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Mobile Banking and Microfinance Institutions Sustainability: Analysis of Digital Financial Services in Rwanda (2011-2015)

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Authors' contributions

The two authors designed, analyzed, interpreted and prepared the manuscript. Both authors read and approved the final manuscript.

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ABSTRACT

The study analyzed the digital financial services in Rwanda basing on mobile money operators, the case study of COPEDU Ltd (2011-2015). The objectives of the study were to examine the technical and non-technical requirements for linking a mobile money account to MFI's normal account in COPEDU Ltd; to assess the usage behavior of the service by the mobile subscribers in COPEDU Ltd, to assess the service effectiveness and cost charges of the mobile money systems of the clients in COPEDU Ltd and finally to determine the impact of the linkage between Mobile money and COPEDU account on savings in COPEDU Ltd.

Research Methodology used was the qualitative and quantitative methods to achieve the research objectives: Both primary and secondary data were collected to 200 clients of COPEDU Ltd using the questionnaire and interview techniques then analyzed through MFI Factsheet_ 3.4, SPSS 16 tools (Pearson correlation, and multi regression analysis).

The outcome indicates that 54% accept that COPEDU can link the ordinary account to Mobile Money account while 46% do not accept it as detailed below: 26.7% of the respondents expect

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funds transfer between the two accounts, 32% expect decreased cost of managing the COPEDU account, 24% said that they expect that it will be easy to access both accounts using a single terminal while 9.3% expect flexibility, independence and freedom and 8% think that the linkage between two accounts will increase the use of money.

Based on the results, the savings on MM Account affect negatively the savings on COPEDU Account for MM users. Therefore the saving on MM accounts for the users increases by 1%, the savings on COPEDU Account decrease by 0.998% ceteris paribus. Due to these results above the linkage of the two accounts could be one of the solutions, which can create the positive relationship. However, the mobile money non-users have the reasons of keeping getting the loans from COPEDU and they feel more secure with their assets. Mobile money has increased the financial services accessibility and usage in Rwanda according to the results.

To sustain their activities, the MFIs should adopt MM system to stay in the market in the future.

Keywords: Mobile banking; financial services; microfinance; financial inclusion.

1. INTRODUCTION

Globally, more than 2.5 billion adults do not have a formal bank account, most of them in developing economies; Demirguc-Kunt & Klapper [1]. Low levels of financial inclusion represent a barrier to socio-economic development in developing countries. Mobile money can be a game changer for people of limited income and an enabler for financial inclusion in developing countries. The recent growth of digital financial services has allowed millions of people who are otherwise excluded from the formal financial system to perform financial transactions relatively cheaply, securely, and reliably quoted from ITU [2].

As sited above, the usage of mobile money is expanding in developing countries, the later push the research to base this study on mobile money as one of the digital financial services which is mostly affordable in Africa especially in Rwanda. Demirguc-Kunt and Klapper [1] argued that mobile money describes financial transactions that are conducted using a mobile phone, where value is stored virtually (e-money) in an account associated with a SIM card. Such transactions are compatible with basic phones and do not require internet access. Mobile money systems have the potential of extending the reach of financial services to populations not served by the traditional banking sector. Referring to Lassaad & Jian [3], mobile money is used to loosely refer to money stored using the Subscriber Identity Module (SIM) as an identifier as opposed to an account number in the conventional banking business. It can also be defined based on its functionality by observing that it includes all the various initiatives (long-distance remittance, micropayments, and informal airtime) aimed at bringing financial

services to the unbanked, as well as convenience for the banked, using mobile telephony technology.

The term has also various synonyms such as 'mobile wallet', 'mobile financial service' and 'mobile payment' and can be defined as a term that describes the services that support/enable electronic money transaction such as account access, money transfer, and mobile commerce over a mobile phone. The various definitions underscore the diversity of the usage of the term across the industry and in the literature Kevin & Pierre [4].

Investopedia explains 'savings' that for those who are financially prudent, the amount of money that is left over after personal expenses have been met can be positive. For those who tend to rely on credit and loans to make ends meet, they will have negative savings. Savings can be turned into further increased income through investing, www.investopedia.com [5].

Microfinance serves as an umbrella term that describes the provision of banking services by poverty-focused financial institutions (microfinance institutions – MFIs) to poor parts of the population that are not being served by mainstream financial services providers Vishal & Sehgal, [6]. MFIs play also a very important role in the economy. More precisely MFIs have a two-fold mission which is social and economic by helping the customers to have active financial lives, intermediate a large part of their income, seek ways to save, borrow and insure and focus first on day to day needs. Stuart Rutherford [7].

As quoted above, the MFIs customers who are the poor need to have different services like microcredit, savings and so on. People's savings

goals generally relate to future payments they would like to make: for school fees, housing, weddings, working capital for trading activities or health emergencies. By planning payments, households can seek to stabilize their daily circumstances, develop opportunities to improve their condition in the future, and mitigate shocks that can set their families back.

Thus, the notions of savings, payments and budgeting are inextricably linked. Even though MFIs are offering those services most people are still excluded from formal financial services in Africa. Jenny, Aker, & Kim [8] urged that in the remote areas of sub-Saharan Africa, less than 20 percent of the population has access to any type of formal financial institution. Jenny et al. [8] illustrates that access to financial services is a key aspect of development, as credit and savings allow households to invest, save and respond to shocks. Households in such contexts typically share risk by self-insurance (savings), including "at home savings" (i.e., under a mattress), saving with collectors or "rotating savings clubs". In addition to savings, rural households often use migration to urban areas as means of diversifying household income. While these strategies are important risk-sharing mechanisms for rural households, they are also subject to risks, including theft (in the case of the mattress), restricted access at relevant times (in the case of the mattress), and restricted access at relevant times (in the case of the savings club), fees or high transaction costs, Jenny et al. [8].

Due to the lack of accessibility and high cost transactions, in March of 2007 M-PESA was introduced into the market by Safaricom, Kenya's largest mobile operator (MO) according to Donner [9]. The application facilitates a variety of financial transactions through the mobile phone. This includes account balance checks, deposits and withdrawals, bill and merchant payments, airtime purchases, and money transfers Hughes & Lonie [10]; Vaughan [11]. The growth of the application has been impressive. USAID [12] illustrates that in the last dozen years mobile technology has flourished throughout the developing world faster than any other technology in history; the latter show that with that growth comes an equally impressive surge of messaging services, providing not just a broadly used means of personal communications, but also a number of valuable information services, from agricultural data reports to healthcare reminders; while latest phenomenon spawned by mobile technology is mobile money;

this trend is providing money transfer services to millions of previously underserved people in the developing world, allowing them to safely send money and pay bills for the first time without having to rely exclusively on cash.

Jonathan et al. [13] urged that East African countries, particularly Kenya led by M-PESA, have been the most successful users of mobile money. Mobile money began in the Philippines in 2001. According to GSMA [14], in December 2011 there were 129 mobile money operators in the world with more than 100 million subscribers. In a survey of 52 mobile money operators, (GSMA) found that there were 141.8 million transactions in June 2011, 80 percent of which occurred in East Africa, with Kenya alone accounting for 34 percent of transactions and 20 percent of the users. In 2011, 16 percent of adults report having used a mobile phone to transfer money or pay a bill in Sub-Saharan Africa, as compared to a global average of 5% (see Fig. 1 for the split across type of usage).

The data like those ones for the year 2012, 2013, and 2014 are not presented from any other report. That is why the researcher gave the situation in 2011 as a reference. While Rwanda started later than the other partner states in the EAC, its growth has been impressive (Jonathan et al., 2013). Registered users reached around 1.2 million in 2012 (11.5 percent of the population), with close to 800 000 active in the month of October John Bosco, [15]. However, it is still small compared to the markets in other East African countries, particularly Kenya, where 67% of the population received transfers via mobile money in 2011 (see Fig. 2); Jonathan et al. According to Jonathan et al. [13] the mobile money services that have been successful have varied substantially across markets. While Kenya has been the biggest success story in terms of overall usage, Somalia, Tajikistan and Albania lead on use of mobile money for bill payments. Kenya is not even in the top 5 Mbiti & Weil [16], despite its success in the use of mobile money for P2P transfers. Mbiti and Weil [16] argue that the low usage of M-PESA to pay bills may be due to long processing times (it will take between one or two days to process) and high time discount rates.

In Rwanda, payment of bills via mobile money is in its progressing well with other new services. With regard to mobile financial services developments, three telecommunication companies which are MTN, TIGO and AIRTEL

have been licensed to offer mobile payment services by the Central Bank and eight commercial banks are offering mobile banking services and internet banking quoted from the BNR (2013) Moreover, banks and Mobile Network Operators (MNOs) have been collaborating towards comprehensive mobile financial services interoperability by end of 2014. Up to June 2013 one Mobile Network Operator was linked to two banks to facilitate funds movement between mobile payments and mobile banking wallets of a client, quoted from BNR, (2013). Access to Finance Rwanda (2012) illustrates that some Rwandan population is consuming informal financial services not only because of poverty, but also due to cost of opening and maintaining an account or the distance to financial institutions' outlets, lack of trust financial institutions and necessary documents. Mobile money may help historically unbanked regions gain financial access.

As mobile banking subscribers, number of transactions and value are increasing year by year, the researcher think that the mobile services are well consumed in Rwanda, and most MFIs in Rwanda do not offer those services, that push the researcher to illustrate the impact of digital financial services on savings in Microfinance institutions in Rwanda, the case study of COPEDU Ltd.

Hypotheses to be verified are the following:

- ✓ The volume of savings of mobile money subscribers within COPEDU decreases compared to the rest of other clients.
- ✓ Linking mobile money account to client's account in COPEDU increases the volume of savings and number of account transactions.

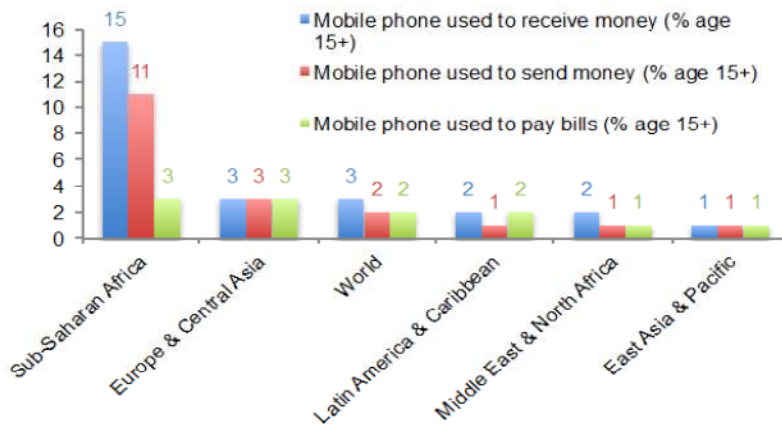


Fig. 1. Use of mobile money in 2011 (% of population age 15+)

Source: Global index 2011

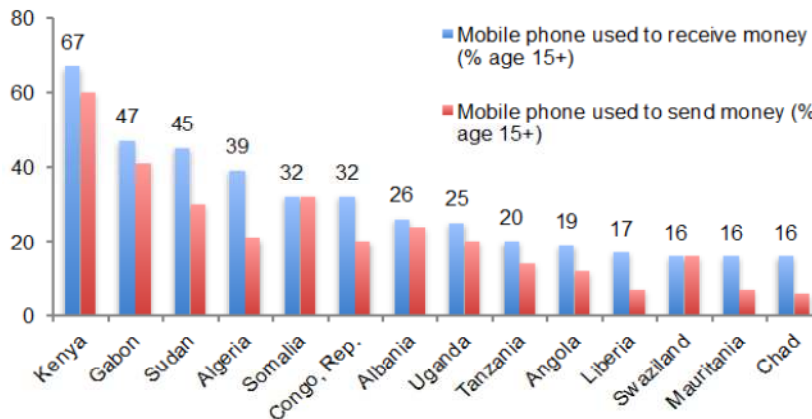


Fig. 2. Mobile money use-P2P transfers in 2011 (% of population age 15+)

Table 1. Evolution of mobile banking, mobile payment and internet banking in Rwanda

Period	Number of subscribers	Number of transactions	Value in frw million
Mobile payment			
Jan-Dec 2012	1,440,541	22,191,674	161,808
Jan-Dec 2013	2,412,007	57,147,777	330,378
Jan-Dec 2014	6,480,449	104,773,115	691,477
Mobile banking			
Jan-Dec 2012	297,537	1,458,063	3,926
Jan-Dec 2013	412,007	2,538,820	17,477
Jan-Dec 2014	659,712	4,637,849	41,281
Internet banking			
Jan-Dec 2012	3,411	10,036	12,746
Jan-Dec 2013	8,869	89,260	117,147
Jan-Dec 2014	41,616	312,264	332,959

Source: BNR, Payment system department, (2015, 43) [17]

2. RESEARCH OBJECTIVES

The general objective of the study is to investigate the impact of digital financial services on Microfinance Institutions 'saving in Rwanda, case study of COPEDU Ltd. Specifically the objectives are:

- ✓ To examine the technical and non-technical requirements for linking a mobile money account to MFI's normal account in COPEDU Ltd.
- ✓ To assess the usage behavior of the service by the mobile subscribers in COPEDU Ltd.
- ✓ To assess the service effectiveness and cost charges of the mobile money systems of the clients in COPEDU Ltd and
- ✓ To determine the impact of the linkage between Mobile money and Copedu account on savings in COPEDU Ltd.

3. LITERATURE REVIEW

- ✓ There are many studies carried out on digital financial services. In this part, the researcher presents some of studies related to the topic. A more focus is made on studies carried out in Rwanda, East Africa Community and Asia.
- ✓ Mwendwa, Alala, and Musiega [18] carried out a research on the Effects of Mobile Money Services on the Performance of the Banking Institutions taking Kakamega Town as their case study. Literature reveals that the mobile money transfer service is faster, cheaper, more reliable, and safer Jack & Suri [19]. The benefits of cashless transaction including less opportunity for fraudulent and criminal

activities, and mobile money technology Wishart [20] have increased adoption rates, Mbogo [21]. The main literature gap exists in revealing how mobile money technology has affected the performance of the banking industry in Kakamega town. From this problematic, the general objective was to examine the effects of mobile money services on the performance of banking institutions and specific objectives were to examine how the various mobile money services' transactions impact the performance of banking institutions, to establish the effect of the accessibility to mobile money services on the performance of banking institutions. Data collection was basically through self-administered questionnaires, both structured and semi-structure interviews and observation. The data collected were analyzed qualitatively and quantitatively using synthetic, statistical, comparative methods.

- ✓ The analysis of data led to following main findings: (a) Accessibility and understandability of mobile money services: The analysis shows that the entire respondents 115 (100%) agreed that one needs not to register with the bank to get access to mobile money services hence uncertain and not necessary response were 0% each. (b) Responses on whether one can access mobile money services any time 24 hours: The analysis reveals that majority of the respondents 73 (63%) strongly agree while 42 (37%) agree that mobile money services can be accessed any time 24 hours. No respondent disagreed, strongly disagreed or were not sure hence 0%. This reveals that mobile money is a 24hrs service. (c) Payments of

- utility bills through mobile money service technology: The study shows that the majority of the respondents, 87% strongly agree that payment of utility bills can be made using mobile money services technology and the remaining 13% also agree while none of the respondents disagree, strongly disagree or is uncertain (0%).
- ✓ This study is related to our research because it assessed the effects of Mobile Money Services on the Performance of the Banking Institutions. They are related as they are assessing the effects of digital financial services (Mobile Money services). Our research is more specific and adopted a different approach to the study of Mwendwa et al. [18] where they assessed the effects of Mobile money on the performance of banks whereas our research assessed the specifically the effects of Digital financial services on the savings of MFIs.
 - ✓ Mani [22] analyzed the effects of Mobile Banking on the Savings Practices of Low Income Users taking the Indian Experience. The resounding success of M-Pesa in Kenya has shown that the ubiquitous mobile technology offers considerable potential for lowering transaction costs and providing secure banking services to vast numbers of poor people in the developing world. Given that large segments of the urban poor in India are financially excluded, EKO's SimpliBank mobile money has a major role to play in delivering cost-effective financial services to the poor. For the provider, the success of mobile money focuses on a macro perspective (namely, EKO's outreach, coverage and targets); for the end user, the impact of EKO's mobile money centers on the micro unit (that is, access, safety, and cost of transaction). Focusing on low-income EKO customers in Delhi, Mani A. Nandhi [23] analyzed the effects of mobile banking on their saving behavior and other informal saving practices.
 - ✓ The researcher interviewed key officials and field managers of EKO, 17 retail agents or CSPs to cross validate the information gathered from EKO customers. In addition, the research involved focus group discussions with non-users of mobile banking and case studies of EKO customers to supplement the survey data. The data analysis was done using comparative, statistical, synthetic and analytical methods. The main findings showed that EKO mobile banking has increased the capacity of low-income users to save; 90 percent of users (N=144) state that their ability to save has increased, EKO mobile account is a safe, trustworthy, and useful savings mechanism, EKO mobile money is a good substitute to informal savings methods: the majority of low income users in the study (95 percent) perceived EKO mobile banking account as a good substitute to informal savings practices such as saving at home, cash on hand, saving with a money guard. EKO mobile banking is a preferred alternative for small savers: about their preference for saving in small lump sums of Rs. 1,000 to 2,000 (\$20 to \$40), 79 percent of users in the study preferred EKO mobile banking accounts as against 26 percent who preferred 'saving at home. A critical finding is that EKO mobile banking service is valued as a boon for small savers and users who depended on risky informal savings practices. In particular, a high percentage of users save in EKO mobile banking for emergencies. More importantly, it is considered as a robust substitute to many informal savings mechanisms as well as a bank account.
 - ✓ This study is related to ours. Mani [22] assessed the Effects of Mobile Banking on the Savings Practices of Low Income Users in India. The mobile banking and mobile money act as financial substitutes to informal financial services (informal savings, "thesaurization" hoarding)... Our study is different to Mani's research as it showed that the usage of financial services has been increased due to Mobile money services and how the linkage of both accounts can increase the savings in COPEDU and MFIs in general.
 - ✓ Recent survey of over 2,000 Kenyan households found that 89% of respondents used M-PESA, a Kenyan mobile money (MM) application, "to save". Morawczynski confirmed this finding after spending over 18 months studying the financial habits of resource poor M-PESA users in two locations: an urban slum called Kibera and village in Western Kenya called Bukura. The study found that M-PESA was integrated into the financial portfolios and acted as a complement, rather than a substitute, to other mechanisms. This

paper expands on these findings by disaggregating the term “savings” and focusing on behavior.

- ✓ Four scenarios have been developed to explain how and why resource poor individuals use MM as a savings mechanism. These scenarios describe the frequency of transactions and the costs associated with each form of savings. A case study accompanies each scenario to explain the circumstances leading to the savings behavior. Two MM applications are central to this analysis—M-PESA in Kenya and Mobile Money in Uganda.
- ✓ The industry has given much attention to scaling MM, either through growth of the distribution network or inclusion of a wide partnership base. These discussions have overshadowed those on products. We have forgotten that M-PESA grew quickly because it was appropriate for poor Kenyans, suited their needs and compatible with their financial habits. The expanding agent network and enrollment of many partners facilitated that growth. In addition to understanding what people do, we must also focus on why it is important to them. This can cultivate value propositions that resonate with this segment. Nearly every Kenyan understood the three words that guided the launch of M-PESA—“send money home”. Finding propositions that work as well for savings—such as for school fees or business investments is equally important. This facilitates the shift of particular markets, as well as the entire MM industry, beyond payments. This study is related to our research because the study is looking for other alternatives of usage of MM services, where linkage of the ordinary account and MM account, could be one of alternatives.
- ✓ As Microfinance is the provision of small scale financial services to unbanked poor people, microfinance is promoted as a poverty reduction tool, the mission of an MFI is to serve the poor and contribute to poverty alleviation. The mobile money came as also as a tool to help poor people to approach financial services easily, we have seen different types of mobile money, how mobile money help the poor and so on. According to the literature review, the researcher consulted books and articles to understand the basics of this work.

4. RESEARCH METHODOLOGY

The methodology of conducting this research is based on different methods among which we have to compare and analyze different sources of information regarding microfinance and mobile money. We analyzed different documents on mobile money and different documents from the institution such as reports and financial reports emphasizing on savings. The data were analyzed through SPSS software by applying the linear regression and the Pearson correlation to access significance of the variables and their relationship.

4.1 Data

Data were collected from the field using questionnaire which was self-directed, observation and interview responding by COPEDU Ltd staff and clients chosen using the technique of sampling. On the client's interview, the researcher used directive and semi-directive interviews. The total population under this study is 39375 where a sample of 200 clients (100 users and 100 non-users of Mobile money) was selected using Yamane's formula. Yamale [24].

4.2 Research Instruments

Primary data and second data collection had been used in order to achieve the research purpose. Primary data has been collected through observation, interview and questionnaire that was developed to a total population of 200 clients of COPEDU Ltd on the efficiency and effectiveness of mobile money services of COPEDU Ltd customers, customers behavior about usage of mobile money services, how they appreciate the usage of mobile money, the challenges they are meeting and the improvement which can be made on mobile money services. References has been made through an intensive review of the reports, journals, books, magazine and internet materials for making a clear understanding of the institution understudy which is COPEDU Ltd and making a good linkage of COPEDU Ltd savings and MM savings by using SPSS version 16.0.

4.3 Models and Techniques

Statistical methods are mathematical concepts, formulas, models, techniques used in statistical analysis of random data. In comparison, deterministic methods are used where the data is easily reproducible or where its behavior is

determined entirely by its initial stage and inputs, www.businessdictionary.org [25]. This method has been useful in this paper especially in analyzing the effects of digital financial services on savings of COPEDU Ltd using linear regression in SPSS 16.00. The following model was run:

$$Y_t = \beta_0 + \beta_1 X_t + \phi_t$$

Where β_0 and β_1 are parameters to be estimated.

To allow interpretation of the estimated equation in terms of percentages, the researcher has put the foreseen equation in logarithmic form.

$$LY_t = \alpha_0 + \alpha_1 LX_t + y_t$$

Where LY_t = Natural logarithm of Savings on COPEDU account LX_t and α_0 and α_1 are parameters to be estimated. Beside this equation, the correlation coefficient was calculated using the SPSS version 16.00. The statistical method helped in computing the correlation between saving on MM (X) and savings on COPEDU account (Y). Pearson's correlation coefficient is a statistical measure of the strength of a linear relationship between paired data. In a sample it is denoted by r and is by design constrained as follows $-1 \leq r \leq 1$ When

- $r = -1$ perfect -ve correlation
- $r = 0$ no correlation
- $r = +1$ perfect +ve correlation

Correlation is an effect size and so we can verbally describe the strength of the correlation using the guide that Evans (1996) suggests for the absolute value of r .

- .00-.19: "Very weak"
- .20-.39: "Weak"
- .40-.59: "Moderate"
- .60-.79: "Strong"
- .80-1.0: "Very strong"

5. FINDINGS AND RESULTS

The findings are discussed according to the objectives and hypothesis of the study.

5.1 Technical and Non-technical Requirements for Linking Mobile Money Account to MFI's Normal Account in COPEDU Ltd

The findings from technical and non-technical requirements show that the non-technical requirements for linking the mobile money

account to ordinary account requires the Compensation scheme between ordinary and MM account; Commercial agreement between COPEDU Ltd and MMOs and Settlement should be done on applied fees while the technical requirements are the following: Both mobile money and COPEDU account are managed through automated information system, those two needs to agree on automated information system to be used; On software level, they need secured link between COPEDU and MNOs and they need to agree on the message to be exchanged on both sides that there is a need of partnership between COPEDU Ltd and MNOs and some agreements between the two parts for their profits. They need to agree on regulations, messages, net income sharing and so on.

5.2 The Usage Behavior of the Service by the Mobile Subscribers in COPEDU Ltd Assessment

The assessment on the usage of the services by the mobile money subscribers in COPEDU Ltd revealed that the respondents had different MM usage behavior where 84.0% of the respondents use Tigo cash, 60% use MTN mobile money and 8% use Airtel Money they use those MNOs because they want to access different mobile money services where (94%) use the money transfer, (88%) use cash deposit and withdraw while (50%) use mobile money to buy and (34%) use mobile money to pay for the following reasons where the majority of respondents (64.6%) use mobile money for person to person transaction, (52.1%) use mobile money services to pay and buy easily while (33.3%) use those services to reduce risk of carrying cash, (18.8%) use mobile money and 6% use these services because of the security of information.

Most of respondents (98%) prefer saving their money on COPEDU account while (2%) prefer to save their money on MM account for different reasons which are the following 73.5% use that account for security of their own money, 71.5% to get a loan while 46.9% are for reparation of their assets and 22.4% save on COPEDU account for a good relationship with their institution.

The behavior of money users is explained by the above, where they keep small amount on the mobile money account for emergencies and small transactions and big amount on COPEDU account for reasons cited and the most MNO used is Tigocash by COPEDU Ltd customers.

5.3 Assessment on the Service Effectiveness and Cost Charges of the Mobile Money Systems of the Clients in COPEDU Ltd

Majority of the respondents 40% of mobile money users agree that MM services are affordable (cost) than COPEDU Account, 12% strongly agree while 32% disagree and 16% strongly disagree. The perception of the respondents about the statement that the costs of using MM are not high compared to the cost of managing accounts in COPEDU. 54% which is the majority of the respondents disagree that the cost of using MM are not high compared to the cost of managing accounts in COPEDU Ltd, 22% strongly disagree while 18% agree and 6% strongly agree. This explains the preference in terms of costs between the two accounts COPEDU account and MM account; 48% of respondents disagree, 28% strongly disagree while 18% and 6% strongly agree as cited above those percentage explain how customers in COPEDU Ltd prefer MM account than COPEDU account.

The MM services are quicker compared to COPEDU, accessibility and facilities. Out of 50 respondents, 80% strongly agree that mobile money are accessed everywhere also 16% agree while 2% disagree and 2% strongly disagree; the study shows that 50% of respondents agree that there are facilities in use MM than COPEDU's services also 16% strongly agree but 12% disagree and 6% strongly disagree. The 58% of the respondents strongly agree that MM services are quicker than COPEDU services, 26% also agree while 6% strongly disagree and 10% disagree.

The perception about the cost of MM services justifies the usage of MM services even if they are expensive. As we have seen that the world's poor do not have a bank account, not only because of poverty but also due to costs, travel distance and paper work involved. On the case of Rwanda, cost is not an issue because at any cost they use financial services. The issue is accessibility and facilities, where MM is a solution.

5.4 Savings done and Transactions done by Mobile Money Users

The evolution of savings for MM users in 2012 to 2013 was negative; this period had a massive

progress usage in digital financial services. From 2013 to 2014, the savings knew a recovery and a positive trend. In that period most of the COPEDU Ltd customers had opened the MM accounts; taking the 2012 as the baseline, the researcher found that the savings of MM users dropped by 19.3% while the number of transactions is explained by this trend % where from 2012-2013 number of transactions increases by 8.5% while from 2012-2014 increases by 50% for MM users but for mobile non-users number of transactions increases by 25.3% from 2012-2013. The number of transactions has been increasing in last 3 years in COPEDU Ltd for the MM subscribers.

5.5 Savings and Transactions done by COPEDU Clients

To achieve the objective, the comparison on the savings of MM users and non-Users was made. The number of transactions of the two and the results show the following Basing on the year 2012, the savings of MM non-users has been increasing by 11.6% in 2012-2013 and by 871.03% in 2014 while for MM users the savings declined from 19.6% from 2012-2013 and increased by 92.6% from 2012-2014, the number of transactions of MM non-users is increasing more than number of transactions of MM users this is explained by the trend % where from 2012-2013 number of transactions increases by 8.5% while from 2012-2014 increases by 50% for MM users but for mobile non-users number of transactions increases by 25.3% from 2012-2013 while from 2012-2014 number of transactions for MM non-users increases by 83.1%. This explains number of times MM users goes to COPEDU compared to MM non-users used the COPEDU Ltd services and products.

Comparing the savings of MM users on COPEDU account and on MM account, the savings has been increasing progressively where the savings on COPEDU where greater than savings on MM account but in 2014 the savings on MM account became greater than savings on ordinary account.

5.6 The Impact of the Linkage between Mobile Money and COPEDU Account on Savings in COPEDU Ltd

The majority of the respondents 54% accept that COPEDU can link the ordinary account to MM account while 46% do not accept it basing on the

following expectations, 26.7% of the respondents expect funds transfer between the two accounts, 32% expect decreased cost of managing the COPEDU account, 24% said that they expect that it will be easy to access both accounts using a single terminal while 9.3% expect flexibility, independence and freedom and 8% think that the linkage between two accounts will increase the use of money. The users of mobile money have suggestions to mobile network operators, to get better services and other institutions planning to offer the same services as MNOs do.

The test made using the Pearson correlation for the following equation: $Y = \beta_0 + \beta_1 X + \epsilon$

H0: $\alpha = 0$, the incidence of linking mobile money account to client's account in COPEDU cannot increase the volume of savings.

H1: $\alpha \neq 1$, incidence of linking mobile money account to client's account in COPEDU can increase the volume of savings.

($R = -0.712$, $N = 50$, $P < 0.001$)

The Pearson correlation coefficient is -0.72 , there is a strong negative correlation between SavB and Sava.

Estimated equation:

$$\text{LnSavB} = 17.476 - 0.501 \text{LnSAVa}$$

P-Value	.000	.046
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$$\text{LnSMMUC} = -1.519 - .998 \text{LnSMMA}$$

P-Value	.014	.035
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Based on the results, the savings on MM Account (LnSAVa) affects negatively the savings on COPEDU Account for MM users as long as the estimated parameter's probability is less than 0.05 (5% level of significance). Therefore the saving on MM accounts for the users increases by 1%, the savings on COPEDU Account decreases by 0.998% ceteris paribus. We accept the H1, because that portion of saving on MM account will jointly on the COPEDU accounts, as the results are shown.

6. CONCLUSION

The provision of mobile money services is increasing due to the offer of the same services or products as the financial institution. Some are more used in mobile money than in financial

institution like money transfer but also the customers prefer COPEDU account than mobile money account due to facts that they think their money is secured above. COPEDU may come up with the counter strategies like agency banking, m-banking and internet banking in order to neutralize the negative impact on their services or to meet customer's needs and preference.

Through mobile money platform customers enjoy a wide range of services because mobile money services are accessed everywhere, there are facilities in their usage and their services are quicker but also the cost is a very big challenge. As the majority agreed that cost is a very big challenge to them, the COPEDU can take advantage of that. The requirement for linking the two accounts would need different agreement from the two parts the MNOs and COPEDU Ltd where the intervention of ADFinance would be successful.

The volume of savings of mobile money subscribers within COPEDU decreases compared to the rest of other clients. Because there is another amount kept on MM account, and COPEDU Ltd should not neglect the amount of money. The incidence of linking mobile money account to client's account in COPEDU can increase the volume of savings because that amount can have an additional value on deposit of COPEDU. The number of transactions of mobile money non-users increases more than the number of transactions of MM users.

7. RECOMMENDATIONS

Basing on the study findings, the following recommendations are forwarded:

- ✓ The COPEDU Ltd should revise their products. Some of their products are not used by their customers. Those products are: Money transfer and forex bureau or make more effort on marketing. COPEDU Ltd should take advantage of MMOs because there is a bigger preference of it than MMOS and COPEDU Ltd should look for the partnership with MNOs for gaining more.
- ✓ Registration before being able to use any mobile money services is still a barrier for adoption across Rwanda, primarily because it has been a retroactive step—MNOs had already issued the bulk of their SIMs before they launched mobile money platforms.

- ✓ In their infancy, mobile money platforms across the country (Rwanda) are predominantly used for m-transfers between known parties. In this case, it is reasonable to accept mobile-money platforms restricted to users of a particular MNO because the parties can agree before-hand to operate on a given network belonging to a particular MNO. As mobile money matures towards m-payments and m-financial services, improved interoperability becomes increasingly critical.
 - ✓ Agency banking should now take a centre stage in the microfinance institutions short term strategic plans to deepen financial services further and ensure inclusion of the unbanked and the under banked as this is a huge market that remains a priority focus of the mobile money service providers. If possible MFIs should target to recruit as many agents as mobile money service providers have done as well as reduce agency banking fees to make their services affordable to both the rich and the have-nots.
 - ✓ MFIS should conduct research on other possible mobile money services packages that are user friendly and develop them so as to enable deposit/withdraw of money using mobile phone which will meet different customer requirements and capture market niches that competitors have not identified hence expand on the market share leading to improved financial performance.
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There is a need to make an inquiry on the impact of mobile money on the MFIs assets, especially non-performing loans. Also the implications of mobile money for monetary policy in Rwanda can be an area for further studies. Researcher can also look the general behavior of mobile money users, comparison of cost of all MNOs operating cost in Rwanda by focusing on customers' protection.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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