KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF HUMANITIES AND SOCIAL SCIENCES

DEPARTMENT OF ECONOMICS

ASSESSING THE IMPACT OF MOBILE MONEY IN PROVIDING FINANCIAL INCLUSION FOR THE RURAL POPULATION OF THE KASENA/NANKANA WEST DISTRICT OF UPPER EAST REGION

A DISSERTATION PRESENTED TO THE DEPARTMENT OF ECONOMIC IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF **MASTER OF SCIENCE IN ECONOMICS.**

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DECLARATION

I hereby declare that this submission is a product of my own effort towards the award of Master of Science Economics. To the best of my knowledge, no part of this work contains material neither previously publish by another person nor material which has been accepted for the award of any degree by any university except where due acknowledgement has been made.

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SUPERVISOR'S DECLARATION

I declare that I have supervised the student in undertaking the study submitted herein and I confirm my permission to present it for assessment.

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CERTIFIED BY

Dr. Yusif Hadrat …… ……..

(Head of Department) (Signature) (Date)

DEDICATION

This Work is dedicated to the almighty God for His Guidance and Protection throughout the study

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ABSTRACT

The introduction of mobile money services by the Telecommunication companies have become a common phenomenon in recent times in a bid to gain comparative advantage through diversification, and increase in market share to boost growth and profitability. This service facilitates the transfer/receipts of money in a convenient, quick and reliable manner. It also provides an ideal platform for small savings to majority of rural population who have no access to formal financial services. The study therefore seeks to explore the impact of mobile money on the savings behavior as well as on the payment (transfers and receipts) in the Kasena/Nankana west district of the Upper East region. Based on self-administered questionnaire for a sample size of 300 respondents of mobile phone users, the study employed the probit model analysis as estimation technique. The results showed that mobile money has provided an ideal platform for savings and promotes delivery of remittances through quick and reliable transfers especially by low-income individuals thereby promoting financial inclusion.

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CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The rapid revolution of Information and Communication Technology has extended to almost every part of the world of which developing nations are not exempted, overtaking line phones and directly moving to mobile phone usage. According to the Africa Mobile Observatory report (2011), the world have about 3.2 billion mobile phone users and Africa has grown to become the second largest mobile market in the world after Asia. Mobile penetration in Africa has grown from 2 to 57 per cent between 2000 and 2010, and there is still a significant opportunity for growth to hit an estimated 84 per cent by 2015. According to Group Special Mobile Association (GSMA) report (2009) in Ghana, mobile phone penetration increased to 57 per cent from 1 percent between 1999 and 2009 and has still continued to rise substantially in the past few years.

GSMA's Mobile Economy (2013) report indicates that, more than 2.5 billion of the adult population globally has no access to basic financial services in order to perform basic financial transactions such as money transfer, savings and borrowing. In developing countries, the adult population with formal bank accounts is only 41 per cent. In Africa, the number of families who have access to formal financial institution such as bank, microfinance, or cooperative stood at only 20 per cent. World Bank (2012) also indicates that, only 30 per cent of the populations of Ghana have bank accounts.

The unbanked population of the world has a significant opportunity for financial inclusion through mobile money services due to increasing levels of mobile

penetration. This allows relatively cheap, secured reliable performance of financial transactions for millions of people who lack the opportunity to access the formal financial system (Jack and Suri, 2014). According to Rangarajan (2008) as cited by Shastri (2014), financial inclusion is the process of ensuring access to appropriate financial products and services needed by vulnerable groups such as weaker section and low income groups at an affordable cost in a fair and transparent manner by main stream institutional players. The rapid spread of mobile phones allowed increasing number of people in rural areas to obtain a substitute to the formal banking, as the service is an alternative for paper-based banking and informal method of money transfer through network of social relations. Hence, it allows people who are far from any bank branch or ATM to make financial transactions (Gbombe and Tomoya, 2014). Technology watch Report (2013), revealed that the biggest achievement of mobile money adoption and usage ever made is in Sub-Saharan Africa, where 16 per cent of adults are said to have paid bills, received or send money through mobile money over the past one year. In Africa, a notable example of mobile money is M-PESA in Kenya, where the Technology Watch Report (2013) indicates that the unbanked population of Kenya doubled from 25 to 50 per cent between 2007 and 2009, and by 2011 the membership grew to more than 15 million from 2.5 million in 2007. It was also revealed that M-PESA users did not just engage in basic services of sending and receiving money but also created an ideal platform for savings

Increase accessibility to formal financial services by households in rural areas of third world countries particularly in Ghana has been made possible by the introduction of mobile money (m-money) services. Jack and Suri (2014), indicated that, mobile-money services have the tendency to decrease the transaction costs of domestic money transfers, thereby allowing low income households in rural areas to make

financial transactions more frequently. Hence increase their risk sharing ability. Mobile -money services therefore serves as a window of opportunity for bringing unbanked and under banked people of rural households in developing countries into the formal financial sector as it can allow access to financial services such as payments, transfers, credit and savings at relatively reduced cost. Aker and Wilson (2013) indicated that, in an attempt to increase financial inclusion especially to illiterate population of Ghana, the BOG introduced the 'EZWICH' -biometric Bankcard that can be used at ATMs. Beside this service, the Telecom industries namely; MTN, Vodafone, Airtel, Glo, Expresso, Tigo have introduce mobile Financial services into Ghana in addition to the usual phone and SMS services. To what extent therefore does mobile money facilitates financial inclusion for the unbanked population of rural people in Ghana.

1.2 Problem Statement

In developing countries especially African countries, less than 50 percent of the total population have access to any formal financial services such as banks, microfinance and cooperatives. For the case of Ghana, about 30 percent of its populace have bank accounts (World Bank, 2012). However, this statistics resulted from the fact that most people are not motivated to adopt formal banking system. For instance, Gbombe and Tomoya (2014) indicated that, the relative concentration of banks in urban centers with limited rural penetration. This is the case of Kasena/Nankana west district where there is only one Rural bank at the time of the research. This increases transaction cost and restrict access. Other factors include; lack of trust, difficulty in accessing funds, cumbersome procedures in opening accounts, and high transaction cost (Demirguc-Kunt and Klapper, 2012) serve as disincentive. Similarly, studies conducted by Nandhi (2012) shows that, the banks equally neglect the poor because, their

livelihoods are not stable, flow of income is uneven, and lack the means to achieve financial discipline.

Hence, in the Kasena/Nankana west district where there is only one rural bank, the poor in hard times, often resort to informal methods and social arrangements involving social network of friends and family to transfer money. Aker and Wilson (2013) observed that, most people also resort to informal risk-sharing arrangements by self-insurance such as saving under a mattress, savings with susu collectors or rotating savings clubs, which poses some element of risk. Nandhi (2012), observe that such arrangements are unsaved, financially and socially expensive but more convenient. Notwithstanding these, financial service accessibility is a crucial component of development, as allow low income earners to invest, save and absorb shocks.

According to Donovan (2012), poverty goes beyond the mere lack of money but includes lack of opportunity to the instruments and means through which the poor could improve their lives. World bank (2012) as cited in Gbombe and Tomoya (2014) revealed that financial inclusion plays crucial role in decreasing poverty at the rural areas as it promotes saving and borrowing in addition to empowerment of the poor to smoothen consumption and protect themselves against a number of vulnerabilities in their lives. The fact that the poor are financially excluded does not necessarily mean that their financial lives are inactive: In fact, the delicate nature of their situation made them to develop sophisticated informal financial instrument (Donovan, 2012). However, the use of only informal instruments suggests that there are still limitations on their financial accessibility. However, an estimated one billion of this population worldwide use a mobile phone (Aker and Wilson, 2013). In the Kasena/Nankana west district there is an estimated 9484 mobile phone users at the time of the research

which can serve as an ideal platform to providing access to financial services. Hence, the numerous risk posed by the informal methods coupled with the location of most financial institution out of the district to the detriment of the rural population may serve as an inducement to the adoption of mobile money.

1.3 Research Objectives

This research seeks to explore the impact of mobile money in providing financial inclusion for the unbanked rural population of the KasenaNankana West district of the Upper East Region of Ghana.

The Specific Objectives to achieve the general objective:

1. To determine the impact of mobile money on the savings of rural population
2. To determine the impact of mobile money on the payment system
3. To determine challenges of using mobile money

1.4 Research Questions

1. What is the impact of mobile money on savings?
2. What is the impact of mobile money on the payment system?
3. What are the challenges of using mobile money?

1.5 Significance of the Study

It has been noticed that literature exists on Mobile money in Ghana. However, there seem to be scanty information on this topic in the Kasena/Nankana West district. The study is therefore intended to make significant contribution to literature by exploring the impact of mobile money in providing financial inclusion for the rural population of the Kasena/Nankana West District in the Upper East region of Ghana. This study is unique because it focuses especially on households in rural areas who are often more financially excluded.

This research would serve as an intellectual exercise. However, findings will go beyond the boundaries of academia. Thus, it will provide Local information on the subject to all stakeholders.

In particular, the results of the study will guide policy makers, Central Bank, Banks, NGOs and Development partners in the design of appropriate interventions, as well as identify areas of co-operation with mobile money service (MMS) providers to make necessary policies aimed at providing financial inclusion for the rural population through the adoption and use of mobile money services. The results of the study can be adopted by government and all stakeholders to decide on the best alternatives to adopting and improving non-cash payment systems since a reliable and efficient payment system is important to an ideal banking and financial operation system, its real economy and to central bank's reputation.

Notwithstanding the crucial role mobile banking plays in the lives of rural poor, there is scanty knowledge about its effect on their welfare. To be more specific, little empirical evidence exists on how access to financial services can impact on the lives of low income earners in developing countries. Besides, sample analysis of studies often focus on mobile money users of urban areas with little attention on the deprive areas which usually tend to have little access to financial services. For instance, Mensah-Nyame (2013), conducted a study on the value of mobile money in the city of Accra. The study centered on business owners who use MTN mobile in the metropolis. The study seeks to assess relative direct impact on welfare that accrues to its users especially in rural communities

1.6 Scope of the Study

The Kasena/Nankana west district is one of the newly created districts in the upper East region located in the north-eastern part of Ghana with the district capital at Paga. The district shares boundaries with Burkina Faso to the north, Kasena/Nankana East district to the south, Sisala East district to the west and Bolgatanga municipality to the east.

The main economic activity of district is subsistence farming with few engaging in petty trading. The district is located along the Volta basin and like most other communities in northern Ghana, has experienced drought, floods, and storms, which affect farming activities thereby worsening their economic situation. Hence, it is considered as one of the deprived districts in Ghana. Beside this, there is only one rural bank located in the district capital at Paga implying that most people are financially excluded and so motivated the researcher to consider this district as the choice of the study area.

In terms of contextual scope, the researcher covered only mobile phone users as well as retail agents in the district. Mobile money serves as relief for majority of rural people who are otherwise excluded from the formal system. Most banks are located outside the reach of the rural population. This inhibits their ability to save, make payments especially transfers, access credit, and insurance. But for the purposes of this research, the researcher restricted the study to savings and the payment System as the basis for financial inclusion.

1.7 Organization of the work

The whole study has been categorized into five chapters.

Chapter one consist of the following; background to the study, statement of the problem, objectives of the study, research questions, significance of the study, scope of the study, limitations of the study and organization of the study. Chapter two includes theoretical framework, Conceptual framework, definitions of concepts such as financial inclusion, the unbanked population, literature review of existing works carried out by other researchers and a summary of the chapter. Chapter three focuses on the research methodology which looks at the study population, sample size and sampling techniques, research design, research instruments, pre-testing of instruments, data collection methods and the estimation strategies. The fourth chapter centers on the results and discussions of findings, while chapter five provides summary of the study, conclusions and policy recommendations of the study

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter comprise of the theoretical framework, conceptual framework, definition of concepts as well as review of existing literature carried out by other researchers.

2.1 Theoretical Framework

2.1.1 The Technology Acceptance Model

The Technology Acceptance Model was developed by Fred Davis (1986) in his doctoral thesis to explain the determinants of information systems and information technology acceptance by individuals. In a bid to investigate the individual acceptance behavior on information Technology and information systems many theories have been developed such as; Theory Reasoned Action (TRA), Theory of Planned Behavior (TPB), The Unified Theory of Acceptance and Use of Technology (UTAUT) as well as Technology Acceptance Model (TAM1and TAM2).

However, Surendran (2012) revealed that, TAM has been widely studied and verified by different studies that examined the individual technology behavior in different information systems construct. The theory is seen as an extension of the Theory of Reasoned Action (Ajzen and Fishbein 1980). Park e tal (2009), noted that TAM provides a platform that allows an individual to establish a relationship as to how external variables influences belief, attitude and intension to use technology. In TAM two factors have been considered to be of great influence to the attitude of the user; perceived usefulness and perceived ease of use. Perceived usefulness has been defined as potential user's subjective probability that adopting a particular application system will enhance his/her job or life performance. On the other hand, perceived ease of use

can be defined as the degree to which potential users expects the target system to be free of effort. These two factors are influenced by external variables such as social, cultural and political factors.

Figure 2.1 illustrates the structure of the TAM model as developed by Davis (1986).

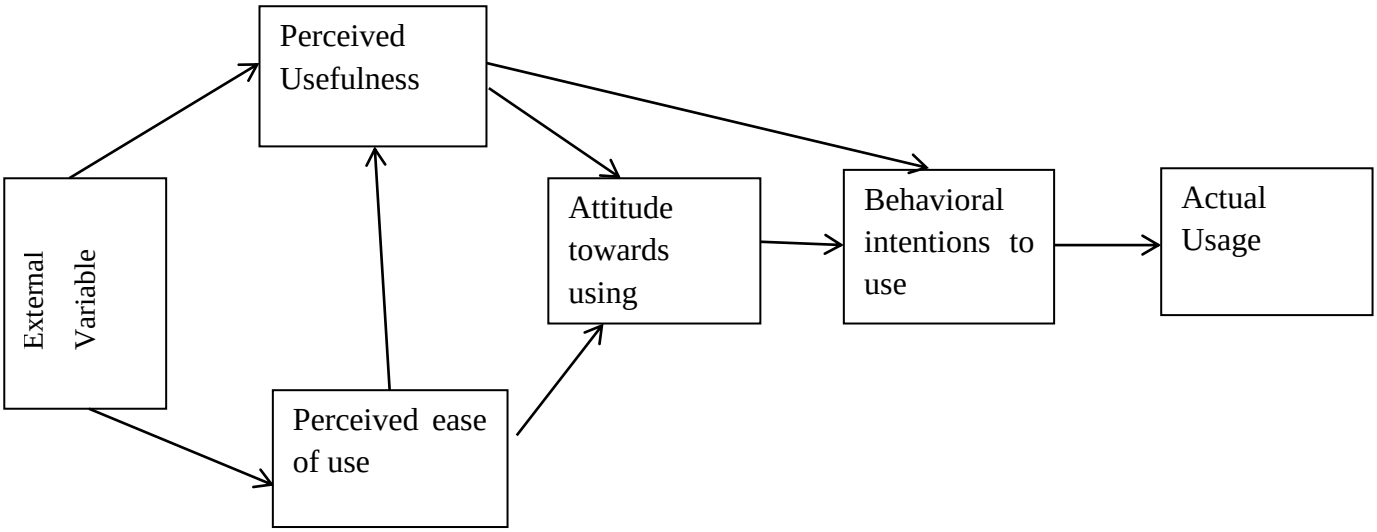

Figure 2.1: The Technology Acceptance Model by Davis (1986)

For the purpose of this study, the TAM model can be operationalized to explain the adoption of mobile money services for payments and savings. With regards to perceived usefulness, the model measures the relative advantage and benefits of the innovation to users. These includes; economic benefits, efficiency, easy accessibility as well as convenience of the service. These advantages make the perceived usefulness as an important factor that determines the adoption of mobile money as means of payment and savings (Siddik et al., 2014). Siddik et al. (2014), further explained that if customers perceive advantages that are provided by mobile money, they are more likely to develop a positive attitude towards adopting the service. The perceived ease of use measures the degree of complexity and compatibility of the

service to customers and hence requires no mental or physical effort to its use relative to other services. Compatibility can greatly influence the adoption of innovation. Pharm and Daim (2011), indicated a number of factors as sub-categories of perceive ease of use which includes; service quality, simplicity, visual factors, speed and innovativeness. Siddik et al. (2014), defined complexity as the difficulty of understanding innovation, thus, simple innovations is easy to adopt than difficult ones. Compatibility on the other hand has been explained as the extent to which an innovation conforms to existing values, past experience as well as needs of the consumer (Siddik et al. 2014). Perceived ease of use has been hypothesized as a predictor of perceive usefulness. All these variables are consistent with the mobile money innovation, hence, making the model an appropriate one for this study.

2.1.2 The Free Market Model

The financial sectors of developing countries in the 1970's and 1980's have the characteristics of Oligopolistic banking system that existed at the time and usually owned by the state with interest rate ceiling, high reserve requirement, directed credit scheme as well as taxes on financial intermediaries that are discriminatory in nature which is usually moves with existing price inflation thereby decreasing the attractiveness of keeping claims on the domestic banking system. McKinnon (1973) and Shaw (1973) as cited in (Goodwin- Groen, 2012). McKinnon (1973) and Shaw (1973) further noted that, these policies results in negative real deposit rate, a fragmented domestic capital markets, and a decrease in the size of the banking system with regards to the whole economy, stifle financial intermediation and a decline real growth rate. McKinnon (1973) and Shaw (1973), however suggested financial liberalization or what is popularly known as free market system as solution to financial repression.

The Free market theory hereafter known technically as shareholder wealth maximization model relies on the principle of projecting market as the sole solution all woes of an economy. It is argued that a market economy has an inherent tendency to move closer to 'Pareto Optimum'. Government policy interventions will move the economies from attaining growth accompanied by removal of all forms of imbalances.

In deregulated financial scenario, banking institutions engage in stock market operations by placing their shares in the capital market to collect funds for their functions. Apart from new generation, and private banks, national commercial banks have also joined the suit thus reducing government shareholding of public commercial banks. Consequently, the pressure of making financial institutions capable of making stock market investment has force such institutions to desist from risky lending. Deregulation facilitated universal banking in which all forms of banking can be done under single a financial institution in a bid to increase financial inclusion. However, the risk in lending coupled with the need to meet capital adequacy as well as pressure to be productively efficient pushed banks to concentrate on certain groups instead of customers in general. This led to financial exclusion for the socially and economically disadvantaged. The focus on more valuable customer group to the detriment of the underprivileged will greatly enrich the value-added in the shareholder wealth maximization sense. Hence, most of the new generation and private banks have been adopting this strategy though such shift led to the separation of low and high income customers mainly in the case of financial products to which they have access.

2.2 Definition of Concepts

2.2. 1 The Concept of Financial Inclusion

Rangarajan (2008) as cited by Shastri (2014), financial inclusion is the process of ensuring accessibility to the right financial services that the vulnerable groups such as

weaker section and low income groups need at an affordable cost in a fair and transparent manner by main stream institutional players. Financial exclusion is a situation where certain consumers such as the low income unemployed, illiterate, women and disable, have no access to appropriate, low cost, fair and safe financial products and services from main stream providers (Shastri, 2014). Susan and Zarazua (2011), re-defined the concept to include informal and semi-formal services such as rotating savings and credit associations (ROSCA) as well as credit and savings cooperative organizations (SACCO). To Triki and Faye (2013), the term can be explained as all steps that ensure affordability, access and availability of formal financial services to all sections of the population with specific priority to particular portions of the population that had suffered exclusion historically from the formal financial services due to factors such as income levels and volatility, gender, location, type of activity, level of financial literacy

2.2.2 Financial Inclusion in Ghana

With Regards to access to finance the world Bank (2012), observed that only 30% of the adult population of Ghana has an account at a formal financial institution which is marginally higher compared to the Sub-Saharan African average of 24%. However, Akudugu (2013) also revealed that about 40% of the research participants are included in the Ghanaian formal financial market whiles the remaining 60% of them excluded. This implies that the level of financial inclusion in the formal financial market in Ghana is less than the global financial inclusion index of 50% (Demirgüç-Kunt & Klapper, 2012). This 40% however reported by Akudugu (2013) is higher, compared to the Sub-Saharan Africa average of 24%. Jaising (2013) reported that just 16% of Ghanaians had savings with a formal financial institution in 2011 and only 6% of Ghanaians had taken a formal loan although as many as 29% of the population

have taken loans from family and friends. About 99% of Ghanaians have knowledge of mobile money services and 29 % are reported to have used the service (CGAP,2016). The CGAP (2016) further noted that 25% are active users of the service.

Variables such as gender, education and geographical location tend to have a tendency to influence the level of financial inclusion as reported by Akudugu (2012). In the Ghanaian society, there is a higher marginal difference in percentage terms regarding the number of males possessing bank accounts with a formal financial institution over their female counterparts. Nevertheless, the level of financial inclusion of females is not only 24 higher than the rest of Sub Saharan Africa but also includes nations grouped as 'Lower Middle Income' categories, as indicated by the World Bank classifications. People with at least a secondary education have highly likely to utilize more financial products and services. Additionally, individuals in urban communities have more access to financial services than their counterparts in the rural areas of the country.

2.2.3 Financial Inclusion Strategies

Financial inclusion strategies are roadmap actions accepted and defined at the national and subnational level which stakeholders adopts to obtained financial inclusion objectives. Strategies that are successful coordinates with the main stakeholders, defined duties among them, as well as indicate a clear planning of resources by, for instance, have targets prioritized (World Bank, 2012). According to the alliance for Financial Inclusion (AFI) (2015), financial inclusion strategies are a comprehensive public document that presents a strategy develop at the national level to systematically accelerate the level financial inclusion. shastri (2014), identify two different aspects of financial inclusion, thus financial literacy which constitute the demand side,

creating the awareness of what people can demand and financial inclusion which is the supply side, provision of financial market and services. The AFI (2015), distinguished between concepts relating to financial inclusion. Namely: Access, that is, ensuring availability and affordability of financial services to users; Usage that is, financial services are frequently and regularly used by customers; and Quality that is, ensuring that financial services are tailored towards the needs of the users. The AFI (2015), further indicated that national financial inclusion strategies have gain prominence in recent years and are becoming increasingly common policy approach of many member institution in the Alliance for Financial Inclusion (AFI). In an attempt to increase financial inclusion to about 70 percent in Nigerian, the Central Bank of Nigeria (CBN) (2010), identify certain targets of the national strategies that will enhance financial inclusion. Hence, credit, payments, savings, insurance and pensions have been identified as crucial components of financial inclusion. After the Maya declaration announced by the AFI in 2011, many member countries are strongly encouraged to make specific measurable commitments and incorporate them into their national strategies as concrete targets (AFI, 2015). The AFI (2015), further indicates that Countries such as Paraguay, Burundi, Tanzania, and Nigeria have identified savings, payments, credit and insurance as targets of financial inclusion. However, for the purpose of this study, the term financial inclusion shall be restricted to only savings and the payment system as target areas.

2.2.4 The Concept of Banking

A bank is a financial intermediary that creates credit by lending money to a borrower, thereby creating a corresponding deposit on the bank's balance sheet. Lending activities can be performed either directly or indirectly through capital markets. The bank of Ghana (BOG, 2004) indicated that the banking system in Ghana comprises of

a national network of licensed and statutory financial institutions that are involve in the banking business under the banking laws.

Banking in Ghana has traditionally been categorized into retail or commercial, merchant as well as development banks. Thus, commercial and development banks could deal with all forms of clients across the financial market whiles merchant banks are limited to only corporate clients (Hinson et al., 2006). Hinson et al. (2006), further noted that the introduction of universal banking law allowed all types of banking activities to be undertaken by a one corporate entity instead of the previously defined narrow path practiced. This enhances the tremendous operations and processing of information of banks leading to an increase in coverage. The bank of Ghana (BOG, 2004) reveals that, banking activities are highly regulated because of the crucial role they play in influencing national economies. It is against this background and the desire to provide level platform for all banks that the concept of universal banking was introduced.

Addison (2003), defined universal banking as a corporate institution in which large banks operate expanded network of branches, with the provision of variety of services, holding many claims on firms (including equity and debt), and part-take directly in the corporate governance of firms that rely on banks for funding or as insurance underwriters. The Bank of Ghana introduced rural banking and streamlined their lending operations to ensure that Bank credit actually benefits the small scale rural producer and the rural community. Rural and Community banks (RCBs) are unit banks that belong to rural community members through buying of shares and are mandated to provide financial intermediation. The BOG introduced Rural Banking hoping to cover small-scale rural producers as well as small towns who benefit from the new credit resources.

The inefficiencies of the formal banking sector to cover low income customers as a result of the shareholder maximization and competition has led to the insurgence of microfinance institutions. Microfinance (MF) has been described as a response to formal banking inability to overcome transaction cost and risk barriers associated with banking small, risky and poor clients, the very high often abusive conditions imposed by the informal money lenders and the failure of government-owned financial institutions to reach the poor (Demirguc-Kunt et al., 2006).

Robinson et al. (2003), define Microfinance as a development tool that provides financial services and products such as very small loans, micro leasing, micro insurance, money transfers, and savings in assist the very and exceptionally poor in expanding and establishing their business. Among the key aims of MFIs is to create an avenue for collateralizing loans and offer capital at relatively low-cost (Dichter and Harper, 2007). The unbanked and the under-banked most often are the poor who lack titled assets to provide as security for loans (Karlan and Morduch, 2009). In addition, the transactions of most unbanked population are often too small a scale to generate much interest from these institution which are basically profit-seeking (Johnston and Morduch, 2008).

According to Hinson et al. (2006), banking activities are classified into three main categories; Formal financial institutions are those incorporated under the Companies Code 1963 and licensed by the Bank of Ghana (BOG) under either the Banking Law 1989. The semi-formal institutions include Non-Governmental Organizations (NGOs) and Credit Unions (CUs) which are legally registered but not licensed by the Bank of Ghana. NGOs are incorporated as companies limited by guarantee (not for profit) under the Companies Code. Credit Unions are registered by the Department of Cooperatives as cooperative thrift societies that take deposits and offer loans to their

members. The informal financial institutions consist of a series of activities referred to as Susu including individual savings collectors, rotating savings and credit associations, and savings and credit "clubs" run by an operator. It also comprise of money lenders, trade creditors, self-help groups, and personal loans from friends and relatives.

2.2.5 Electronic Banking

There is no generally agreed definition of electronic payment as many scholars view it from different perspective. The branchless banking approach as it is generally known, is a situation in which banking services are offered to consumers through the use technology such as mobile phones, payment cards, post offices or small retailers (Ivatury & Mas, 2008). To the European Central Bank (2003) the term refers to "a payer's transfer of monetary claim on a party agreeable to the beneficiary". Kalakota and Whinston (1997), viewed electronic banking as a financial transaction that occur online between the buyer and the seller. This payment is usually promoted by digital financial tools such as encrypted credit card numbers, electronic cheque or digital cash with the backing of a financial intermediary.

2.2.6 Types of Electronic Banking

Automated Teller Machine: is a combination of computer terminal with cash vaults and records keeping system in one unit allowing clients to enter the bank's book keeping system with plastic card that contains personal identification number (Rose, 1999).

Credit and Debit Cards: It is a plastic card that gives assurance to the seller that the person holding it has satisfactory credit rating and that the one issuing it will ensure that the seller obtains payment for goods and items delivered (Pierce, 2001).

Smart Card: It is a plastic card with embedded computer chip which can store and transact data among clients. The data in the form of value or information is stored on the computer chip either as a memory or as a microprocessor (smartcard basics, 2004).

Electronic Fund Transfer at Point of Sale (EFT/POS): it is an online transfer that involves the use of plastic cards at terminals or merchant premises that allow clients to transfer funds instantly from their bank account to a merchant accounts when making purchases. Debit cards are used to activate the transfer process (chorafas, 1998).

Telephone Banking: Telebanking as affectionately called is a form of virtual banking that deliver financial services using telecommunication networks and devices. Automated Voice Response (AVR) technology is used to carry out the transaction. The client achieves this by dialing a touch-tone connected to an automated system of the bank (Balachandher et al., 2001).

Personal Computer Banking (Home Banking)*:* P-C banking as it sometimes called is a form of services wide web (Balachandher et al., 2001). Balachandher et al. (2001) further explains that the Automated Voice Response (AVR) technology supports the operations and clients can make business transactions by dialing a touch-tone connected to an automated system of the bank.

Online/Internet Payments: This is the means by which clients undertake business transaction with a bank via the internet network. Clients can access their bank accounts and make transfers through a web site provided by bank and abiding by some rigorous security checks (Neuman and Medvinsky, 1996).

Electronic Purses/Wallets*:* Two types of electronic wallet (e-wallet) has been identified, thus; E-wallets which can store cards numbers, this is a virtual wallet that can store credit card and debit card information and allow clients to buy goods from their e-wallets using the card (Rudl, 2012). The other type of E-wallets is those that store card numbers and cash hence it is known as digital wallet is and permit customers to store digital cash, that has been transferred from a credit card, debit card or virtual cheque inside their e-wallets. Its operations are similar to having a virtual savings account where charges are made for ongoing purchases, particularly micro-payments (Rudl, 2012).

2.2.7 Mobile Banking and Money Transfer

Cernev et al. (2011), described a mobile banking as a branchless banking made through a mobile device such as a cell phone, Personal Digital Assistance (PDA) and other portable devices linked to telecommunication network to facilitate banking services. Mobile financial services are intermittently treated as mobile banking (m-banking), mobile payment (m-payment), and mobile transfer (m-transfer). The three have different dimensions and applications which inclusively we can described as mobile money (Hossain and Sarker, 2015). Most banks provide SMS banking for their customers which allow them to make enquiries without physical contact with the bank branch. For instance, balance enquiries, transactions enquiries, statements request as well as cheque book request can easily be made on your mobile phone (Achieng and Ingari, 2015). On the other hand, Zika (2005), defined mobile payments as electronic payments made through mobile device such as cell phone or personal digital assistant (PDA). It makes use of a mobile device to effect the payments and information on users banking is stored in an embedded SIM card. Many scholars often separate mobile payments from mobile banking. However, mobile payments relies on the

framework of m-banking services, hence, mobile payments cannot be operational without m-banking. Thus, in this study, m-banking shall refer to both m-banking services and mobile payments. Among mobile networks that provide mobile money services in Ghana include; Vodafone, MTN, Airtel, Tigo

2.2.8 M-Banking Stakeholders

Worldwide, m-banking services involve three key stakeholders who play crucial role in the provision and delivery of the service. These are banks, mobile network operators (MNO), and mobile banking technology vendors (MBTVs). (Krugel, 2007).

Banks

Among the major and important players in the m-banking industry is banks which are dedicated to providing financial services to customers at least cost methods. (Nyame-mensah, 2013). As a result, the mobile phone has become one of the most cost effective and efficient technologies adopted to reach the consumer. This is an increasingly profitable and popular business for banks. (Nyame-Mensah, 2013) A bank can participate in the m-banking industry in three ways;

- Extending its payments franchise to mobile facilities through the leveraging of an MNO's bearer channel (data, voice and other services)
- Extending the customer base to target new market segments through the leveraging of the MNO brand, distribution network and extended customer base; or
- Allowing the MNO to become a bank by using the bank's financial license and/or infrastructure (Krugel, 2007).

The MNOs

The mobile network operators (MNOs) are exploring business strategies and avenues to make accessible to their customers new range of services and cover new clients thus by participating in the m-banking industry. Krugel (2007), reveal that MNOs are becoming leaders at the global level since the provision of network infrastructure and technological capabilities such as the mobile phone that enable clients to enjoy m-banking services is their responsibility. M-banking industry is seen by MNOs as value creating activity that raises their customer level due to the creativity to new and existing customers, and generates additional steam of revenue outside their traditional services due to the introduction of the new service (Krugel, 2007). An MNO can participate in m-banking industry in following three ways;

- Extending a bank's payment through the provision bearer channel for a bank
- Make available to customers their brand, extended customer base and network distribution or
- Becoming a bank either by a applying for banking permit or liaising with a bank-like financial institution using their existing customer base and infrastructure (Krugel, 2007)

The MBTVs

The mobile banking technology vendors (MBTVs) have been crucial in the development and delivering services to customers since the introduction of m-banking services. Krugel (2007), indicates that billions of dollars have been spent by these agents to pioneer the application and creating the ideal grounds that allow clients to used m-banking services on their mobile phones as well as created that integrates the m-banking participants. That is, MNO, banking systems, user application, access

channel and ensuring that current banking guidelines and services can be seen and used on clients mobile phone and understood by banking systems.

2.3 Conceptual Framework

The conceptual framework of this study highlights the crucial role of mobile money services such savings and payments on the lives of the unbanked population especially the poor in the rural areas of Ghana. Mobile money services play a significant role in providing banking services to poor and vulnerable that has no access to formal banking services. This relationship has been explained in figure 1 showing the various variables. The focuses on mobile money which is the independent variable with several indicators such as transaction cost, reliability, convenience, accessibility and security as the baseline for its adoption by the poor and vulnerable especially who reside in rural areas and are financially excluded. In order to bring out the individual differences of impact with regards to the dependent variables, control variables have been introduced which include age, gender, marital status, educational status, income level.

The study has two dependent variables, thus, savings and the payment system. The mobile money market in Ghana is increasing rapidly and majority of people are patronizing it especially the financially excluded in society. Hence, it has become the most convenient alternative banking service for majority of people who use it for savings as well as making payments. Given this, the study seeks to investigate the impact of mobile money as the independent variable on the savings and payment system (transfers and receipts). The figure one clearly illustrate this phenomenon.

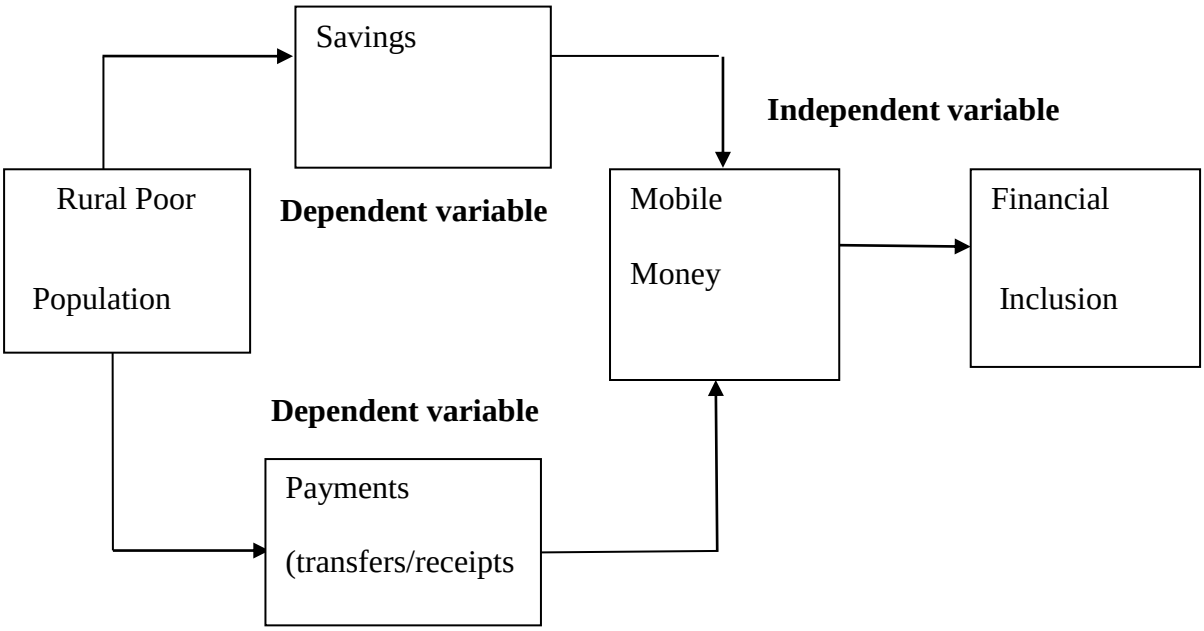

Figure 2.2 Illustration financial Inclusion;

Source Author's Construct

2.4 Empirical Review

This section focuses on the analyzing empirical studies conducted on the concept of financial inclusion. Many scholars tend to agree that financial inclusion plays a key role in poverty reduction and promoting economic growth, hence a number of intellectuals begin to investigate this phenomenon. Several works have been conducted by many scholars that support the view that financial inclusion is vital for the poor and vulnerable in society.

Nnandhi (2012), conducted a survey in Delhi, India on everyday usage and effects of mobile money on savings practices of low income users. Using a sample of 160 customers and 20 agents, it was revealed that, EKO partners with a network of agents that provided banking services to people with no access to formal bank account and by 2011, EKO had captured wider customer base.

Similarly, an action-oriented research was conducted by Aker and Wilson (2013), in WA, northern Ghana. Using a sample of four villages, their results indicated that 80% use the service for transfers whiles 76% use it for savings.

Using the logistic model and a randomly selected 500 respondents, Serge and Clovis (2014), study on mobile money and savings in Saaba and Ouagadougou in Burkina Faso confirmed that, mobile money increases people's ability to save. In effect, their study confirmed that mobile money serves as alternative means of banking for the unbanked.

Mbogo (2010), conducted a study on the impact of mobile payments and the growth of small-scale businesses in Nairobi, Kenya using survey and sample size of 409 micro business entrepreneurs. The study found that convenience of mobile money transfer technology, in addition to accessibility, cost, support and security factors are related to behavioral intension of its use and actual usage of the mobile payment services by micro-businesses to enhance their success and growth.

Similar research was conducted by Litondo and Ntale (2013) in Nairobi, Kenya on the determinants of mobile phone usage for e-commerce among micro and small enterprise in Kenya. Employing the Linear Probability Model (LPM), Logit and Probit, and sample size of 384 small and medium scale enterprises, the study revealed that education is the prime determinant of mobile phone usage for e-commerce.

Siddik et al. (2014), studied financial inclusion through mobile banking in Bangladesh and employed the Structural Equation Modeling and sample size of 555 respondents. Their findings indicated that, perceived financial cost, perceived risk and subjective norm are the most influencing factors that affect people's behavioral intension to adopt mobile banking.

Findings of Gbombe and Tomoya (2014), on mobile money, remittances, and rural household welfare in Uganda using panel household data and applying Logit, indicated that adopting mobile money increases per capita consumption by 72%. Results also indicate that using mobile money makes remittances more frequent than non-users.

Furthermore, Ngaruiya et al. (2014), conducted a study in Nakurugu district of Kenya on the effects of mobile money transactions on financial performance of small and medium scale enterprises using descriptive research design, purposive sampling technique and sample size of 120 businesses. The results revealed that mobile money transactions have a significant effect on sales revenue.

In addition, Muisyo et al., (2014), conducted research on the effects of mobile money on the performance of banking institutions in Kakamega town in Kenya. Adopting self-administered questionnaire on a sample of 115 and employing a correlation analysis, the results showed that the introduction of mobile money services have contributed positively to the financial performance of banks. Convenience and reliability despite the technical challenges at time led to customer satisfaction and loyalty.

Another Research conducted was by Orotin et al. (2014), on the unbanked to assess the impact of mobile phone money transfer on market development in Uganda. Using a sample of 4 MNOs, 8 mobile money retail agents and 19 mobile money users, qualitative research design as well as descriptive statistics, it was revealed that mobile money has significant impact on users and market development with the dominant activity being money transfer.

2.4.1 The Impact of Mobile Money on the Payment System

According to the World Bank (2013), the payment system may be described as an arrangement which facilitates the transfer of funds to participants in the system and includes a number of payment instruments, regulations, rules, standards, procedures, infrastructure, and institutions related to clearing settlement of funds. The payment system may also be described as the entire matrix of institutional infrastructure arrangement and processes set up in a country to allow economic agents thus individuals, businesses, organizations, and governments, to initiate and transfer monetary claims in the form of commercial and central banks' liabilities (bank of Ghana, 2014). The bank of Ghana (BOG, 2014) further noted that the payment system in Ghana has improved significantly over the past years and continues to evolve to satisfy the development demands of the nation.

The current trends in the payment system development in Ghana are influenced by economic, financial, public sector policy factors in addition to growing local ICT industry and global trends in payment systems development. Rapid adoption and frequent usage of mobile money services generated a variety of positive outcomes on the payment system. The use of mobile money on Payments has the tendency to promote economic activities. It reduces the cost and delays of exchanging goods and services hence support the growth of transactions. The development of the payment system is closely related with the movement of goods, services, capital and people. The efficiency of a payment system directly affects the efficiency of the circulation of goods and services and the pace of economic expansion.

In addition, M-money is promoting the development of cashless economy in Ghana. Due to the limited number of formal banking institutions especially in rural areas, most people transact by giving physical cash hence making it difficult for the

regulators to monitor the trail. Mobile money creates transactions that are transparent in nature. It is equal to the credit or debit cards that allow monitoring of the audit trail by the regulators. It makes money flow from the informal sector to the formal sector more visible, hence the velocity of money can easily be determined

The mobile money has significantly transformed the patterns of remittances of Consumers. Customers began to make smaller, and more frequent transfers whiles urban dwellers started remitting small amounts with greater frequency (Morawczynski and Pickens, 2009). For instance, before adopting M-PESA, Morawczynski and Pickens (2009) further explain that, most clients remit home once a month or once every two month and that mobile money is cheap and easily accessible hence the frequency of the transfers. Thus one can send any amount at anywhere, anytime. This leads to an increase in income levels of rural dwellers, making it possible for them to save when retrieving the money.

Mobile money reduces transaction cost as clients no longer need to pay for transport costs to urban centers, where most of the money transfer services are located. Instead, they make the withdrawal directly from mobile money vendors (Morawczynski and Pickens, 2009). Jack and Suri (2011) indicate that such cost involves fix cost which includes travel and time cost as well as variable cost which is expected losses due to theft or loss during the long distance. Such a reduction is vitally important for the rural recipients, who depend heavily on remittances for their livelihoods hence enhances smooth consumption. This has led to its increasing contribution to economic growth and development in Ghana.

The World Bank posits that decreasing commission charges by 2% to 5% could increase the flow of remittances by 50% – 70% thereby boosting local economies.

Decreasing the cost of each individual's remittances could allow the sending of lower-valued remittances than average transfer value today. Mobile money has led to increased remittances and hence increased economic activities resulting into rapid economic growth. The Ministry of Finance has found out that the income of rural dwellers have increased since they started using mobile money.

Mobile money leads to increase access to financial inclusion. Developing nations are seriously handicapped by physical infrastructure of the financial institutions, implying that majority of the population will not be financially included in the formal banking sector. Mobile money grant more accessibility to many Ghanaians especially low income consumers and those in rural areas due to the high number of agent operators. It supports the Micro banking institutions to achieve deeper outreach into the rural areas at faster rate with minimal increases in cost. There is a multiplier effect of financial inclusion on the lives of low income consumers who were outside the formal financial sector. Accessibility to financial services by the poor can lead to improve management of their cash flow, promoting financial planning and raises savings level with increased options for their old age.

Mobile money is considered to be very convenient by majority of its users. In countries whose economies are still emerging, Majority of people who have migrated to distant places in search of jobs and need to send remittances home does so at high cost. Such high cost usually compels many people to rely on informal sources which are a social network of family and friends with its associated risk to send money home. Relying on risky and unregulated service and travelling longer distances with money in an unsafe and unpredictable environment increased transaction cost. The adoption and usage of mobile money which has numerous agents and 24-hour service, anywhere and any day is a relief to many low income consumers as a result of

reduced cost and risk, avoiding the inconveniences of the banks hence increases the frequency of the remittances.

2.4.2 The impact of mobile banking on savings;

According to John Maynard Keynes (1936), savings is the excess of income over consumption. Keynes further explained that, it is that portion of income of the period which has not been consumed. Most people hold the view that saving small amounts regularly, can secure their future. In Ghana, limited access to formal financial services especially by those in rural areas makes informal mechanisms serve as an important avenue in which individuals and households saves. These informal mechanisms as indicated by Serge and Clovis (2014), include saving; in livestock, in jewelry, under mattress at home, with a neighbor, or in a more organized manner with the Rotating Saving and Credit Associations (ROSCA) or with Susu Groups. Serge and Clovis (2014), further indicated that such informal mechanism are subject to high risk. Thousands of Susu collectors visit clients at home and workplace daily to collect savings of small amounts for a fee at the end of the month which is equal to one day savings, to pay for the service rendered. This indicates that Ghanaians have strong desire to save, even at high negative interest rates.

The Poor do not just have low incomes, but also irregular. According Mas (2009), two factors manifest poverty, low and stagnant labor productivity and the occurrence of unexpected events in most cases in health or weather related issues that sometimes overwhelm family finances and may limit their chances of hanging on to accumulated assets. Rutherford (1999) posits that the Poor can save because of life cycle needs, manage emergency issues, acquire assets and business development. The choice of saving for predictable purposes in the form of investments and unpredictable purpose through self-insurance against adverse shocks should be core when proposing

financial-services for the poor. Deaton (1997) revealed that precautionary savings is usually the best option for the poor as there is highly volatile and find it difficult to obtain credit for consumption smoothening.

Studies indicate that the poor save little amounts via a number of informal methods (Banerjee and Duflo, 2007). But informal savings methods are usually risky due to theft and/or asset depreciation. If the poor have good savings mechanism such as mobile money which is reliable and available, safe and affordable, they would enable them manage their money well and overcome unpredictable shocks and predictable events (Karlan and Morduch, 2009).

Reaching vulnerable extreme rural customers always has been a challenge for MFIs. Poor people want to get most convenient and affordable services to manage their little income. Goss and Roberts (2011), indicates that, apart from obtaining a loan, the poor are often relaxed to travel distances and save little amount into an account, especially the small scale entrepreneurs who are busy with their business and cannot travel distances to pay installments. There is also the worry of the safety of carrying money for longer distances. Mobile banking addresses this challenge in a convenient and safe manner by creating proximity. Transaction costs decreases as customers need not bear transportation cost to travel to any bank branch.

Expansion of accessibility to reliable, low-cost deposit accounts through mobile banking has the tendency to raise the capital stock. Karlan and Morduch (2009) explain that, the macro point of view places natural focus on savings basically as means of raising the level of wealth. Given that such expansions will be favorable to low-income section of the population, then, there is the tendency to decrease poverty and inequality (Karlan and Morduch, 2009). Rosenzweig (2001), argue that saving

can be another crucial means of consumption smoothening from one month to another and to manage within-year expenditure and not mainly a way of building long-term balances. Furthermore, saving may be promoting welfare even if not particularly raising productivity. Collins e tal (2009) in their study of financial lives of the poor, identify a common behavior of rigorous adoption of saving methods but comparatively small average balances.

There have been few fully accepted literature on effects, as well as small intensive research of whether the core poor can benefit equally from financial accessibility like the less poor—or even the core poor benefitting more than the others. Either possibility is in line with economic theory. In the same vein, knowledge of saving attitude and risk management strategies of poor is only now accumulating, as the way we understand price elasticity and the demand for particular qualities of service.

If there are some differences on the lack of accessibility to formal financial services depending on, the living place, the gender, the level and types of incomes of population, then it is important to consider these issues while trying to examine the impacts of mobile money on the savings attitude. Collins e tal (2009), clearly explained that in most third world countries people do not only have to leave with low incomes but that these incomes are not also regular and that little financial opportunities are at their disposal to enable them manage these incomes.

Factors such as, place of residence (rural/urban), gender and educational level are crucial for the determination of access to formal financial services. Indeed, the breakdown of financial infrastructure indicates differences between rural and urban areas. In most sub-Saharan Africa countries, the population of rural areas is often so high constituting about 60% of the total population of African yet remain the areas

where commercial bank's activities are still not well developed. In this country, nearly all formal financial institutions are located in urban areas to the detriment of rural population. This implies that rural dwellers have little access broad range of financial services as compared to their urban counterparts to deal with predictable and unpredictable life issue. Mobile money introduced by the MNOs can however serve as a substitute to closing this gap.

CHAPTER THREE

METHODOLOGY

3.0 Introduction

The research methodology employed in this study comprises; the study population, sampling techniques and sample size, sources of research data, research instruments, pre-testing of instruments, data collection and processing as well as data analysis and presentation.

3.1 Study Area and Population

Kasena/Nankana district is one of the newly created districts in the upper East region that is carved out of the Kasena/Nankana district in 2007. The district is located in the north-eastern part of Ghana and lie approximately between latitude 10.97 degrees north longitude 01.10 degrees west with the district capital at Paga. The total land area of the district is approximately 1004 square kilometers. The district shares boundaries with Burkina Faso to the north, Kasena/Nankana East district to the south, Sisala East district to the west and Bolgatanga municipality to the east.

The total population of the Kassena/Nankana west district according to 2010 population census was 70667 with 34747 male constituting 49.2% and 35920 females constituting 50.8%. With a growth rate of 1%, the current total projected population is 75005, with male population of 36880 constituting 49.2% and female population of 38125 constituting 50.8% according to report by Statistical service of Ghana (2015). The age-sex structure of the district is typical of the rural Ghanaian situation. The male-female ratio of 49.2% males and 50.8% female is in line with the national figures of female dominance though slightly different.

The dominant economic activity of the district is basically subsistence agriculture employing about 68.7% of the population. The district is located in the interior continental climatic zone that experienced prolong dry season characterized dry winds between November and February known as Harmattan. There are few dams and dugouts which are being used for dry season farming but not enough to engage majority. The district is also located along the Volta basin and like most other communities in northern Ghana, has experienced drought, floods, and storms, which affect farming activities thereby worsening their economic situation. On commerce, trading activities are mainly of rural characteristics and revolves around food stuffs, livestock and craft whiles local industrial activities include; Shea-butter extraction, Pottery, Pito brewing, dawadawa processing, weaving and dress making as well as rice milling which are one-man business and hardly employ people thereby leading to higher poverty levels hence, considered as one of the deprive districts in Ghana. There is only one rural bank in the district located at Paga, Chiana and Sirigu. This implies that majority of the population is financially excluded. However, there are Mobile Network Operators (MNO) in the district which include; MTN, Vodafone, Tigo, Airtel. The activities of Glo are however limited. These MNOs in the district all operate mobile money services which have the tendency of providing financial inclusion. Hence, motivated the researcher to consider this district as the choice of the study area

The target population is 9484 mobile phone users who comprise of mobile money users as well as non-mobile money users. This target population is defined as persons who possess a mobile phone and have the chance of using money mobile

3.2 Types and Sources of Data

Primary as well as secondary data sources are employed. Primary sources is obtained from the field using self - administered questionnaire of individuals as well as small and medium scale entrepreneurs with mobile money account. Secondary data was reviewed from journals, articles, books and annual reports

3.3 Sampling Techniques and Sample Size

Probability method is adopted. The researcher used the simple random sampling to select 300 respondents of both mobile money and non-mobile money users. The non-mobile money users served as the control group. The reason behind the employment of this probability sampling method was to allow equal opportunity of being interviewed and so minimize bias in the selection process. The sample size is determined using the formula $n = \frac{N}{1 + N\,(\alpha)^2}$

Where;

n = sample size

N = sampled population (9484)

α = confidence interval (5%)

Hence; n = $\frac{9484}{1+9484(0.05)^2}$ = 384

But due to resource constrain as well as time, the researcher used his discretion to reduce the figure to 300 which the researcher thinks is representative enough.

3.4 Data Collection Techniques and Analysis

The researcher employed primary data through self-administered questionnaires to collect information from all respondents. The study employed regression analysis and descriptive statistics such as tables and graphs to help describe the impact of mobile

money on savings and transfers or payments in order to have a visual presentation by taking into account the various factors that may influence savings and transfer. In the regression analysis the researcher used probit model to analyze the impact of mobile money on savings and the payment system. The dependent variable is a dummy variable which is equals to 1 if the respondent saves (either with mobile money or bank) and 0 otherwise. The respondents are expected to give a yes or no response. For instance, data on savings is collected as follows; during the last 12 months did you save money? Yes/no.

The data collected is edited, coded, categorized and entered according to themes to make meaningful analysis. Analysis is centered on the research objectives, the research questions and the themes used under the literature review section. Data collected from the field are then processed and analyzed using statistical package for service solution (Stata version 11).

3.5 Model Specifications

3.5.1 Model for Savings

The Probit model is used to examine the impact of mobile money on savings patterns. In Probit models, the dependent variable is a qualitative response variables that can take two responses say, yes or no (Gujarati, 2004). The choice of probit is because, the probit model has a normal distribution, and to also overcome the fundamental problem of linearity as assumed by the linear probability model (LPM). Because the dependent variable y is binary in nature, the objective is to find the probability of an event happening, hence the study seeks to find the likelihood of a person using mobile money account for savings. Using sampled response obtained from self-administered questionnaires, the study determines whether a person using mobile money makes

savings on it and the reason for its adoption. Therefore, the dependent variable y (savings) is a binary response variable that takes two values thus, 1 or 0.

Letting y (qualitative variable) represent the response of the sampled population. Hence, takes value of 1, if a person indicates savings (either with mobile money or bank), Y= 0, if does not save. It then follows that;

Y_j= f (X_j),…….

(3.1)

Where; f is the functional form of the model and X denotes the control variables. This illustration indicates the relationship between savings and mobile money as well as other factors that determine savings. Hence, the model will be given as;

Probit [p(y=1)] = $\delta+\beta_1 mm_1 + B_2X_2 + B_3X_3 + B_4X_4 + B_5X_5 + B_6X_6 + B_7X_7 + \varepsilon$

..... (3.2)

Where;

y = qualitative dependent variable; takes 1, if a person indicates savings (either with mobile money or bank) and 0 if a person does not save.

Mm = Qualitative independent variable (mm = 1, if the person uses mobile money, and mm = 0, if otherwise)

(X) is a vector for control variables. The assumption is that mobile money is an exogenous variable that is uncorrelated with the error term and the control variables, which includes;

X_2 = Gender

X_3 = Age

X_4= Educational status

X_5 = Employment status

X_6= Marital status

X_7 =Income

ε= the error term

3.5.2 Model for the Payment System

The probit model is used for the impact of mobile money on the payment system. The probit model measures the rate of change of a probability of an event happening. In this study, the aim is to find the probability that, a person adopts mobile money as a means of making payments (to transfer/withdraw cash,). Where payment is a qualitative dependent variable can take only two values, either 1 or 0.

Letting z (qualitative variable) representing the observed response of sample population (jth observation). Hence, z = 1 if a person makes payments and z = 0 if a person do not make payments. It then follows that;

Z j = g (Xj)

…… (3.3)

Where;

g is the functional form of the model. This illustrates the relationship between payments and mobile money. The model is then given as;

Probit [p(z = 1)] = α +$\partial_1 mm + \partial_2 X_2 + \partial_3 X_3 + \partial_4 X_4 + \partial_5 X_5 + \partial_6 X_6 + \partial_7 X_7 + \varepsilon$

…… (3.4)

Where;

z = dependent variable (a dummy variable; 1 if a person makes payments, 0 if do not make payments.)

mm = dummy variable; (mm = 1 if uses mobile money, mm = 0 otherwise)

X = control variable which includes

X_2= Gender

X_3= Age

X_4 = Educational status

X_5 = Employment status

X_6 = Marital status

X_7= Income

ε = error term

3.6 Definitions, Measurement of Variables and their Expected Signs

3.6.1 Dependent Variables

Savings

Savings is defined as the proportion of income that is not consumed. In this is context, savings refers to general savings thus, either through with mobile money or bank, The variable 'y' (savings) is the dependent variable, where an individual could be saving (either with mobile money or bank) for predictable and unpredictable purposes. Savings is a dummy assuming the value of 1 if a person saves (either with mobile money or bank) and 0 otherwise.

Payments

Payment is the exchange of cash for goods and services as well as transfers/withdrawal of cash either through mobile money or bank. In the context of this the concept is limited to only transfers/receipts either with a bank or mobile money. The variable 'z' (payments) is a dependent variable, where a person makes

payments. A dummy variable, takes 1 if a person is reported made payments and 0 otherwise.

3.6.2 Independent Variables

Mobile Money

Mobile money is a form of mobile banking that allows clients to enjoy banking services through the use of their mobile phone. Mobile money (mobile money) here is explained as individuals who have m-money account. M-money is a dummy described as mm = 1 if user of mobile money and mm = 0, otherwise. To bring out the effect of mobile money on savings and the payment system, we must assume that the explanatory variable (mobile money) is exogenous and uncorrelated with the error term as well as the control variables. The possible explanation behind this assumption of the exogenous use of mobile money may be due to the fact that; usage of mobile money does not automatically imply that users save; and, savings by individuals do not imply that they are predictable and unpredictable purposes), then the coefficient β_1 should be less than zero (negative). On the other hand, if users of mobile money have the ability to save more than the non- users, then the coefficient δ_1 is positive and significantly different from zero

On the payment system, mobile money has the tendency to influence payments. Mobile money users are more likely to make payments than non-users. This is because mobile money provides fast and convenient, as well as easy access to services anytime, anywhere and allow frequent and easy access to transfer/receipts. Payment is a dummy variable that takes 1 if a person made payment and 0 otherwise. In this study, Mobile money is expected to show a positive sign implying that users will have the ability to make payments than non-users.

Age

The Age subsample is categorized old and young, thus, the old persons are those above 60 years and are on retirement whiles the young are those who are economically active and fall within the working age group (15-60 years). Age is a dummy, categorized in following form; ($X_3 = 1$ if 15-20 years, $X_3 = 2$ if 21-30years, $X_3 = 3$ if 31-40years, $X_3 = 4$ if 41-50years, $X_3 = 5$ if 51-60years and, $X_3 = 0$ if above 60years). The control category is those above 60years. Age will be positive for young people since they must save towards old age, whiles the aged tend to dissave because they no longer earn, holding other factors constant. This is consistent with the life-cycle hypothesis that individual spread their lifetime consumption over their life by saving during their earning period and maintaining consumption during old age.

On the payment system, Persons within the working age group (15-60years) are more likely to make payments persons on retirement (above 60years). This is because young people are economically active all things being equal hence more likely to make payments (transfers and receipts) due to series of transaction they may engage in than those on retirement who are consuming from savings and remittances and resistant to change. Age will have positive sign for young people and negative for the aged.

Gender

Gender is whether the person is male or female. Gender is a dummy that takes the form ($X_2 = 1$ if female, $X_2 = 0$ if male). All things being equal, females are more likely to save than their male counterparts. This is because females are vulnerable and economically disadvantaged and so usually take precautionary measures to protect

themselves against unexpected risk and vulnerabilities. In this regards, females turn to save even the smallest amounts especially those who engage in economic activities than their male counterparts. This is consistent with Mbarathi (2004) who indicated that women are likely to save more especially through mobile money to protect themselves against unexpected risk and vulnerabilities. Females turn save more than their male counterpart, hence have a negative sign.

In terms of the payment system, males are more likely to make payments than their female counterparts. This is due to the fact that males control economic resources and are economically active than females counterparts, hence have tendency to make payments and so give positive sign.

Marital Status

Marital status is whether an individual is married or unmarried. . Marital status is a dummy that takes the form (X_6 =1 if married, $X_6 = 0$ if otherwise). Marital status has an ambiguous effect. On one hand, individuals who are married may be saving (either in the bank or with mobile money) for family projects (predictable purposes) as well as saving for emergencies (unpredictable purposes) than those who are unmarried and so gives a positive sign. On the other hand, individual who are married may find it difficult to save due to increased pressure on family income as a result of increased consumption, hence negative sign.

On the payment system (transfers/receipts), people who are married increase their network of social relations because of their in-laws than those who are not married hence, are more likely to make payments than those who are not married all things being equal. For instance, husbands are likely to transfer to wives, parents and in-laws

where distance is a barrier. The reverse is also true in the case of wives. Hence, married people will have a positive sign.

Income level

Income simply refers money generated from engaging in any economic activity. According Keynes (1936), income is a key determinant of savings. Thus, income is either consumed or saved Income is a categorized into various income groups, ($X_7 =$ 1 if less than 100, $X_7 = 2$ if 101- 200, $X_7 =$3 if 201-400, $X_7 = 4$ if 401-600, $X_7 =$5 if 601-800 and, $X_7 = 6$ if 801-1000 and $X_7 = 7$ above 1000. The control group is those with less than Ghc100. Individuals with relatively high and constant flow of income are more likely to save than persons with low and irregular flow of income. This implies that the coefficient of income levels will be positive and greater than zero for those with high incomes and less than zero for income users.

In terms of payments, persons with high incomes are more likely to make payments (transfers and receipts) than low income earners, all things being equal. This is because those with high incomes engage in series of transactions and so are more likely to make payments (transfers/receipts either through mobile money or banks). Therefore, high income earners will have positive effect and negative sign for low income individuals.

Employment Status

Employment status shall be used to analyze the impact of mobile money on savings. Employment refers to whether a person is engaged in any economic activity or not, thus, whether the person is employed or not. Employment status is a dummy described as $X_5 = 1$ if one is employed and $X_5 = 0$ if otherwise. Individuals who are

employed have a greater opportunity to save than those who are unemployed. This is because those who are employed earn income and so have a better chance of saving Hence, the coefficient for employment status will be positive for those are employed and negative for those who are unemployed.

Type of employment

The type of employment is used to analyze the impact of mobile money on payments. This refers to whether the person is with the formal sector and receives salary through the bank or self-employed. Type of employment is a dummy described as $X_5 = 1$ if self-employed and $X_5 = 0$ if otherwise. The type of employment has impact on payments. Persons in the formal sector who receive salary through the bank all things held constant are more likely to make payments than the Self-employed persons. This is because persons employed in the formal sector have access formal financial services in addition to other services such as mobile money and so will have positive sign, while those who are self-employed will have negative sign.

Educational Status

Education refers to whether a person has attained at least a minimum of basic education to the tertiary level or uneducated. Educational status is a categorical variable that take the following form; ($X_4 = 1$ if uneducated, $X_4 = 2$ if basic education, $X_4 = 3$ if secondary and $X_4 = 4$ if tertiary). In this variable, the uneducated is controlled. Educational statuses of people also have an impact on savings. In developing countries, illiteracy as well as low financial literacy have often been noted as the causes of low savings behavior. Therefore, Persons with low level of education are less likely to save (either through bank or mobile money) and so gives a positive

sign. This is because people with low education level have no access to formal financial services due to financial illiteracy.

Persons with high educational status are more likely to make payments (transfers/receipts either via bank or mobile money) than those with low or no education. This is because persons with high education have access to formal financial services and have knowledge of various modes of payment available. Educated persons are also more likely to accept change and hence adopt new technologies that emerge than those with low education who are resistant to change. Therefore, persons with high educational status will have positive effect whiles those with low or no education will have negative effect.

Table 3.1 Variable Description Table

Variable	**Description**	**Expected sign**
Mobile money	Indicate whether the person is a user or non-user of mobile money, encoded as mm=1, if a person is a user and mm=0, for non-users X_7 =1	Expected to be positive (+)
Gender	Indicate the gender of respondent, Encoded as X_2 = 1 for Female, X_2 = 0 if male	Positive (+)
Age	Indicate the age of respondents, encoded as X_3 =1, for 15-20 yrs, X_3 =2 for 21- 30 yrs, X_3 =3 for 31-40yrs, X_3 =4 for 41-50 yrs, X_3 =5 for 51- 60 yrs, X_3 =0 for 60 and above	Positive for the young population
educational status	Indicate the education level of respondent, Encoded as X_4 =0 for Illiterate, X_4 =1 Primary, X_4 =2	Positive for those educated and

	Secondary, X_4 =3 for tertiary	negative for uneducated
Employment status	Indicate whether a person is engaged in economic activity (employed) or not, encoded as X_5 = 1 for unemployed and X_5 = 0 , otherwise	Positive for the employed
Marital status	Indicate the marital situation of respondent, Encoded as X_6 = 1 if Married, X_6 =0 if Single	Ambiguous effect (i.e can be positive or negative)
Income level	Indicate the various incomes levels of respondents, encoded as X_7 =0 for less than 100, X_7 =1 for 101-200, X_7 =2 for 201-400, X_7 =3 for 401-600, X_7 =4 for 601-800, X_7 =5 for 801-1000, X_7 =6 for above 1000 **Note**: all figures in the income category are in Ghana cedi	Positive sign

3.7 Estimation Technique

The study employed the probit model analysis to examine the impact of mobile money on savings behavior and payment systems. (Gujarati, 2004). Because the dependent variable y is binary in nature, the objective is to find the probability of an event happening, hence the study seeks to find the likelihood of a person using mobile money account make savings and payments. Using the maximum likelihood approach

of estimation, which consist of estimating the unknown parameters in such a manner that the probability of observing the given Y's is as high as possible (Gujarati, 2004).To use the maximum likelihood, one must make an assumption about probability distribution of the disturbance term, thus it follows the normal distribution. This model can also be used in large samples, hence it is also referred to as large- sample method. Using sampled response obtained from self-administered questionnaires, the study determines whether the adoption of mobile money have impact on the savings behavior as well as on payments (transfers/receipts). For instance, if the dependent variable y (savings) is a binary response variable then it takes two values thus, 1 or 0. Letting y (qualitative variable) represent the response of the sampled population. Hence, takes value of 1, if a person indicates savings, Y= 0, if does not save.

3.8 Reliability Test

There was pre-testing of the instrument to ensure its reliability and validity. This was done at Chiana in the western part of the Kassena/Nankana West district where five people were interviewed to check if the questionnaire design is consistent and can help achieve the research objectives. Modifications were made after the necessary adjustments were made to those portions that were considered unclear, inaccurate, inappropriate and misleading. Thus, the pilot study was done to measure the authenticity and reliability of the questionnaire to ensure that it is appropriate for the study.

The Cronbach Alpha value was used as a measure of reliability of the instruments used in soliciting information from respondents on the impact of mobile money on savings and the payment. The Alpha was developed by Lee Cronbach in 1951 as a measure of internal consistency of test or scale. It is express as a value between 0 and

1 (Tavakol, 2011). Internal consistency describes the extent to which the items in a given instrument measure the same concept. The closer the value of Alpha is to 1.0, the greater the internal consistency (Tavakol, 2011). If all the items on the scale are entirely independent of each other (no covariance or not correlated) then, Alpha = 0, and if all items are highly correlated (or high covariance), then Alpha will be closer to 1(Goforth, 2016). Many methodologies recommend a minimum Alpha coefficient of between 0.65 to 0.90 as good whiles less than five (<5) is unacceptable (Goforth, 2016)

CHAPTER FOUR

RESULTS AND DISCUSSION

4.1 Introduction

This chapter dwells on analysis and discussion of the results of the study. The chapter employed descriptive and regression analysis in presenting the results obtained. The chapter comprises of four sections namely; descriptive analysis, regression analysis of the impact of mobile money on savings, regression analysis on the impact of mobile money on payments and analysis of the reliability test of the study.

4.2 Descriptive Analysis

This sections deals with the demographic analysis of characteristics of respondents thus, mobile money users who were interviewed by the researcher. The demographic characteristics results are analyzed and presented table 1and table 2; Employment status, sector of employment, occupation as well as income levels of respondents.

4.2.1 Personal information of respondents

This is section discusses the personal information of respondents which include the following categories; age, gender, marital status, educational status. This is presented in table 1.

Table 4.1 Personal Information of respondents

	Category	Frequency	Percent
Gender	Male	139	46
	Female	161	54
	Total	300	100
Age of Respondents	15-20 years	28	9
	21-30 years	127	42
	31-40 years	108	36
	41-50 years	16	5
	51-60 years	11	4
	60 and above	10	3
	Total	300	100
Education Level	Educated	230	77
	Uneducated	70	23
	Total	300	100
Marital Status	Unmarried	133	44
	Married	167	56
	Total	300	100

Source: Field survey

The results from table 1 indicate that respondents who fall between the ages of 21-30years constituting 42% dominate all age groups. This is followed by age 31-40years with 36%. These age groups dominate as compared least group of above 60yrs which has 3%. This implies that these age groups are the most active users of the mobile

money service due partly to the fact that, they economically active, and can also easily embraced change.

Besides, the educated class defined as those who have acquired minimum of basic education constituting 77% dominates the service as compared to those who are uneducated. This implies that, the educated majority are those who easily embrace change hence their dominance over the service. Majority of the educated who possess bank accounts still use mobile money for transactions. In addition, students equally embraced the service as the most effective way to receive remittances from their parents and relatives instead of informal mechanisms or struggling in long queues in the bank to receive small amounts.

On marital status, 56% are married whiles the remaining 44% are unmarried. Gender is another important demographic characteristics, the female category dominates the respondents as the constitute 54% as compared to the male constitute 46%. On the economic characteristics, those who are employed constituting 72% of the respondent patronized the service more than the unemployed who are only 28%.

4.2.2 Economic Characteristics of Respondents

This section dwells on economic characteristics of respondents. This includes employment status, sector of employment, occupation and income level. This is illustrated in table 2 below

Table 4.2 Economic Characteristics of Respondents

	Category	Frequency	Percent
Employment status	Unemployed	84	28
	Employed	216	72
	Total	300	100
Sector of employment	Public and private sector	101	45
	Self-employed	121	55
	Total	222	100
Occupation	Trading	58	23
	Teaching	61	24
	Civil servant	24	10
	Farming	28	11
	Student	35	14
	Other	46	18
	Total	252	100
Income level	Less than 100	58	23
	101-200	50	20
	201-400	43	17
	401-600	32	13
	601-800	30	12
	801-1000	9	4
	above 1000	34	13
	Total	256	100

Source; Field Survey

From table 2, low-income earners are the dominant group among all income categories of users. Those whose income falls between less than 100, to 400 are the dominant respondents constituting 60% of the sampled population. On category of occupation, the self-employed such traders, farmers, as well as other self-employed

such as the hairdressers, masons, carpenters, tailors, constituting 55% patronized the service more whiles student respondents are 14% of the total sample size

4.3 Mobile Money Account usage Characteristics

This section of the chapter discusses the mobile money characteristics of the respondents. This comprise of m-money account savings, m-money account withdrawals and transfers, reasons for the adoption of m-money, challenges they face as well as their suggestions for the improvement of the service.

4.3.1 Comparing Savings and Withdrawals/Transfer of Respondents

Here the study looks at the number of people holding bank accounts and compares the behavior of respondents with regards to savings on one hand and withdrawals/receipts on the other hand. This has been illustrated in table 3 below.

Table 4.3: Comparing Savings and Withdrawals/Receipts

		Frequency	Percentage
m-money account	No	15	5
	yes	285	95
	Total	300	100
m-money withdrawal	No	45	15
	Yes	25	85
	Total	300	100
m-money savings	No	139	46.33

	Yes	161	53.67
	Total	300	100
Bank account savings	No	124	41.33
	Yes	176	58.67
	Total	300	100
Bank account	No	96	32
	Yes	204	68
	Total	300	100

On the mobile money account holding, 95% of the respondents have mobile money account out of which 68% have bank accounts. 53.67% and 58.67% are reported to have saved on their mobile money account and bank account respectively as indicated in table 3 above. 85% of the respondents who possess both bank and mobile money accounts indicated that mobile money has not impacted on their bank savings. Whiles about 85% respondents have made withdrawal from their mobile money accounts. From table 3, it can be deduced that about 31.33% of the account holders use the account for only withdrawals/receipts instead of saving indicating that those who withdraw are more than those who save. One can also deduce that 5% save only in banks and do not save on mobile money account.

Reasons for the adoption of mobile money

This section presents the reasons that motivated the adoption of the mobile money account service. The section clearly shows the major reason for the adoption of the service as well as the least ranked reason. This is illustrated in the table below.

Table 4.4 Reasons for the Adoption of Mobile Money

Table 3 Reasons for mobile money Adoption

Category	Frequency	Percent
Easily accessible	126	42%
Fast and convenient	102	34
Cost effective	48	16
Reliable and secured	18	6
other	6	2
Total	300	100

From Table 4, the major reason why people adopt the service is because it is easily accessible to them. This constituting 42% of respondents, 34% indicated that it is fast and convenient and 16% said it is cost effective, 6% indicated that it is reliable and secured whiles the least ranked reason is other reasons such as, they are compelled by family and friends to use it constitute only 2%. With easy accessibility as the major reason followed by fast and convenient, it implies that mobile money serve as a window of opportunity for the financially excluded such as the vulnerable groups especially those in the rural areas

Challenges of using the mobile money

This section focuses on the challenges clients face in the use of mobile money services. The section identifies the top ranked challenge and the least challenge. Figure 4.1 below illustrates the challenges.

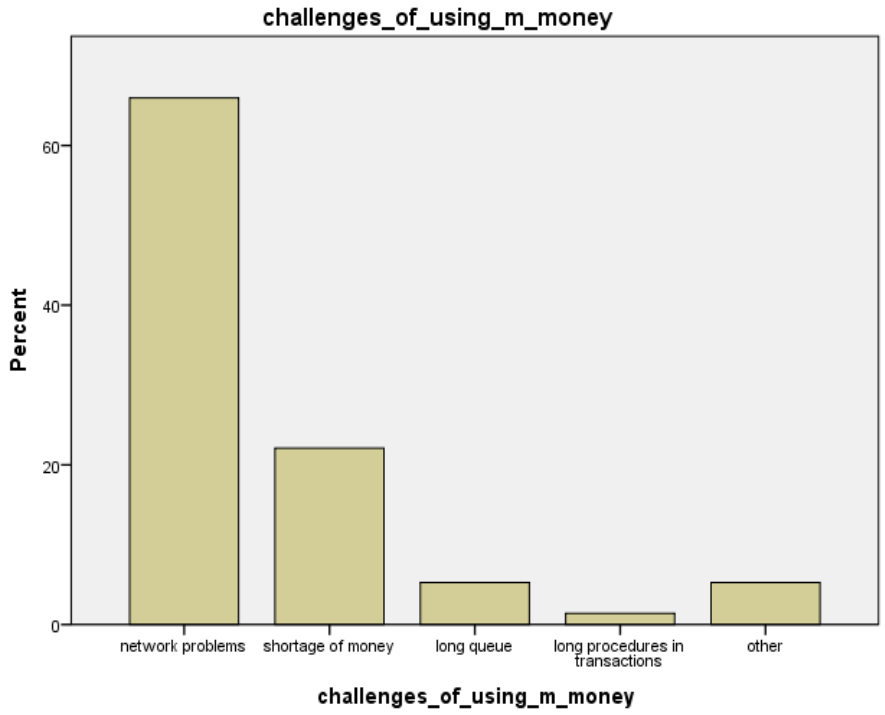

Figure 4.1 Illustration of the Challenges of using Mobile Money

Network problems are ranked the leading challenge representing 66% followed by shortage of money constituting 22%. About 5% of the respondents indicated other challenges such as unfriendly treatment from retail agents, failure of mobile network operators (MNOs) to address accounts problems on time, increased in cost of transaction, and inability to transact across networks whiles long procedures in transactions is the least ranked reasons with 1%. However, many suggestions were made towards the improvement of the services.

Suggestion for improvement of the mobile money service

This section discusses the various suggestions that had been offered by respondents for improvement of the service. This have been illustrated in Figure 4.2 below.

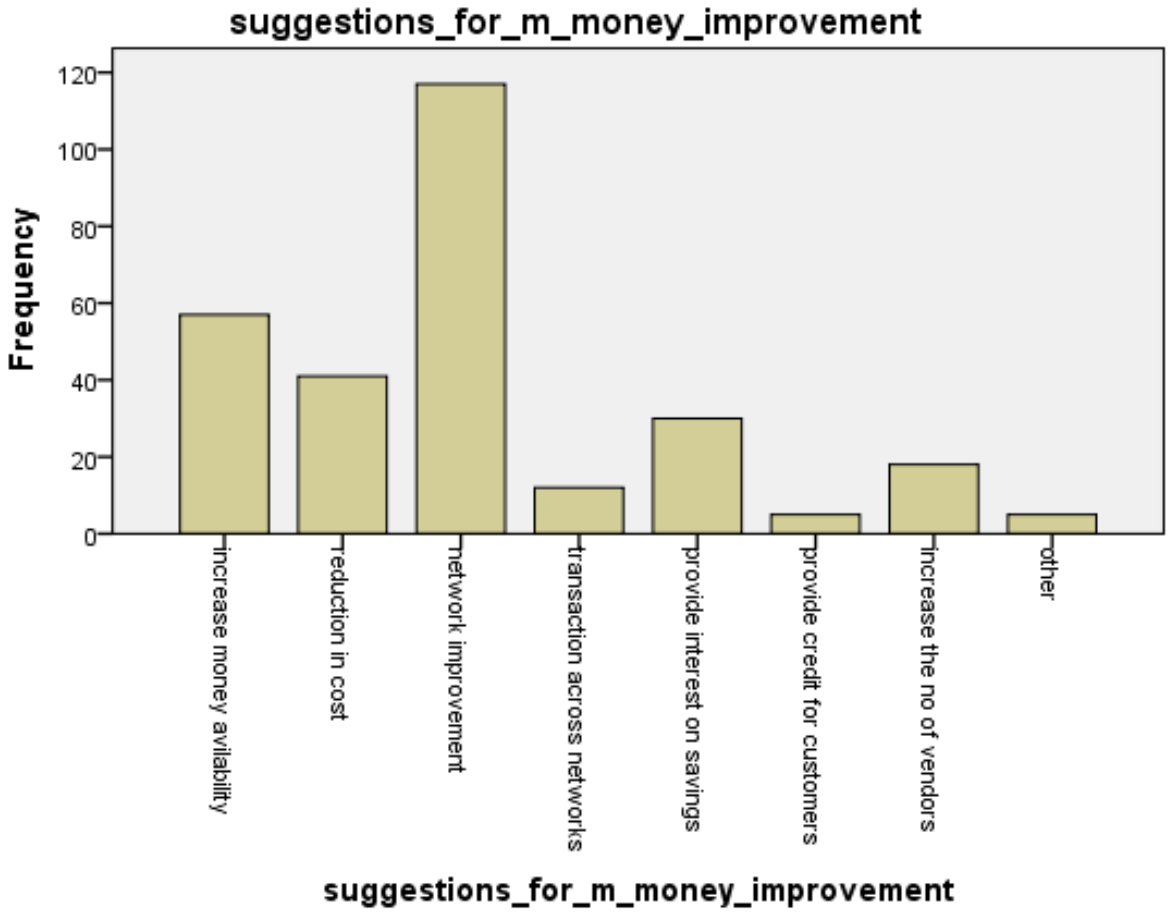

Figure 4.2 Illustration of the Suggestions for Improvement

The statistics above indicates that 41% are calling for network improvement, 20% suggested increased availability of money with the retail agents, and 14% are interested in reduction of the cost of transaction while 11% want to have interest on their savings. These percentages imply that if these suggestions are taken into consideration, then it has the potentials to serve as a window of opportunity for the poor and vulnerable groups that are financially excluded.

4.2 Analysis for the Effect of Mobile Money on Savings

This section discusses the impact of mobile money on savings in the Kasena/Nankana district of the upper East region. The analysis was based on probit regression model using the stata (version 11). The result of the model is shown in Table 5 below;

Table 4.5: Probit Regression Results for the Impact Mobile Money on Savings

		Robust	
Variables (savings**)**	**Coefficient**	**Std. Error**	**Marginal Effect (dy/dx)**
m-money (No savings)			
m-money account savings	.9898042***	0.2435772	0.3443202
Age (above 60years)			
15-20years	1.927279***	0.6637535	0.3648348
21-30years	1.699159*******	0.6152511	0.51873
31-40years	1.284856**	0.643202	0.4115494
41-50years	0.7543627	0.7163294	0.2195318
51-60years	2.229336***	0.8442294	0.3552808
Gender (male)			
Gender	-0.2735592	0.2411559	-0.093479
Empl status (employed)			
Empl status	-1.030609******	0.4501131	-0.2915364
Income level (less thanGH¢**100)**			
GH¢101.00- GH¢ 200.00	0.8183962**	0.3606095	0.2526051
GH¢ 201.00- GH¢ 400.00	0.4671708	0.3807599	0.1539888
GH¢ 401.00-GH¢ 600.00	0.2063417	0,4950457	0.071471
GH¢ 601.00-GH¢ 800.00	2.049832***	0.5763602	0.4020069

GH¢ 801.00-GH¢ 1000.00	-0.0896231	0.6978487	-0.0324868
Above GH¢ 1000.00	0.5029875	0.6644701	0.1644882
Marital status (unmarried)			
Marital status	0.2218575	0.2852557	0.807012
educ status (uneducated)			
Basic educ	0.2301156	0.2649566	0.0809228
Secondary educ	-0.5413906	0.3712369	-0.2052043
Tertiary educ	0.9847338**	0.4651401	0.3150769
Constant	-1.356291	0.7641841	

Number of observations = 264	Prob > Chi-square = 0.0000
Wald Chi-square (18) = 62.77	Pseudo R^2 = 0.2882

Note: Reference categories are in parentheses and ***, and ** denote 1%, and 5% Significance level

The overall model is significant because chi-square is significant at the 1% and about 29% of the variation in the probability of saving is explained by the following variables; age, income level, mobile money, marital status, gender, educational status and employment status.

From Table 5, the results for the savings model indicate that, mobile money adoption is significant with and positive at the 1%. The results indicate that, there is a positive relationship between mobile money and savings hence, m-money increases the probability of saving since the coefficient of our variable of interest is significant. It also shows that, if a person adopts mobile money, then the probability of the person saving increases by 34.4%. One can therefore conclude that mobile money can be a

useful tool for savings because though majority of the respondents indicated that they have bank accounts, still find mobile money as a useful tool to save, either for predictable or unpredictable purposes. The findings of the study support the fact that mobile money adoption and usage increases access to finance, hence the service can allow previously financially excluded individuals to gain access to finance which is in line with the findings of Nnandhi (2012).

The results again showed that age is an important variable in savings since age is statistically significant and positive for persons that fall within the following age category (15-20, 21-30, 51-60 years) and 31-40 years at 1% and 5% level of significance respectively whiles persons between 41-50 years is statistically insignificant but have a positive sign as shown in table 5. This implies that, there is positive relationship between individuals who fall within working-age group and savings. The implication is that, individuals who fall between 15-20years, 21-30years and 31-40years have 37.5%, 52% and 41% probability of saving respectively. The intuition is that, individuals within these ages have reduced family pressure either because they do not have children yet or children are few and young so have limited needs. This reduces their dependency ratio thereby allowing them to save more, all things being equal. Person's whose age falls between 41-50years though statistically insignificant, exhibit a positive relationship with savings, all things being equal. Equally, persons within age 51-60 years are more likely to save. This is because individuals within this category have many children who have weaned themselves from parental care, thus reducing family expenditure and also given the fact that individuals within this are preparing for retirement try to save more. The control group thus, those who are 61years and above, are expected to dissave, all things being equal. Results showed a hump-shape relationship between age and savings which is

consistent with its sign discussed earlier and in line with the life-cycle hypothesis which states that individuals spread their lifetime consumption over their entire life by saving more during their economically active periods to maintain consumption when they are on retirement. The results are also similar to the work of Serge and Clovis (2014) who indicated that age is significant in savings.

The marital status is also an important variable that can be used in determined savings behavior but the a priori sign indicates an ambiguous effect. Marital status has further been categorized into married, and unmarried. The unmarried group serves as the control group whiles the married is the dummy. The results indicate that marital status is statistically insignificant but positive in both dummies at the 5% level of significance. This implies that there is a positive relationship between marital status and savings but there is no significant difference between the control group and the dummies on the probability of saving. Thus, people who are married have the same probability to save as the unmarried. This does not confirms the ‘’size effect’’ which means that the larger the family size, the less likelihood for savings. This is not consistent with economic theory which states that large households are more likely to have more dependents than small family size, all things being equal. The findings are also not consistent the findings of Serge and Clovis (2014), who indicated that a household of more than one is less likely to save as compared living alone.

Income levels have often remained a crucial factor in determining the savings behavior of people. Thus, high income individuals are more likely to save than low income people, all things being equal. The results from this study confirmed that income level is indeed important factor determining savings. From table 5, income category (101-200) and (601-800) are significant at 1% and 5% respectively. This means that people whose incomes are within (101-200) and (601-800) have a 25.26%

and 40.2% probability to save especially if they are users of mobile money. However, income category (201-400), (401-600), (801-1000) and (above 1000) are statistically insignificant but positive this may be due to their attitude towards savings. This is consistent with the theory of Keynes (1936) who argue that income is a key determinant of savings. It is also in line with the permanent income hypothesis which assumes that people attempt to maintain a fairly constant standard of living even though their incomes vary considerably. The findings of the study confirm that the findings of Clovis and Serge (2014) who indicated that increase in income induce people to build up savings.

Another important variable of interest is the educational status of respondents. Education has been categorized into tertiary, secondary and basic education. In developing countries, illiteracy as well as low financial literacy has often been noted as the causes of low savings behavior (Clovis and Serge (2014). Results from this study indicate that, the coefficient of tertiary education is positive and statistically significant at the 5% level. This implies that, the people who have acquired tertiary education have a 31.5% probability to save than the control group and those with low education. There is however no significant difference in the probability of saving between the control group and the basic as well as the secondary categories. This is because basic and secondary education category have low financial literacy and so may not be aware of the various opportunities of saving. The results are in the same direction with the findings of Litondo and Ntale (2013) in Kenya who concluded that education is a prime determinant of adoption of mobile money.

Results from table 5, indicates that employment status is significant at the 5% level but negative. This implies that there is a negative relationship between savings and employment status. This negative relationship may be attributed to partly because of

poor attitude towards savings or the inability of their incomes to meet their needs as a result of high dependency ration. This is not consistent with the findings of Clovis and Serge (2014) who indicated that employment level is significant for savings.

Results from table 5 indicate that, there is no significant difference in the probability of savings between control group (male) and the dummy variable (female). There is no significant difference in the probability of saving between female users of mobile money and their male counterparts who use mobile money. These findings are not in consonance with the results of Mbarathi and Diga (2014) that who indicated that mobile money can be a useful tool for women to save to protect themselves from unexpected risk and vulnerabilities as well as plan for immediate needs and hence reduce inequality between men and women

4.3 Analysis of the Effect of Mobile Money on the Payment System

This section focuses on the effects of mobile money as a means of payments in the Kasena/Nankana district of the Upper East Region. Employing the probit model, the analysis was done using stata (version 11) and the results presented in table 6 below

Table 4.6: Probit regression results for impact mobile money on payments

Variables (payments)	Coefficient	Robust Std. Error	Marginal Effect (dy/dx)
m-money (No payments)			
m-money account payments	1.321163***	.427701	.163349
Age (15-20years)			
21-30years	-4.34717***	.3992777	-.8975499
31-40years	-4.959166***	.4554586	-.8724728
41-50years	-5.678215***	.6614655	-.9740745
Above 60years	-6.29598 ***	.6891242	-.9657253
Gender (male)			
Gender	.2794092	.3055507	.0398429
Empl sector (self empl)			
Empl sector	-.3507614	.5056393	-.0419037
Income level (GH¢ 801-1000)			
Less than GH¢100	.2161462	.6085589	.0232356
GH¢101.00- GH¢ 200.00	.9814878	.6133992	.0807513
GH¢ 201.00- GH¢ 400.00	.2594085	.5013011	.0279766
GH¢ 401.00-GH¢ 600.00	-.2090674	.4792604	.0285505
GH¢ 601.00-GH¢ 800.00	1.260282**	.5452725	.0808525
Marital status (unmarried)			
Marital status	-.2364843	.4490869	-.0268826
educ status (uneducated)			
Basic educ	.2923748	.3672121	.0329283

Secondary educ	.8813212**	.41857	.0627906
Tertiary educ	1.283202**	.5527412	.1351828
Constant	4.468895***	.592688	

Number of observations = 224	Prob > Chi-square = 0.0000
Wald Chi-square (16) = 709.05	Pseudo R^2 = 0.3849

Note: Reference categories are in parentheses and ***, and ** denote 1%, and 5% Significance level

From table 6, the overall model is significant at the 1% judging from the Chi-square value and about 38.5% of the variations in the probability of a person making payments is explained by the variables m-money age, level of education, married, divorce, and employment status as well as income level. Below is the analysis of the individual variable effect

From Table 6, the results for the payments model indicate that, mobile money adoption is significant and positive at the 1% level of significance. The results indicate that, there is a positive relationship between mobile money and payments and hence, m-money increases the likelihood of making payment. It also shows that, people who adopt mobile money are 16.3% more likely to make payments. one can therefore conclude that mobile money can be a useful tool for payments because despite alternative modes of payments that may be available to the respondents, still find mobile money as a useful tool for payments because. This is due to the fact that mobile money is fast and convenient as well as easily accessible. This is consistent with the findings of Mbogo (2010) who indicated that facilitates payments.

The age of a person can determine the rate at which payment (transfers/receipts) are made. From table seven above, all age categories are significant at 1% but negative. The implication is that all things being equal, all the categories are less likely to make payments as compared to the control group (15-20years). This may be attributed to the fact that, people within control group categories are younger and are either taking remittances or running errands for their elderly siblings or parents. This results is not consonance with Tugume (2015) who indicated age is not significant in making payments

Results from table 6 there is no significant difference in the probability of payments between control group (male) and the dummy variable (female) indicating that, there is no significant difference in the probability of payment between female and their male counterparts especially if they use mobile money. However, there is a positive relationship between gender and payments. This is not in line the findings of Sivapragasam et al. (2011) who found that females are more likely to make payments than their male counterparts

The marital status of individual affects payments (transfers/receipts) system. This is because people who are married turn to have greater number of relations as a result of in-laws as compared to those who are unmarried. From table 6, the results show that marital status is statistically insignificant. This implies that, there is no significant difference between the control group and the dummies on the use of mobile money as a means of payment. This implies that married couples as well as the divorce who use mobile money have equal probability to make transfers/receipts as the control group (unmarried). This results is not consonance with the findings of Tugume et al. (2015) who concluded that marital status could increase the probability that a consumer using mobile money make payments.

The educational status of individuals have ambiguous effect may show no sign when it comes to payments since education allow individuals to embrace change. On the other hand, people who are educated have access to formal financial service and so are less likely to embrace mobile money as a means of payment. From the results in table 6, both tertiary and secondary education is statistically significant at 5% and positive judging from the P-value. Implying that, persons who acquire tertiary and secondary education are 13.5% and 6.3% respectively more likely to make payments. There is significant difference between the control group and in the probability of making payment and the basic education dummy especially users of mobile money. This is consistent with the findings of sivapragasam et al. (2011) who noted education is a key determinant of payments.

The level of an individual income can influence the use of mobile money by the individual as a means of payment. For instance, high income individuals have a greater probability to make payments than low income peoples especially those who use mobile money. The findings from the regression in table 6 indicate that, income level category (601-800) at 5% significance level and positive judging from the P-value. This shows that people in income category (601-800) are 8.1% more likely to make payments especially if the use mobile money. Income categories (less than 100, 101-200, 201-400, and 401-600) are however statistically insignificant. The implication is that relatively high income earners are more likely to make payments than low income earners especially those who use mobile money. This is in line the results of Sivapragasam et al. (2011) who noted that those on higher income are more likelihood use mobile money for payments.

The type of employment is described as the economic activity one engages in, thus, whether the person is self-employed or employed in the formal sector. From the

results above, employment status is statistically significant. This implies that there is no significant difference between the control group (self-employed persons) in the likelihood of payment and the dummy given that the person is a user of mobile money. This can be attributed to innovations such as mobile money that have brought financial services to the door steps of the financially excluded. This findings support the view of Tugume et al. (2015).

RELIABILITY TEST ANALYSIS

This section discusses the reliability and authenticity of the items used in the questionnare for the data collection. The Cronbach Alpha value was used to test the reliability of the instruments used in eliciting information from the respondents on the impact of mobile money on savings and payments. The results of the test is presented in table 7 and 8 as shown below;

Table4.7 Reliability Test Results for Savings Model

Cronbach Alpha value	Number of Items
0.8171	10

Source; Analysis based on field survey data, June, 2016. Note; for details of test see Appendix

From table 7 above, the Cronbach Alpha value is 0.8171 which demonstrates the level of internal consistency of 81.71%. A minimum alpha value of 0.65 to a maximumof 0.90 is considered acceptable for internal consistency. Hence, the result shows a high degree of internal consistency. This implies that the questionnaire used for the data collection is authentic and reliable. This Implies that,there is a high tendency of obtaining the same results if the questionnaire is administered on the same respondents for the second time

Table 4.8 Reliability Test Results for Payments Model

Cronbach Alpha value	Number of Items
0.7026	10

Source; Analysis based on field survey data, June, 2016. Note; for details of test see Appendix

From table 8, the Alpha value is 0.7026 which implies a high level of internal consistency of 70.26%. An alpha value between 0.65 to 0.90 is considered acceptable for internal consistency. Hence, the result shows a high degree of internal consistency. This implies that the instrument used for soliciting information from respondents is very good and reliable. This Implies that,there is a high tendency of obtaining the same results if the questionnaire is administered on the same respondents for the second time

CHAPTER FIVE

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this chapter, the summary of the results the study, the conclusions drawn as well as the recommendations of the study based on the findings are discussed.

5.2 Summary of Findings

The summary of results is done with considerations to the three research questions of the study which includes the following: what is the impact of mobile money on the savings, what is the impact of mobile money on the payments (transfers/ receipts) and the challenges of using mobile money in the Kasena/Nankana west District. Summary of research question is given below;

The results show that mobile money plays a key role in terms of savings irrespective of marital status, gender, as well as educational level of people. The low income self-employed individuals such as those in petty trading, artisans, hairdressers, tailors, street hawkers and market women found it as a welcome innovation, source of relief and opportunity for them to drop small amounts in their accounts conveniently and have access to it anytime anywhere without any stress. Apart from the self-employed, those in the formal sector equally found it useful to save some amounts there for easy access and convenience in times of emergency. Hence, the researcher observe that fast and convenient, easily accessible and reliable and secured were the most reasons respondents give for the adoption of the service.

Statistics from the analysis indicates that about 95% of the respondents have mobile money accounts which they basically use for transfer and receipts of money. The remaining 15% who no mobile money accounts either make transfers/receipts through

family members/ friends accounts through special arrangements with the MNOs where password is offered for transfer and receipts of money. This elicits the central role mobile money play in payments. The results further indicate that, the innovation of mobile money is a blessing to many households irrespective of educational status, especially those in rural areas who have at least one migrant family members in the city. Hence, Remittances has been found by many researchers as the most crucial function mobile money plays in the payment system since it allows low-income individuals transfer and receive remittances even at small amounts in a secured and reliable manner and hence increase the frequency of remittances. It was also realized that many students can now brief a sigh of relief as they can easily access cash from their relations instead of the queuing in banks for small amounts or through the informal mechanism with its associated risk.

Despite the crucial role mobile money service play in savings as well as payments, there are usually so many challenges that prevent consumers from getting the best of benefit. Among the challenges include; network problems, shortage of money, long queues at certain retail centers and difficult procedures in transactions. Other challenges are increase cost of transactions, unfriendly treatment from retail agents, and lackadaisical attitude of resolving account problems by MNOs agents. Among these, the most rated challenges are the network problems, shortage of money as well as high cost of transactions.

5.3 Conclusion

The study focused on the impact of mobile money in providing financial inclusion for rural people in the Kasena/Nankana district of the Upper East region. Using a sample of 300 respondents, the probit regression was used as an estimation technique. Financial inclusion has been cited as important factor in promoting economic growth.

This has been facilitated by the introduction of mobile money. Mobile banking can grow the economy, improve lives and reduce poverty as well as strengthened global competition. The study established that mobile money have the tendency to promote savings especially among the low-income earners such as petty traders, artisans and street hawkers. It has also been noted that mobile money is a solution to problems of rural remittances as it serve as an avenue by which individuals can fulfill their social obligation by extending financial support to family members in hard times through the transfers and receipts of even very small amounts at convenient and secured manner. It was realized that majority of consumers use the service because it has been perceived to be fast and convenient, easily accessible, and reliable and secure. However, many suggestions were provided by respondents towards enhancing the efficiency of the service. These comprises; reduction in transaction cost, transactions across networks, interest on savings, providing mobile credits and increase in the numbers vendors especially in rural areas where formal banking services are not available.

5.4 Recommendations

The introduction of mobile money serve as a relief to many people and as such it has contributed significantly towards breaching the financial exclusion gap especially the unbanked population in rural areas, however, can still be done towards enhancing efficiency of the service. Based on the results from the study, one can make the following recommendations;

Improvement in the network to enhance convenience and reliability of the service, reduction in transaction cost as well as MNOs should also be considering linking customers with bank accounts to their mobile money accounts and providing interest on savings to serve as an inducement for people to save on their mobile money

accounts, customers should be allowed to transfer/receive money across networks on their e-wallet, and the government of Ghana, financial institutions and other stakeholders should be considering liaising with the Mobile Network Operator's (MNOs) to use this channel to provide credits to low-income earners in the rural areas. These have been discussed in detail below.

Based on the fact that network problems is the top challenging issue of the clients. They study wish to recommend that there should be an upgrade in the network system to allow easy, reliable and convenient delivery of the service. This will allow the general public to develop confidence in the security and reliability of the mobile money system as in the case of the banks. This is to prevent fraud from smart people guarantee the safety of the assets of people.

High transaction cost has been offered as one of the major suggestions for improvement of the service. Transaction cost refers to the cost of transferring and withdrawing an amount. At the time collecting the data, there was an increase in cost of transaction hence, the call by many for cost reduction. The study wish to advice that MNOs should consider reducing transaction cost as many of respondents indicated that there had been a recent upsurge in the cost of transaction which is gradually drifting customers especially those with other options away from the service. This serves as disincentive to many users, and gradually closing that window of opportunity the mobile money service is offering to the unbank population especially those in the rural areas of Ghana.

The MNOs should be considering developing a system where customers with bank accounts would be linked to their mobile money accounts and also provide interest for money saved on mobile money accounts. This will serve as an inducement for people

who to save in their mobile money accounts as in the case of formal financial institutions. Connecting ones bank accounts to mobile money accounts will encourage most of the unbank population to especially those who engage in small scale businesses to save there conveniently and mobilize resources for their growth

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APPENDICES

APPENDIX A

INTERVIEW QUESTIONNAIRE

I am Baako, Emmanuel, a Master of Science (Msc) student at the Economics Department of Kwame Nkrumah University of Science and Technology (KNUST). **I am undertaking a research on the topic "The impact of mobile-money on savings and payment system among rural population in Kasena-Nankana district".**

Therefore, I should be grateful if you could answer the questions below to enable me successfully undertake the research. **The information given is purposely for academic study and will be treated with utmost confidentiality**

PERSONAL DATA

1. Gender Male [ ] Female [ ]

2. Age : 15-20 yrs [ ] 21-30 yrs [ ] 31-40 yrs [ ] 41-50 yrs [ ] 51-60 yrs [ ] Above 60 yrs [ ]

3. Educational level: None [ ] Basic [ ] Secondary [ ] Tertiary [ ]

4. Marital status : Single [ ] Married [ ] Divorced [ ] Widowed/Widower [ ]

5. Employment Status Employed [ ] Unemployed [ ]

6. If Employed, What is the sector of employment?

   Self-employed [ ] formal Sector [ ]

7. Occupation: Trading [ ] Teaching [ ] Civil servant [ ] Farming [ ] Other (please specify)……...

8. Income level: Less than GHc 100.00 [ ] GHc 100.00 – 200.00 [ ] GHc 201.00 – 400.00 [ ] GHc 401.00-600.00 [ ] GHc 601.00 – 800.00 [ ] GHc 801.00- 1000.00 Above GHc 1000.00 [ ]

INFORMATION ON MOBILE MONEY

9. Do you have a mobile phone? Yes [ ] No [ ]

10. How long have you been using mobile phone? Less than 1 year [ ] 1-2 years [ ]

3-4 years [ ] 4-5 years [ ] Above 5 years [ ]

11. Do you have mobile money Account? Yes [ ] No [ ]

12. How long have you been using mobile money account? Less than 6 months [ ] 7 months to 1 year [ ] 1 year – 2 years [ ]

Above 2 years [ ]

13. Do you save on mobile money account? Yes [ ] No [ ]

14. Do you withdraw money from your mobile money account? Yes [ ] No [ ]

15. How often do you use the mobile money account for transactions?

Monthly [ ] Quarterly [ ] Semi-annually [ ] Annually [ ] Irregular [ ]

16. Why do you prefer mobile money account transactions to Bank's transactions?

It is easily accessible [ ] It is reliable and secured [ ] It is cost effective [ ]

It is fast and convenient [ ] Others specify…….....

17. What challenges do you normally face when using mobile money account for transactions? Network problems [ ] Shortage of money [ ]

Long queue [ ]

Long procedures in undertaken transaction [ ] Other (Please specify)……

FINANCIAL INFORMATION (PRACTICES, SAVINGS AND PAYMENT SYSTEM)

17. Do you have bank account? Yes [ ] No [ ]

18. How long has it been opened? Less than 6 months [ ] 7 months to 1 year [ ]

    1 year – 2 years [ ] 3-4 years [ ] Above 4 years [ ]

19. Do you save with your bank? Yes [ ] No [ ]

20. How often do you save at your bank? Monthly [ ] Quarterly [ ] Semi-annually [ ] Annually [ ] Irregular [ ]

21. What financial practice do you engage in? Bank [ ] Susu group [ ] Microfinance [ ] Saving at home [ ] other specify [ ]

22. Has having mobile money account change or affected your savings at the bank?

    Yes [ ] No [ ]

23. Before the introduction of mobile money which of the following did you normally use in transferring or for receiving money? **(Please select only one).**

    ATM [ ] E-Zwich [ ] Money gram [ ] Bank Teller [ ] Informal mechanism

24. Please give reason(s) for your choice in **question 22?**

    It is easily accessible [ ] It is reliable and secured [ ] It is cost effective [ ]

It is fast and convenient [ ] Others

specify…….....

25. What do you think should be done to improve the mobile money system of payment and savings?

……

<u>Thank you very much</u>

APPENDICE B

Regression results for savings model

Probit regression Number of obs = 264

Wald chi2(18) = 62.77

Prob > chi2 = 0.0000

Log pseudolikelihood = -125.01434 Pseudo R2 = 0.2882

| Robust

GENSAVINGS | Coef. Std. Err. z P>|z| [95% Conf. Interval]

MMSAVINGS | .9898042 .2435772 4.06 0.000 .5124016 1.467207

AGEcat1 | 1.927279 .6637535 2.90 0.004 .6263462 3.228212

AGEcat2 | 1.699159 .6152511 2.76 0.006 .4932887 2.905029

AGEcat3 | 1.284856 .643202 2.00 0.046 .0242035 2.545509

AGEcat4 | .7543627 .7163294 1.05 0.292 -.6496172 2.158343

AGEcat5 | 2.229336 .8442294 2.64 0.008 .5746763 3.883995

GENDER | -.2735592 .2411559 -1.13 0.257 -.746216 .1990977

EMPST | -1.030609 .4501131 -2.29 0.022 -1.912814 -.1484031

INCLEVELcat2 | .8183962 .3606095 2.27 0.023 .1116146 1.525178

INCLEVELcat3 | .4671708 .3807599 1.23 0.220 -.2791049 1.213446

INCLEVELcat4 | .2063417 .4950457 0.42 0.677 -.76393 1.176613

INCLEVELcat5 | 2.049832 .5763602 3.56 0.000 .9201867 3.179477

INCLEVELcat6 | -.0896231 .6978487 -0.13 0.898 -1.457381 1.278135

INCLEVELcat7 | .5092875 .6644701 0.77 0.443 -.7930499 1.811625

MASTcat2 | .2218575 .2852537 0.78 0.437 -.3372295 .7809445

EDUCLEVELcat2 | .2301156 .2649566 0.87 0.385 -.2891898 .7494211

EDUCLEVELcat3 | -.5413906 .3712369 -1.46 0.145 -1.269001 .1862203

EDUCLEVELcat4 | .9847338 .4651401 2.12 0.034 .0730761 1.896392

_cons | -1.356291 .7641841 -1.77 0.076 -2.854064 .1414822

Marginal effects after probit

y = Pr(GENSAVINGS) (predict)

= .67402003

---

variable | dy/dx Std. Err. z P>|z| [95% C.I.] X

---+---

MMSAVI~S*| .3443202 .08012 4.30 0.000 .187286 .501355 .492424

AGEcat1*| .3648348 .05091 7.17 0.000 .265057 .464612 .07197

AGEcat2*| .51873 .14568 3.56 0.000 .233205 .804255 .397727

AGEcat3*| .4115494 .17105 2.41 0.016 .076299 .7468 .390152

AGEcat4*| .2195318 .15314 1.43 0.152 -.080608 .519672 .060606

AGEcat5*| .3552808 .04164 8.53 0.000 .273664 .436897 .041667

GENDER*| -.093479 .07827 -1.19 0.232 -.246886 .059928 .871212

EMPST*| -.2915364 .09411 -3.10 0.002 -.475988 -.107085 .848485

INCLEV~2*| .2526051 .09169 2.76 0.006 .072901 .432309 .200758

INCLEV~3*| .1539888 .11431 1.35 0.178 -.070056 .378034 .162879

INCLEV~4*| .071471 .16446 0.43 0.664 -.25086 .393802 .121212

INCLEV~5*| .4020069 .04696 8.56 0.000 .309961 .494052 .113636

INCLEV~6*| -.032868 .25972 -0.13 0.899 -.541904 .476168 .037879

INCLEV~7*| .1644882 .19057 0.86 0.388 -.209023 .537999 .128788

MASTcat2*| .0807012 .10459 0.77 0.440 -.124294 .285696 .613636

EDUCLE~2*| .0809228 .09097 0.89 0.374 -.09737 .259216 .291667

EDUCLE~3*| -.2052043 .14458 -1.42 0.156 -.488583 .078174 .189394

EDUCLE~4*| .3150769 .11954 2.64 0.008 .080782 .549372 .32197

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Reliability test result of savings using Cronbach alpha value

Test scale = mean(standardized items)

			average		
			item-test	item-rest	interitem
Item	Obs	Sign	correlation	correlation	correlation	alpha
GENDER	300	+	0.1804	0.0912	0.1456	0.8215
AGE	300	+	0.7449	0.7023	0.1262	0.7960
EDUCSTATUS	300	+	0.5269	0.4586	0.1339	0.8067
MAST	300	+	0.6732	0.6210	0.1290	0.8000
EMPST	300	+	0.6819	0.6264	0.1290	0.8000
INCOMELEVEL	264	+	0.8110	0.7764	0.1261	0.7957
MMSAVINGS	300	-	0.4025	0.3255	0.1383	0.8125
AGEcat1	300	-	0.4143	0.3311	0.1377	0.8117

AGEcat2	300	-	0.4954	0.4220	0.1343	0.8073
AGEcat3	300	+	0.4141	0.3379	0.1377	0.8117
AGEcat4	300	+	0.3075	0.2274	0.1411	0.8160
AGEcat5	300	+	0.2581	0.1761	0.1427	0.8180
AGEcat6	300	+	0.2725	0.1910	0.1421	0.8173
EDUCLEVELc~1	300	-	0.2384	0.1491	0.1440	0.8196
EDUCLEVELc~2	300	-	0.1565	0.0677	0.1461	0.8220
EDUCLEVELc~3	300	-	0.3911	0.3098	0.1374	0.8114
EDUCLEVELc~4	300	+	0.7218	0.6769	0.1270	0.7971
INCLEVELcat1	264	-	0.5751	0.5099	0.1329	0.8054
INCLEVELcat2	264	-	0.3538	0.2712	0.1397	0.8143
INCLEVELcat3	264	+	0.0960	0.0057	0.1472	0.8233
INCLEVELcat4	264	+	0.2639	0.1772	0.1423	0.8176
INCLEVELcat5	264	+	0.1941	0.1053	0.1443	0.8199
INCLEVELcat6	264	+	0.1117	0.0216	0.1468	0.8228
INCLEVELcat7	264	+	0.5404	0.4717	0.1342	0.8071
MASTcat1	300	-	0.6735	0.6212	0.1290	0.8000
MASTcat2	300	+	0.6474	0.5920	0.1300	0.8013
MASTcat3	300	+	0.1239	0.0391	0.1473	0.8234
Test scale					0.1376	0.8171

Test scale = mean(standardized items)

			average		
			item-test	item-rest	interitem
Item	Obs	Sign	correlation	correlation	correlation	alpha
GENDER	300	+	0.1804	0.0912	0.1456	0.8215
AGE	300	+	0.7449	0.7023	0.1262	0.7960
EDUCSTATUS	300	+	0.5269	0.4586	0.1339	0.8067
MAST	300	+	0.6732	0.6210	0.1290	0.8000
EMPST	300	+	0.6819	0.6264	0.1290	0.8000
INCOMELEVEL	264	+	0.8110	0.7764	0.1261	0.7957
MMSAVINGS	300	-	0.4025	0.3255	0.1383	0.8125
Test scale					0.1376	0.8046

Regression Results of payment model

Probit regression Number of obs = 224

Wald chi2(16) = 709.05

Prob > chi2 = 0.0000

Log pseudolikelihood = -66.489559 Pseudo R2 = 0.3849

| Robust

PAYMENT | Coef. Std. Err. z P>|z| [95% Conf. Interval]

---+---

MMSAVINGS | 1.321163 .427701 3.09 0.002 .4828849 2.159442

AGEcat2 | -4.34717 .3992777 -10.89 0.000 -5.12974 -3.5646

AGEcat3 | -4.959166 .4554586 -10.89 0.000 -5.851849 -4.066484

AGEcat4 | -5.678215 .6614655 -8.58 0.000 -6.974664 -4.381767

AGEcat6 | -6.29598 .6891242 -9.14 0.000 -7.646639 -4.945321

GENDER | .2794092 .3055507 0.91 0.360 -.3194592 .8782777

SECEMP | -.3507614 .5056393 -0.69 0.488 -1.341796 .6402733

INCLEVELcat1 | .2161462 .6085589 0.36 0.722 -.9766073 1.4089

INCLEVELcat2 | .9814878 .6133992 1.60 0.110 -.2207525 2.183728

INCLEVELcat3 | .2594085 .5013011 0.52 0.605 -.7231236 1.241941

INCLEVELcat4 | -.2090674 .4792604 -0.44 0.663 -1.148401 .7302658

INCLEVELcat5 | 1.260282 .5452725 2.31 0.021 .1915676 2.328997

MASTcat2 | -.2364843 .4490869 -0.53 0.598 -1.116679 .6437099

EDUCLEVELcat2 | .2923748 .3672121 0.80 0.426 -.4273476 1.012097

EDUCLEVELcat3 | .8813212 .41857 2.11 0.035 .0609392 1.701703

EDUCLEVELcat4 | 1.283202 .5527412 2.32 0.020 .1998488 2.366554

_cons | 4.468895 .592688 7.54 0.000 3.307248 5.630542

. mfx

Marginal effects after probit

y = Pr(PAYMENT) (predict)

= .93826349

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variable | dy/dx Std. Err. z P>|z| [95% C.I.] X

---+---

MMSAVI~S*| .163349 .04456 3.67 0.000 .076014 .250684 .459821

AGEcat2*| -.8975499 .05128 -17.50 0.000 -.998059 -.79704 .352679

AGEcat3*| -.8724728 .05327 -16.38 0.000 -.976875 -.76807 .459821

AGEcat4*| -.9740745 .01021 -95.39 0.000 -.994089 -.95406 .071429

AGEcat6*| -.9657253 .01178 -82.01 0.000 -.988806 -.942645 .044643

GENDER*| .0398429 .0491 0.81 0.417 -.056387 .136073 .870536

SECEMP*| -.0419037 .06144 -0.68 0.495 -.162329 .078522 .549107

INCLEV~1*| .0232356 .0589 0.39 0.693 -.092209 .13868 .125

INCLEV~2*| .0807513 .04041 2.00 0.046 .001553 .159949 .209821

INCLEV~3*| .0279766 .05006 0.56 0.576 -.070136 .126089 .191964

INCLEV~4*| -.0285505 .07264 -0.39 0.694 -.170925 .113824 .142857

INCLEV~5*| .0808525 .02633 3.07 0.002 .029241 .132464 .133929

MASTcat2*| -.0268826 .04556 -0.59 0.555 -.116175 .06241 .696429

EDUCLE~2*| .0329283 .03902 0.84 0.399 -.043558 .109415 .316964

EDUCLE~3*| .0627906 .02106 2.98 0.003 .02152 .104061 .09375

EDUCLE~4*| .1351828 .05613 2.41 0.016 .025176 .24519 .375

(*) dy/dx is for discrete change of dummy variable from 0 to 1

Reliability test Result for payment using Cronbach alpha value

Test scale = mean(standardized items)

			average item-test correlation	average item-rest correlation	interitem correlation	alpha
PAYMENT	300	-	0.3696	0.2511	0.1014	0.6929
MAST	300	+	0.5882	0.4954	0.0928	0.6717
SECEMP	300	+	0.7012	0.6184	0.0881	0.6591
MMSAVINGS	300	-	0.4502	0.3410	0.0988	0.6867
AGEcat1	300	-	0.4202	0.2945	0.0997	0.6890
AGEcat2	300	-	0.4907	0.3802	0.0958	0.6795
AGEcat3	300	+	0.4179	0.3057	0.0999	0.6893
AGEcat4	300	+	0.3162	0.2001	0.1039	0.6986
AGEcat5	300	+	0.2410	0.1214	0.1072	0.7060
AGEcat6	300	+	0.2660	0.1474	0.1059	0.7032
EDUCLEVELc~1	300	-	0.1984	0.0644	0.1100	0.7119
EDUCLEVELc~2	300	-	0.1651	0.0355	0.1103	0.7126

EDUCLEVELc~3	300	-	0.4136	0.2949	0.0986	0.6863
EDUCLEVELc~4	300	+	0.7119	0.6427	0.0866	0.6547
INCLEVELcat1	264	-	0.5977	0.5044	0.0928	0.6718
INCLEVELcat2	264	-	0.3863	0.2683	0.1013	0.6927
INCLEVELcat3	264	+	0.1268	-0.0026	0.1110	0.7141
INCLEVELcat4	264	+	0.3051	0.1814	0.1044	0.6998
INCLEVELcat5	264	+	0.2066	0.0787	0.1080	0.7078
INCLEVELcat6	264	+	0.1383	0.0091	0.1107	0.7134
INCLEVELcat7	264	+	0.5068	0.4010	0.0967	0.6816
Test scale					0.1011	0.7026