on the savings practices of low income users-The Indian Experience, IMFT-working paper

Ntwiga, D. B. (2016). Financial Inclusion and Cream Skimming in Kenya's Financial Sector, International Journal of Research in Finance and Marketing, 6(1), 41-47.

McKenzie, David. 2012. ``Beyond the baseline and follow-up": the case for more T in experiments. *Journal of Development Economics* 99, no. 2: 210-221.

Ouma, S. A., Odongo, T. M. and M. Were (2017). Mobile financial services and financial inclusion: Is it a boon for savings mobilisation? Review of Development Finance, http://dx.doi.org/10.1016/j.rdf.2017.01.001

Reserve Bank of Malawi (2017). National Payment System Report, Vol 5, Issue 9.

Ssekandi, J., Zigiti, Z., Joloba, D., Kachero, B., and Galiwango, S., (2015). PEP Working Paper

Toma, S., Grigore, A. Marinescu, P., 2014. Procedia Economics and Finance 8, 436 – 443.

Valdivia, M., (2014). Business Training plus for Female Entrepreneurship? Short and Medium-term Experimental evidence from Peru. PEP Working Paper

World Bank., (2011). World Bank Financial Inclusion Report, Washington DC

10 Appendices

Appendix 1: ANCOVA Regression results on impact of mobile money promotions on knowledge of mobile money services

	Receiving money	Transferring money	Paying bills	Saving money	Obtaining loan
Treatment	0.052	0.047	0.043**	0.056*	0.038
L.know_receive_money	0.268***				
sex	0.239**	0.112	0.019	0.094	0.015
1.education	0.000	0.000	0.000	0.000	0.000
2.education	0.145***	0.037	0.047**	0.084*	0.084**
3.education	0.324***	0.146***	0.057**	0.174***	0.112***
4.education	0.371***	0.308***	0.136	0.336***	0.109
5.education	0.355***	0.370***	0.223**	0.367***	0.271**
1.employment	0.000	0.000	0.000	0.000	0.000
2.employment	0.339**	-0.863***	0.025	-0.856***	0.152
3.employment	0.290***	-0.910***	0.104*	-0.823***	0.076
4.employment	0.204***	-0.946***	0.072*	-0.906***	0.095**
5.employment	0.128	-0.825***	-0.005	-0.915***	-0.127
6.employment	0.676***	-0.843***	0.078	-0.952***	0.009
7.employment	0.145**	-1.026***	0.062	-0.931***	-0.003
0.married	0.000	0.000	0.000	0.000	0.000
1.married	-0.105	-0.036	0.071	0.039	-0.055
2.married	-0.042	-0.072	0.027	-0.013	-0.092
4.married	-0.065	-0.131	0.005	-0.014	-0.101
5.married	-0.137	-0.151	0.038	-0.009	-0.159
6.married	-0.092	-0.064	-0.012	0.038	-0.123
1.district	0.000	0.000	0.000	0.000	0.000
2.district	-0.129**	-0.057	-0.030	-0.048	-0.008
L.know_transfer_money		0.234***			
L.know_pay_bills			0.234***		
L.know_save_money				0.373***	
L.know_get_loan					0.111*
_cons	-0.060	1.067***	-0.128	0.869***	0.036
r2_a	0.229	0.156	0.082	0.218	0.055
F	.	.	.	.	.
p	.	.	.	.	.
df_r	41.000	41.000	41.000	41.000	41.000
df_m	18.000	18.000	18.000	18.000	18.000
rss	90.764	71.397	31.380	60.938	55.825
N	554	554	554	554	554

Appendix 2: Results on impact of mobile money on Mbile money utilisation

	Receiving money	Transferring money	Paying bills	Saving money	Obtaining loan	Mobile money account
treat	0.106***	0.010	-0.001	0.046**	-0.005	0.040
sex	0.169**	0.060	-0.033*	0.141**	-0.021*	0.294***
1.education	0.000	0.000	0.000	0.000	0.000	0.000
2.education	0.039	0.004	-0.002	-0.003	0.004	0.008
3.education	0.155***	0.053**	-0.006	0.051*	0.019	0.123***
4.education	0.217**	-0.051	0.022	0.094	-0.012	0.172**
5.education	0.194	0.335***	0.110	0.382***	0.131	0.443***
1.employment	0.000	0.000	0.000	0.000	0.000	0.000
2.employment	0.284*	-1.008***	-0.026	-0.885***	-0.048**	-0.728***
3.employment	0.153**	-1.033***	-0.002	-0.953***	-0.013	-0.879***
4.employment	0.029	-1.058***	-0.027**	-0.994***	-0.007	-0.919***
5.employment	0.054	-0.989***	-0.002	-1.063***	-0.033*	-1.101***
6.employment	0.231	-0.964***	-0.067	-0.905***	-0.059	-0.843***
7.employment	0.109	-1.084***	-0.020*	-1.018***	-0.041***	-0.957***
0.married	0.000	0.000	0.000	0.000	0.000	0.000
1.married	0.008	0.001	0.046*	-0.024	-0.056	0.061
2.married	-0.047	0.002	0.029	-0.031	-0.056	0.103
4.married	0.007	-0.041	0.024	-0.065	0.005	0.075
5.married	-0.097	-0.077	0.017	-0.044	-0.082	0.043
6.married	0.077	-0.007	0.021	-0.058	-0.072	0.083
1.district	0.000	0.000	0.000	0.000	0.000	0.000
2.district	-0.091**	-0.031	0.017	-0.014	0.000	-0.052
L.Received money	0.312***					
L.Transferred money		0.246***				
L.Paid bills			0.279**			
L.Save money				0.234***		
L.Obtain loan					0.048	
L.own MM account						0.437***
_cons	-0.048	1.063***	-0.015	1.000***	0.084	0.910***
r2_a	0.178	0.229	0.149	0.238	0.030	0.263
F	.	.	.	.	.	.
p	.	.	.	.	.	.
df_r	41.000	41.000	41.000	41.000	41.000	41.000
df_m	18.000	18.000	18.000	18.000	18.000	18.000
rss	83.047	23.759	5.681	26.660	11.000	70.414
N	554	554	554	554	554	554

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix 3 : Control groups

No	Name of VSLA	Baseline	End line	Attrition Rate	Group size
1	Mwaiwathu	5	4	0.8	7
2	Madothi	8	4	0.5	12
3	Titukuke	10	9	0.9	
4	Tiyanjane iv	10			24
5	Mjombo	11	11	1	15
6	Chigonjetso	12	10	0.83	12
7	Tisanyozane	12	13	1	13
8	Lake Chiuta FA	14	8	0.57	15
9	Umodzi	14	8	0.57	19
10	Chikondano	16	14	0.875	19
11	Gwemba	16	16	1	16
12	Masawu	16	16	1	
12	Mgwirizano 1	16	14	0.875	20
14	Tiyanjane A	16	10	0.625	25
15	Chilungamo	17	13	0.765	22
16	Chisopo	17	16	0.941	20
17	Tasangalara B	17	14	0.824	20
18	Chimwemwe 1	21	21	1	21
19	Mango	21	16	0.762	22
20	Namapiri	22	22	1	25
21	Tisayambane	23	21	0.913	25
	Total	314	346		660

Appendix 4: Treated groups

No	Name of VSLA	Baseline	Endline	Attrition Rate	Group size
1	Chisangalaro	14	16		19
2	Guma	18	19		
3	Kachere	7	8		13
4	Namawatu	10	11		15
5	Phindu	13	13	1	25
6	Simon BVC	7	6	0.86	12
7	Talandira	14	11	0.79	13
8	Tidziwane	36	40		40
9	Tigwirizane A	17	20		22
10	Tigwirizane B	24	33		30
11	Tikondane A	12	10	0.83	12
12	Tikondane B	14	14	1	15
13	Tikondane C	26	25	0.962	25
14	Tikondane D	32	26	0.813	30
15	Tiyamike	17	10	0.59	24
16	Tiyanjane 1	8	7	0.875	15
17	Tiyanjane i	13			13
18	Tiyanjane ii	11			15
19	Tiyanjane iii	11			14
20	Ufulu	17	20		18
21	Ulemu	25	25	1	27
	Total	346			660

SMS templates

Za chuma:

Khalani ndi dongosolo labwino loyendetsera chuma. Kusunga ndalama pa ndalama imene timapeza ndikothandiza pa chuma.Sungani ndalama ku malo ngati ku bank , bank nkhonde kapena foni ya m'manja (Airtel Money/TNM Mpamba).

Sungani kaundula wa buzinesi yanu woonetsa ndalama zomwe mwagwiritsa ntchito ndi phindu lomwe mwapeza kuti mudziwe ngati business ikuchita bwino kapena ayi. Pewani kutenga mpamba wa bizinezi ndi kugwiritsira ntchito za pakhomo. Gwiritsani ntchito phindu la ndalama lomwe mwapeza pa bizinesi yanu powonjezera mpamba wa business yanu kuti buzinesi yanu ikule.

TNM Mpamba

Gwiritsani ntchito TNM Mpamba posunga ndalama , kutumiza ndalama, kulandila ndalama, kufesa ndalama komanso kugula ma unisi Choncho,sungani ndalama zanu kapena zagulu lanu ku TNM Mpamba kuti zisamalike.Kuti muthe kutero, tsegulani kapena pitani kwa ejenti wa TNM kuti akutsegulireni akaunti ya TNM Mpamba.

Airtel Money

Gwiritsani ntchito Airtel Money posunga ndalama , kutumiza ndalama, kulandila ndalama, kufesa ndalama komanso kugula ma unisi Choncho,sungani ndalama zanu kapena zagulu lanu ku Airtel Money kuti zisamalike.Kuti muthe kutero, tsegulani kapena pitani kwa ejenti wa Airtel kuti akutsegulireni akaunti ya Airtel Money.